

POLITICAL ECONOMY PERSPECTIVES ON THE GREEK CRISIS

Debt, Austerity and Unemployment

Edited by

Ioannis Bournakis

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Political Economy Perspectives on the Greek Crisis

Ioannis Bournakis · Christopher Tsoukis
Dimitris K. Christopoulos
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Editors

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Part I

Introduction and Political Economy Approaches

1

Introduction

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1.1 Introduction

After brewing for some months, the Greek sovereign debt crisis finally erupted fully in May 2010. Seven years later, at the time of writing

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(Spring 2017), the process that was set in train in 2010 is not yet over. With GDP in real terms down about 25% from pre-crisis levels, living standards having dipped further still due to the high taxation, unemployment close to the 25% and youth unemployment nearly 60%, poverty and inequality rising, and debt persisting at 180% of GDP despite an unprecedented fiscal consolidation, this crisis will not be a mere footnote in the country's tumultuous recent history. Apart from its own narrative, the Greek crisis and bailout process are intertwined with the global financial crisis of 2007–2009 (to which some say it is a successor), the structure of the Eurozone (the architectural weaknesses of which may be linked to the crisis) and the behaviour of other countries in the Eurozone's southern flank (which underwent crisis of a different order of magnitude but of a broadly similar nature). Thus, an examination of the Greek crisis and bailout process has the potential to shed light not only on the weaknesses of a peripheral Eurozone country and on the mechanisms put in place by the EU and Eurozone to deal with it, but also on the nature of the Eurozone and the pressures it places on policy-making.

The book in hand aims to examine the country's features that have played a role in the emergence and unfolding of the crisis as well as shedding light on the crisis itself and its effects. While there is a wealth of related academic literature, popular writings and op-ed commentary in dealing with this experience and analyzing the issues and open questions, as yet there are few efforts to present an integrated analysis of this experience. The present volume aims to fill this gap. The book and its 16 chapters are broadly based, offering political-economy, macroeconomic as well as sectoral and other perspectives on the country, its recent economic history, the experience of the crisis and prospects. They are written in a way that straddles academic style and more popular writing and should, therefore, be of interest to wide audiences.

This chapter introduces the volume and provides background information to the Greek crisis. Reflecting the broad nature of the volume, it, too, is quite wide-ranging. It discusses the country's recent macroeconomic performance, possible reasons as to why the country found itself in such difficulties (beyond the immediate reason that public finances became unsustainable), it places the Greek crisis in the context of the

wider Eurozone architecture and its weaknesses (according to critics), and provides a chronology of the crisis. In this context, landmark developments are discussed such as the various (three to-date) ‘Memoranda’ of conditions, the PSI debt relief of 2012 as well as offering an overview of the different approaches to the crisis and discussing prospects. This chapter concludes by briefly summarising the other contributions (15) to the volume. It is subdivided into nine Sections broadly along the above themes.

1.2 The Greek Crisis in the Context of Wider Eurozone Developments

A consensus view of the fundamental causes of the wider Eurozone crisis, part of which is the Greek crisis (alongside the crises in Ireland, Portugal, Cyprus and even Spain) is rather elusive. Most commentators would put the blame on the structural problems of the Eurozone, but there are considerable differences in emphasis. Three different approaches would highlight the:

- Deep asymmetries and chronic imbalances of the type emphasised (as prohibitive) by the vintage ‘Optimal currency Areas’ literature: serious imbalances in competitiveness and savings/investments/current accounts/capital flows, the ensuing capital reversals and ‘sudden stops’,—Melitz 2016, De Grauwe 2015, Baldwin and Giavazzi 2015b, asymmetric treatment of surplus and deficit countries Moravczik, 2012, serious divergences in competitiveness, Granville (2016), deep asymmetries in nature and growth performances among EU countries and regions, Iversen and Hope (2016), Streek (2015).
- A variant of the above view (Feld et al. 2016) would recognise that there were indeed asymmetric capital flows but the pathological element was that these were used to finance excessive government and private consumption spending as opposed to productive investment spending.
- Excessive indebtedness—lack of fiscal discipline, government debts and deficits.

- Imperfection and incompleteness of the Eurozone's institutional design and 'architecture' lack of lender of last resort, no political union therefore no accountability of the Central Bank, no fiscal transfers, weak ECB, no banking union inadequate or flawed official handling and policy responses; Wyplosz (Chap. 2 of this volume; Melitz (2016))
- The 2007–2009 (exogenous for the EZ) financial crisis.

Naturally, these points of view, or emphasis, are not mutually incompatible. Indeed, everybody would probably agree that the EZ crisis seems to have been a multi-faceted crisis and that all the above features have played some role; the question is what is the most fundamental underlying causes. While more holistic approaches (Shambaugh 2012; Gourinchas, Philippon and Vayanos 2016) emphasise the multiple links between the various aspects, others emphasise particular aspects: Baldwin and Giavazzi (2015a, b), Hughes Hallett and Martinez Oliva (2015) and Lane (2012) put the main blame on the external imbalances and capital flows; while Wyplosz (Chap. 2 this volume) on debts/deficits and inadequate governance.

Against this background, the Greek crisis erupted in early 2010, but it had been brewing since September 2009. In the words of Micossi (2015):

The Greek fiscal crisis acted as a detonator in two ways. It alerted the authorities and public opinions in Germany and the other 'core' countries to the possibility of large (and hidden) violations of the common fiscal rules; and it alerted financial markets to the risk of a sovereign default in a system where the provision of liquidity to ensure the orderly rollover of distressed sovereigns is not guaranteed.

1.3 Summary Indicators of the Greek Crisis

Table 1.1 summarises the country's experience in the years preceding and during the crisis. The middle columns give the state of public finances (government debt and deficit) that triggered the crisis from the late 2009–early 2010. The same columns not only show the herculean

Table 1.1 Main macroeconomic indicators

Year	RGDP	Unemp	Pri budget	Budget	Debt	RURL	CA
2001	82.7	10.8	0.8	-5.5	107.1	74.3	-9.8
2007	104.7	84	-2.2	-6.7	103.1	83.3	-15.2
2009	100	9.6	-10.1	-15.1	126.7	85.8	-12.4
2013	77	27.5	-9.1	-13.2	177.4	87.6	-2.0
2016	78.8	24.8	2.3	-1.1	180	90.3	1.76

Notes RGDP: Real GDP (2009 = 100); Unemp: Unemployment (%); Pri Budget: Government primary budget balance (% of GDP); Budget: Government primary budget balance (% of GDP; -=deficit); Debt: Public debt (% of GDP); RURL: Relative Unit Labour cost; CA: Current account (% of GDP). *Source* OECD and AMECO database of the European Commission

fiscal adjustment that the country has achieved in the space of seven or so years (unprecedented since the Great Depression of the 1930s) but also the root of the continuing malaise: the persistence of extremely high indebtedness (despite the ‘Private Sector Involvement’, the drastic private sector ‘haircut’ of 2012). The first two columns show the cost of the crisis for the domestic economy: A real GDP that registered an increase of 25% and more during the good years of the EMU (when markets did not notice the internal and external deficits-fuelled growth and low-interest rates and inflation boosted credit and consumption expansion) but that it now about 25% less than the 2001 level; and living standards that are even lower as there has been and continues to be a barrage of taxes. Unemployment has soared to the 25% mark; youth unemployment (not shown) is nearer 60%. Inequality, poverty and social exclusion, all have been rising drastically since 2010; though these phenomena cannot be captured by a few numbers, OECD data reveal that Greece’ Gini coefficient was around 0.3–0.35 for the latter part of the 2000s, climbing to 0.34–0.345 around 2013. At the same time, the relative poverty rate climbed from about 0.12–0.13 to 0.15. The picture would not be complete without a look at the taxation, which (ample anecdotal evidence suggests) has been rising across the board. A recent report by OECD (2017) suggests that in Greece, the average single worker faced a net average tax rate of 25.4% in 2016 (OECD average: 25.5%). Taking into account child-related benefits and tax provisions, the equivalent tax rate for an average married worker with two children was 23% in 2016, which is the fifth highest in the OECD (whose average is 14.3%).

In other words, income and social insurance contributions taxation are quite high if one takes into account what one can expect back in terms of welfare provisions, which are quite low. The same report shows some evidence that taxation increased in the first years after the crisis (but is now at 2010 levels). Of course, the high incidence of tax evasion in Greece casts some doubt on the validity of these figures. On the indirect taxation side, VAT now (April 2017) stands at 24%.

The final two columns reveal one basic reason for the country's underlying economic malaise: the rapid rise in costs (in relation to other countries) which translated into a rise in unit labour costs that could not now be compensated by currency depreciation and concomitant loss of competitiveness. As a result of the combined (and to some extent overlapping) forces of loss of competitiveness, rise in consumption and decline in saving and the government budget deficits, the external balance (current account) deteriorated dramatically in the run-up to the crisis; it has improved since then but this is due much more to the drops in imports as a result of the recession than a sustained increase in exports. Competitiveness and external (im)balances will be touched upon in various places in this volume, particularly Chap. 16 by Bournakis and Tsoukis. Since the onset of the crisis, competitiveness has been improving due to the decline in wages (in polite lingo, this is the 'internal devaluation' process), but an improvement in exports remains at once a serious challenge and a paramount objective for a sustained recovery.

1.4 Looking for Culprits: What Went Wrong

As with the possible flaws of the Eurozone (if any), so too is there rather little agreement on why Greece found itself in the eye of the storm. There has been a chronic tendency for rather profligate public spending and precarious public finances. Public debt/GDP has been slightly over the 100% marks since at least the early 1990s and the budget deficit has been persistently negative over that period. So much is agreed upon; the difficulty is to understand clearly the processes that led to this: Dysfunctionalities of the Greek political system (clientellism, tax evasion, corruption; the official statistics showing the state of the

public finances had been ‘doctored’); weak growth, de-industrialisation, negative FDI flows (Greece was one of the major investors in the Balkans and Eastern Europe in the 1990s) that may have crowded out domestic investment; or simply a ‘historical accident’ of some imprudent and incompetent governments. All these features have no doubt played a role, but there will be scant agreement on which is the most fundamental.

A factor that is rarely mentioned is demographic change. Greece’s Total Fertility Rate was 2.4 in 1970, 2.23 in 1980 then down to 1.4 in 1990 and about 1.35 now, lower since 1990 than the EU-28 average that now is about 1.5—OECD data—and well below the 2.1 rate that is required in order to keep a population steady. So, the country went from having one of the healthiest demographic pyramids in Western Europe to one of the weakest in the space of a few short decades. As reported in the *New York Times* (2017), many of the trends are shared among southern European countries and are exacerbated by the crisis: About half of the women born after 1970 will remain childless; many of the young will emigrate. Apart from the well-known consequences for national insurance and pensions, these developments will no doubt have long-run implications on fiscal systems, productivity and entrepreneurship; they cast immigration, another challenge currently facing Greece and Italy in particular, into a different light: In the longer run, young immigrant populations will play a key role towards demographic and fiscal balance. Demographic developments are surely part of the explanation for Greece’s slide towards crisis, but it is beyond our scope to evaluate their precise contribution.

The unsustainable public funding of the pension system deserves a special mention here. Former Minister of Work and Pensions (2000–2001) and respected authority on the economics of national insurance, Yiannitsis (2016) provides some glaring statistics. The ‘replacement ratio’ (gross pensions to final salary) was the highest among OECD countries in 2009 at 95.7%. Since the onset of the crisis, this ratio fell dramatically (following the general falling trend but more so) and stood at 57.9% in 2013; still above the OECD average but only fractionally so (Table 6, p. 67). The public sector contributed well above 5% each year after 2000 towards plugging the funding holes of the national

insurance system, reaching a whopping 9.7% in 2009. In other words, the largest part of the budget deficits of recent years was probably due to the public sector subsidising pensions. However, total spending on pensions was not particularly excessive: it stood at 13.8% of GDP in 2009, slightly above the EU-28 average of 13.2%. Since the crisis, pensions have been drastically reduced in both public and private sectors (often of the order of 40%), but the total percentage in terms of GDP increased to 16% in 2014 as output fell and more employees were incentivised to retire early. As a result of these tendencies and of the ‘haircut’ of PSI in which the government bonds that pension funds held in large amounts were wiped out, despite the drastic cuts in pensions across the board and despite the repeated overhaul of the system, the pension system’s finances remain unsustainable. The topic is becoming a focal point of generational conflict as the old are rapidly sinking into poverty while the young are called upon to fund much more generous pension provision than what they will themselves enjoy: There is, in fact, a vicious circle where the drop in GDP weakens further the pension system’s finances and necessitates fresh cuts, which are recessionary. Together with the Non-Performing Loans owed to banks (NPLs— see Chap. 13 by Tzavalis, Charalambakis and Dendramis), this mechanism is part and parcel of a strongly recessionary ‘fiscal multiplier’ as argued by Tsoukis in Chap (10). As with competitiveness and exports, finding a sustainable footing for national insurance remains a serious challenge and a paramount objective on the country’s way to recovery.

Looking for culprits (causes that is, not people), it is worth debunking two myths: Firstly, Greece does not have an excessive government sector by historical and comparative standards. Historically, Greece’s total government spending has followed international trends, being close to the average of OECD and EU-15 countries. Around 40–45% of GDP for most of the 1990s and 2000s, it was about 45% on the eve of the crisis (2008). This was by no means excessive; the only deviation from the norm was perhaps that while everywhere there was a tendency for retrenchment from about 2000 on, in Greece that was not the case and there was even an increase in spending from 2007 with the onset of the international financial crisis. A similar story is told by the number of civil servants in wider government. Iordanoglou (2010) shows that

in 2008 there were about one million public sector employees, or about 22% of the labour force. This is comparable to the EU-15 average of 21%. Greece did not stand out in terms of the composition of spending or taxes, either. What was, of course, different, were the excessive (and hidden) deficits that were built from 2007 on.

Second, it is argued sometimes that credit growth played a part in the crisis (Gourinchas et al. 2016). In this regard, it is worth emphasising that the bank-assets-to-GDP ratio in Greece was 173% in 2008, the lowest in the Eurozone (see Baldwin and Giavazzi 2015b, Table 2). This is an indication of the fact that the country's banking sector was in a good shape prior to the crisis; the crisis was not due to weak banking as, e.g. in Ireland. With the onset of the crisis, the 'haircut' of private debt of 2012 (PSI) and the drastic rise in non-performing loans (close to 50% in 20016), the banking sector went into difficulties requiring successive rounds of recapitalisation. But it should be clear that the banking sector was a victim, not a culprit.

With bank-assets-GDP as an indicator of private debt, it is evident that both private and total (public + private) indebtedness were one of the lowest in the Eurozone. Interestingly, Weder Di Mauro (2015) argues that high total indebtedness was the main cause of the Eurozone crisis. That aside, there is a political economy corollary from this point: what seems to have happened in Greece is that the indebtedness was shifted from private to public sector. The culture, that the political system fails to correct and indeed crystallises, is one that views the public sphere (and finances) as a common pool for unlimited grazing. This results in a heightened 'tragedy of the commons' which eventually came to haunt us.

Iversen et al. (2016) and Streek (2015) both place the well-documented imbalances in Europe in a varieties of the capitalism-theoretic framework, contrasting northern, efficiency-driven and export-oriented countries and economies, with the economically statist, domestic demand-led economies of the south. This general schema seems a good starting point for analysing the Greek experience; to which one should add de-industrialisation, demographic change and the impact on the pensions system, and the country's dysfunctional political system. All these factors have been commented upon, except de-industrialisation.

Indeed, back in the 197s and 80s, Greece seems to have suffered from the premature de-industrialisation that Rodrik (2015) identified for Latin American, sub-Saharan African and other emerging economies a generation later.

Regarding the macroeconomic dynamics that unfolded in the run-up to and immediately after the crisis (i.e. the years around 2010), Gourinchas et al. (2016) seem right when they suggest that there existed a toxic combination of faulty fiscal policies, credit growth and weak and asymmetric macroeconomic performances. For those versed in macroeconomics, this is displayed in the well-known ‘three-gaps’ equation of National Income Accounting:

$$S-I + T-G = X-Im$$

where,

S: private saving

I: private investment

T: taxes

G: government spending

X: exports

Im: Imports

A number of interpretations can be given to this equation, but for our purposes it says that the credit-fuelled boom (low/negative $S-I$) plus a government deficit ($T-G < 0$) were matched by an external trade deficit and concomitant capital inflows. Around the time of the crisis, all the deficits burst: so, the crisis was characterised by a ‘sudden stop’ (on the RHS above, external borrowing dried up), sovereign default ($G-T > 0$ had to be corrected) and the bursting of the lending boom (reflected on $S-I$). But as argued, the lending boom did not burst until after 2009, which leaves the internal (government budget) and external (trade deficit and capital inflows) imbalances as the key actors of the drama.

As with all accounting identities, this equation does not reveal which of the three ultimately drove the others; in technical language, it does not reveal causation. Regarding the relation between the internal (government budget) and external (im)balances, the well-known ‘twin deficits hypothesis’ suggests that causality runs from the former to the

latter; but it may also be argued that weak export performance (and hence external balance) may prompt stronger government spending, thus causality could also conceivably run the other way around (as well). Indeed, constructing a novel and detailed data set on wealth and its various aspects (external and government wealth), Hyppolite (2016) argues that the external indebtedness was equally, if not more, important as a cause of the crisis than government debt. Thus, and in line with the analyses in Baldwin and Giavazzi (2015a, b), the Greek crisis could be understood as a classic balance of payments crisis in a European context, whereby hot money flows from north to south financed the pre-crisis boom; in this respect, the argument goes, Greece was no different than the other peripheral EU countries, except that it had a larger government sector. We have seen that this is probably an accurate statement, except in so far as the government sector covered the generous and unfunded social security provision. So, a more nuanced view may be that the country showed a tendency for public profligacy and a private sector that, all said, lived above its means during the euro years; but these tendencies were allowed (if not encouraged) by the abundant capital inflows that developed in the context of an asymmetric Eurozone.

1.5 A Chronology of the Crisis

As already mentioned, the period following 1981 was a period of precarious public finances in Greece: Between 1980 and 1993 the Greek public debt, as a percentage of GDP, rose from approximately 28% to almost 112%. Except for the years preceding the entry of Greece into the European Monetary Union (EMU), the high levels of public debt were also accompanied by large primary deficits. This all came to a head in October 2009, when the newly elected centre-left government of G. Papandreou revealed that the actual government deficit as a percentage of GDP was going to be 12.7, more than double the 6% value that had been previously announced by the outgoing centre-right government of K. Karamanlis¹; the preliminary phase of the crisis had arrived. This

¹The final revised figure was 15.4%.

announcement alerted financial markets to the country's parlous state of government finances but also to the possibility of structural weaknesses in the Eurozone. The country's creditworthiness was immediately and seriously undermined. From 22 October to 23 December 2009, Greece's credit rating was downgraded by all three credit rating agencies, leading thus to increased interest rates on Greek bonds. To address the concerns of the European finance ministers' regarding the size of the Greek public debt and gain back the trust of investors and EU partners, the Papandreou government passed a series of austerity measures, but to no avail. By late April 2010, the spread between the yield on Greek and German 10-year bonds had surpassed 1000 basis points, making borrowing by the Greek government prohibitively expensive and casting doubt over its ability to refinance existing public debt. In light of this, and a €16bn debt maturing in May, Papandreou was forced to request financial assistance from European fellow governments: The crisis had formally arrived.

The exact deliberations under which the bailout was agreed are shrouded somewhat in mystery—see below. On 2 May, the IMF, the European Commission and the European Central Bank (ECB), collectively (and somewhat pejoratively) known as 'Troika' later turned to the more politically correct 'Institutions', agreed to offer a three-year rescue package of €110bn (of which 80 were by the EU and the rest from the IMF). In return, the Greek government undertook to implement an Adjustment Programme involving a series of cuts in public spending and structural reforms prescribed in the associated (first) 'Memorandum of Understanding' ('First Memorandum' for short). But the initial plan (and optimism) that the country would be able to return to markets on its own by 2012 proved widely off the mark: Not surprisingly, the fiscal consolidation proved deeply recessionary; so much so that (for instance) the IMF repeatedly failed to forecast accurately and had to downgrade its own forecasts (see Blanchard and Leigh 2013). As a result of the decrease in GDP and the new loans, the debt-to-GDP ratio was on the rise. By 27 July 2011, Greece's credit rating was downgraded to just a step above 'junk'. Following such adverse events, the government of G. Papandreou was forced to resign later in the year. It was succeeded by a coalition government under L. Papademos, a

respected technocrat, former Governor of the Bank of Greece and Vice President of the ECB. This government requested and agreed a second Adjustment Programme on 21 February 2012, involving a loan of €130bn in exchange for another package of austerity measures and structural reforms (the ‘Second Memorandum’).

By the end of 2011, government debt was €356bn, or 172% of GDP. Such a level of indebtedness was widely seen as unsustainable (not least by the IMF), prompting discussions and initiatives for its reduction. In Spring that year, a debt restructuring programme (the ‘Private Sector Involvement’ or PSI) was completed. This involved swapping about €205bn of privately held Greek government debt (including 10bn of government-guaranteed debt of public sector enterprises) with new bonds issued by the European Financial Stability Fund (EFSF) and new government bonds. The swap involved both a considerable reduction in the face value of privately held debt (‘haircut’) of about €107bn or 56% of 2012 GDP (but note that the debt owed to the ECB was excluded from this) and an extension of maturities, as both new bonds were of longer maturities than the bonds they replaced. The careful study of Zettelmeyer et al. (2013) calculates that in present value terms, the reduction in debt was of the order of 60–65%. To this, one should add about 10% reduction (in present value terms) achieved by the second phase, the debt buy-back (involving buying back of the newly issued bonds) of December 2012. At the end of the process, in December 2012, about 35bn euros of Greek government debt remained in private hands, or about 13% of what existed in May 2010, at the onset of the crisis. Even allowing for 25bn new loans that were provided to Greece in order to recapitalise its banks that were hit by the haircut (as they were holding large amounts of Greek government bonds), Zettelmeyer et al. (2013) calculate that in present value terms, upwards of 50% of GDP worth of bond value was transferred from private creditors to Greece.

This debt restructuring and buy-back were clearly the world’s largest sovereign debt restructuring ever. The next such operation was Argentina’s 2005 debt exchange, which only allowed a transfer of about 22.5% of GDP. Critics, starting from the careful analysis of Zettelmeyer et al. (2013) but also IMF (2015, para. 46, p. 38), Wyplosz (Chap. 3

here), Pisani-Ferry (2013) and many others (including our contributors Grahl, Chap. 4 and Bratsiotis and Cobham, Chap. 5) argue that this restructuring and haircut was too little, too late. It should have happened at the onset of the crisis in 2010 or soon after. It thus failed in its main objective, which was to place on Greek government debt on a sustainable footing; which soon after started rising again (see Table 1.1). And although it was a carefully designed and executed, complex legal operation, it could have achieved more for Greece. Finally, there was ‘collateral damage’ in the heavy losses inflicted on domestic holders of Greek debt:

- Greek pension funds, contributing to the vicious circle that enveloped the pensions system, as analysed;
- Greek banks; those received a recapitalisation sweetener of 25bn euros which however was registered under Greek debt; and ownership changed hands as a result of that;
- Cypriot banks that were similarly exposed but were not entitled to recapitalisation, thus leading to the Cypriot ‘bail-in’ of March 2013 (Michaelides 2014).

Fresh elections took place in May and again in June 2012, which led to the formation of another coalition government headed by the centre-right party leader A. Samaras. Despite the new bailout program and the austerity put in place, there were no signs of recovery by the end of 2014. The government of A. Samaras was also essentially forced to declare early elections. On 25 January 2015, the left-wing SYRIZA won the elections on the promise of ending all austerity and getting the country out of the previously signed two Memoranda; a new coalition government was formed with the small, right-wing party of Independent Greeks (ANEL). With the flamboyant Y. Varoufakis in office as new Finance Minister, a long process of negotiation with the lenders started, which lasted until June. Varoufakis’ (and Greece’s) main argument was that the policies mandated by the three ‘Institutions’ (|EU Commission, ECB and IMF, or ‘Troika’) were recessionary and led to an austerity-debt vicious spiral. Creditors, while recognising Greece’s substantial efforts in undertaking adjustment and stabilisation policies,

maintained that Greece needed to pursue the structural reform agenda in a more determined manner. Without a final agreement between Greece and the three Institutions and the expiration of the second bailout programme just around the corner, in June the ECB froze the Emergency Liquidity Assistance (ELA) for Greece, which was the main mechanism for providing liquidity to Greek banks. Matters came to a head when Greece was offered a “take it or leave it” deal in the Euro Group meeting of 27 June 2015. At that point, Prime Minister Tsipras announced a referendum on a new bailout agreement on offer for 5 July. Following the announcement, all banks in Greece were closed and strict capital controls were imposed. On 30 June, Greece became the first developed economy to miss a payment on an IMF loan and fall into arrears. The pre-referendum period was very short (barely a week) but the atmosphere quite tense; talk of ‘Grexit’ (from the euro) abound across the world. Despite an over 61% vote against a new bailout agreement, the Tsipras government was eventually forced to accept a deal for a new €86bn bailout programme extended over three years (the Third ‘Memorandum’). It is worth pointing out, and that is a widely shared interpretation invoked by Tsipras, that at every point, the great majority in the country advocated staying inside the euro; the proponents of a new drachma were a narrow minority. Tsipras’ argument was that the referendum result was against the bailout and its terms, not the euro.

Nonetheless, signing the new bailout agreement was a humiliating *volte face* for Tsipras; despite this, SYRIZA was voted again into power in snap elections in September 2015. With the mild-mannered E. Tsakalotos having replaced Varoufakis as Finance Minister, the SYRIZA government continues the same course as predecessor governments: keep taking the (bitter) pill of compliance with the Memoranda in an effort to meet the creditors’ demands, secure financing and keep the country in the euro. Nearly one and a half years later, at the time of writing, the same themes dominate the news agenda: Creditors accuse Greece that it fails to comply (or does so only half-heartedly) with the provisions that it has signed; while Greece is wary of seven years of painful austerity and recessionary policy measures. Despite Grexit having waned from view (partly eclipsed by discussions around Brexit), there continues to be some uncertainty regarding the

implementation of the third ‘Memorandum’ and its associated conditionality. Disagreements between the Greek government and the creditors regarding the reforms that are necessary to restore the country’s competitiveness and jumpstart the economy delay the closure of the second review of the programme. As a result, Greece remains outside the ECB’s Quantitative Easing programme, with all the recessionary consequences that this entails.

1.6 Current Outlook and Prospects

Though talk of Grexit has disappeared from the discussion, the Greek bailout process is not over. Currently, there is a review of compliance by Greece to the conditions set by the Institutions (creditors) (that Greece has—supposedly—agreed to) in order for a new tranche of about €7bn of funds to be released in July 2017 to finance maturing bonds. At issue is further reform of labour markets—the call is for further liberalisation, further reform of pensions, and further fiscal consolidation (on both sides of the balance, i.e. further cuts in wages and other expenditures and increases in taxes) and privatisations. Greece has already achieved a record adjustment, as mentioned, with 2016 having ended with a record primary budget surplus of 3.9% and an overall surplus of 0.7% (figures confirmed by Eurostat 24/4/2017). At stake now is whether such surpluses are sustainable in the medium term. The issue of whether such conditionality, further structural reforms (or liberalisation) and austerity make sense will be touched upon below and will be taken up at various places in this volume, particularly in Chap. 3 by Rodrik, 6 by Karanasos et al., and 11 by Tsoukis.

Two particular issues that currently fuel uncertainty concern the participation of the IMF and the longer horizon. Acknowledging the fact that, at about 180% of GDP, Greece’s debt remains unsustainable (IMF 2015) and bound by its constitution not to lend when the probability of recovering the loans is not high, the IMF appears reluctant to renew its funding when it expires and wishes only to provide technical (advisory) assistance. The EU, on the other hand, wants the IMF to play a full part in the bailout (that is the condition under

which the Third Memorandum and bailout was voted through by the German Parliament). The IMF wishes to see a further reduction in Greek debt (if not a nominal haircut, at least a prolongation of maturities and reduction in interest rates), something resisted by the EU; it argues that persistent primary surpluses of the order of 3.5% of GDP currently agreed until at least 2020 if not longer are not sustainable for long. Against this, the IMF wants to see a more drastic reform and liberalization agenda, though the latest pronouncements (interviews by C. Lagarde and M. Obstfeld before the Spring Assembly) suggest that the IMF thinks that Greece has already done enough on this front (see also the blog by Hagan et al. 2017). So, currently the exact terms accompanying the pending tranche of €7bn remain yet to be finalised; and the discussions about a further debt relief are being pushed back yet again. The second point of uncertainty is what happens after the end of the current (third) Memorandum and financing programme; the German government has made it clear that there will not be another one. This implies that if Greece wants to stay in the euro, it must raise the funds required for it to meet the interest and maturing bond payments from 2019 and beyond in the markets.

Nominal debt remains persistently high but its maturity structure has been changed at various points and is now quite long; interest rates are very low. These features have been facilitated by the fact that that almost all the debt, following the PSI of 2012, is now official (owed to the ECB, European Stability Mechanism–ESM, national governments and the IMF). As a result, in present value terms, Greece's debt has been calculated as no more than 100% of GDP (Schumacher and Weder di Mauro 2015; the IMF's estimates are in IMF 2015, 2016); see Chap. 7 by Wickens for more on the country's fiscal (in)solvency. To conclude this part, we review the schedule of payments that need to be made from now on and the cost of servicing the debt in the years ahead (Figs. 1.1 and 1.2). It has been pointed out that the average interest rate and the cost of servicing the debt is one of the lowest in Europe and the lowest Greece has had in the past 20 years (Christodoulakis 2016). All these features suggest that the debt should be sustainable. We return to the issue of debt sustainability below when we take stock.

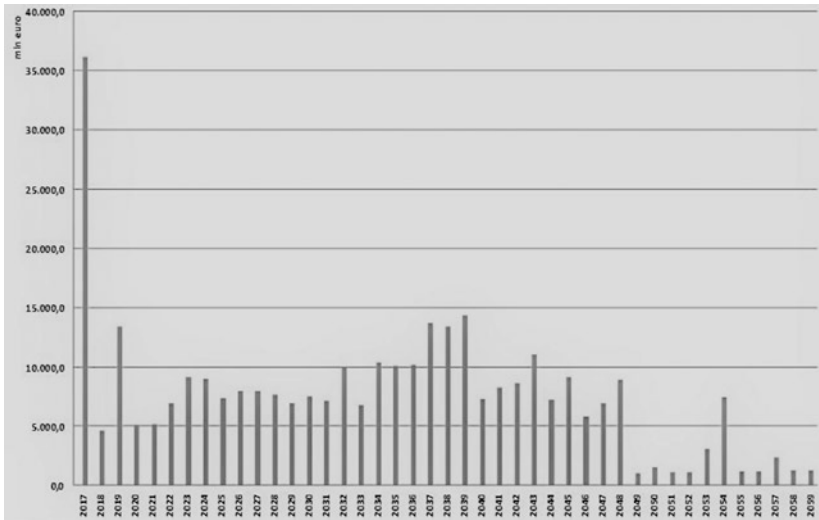


Fig. 1.1 Greek Debt Maturity Profile. *Source* Public Debt Management Agency of Greece (PDMA), accessed 8/4/17. <http://www.pdma.gr/en/public-debt-strategy/public-debt/maturity-profile-en>. *Notes* As of 31-12-17; unit: millions of euro

1.7 Taking Stock

The purpose of this section is to take stock and critically evaluate, to the extent possible, the process so far. Starting from the obvious, Greece went essentially bankrupt in 2010 and was only able to state afloat with the ‘clinical support system’ of EU and IMF financial assistance. Clearly, this assistance enabled the country to avoid a disorderly default and a concomitant fiscal correction overnight; in which case, the economic and social cost would have been a lot higher. Greece borrowed from countries even poorer than itself so that it could maintain a fraction of its former living standards and it is grateful for this support. It also became clear quickly (though only implicitly) what a disorderly default would have implied: Exit from the euro; which the vast majority of public opinion in Greece always wanted to avoid, as mentioned. Against this, the country has paid and continues to pay a heavy price in terms of fallen living standards, high unemployment and rampant impoverishment of large swathes of former middle classes (particularly pensioners).

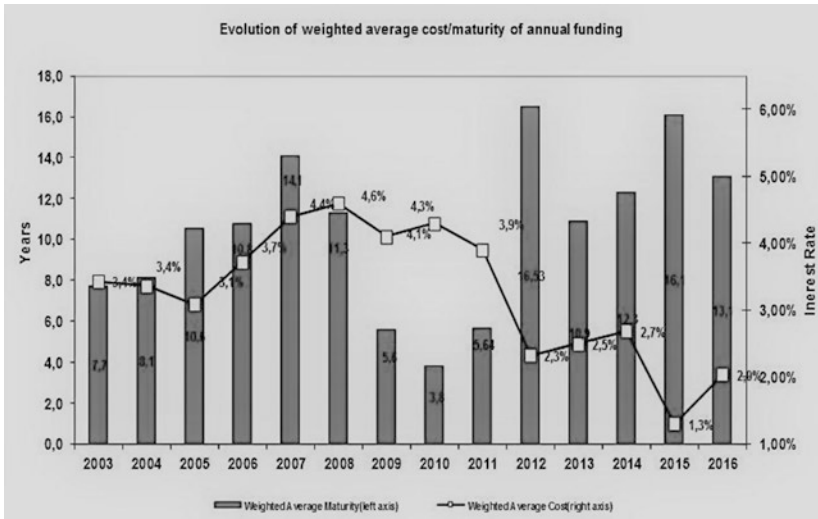


Fig. 1.2 Greek public debt: Cost of annual funding and average maturity
Source Public Debt Management Agency of Greece (PDMA), accessed 8/4/17)
<http://www.pdma.gr/en/public-debt-strategy/public-debt/historical-characteristics/weighted-average-cost-maturity-of-annual-funding>. *Notes* Weighted average cost of annual funding (as a % of GDP, RHS) and average maturity (LHS) as of 31-12-17

Though some measure of growth will sooner or later return, it will take decades for living standards to be restored and unemployment to come down to normal levels (on that, see Chap. 12 by Bournakis and Christopoulos).

Because of labour market weakness but also under the guise of structural reforms, the labour market is in practice completely liberalised and deregulated—with only token bargaining, wages in arrears and (illegal) payments in kind; non-performing loans due to banks are now close to the 50% mark, the stock market and housing market practically dead (on all these, see Tsoukis, Chap. 10), banks in repeated need of recapitalisation and now practically owned by the ESM; public enterprises—even profitable ones—are up for fire-sale: Greece is a different country than a few years ago and, whether good or bad, inevitable or not, much more neoliberal. Not all is bad though: As part of the conditionality, the

country has had to modernise: The Statistical Authority (ELSTAT), the Public Debt Management Agency, the Public Revenues Authority, all now are independent authorities with executive powers; political meddling with them is no longer possible. There is a more concerted drive for combating tax evasion; there is a renewed drive for reducing red tape and increasing transparency. At the same time, serious challenges remain, listed in no particular order: Increasing competitiveness and the economy's export orientation (see Chap. 16 by Bournakis and Tsoukis); further reform of the pensions system, part cause and part effect of the current malaise; reform of the tax system, with the aim of making it simpler and fairer and of reducing tax evasion; reform of the public sector, making it more productive and efficient; reform of the justice system which is impartial but overloaded and very slow. The list goes on.

Is this all inevitable? Could it have happened differently and could the country been spared the hardship? Discussion of these and many other related questions often revolve around two narratives. We present the outlines of the arguments here, while we take up more specific points as the discussion unfolds later on. The 'mainstream' narrative (Feld et al. 2015; Feld 2016; Feld et al. 2016) recognises that the prescribed path is hard but argues that it provides generous financial assistance, in contravention to the EU Treaties that do not allow bailouts, and will eventually lead to recovery. As part of the assistance, the generous PSI of 2012 took place and the official debt is offered on generous terms, both allowing a drastic write-down of Greek debt in present-value terms. The narrative argues that the assistance is provided against promises to put public finances in order and to engage in reforms of the labour and product markets that will restore growth. Thus, the 'mainstream' narrative is constructed around basic logic and principles of international finance, but also 'ordoliberal' principles of respect for rules, 'hard budget constraints', 'liability-and-control' and the balance between rights and obligations. All these are required to safeguard and cement a union between sovereign states and buttress the credibility of the euro. It recognises the conflict of interest between creditors and debtors but argues that no creditor would want to lose money. It lays down 'red lines' in precluding any permanent transfer systems such as outright debt forgiveness, eurobonds or more fiscal transfers in the

EU other than the existing ones (from the Structural Funds). This line of thinking barely mentions the German debt forgiveness of 1953 (of which Greece was a signatory); of course, circumstances were different.

The 'critical' narrative takes aim at the overall direction of the conditionality programme as well as the specific policy choices of the crisis; in this light, it argues that the hardship is unnecessary. Literature here abounds and we draw liberally from Ardagna and Caselli (2014), Baldwin and Giavazzi (2015a), Copelovitch et al. (2016), Moravcsik (2012), Streek (2015), Watkins (2013, 2014) and Wyplosz (Chap. 2 in this volume), as well as renowned economic commentators such as Paul Krugman and Simon Wren-Lewis, among others; this literature, often critical in varying shades, offers valuable perspectives and critiques of the Greek and broader eurozone crisis. In our volume, the 'critical' narrative is represented by Chap. 2 by Wyplosz, 4 by Grahl, 5 by Bratsiotis and Cobham and 6 by Karanasos et al. The 'critical' narrative would start from the fact that Greece's malaise is inextricably bound with the Eurozone's structural weaknesses and asymmetries; the deficits of Greece (and the wider southern EU) were permitted (financed) by the north's surpluses and hot money flows. Against that two-sided coin, the burden of adjustment falls entirely on debtors. That is, of course, true, except that non-one noticed, much less complained, when that was happening. And Greece's fiscal profligacy (and sugar-coated if not downright cooked statistics) is undeniable. Equally undeniable is, however, the fact that the burden of adjustment is asymmetric as are the benefits of the euro (Moravcsik 2012; Granville 2016). Furthermore, this narrative notes the political asymmetries of an intergovernmentalist, German-led Europe, with the Bundestag and the German Supreme Court being the arbiters of the major decisions; the largely cosmetic European Parliament has sunk further into unimportance, being a collateral damage of the crisis. On the policy front, the harsh austerity has drawn sharp criticism; as has the fact that the PSI was too little/too late; and the fact that when the ECB withdrew liquidity from Greek banks in June 2015, forcing the imposition of capital controls, it contravened its own constitution as a Central Bank co-owned by Greece (Wyplosz, Chap. 2). Against that, one could argue that there was no way that

policy mistakes could not have been committed in such a process of sailing into uncharted waters and that we are all wiser after the fact.

Any concrete balance sheet should include the actual financial flows, the 'smoking gun': Following the careful studies of Rocholl and Stahmer (2016) and Triantopoulos (2015), we have a clear idea about how the monies from the First and Second Programmes (of 2010 and 2012) were disposed: According to the first of these studies, these programmes amounted to €215.9bn in disbursed funds, €73bn from the first programme (against a planned amount of €110bn) and €142.9bn from the second programme (planned: €140bn). In sum, the IMF disbursed €32 billion and the EU €183.9bn. Importantly, Rocholl and Stahmer (2016) calculated that only €9.7bn, or less than 5% of the total amount of €215.9bn, directly contributed to the Greek budget. More than 64% (€139.2bn) was used to service existing debt (repay maturing bonds and make interest payments); 17% (€37.3bn) was used to recapitalise Greek banks, while the remaining 14% (€29.7bn) provided incentives for investors to engage in the Private Sector Involvement (PSI) in March 2012. Triantopoulos (2015) reports similar (though not identical) numbers.²

Next, come the motives. Going back to the start of the crisis in May 2010, there seems to have been some initial German reluctance for a rescue; this was later overcome at American insistence. Key must have been the realisation that a Greek disorderly default would have jeopardised the viability of major German and French banks that were heavily exposed to loans to Greece (and were fresh from the tumult of 2007–2009); and would have perhaps fatally undermine the euro itself (whose credibility would have suffered a major blow with the first departure). Critics argue that the main motive was to save the banks rather than Greece, but further cash for banks in the wake of the financial crisis would be politically unacceptable, hence it was disguised as saving Greece (Ardagna and Caselli 2014; Watkins 2014). Moreover, the PSI

²We thank Professor P. Liargovas and Dr. A. Lyras of the Parliamentary Budget Office for helpful information on these matters.

and ‘haircut’ of 2012 was only agreed after the said banks had unwound their positions in Greek debt (Watkins 2014).

But no rescue package could be unconditional: ‘No guarantees without control,’ said Mrs Merkel according to then US Finance Secretary Tim Geithner’s memoirs (see Watkins 2014). Thus, the EU requested the technical assistance of the IMF which had a long experience in adjustment programmes (‘conditionality’) related to bailouts. Yet, as discussed in Chap. 10 by Tsoukis, such conditionality is by no means uncontroversial. We have already seen that the IMF has consistently underestimated the recessionary effects of austerity in Greece (Blanchard and Leigh 2013; Pisani-Ferry et al. 2013; Wyplosz 2017); we comment below on what appears to be a recent shift in the IMF’s thinking on Greece. Broader experience from countries which have gone through such programmes is at best mixed; at worst, downright negative (Barro and Lee 2005; see also Dreher 2009). The literature argues almost with one voice that a precondition for success of adjustment programmes is ‘ownership’, the wholehearted espousal of the reform agenda by the country in question (see Dreher 2009, and the many studies he cites); furthermore, ownership should be construed not only as the willingness to carry out a program, but also as the technical capacity to design and implement it and the political ability to do so (Drazen and Isard 2004). As Rodrik (Chap. 3) analyses, none of these conditions is in place in Greece; all recipes were designed outside the country, being a ‘laundry list’ of clichés as opposed to a series of carefully thought out, prioritised reforms that address the key ‘binding constraints’ that impede growth. Surely, a VAT of 24% contradicts the main objective of achieving competitiveness. Moreover, as Tsoukis (Chap. 10) suggests, the theorem of the ‘second-best tells us that such structural reforms will work in a reasonably well-functioning economy; in abnormal situations, more reforms may lead us away from the main objectives: Structural reforms, much needed in many cases from a long-term perspective, will be recessionary in the short run and therefore counterproductive. The ‘mainstream’ counternarrative is that Greece’s main problem is that it never produced a coherent plan of its own; and it has only half-heartedly adopted and implemented the reforms. Apparent on both sides, creditors and Greece, is a kind of fatigue:

Ardagna and Caselli (2014) speak of a Laffer Curve of reform effort and political will. From Greece's point of view, there is a feeling that whatever the country does is never enough, and more will be asked in the next round of negotiations.

Debt remains a point of contention between Greece and creditors. As we have seen, it is persistently high, prompting calls for further debt relief (see, e.g. Pisani-Ferry 2016). But (the mainstream view would argue, with some justification) its profile and the average cost of service render it sustainable (see Christodoulakis 2016). Against this, financial markets will know the debt overhang, and the resulting premia and overall uncertainty will postpone recovery. For this reason, Greece's standard demand is further debt relief, a demand that meets the steadfast refusal of creditors (Feld 2016); the argument is that the PSI, maturity extension and lowering of interest rates were generous enough and a further face-value haircut is out of the question. In any case, there has been talk of a further debt relief (in the form of altering the profile, not nominal cut) since 2012; every time, a possible settlement is getting postponed till after 'the completion of the current programme'.

The political asymmetries related to the crisis have been mentioned; they apply to Greece in an amplified way. Though the theory is that the Troika of Institutions will not 'dictate in detail' the adjustment programme and the reform process (Feld et al. 2015), the theory is far from the practice: There is in fact micro-management of a rather humiliating kind, that erodes both sovereignty (when important policies are dictated to the country by low-key technocrats) and democracy (when Parliament is reduced to rubber-stumping take-it-or-leave-it 'offers' of agreements). Rodrik (2010) drew an early lesson from the Greek experience, noting the incompatible trilemma of economic globalisation, political democracy and the nation-state. There is often talk of what creditors may find politically acceptable with their electorates and such considerations did indeed inform the terms of the assistance packages that Greece and the other countries got (Blanchard 2012, 2015) but never what terms debtors may find politically acceptable. In terms of wider politics, there have been five national elections since September 2009, resulting in four Prime Ministers (excluding care-takers). In a country where government and Prime Ministers used to stay in office

normally for the best part of a decade, this despair-fuelled ‘high-frequency’ politics seems to be the watermark of the crisis.

1.8 A Proposal

We pointed out above that one may discern two narratives about the Greek crisis, the mainstream one that argues essentially that Greece must continue to take the bitter pills and the critical one that argues that the country has suffered gratuitously (this is, of course, to exaggerate and over-simplify). We finish with a third, ‘middle-of-the-road’ narrative and a policy proposal that follows from it. This recognises the harsh reality of the (any, in fact) adjustment programme as inevitable; it argues that financial assistance was both necessary and generous, and is agnostic about various aspects of the other narratives, bypassing any questions of fairness. The main point is that the current conditionality is self-defeating as it keeps the country in recession (see e.g. House and Tesar (2017) for estimates; and Chap. 10 for more details); in doing so, it violates some of the key ‘commandments’ of proper fiscal adjustments stipulated by Blanchard and Cotarelli (2010) and much macroeconomic analysis related to the ‘fiscal multiplier’ (see the Chapter). As a result, the present-value of the receipts (primary surpluses) that creditors will receive is lower than it could be, even though the mandated surpluses are quite high. To this, one may add the related criticism of Eichengreen and Panizza (2014) that such high surpluses are not sustainable for long, either economically or politically. The Chapter’s analysis shows the existence of a ‘debt Laffer Curve’ with a maximum sustainable primary surplus that maximises the present value of payments to creditors while at the same time returning the country to growth. The policy corollary of this analysis is that the primary objective now should be a return to growth by a combination of partial relaxation of austerity (as argued in Chap. 10 by Tsoukis) and an agenda of focused structural reforms targeted at the main ‘bottlenecks’ that hinder growth and export performance, as pointed out in Chap. 3 by Rodrik. The pursuit of excessive austerity is self-defeating, while, as Chap. 16 by Bournakis and Tsoukis argues, an improvement in competitiveness takes much more

than a simple (and drastic) internal devaluation and broad-brush but unfocused reforms. All of this, of course, requires Greece to formulate its own credible reform agenda and to pursue it vigorously. Some additional debt relief, in the form of an extension of maturities and reduction in interest rates, if not an outright haircut, may be necessary. And it will be very helpful if the required surpluses was growth-indexed, along with the lines of Sachs's (2011) suggestion at the outset of the crisis.

1.9 Summary of the Contributions to this Volume

As mentioned, this volume offers an integrated overview of the Greece's economy and its experience since 2010. The rest (sixteen Chapters) of the volume take up themes flagged up in this Introduction in more detail. These contributions are broadly based, offering political-economy, macroeconomic as well as sectoral and other perspectives on the country, its recent economic history, the experience of the crisis and prospects. They are written in a way that straddles academic style and more popular writing, aiming to be accessible and of interest to anyone interested not only in the Greek experience as such but also the experience of the Euro and European integration at large.

In Chap. 2 (The Eurozone crisis: A near-perfect case of mismanagement), Charles Wyplosz presents a wide-ranging, sharp criticism of the policy decisions, and mistakes, of the Eurozone in the handling of the Greek and wider crises. It is argued that the imperfections in the institutional setup contributed a lot to the Eurozone crisis. The wrong concept of fiscal discipline, the inability of the ECB to act as lender of last resort, the absence of a banking union, they all allowed some public debts to increase dangerously; the lack of comprehension of the crisis by political leaders led to contagion and a deep depression. Some of the institutional flaws have been dealt with, but partially so. Existing institutions have been unable to design timely and adequate policy responses. The Commission has limited itself to imposing pro-cyclical austerity policies. The 'Community method' has given way to

intergovernmentalism. The dramatic economic and social impact of the crisis has left a disastrous perception of Europe, with potentially momentous costs in the long run.

In Chap. 3 (Structural Reforms in the EU), Dani Rodrik reconsiders the notion of and rationale for ‘structural reforms’. Structural reforms are changes in labour and product markets as well as wider institutional changes that aim to increase the efficiency of which labour and capital are allocated in the economy, ensuring that these resources go where their contribution to national income is largest. If successful, such changes promote productivity, investment and growth. Structural reforms are often part of the conditionality accompanying financial assistance, and the assistance offered to Greece since 2010 is no exception; in fact, the package of required structural reforms is quite demanding. But their positive effects are often grossly overestimated; they are uncertain, they accrue only in the long run and will affect (if and when) only potential output. Convergence of actual output to potential output is very slow, at best. So, Greece, having already achieved a lot in terms of structural change, can only benefit marginally from more reforms in the near future. From a wider perspective, it is argued that ‘growth accelerations’ (on which the author has worked with Ricardo Hausmann and Lant Pritchett) are the results of selective, targeted reforms that address the ‘binding constraints’ that an economy faces, the key obstacles to growth rather than broad liberalisation and economy-wide reforms. With co-authors Ricardo Hausmann and Andres Velasco, the author has identified such binding constraints in various economies. In this light, the author argues that the broad reforms required of Greece are misplaced; in contrast, a better prioritised reform strategy should focus on promoting exports.

‘If you break it, you own it’, argues John Grahl in Chap. 4 (The Responsibility of the EU). The author takes a critical political economy approach to the whole strategy adopted by the EU and its constituent authorities (ECB, Commission, EFSF and ESM) as well as the IMF towards Greece once it became clear that the country is insolvent. It argues that the main responsibility for the continuing debacle over a country whose debt is of the order of 2% of EU GDP lies with the EU and its overall approach—which is not to ignore or downplay the

serious failures and weaknesses of Greece itself. Particular themes of the critique include the fact that co-responsibility for the country's excessive indebtedness lies also with the lenders who financed the exorbitant debts in the first place; but who then were fully rescued, at least in the beginning. The country has had very little political clout over the adjustment programmes that have been imposed on her, micro-management of which from outside seriously erodes its sovereignty and democracy. The resulting austerity has been largely self-propagating and self-defeating, plunging the country into a perma-recession for generations to come, with grave social consequences.

Germany has played a key role in coordinating (and of course, funding) the financial assistance that has been provided to Greece and other countries involved in the Euro-crisis. This is the point of departure for George Bratsiotis and David Cobham in Chap. 5 (On the institutional responses to the Euro crisis: Is there a role for 'German Macroeconomics?'). The authors first ask whether there is something different about the macroeconomic thinking that prevails in Germany, which leads the German government to argue for different policies from those which many other policymakers and economists put forward. They give a qualified positive answer to this question, and then consider the distinctive attitudes held by the German government and/or central bank with respect to the process of monetary integration in Europe and then to the Eurozone crisis. They argue that German opposition to the use of expansionary fiscal policy and of unconventional monetary policy has made a major contribution to the failure to deal appropriately with the Greek crisis or to bring about a strong recovery in the Eurozone.

The Greek and wider Eurozone crisis (or crises?) have attracted a lot of attention in both the academic literatures but also in more popular writings by commentators. At the crossroads of these two literatures one can find the writings of academic economists who write in blogs and op-eds, exploiting the immediacy and speed that technology provides. In Chap. 6 (Austerity and the Greek Dra(ch)ma: Three economists's views and a comment), Menelaos Karanasos, Panagiotis Koutroumpis, John Hatgioannides, Marika Karanassou and Hector Sala summarise the opinions of three internationally respected authorities (two Nobel laureates among them), namely Paul De Grauwe, Paul Krugman and

Joseph Stiglitz, on the eurozone crisis as well as the Greek case. Thus, this chapter provides a different angle to much of the discussion of this Introduction and the rest of the volume. All three have expressed various reservations about the single currency. While De Grauwe and Stiglitz have highlighted the design failures of the Eurozone, Krugman has argued that the creation of the common currency was a terrible mistake. In support of their claims, we provide evidence of the negative consequences of the austerity measures that were implemented by the troika on the Greek economy for a period covering 2010–2014. After seven years of austerity, Greece has experienced significant deflationary dynamics, deep recession as well as high unemployment rates.

The departure point of Chap. 7 (A macroeconomic perspective on the Greek debt crisis) by Michael Wickens is that, according to the Greece's credit ratings, the probability of default for a 10-year Greek government bond in 2015 was at least 0.4; in other words, the country was practically bankrupt. The chapter investigates how this state of affairs arose and what are the policy options for the country to avoid default. Part of the problem has been a consequence of its political choices, part a failure of fiscal policy and part the result of being in the euro. The political choice over the last nearly forty years was to raise the size of the public sector in Greece's quest to become more like those of its northern European neighbours. The unfortunate fiscal failure was that its tax revenues did not keep pace with its public expenditures which resulted in a huge increase in its level of debt. Another political choice, it is argued, was the decision to join the euro, which has exacerbated the country's financial problems of Greece. Although the emphasis has been on the debt crisis, as it is of immediate concern, the longer term problem is Greece's competitiveness and the effect this has on economic growth and hence tax revenues. In order to survive within the euro system, the country needs to modernise and become more productive and efficient. Additionally, though Greece has already done much to improve its fiscal stance, it still needs to go further and generate permanent primary surpluses. The current rescue package requires surpluses of the order of 3.5% of GDP for the medium term. Alleviation of the debt burden (either outright write-downs or extensions of maturity and reduction in interest rates) would, of course, make the task of

debt management easier. The alternative is for Greece to leave the euro area and probably default on its debt. It would still need to carry out the same fiscal reforms, and it would bring other short-term costs, but there would be considerable long-term benefits. These are tough choices but they are the only way that Greece can retake control of its economy. In other words, the author concludes by making the economic case for Grexit. A prospect that does not command much support in the country, as argued above, as surrounding the economic arguments will be social and political ramifications that may dwarf any economic benefits.

In Chap. 8 (On the role of the credit rating agencies in the Euro zone crisis), Periklis Boumparis, Costas Milas and Theodore Panagiotidis examine the determinants of credit ratings for 18 Eurozone countries over the period 2002–2013. Sovereign credit ratings are decomposed into high and low ratings, the high rated being AA- and above, and the low rated being A + and below. The authors consider a set of macroeconomic and risk variables as their determinants. First, they find greater explanatory power for the former sample (high rated). Second, the results reveal an asymmetric response of cumulated current accounts for high and low ratings. Third, the chapter provides evidence that the fiscal and the external sector are significant after 2009 only for the low-rated economies. Focusing on Greece, the evidence is shown that the government debt and cumulative current account played a significant role in the downgrade of Greek bonds.

Chapter 9 (The Greek Great Depression: A General Equilibrium study of its Drivers) by George Economides, Apostolis Philippopoulos and Dimitris Papageorgiou provides a quantitative study of the main determinants of the Greek great depression since 2010. The authors use a medium-scale DSGE model calibrated to the Greek economy between 2000 and 2009 (the euphoria years that followed the adoption of the euro). Then, departing from 2010, simulations show that the fiscal policy mix adopted, jointly with the deterioration in institutional quality and, specifically, in the degree of protection of property rights, can explain essentially all the total loss in GDP between 2010 and 2015 (around 26%). In particular, the fiscal policy mix accounts for 14% of the total output loss, while the deterioration in property rights accounts for another 8%. It thus naturally follows that a less distorting

fiscal policy mix and a stronger protection of property rights are necessary conditions for Greece's economic recovery.

Austerity and 'fiscal consolidation' is motivated by the need to put public finances in order but, because it causes a recession and a reduction in GDP, its effectiveness on the debt-GDP ratio may prove a double-edged sword. Though this is widely suspected, indeed supported by the literature (House et al. 2017; De Grauwe and Ji 2013), it has not yet been crystallised in basic theory. Chap. 10 (The limits of austerity: The fiscal multiplier and the 'debt Laffer curve') by Christopher Tsoukis embeds this idea into a simple formal framework of public finances and discusses austerity, conditionality and structural reforms more widely. It asks whether there is any maximum public debt-GDP ratio that is serviceable when one allows for the fiscal effects of the required primary surpluses (the 'fiscal multiplier'). This simple but novel approach yields a debt Laffer curve that defines the debt and deficit (as ratios over GDP) that may be feasibly sustained. Next, the chapter reviews estimates of the fiscal multiplier and argues on this basis that the maximum sustainable debt-GDP is likely less than 100% and the maximum feasible primary surplus is less than the 3.5% required by Greece's creditors for the medium term; this analysis shows that insistence on such targets will be self-defeating. Finally, the chapter critically reviews structural reforms, a key pillar of the conditionality imposed on Greece. The policy corollary is that the paramount objective for both Greece and its creditors should be the return to high rates of growth, and currently, this requires relaxation of austerity above all.

The underground economy is quite prominent in Greece (though by its nature, the topic does not allow confident, concrete estimates) and this complicates the estimation of the effects of fiscal policy as well as the efforts for fiscal rationalisation. This issue motivates the next Chap. 11 (Fiscal Consolidation Policies and the Underground Economy: The Case of Greece): Evi Pappa, Rana Sajedi and Eugenia Vella examine the effects of fiscal consolidation policies using a New Keynesian model with an underground sector, calibrated for the Greek economy. They find that spending cuts induce a reallocation of production towards the formal sector, thus reducing tax evasion. On the other hand, tax hikes increase the incentives to produce in the less productive underground

sector, implying higher output and unemployment costs. The model is used to assess the recent fiscal consolidation plans in Greece. The results provide evidence of an increase in underground activity during these consolidations. They also reveal significant output and welfare costs, which are exacerbated by the presence of the underground economy.

High and prolonged unemployment is one of the main social costs of the Greek crisis; this is the theme of the next Chap. (12), titled ‘Output and Unemployment: Estimating Okun’s Law for Greece’, in which co-editors Ioannis Bournakis and Dimitris Christopoulos estimate Okun’s Law for Greece over the period 1960–2015. Their analysis indicates that the growth-unemployment nexus in Greece is subject to non-linearities with the existence of lower and higher growth rate regimes. The critical growth rate threshold is found to be at the 1%. Accordingly, the elasticity of unemployment is estimated to be 1.47% when the economy grows at a rate above 1% while unemployment falls by 1.21% when the economy expands at a rate below 1%. These estimates indicate a rather gloomy prospect for the reduction of unemployment in Greece’s present economic climate. To restore employment to the pre-crisis level, a period of 11 years is required if the growth rate is at the upper regime—above 1%—while this time horizon increases to 13.4 years if the economy is at the lower regime—below 1%.

The topic of Chap. 13, titled: ‘On the Determinants of Non-Performing Loans (NPLs): Lessons from Greece’ by Elias Tzavalis, Evangelos Charalambakis and Yannis Dendramis, is NPLs, which are rising meteorically, with serious implications for the financial viability of commercial banks (which have been repeatedly capitalised for this very reason) and for the effects of austerity (the fiscal multiplier, which is larger downwards, as argued). In particular, the Chapter investigates the relationship between NPLs and their fundamentals, mainly bank and macroeconomic variables. This is done based on the aggregate portfolio loans in the Greek economy. It is argued that Greece constitutes an interesting case for studying the factors determining NPLs, given the pervasive recessionary conditions that have characterised it, since the outbreak of the crisis in 2010. The chapter proposes a new econometric framework which extends the SUR (seemingly unrelated regressions) framework to allow for a common break in its slope coefficient of

unknown date. The results reveal that the deterioration in the macroeconomic conditions (captured by very high rates of unemployment) and political uncertainty constitute key factors of explaining the sharp rise of NPLs of the Greek banking sector after the first quarter of the year 2012. With the exception of bank profitability, bank-specific variables associated with bank capitalisation and liquidity risk seem to determine NPLs only under normal economic conditions.

Chapter 14 (Who exports high-quality manufacturing products? some empirical regularities from Greek exporting firms) by Sarantis Kalyvitis assesses the quality of Greek manufacturing exports and links the estimates to the labour structure of exporting firms. Export quality is estimated to have fallen by 1% per year on average in the period 1998–2010, but recovered in 2011 and 2012 when export quality displayed a cumulative rise of 25.7%, yielding a cumulative rise of 9.2% over the entire period 1998–2012. Linking the quality estimates at the product level with exporting firms shows that higher product quality is associated with exporters that have a higher share of their wage bill paid to skilled workers. This positive relationship stems from firms with higher skilled to unskilled employment ratios, rather than higher wage skill premia, and is more pronounced in large and rich destinations.

Chapter 15 (Spatial structure and spatial dynamics of regional incomes in Greece) by Burhan Can Karahasan and Vassilis Monastiriotis explores the theme of spatial asymmetries in Greece, a country where about half of population and more than half of GDP is concentrated around Athens, and much of the land mass is mountainous and uninhabited, while there is a whole host of disconnected islands. This chapter offers a detailed analysis of spatial asymmetries and dynamics in Greece over the long period. The analysis finds a general picture of weak spatial associations ('spatial randomness'), underpinned by a number of disconcerting patterns: a trend of increasingly localised spatial disparities; a single-cluster formation ('hotspot') around Athens and the south Aegean islands; a significant role of space ('neighbourliness') for determining regional convergence and divergence; and, most importantly, the emergence of two antithetical trends in spatial association during the period of financialisation in the country (intensifying associations in the Athens cluster and increasing spatial randomness

outside this). We claim that understanding these patterns and trends is paramount for designing appropriate policies for sustainable and spatially-equitable growth in the country in its post-crisis environment.

The volume concludes with Chap. 16 by co-editors Ioannis Bournakis and Christopher Tsoukis, titled: ‘Greece’s competitiveness: A survey and concluding remarks’. The chapter identifies the specialisation pattern of the Greek economy in the years prior to the crisis and analyses the various conceptual dimensions of competitiveness. Although Greece has experienced an increase in Unit Labour Costs (ULC), this could not be regarded as the only, not perhaps even the key, factor behind the accumulated current account imbalances. Greece has been gradually de-industrialising since 1980s and this process accelerated in the years after country’s accession to the common currency. The post-euro era was essentially a period of massive capital inflows, which transformed Greece into a highly introvert economy. Improving competitiveness in Greece requires a different production and export paradigm, which is not embedded into the recipe of internal devaluation imposed to Greece in exchange of external bailout programmes. In an increasingly globalised environment being competitive is a far more complex process than simply reducing the cost of labour as manifested in the Competitiveness Pact (2011). It is now up to Greece’s political and economic elite to design and implement an economic regeneration plan, an extremely challenging task given the chronic inadequacy of the political system.

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2

The Eurozone Crisis: A Near-Perfect Case of Mismanagement

Charles Wyplosz

2.1 Introduction

For nearly three years, from early 2010 to late 2012, the Eurozone has lived on the brink of breakup. The banking and financial systems became fragmented, gravely impairing the effectiveness of the common monetary policy. Policymakers have appeared as clueless in the face of a recession of unprecedented depth and length. Elected Heads of Governments have been summarily pushed to resign by their pairs. The European Commission has given the impression of being unable to

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reconcile deep disagreements, leaving one country, Germany, in charge of masterminding policy responses. Even with enhanced powers, the European Parliament has remained passive. As the intensity of the crisis has receded, policymakers have declared victory prematurely and studiously ignored the risks of a legacy of huge public debts.

The crisis did not erupt in clear skies. It was years in the making. Warnings were not heeded. Poor institutions, whose weaknesses had been carefully described, were left untouched or superficially patched. When the crisis finally revealed these cracks, policymakers chose to avoid any deep questioning. It is only at the insistence of the ECB, quite late in the game, that a banking union was set up, but only partially so. It is only under ECB pressure that a new fiscal discipline regime—the fiscal compact—was set up but poorly implemented. It is often said that a good crisis should never be wasted; in many respects, this one has been wasted. The result is a wave of Euro-skepticism whose deleterious effects will be felt for many years to come.

Even now, five years later, major disagreements about the source and unfolding of the Eurozone crisis remain. A popular and entrenched narrative emphasizes competitiveness issues. It portrays the periphery economies as unable to operate in an integrated market. Excessive production costs are described as the cause of the crisis even though the evidence tells a different story (Wyplosz 2013b). Current account balances are then misinterpreted as driven by labor costs and as a cause of the crisis, while they are a symptom of excessive spending driven by either fiscal indiscipline or excessive credit growth (European Commission 2009; Lane and Peels 2012; Wyplosz 2013a). This paper aims at offering a consistent narrative of the crisis.

It takes as its starting point the view that the sovereign debt crisis is due to fiscal indiscipline, as described in Sect. 2.2. Section 2.3 presents the decisions taken when the Greek crisis broke out. These measures were presented as “unique and exceptional,” only to shape the management of the following crises. Section 2.4 analyses the long period during which the crisis spread. The turnaround finally occurred at end-2012 when the ECB took the steps that it should have taken earlier, as explained in Sect. 2.5. This does not mean that the crisis is over, however; Sect. 2.6 explains that the legacy of large public debts constitutes a threat that

is currently ignored. The concluding section attempts to interpret these policy failures.

2.2 Before the Crisis: Fiscal Indiscipline

With few exceptions, the Eurozone countries share a long history of fiscal indiscipline. During the period 1970–1995, average public indebtedness has more than doubled as a percentage of GDP, as Fig. 2.1 illustrates. Over the next ten years, the average debt ratio has declined, but modestly. Following the onset of the global financial crisis, the increase has been swift, as in many other developed countries.

Averages conceal many important details, which Table 2.1 fills. Two countries, Germany and Luxembourg, were virtuous during the 1970 and 1980s but Germany's unification proved to be very costly in the 1990s. On the other hand, three countries (Belgium, Ireland, and the Netherlands) were not virtuous over the first period but then made serious corrections. In the years that followed the adoption of the euro, six countries (Belgium, Finland, Ireland, Italy, the Netherlands, and Spain)

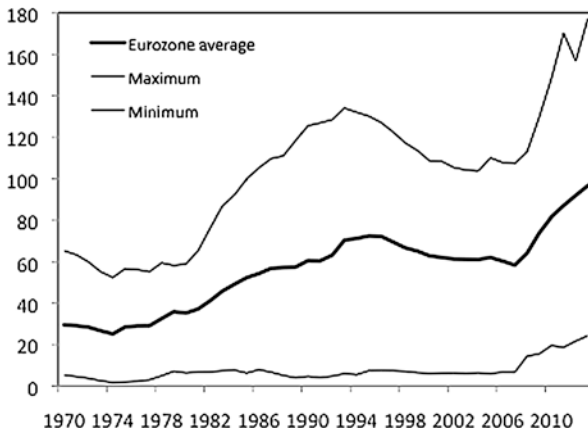


Fig. 2.1 General government public debts (% of GDP). *Source* 1970–1989: Historical public debt database, IMF; 1990–2013: AMECO, European commission. *Note* Eurozone average is unweighted, original 12 member countries

Table 2.1 Changes in the debt to GDP ratio (%)

	1970–1990	1990–1998	1998–2007	2007–2009	2009–2014
Austria	40.0	8.2	−4.2	8.9	5.2
Belgium	78.1	−8.3	−33.2	11.7	4.8
Finland	8.7	34.3	−13.2	8.4	16.9
France	14.2	24.4	4.6	15.0	16.9
Germany	−18.3	21.0	4.7	9.3	2.7
Greece	47.0	22.9	12.8	22.4	47.3
Ireland	50.4	−39.0	−28.2	39.6	55.8
Italy	57.2	20.1	−11.1	13.1	17.3
Luxembourg	−5.2	2.4	−0.4	8.9	9.9
Netherlands	11.5	−11.1	−20.4	15.5	14.5
Portugal	19.1	−1.5	16.6	15.3	42.9
Spain	28.7	21.5	−27.9	17.7	44.9

Source See Fig. 2.1

also successfully drove their public debts down by large amounts. In contrast, three countries (France, Greece, and Portugal) never seriously dealt with their public deficits, and that observation applies to Germany as well since the early 1990s. During the global financial crisis, all countries saw their public debts rise, in some cases (Ireland and Greece) in an explosive manner. The same occurred during the sovereign debt crisis (2009–2013), with several cases of doubling or near doubling of the debt ratio (Greece, Ireland, Portugal, and Spain).

The evolution of the last six years dwarfs the earlier increases, but massive debt build-up during a period of historical hardship is not untoward. What is less understandable is a continuing stream of deficits over complete business cycles. This is what lies behind the upward debt ratio trends observed in nearly all Eurozone countries (Fig. 2.2).

A debt build-up is often described as adverse to growth because it imposes a high debt burden. This is true but when debt becomes large, there is a much more pressing risk. Like any asset, public debts are susceptible of being subject to self-fulfilling crises. A characteristic of most financial crises is that they are long in coming and are often triggered by an unexpected event. The occurrence of the crisis, then, is not really surprising but the timing of its occurrence is.

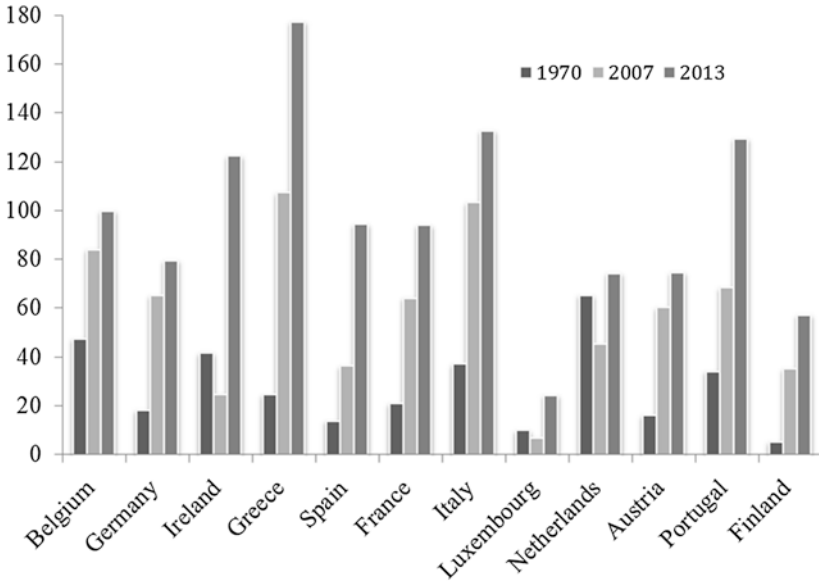


Fig. 2.2 Debt ratios in 1970, 2007, and 2013. Source See Fig. 2.1

The Greek case is a case in point. By 2007, the debt was above 100% of GDP and yet the risk premium relative to German bonds was negligible. It is commonplace today to blame markets for their shortsightedness. Indeed, at the time, the ECB often expressed uneasiness with what it saw as a lack of market-driven discipline. This was a case of a “good equilibrium.” Investors did not take seriously the risk of a debt default, and they were right. Absent the global financial crisis, there was a distinct possibility that Greece could have continued to serve its debt, quite possibly an even higher one. The financial crisis, however, reduced risk appetite and investors started to question this benign scenario. Once doubts settled in, the risk premium started to rise and to make the debt less stable, especially as the GDP growth rate took a dive. This intensified investors’ unease, leading to further increases in the risk premium, and so on. The Greek debt situation shifted to a “bad equilibrium” when it was revealed that deficit accounting has been doctored.

The risk premium became as excessively large in 2010 as it had been previously too small.

Multiple equilibria, which make self-fulfilling crises possible, are a defining characteristic of financial markets. This is a classic case of market failure. It is driven by shifting market expectations. Expectations are neither right nor wrong; they represent the “average view” of investors regarding future developments that may or may not materialize. Policymakers always lament this instability; instead, they should take the existence of multiple equilibria into account and act accordingly. The combination of a market failure (multiple equilibria) and of a policy failure (rampant fiscal indiscipline) allowed the crisis to erupt. Indeed, the crisis had been in the making for quite a while.

The upshot is that large public debts are bad, particularly because they constitute a risk of a self-fulfilling attack. The attack may or may not ever occur, but the risk is there, hidden when the equilibrium is “good.” Large public debts are an accident waiting to happen. Policymakers should avoid large debt buildups and, when debts are big, they must ensure that the accident will not happen. In the Eurozone, they failed on both accounts.

2.3 Greece: The Mother of the Eurozone Crisis

The economic situation deteriorated rapidly after the onset of the global financial crisis. As the growth rate rapidly turned from positive to negative, the budget sharply deteriorated, as can be seen in Fig. 2.3. What put Greece on the market’s radar screen was the recognition by the government newly elected at end 2009 that its predecessor had doctored the deficit figures. This triggered a self-fulfilling process. Given the deteriorating situation, the Greek government was losing market access and could not, therefore, deal with the crisis on its own.

This was a classic situation. Either Greece would get external help or it would default. The normal process, in this case, is to apply for IMF support and associated conditionality, which could possibly include a partial default. But, early on, the ECB came out with the “two no” position: no recourse to the IMF and no default. This effectively blocked

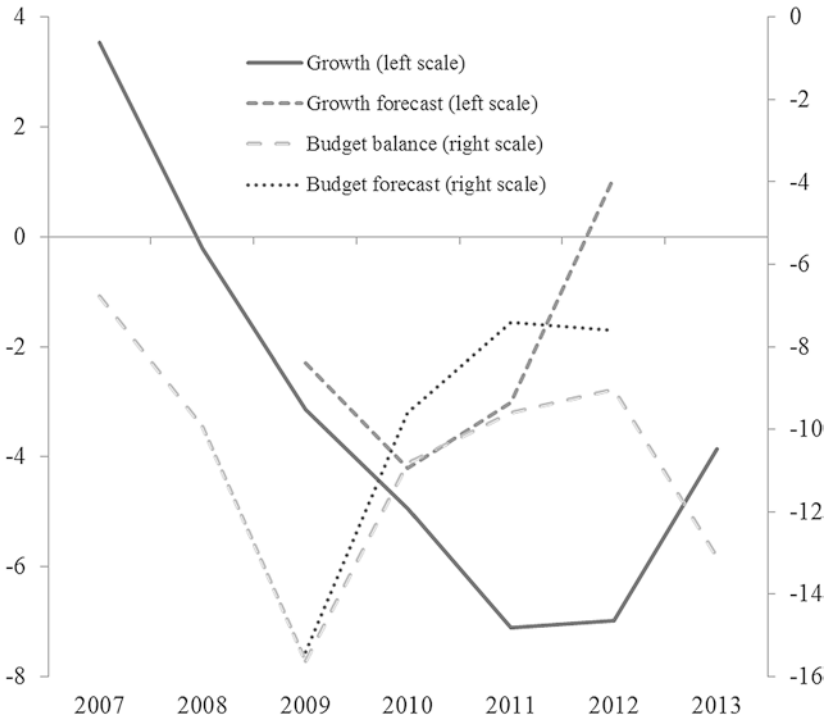


Fig. 2.3 Greece in the crisis years. *Source* AMECO, European commission and European Commission (2010)

any solution, when one takes into account that the European Treaty has a no-bailout clause that prohibits assistance by governments (art. 125) and by the ECB (art. 123).

Something had to give, and all three blocking points were circumvented. First, in May 2010, the IMF was called in, but within the new Troika arrangement. Second, the arrangement also drew in the ECB and member governments against the spirit—if not the letter—of the no-bailout clause. Finally, a default, under the euphemism of Private Sector Involvement (PSI), was organized at end 2011, wiping out some 75% of GDP worth of Greek public debt.¹ Even though it

¹One of the most staggering mistakes was the “Deauville walk”. Upon return from their walk by the sea, Chancellor Merkel and President Sarkozy pre-announced the future debt write down. Warning ahead of time is a financial market cardinal sin and it did send markets into a tailspin.

was presented as voluntary, it was a default. In the event, it ruined the unprepared Cypriot banks and led directly to the Cyprus crisis some two years later. These decisions have shaped the crisis.

First, the Greek package was presented as “exceptional and unique.” In fact, it has become the blueprint for the subsequent packages. The political leaders believed that they were not creating a precedent, only to be trapped by it later on.

Second, until then, the IMF had never accepted to be the junior partner of rescue operations. Instead, the well-established procedure was for the IMF to lead negotiations and craft a package. If the costs exceeded its resources, including the lending ceiling, the IMF would then call upon friends of the country to contribute additional bilateral resources, but these resources were only disbursed with its agreement. This was a standard and time-tested practice. In 1998, it had rejected the Japanese offer to create an Asian Monetary Fund to deal with the spreading East Asian crisis, precisely because it wanted to be in charge alone. Historians will have to explain the reasons that led to such a radical change, but it is now acknowledged that it was not a felicitous one, as detailed below.

Third, the effective violation of the no-bailout clause is of historical importance. From the start of planning for the common currency, it was clear that fiscal discipline was a key requirement (Delors Committee 1989). The chosen solution was the adoption of the Stability and Growth Pact and the no-bailout clause. For well-understood reasons (Eichengreen and Wyplosz 1998; Wyplosz 2013a), the Stability and Growth Pact was bound to fail, leaving the no-bailout clause as the only safeguard against the deficit bias. The power of the clause depends entirely on its credibility, which provides incentives for governments to be fiscally disciplined. The fact that the clause was pushed aside the very first time when it becomes binding means that its credibility has been shattered and, therefore, that it has no incentive power. Effectively, the Eurozone has no effective fiscal discipline

mechanism in place and restoring the no-bailout clause credibility is nearly mission impossible.²

Fourth, the approach to the bailout package evidenced a surprising lack of understanding of the nature of financial crises, at the government level, at the Commission and even at the ECB. In early 2010, suggestions were made that Greece would be offered a €10 billion loan. A few weeks later, the figure was raised to €20 billion. In the end, the May 2010 package provided €110 billion, followed by a new loan of €130 billion in 2012, and more might be coming. In addition, the loans initially carried high-interest rate, suggestive of a punishment intent. The impact on debt build-up was disastrous *vr3 vr3*. Eventually, these interest rates were lowered.

Fifth, the conditions attached to the loans, which also shaped subsequent programs, imposed terse austerity fiscal policies. Given the deepening recession in Greece, it came as a shock that a severely pro-cyclical stance would be required.³ In the tense debate that followed, the Troika argued that the multipliers were very small, possibly negative. This belief was formalized in the Fall of 2010 optimistic forecasts, as seen in

Figure 2.3. Subsequently, the IMF, which signed on these forecasts, has acknowledged its mistake (Blanchard and Leigh 2013).

Fifth, the discarding the no-bailout clause was justified by the urgent need to prevent contagion. As we know all too well, contagion still occurred. In fact, an argument can be made that the austerity program alarmed the financial markets even more. This can be seen in Fig. 2.4, which displays the interest rate spreads over the German bonds.

Finally, the creation of the Troika is difficult to understand from a political viewpoint. For decades, the IMF has assumed the role of bad cop, leaving behind its programs a trail of deep resentment. The Troika

²The 2012 reforms of the Stability and Growth Pact, including the two pack-six pack legislation and the fiscal compact, massively increase the weight and complexity of the bureaucratic process. It does not change any of the fundamental weaknesses of the Stability and Growth Pact, *inter alia* its incompatibility with national sovereignty in budgetary matters. It may affect behavior on the margin, as it has in the past, but it cannot be decisive, as it should be.

³The IMF had officially acknowledged that similar policies imposed during the Asian crisis had been misguided.

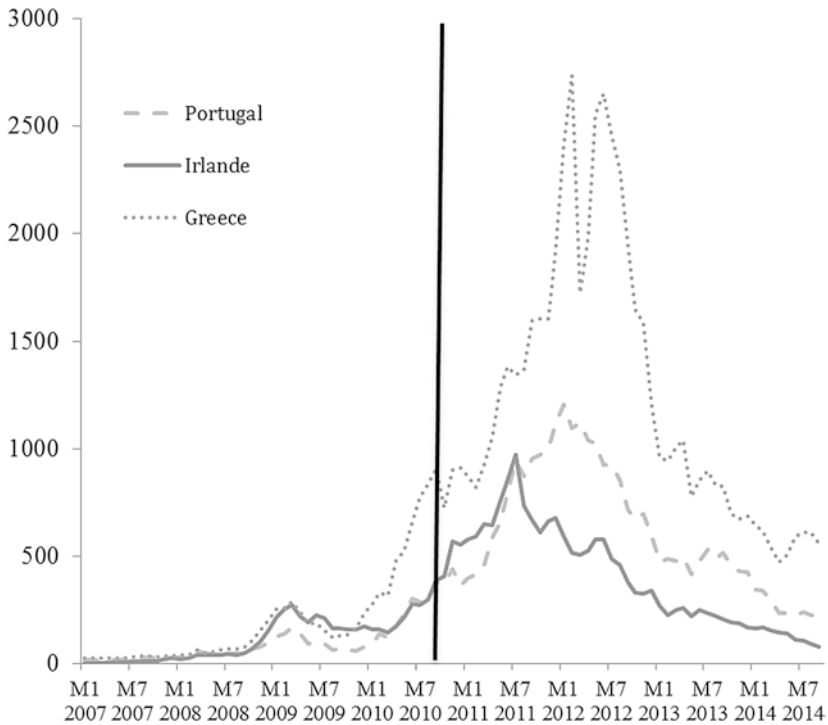


Fig. 2.4 Interest rate spreads on 10-year government bonds. *Source International Financial Statistics, IMF.* *Note* The vertical line indicates the date of the Greek bailout (May 2010)

visibly put the European Commission in the front seat. Not only this led to disagreements with the IMF, which even let it be known that it found the program too harsh, but it also left a legacy of resentment that will not disappear. In contrast with the IMF, which leaves the scene once the program is over, the European Commission will remain engaged with all member countries. In addition, by assuming the role of bad cop, the Commission has contributed to the emergence of a popular anti-Europe sentiment that is unlikely to go away. The long-run political consequences could well be considerable.

In the same vein, the ECB has found itself in a position to impose conditions on governments. This runs counter to its staunch—and fully

justified—attachment to the principle of central bank independence from member governments. Independence, however, needs to go both ways. By undermining national budgetary sovereignty, the ECB has put itself in a delicate position. The argument that the ECB must defend the principle of monetary dominance—the fact that monetary policy should never be called upon to plug the public sector budget constraint—does not justify the ECB membership in the Troika as part of a program that involves central bank loans to member governments, even if they are indirect, in contradiction with the no-bailout clause.

2.4 Contagion: Muddling-Through

The worst period of the crisis is between the Greek bailout and mid-2012, when the ECB made its moves, as described in Sect. 2.5. During this period, the European Council met at frequent intervals (about every other month) to deal with a continuously worsening situation, well illustrated in Fig. 2.4. Each meeting was presented before and after as a major success, which would bring the crisis to its end. In fact, most of them were quickly followed by a new ratcheting up of risk premium because the decisions taken were not addressing market anguish.

Table 2.2 lists all the Summits that took place during the acute phase of the Sovereign Debt Crisis, indicating for each one the decisions taken regarding the crisis. With few exceptions, the statements published after the meetings indicate a continuous focus on austerity policies and the need for countries under Troika programs to abide by their commitments.⁴ The few relevant decisions include the creation of the European Stability Mechanism (December 2010), the debt reduction for Greece (July 2011) and the decisions to create the Single Supervisory Mechanism (June 2012) and the Single Resolution Mechanism (December 2012). Although the statements frequently refer

⁴A constant theme, developed at every single meeting, is the Europe 2020 program to boost growth and employment. At some point, the statement reflects frustration with this litany: “However, efforts undertaken to date remain insufficient to meet most of these targets” (European Council, March 1–2 2012).

Table 2.2 European Summits, May 2010–End 2012

2010	May 7	Greek bailout
	June 17	Europe 2020, work on fiscal consolidation
	September 16	“Maintain momentum on the reform of European governance”
	October 28–29	More on governance, no decision
	December 16–17	Creation of European Stability Mechanism (ESM)
2011	February 4	None
	March 11	Lending capacity of ESM set at €500 billion
	March 24–25	Adoption of Six Pack concerning fiscal discipline
	June 23–24	New program for Greece
	July 21	Ban on short selling PSI for Greece, Bank capital requirement. Two Pack for fiscal discipline,
	October 23–26	Euro Summits at least twice a year
	December 8–9	Fiscal compact
2012	January 30	None
	March 1–2	None
	March 23	“We want Greece to remain in the euro area”
	June 28–29	Single Supervision Mechanism (SSM), part of Banking Union
	October 18–19	ECB in charge of SSM; ESM allowed to lend to banks
	November 22–23	None
	December 13–14	Single Resolution Mechanism (SRM), part of Banking Union

Note Some meetings were restricted to Eurozone members. The table only reports decisions regarding the Euro area

Source Compiled by the author from European Council (<http://www.european-council.europa.eu/>)

to the gravity of the situation, actual decisions are remarkably few and far apart.

Most importantly, many decisions were either irrelevant or even counterproductive. Several Summits attached considerable importance to the strengthening of the Stability and Growth Pact. Even if one is willing to accept that they have succeeded—a view strongly rejected in Sect. 2.3—this is a long run issue that was irrelevant for the crisis. The leaders seem to have believed that the markets were spooked by the lack of fiscal discipline and that reinforcing the pact would calm them down. In fact, the markets were spooked by the legacy of high

accumulated debts and the urgent need for a return to growth in order to avoid a damaging decline of the denominator of the debt to GDP ratio. The markets correctly saw the fiscal consolidation requested by the Commission—a.k.a. austerity—as preventing growth and aggravating the debt problem.

Much the same applies to the creation of the temporary European Financial Stability Fund (EFSF), and of its permanent successor, the ESM, by the Eurogroup of finance ministers. They believed that bail-outs were exactly what the markets wanted to see. Yet, neither the EFSF nor the ESM had any lasting effects on the risk premia. These were resources provided by the public sector to governments that the private sector was unwilling to support anymore. It was most unlikely that the markets would be reassured by increases in the stock of debt, especially by creditors likely to enjoy seniority, either formally (the IMF and the ECB) or informally.

The governments were not just misunderstanding markets, they did not even listen to investors. A self-fulfilling crisis comes to an end either after a crash or when market expectations are changed. Policies can change market expectations only if they address market concerns, on their terms. Progressively, the stock of debts under suspicion (the three bailed-out countries *plus* Spain and Italy) reached some €3000 billion. The late creation of the ESM, with a maximum lending capacity of €500 billion, was again not of an adequate order of magnitude. While policymakers were concerned about flows (annual budget deficits), the markets were worried about the stocks of debts.

This criticism applies to the ECB as well. During the period under review, it has kept its interest rate higher than the Federal Reserve and the Bank of England, even raising it in mid-2011 when the crisis was getting worse. Similarly, throughout both the financial crisis and this phase of the Sovereign Debt Crisis, the ECB has expanded its balance sheet but much less than the two other central banks. During both periods, the ECB has made it clear that its objective was to deliver price stability and that it was incompatible with acting as a lender of last resort, either to banks or to governments. This has led de Grauwe (2012) to explain why the debt crisis has only affected Eurozone member

countries: in other developed countries, the markets have never doubted that central banks would never accept a default on their public debt. The ECB too has opposed defaults, including the Greek PSI, but it did not take the measures required to rule them out. On the contrary, by calling for rapid fiscal stabilization, the ECB reinforced market fears and, therefore, contributed to the spread of the crisis throughout the Eurozone.

2.5 Turnaround: The ECB Against Governments

The acute phase of the crisis ended between the end of 2011 and mid-2012 (Fig. 2.4). It can be traced to two key actions of the ECB. At the end of 2011, the ECB announced the long-term refinancing operation (LTRO), a fixed rate full allotment program of lending to banks. As noted above, markets look at stocks. By December 2011, the balance sheets of the ECB had spent nearly €500 billion, the total lending capacity of the ESM. By March 2012, it had spent another €500 billion (Fig. 2.5).

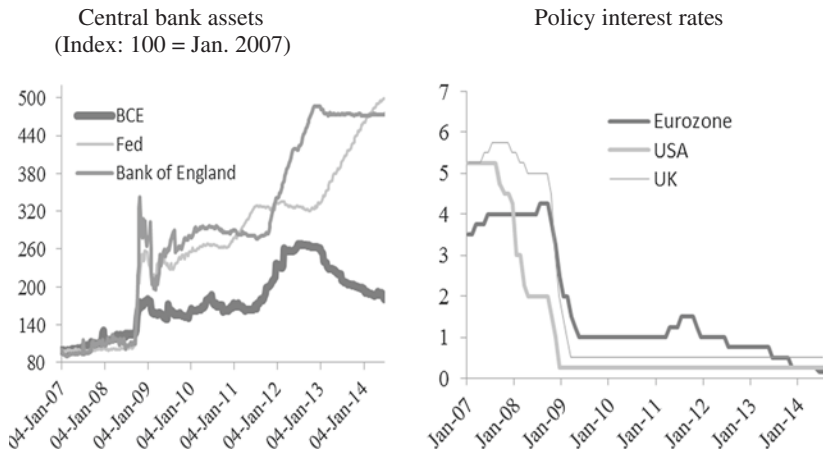


Fig. 2.5 The ECB, the fed and the Bank of England. Sources European Central Bank, Federal Reserve, and Bank of England

Then, during the Summer of 2012, the ECB announced the outright market transactions (OMT) program. The significance of this program is that it commits the central bank not to amounts, but to prices. The unlimited ability of a central bank to absorb or sell assets is what creates the possibility of controlling asset prices or interest rates. The markets were influenced by the size of the LTRO but that could never be the definitive weapon because it was not targeting any price. The quantum step of the OMT program was to announce that the interest rates on crisis countries had to go down. By famously pledging to buy bonds in “whatever it takes” amounts, the ECB finally acted as a central bank. Without spending one euro (so far), the ECB has turned the situation around.

Even the OMT program, is not exempt of criticism, though. The interest rate target has not been announced and the ECB has conditioned its interventions to countries that are under a Troika program. Limits to unlimited actions undermine the intention. The reason for these limitations is most likely related to growing chasm between the ECB and (some) governments. The ECB considered that it could not go farther.

All indications are that the ECB, possibly under its new leadership, finally grasped the nature of the crisis and of the necessary policy responses, while governments continued to favor the muddling-through approach that had failed so far. This obviously put the ECB at odds with the governments. Of great interest is that before each of its two “knock down” punches, the ECB presented the governments with urgent central bank requests.

First, as it was preparing the LTRO, the ECB told the government that the Eurozone needed a “fiscal compact” that would make fiscal discipline a national constitutional responsibility. Decentralizing fiscal discipline had been advocated earlier (Wyplosz 2012) as the way of avoiding the conflict between the Stability and Growth Pact and national sovereignty. The ECB can act as lender of the resort to governments only if it has solid reasons to expect that fiscal profligacy will never be seen again. At any rate, its request was promptly satisfied.

Within weeks, a new treaty (The Treaty on Stability, Cooperation, and Governance, TSCG) was adopted. It requires national legislation and budget rule. Unfortunately, the treaty is vague and its implementation falls short of what is needed.

Next, before launching the OMT program, the ECB called for a banking union, one of the glaring oversights of the Maastricht Treaty, which makes it impossible for the ECB to act as lender of last resort to banks. Indeed, a central bank needs to have real time knowledge of the situation of banks that require support. Such knowledge rests with the supervisor. But national supervisors are known to tread very carefully when national champions are in difficulty, which is bound to prevent timely and accurate communication. Here again, the governments immediately approved the idea. It then took months to create the Single Supervision Mechanism (SSM) and many more months—along with constant ECB providing—to adopt the single resolution mechanism (SRM). Both are notably insufficient.

2.6 The Public Debt Legacy

The decline in risk premia indicates that the financial markets are no longer acutely worried about public defaults or a breakup of the Eurozone. The crisis, however, has left a legacy of high public debts. In fact, public debts are higher now than they were before the crisis, considerably higher in several cases. The decline in risk premia does not indicate that the markets are reassured about debt sustainability; it simply means that they regard the ECB as likely to act as lender of last resort. However, this commitment is both vague and conditional. As noted earlier, and it has never been tested. A new phase of acute market pressure is therefore plausible.

The official response remains as misleading as ever. They delude themselves by not looking at the existing stock of debt, relying instead on continuing austerity policies to reduce the flow of new debt. The process of debt reduction that they envision is likely to take decades (Eichengreen and Panizza 2014). Once again, the political leaders show no sign of understanding the pressing danger of a recurrence of contagious self-fulfilling crises.

The only way of eliminating the threat of renewed market panic is to reduce the debt stocks. Barring rapid and unexpected inflation, which the ECB would never condone, the only solution is to restructure public debts where they are evidently too large for comfort. There are two good reasons to reject this solution. First, some public debts are owed to governments, to the ECB, and to the ESM. A debt restructuring would impose losses on these creditors. This would amount to debt burden sharing among Eurozone countries, which the less indebted countries adamantly reject for perfectly understandable reasons. Second, during the crisis, national public debts have migrated to the books of national banks. A debt restructuring of the appropriate size would threaten the survival of banks and require new cash injections, financed by fresh public borrowing. This would nullify the debt restructuring effort. A solution, the PADRE plan, has been advocated in Paris and Wyplosz (2014). It involves the purchase by a specially created agency of large amounts of all public debts. The agency would then swap these bonds into zero-interest rate perpetuities in exchange for an equivalent (in present value terms) transfer to the agency of seigniorage income to be received on the relevant horizon. This would involve no cost to banks and no transfers among Eurozone countries. In effect, it would simply guarantee that the restructured debts will be paid for by future generations in each country. In practice, it would remove from the market place the excessive debt stocks that stand to trigger self-fulfilling crises.

2.7 Conclusions

The Eurozone crisis occurred because the institutional setup was imperfect. The wrong concept of fiscal discipline allowed some public debts to increase dangerously before the crisis while the inability of the ECB to act as lender of last resort to banks, due to the absence of a banking union, led to explosive debt surges in some countries. The incredible lack of comprehension of the crisis by political leaders led to contagion and a deep depression for three years. It was only when the ECB became active in 2012 that the crisis came under control.

Some of the institution flaws have been dealt with, but partially so. The fiscal compact (TSCG) does not fully decentralize fiscal discipline and has been weakly implemented. The Banking Union leaves many banks outside the SSM and the SRM; it is also far too complex to be efficient. At least, steps have been taken in the right direction. Further steps are urgently needed but it is likely that it will require a new crisis for governments to take action.

On the other hand, governance has gravely deteriorated. Existing institutions have been unable to design timely and adequate policy responses. The Commission has limited itself to impose pro-cyclical austerity policies and to try to increase its power. Important changes have been proposed by other bodies (the ECB, the Eurogroup or national governments). The “Community method” has given way to intergovernmentalism of the worst kind. Indeed, the vacuum has been filled by the emergence of one country, Germany, as the effective leader. This is a highly truncated form of intergovernmentalism. It is an ineffective form because any country will always use its influence to advance solution that meets its interests, which is what Germany has done. It is also politically dangerous since other public opinions are bound to resent the situation. The dramatic economic and social impact of the crisis has left a disastrous perception of what Europe is. The costs could well be momentous in the long run.

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3

The Elusive Promise of Structural Reform

Dani Rodrik

3.1 Structural Reforms: The Concept

Structural reform—or more accurately talk of structural reform—is everywhere nowadays. Every country struggling for economic growth, it seems, is getting the same message from the chattering classes as well as the deep-pocketed multilateral finance agencies like the IMF and the European Central Bank: half measures are not enough.

In practice, structural reform has come to represent a grab bag of policies meant to enhance productivity and improve the functioning

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of the supply side of the economy. These measures aim to sweep away impediments to the functioning of labor, goods, and services markets—to make it easier for firms to fire unwanted employees, to break business and union monopoly power, to privatize state assets, to reduce regulation and red tape, to remove licensing fees and other costs that deter market entry, to improve the efficiency of the courts, to enforce property rights, to enhance contract enforcement and so on. Indeed, the grab bag is even bigger. Often, for example, structural reform includes changes in taxes and social security programs with an eye toward fiscal sustainability.

The overarching goal is to increase the efficiency of which labor and capital are allocated in the economy, ensuring that these resources go where their contribution to national income is largest. Success comes in the form of increased productivity, more private investment and, of course, more rapid economic growth.

Perhaps nowhere in recent years has the gospel of structural reform been promoted with greater vehemence than in Greece. Indeed, Greece's creditors have made it crystal clear that structural reform, boldly conceived and implemented without slippage, is critical to economic recovery and growth—and most persuasively to Greeks, that bailout funds will not be forthcoming without it.

The International Monetary Fund and European public lenders understood that the fiscal austerity they prescribed would be costly to incomes and employment (though a retrospective IMF study later showed they significantly underestimated by how much). But there would be a compensatory boost to the economy, they argued, that would come from the long-delayed and much-needed opening of the Greek economy to competitive market forces.

The specifics demanded from Greece ranged from gut-wrenching to mundane. They included (in no particular order) lower barriers to entry in service businesses, such as notaries, pharmacies, and taxis; reduced scope of collective bargaining; privatization of state assets; a rollback of pensions and the cleanup of Greece's notoriously inefficient and arguably corrupt tax administration. The IMF's then-chief economist, Olivier Blanchard, (among others) argued that such reforms were critical in light of the "dismal productivity growth record of Greece before the

program.” Less ambitious reforms wouldn’t do because they would have less impact on growth potential and necessitate greater debt relief.

3.2 Partial Amnesia

But the policy prescribers, it seems, suffered from selective memory. Structural reform as a remedy for slow (or no) growth has been around at least since the early 1980s. At that time, the World Bank began to insist on economy-wide liberalizing reforms as the quid pro quo for developing countries in Asia, Africa and the Middle East in return for “structuraladjustment” loans. These policies were then extended and codified in Latin America during the 1990s under the umbrella of the Washington Consensus. Many of the former socialist economies adopted similar policies (in some cases, voluntarily) when they opened up their economies during the 1990s.

Oddly, though, debate over the reforms pressed on Greece and other crisis-battered countries on the periphery of Europe did not benefit from lessons learned in these other settings. A serious look at the vast experience with privatization, deregulation, and liberalization since the 1980s—in Latin America, post-socialist economies and Asia in particular—would have produced much less optimism about the benefits of the kinds of reforms Athens was asked to impose.

That experience suggests that structural reform yields growth only over the longer term, at best; more often than not, the short-run effects are negative. One meta-study of 46 different research papers on post-socialist economies found that the impact of structural reform varied across the board. The modal estimate of the impact was statistically insignificant, meaning that it was impossible to conclude with any confidence whether the effects were positive or negative. In Latin America, for example, some economies have flourished in the wake of reform (think Chile) and some have lagged (as in Mexico).

These results may seem surprising at first glance but are, in fact, consistent with what economic theory teaches. The standard convergence framework that economists use to analyze growth across countries gives us little reason to expect strong short-term growth promoting

effects. Reform works by raising the *potential* income of the economy in the long run.

Take Greece. Opening the regulated professions will eventually lead more productive firms to drive out inefficient suppliers. The privatization of state enterprises will lead to the rationalization of production (and dismissal of all the excess workers employed through political patronage). But these changes will require years to work themselves through the economy. And in the short run, they may yield perverse effects. For example, the loss of the (however disappointing) output of workers laid off by privatized enterprises will subtract from, rather than add to, national income.

Economists have spent significant effort at estimating the speed with which economies tend to converge to their long-run levels of income. The near-consensus of academic studies is that convergence is pretty slow, at a rate of about 2% per year. That is, an economy tends to close 2% of the gap each year between its actual and potential income levels.

This estimate helps us gauge the magnitude of growth, we can expect from structural reform. Let's be wildly optimistic and suppose that structural reforms enable Greece to double its potential income over three years, which would push Greece's potential per-capita GDP significantly beyond the European Union average. Applying convergence math, this would produce an annual growth a boost of only about 1.3% per year on average over the next three years. To place this the number in perspective, remember that Greek GDP has shrunk by 25% since 2009.

So if structural reforms have so far not paid off in Greece, it is not necessarily because the country's governments have slacked off. Indeed, it is easy—but also largely erroneous—to blame successive Greek governments for unenthusiastic implementation of structural reform and significant slippages. Certainly, Greece has not delivered on every measure it agreed to adopt. Given the magnitude of effort needed, which government could? Yet, remarkably, Greece moved up by nearly 40 positions between 2010 and 2015 in the World Bank's Ease of Doing Business rankings. The country's labor markets are more "flexible"—meaning liberalized—today than those of most other eurozone countries. Greece's "failure" arises instead from the very the logic of structural

reform: the bulk of the benefits comes much later, not when their creditors (and unemployed Greeks) need them most.

3.3 What Triggers Takeoffs?

This leaves us with an apparent puzzle. If structural reforms deliver their growth payoffs so slowly, how are we to explain the numerous instances of abrupt takeoffs in East Asia and elsewhere? If such takeoffs are not the product of conventional structural reform, what does drive them?

A few words first on growth takeoffs. A decade ago, Ricardo Hausmann, Lant Pritchett and I published an article that documented the basic stylized facts about what we called “growth accelerations.” We defined a growth acceleration as an increase in per-capita the growth of 2% points or more (with most of the episodes we identified exceeding this threshold by a wide margin). To qualify as acceleration, the increase in the growth rate had to be sustained for at least eight years, and the post-acceleration rate had to be at least 3.5% annually (per capita). In addition, to rule out cases of acceleration purely attributable to recovery from recession, we required that post-acceleration output exceed the pre-episode peak level of income.

We were surprised to discover how frequent these episodes of growth acceleration are. We identified more than 80 cases over the 35-year period from 1957 to 1992. This meant the probability that any given country would experience a growth acceleration sometime during a decade was as high as 25%. Of the 110 countries included in the sample, 60 had at least one acceleration in the 1957–1992 period.

More important, we found that standard factors economists think to play a role in the growth do not do a good job of predicting acceleration. In particular, structural reforms were only loosely correlated with turning points in economic performance. Fewer than 15% of significant economic liberalizations produced growth accelerations, and only 16% of growth accelerations were preceded by economic liberalization.

Some growth accelerations were obviously the result of fortuitous external conditions (such as a rise in the world prices of a country’s major exports) or other changes not directly attributable to economic

policy (such as changes in political regime). But in most cases, there was no smoking gun. That got us thinking about what might lie behind these instances when economic prospects suddenly brightened.

India's growth acceleration in the early 1980s is perhaps a paradigmatic case. The country's growth rate more than doubled, from 1.7% in 1950–1980 to 3.8% in 1980–2000, with a clear turning point in 1981–1982. Yet serious liberalizing reforms in India did not arrive until 1991, when Manmohan Singh slashed trade barriers, welcomed foreign investment and began both privatization and the dismantling of what is derisively called the license raj. In other words, the pickup in India's growth preceded the 1991 liberalization by a full decade.

Arvind Subramanian and I concluded that the trigger to India's economic growth was an attitudinal shift on the part of the national government in 1980. Until that time, the rhetoric of the reigning Congress Party had been all about socialism and pro-poor policies. When Indira Gandhi returned to power in 1980, she realigned herself politically with the organized private sector and dropped her previous rhetoric. The national government's attitude toward business went from being outright hostile to supportive.

Note that this was a pro-business shift rather than a pro-market shift. It was not supported by liberalizing reforms, which would only come a decade down the road. Indira Gandhi's switch was further reinforced, in a more explicit manner, by Rajiv Gandhi after his rise to power in 1984. This seems to have been the key change that unleashed what Keynes called the "animal spirits" of the Indian private sector.

The moral of the Indian story is that small changes can make a big difference in economies that suffer from multiple distortions. The Chinese growth acceleration after 1978 very much bears this out. The Chinese economic takeoff wasn't the product of economy-wide reforms or a major liberalization. It was the consequence of specific reforms that loosened collective farming rules and allowed farmers to sell excess production—after state quotas were fulfilled—at uncontrolled market prices. The same type of selective, targeted reforms in urban industrial development, trade, foreign investment, and finance would unfold over the next three decades, keeping the Chinese miracle going and going.

Or consider Mauritius, one of Africa's few growth successes in the twentieth century, which experienced its growth acceleration in 1971. The trigger seems to have been the establishment of a largely unregulated export processing zone that led to a boom in the garment exports, even as the rest of the economy remained heavily controlled and protected.

What is common to these cases is that the takeoffs were associated with a targeted removal of key obstacles to growth, rather than broad liberalization and economy-wide reforms. India, China, and Mauritius all benefited from growth strategies that specifically focused on removing binding constraints on growth. Targeting reforms on areas where the growth returns are the greatest maximizes early benefits. It also ensures that scarce political capital and administrative resources are spent on the battles that really matter.

3.4 Maximum Gain for Minimum Pain

Along with my Harvard colleagues Ricardo Hausmann and Andres Velasco, I undertook to identify the binding constraints to growth in specific settings in a 2005 article. For example, an economy in which the main constraint on growth was poor access to finance should exhibit different symptoms (high-interest rates, the strong responsiveness of domestic investment to foreign capital inflows, etc.) than an economy whose main problem was low profitability of private investment (low interest rates, ample liquidity in the banking system, etc.). When entrepreneurship is hampered primarily by market failures rather than government failures, the country may rank high on standard creditworthiness measures like transparency or institutional quality, but private investment will remain low.

A focus on binding constraints helps us see why remedies that are not well targeted—broad structural reforms—are ineffective, at best, and sometimes counterproductive. Cutting red tape and reducing regulation does little to spur private economic activity when the constraint lies on the finance side. Improving financial intermediation does not raise private investment when entrepreneurs expect low profits. Successful

policy design must rely on more on domestic experimentation and local institutional innovations—and much less on “best practices” and blueprints adopted from international experience.

Going back to Greece, where is the binding constraint on that economy today? With a quarter of the labor force out of work, I would argue that the quickest way to get the economy back on its feet would be to increase the private sector’s demand for workers. Supply-side measures, such as conventional structural reforms, can’t be particularly effective at present because the binding constraint is on demand rather than supply. Deregulating professions does not boost entry when aggregate demand is depressed. Making it easier to fire workers does not induce firms to invest and produce more; it just facilitates laying off workers. As helpful as these measures may be in promoting long-term growth, they don’t do much for the economy in the short run and may even make things worse.

However, conventional demand-side remedies like government spending, tax cuts, or devaluation are ruled out by both the burden of public debt and Greece’s membership in the eurozone. In principle, wage deflation should have been a substitute for currency depreciation, making Greek goods and services cheaper in foreign markets. And Greek wages have come down substantially. But here, too, the absence of a single-minded focus on the binding constraints have proved costly.

Different elements in the structural reforms have had conflicting effects on export competitiveness. In manufacturing, for example, the competitiveness benefits of wage cuts were offset by the cost of increases in energy prices resulting from fiscal austerity measures and state enterprise price adjustments. A better prioritized reform strategy could have protected export activities from this adverse effect.

The absence of the ability to devalue or depreciate the currency remains a serious impediment. But the experience of other countries provides a rich menu of alternative tools for export promotion ranging from tax incentives to special zones to targeted infrastructure projects. Greece and its creditors need to recognize the importance (and priority) of improving the profitability of sectors that produce tradable goods and services, and to reorganize reforms around that task.

Most urgently, the government needs to set up an institution close to the prime minister tasked with fostering a dialogue with potential investors—both domestic and foreign—in export-oriented projects. This institution needs to have the ability to remove obstacles identified in the process, to avoid having its proposals languish in ministries with other priorities. These obstacles are typically highly specific to the investment—a zoning regulation here, the lack of a labor-training program there—and are unlikely to be targeted by broad structural reforms.

Some observers of the Greek economy deride the value of export promotion, arguing that the country is hindered by a lack of diversity in tradable goods and services, and is thus unlikely to respond to incentives. But the the experience of other countries makes clear that low export and diversification levels are not destiny. Sizable—and credible—changes in export incentives typically produce robust responses, even where exports are confined to a few traditional crops. It is now forgotten that Taiwan exported sugar, rice, and little else before its trade took off in the early 1960s.

Closer by, export pessimism was the dominant the mood among Turkey's elites before the reforms in the early 1980s, which mainly consisted of export subsidies, produced a rapid the rise in the export-GDP ratio. In Taiwan, Turkey and elsewhere, new exports rather than traditional products have led the way. There's no straightforward means to predict what these new exports will be before the incentives are put in place. But this opacity should not be grounds for pessimism about their likelihood of emerging.

3.5 Pay Now, Pay Later

Ultimately, the choice of reform boils down to one of two approaches. The conventional structural reform agenda relies on a “big bang”—as many changes as possible, as quickly as feasible. Politically, this approach typically exploits a window of opportunity created by economic crisis that reformers fear will close when normal times return. The costs of bigbang reform—higher unemployment, slower recovery—are tolerated in order to reap what is hoped will be sizable benefits down

the line. This kind of reform perhaps works best when there are external anchors that prevent backsliding as short-term costs mount.

Poland in the early 1990s is arguably the model. The prospect of European Union membership—and the promise of becoming a “normal European country” after a half century of isolation from the West—held the reforms together despite high unemployment and serious economic dislocation early on.

Elsewhere, in the absence of external anchors there is always a real threat that the backlash will dominate. Bolivia and Venezuela in Latin America fit this latter mold.

The second approach is less ambitious, consisting of sequential targeting of binding constraints. The political strategy underpinning this style of reform is the expectation that early wins will create political support for reforms (and reformers) over time. When binding constraints are successfully targeted, the early growth payoffs can be quite spectacular.

This is the quintessential model perfected in China, but versions have been at play in South Korea, Taiwan, and India at different times. Because the reforms are partial, they never quite do away with the insiders (and their ability to extract gains through market power and political connections), who are typically less than enthusiastic about continuing reforms. So there is always the risk that such reforms will get stuck midway and the early growth benefits will dissipate.

Greece has taken the first route—likely less because this was the country’s choice than because its creditors left it with little alternative. If the results have been disappointing to date, it is for reasons that should have been expected at the outset. It remains to be seen whether Greeks’ evident desire to remain in the eurozone (or at least their fears of the alternative) will prove sufficient counterweight to the pain that the country has yet to endure.

4

The Responsibility of the EU

John Grahl

4.1 Introduction

Although the Greek case stands out from that of other crisis-struck members of the eurozone, it is important to recognise that Greece is the most serious victim of a process which also disrupted the economies of several other countries.

According to the Commission's AMECO database,¹ in 2016, nearly ten years after the global financial crisis, GDP stood below its 2007 levels in: Spain (down by 0.5%); Italy (8%); Cyprus (3%); and Portugal (4.5%). Thus in at least four other eurozone members, the functioning of the monetary union has prevented recovery from a decade-long recession. Of course, the collapse of production in Greece (down by more than 26%) dwarfs these cases, but it is clear that a general process is at work. Further, the exceptional scale of the Greek decline cannot be completely attributed to factors internal to Greece: policy in the

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country has been imposed, in an increasingly intrusive manner, by the Troika. If you break it you own it—the socio-economic catastrophe that is Greece today is to an embarrassing extent the property of the “institutions” (ECB, Commission, IMF, and latterly the European Stability Mechanism) and of the German-led Council which impelled them on their course.

There are exceptions, but they turn out to prove the rule. Ireland has staged an impressive recovery with GDP, down 9% in 2009 more than 30% above its 2007 level by 2016. However, scars remain: unemployment in Ireland which peaked at 15% in 2012 was still in 2016 above 8%; the Irish anti-poverty programme has been essentially abandoned, and Ireland has returned to its historic position as a country of emigration. And the Irish recovery owes nothing to the Eurozone and everything to Ireland’s other economic relations. Unlike the countries of Southern Europe, Ireland has major markets outside the Eurozone, notably with the UK which of course includes part of the island of Ireland, and it has a key role in the supply chains of US multinationals selling into the UK, the EU and elsewhere. Hence, Ireland could to a large extent export its way out of recession: its exports in 2016 were 83% higher in real terms than in 2007. The countries of Southern Europe, with few markets outside the austerity bound Eurozone, were quite unable to achieve that kind of performance. Spain and Italy also compressed their imports over this period—thus exporting their recessions—while exports from Greece itself actually fell by 3%.

The Baltic Republics were not, at the outbreak of the crisis, members of the Eurozone but their currencies were pegged to the euro. These pegs were resolutely maintained throughout the crisis with a view to their joining the currency union and they have now indeed done so. In consequence, they suffered the same pressures as the peripheral members of the monetary union—a drastic cessation of private capital inflows, the bursting of asset price bubbles, a collapse of demand and, as a necessary result of the fixed exchange rate, a severe contraction in economic activity. Emigration provided a safety valve for their labour markets. Although the Commission offered a narrative of recovery in the Baltics brought about by disciplined budgetary policies, only support from the EU kept them afloat—structural fund spending, although of

Table 4.1 How to get out of debt, by Wolfgang Schäuble

General government consolidated gross debt			
% of GDP			
	2008	2012	2016
Euro area	68.5	91.4	91.6
Ireland	42.4	119.5	75.4
Greece	109.4	159.6	181.6
Spain	39.4	85.7	99.5
Italy	102.4	123.3	133.0
Cyprus	44.7	79.3	107.1
Portugal	71.7	126.2	130.3

AMECO

only token significance in the EU as a whole, was, when concentrated on these very small model pupils in the austerity class, enough to avoid the worst. (Hudson 2014)

To establish the responsibility of the EU for the eurozone crisis and for the Greek catastrophe, in particular, it is by no means necessary to exonerate Greek governments. Their profligate expenditures, especially under Karamanlis, were a *sufficient* condition for the fiscal crisis which broke out in 2010. But, as Hyman Minsky insisted, that which cannot be financed will not occur. Excessive state borrowing, together with an unsustainable rise in Greek incomes could only take place because of the deep malfunctions in the monetary union which allowed them to be financed on ever cheaper terms by destabilising speculative capital flows—these malfunctions were most certainly a *necessary* condition of the crisis. The drastic tightening of budgetary policy that was then imposed by EU institutions and the IMF turned the crisis into a depression which continues to this day (Table 4.1).

The self-defeating nature of the whole austerity drive is revealed in the actual destabilisation of public finance which it has brought about. In fact, the usual debt statistics overstate the liabilities of the Greek government because creditor concessions on coupon payments and repayment dates have greatly reduced the present value of Greek bonds. Nevertheless, even this reduced sum is, by most accounts, unsustainable. According to AMECO data,² the Greek government will have achieved a primary surplus (1.4% of GDP) in 2016 but still has a

substantial deficit (-4.3% of GDP) when interest payments are taken into account. The Commission forecasts that Greece will be able to start paying down its debt in 2018, but its forecasts have been systematically too optimistic in the past and probably remain so in order to avoid condemning in advance its own austerity policies.

Across advanced economies and especially in the EU, there was a rapid move away from the brief period of supportive budgetary policies after the global crisis of 2007–2008 towards drastic fiscal consolidation. But, given the persistent failure to achieve recovery, unprecedented monetary easing was needed to shore up economic activity. As a result, the macroeconomic stance trembles on the brink of absurdity. On the one hand, the target of fiscal austerity is debt—public debt is excoriated and no expenditure cuts are too drastic in combatting it. At the same time, the massive loans advanced by the ECB and its enormous asset purchases are regarded as a categorically different entity: this is most certainly public debt but debt regarded as completely necessary and justified by economic circumstances. Now the only logical basis for this absolute distinction between government and central bank debt would be the assumption that the latter does not have to be repaid, that as interest and principal start to flow back to the ECB, it will simply roll over its position with new loans and bond purchases. In other words, the debt will be permanently monetised. The repeated demands by fiscal hawks that governments and countries “live within their means” seem ironic in a situation where each new round of economies necessitates further expansion of central bank balance sheets.

Chief among the fiscal hawks was the European Commission, who began to demand retrenchment as early as 2009. IMF economists Blanchard and Leigh (2013) identified a general error—underestimation of the fiscal multiplier—leading to a much higher cost in lost output and employment than had been anticipated. In the case of Greece, however, the error was catastrophic because of the sheer size of the consolidation that was attempted.

Two recent studies published in *Brookings Papers on Economic Activity* confirm the repeated failure of Troika-imposed policies. Di Mauro and Schumacher (2015) write:

... despite the extraordinary amount of private and public debt relief Greece has already received, including the granting of exemptions by creditors to their typically sound lending rules (34 times thus far), further debt restructuring will still be necessary. Repayment of loans to European institutions now could extend over several decades (past the 2054 terms in place) ...

House and Tesar (2015) estimate the size of the fiscal adjustment that would still be needed, not to meet Greek liabilities in full, but to move partly towards such a situation. They conclude:

—In the baseline case calibrated to the Greek economy, all of the tax and expenditure policies that we consider produce declines in output in both the short and the long run. The model projection for the near term involves output declines on the order of 1 to 2% of 2014 GDP.

—Projections of the primary surplus based on static revenue scoring grossly overestimate the actual amount of revenue that Greece would raise from tax increases. The overestimate is because the static projections ignore endogenous adjustments of capital and labour.

—Meeting the debt repayment schedule is substantially more costly because Greece is a small economy that is integrated with the larger European economy. Failure to incorporate the impact of capital and labor mobility results in a significant overestimate of future revenue.

—Delaying the implementation of tax increases or government expenditure cuts can help mitigate the short-run fall in output, but such delays require greater economic hardship in the long run.

We are moving therefore to a further Memorandum of Understanding, the fourth or the fifth depending on how one treats MoU supplements. No doubt further pain will be imposed and further inadequate debt relief offered. However, Germany's embarrassing ownership of the whole Greek debacle is not to be mentioned until German elections are safely out of the way.

4.2 Technical Issues

The neocolonial nature of the Troika's interventions in Greece has been recognised by many commentators. There was the early ill-fated attempt at "technical" government under Lucas Papademos following the humiliation and resignation of Papandreou, who was told that a referendum on Troika demands was unacceptable. When the next "adjustment programme" proved to be necessary in 2012, Papandreou and Samaras, heads of PASOK and New Democracy, respectively, were required to guarantee support for the second adjustment programme in advance, thus rendering the subsequent general election virtually meaningless.

The efforts of the coalition government that followed to obey the diktat of the Troika resulted only in a massive contraction of economic activity.

The subsidiarity clauses of the European Treaties put strict limits on the powers of EU institutions to interfere in the affairs of member states. But when the Commission acts not as an EU authority but as a **creditor**, there are apparently no limits to its power.

The MoU of Spring 2012 was a totalitarian document:

Prior to the first disbursement of the new programme [that is, before any emergency loans were to be made]

..... [example 1] Reduction in pharmaceutical expenditure by at least EUR 1 076 million, in 2012 by reducing medicine prices (generics and branded medicines), increasing copayments, reducing pharmacists' and wholesalers' trade margins, application of compulsory e-prescription by active substance and protocols, the update of the positive list of medicines and the implementation of a mechanism of quarterly rebates (automatic claw-back) to be paid by the pharmaceutical industry.

..... [example 2] Reduction in the number of deputy mayors and associated staff with the aim of saving at least EUR 30 million.

Reduction in the central government's operational expenditure, and election related spending, by at least EUR 270 million, compared to the budget.

Frontloading cuts in subsidies to residents in remote areas, and cuts in grants to several entities supervised by the several ministries, with the aim of reducing expenditure in 2012 by at least EUR 190 million. (European Commission 2012, p. 124)

And so on and so forth. Now, the organisation of local government in Greece is a matter for the Greeks. One can object, “but the Greek state is insolvent”. It certainly is, but the organisation of local government is **still** a matter for the Greeks. Creditors must have their due but their power, like that of any party in a liberal democratic polity, must be limited.

The two general elections in 2012 completely transformed the Greek political landscape. New Democracy and PASOK which had alternated in power since the end of military dictatorship in 1974 suffered drastic defeats and, even moving into coalition with each other, they needed the support of smaller formations to obtain a parliamentary majority. The electorate certainly held the two major parties responsible for the economic crisis in Greece. But, they were also regarded as having been pusillanimous in their dealings with the institutions of the Troika, as when George Papandreou backed down from his call for a referendum on the Troika’s conditions for emergency loans. The meteoric rise of Syriza, an alliance of left-wing groups (it subsequently became, at least in form, a single party) which had won only 4% of the vote in 2009, was promoted by both these reproaches to the established parties.

The efforts of the coalition government, led by Antonis Samaras, to meet the targets set in the second MoU only crashed the economy and led to enormous unrest. The targets were a primary government surplus (that is, before interest payments on government debt) of 1.8% of GDP in 2013 and 4.5% in 2014. This would have been a massive consolidation even in good times when private consumption and investment spending was strong and resilient. In the middle of a comprehensive social, political and economic crisis, it was utopian. The assumed starting point was a deficit of -1.0% in 2012 (the actual figure was -3.7%). The outcomes were a primary deficit of -9.1% in 2013, a tiny surplus of 0.4% in 2014, followed by a further descent into a deficit of -3.9% in 2015.

The victory of Syriza in the first election of 2015 gave birth to the hope that not only would concessions be made to Greece but that also significant reforms of the currency union would be promoted by the revolt of the Greeks, armed with reasonable objections to the status quo and with a deep commitment to the European project. The response of the EU to the challenge was a complete refusal even to consider the Greek position: negotiations on further emergency finance would only take place after Syriza had agreed to continue with all the commitments entered into by previous Greek governments. The deliberate humiliation of Greek representatives has been graphically reported by the Greek finance minister at the time, Yanis Varoufakis (2015). It contrasts with a much more passive approach to the virulent nationalism, hostility to the EU, violations of press freedom and human rights and assaults on the independence of the judiciary by governments in such member states as Poland and Hungary.

A referendum called by Syriza on the Troika's terms for more loan finance resulted in a big majority for "No". In spite of this, no concessions were forthcoming from the Troika and the Tsipras administration decided to concede to all their demands. Again, in spite of this, Syriza won in the following general election. It seems that many Greek voters, although they condemned the impositions of EU institutions, were not prepared to risk a rupture with the EU. Not enough time had passed for either PASOK or New Democracy to claim a new virginity.

One grouping which broke from Syriza at this point, arguing that Greece should abandon the euro (see Flassbeck and Lapavistas, 2015), failed to attract electoral support. Was there a third option—between surrender and departure? Varoufakis suggests as much but it is not clear whether continued resistance was possible within the eurozone. Prime Minister Tsipras thought Schäuble was inviting him to commit political suicide when he suggested that Greece takes "time out" of the monetary union.³

The third MoU,⁴ signed by the new Finance Minister Euclid Tsakalotos in August 2015, presents a detailed, micro-managed agenda

for a complete overhaul of the Greek state: the social security system; the health care and pharmaceutical systems; the auditing and control of procurement; financial regulation and governance of the banks; the design and functioning of the taxation system; privatisation of state assets⁵; deregulation of entry into several professions and much more. Pre-empting consideration by the Greek parliament, the legislation required for this programme was set out in advance and with a detailed timetable.

Although the share of GDP going to wages is exceptionally low in Greece,⁶ previous governments had, on Troika instructions, comprehensively deregulated the labour market. To give only three examples, minimum wages were drastically reduced; collective agreements were robbed of legal force; access to arbitration was denied to trade unions. Minor adjustments to the resulting situation were made by Syriza; the Troika demanded repeal of the legislation involved. An ETUI report sums up the situation after the third MoU:

Overall, the wide ranging anti-crisis measures implemented in Greece reflected an uneven balance between economic adjustments and social situation, increasingly deregulated the labor market and inevitably tested and keep on testing the limits of social cohesion. (Clauwaert et al. 2017, p. 21)

Beyond the substance of the “reforms”, the way they were discussed (or not discussed) was an additional source of tension. Syriza pressed for discussions between Greek ministers and named members of the institutions, in order to make clear the EU’s responsibility for specific measures; the Troika resisted this, representing its commands as “technical issues” to be dealt with by teams of experts from the Commission’s “Structural Reform Support Service”.

Once again, the macroeconomic assumptions on which the whole programme was based were wildly optimistic. The IMF itself, while demanding medium-term pension and tax reforms, states: “... contrary

to our advice, the Greek Government agreed with the European institutions to temporarily compress spending further if needed to ensure that the surplus would reach 3.5% of GDP..... We think that these cuts have already gone too far, but the ESM program assumes even more of them, with an increase in the primary surplus to 3.5% of GDP achieved through further cuts in investment and discretionary spending. Perhaps through a Herculean effort Greece could manage the spending cuts needed to achieve a 3.5% of GDP deficit in the short run. But experience has shown that they cannot be sustained and are inconsistent with Greece's ambitious long-term growth target". (Obstfeld and Thomsen 2016)

The demand, in the third MoU, for Greek "ownership" of the Troika's strategy seems only to add insult to injury. "Greece needs to build upon the agreed recovery strategy and develop a genuine growth strategy which is Greek-owned and Greek-led". (MoU 2015, p. 5). Consider how the "Greek-led" process excludes the Greek government from control of the body responsible for stabilising the banking system, the HFSF:

The independence of the HFSF will be fully respected and its governance structure reinforced, with a view to preventing any political interference in its management or activities. By mid-October 2015 (**key deliverable**), the HFSF law will be amended so as to (i) bring the law in line with the BRRD transposition and the new recapitalization framework to be developed (ii) to reinforce the HFSF's governance arrangements in line with the Euro Summit statement especially by changing the selection and appointment process and in particular, (a) a new procedure for the selection and appointment of members in the Executive Board and General Council will be designed by end September 2015 which will imply a greater role for the Institutions than in the past; (b) a Selection Panel will be set up, composed of six independent expert members, of which three appointed by the EU institutions - including the chairman with a casting vote in the event of a tie - and three appointed by the authorities (two by the Ministry of Finance and one by the Bank of Greece). (MoU 2015, p. 20)

In what sense could the Greek government assume “ownership” of such a procedure? Tsipras, on the other hand, can assert: These things are done by me, but it is not I who does them.

4.3 Germany: *Rechtstaat*; Greece: *Unrechtstaat*

The loss of democratic autonomy in Greece under the MoUs is virtually total. The Syriza government, after it agreed on the third MoU, put forward the notion of a parallel programme to run beside that of the Troika, not in contravention of the latter but attempting to mitigate some of its distributional effects and trying to introduce some measures related to the actual values and objectives of their party. They were swiftly instructed to do no such thing: their task was to be the MoU, the whole MoU and nothing but the MoU.

In Germany, Eurosceptic citizens have repeatedly appealed against EU decisions to the constitutional court in Karlsruhe. These appeals usually fail but, in delivering its judgments, the *Verfassungsgericht* is careful not to restrict the scope of its own jurisdiction. It may declare the ECB or the ESM to be acceptable but leaves no doubt that it could have quite legitimately found otherwise. Greek pensioners, plundered on behalf of other state creditors with no stronger claim than their own, secured a court judgment that declared the cuts to be unconstitutional. The court, however, declined to offer a remedy. German constitutional law trumps even the strongest clauses in the EU treaties. Greek law can only utter an impotent squeal of protest.

The Office of the UN Commissioner for Human Rights has repeatedly reported violations of human rights in Greece as a result of the policies imposed by the Troika. For example, a report in 2013 stated: “Significantly, the public spending cuts and labour market reforms have resulted in increased unemployment (in particular among young people), homelessness, poverty and social exclusion (with approximately 11% of the population living in extreme poverty), and severely reduced access to public services, such as health care and education”.⁷

Of course, international human rights law is soft; the policy conditions set by the institutions are hard.

4.4 Social Europe?

First adjustment programme, April 2010: “The fiscal adjustment is fairly distributed across the society, and **protects the most vulnerable**”. (European Commission 2010a)

Interim review, July 2010: “... a number of elements need possible further consideration, such as the binding nature of the budgets for local governments **and social security funds ...**” (European Commission 2010b)

Fourth Review, July 2011: “Expenditure measures include cuts in the public-sector wage bill, operational expenditure, defence expenditure and investment; reduction in transfers to extra-budgetary funds and other entities; savings in state owned enterprises; cost-cutting initiatives in healthcare expenditure, pensions and other social benefits **while protecting the most vulnerable**”. (European Commission 2011)

Second adjustment programme, March 2012: “Several factors hampered implementation [of the first programme. JG]: political instability, social unrest and issues of administrative capacity and, more fundamentally, a recession that was much deeper than previously projected. (p1) The review is expected to focus on and contribute to savings in social transfers, while preserving basic social protection (p3) ... social considerations have always been present in the design of the programme (p8) ... The on-going review of social programmes aims at better targeting beneficiaries and **to protect the vulnerable effectively** (European Commission 2012, p. 9) ...”

Statement by the Troika, March 2014: “Alongside structural reforms, the authorities are continuing their efforts to **strengthen the social safety net** to cushion the impact of the economic downturn”.⁸

Third Memorandum of Understanding, August 2015: “The economic crisis has had an unprecedented impact on social welfare. The

most pressing priority for the government is to provide **immediate support to the most vulnerable** to help alleviate the impact of the renewed downturn”. (MoU 2015, p. 16)

The most recent issue of *Employment and Social Developments in Europe* reports that from 2007 to 2014 the fraction of the Greek population subject to “severe material deprivation” rose from 11.5 to 21.5%. Total employment in thousands fell from 4444 to 3536. The unemployment rate, 7.8% in 2008, rose by 2016 to 23.5%. Since other poverty measures are relative, the immiserisation of the nation as a whole tends to reduce them: the threshold for a single person fell by 25% from €6873 in 2007 to €5126 in 2014. In spite of this, those at risk of poverty rose from 20.3% to 22.1%. Thus, at present, the categories, “at risk of poverty” and “subject to severe material deprivation” practically coincide. (European Commission 2016)

To indicate the pressures on young people, one cannot simply take their unemployment rate because a large number of them are full-time students and thus excluded from the denominator. On the other hand, one cannot simply take the unemployment ratio because some of those supposedly studying, and thus excluded from both the numerator and the denominator, are, in reality, unemployed. For the population aged 16–24, the latter figure was 15.2% in 2014, the former 58.1%. For the same age group, the NEETs—not in education, employment or training—stood at 19.1% so that there are many young people who have ceased to be active and are not recorded as unemployed. (Although the NEET figures for the next older generation, 25 to 34, are not given the same prominence, they are actually worse.) The EU’s “employment guarantee” for the young unemployed was, in Greece, an order of magnitude too small to have any real impact on this situation—the funds available could only provide a few weeks’ employment at the reduced minimum wage for each of the young unemployed.

In spite of the repeated insistence on protection for the most vulnerable, there has been no reduction in inequality. The Gini coefficient, already one of the highest in Europe before the global crisis, has risen slightly from 34.3 to 34.5. Another inequality indicator, the 80/20

Table 4.2 Social protection in Greece

Social Protection Expenditure (% of GDP) 2014		
	Greece	EU
Old Age	15.3	10.4
Sickness and disability	1.6	2.8
Survivors	1.6	1.4
Family and children	0.7	1.7
Unemployment	0.7	1.5
Housing	0.1	0.5
R&D social protection	0.0	0.0
Social exclusion n.e.c.	0.0	0.8
Social protection n.e.c.	0.0	0.0
Total	20.1	19.4

Eurostat

quintile ratio, rose from 6.0% to 6.5% between 2007 and 2014. The Troika's repeated demands for pension "reform" in Greece should be seen in the context of the extremely unbalanced pattern of Greek social protection expenditure (Table 4.2).

No doubt the Greek expenditure pattern is out of date, and it would be preferable to increase direct spending on the problems of working age people. However, the Greek data reflect a society in which family structures are still more important than in much of Northern Europe. To a large extent, pensions are a substitute for other expenditures and are funnelled from older to younger family members. The degree of dependence within families which follows is not desirable but it is hardly possible to carry out a comprehensive renewal of the social protection system when the whole public service is in turmoil and there is immense pressure on all government spending. The IMF states: "Greece does not have the kind of unemployment compensation and other well-targeted social benefits that are commonplace elsewhere in Europe and that are critical for broad social support in a modern market-oriented economy". In their absence, however, pension "reform" means the dismantling of the only social protection regime which actually functions.⁹

As for protection of the vulnerable, the UN report cited above¹⁰ states: "The impact has been particularly severe on the most vulnerable: the poor, older persons, pensioners, persons with disabilities, women, children and immigrants".

4.5 Who Was Being Rescued?

Bordo and Schwartz (2000) write on the Mexican bailout of 1982:

The Federal Reserve and the IMF took on the mission of mediating debt negotiations between the borrowers and financial community The strategy of officials at the Federal Reserve, the Treasury, and the international multilateral financial agencies was to obfuscate the dire situation of the US money center banks. The officials exhorted them to lend new money so the delinquent debtors would be able to pay the interest due, to maintain the fiction that the loans were sound. (p. 12)

The politics might have been quite important. Mexico is a relatively low-income country with big social and economic problems. Citizens in the USA and Western Europe were perhaps inclined to cut the Mexicans some slack, but they might have been less enthusiastic to see public money spent to indemnify prosperous, powerful, American and European bankers for their ill-judged loans.

As the first Greek adjustment programme began in 2010, it was, likewise, decided to avoid any restructuring of privately held Greek debt. This move—obviously disadvantageous for the Greeks—arose from a concern for general eurozone stability which as usual coincided with the interests of the big banks. Subsequently, of course, haircuts for private holders of Greek bonds were agreed, but at the same time an increasing fraction of the debt has been purchased by public authorities: the Greek Lending Facility (a group of bilateral loans from eurozone governments organised by the Commission); the IMF, the ECB and the old and new stabilisation agencies—the “Stability Facility” and the European Stability Mechanism. According to the most recent assessment by the IMF (2016), only 22% of outstanding debt remains in the hands of private creditors. Losses have been monetised and socialised, in principle temporarily, in practice permanently—but whose losses?

The same IMF document abandons the sustainability analysis produced in 2015 which itself abandoned the previous analysis relating to the 2012 adjustment programme. The contrast is striking: instead of government debt gradually falling to some 70% of GDP by 2058 it is

now reckoned to grow to 250% by the same date. An irony is that this access of realism by a major creditor may have put even more pressure on the debtor. Tsakalotos has complained that although the IMF proposes a new write-down of the debt held by EU governments and institutions, in the absence of such concessions they feel obliged to call for even more austerity measures from Greece.¹¹

4.6 Conclusion: Nothing Has Been Achieved

Most [IMF] Directors considered that, despite Greece's enormous sacrifices and European partners' generous support, further relief may well be required to restore debtsustainability. They stressed the need to calibrate such relief on realistic assumptions about Greece's ability to generate sustained surpluses and long term growth. (IMF 2017, p. 3)

The German Finance Minister Wolfgang Schäuble will make no concessions in the dispute over the Greek rescue programme. The country is not yet out of the woods, he said in an ARD report to be broadcast at the weekend. 'Therefore the pressure must be kept on Greece to carry out reforms and become competitive.' Schäuble says further that he does not expect a Grexit—Greece's departure from the eurozone. If Greece fulfils the agreement with the creditor institutions then the negotiated third assistance programme up to 2018 would be implemented successfully. Schäuble declares that there can be no reduction in debt for a member of the eurozone. No member of the eurozone should be liable for another. Otherwise Greece could not remain in the currency union. The most serious problem for Greece at present was not debt. At present Greece pays less interest than Germany. But Greece gives itself a higher living standard than it earns. Pensions are rather higher than in the average eurozone country. 'Therefore the problem is competitiveness', says Schäuble. Greece must become more competitive through reforms.' (posted on the kurier.at website, 8/02/2017¹²)

Once the Trump administration sends its representatives to the IMF board, expect the climate to become even more hostile. My expectation

is that the IMF will ultimately pull out of the Greek programme, leaving the Europeans free to mismanage the ongoing Greek crisis on their own. ... The Greek crisis is only the most glaring example of failure to tell the truth. There are many others. Italy's membership of a monetary union with Germany is also transparently unsustainable. Wolfgang Münchau, *Financial Times*, 13/02/2017, p. 11

Greece is only a very small part of the eurozone economy (and, *a fortiori*, of the EU economy). Greek GDP amounted in 2008 to 2.5% of the eurozone (1.6% of the EU) total. The economic collapse has further reduced these figures to 1.9% of the eurozone (1.2% of EU) GDP in 2016. Significant assistance, minimising the decline in output and employment, was prevented by a lack of political will, not by a scarcity of resources.

In the same context, one can mention the very high military expenditures in Greece: 2.7% of GDP against 1.3% for the EU as a whole. Much of the war materiel purchased is imported from Germany; the same is true for Turkey, the putative enemy in spite of being a NATO ally. The Memoranda of Understanding mention, but do not stress, these expenditures.

Locusts have eaten the seven years since the first MoU. At the time of writing (February 2017), there is a widespread expectation that Greece will not be able to make payments on its debt due in the summer. All parties are exasperated—the Greek people whose living standards have collapsed without any sign of a recovery; the German people largely convinced that all responsibility for the debacle rests with the Greeks themselves; the personnel of the creditor institutions who are now sharply divided with the IMF calling for debt write-downs refused by the EU; the Greek representatives reduced to carrying out “reforms” they know to be useless or actively harmful, while their compromises with “the institutions” erode what remains of their popular support.

Disagreements between the IMF and the European Commission may block access to more finance and force Greece into default. If Wolfgang Schäuble's recent comments are to be believed the outcome may well be

the withdrawal of ECB credits to the Greek banking system, the failure of the latter, the collapse of euro payments within Greece and the de facto introduction of a new currency.

However, as time passes, it will become increasingly difficult to paint Greece as the exception to a general rule of progress and prosperity in the eurozone. Looming over the whole scene is the chronic inability of Italy to achieve economic recovery within the constraints of the monetary union. It will not be possible to treat Italy in the same way as Greece. It is to be hoped, however, that the growing threat of a rupture with Italy will induce EU leaders to reconsider the fundamental structure of the monetary union and indeed of the EU itself. Fritz Scharpf (2016, p. 1) puts it succinctly: “the European Monetary Union (EMU) explicitly removed or rigidly constrained national problem-solving capacities without, however, creating European capacities that could address the diversity of national economic conditions”. That Greece is the worst affected victim of this general process is in part the consequence of political irresponsibility within Greece itself. But if Greece is forced out of the eurozone without fundamental change to its rules and institutions, then the exclusion could turn out to be just the first step in a general failure of the currency union. On the other hand, if necessary changes to the eurozone were to be addressed—complementary measures to pursue developmental and social objectives, financed on a supra-national scale under the supervision of stronger central political instances—then a resolution of the Greek crisis would hardly represent a serious additional challenge.

If you break it, you own it. EU leaders will once again have to explain to taxpayers why they are writing off a lot more Greek debt, or, by forcing Greece out of the currency union, to acknowledge that the strategies they have dogmatically and arrogantly imposed have totally failed. In either case they can hardly escape their share of responsibility for the Greek predicament.

Notes

1. Consulted 28/01/16.
2. Again consulted 28/01/17.
3. The decision to accept the demands of the institutions was taken only by members of the Syriza government; the central committee of Syriza was not consulted and did not agree with the decision. See Silverman (2016) Chap. 12 for the colourful events of summer 2015. The disgraceful humiliation of Tsipras and Tsakalotos by the Troika has been described as “mental waterboarding”.
4. Memorandum of Understanding between the European Commission acting on behalf of the European Stability Mechanism and the Hellenic Republic and the Bank of Greece, <https://www.esm.europa.eu/sites/default/files/2015-08-19gr-esm-ffpublicationversion.pdf>. Hereafter MoU (2015). See also the version annotated by Yanis Varoufakis, on his blog: www.yanisvaroufakis.eu.
5. Setting time limits for privatisations turned them into fire sales where the purchaser was in control. The specified targets for privatisation receipts proved to be hopelessly unrealistic. Since most of the purchasers of under-priced assets were foreign, the result is a permanent loss of wealth by the Greek people.
6. 50.0% in Greece against a weighted average of 55.4% for the EU and 55.3% for the eurozone (AMECO, consulted 17/02/17).
7. UN Human Rights Council, mission to Greece (22–27 April, 2013): http://www.ohchr.org/EN/HRBodies/HRC/RegularSessions/Session25/_layouts/15/WopiFrame.aspx?sourcedoc=/EN/HRBodies/HRC/RegularSessions/Session25/Documents/A-HRC-25-50-Add1_en.doc&action=default&DefaultItemOpen=1.
8. IMF Press Release No 14/112 Statement by the European Commission, the ECB and the IMF on Greece: <https://www.imf.org/en/News/Articles/2015/09/14/01/49/pr14112>.
9. Pension spending as a whole has been repeatedly reformed since 2010. Continuing imbalances in the major pension funds are essentially a consequence of the depression: “Pension spending increased from 14.8 to 17.7% of GDP during 2010–2015. Although the average pension (calculated as the ratio of nominal pension spending to the number of retirees) declined by about 8% during this period, this was not sufficient to offset the decline in GDP (by around 25%), leading to an

increase in pension spending relative to output”. (IMF, 2017, p. 33). Such calculations, however, have not stopped the institutions from chasing induced effects downwards.

10. See footnote 6.

11. The IMF deny this.

12. <https://kurier.at/politik/ausland/schaeuble-griechenland-leistet-sich-zu-viel/245.565.681>, consulted 13/02/2017.

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5

German Macroeconomic Thought and Its Effects

George Bratsiotis and David Cobham

In this chapter, we first address a question which has emerged from the debates about economic policy and the Eurozone crisis over the last few years: is there something different about the macroeconomic thinking that prevails in Germany, which leads the German government to argue for different policies from those which many other governments and commentators put forward? We give a guarded and qualified positive answer to this question, and then go on to look at some possible examples. In the past, the German government and/or central bank held some distinctive attitudes on a range of policy issues, notably with respect to the process of monetary integration in Europe, but many of these could be defended along more conventional lines. On the other hand, in the last few years, the German government has consistently

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argued for positions which are genuinely more difficult to uphold on the basis of conventional macroeconomic thinking. And those positions appear to have had some significant adverse effects on the working out of the Eurozone crisis including, in particular, the repeated negotiations between the European Commission and the European Central Bank, on the one hand, and the Greek government, on the other.

5.1 German Macroeconomic Thought

The issue of the distinctiveness of German macroeconomic thinking has recently been addressed by a number of authors in their contributions to an ebook which we edited (Bratsiotis and Cobham 2016), and we draw heavily on these. The first point to be made is that no one believes that the academic macroeconomic theory taught in the German education system is unusual. Indeed, as Lars Feld says, “the New Keynesian paradigm dominates the research of German macro- and monetary economists”, as it does those of the US, the UK and elsewhere. This phenomenon should not come as a surprise today: while French, as well as German economics, retained some distinctive national characteristics for several decades after 1945,¹ the economics of Western countries has converged strongly in the last 20–30 years as economists from all countries increasingly attend the same conferences, publish in the same journals (and the same language) and use the same textbooks for teaching, particularly at the postgraduate level. There is, however, another sphere in which differences in macroeconomic thinking persist: the sphere of policy debates. But before we turn to that we should look at the distinctive elements to be found in German macroeconomic thinking in the years before that convergence took place.

There is widespread agreement that German thought was heavily inflected by the *Ordnungspolitik* ideas developed by Walter Eucken and the Freiburg School of Economics, mainly in the 1940s. Lars Feld (2016) and Peter Bofinger (2016)—the first a supporter and the second a critic of these ideas—each regard them as both distinctive and influential. Bofinger emphasises three points in Eucken’s views: opposition to ‘full employment policy’ (which he believed would lead to central planning

and dictatorship); hostility to corporatism and in particular to trade unions; and aversion to inflation (seen as the result of excessive monetary expansion). Feld puts the stress more, or in addition, on the Ordoliberal insistence that the government's role is purely to establish and maintain a stable and 'rules-based' framework, within which market forces can be relied upon to reach efficient outcomes, and on the 'liability principle', that economic agents should bear the full consequences of their actions.

While these views do not affect the macroeconomic theory of German economists, they clearly feed strongly into German policy debates. They leave little role for aggregate demand management, since fiscal deficits and monetary expansion must be avoided, and they identify the solution to demand deficiency as price flexibility and competitiveness (which would typically require structural reform). At the same time the liability principle, now expressed as the 'unity of liability and control', tends to rule out both debt relief and what in EU circles is often called 'solidarity' (richer nations assisting poorer ones). Arguments and propositions of this sort can be found most obviously in the reports of the German Council of Economic Experts (GCEE, in German the Sachverständigenrat) since its establishment in 1963: this is a council of academic economists appointed by the government, partly on the basis of consultation with industrial, financial and trade union interests, whose remit is to assess current developments in the German economy and advise the government on economic policies. In recent years, the membership has consisted of Peter Bofinger, Lars Feld, Christoph Schmidt (chair), Isabel Schnabel and Volker Wieland, and there has been a clear division between the first of these and the other four. The GCEE has a significant input into and impact on German public debate on economic policy questions.

It seems reasonable to conclude that, while German macroeconomic theory and research do not differ in any systematic way from what is done elsewhere, there is a set of distinctive German attitudes on economic policy questions which underlie, in particular, the following German government policy stances in recent European debates: (1) opposition to aggregate demand policies, either fiscal in the form of deficit-increasing policies or monetary in the form of quantitative easing and other expansionary policies; (2) emphasis on the improvements in competitiveness as the only true path back to full employment and

growth; and (3) opposition to debt restructuring for countries which have been pulled down into the ‘doom loop’, where heavy lending by banks to governments weakens the solvency and credibility of them both.² These recommendations have not been pursued to the exclusion of everything else, and they have not always been fully implemented (Zuleeg 2016). But they have deeply coloured the policy debates between EU countries and institutions.

There is also considerable agreement (e.g. Bofinger 2016; Burda 2016; Feld 2016; Mélitz 2016) that these distinctive German attitudes to economic policy questions can be related to aspects of German history and the German economy and to German national interests.³ The German post-war reconstruction ‘miracle’ is often attributed to structural reforms and wage moderation, but it took place at a time when world demand was growing strongly and the German economy was highly competitive: it is correct that there was little expansionary fiscal or monetary policy from the late 1940s to the late 1960s, but there was no need for it since demand for German products was growing anyway (the first post-war German recession was in 1966–1967, and that is when Keynesian policies first came to the fore).⁴ Decades later, when the German economy was languishing after a reunification which the government had hoped could be implemented without tax rises (von Hagen and Strauch 1999), a combination of labour market decentralisation resulting from structural change and labour market liberalisation in the Hartz reforms brought about a striking improvement in German competitiveness (Dustmann et al. 2014; Granville 2016). That improvement is widely believed to have produced what is sometimes referred to as a second German economic miracle in the form of a return to growth and a large decline in unemployment, the latter of which was only marginally disturbed by the global financial crisis. Again, domestic demand policies were not important in this process, but demand was expanded via the improvement in competitiveness, that is, external demand was substituted for domestic demand (other Eurozone countries provided the demand growth via their own losses of competitiveness and their attempts to maintain their domestic aggregate demand). In addition, it has been shown that the German economy is unusually open for such a large economy (Bofinger 2016), which means that the standard

(domestic) multiplier effects of fiscal expansion are likely to be lower in Germany than in other similar-sized economies, and much smaller than in the smaller economies of the Eurozone. It is also arguable that Germany has a unique position as the strongest economy in a currency area, where the relative weakness of some other economies tends to keep the external exchange rate of the area more depreciated than the (counterfactual) exchange rate of a German economy with its own currency.

The preference for the unity of liability and control rests heavily on the idea of moral hazard: agents need to bear the full consequences of their actions because if they do not they will choose actions that involve adverse effects for others. But in the Eurozone financial crisis, the concept of moral hazard was applied mainly to the borrowers, the allegedly profligate governments which had borrowed too freely and were now in a precarious financial position, and not to the banks who had supplied the loans and bought the bonds concerned (Wyplosz 2016). The banks which were most heavily involved in lending to the Greek government, for example, included German and French banks. It is, therefore, perhaps not surprising that the German and French governments were happy for the Greek government to borrow more when the crisis started so that it could pay off its debts to their banks, even if that meant trouble further down the road for the Greeks.

5.2 German Macroeconomic Thinking and European Monetary Integration

There are at least three points at which a specifically German input to the process of European monetary integration was important. The first was in the discussions leading up to the Werner Report in 1970, which first set out a plan, or at least an objective, of monetary union. Debate centred on a difference between the ‘monetarist’ views of France, Belgium and Italy and the ‘economist’ views of Germany and the Netherlands: the former envisaged the locking of exchange rates as a lever for compelling the convergence between countries required to make the goal viable, whereas the latter envisaged the attainment of the goal as the culmination of a long process of convergence of budgetary and other policies and

performance (Gros and Thygesen 1998, Chap. 10). The resolution of this difference in the Werner Report was its argument for parallel progress in the monetary and non-monetary areas, but the report essentially set out the goal and the first steps in coordination without specifying further steps or a full pathway to the goal. Standard accounts do not ascribe the German views to *Ordnungspolitik* and it is difficult to see any such derivation. They should perhaps be seen more as stemming from a general caution about the ability of (all) politicians and governments to keep to their commitments, and the need for evidence of convergence before the creation of new institutions in which responsibility would be diffused—and from a desire to protect the interests of the strong-currency Germany from the potential ravages of its more profligate partners.

A second point at which specifically German views and actions strongly affected the process of European monetary integration was the German reunification and currency union in 1990. The West German government embarked on reunification with the claim that it would impose no burden on West Germany, and more specifically that no tax rises would be necessary (von Hagen and Strauch 1999). The currency union then involved a conversion rate for the Ostmark into the Deutsche Mark which was the subject of enduring controversy.⁵ In the event, however, it seems likely that the process was dominated by, first, the collapse of East German industry once it was opened up to competitive pressures from the West and, second, the enormous pressures for wage rises in the East (pressures which were primarily political and social but probably aggravated by the extension of West German social security benefits to the new citizens from the East, and by the desire of Western trade unions to preserve their own competitive position) (Brenke 2015). The upshot was a massive rise in the German budget deficit as a result of the flow of unemployment benefits and industrial subsidies to the East.

For European monetary integration what was more important than this sudden loosening of fiscal policy was the Bundesbank's response: in order to prevent what it saw as a serious threat to price stability, it raised its discount rate from 4% in early 1989 to 8.75% in July 1992. This created enormous pressures on the exchange rates within the European Monetary System, particularly as the business cycle in the other

countries had peaked in 1989 while Germany's reunification-fuelled upswing continued well into 1991. The Bundesbank had argued for an appreciation of the DM, that is a general currency realignment within the EMS, which would have assisted its efforts to bring inflation under control (Gros and Thygesen 1998, p. 216), but other countries refused to accept the loss of credibility which they believed would be involved. Later, the Bundesbank was held responsible for Black Wednesday (16 September, 1992, when the Italian lira and the pound sterling left the Exchange Rate Mechanism of the EMS) and for much of the turmoil that recurred over the following 10 months (at the end of which the ERM bands were widened from 2.25% on either side of parity to 15% on either side). However, there are strong arguments to the effect that the UK in the summer of 1992 and France in the spring of 1993 both committed serious policy mistakes, in the sense that they tried to get lower domestic interest rates without devaluation, a policy mix which was incompatible with equilibrium in the financial markets unless the Bundesbank lowered its own interest rate (Mélitz 1994; Cobham 1997 and 2002, Chap. 5). But the Bundesbank's views were well-known and its policies were predictable, and its independence should have made it clear that it was not susceptible to pressure. Its behaviour in this episode can be regarded as broadly consistent with Ordoliberal opposition to large fiscal deficits and insistence on monetary contraction to fight inflation. But in the face of the German government's fiscal loosening and the refusal by other countries of a DM appreciation within the ERM, it is difficult to see what else an independent, inflation-averse, central bank could have done. In any case, as it turned out, the EMS upheavals of 1992–1993 may have delayed the process of European monetary union by a few years but they obviously did not prevent it; indeed, the upheavals could even be regarded as a necessary and desirable correction to some of the optimism and some of the policies being implemented in the run-up to EMU.

A third point at which German economic policy views were important in shaping events is in the debates which led to the basic agreement on EMU in the Maastricht Treaty of 1991. Here, it is useful to distinguish between three key elements of the monetary union arrangements which emerged: independence for the union-level central bank;

the location of monetary authority at the level of the union but that of banking supervision and financial stability authority at the national level; and the constraints on national fiscal decision-making.

The Bundesbank had always had a large measure of independence, in contrast to most other European central banks,⁶ and governments in other countries had explicitly rejected central bank independence (CBI).⁷ Germany's insistence that EMU should be based on an independent union-level central bank was—like much of the advocacy for central bank independence—more consistent with the 'delegation' view in Bean (1998) than with the 'conservative central banker' view of Rogoff (1985), and certainly did not need an exclusively Ordoliberal underpinning. Moreover, academic opinion in this area had been shifting strongly in favour of CBI from the early 1980s, and public opinion more widely was beginning to shift, with independence being seen not as a form of pre-commitment within a time-inconsistency perspective but, for example in France, as a way to obtain a better trade-off between interest rates and exchange rates. Thus, the German position did not reflect a specifically German or Ordoliberal perspective, and by the late 1980s, it was pushing at an open door.⁸

On banking supervision and financial stability the German tradition had always been one of 'separation'—that is, supervision being undertaken by an agency separate from the central bank – as opposed to the 'combination' typical of the UK, but also of France, Italy and Spain (Goodhart and Schoenmaker 1995). It seems that there was little discussion of the issue in the construction of EMU, and Germany did not attempt to press for its model to be generalised. Instead, it was agreed that banking supervision and financial stability more generally would continue to be implemented at the national rather than at the union level, and with each country's traditional choice between separation and combination. While separation could be rationalised in terms of Ordoliberal thinking—in terms of the need for a rules-based framework, where there would be no conflicting incentives on the monetary authority—it does not need such a rationalisation, and as Goodhart and Schoenmaker (1995) make clear, the arguments are in any case more finely balanced. Thus, Germany cannot be accused here of imposing something inappropriate against the wishes of other countries.

Fiscal discipline within EMU, however, is another matter. The arguments for and against constraints on national authorities' decision-making within a monetary union are many and complex (De Grauwe 2016, Chap. 10; Gros and Thygesen 1998, Chap. 8): among the more important arguments are, on the one hand, the proposition that countries with no independent monetary policy might need to make more use of fiscal policy for stabilisation; and on the other hand, the argument that independent use of national fiscal policy might involve serious spillovers to other countries. However, it is clear that Germany pressed for serious limits on fiscal deficits and debt, and such limits were incorporated first in the protocol on the admission to EMU and then in the Stability and Growth Pact. Germany's position here looks much more like an ordoliberal one, with its aversion to deficits and debt—indeed, Gros and Thygesen (1998, p. 549) relate the Maastricht arrangements specifically to *Ordnungspolitik*.

5.3 German Policy Thinking and the Euro Crisis

As many commentators from academia, media and policy circles have frequently suggested, Germany's political and economic policy thinking was a major contributor to the economic stalemate and prolonged recession experienced in the Eurozone following the outbreak of the Euro crisis.⁹ This thinking resulted in a very harsh stance in Greece's economic bailout programme and brought Germany's policymakers into frequent friction with the ECB and the IMF, while their economic views also attracted much criticism from the US.

5.3.1 Competitiveness and Growth: Which Way to Recovery for Greece?

In the ten years from the launch of the Eurozone (on 1st January 1999) to the beginning of the Eurozone crisis (end of 2009), Greece had gradually lost around 25% of its international competitiveness. This resulted in an increasing current account deficit that by 2009 reached 12.3%

of GDP, a gradual crowding out of private sector investment, and a persistent fall in inward foreign direct investment. Although Greece's current account deficit was the largest in the Eurozone area, many other Eurozone countries were also experiencing rising current account deficits, notably Spain, Portugal and Ireland, but also France and Italy which at least before the launch had been enjoying positive balances. During the same period (1999–2009), these trends were exactly the opposite for Germany, which experienced a fast-rising current account surplus which in 2016 was still rising, while its inward foreign direct investment reached its highest level in 2000 and remained on average much higher than its levels before the launch of the euro and all the way until the Euro crisis (2008–2009) (Fig. 5.1).

Having joined the Euro (in 2001) and thus given up the option of devaluing its national currency, Greece could increase its international competitiveness mainly through two channels: (1) a reduction in its labour costs, which would eventually reduce its relative prices, and (2) introducing structural and legislative reforms that would increase efficiency and productivity. Real wage reductions can have an immediate improvement on international competitiveness, but such an



Fig. 5.1 Current account balances % of GDP. Source OECD

improvement may be short-lived (because inflation and wages will start to rise again) and more importantly it does not deal with the root of the problem, namely Greece's long-term low international competitiveness and its public-sector inefficiencies and corruption that hinder the development of a healthy economic environment for efficient and competitive private enterprises. Thus, introducing structural reforms that target Greece's deep-rooted inefficiencies is of paramount importance, but the problem with such supply-side policies is that usually, they take a long time to be designed, approved and implemented and an even longer time to become effective. Therefore, in addition to such long-term structural reforms, in the short-run the fast-deepening recession in Greece, which was jeopardising its fiscal austerity programme, needed to be supported by some aggregate demand boost, some form of monetary stimulus combined with an investment that would help the banking sector and the real economy pick up the pace again. However, this is where ideology and macroeconomic thinking can play a very decisive role. Shortly after the outbreak of the financial crisis, both the US and the UK pursued a strong aggregate demand policy to promote economic growth. Both countries reduced interest rates and conducted large-scale monetary expansions (quantitative easing), while the government borrowing was spread over a long period. Germany allowed some initial fiscal easing, but this was rapidly curtailed and then reversed: German macro thinking indicated that fiscal austerity was the only solution, and aggregate demand management, particularly, that involving monetary expansion, would just result in spiralling inflation and high deficits and debt, which would eventually produce increased pessimism in the real economy, leading to underinvestment and volatility in the financial markets.

However, the 2008 financial crisis that triggered the Euro crisis has reminded us all of an important, but often forgotten, the lesson from the Great Depression in the 1930s: the tight monetary policy that the US Fed pursued at that time was a grave mistake that resulted in panic, bank runs and a prolonged recession. When the economy is in a deep recession and the financial markets are pessimistic, the way forward for economic growth is old-fashioned aggregate demand management. Increasing the money supply and liquidity in the banking system, while

spreading the repayment of debt into the future (using longer term borrowing), thus allowing the economy breathing space to come out of the recession, can speed the economic recovery and eventually the repayment of debt (Fig. 5.2).

This was indeed the policy followed by the UK and the US. The US, which was openly calling for more fiscal support for Greece, managed to come out of the recession first (in the second quarter of 2009), followed by the UK (in the last quarter of 2009), whose deficit in 2014 exceeded that of Greece. Despite the massive quantitative easing that took place in the US and the UK, neither country experienced rising inflation. Moreover contrary to the German view, this large-scale monetary expansion appeased the financial markets and led to a valuable revival of business confidence. Despite this, and also despite the pleas by the US Government for a more expansionary fiscal policy in Europe, the German government continued to repeat that “austerity is the only solution”, a call which became even stronger from 2005 when Ms. Merkel assumed office (Demetriades 2016), but this soon brought Germany into friction with the ECB and the IMF.

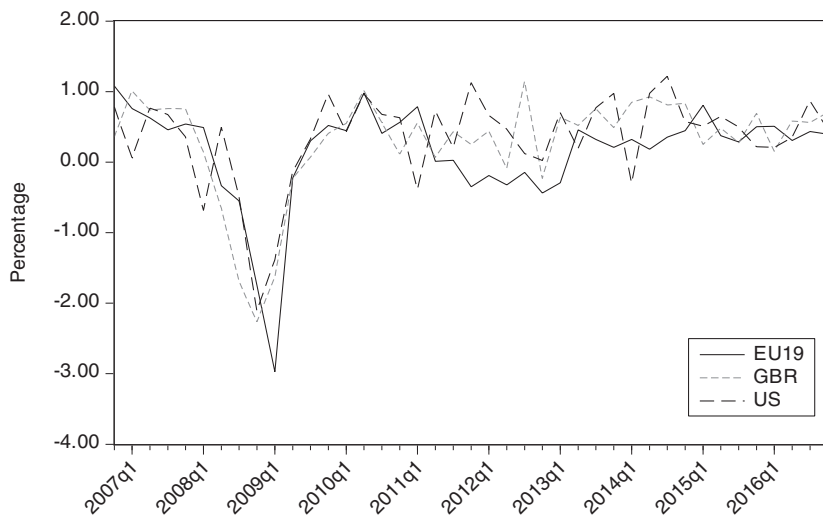


Fig. 5.2 Recession and recovery: US, UK and Euro-area. Source OECD

5.3.2 ECB Vs German Policy Thinking in the Euro Crisis

One of the key roles of a central bank is to act as ‘lender of last resort’. The ECB had not been given a clear role of this kind at its inception (partly because financial supervision was left at the national level), but it rapidly acquired two ways of providing liquidity assistance to credit institutions in the Euro area: (a) the Eurosystem’s monetary policy operations, including Quantitative Easing (QE) and (b) the Eurosystem’s Emergency Liquidity Assistance (ELA). The former is the main form of credit assistance via open market operations, whereas the latter is mainly for exceptional cases, particularly, for institutions that have no credible collateral to pledge against regular funding operations, and usually, it comes at a higher borrowing cost than the former.

By 2010, the Euro area appeared to be coming out of the recession, largely because of Germany’s strong economic performance, but its economic growth stagnated and only a year later, in 2011, it fell back and remained negative until 2013. The prolonged low economic growth in the Eurozone, together with the widening of the bond spreads of many member states against Germany’s bund, prompted a clash between the ECB and Germany. The ECB wanted to see lower interest rates and monetary policy intervention through quantitative easing, as it had proved successful in the US and the UK, but Germany resisted. The ECB’s views were echoed again by France, on 16 November 2011, and by other member states that called for the ECB to intervene with the necessary measures to ensure financial stability in Europe. These efforts, however, were rejected again by the German Chancellor Angela Merkel who said that Germany would resist any attempts by the ECB to intervene in trying to resolve the crisis, as EU legislation prohibited such acts. (The Guardian, and Reuters, 16 November 2011) Germany’s stance raised many questions about the overall role and economic independence of the ECB.

In January 2013, the head of the ECB, Mario Draghi, clashed strongly with the German Finance Minister, Mr. Wolfgang Schäuble for his stance on Cyprus; this time the latter opposed the ECB acting as a lender of last resort to protect the island’s savers on the grounds that Cyprus was not “systemically relevant” (Der Spiegel, 28 January 2013).

In their disagreement, Mr. Draghi indicated to the law-trained finance minister of Germany, that the assessment of the spread of risk from banks in Cyprus defaulting to the rest of the Euro area should be left to economic experts. Despite the ECB's efforts and its argument that Cyprus was entitled to assistance from the ECB because it had been contributing to the bailout fund, Germany's pressure paid off. On 25 March, the Troika decided to close down the island's second-largest bank (Laiki) and seize deposits over 100,000 Euros. For the first time in modern European economic history, a central bank's key role of lender of last resort was not fulfilled. The Economist described this bailout as "Unfair, short-sighted and self-defeating" (The Economist, 16 March 2013), but the financial markets, which had feared the worst following Germany's stance, bounced back on the news that some partial bailout had in the end been approved.

Policy clashes between the two intellectual poles of the Eurozone, the ECB and Germany, continued throughout the financial crisis and Germany's power overruled the ECB on every occasion up to 2015 when, tired of criticism for the prolonged recession in Europe, Germany agreed, very reluctantly, to allow the ECB to try quantitative easing. As a concession to Berlin, the ECB had to agree that the national central banks would still be mainly responsible for a potential default of their governments and that Greek bonds could be excluded from QE, if the EU leaders felt that Greece was not complying with its creditors' demands. Thus in March 2015, six years after the US and the UK had successfully tried QE, the ECB finally began buying government bonds from national governments, but on 4 February 2015, before the QE was even launched, the ECB announced that the Eurosystem's monetary policy operations would not be available to help the desperately liquidity-constrained Greek banks, leaving them dependent on the ECB's Emergency Liquidity Assistance (ELA) programme, which is much shorter term borrowing and at a higher interest rate. So ironically again, the country that needed an aggregate demand boost the most in the Eurozone, was to be excluded from the benefits of QE under pressure from Germany. This was seen by Berlin as yet another device that it could use, along with Troika, to exercise immense political pressure on the Greek government to behave according to its

creditors' very strict fiscal demands (or 'fiscal waterboarding', as Greece's Finance Minister, Yannis Varoufakis bluntly described it a few years later—Business Insider, 3 April 2016).

With the introduction of quantitative easing by the ECB, stock markets on both sides of the Atlantic soared and the Euro area's economic growth picked up the pace before the end of 2015. However, this excessive monetary expansion was still at odds with German thinking and it very soon resulted in much criticism from both private and policy circles in Germany. For example, the chief economist of Deutsche Bank, David Folkerts-Landau, embarked on a severe attack against the ECB's policy with a research note entitled 'The Dark Sides of QE' (Deutsche Bank Research, 1 November 2016), while characteristically earlier in September 2016 the German Finance Minister, Mr. Schäuble, had mocked the ECB's quantitative easing programme in a public meeting by saying, "I think it's called QE, I don't even know what that means." (Reuters, 26 September 2016). Two days later, Germany's Finance Minister clashed again with the ECB because of its QE programme and because interest rates remained low in the Eurozone. The Head of the ECB wanted to retain low-interest rates in the Eurozone to help the ailing Eurozone countries, but Germany and other German bankers (notably Deutsche Bank) were blaming the ECB's policies for hurting German savers (lenders) and banks (Reuters, 28 September 2016).

The examples above are only a small sample of the clashes that took place between the ECB and Germany during and after the financial crisis. It is clear that since the outbreak of the financial crisis the relationship between the ECB and Germany could at best be described as very difficult. Continuous frictions between the two were inevitable as the ECB's macro policy thinking was similar to that in the US and the UK, whereas Germany's thinking matched better that of the IMF, but even that only lasted for a very short period.

5.3.3 IMF vs German Policy Thinking in the Euro Crisis

Ironically, early in the Euro crisis, the ECB had stated that as a matter of credibility it would not seek help from the IMF, but resolve any

Eurozone problems by itself whatever the cost. Berlin, however, and particularly, Mrs. Merkel was thinking very differently and exerted a great deal of pressure on other Euro leaders and the ECB, and in the end, they succeeded in getting the IMF involved in the fiscal programme for Greece's massive debt. The German government was not oblivious to the fact that this could potentially dent the Eurozone's credibility, but IMF involvement offered two advantages for Germany. First, by reputation, the IMF would only settle for the strictest of fiscal austerity programmes and its implementation. This way the IMF would oversee an austerity programme that would ensure creditor countries received their loans back without Germany, the biggest creditor to Greece, appearing directly as the ruthless orchestrator of Greece's unprecedented austerity plan. Second, having the IMF involved would bring a credibility to the bailout and fiscal austerity programme that would appease even the most sceptical German lawmaker, member of parliament, or voter.

However, right from the beginning of its involvement, in early 2010, the IMF argued that restructuring Greece's debt was necessary if the country were to have any chance of repaying its debt in the future, but then followed the decisions reached in Europe (Wyplosz and Sgherri 2016). For the first 2 years into the Greek crisis (2009–2011), Germany organised loans to Greece at punishing rates and opposed any restructuring or bailouts. If the Eurobond (or stability bond) had been introduced, as many experts had suggested (see, De Grauwe and Moesen 2009), either then or later in 2011 when the EC had officially proposed it (see EC, Green Paper 2011), this would have resulted in the elimination of all the problems that resulted from Euro members having different spreads against the bund and in Greece avoiding the massive interest rate differentials it had to pay in refinancing its debt. However, Germany always rejected this idea because it believed that national bonds trading at different interest rates could act as a 'discipline' on debtor countries, even if all member states shared a common policy interest rate and a single monetary policy (Financial Times, 22 May 2012). Even more obstructive for the Eurozone economy as a whole, despite the massive quantitative easing taking place at the same time in the US and the UK, German pressure would continuously restrain the ECB from providing extra liquidity to the Eurozone markets.

It was in October 2011, and only under persistent pressure from the IMF, that Germany agreed with other European leaders to restructure part of the Greek public debt. The restructuring of 2012 that followed was the largest debt restructuring of sovereign debt in history (approx. 50% of 2012 GDP), but it still amounted to ‘too little too late’. In the first two years of policy inaction by the Troika (IMF/EC/ECB), and with very high borrowing rates, Greek debt soared from around 120% of GDP in 2009 to 172% of GDP by the end of 2011. According to IMF data, in 2011 alone Greece paid about 7.3% of GDP (€15 billion) on debt interest payments. However, the restructuring that took place in 2012 was based largely on the funds that came from a second rescue package agreed with the IMF and the EU, which involved further borrowing and thus further interest payments and capital outflows from Greece, mainly to Germany and other creditor countries. As a result, after its restructuring in 2012, Greek debt still grew to around 160% of GDP by the end of 2012, making it unlikely that Greece could ever repay its debt.

In fact, since the beginning of its fiscal consolidation programme in 2009, Greece’s government deficit has been reduced faster than in any other economic austerity programme in recent years but, because the macroeconomic policies and targets set by the Troika were causing a severe recession in the economy, its debt/GDP ratio has risen even faster than before the Troika’s measures were introduced. The Troika’s policy proved to be a big failure as Greek debt soared from around 120% of GDP in 2009 to 180% of GDP in 2014, despite the massive fiscal deficit cuts. Since Greece’s debt repayment efforts were obviously becoming a vicious circle, the IMF’s thinking started to deviate significantly from that in Berlin and as a result the IMF started to place more pressure on Germany and other creditor countries to write off, or restructure part of, Greece’s debt, calling it ‘unsustainable’.¹⁰ On 11 October 2012, in a news conference in Tokyo, the IMF Managing Director Christine Lagarde acknowledged that the IMF had seriously underestimated Greece’s fiscal multipliers and “countries like Greece and Spain should be given more time to reduce their budget deficits ...because cutting too far, too fast would do more harm than good” (Financial Times, 11 October 2012). However, Germany’s Finance Minister

immediately pushed back by saying, “back-tracking on debt-reduction goals would only hurt confidence”, (Reuters, 11 October 2012). On 5 January 2013, the IMF’s top economist, Olivier Blanchard, also publicly acknowledged that the IMF blew its forecasts for Greece and other European economies because it did not fully understand how government austerity efforts would undermine economic growth, and called for investment policies that would boost Greece’s economic productivity and growth, but such calls were rejected by Germany and its creditor allies (The Washington Post, 5 January 2013).

The differences in policy thinking between the IMF and Germany became stronger following the second bailout in 2012, and intensified further in 2015 and 2016 when Euro leaders started talking of a third bailout. Greece’s economic conditions were not improving and it was obvious by now that the country’s unprecedented austerity programme and sacrifices were barely sufficient to keep the country in line with its payments to its creditors.

In October 2016, the IMF’s Deputy Head, David Lipton, told the German press that it was unlikely the IMF would get involved in a third bail-out because it was high time Greece received some debt relief, an idea rejected again by Germany. (Sputnik International, 10 October 2016). Even in early 2017, when the IMF announced that it no longer wanted to participate in Greece’s fiscal programme unless there was some debt relief for Greece, Germany refused to back down. Instead, the German Chancellor, Mrs. Angela Merkel, convinced the IMF Managing Director Christine Lagarde that it was in Greece’s own interest that the IMF remained involved in the supervision of Greece’s austerity programme, because the IMF’s departure would bring a completely new deal for Greece that would have to be even harsher than its existing one, if it was ever to be approved by the German parliament.

5.4 Concluding Comments

Throughout the Euro crisis, Germany’s policy thinking clashed strongly not only with that of the ECB, but also with that of the IMF, the very institution the German government insisted was brought on board as an

expert policy advisor on fiscal consolidations. In most, if not all cases, German thinking won the argument, not always for being the most logical, but surely for being promoted by the most powerful. Does this matter? With Germany as the unofficial hegemon of Europe, German thinking matters significantly and its stance during the Euro crisis has been largely responsible, not just for Greece's prolonged plight and its missed opportunity of a structural reform, but potentially for worsening the future of Europe as a whole.

The few structural reforms that were actually implemented in Greece appeared to aim mainly at the faster collection of tax revenues (i.e. the modernisation of the tax system, which became more efficient, though not necessarily more fair, and also the opening up of 'closed professions', including pharmacies, engineers, lawyers, taxis, trucks, etc.). In reality, Greek governments and their monitoring creditors failed to use the seven years (so far) of Greece's relentless austerity programme as a window of opportunity to endorse the required legislation and reforms that would set the foundations for an efficient and modern public sector, free of corruption, nepotism and partisan influences, and would help make the Greek economy more competitive. Such a move would have restored Greek people's trust in the public sector (a deep-rooted problem that is key to many of Greece's failings, including tax evasion), but also in Europe and Germany as its leader. Instead, the Troika's policy advice, under close German monitoring, was just boiled down to fast reductions in real wages and pensions and cuts in health care and education, which produced the kind of economic statistics observed only during wars or massive natural disasters. Ironically, the very measures and reforms that were being implemented to improve Greece's competitiveness have so far had exactly the opposite effects. By 2016, Greece's international competitiveness ranked 56th out of 61 countries surveyed, the lowest ever in its economic history (International Institute for Management Development, IMD 2016).

More generally, the relentlessly harsh economic line of the German government and also its arguments with the ECB and the IMF prolonged the European crisis and led to a further divide between satisfied Germans and many other unhappy Europeans who started to rise up against the growing 'lack of democracy' in Europe. This has led to

social and political unrest in many European countries, and resulted in the creation of a number of extreme political parties which have gained popularity across Europe by vowing to take their countries out of the Euro or the EU altogether. The UK has already voted to leave the EU, while anti-Euro sentiment is growing fast in France, Italy and elsewhere.

All this naturally raises more question than answers. How did Europe come to this? Why did Germany never oppose the massive Greek debt that was building up fast for many years before the crisis? Why should the borrower bear all the punishment for irresponsible borrowing? How can any single member state systematically overrule the policy decisions of the ECB, or the advice of the IMF, when the latter is officially involved in a fiscal programme? Was German thinking allowed to be too influential in the design of the Euro system and later in the design of the Euro area and the role of the ECB? Why was the Eurobond not allowed to be introduced? Why was a proper provision of fiscal transfers from high-income to low-income states not agreed in the design of the monetary union, when member states were giving up their monetary policy autonomy? Why was the independence of the ECB, and even its key role as a lender of last resort, taken away and made subject to approval by the German parliament? Why was the whole Euro system designed in such a way that a strongly performing economy, like Germany, could benefit from it, but any potential provision that related to fiscal transfers, or risk-sharing, with a weaker economy, was very carefully drafted out from its design? These are only a small selection of questions that point to the same conclusion: German policy thinking needs to change and the Euro area needs to rethink fundamentally its institutional and policy design, or else it may be risking Europe's future unity and economic prosperity.

Notes

1. Italian economics, on the other hand, was closer to US economics from much earlier, because so many Italian economists did their doctoral work in the US from the 1940s onwards.
2. See, for example, Baldwin et al. (2015).

3. These attitudes are also broadly supported by German public opinion, see Hayo and Neumeier (2016).
4. See also Wolf (1993).
5. The Bundesbank had argued for an exchange rate which would have been better for the competitiveness of East German industry, but the German government chose a rate which was more generous to the savings of East German households (Buiter et al. 1998, p. 7). See also Brenke (2015).
6. On the Grilli et al. (1991) measure the Bundesbank scored 7 out of 8 for economic independence and 6 out of 8 for political independence, while the Banque de France scored 5 and 2, the Bank of England 5 and 1, and the Banca d'Italia 1 and 4.
7. For example, Prime Ministers Thatcher and Major rejected CBI in response to arguments from Lawson and Lamont when they were Chancellors of the Exchequer (minister of finance).
8. As Gros and Thygesen put it, “The [Maastricht] compromise became acceptable only after policy-makers in countries other than Germany (and the Netherlands) had realized the advantages of price stability.” In that case, “there is no need to fall back on the simplistic argument that EMU was simply a *quid pro quo*: French acceptance of German reunification in return for EMU.” (1998, p. 411).
9. Economists tend to prefer explanations of phenomena such as the Eurozone crisis which rely on alleged structural design flaws, but in this case, it is easy to argue that policy mistakes of various kinds were also of fundamental importance. See Sandbu (2015, especially Chap. 5) for an emphasis on policy mistakes.
10. The IMF is neither monolithic nor unchanging. Indeed, some of the best critiques of the austerity doctrines were produced by IMF research economists (see Cobham 2016).

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6

Seven Years of Austerity and the Greek Dra(ch)ma: Three Economists' Views and a Comment

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6.1 Introduction

After the global financial crisis of 2008–2009, which was characterized by many top economists (such as Behraves, Rogoff and Roubini during the special economic forum CERAWEEK in 2009 in Houston) as the worst since the Great Depression of 1939, the European Union (EU) sovereign debt crisis broke out.¹

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In this paper, we summarize the opinion of three renowned economists (alphabetically), namely Paul De Grauwe, Paul Krugman and Joseph Stiglitz, on the Eurozone crisis as well as the Greek case.

Krugman (2010) argues that the creation of the common currency was a terrible mistake while according to Stiglitz (2015e) euro is poorly designed and the European Central Bank (ECB) focuses single-mindedly on inflation and it is not provided with the adequate tools to address unemployment. These weaknesses in the designs of the euro and the ECB damage Europe's prospects (Greek ones even more). Troika used bad models and forecasts and the result of the macro-policies it demanded was a deep Greek depression without end, which possibly will lead to even greater economic, political and social chaos. The cost in human suffering has already been too high. Similar austerity programmes (and structural reforms) imposed by the International Monetary Fund (IMF) on the East Asian countries in the late 1990s had devastating effects. Greece might end up as a depleted country-one that has sold all its assets, and whose bright young people have emigrated.

The Greek disaster (tragedy) is a very short story, just a few paragraphs (and only 5 years) long, and it goes like that.

6.1.1 The Boom

During the period 2000–2008 there was an influx of cheap loans and large amounts of capital that created the boom. The Greek government for many years borrowed and spent in excess of the country's capabilities. For example, Goldman Sachs structured irresponsible deals that enabled the Greek government at the time of the Maastricht Treaty to skew the numbers of its debt.

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The booming economy experienced high-inflation rates and increases in unit labour costs, and this boom led to large current account deficits. The nominal interest rate (set by ECB) was too low and, thus, when inflation rose the low real interest aggravated the boom.

6.1.2 The Bust

When the capital inflows (the music as Krugman puts it) stopped Greece was faced with high costs and prices. When the boom turned into a bust there was a massive outflow of liquidity when investors massively sold Greek government bonds pushing interest rates to unsustainably high levels. Due to a poorly designed euro, money during the crisis flew from the weak country's (that is Greece) banks to the strong, leading to divergence. The North unwillingly provided funds to Greece but under strict macroeconomic and fiscal conditions, even though almost none of the surprisingly large amount of money loaned to Greece has actually gone there. Instead, it has gone to pay off private sector creditors, including German and French banks.

Instantaneous austerity programmes were applied (ruthlessly cutting spending and raising taxes), leading to a deep recession, which reduced government revenues and as a result, the austerity programmes were intensified. The rapid fiscal consolidation and tightening of the budget deficit deliberately threw Greece into a deep recession with long standing effects and catastrophic consequences.

There was a unilateral absorption of the crisis. That is, a drastic reduction in wages and in prices (an internal devaluation), which in turn produced a deeper recession. Consequently, deflationary dynamics developed (imposed by the common monetary policy), which plunged not only Greece but the euro area as well into a double-dip recession. Because of the incoming deflation, the debt burden in Greece worsen. This resound increase in debt levels, eventually led to unsustainable debt to GDP ratios.

Also as deflation took its toll on growth and employment the Greek government attempted to discipline its debt with more drastic spending cuts and tax increases, which further increased the already high

unemployment rate and led the bond markets to lose confidence and ‘push the situation to the brink’. Therefore, the macro-policies demanded by the troika were a built-in destabilizer, which led to unacceptable levels of unemployment and ever growing inequality.

As Krugman (2015b) highlights the Greek governments’ deficiency (i.e. irresponsible borrowing which reflects irresponsible lending) has been repeatedly paid by the Greek citizens at a high cost, and the most decisive issue now is to do everything possible to ‘end the bleeding’.

Most importantly, in order to avoid a GREXIT, Greece needs deep debt restructuring (see also Lagarde’s view on the matter in WSJ 2015). That is, a write-off of a significant portion of its debt; a deal that would lengthen the time over which loans have to be paid back; lowering of interest rates; exchanging part of the debt for GDP-linked bonds. The ECB should act as a lender of last resort and it must provide liquidity immediately. Further, the European Investment Bank should play a more active role in Greece by restoring the inflationary dynamics. Finally, more reasonable budget goals and structural reforms should be demanded by Europe (Stiglitz 2010, 2015b, c, d, f).

A GREXIT from the euro could cause the absolute collapse of the Greek economy. That is, create financial chaos and have catastrophic consequences on its banking system. It might also undermine the credibility of the euro and impose threats on the global economy through contagion risks. An alternative way to exit from the crisis, might be moving towards a dual currency circulation.

However, the authors fear that the collective voice of these three renowned economists will be nothing more than an ‘I am the voice of one crying in the wilderness’² where the wilderness (or the desert) is the Eurozone.

In support of their claims, we provide evidence of the negative impacts of the austerity plans on the Greek economy for a period covering 2010–2014.

The remainder of the paper is organized as follows. Section 6.2 reviews the three economists’ view on the European crisis and the Greek issue. Section 6.3 presents our comments, focusing our analysis on the impact that the austerity programs have had on the Greek economy and Sect. 6.4 consists of our concluding remarks.

6.2 Three Economists' Views

6.2.1 Paul de Grauwe (on the Eurozone Crisis)

6.2.1.1 Debtors and Creditors

De Grauwe (2016) based his arguments on three fundamental axes. The first one supported the idea that the Eurozone crisis contributed towards unsustainable government debts that will trouble the euro area further, second, the problematic (and hence possibly inefficient) fiscal policies remain at the centre of the continuously soft economic expansion of the Eurozone and third, despite the Institutions' efforts at reform, these were not sufficient to address and solve the design failures of the Eurozone.

De Grauwe focused on how the European Economic and Monetary Union (EMU) is governed. In particular, he distinguishes the Eurozone into two parts, namely the countries that belong geographically to the North of Europe (e.g. France, Germany, The Netherlands and Austria) and those belonging to the South of Europe (e.g. Greece, Portugal and Spain).

He points out that the Southern European countries (Ireland as well) are the ones that have accumulated current account deficits in the past (De Grauwe 2016). As a result, they have become the debtors, and have been hit by sudden liquidity stops and have then been forced to beg the Northern countries (that is, the creditors who have built up current account surpluses) for financial support. The direct effect of that was the dominant impact of the creditor countries on the debtor ones and on the Eurozone in general. Austerity is the mechanism through which the loans that the reckless creditor nations have extended to the South in the past will be repaid in the future.

However, De Grauwe (2016) is a proponent of the 'symmetric' view that 'for every foolish debtor (a nation who took on too much debt) there must be a foolish creditor (a nation that extended too much credit)'. Therefore, he argues that not only the debtor nations, but the creditor nations as well, should share the cost of this adjustment. De Grauwe also supports the view that as it happens in the case of banks that are facing the risk of losing part of their loan capital as a

consequence of the potential bankruptcy of a borrower the same could apply in the case of the countries-creditors.

6.2.1.2 Relative Unit Labour Costs

As explained above, the North unwillingly provided funds to the South, but under strict macroeconomic and fiscal conditions. This meant that the debtor countries were obliged to cut spending and to increase taxes. Austerity was the key point for the creditor countries in order to express their solidarity to the debtor ones.

Therefore, that symmetric process, meaning the sharing of responsibilities between debtor and creditor countries, never took place. On the contrary, De Grauwe (2016) stated that debtor countries were indebted to repay in full their loans to the countries-creditors. This asymmetric view led to a series of cutting measures, such as drastic reductions in wages and in prices on the part of debtor countries, which in turn produced deeper recessions. As a result of this ‘internal devaluation’ the relative unit labour costs (the unit labour cost of a country over the average unit labour cost in the rest of the Eurozone) of the debtor countries (that is, of Ireland, Spain, Greece, and to a lesser extend of Portugal and Italy) decreased dramatically (De Grauwe 2016). In addition, De Grauwe highlighted the fact that these internal devaluations were very costly in terms of lost output and employment. Consequently, this unilateral absorption of the crisis by the debtor countries developed some deflationary dynamics, which plunged the euro area into a double-dip recession.

6.2.1.3 Debt Ratios

As a result of the 2008, banking crisis the government debt (to GDP) ratios of the debtor countries started to increase. According to De Grauwe (2016) the austerity induced recession just made things even worse, since both the GDP and the government revenues decreased (the latter decline led to higher budget deficits and debts) and, therefore, debt to GDP ratios increased even more. In fact, the more intense

the austerity measures were the more resounding was the increase in debt levels, eventually leading to unsustainable debt ratios (De Grauwe 2016). Thus, all these sacrifices (from the Southern countries) were partially blamed for making things worse. Furthermore, De Grauwe provides empirical (cross-section) evidence for the negative impact of austerity (introduced by the IMF as the variable of the fiscal impulse) on the cumulative growth during 2009–2012 (De Grauwe 2016).

Finally, in a simulation study (assuming that nominal growth will be equal to the nominal interest rate, and that primary surpluses will be created) De Grauwe (2016) found that even under these favourable macroeconomic conditions it will take a long time (many decades in fact) for the indebted nations to halve their debt levels and to achieve sustainability.

6.2.1.4 Design Failures of the Eurozone

The third argument that De Grauwe's paper is based on is the design failures of the Eurozone and the inadequate attempts to resolve them.

6.2.1.5 Single Interest Rate

The existence of a common interest rate (fixed by the ECB) among the euro area members imposed pressure on the countries in recession in contrast to the growing ones, where the interest rate was too low. As pointed out by De Grauwe (2016) the single interest rate that the ECB imposed on all member countries was too low for Spain, Ireland and Greece, whose economies were starting to boom. When inflation also rose in these booming countries the low-interest rate aggravated the boom. Those divergent dynamics led to discrepancies in inflation, relative unit labour costs and current accounts (De Grauwe 2015). The booming economies of the South experienced higher levels of inflation rates and increases in unit labour costs, which in turn led to large current account deficits. On the other side, Northern countries (who financed the booms in the Southern countries by credit) accumulated current account surpluses.

6.2.1.6 Lender of Last Resort

De Grauwe (2016) argued that the elimination of the lender of last resort backing of the member state countries triggered self-fulfilling liquidity crises. These crises (which emerged when booms turned into busts) were caused by a massive outflow of liquidity when investors lost confidence in Greece, Portugal and Spain, and massively sold the government bonds of these countries, pushing interest rates to unsustainably high levels. Then these crises turned into solvency crises. De Grauwe says: 'The governments of the problem countries were forced into instantaneous austerity programmes, by cutting spending and raising taxes. These programmes led to deep recessions, which in turn reduced government revenues even further, forcing these countries to intensify the austerity programmes'. Eventually, this led to a deflationary spiral that made the fiscal crisis more intense.

De Grauwe (2016) defends the theory which implies that despite the fact that fundamentals cannot be ignored there is a special role for the central bank, which has to provide liquidity in times of market panic. The role of national stabilizer was undertaken (finally) by the ECB after its decision and the launch of the Outright Monetary Transactions (OMT) on the 6th of September 2012. With this political move, the ECB became lender of last resort for banks as well as sovereigns. The beneficial effect of the decision can be seen from Fig. 5 in De Grauwe (2016), where spreads declined drastically after the announcement of the OMT.

6.2.1.7 Policy Implications

De Grauwe argues that although the ECB is the 'ultimate guarantor of the sovereign debt in the Eurozone' and in this sense has evolved into a central bank such as the Federal Reserve, there is no primacy of the governments of each of the member states over the central bank. De Grauwe (2016) suggests the formation of a Eurozone government that will have control over the ECB and will be supported by a European Parliament.

De Grauwe also points out that the European Commission (EC) and the ECB have seen a significant increase in their power since the sovereign debt crisis in the Eurozone, without a concomitant increase

in their accountability (e.g. the EC can now force countries to raise taxes and reduce spending, without, however, having to bear the political cost of these decisions). De Grauwe highlights the fact that both the EC and ECB with their decisions affect millions of people's welfare. Nevertheless, these people are unable to express their disagreement with such decisions via democratic means such as elections.

De Grauwe (2016) concludes by suggesting that the Eurozone should direct its efforts towards a fiscal and political union where a Eurozone government supported by a European Parliament will be dominant over the central bank in times of crisis.

6.2.2 Paul Krugman (on the Greek Issue)

Numerous times during the EU sovereign debt crisis the Nobel laureate economist Paul Krugman expressed his opinion regarding the failure to tackle the Greek crisis issue by the Institutions. In this paper, we will summarize four of the articles that Krugman wrote in his column in *The New York Times*.

6.2.2.1 From Problems and Troubles to a Catastrophe

Even from 2010, when the first signs of the Greek catastrophe that would follow in the coming years unfolded, Krugman stated that Greece was approaching the zero point. According to Krugman (2010), Greece ('a faraway country with an economy roughly the size of greater Miami') is paying the price for past fiscal irrationality. Yet this view is only one side of the coin, and is by no means the whole story (Krugman 2015a).

Indeed Greece (that is, its various Governments) for many years borrowed and spent in excess of the country's capabilities. Although the Greek government was spending beyond its means in the late 2000s since then it has repeatedly cut public spending and raised taxes. However, a restriction of the primary deficit should have occurred by now. On the contrary, the national account statistics have not improved.

In Greece, the influx of cheap loans and large amounts of capital into the country as well as it being a member of the Eurozone boosted inflation. When the capital inflows (the music as Krugman puts it) stopped

Greece was faced with high costs and prices, which were significantly greater than those of the big European economies. Since prices had to come down, Krugman (back in 2010) predicted (correctly) that because of the incoming deflation the debt burden in Greece would worsen.

He also predicted (again correctly) that as deflation took its toll on growth and employment (as pointed out by Krugman even a G7 country with its own currency like Japan can be trapped in a deflationary vortex) the Greek government would attempt to discipline its debt (indeed today Greek debt is up only 6% since 2009, partly because it received some debt relief in 2012) with drastic spending cuts and tax increases, which would further increase the already high unemployment rate and would lead the bond markets to lose confidence and 'push the situation to the brink'. Krugman (2010) argued that with German support (which unfortunately did not materialize) the European countries should have guaranteed Greek debt in exchange for an obligation to undertake harsh fiscal measures. However, in 2015, one member of the troika, the IMF reached the conclusion unilaterally that Greece's debt cannot be repaid. Krugman (2015c) points out that it was Greece's inability, thanks to the euro, to offset fiscal austerity with easy money that turned its debt troubles into a catastrophe. In Krugman's words: 'It was the toxic combination of austerity (drastic fiscal retrenchment) with hard money that resulted in the Greek disaster'. That is, Greece did not have the choice of devaluation or any other monetary policy tool to support its failing economy.

Back in 2010, Krugman also argued that a possible GREXIT from the euro (according to him the creation of the common currency was a 'terrible mistake' since Europe did not fulfil the criteria for a prosperous common currency nor the appropriate fiscal and banking union in order to prevent or to confront crises such as the recent one; see Krugman 2015a) would have catastrophic consequences on its banking system. Krugman further highlights the fact that two of the many risks of a GREXIT are 'financial chaos and of business hobbled both by banking troubles and by uncertainty over the legal status of debt'. Accordingly, since abandoning the single currency could cause the absolute collapse of the economy, the Greek government (which is now begging for a standstill on further austerity) has succumbed to creditors'

claims for strict austerity plans and structural reforms. In Greece, which did not have the option of a currency devaluation that would have made its exports more competitive and would have broken the cycle of deflation as, for example, in Canada in the 1990s,³ the failed austerity brought a depression and the collapse of the Greek economy. So now, in the words of Krugman, ‘we know that even harsher austerity is a dead-end’.

Krugman (2015a), argued that ‘the troika officials, these supposed technocrats, are in fact fantasists who have disregarded everything we know about macroeconomics’.

Although many analysts used to claim that the adoption of the euro was an irrevocable move, Krugman (2015b) wonders whether a GREXIT might work, as in the case of Iceland, where the devaluation of 2008–2009 proved to be extremely successful, or the case of Argentina, which abandoned its one-peso-one-dollar policy in the period 2001–2002. After all, even in the event that Greece receives generous debt relief, leaving the euro might be the only means of escape from the economic depression that the country has faced for five years now.

6.2.3 Joseph E. Stiglitz (on the Greek Issue)

6.2.3.1 The Austerity Programme

With the outbreak of the Greek crisis, Stiglitz (2010), in an article in *The Guardian*, castigated the role of the developed countries in Europe towards the Greek issue. In particular, while Greece was criticized severely for falsifying the figures of the national statistics, this did not happen for other countries of Europe when they exceeded the upper limit of the deficit as a percentage of GDP established by the Treaty of Maastricht. According to Stiglitz (2010) the Treaty of Maastricht, had already been converted into a two-speed Treaty, one for the strong European countries and one for the weak ones. Although the financial crisis (of 2007–2008) brought to the surface the structural weaknesses of the Greek economy, the large deficit of Greece was partially due to that financial crisis (Greece, like many other countries, was

not responsible for causing this global crisis, yet the economy felt the impacts very severely).

After almost five years of austerity experiments on Greece, he revisited the issue with 6 more articles in high volume/traffic newspapers and blogs. According to Stiglitz (2015a), the Eurozone appears not to be a very democratic project, and the true nature of the ongoing debt dispute is not about money or debates around robust economic policies but about power (see also De Grauwe 2016). The programme that the troika foisted on Greece for the past five years has been characterized by Stiglitz as abysmal.

Moreover, Stiglitz (2015a, c) alludes to the fact that the implementation of the austerity programme, the EAP, economic adjustment programme (Greece had the most significant and rapid fiscal consolidation among the advanced European economies, ruthlessly cutting back on expenditure and raising new revenues) 'deliberately' led to a depression that had long-standing effects and 'catastrophic consequences', and it is already deeper and more prolonged than the Great Depression in the US. Finally, Stiglitz (2015c) points out that without any of these reforms, Greece grew at a faster rate than the EU beginning in the mid-1990s until the global crisis (4 vs 2%).

6.2.3.2 Criticisms

According to Stiglitz (2015e), weaknesses in the design of the euro and the design of the ECB, which is not provided with adequate tools to address unemployment, damage Europe's prospects. It appears that the countries that decided not to be part of the common currency, such as Sweden, seem to be in better condition than those that joined the Eurozone, for example, countries like Greece, Portugal and Spain that cannot change economic policies, no matter how harmful they become. Stiglitz argues that the euro is 'poorly designed as in a crisis money flows from the weak country's bank to the strong, leading to divergence' (for the divergence problem in the Eurozone check, among others, Karanasos et al. 2016). Stiglitz (2015d) alludes to the fact that GDP today is lower by 17% than the level that it would have been had the soft pattern of European economic growth continued its course.

Greece and other Eurozone member countries have turned over their monetary sovereignty to the ECB, which focuses single-mindedly on inflation. As a result, unemployment rose, and insufficient attention was paid to financial stability (Stiglitz 2015a; see also De Grauwe 2016). It seems that Greece's destiny is not in her own hands.

According to Stiglitz (2015a) the troika used bad forecasts and models. The troika's demands (e.g. that Greece should achieve a primary budget surplus, excluding interest payments, of 3.5% of GDP by 2018) have been condemned by economists around the world, among them Stiglitz, who argues that such demands will lead to unsustainable levels of debt and a deeper downturn. In his words (2015f), the macro-policies demanded by the troika and its incoherent programme will lead to a deeper Greek depression without end, unacceptable levels of unemployment and ever growing inequality. It is a built-in destabilizer. The high unemployment rate will drive down wages and lower Greeks' standard of living even more, possibly leading to even greater economic, social and political chaos. Actually, the first two have already arrived whereas the third one is around the corner.

Furthermore, Stiglitz (2010) argues that although Greece is among the poorest of the European family, if Europe had developed a more efficient solidarity and stabilisation framework, then budget deficits in the periphery of Europe might have been smaller and hence easier to manage. For example, in the USA there is a sense of social cohesiveness and, hence, when one part of the country has difficulties, federal spending can be diverted to help those parts that are in need. Unlike the US structural framework, the EU before and even after the introduction of the common currency did not have an overall support mechanism (either financial or structural) in order to protect its economies when they face financial constraints.

In addition, Europe did not adopt the principle of do no 'harm'. As mentioned by Stiglitz (2010; in his article in the Guardian) the ECB announced that it would not accept Greek bonds as collateral and assigned the task of the evaluation of the credit-worthiness of Greek bonds to the rating agencies. Additionally, announcements made by the EU leaders exacerbated Greece's problem. A large part of Greece's deficit is the result of the global recession, which revealed the deep-rooted

structural problems of the Greek economy. However, European leaders' statements have sent the interest rates Greece has to pay soaring, making it all the more difficult for Greece to tame its deficits (Stiglitz 2010).

Furthermore, Stiglitz claims that Greece needs debt restructuring. It is an oxymoron that the defeated Germany (after World War II) that received unconditional aid from US with the Marshall Plan (which constituted in real terms the largest financial assistance and debt reduction in world history) now refuses even to discuss such a scenario in the case of Greece (Stiglitz 2015d). Although some of Greece's debt was restructured, it was too little and not done well. When the crisis began, Greece's debt was about 117% of its GDP. Today, after restructuring, after a programme allegedly designed to increase the sustainability of debt, it stands at 177% (Stiglitz 2015c).

Stiglitz (2015c) brings up the point that Greece's bailout was not a bailout of the country but of the Western banks, who did not do adequate due diligence. In full agreement with De Grauwe's (2016) arguments, he noted that the lenders 'bear even more responsibility for the current mess than the borrowers'. For example, it is remarkable that almost none of the surprisingly large amount of money loaned to Greece has actually gone there. According to Stiglitz (2015a, c; see also some recent figures published by IMF) 90% of it has gone to pay off private sector creditors, including German and French banks. As another example, Goldman Sachs structured irresponsible deals that enabled the Greek government at the time of the Maastricht Treaty to skew the numbers of its debt.

Stiglitz points out that similar austerity programmes (and structural reforms) imposed by the IMF on the East Asian countries in the late 1990s had devastating effects. In particular, he stated that 'both before and after the crisis in East Asia, and those in Africa and in Latin America (most recently, in Argentina), these programmes failed, turning downturns into recessions, recessions into depressions', (Stiglitz 2015f). A prominent example is the case of Indonesia (which surrendered its economic sovereignty), where in 1998 the IMF ruined the country's banking system (see Stiglitz 2015f).

6.2.3.3 Negative Consequences of the Programme

In the last five years, the Greeks have managed to transform a large primary deficit into a surplus. This was a great achievement. However, the rapid tightening of the budget deficit threw Greece into a deep recession, and the cost in human suffering has been extremely high. According to Stiglitz's experience there has been no other intentional recession that resulted in such destructive results. There is a 25% decline in the country's GDP, and Greece's rate of unemployment has reached its peak of 25% (with youth unemployment rate exceeding 50%).

Moreover, as pointed out by Stiglitz, these types of policies (e.g. tax hikes and pension cuts) have done so much to increase inequality in so many advanced countries. Despite the fact that the IMF has warned of the dangers that the high taxation might impose, yet in Greece the troika insisted on imposing high taxes even at low-income levels. A mistaken tax policy can help destroy an economy. Although the requirement is intended to reduce tax evasion, in the case of Greece, it will destroy small business (Stiglitz 2015f).

6.2.3.4 What Has to Be Done?

The solution of the 'Greek problem' according to Stiglitz might lie in the following points.

Stiglitz (2010) claims that Europe should re-examine the short-run budgetary targets (meaning more reasonable primary budget surplus targets that is the imbalance between government revenues and expenditure) it sets for Greece in terms of the structural deficit. In particular, more reasonable budget goals, such as a 'primary surplus' of 1%, and reasonable structural reforms should be demanded by Europe. No country can sustain levels of primary surpluses as high as 3.5% for a long period of time without deepening the recession and causing social and political unrest.

Stiglitz (2015b, c, f) indicates that Greece needs deep debt restructuring, that is, a write-off of a significant portion of Greece's debt (estimated to be worth close to \$300 billion in bailouts), or at least a deal that would lengthen the time over which loans have to be paid back (even the IMF, i.e. its current managing director Christine Lagarde, is calling for deep debt restructuring).

An alternative scenario of debt restructuring, proposed by Stiglitz (2015c, d), is either lowering interest rates or exchanging part of the debt for GDP-linked bonds, which would pay more in case Greece recovered. Such an exchange lines up the incentives of debtors and creditors (unlike the current system, where Germany benefits from the weaknesses in Greece; see also De Grauwe 2016).

Furthermore, the European Investment Bank should undertake countercyclical investments in the country and offset the deflationary impacts of the austerity programmes (e.g. the budget cuts). In general, it should play a more active role in Greece by restoring the inflationary dynamics. The provision of such support might lower interest rates, and help the country achieve budgetary balance (Stiglitz 2010).

Stiglitz (2015c) also suggests that the ECB should act as a lender of last resort and he argues that it must provide liquidity immediately (see also De Grauwe 2016). That is, it should offer the stimulus money that two successive Greek governments have been requesting.

6.2.3.5 GREXIT

During an interview in TIME magazine, Stiglitz (2015b) called attention to the fact that there is no way to predict the long-run consequences of Greece abandoning the euro. A GREXIT might undermine the credibility of the euro and impose threats on the global economy through contagion risks. If the Greek economy recovers after abandoning the euro, this may trigger intense anti-euro politics. If, on the other hand, the Greek economy collapses outside the euro, then there will be a failed state on the edge of Europe, and that is when the geopolitics will become very ugly, Stiglitz (2015b).

In an economy which is globalized to such an extent it is difficult to know all the linkages, and thus safe predictions related to the connections between events and institutions are most probably impossible. For example, many countries of Eastern Europe are still heavily dependent on Greek banks, and in the case of the bad scenario, that is, those banks collapsing, the EU will face the risk of a financial turmoil that could easily be transmitted to the rest of the world economy (Stiglitz 2015d).

6.2.3.6 Parallel Currency (and the Similarities with Argentina)

Stiglitz (2015e) points out that an alternative way to exit the crisis might be moving towards a dual currency circulation, using both the euro and a ‘Greek euro’, a currency that would be tradable only within the country’s own banking system.

Argentina (Campos et al. 2012, 2015, among others, present a detailed analysis of economic growth in Argentina) and others have shown how this can be done. In particular, the government would recapitalize the banks using the newly issued currency, extend the capital controls, limit withdrawals from banks, and promote money transfers within the banking system from one party to another (Stiglitz 2015d). Despite the fact that every country is different there are, however, some astonishing resemblances between the two countries (Argentina and Greece). Both countries were being choked by austerity as well as (under the IMF programmes) experiencing rising unemployment, poverty and immense suffering (Stiglitz 2015d).

6.3 A Comment: The Greek Economy After Five Years of Austerity

The outbreak of the crisis in 2008 found the Greek economy already crumbling. GDP per capita growth was in steep decline during 2008 (−0.65%) after a period (1998–2007) with a benign macroeconomic environment, with an average growth rate of +3.38% [for example, the GDP of North Greece and Aegean Islands was similar to that of Croatia and Cameroon in 2008 (namely 60,600 and 23,300 million euros respectively) while in 2012 it was similar to that of Slovenia and Equatorial Guinea (around 47,500 and 18,100 million euros respectively)]. It is noteworthy that in 2008 the gross general government debt reached its highest level (112.9% of GDP, see also Ali et al. 2010) since the restoration of democracy in 1974.⁴

For the next five years (2010–2015), Greece implemented endless austerity (solidarity) measures that had disastrous effects (see Krugman and Stiglitz above) on its economy. Stiglitz (2015a) cannot recall any other depression (like Greece’s) that resulted in such a devastating

impact. In this section, we will try to present the consequences that the five years of restrictive policies had on the Greek economy and on society in general.

6.3.1 Macroeconomic Indicators

6.3.1.1 Monetary Aggregates and Inflation Rates

Monetary aggregates are very important tools for the ECB. By adjusting them the central bank can control inflation. The monetary aggregates (M1, M2 and M3) for Greece from 2001 to 2015 show a downward trend, especially for M2 and M3 aggregates.

Since the level of inflation is directly affected by monetary aggregates, the Greek economy faced a decreasing trend of inflation rates after 2010 and negative ones from 2013 and onwards. This sharp drop of inflation rates during the period 2010–2015 might be due to three reasons: first because of a reduction in money supply, second due to lower credit and third because of reduced consumer spending.⁵ In the last three years, deflation put pressure on unemployment rates, transforming a recession into a depression (see Krugman [2015a](#)).

6.3.1.2 Unemployment Rates

The effects of the crisis were even more severe for unemployment rates. The harmonized unemployment rate, increased after 2010 and amounted to 25.5% in 2015 (it more than doubled after 2010) according to Eurostat projections. Even more remarkable is the youth unemployment rate (the group of unemployed persons aged between 15 and 24) for Greece, reaching 52.4% in 2014 and reflecting how difficult it is for the young people to find a job. However, due to the fact that many young people are studying full-time and are therefore neither working nor looking for a job (so they are not included in the workforce, which is used as the denominator for calculating the unemployment rate), for this reason, youth unemployment ratios are estimated as well (the share of unemployed for the whole population). In particular, the youth

unemployment ratio for the ages between 15 and 24 rose from 9.9% in 2010 to 14.7% in 2014 and for the ages from 25 to 29 years old the unemployment ratio rose from 16.7% in 2010 to 34.9% in 2014.⁶

6.3.1.3 Maastricht Criterion Interest Rates

Interestingly, despite the fiscal consolidation of the previous years (2010–2014) the Greek economy seems to have diverged even more from the EMU countries (see Fig. 6.15 in the Appendix). Maastricht criterion bond yields are long-term interest rates, used as a convergence criterion for the EMU, based on the Treaty of Maastricht (Eurostat 2015).

6.3.1.4 Athens Stock Exchange (ASE), Private Sector Credit Flow and Foreign Direct Investment (FDI)

Stock markets can very often be used as a barometer of future business and consumer confidence. The ASE is constantly shrinking from 2008 (the outbreak of the financial crisis) and onwards. In addition, since the financial crisis of 2008 (when the credit flow started decreasing), and especially after the adoption of the austerity plans by the Greek government, private credit flow levels reached negative values, suggesting that during the period 2010–2014 businesses operated in a very tight liquidity environment since credit institutions were extremely unwilling to fund them. Similarly, according to the Bank of Greece (2015), foreign direct investment (in millions of euros) continuously diminished after 2010 (and the launch of the austerity plans imposed by the troika) by losing almost 60% of its initial value in 2010.⁷

6.3.1.5 Healthcare Access, Poverty Risks, Suicides and Birth Rates

It is clear that the restrictive policies that were employed in Greece after 2010 did not leave the health sector unaffected. The percentage of the persons whose medical needs were not met due to the high cost

of treatment increased from 8% in 2010 to 14% in 2014. Hence, the citizens' access to health services was limited further during the period 2010–2014. Ever more remarkable is the increase in the rate of the people at risk of poverty or social exclusion (as a share of the total population). The percentage of the people that face the risk of poverty and social exclusion increased from around 28% in 2010 to 36% in 2014, demonstrating the serious social consequences of the austerity programme. As far as the number of suicides is concerned, Branas et al. (2015) argued that since the beginning of the austerity measures in 2011 Greek society has been faced with an increasing number of total suicides, marking the negative (unintended) impacts that these policies might have had on the mental health of the people.⁸

6.4 Conclusions

In this section, we will further discuss and summarize our results. Since the Greek economy's integration in the EAP in 2010, much has been written and said about the necessity and efficiency of these programmes. Among them are the three economists Paul De Grauwe, Paul Krugman and Joseph Stiglitz.

In particular, De Grauwe argued, first that the euro area crisis contributed towards unsustainable government debts, second, the ill-designed fiscal policies remain at the centre of the continuously weakened economic expansion of the zone and third despite the Institutions' efforts for reforms, these were not sufficient to address and solve the design failures of the Eurozone. All the parties are responsible for the imbalances that existed between the euro area countries, 'for every foolish debtor there must be a foolish creditor' (De Grauwe 2016).

Krugman, with a series of articles, illustrates the incomplete tackling of the Greek crisis by the Institutions and that the creation of the euro was a 'terrible mistake' (see Krugman 2015a).

Stiglitz (2010) argues that although Greece is among the poorest of the European family, if Europe had developed a more efficient solidarity and stabilisation framework, then budget deficits in the periphery of Europe might have been smaller and hence easier to manage. In

addition, Europe did not adopt the principle of do no ‘harm’. In full agreement with De Grauwe’s (2016) arguments, Stiglitz noted that the lenders ‘bear even more responsibility for the current mess than the borrowers’.

In support of their claims, we provide evidence that show the deterioration of the Greek economy and the difficulties faced by society during the five years of austerity measures.⁹

Notes

1. For more details check the Appendix.
2. As it is written in the book of the words of Isaiah the prophet.
3. In the words of Krugman (2015b): ‘The truth is that Europe’s self-styled technocrats are like medieval doctors who insisted on bleeding their patients—and when their treatment made the patients sicker, demanded even more bleeding.’
4. See Figs. 6.3, 6.4, 6.5 and 6.6 in the Appendix.
5. See Figs. 6.7, 6.8, 6.9, 6.10 and 6.11 in the Appendix.
6. See Figs. 6.12, 6.13 and 6.14 in the Appendix.
7. See Figs. 6.16, 6.17 and 6.18 in the Appendix.
8. See Figs. 6.19 and 6.20 in the Appendix.
9. For more see Appendix.

Appendix Introduction

Eighteen years earlier, in 1992, the Treaty on the European Union was signed in Maastricht by the EU ministers of finance and foreign affairs. Under this agreement the idea of the single currency was introduced and the main principles of economic and monetary policy were established. Among others one key element of the Treaty was that the member states should refrain from high levels of public deficits [The European Commission (EC) 1992]. However, from the early 2000s many EU countries that signed the Treaty of Maastricht failed to keep their deficit and debt at low levels (see Figs. 6.1, 6.2).

In Figs. 6.1 and 6.2 we distinguish the Eurozone countries into five different groups depending on the geographical region to which they belong. In particular, the first group consists of the ‘Inner Six’ countries (e.g., Belgium, France, Germany, Italy, Luxembourg and The Netherlands), the second group the so-called ‘PIGS’ (i.e., Greece, Ireland, Portugal and Spain), the third group the Central European countries (e.g., Austria, Slovakia, Slovenia), the fourth group the Baltic countries (e.g., Estonia, Latvia, Lithuania) including Finland and the fifth group is Insular Europe (i.e., Cyprus and Malta). Figure 6.1 shows that government deficits as a share of GDP in the period 2000–2007 were among others quite high for France, Germany, Italy and The Netherlands (countries of the Inner Six group) and Portugal and Greece (countries of the PIGS group). Data for Greece’s deficit are available from 2006 and onwards. However, the OECD’s economic outlook for Greece reported that the Greek government balance sheets were suffering from high levels of deficit even from the early 1980s. In addition, according to many views (although not scientifically proven) a debt-to-GDP ratio could be optimal if it is around 60%. But why is this ratio so important? Simply because the higher the ratio the more difficult it is for the country to repay its debts and hence the higher the probability (for the country) of being downgraded by the rating agencies (such as Standard & Poor’s, Moody’s and Fitch). In Fig. 6.2 data report that among the euro area countries only Belgium (though with a decreasing trend) and Italy from the Inner Six group and Greece and Portugal from the PIGS group had a debt-to-GDP ratio higher than 60%.

Nevertheless, despite these disparities between the countries that followed the rules imposed by the Treaty of Maastricht and those that faced difficulties in doing so, the common currency seemed to function well (from 2002 to early 2008 when the financial crisis began). But the weaknesses and the problems for the single currency were to appear shortly after the global financial crisis of 2008–2009, which led to the well-known EU sovereign debt crisis (of Greece, Ireland and Portugal) (Tables 6.1, 6.2).

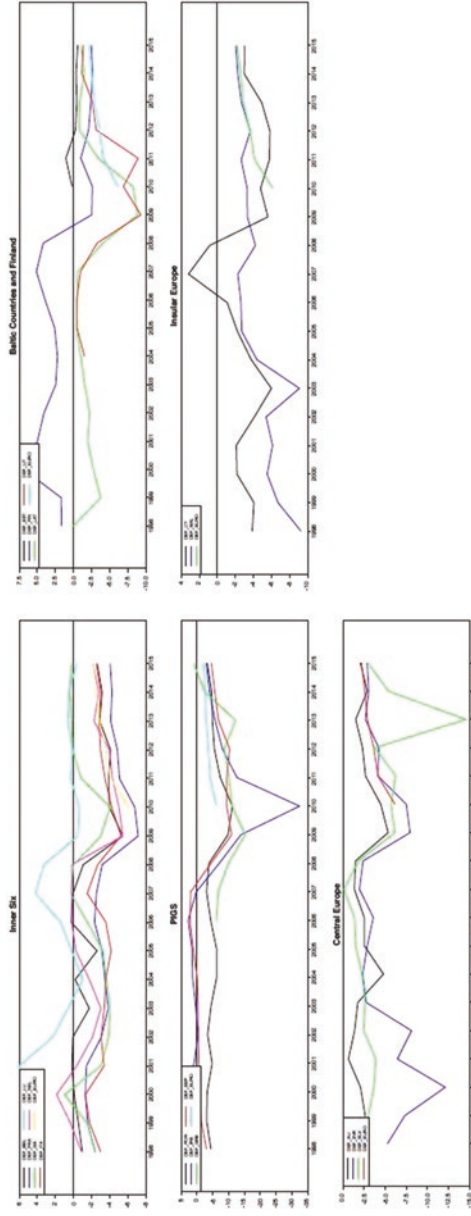


Fig. 6.1 Government deficit as a share of gdp for Eurozone countries and Euro-average, 1998–2015 (yearly rate of change) Source Eurostat

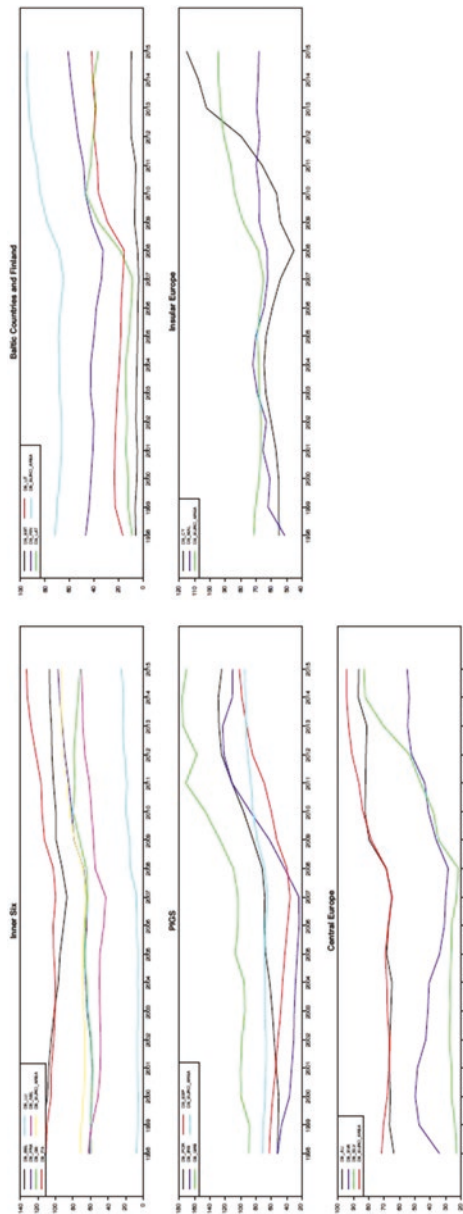


Fig. 6.2 Government debt as a share of gdp for Eurozone countries and Euro-average. 1998–2015 (yearly rate of change) Source Eurostat

Table 6.1 Notable phrases spoken by the three economists

Paul De Grauwe	Paul Krugman	Joseph Stiglitz
<p>1. For every foolish debtor there must be a foolish creditor</p> <p>2. The existing stabilizers... were stripped away from the member-states. This left the member-states naked and fragile</p> <p>3. European integration has taken the form of bureaucratic integration as a substitute for political integration</p> <p>4. The euro crisis is not over</p>	<p>1. Greece did indeed run up too much debt (with a lot of help from irresponsible lenders)</p> <p>2. What turned Greek debt troubles into catastrophe was Greece's inability to impose fiscal austerity, yes, but offset it with easy money</p> <p>3. Greece's formula for disaster it involved the toxic combination of austerity with hard money</p> <p>4. The euro trapped Greece in an economic straitjacket</p> <p>5. These supposed technocrats (the troika officials) are in fact fantasists who have disregarded everything we know about macroeconomics</p> <p>6. Europe's self-styled technocrats are like medieval doctors who insisted on bleeding their patients</p> <p>7. Greeks have paid for their government's sins many times over. The important thing now is to do whatever it takes to end the bleeding</p>	<p>1. The economics behind the program that the troika foisted on Greece five years ago has been abysmal</p> <p>2. I can think of no depression, ever, that has been so deliberate and had such catastrophic consequences</p> <p>3. The Eurozone was never a very democratic project</p> <p>4. Greece the sacrificial lamb</p> <p>5. Troika has a criminal responsibility for causing a major recession</p> <p>6. Europe should at least adopt the principle of 'do no harm'</p>

Table 6.2 Impact of austerity policies on the Greek economy. *Notes* For details see Figs. 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13, 6.14, 6.15, 6.16, 6.17, 6.18, 6.19, 6.20, 6.21, 6.22 and 6.23

Macroeconomic indicators

1. Over a period of four years Greek society's wealth was reduced by 20%
 2. There was a sharp drop of inflation rates during the period 2010–2015, which put pressure on unemployment rates
 3. Consumers' confidence in Greece after 2010 fell sharply, which had a significantly negative impact on private consumption
 4. The harmonized unemployment rate amounted in 2015 to 25.5% (more than doubled since 2010) Youth unemployment rate reached 52.4% in 2014
 5. After the launch of the first EAP the Greek long-term interest rate (used as a convergence criterion for the EMU) diverged from that of the euro area significantly
 6. The Athens stock market exchange (ASE) is constantly shrinking from 2008
 7. After the adoption of the austerity plans credit flow levels reached negative values
 8. Foreign direct investment lost almost 60% of its initial value in 2010
 9. The credit default swap (CDS) spread (at basis points) is still at high levels
 10. Three rating agencies negatively assessed the creditworthiness of the Greek bonds
 11. The % of persons whose medical needs were not met (due to the high cost of treatment) almost doubled the period 2010–2014
 12. The % of the people that face the risk of poverty and social exclusion increased from around 28% in 2010 to 36% in 2014
 13. Since 2011 Greek society has been faced with an increasing number of total suicides
 14. The birth rates drop in the period 2010–2014
-

A Comment: The Greek Economy after Five Years of Austerity

After the condemnation of Greece by the EC because of misrepresentation of its national statistical data, the newly elected socialist government was forced (by the events) to revise the estimations regarding the level of general government deficit (notably Eurostat reports data related to government deficit for Greece after 2011 see Fig. 6.5) from 5 to 7.7% for 2008 and from 3.7 (the figure predicted by the previous government some months earlier) to 12.5% for the year 2009. Already,

since October 2009, the 10-year government bond yields started to rise (see Fig. 6.6). From Fig. 6.5, we can notice that when the Greek Prime Minister (PM) George Papandreou called on his EU partners and the IMF to provide financial assistance (23rd April 2010), the long term government bond yields reached levels around 8% and after that the rates followed a rising pattern. The economic calvary of Greece had just begun.

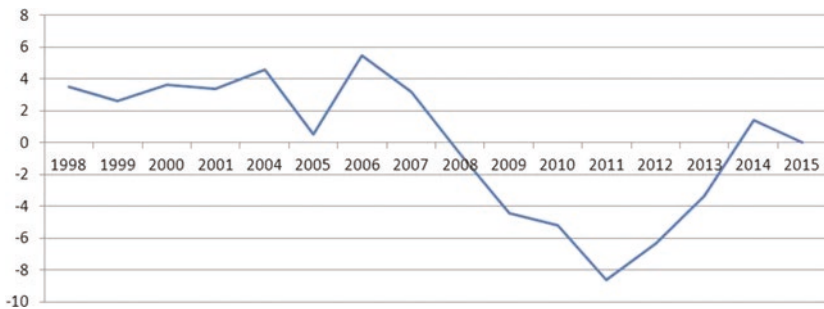


Fig. 6.3 GDP per capita growth (% change) for Greece, annual data 1998–2015. Source World Bank

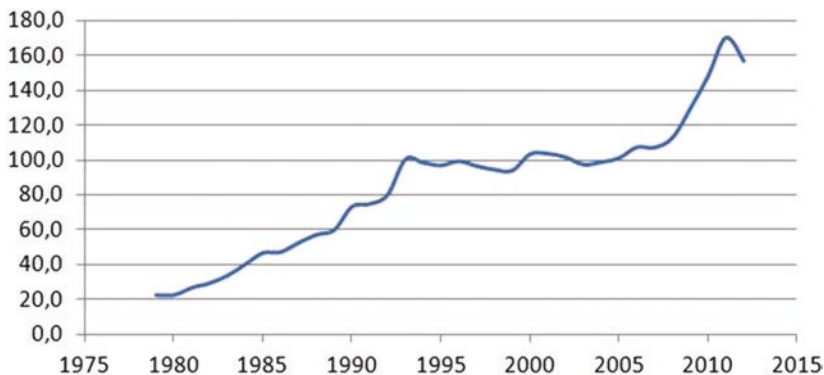


Fig. 6.4 Gross general government debt (% of GDP), annual data 1979–2012. Source Ali et al. (2010)

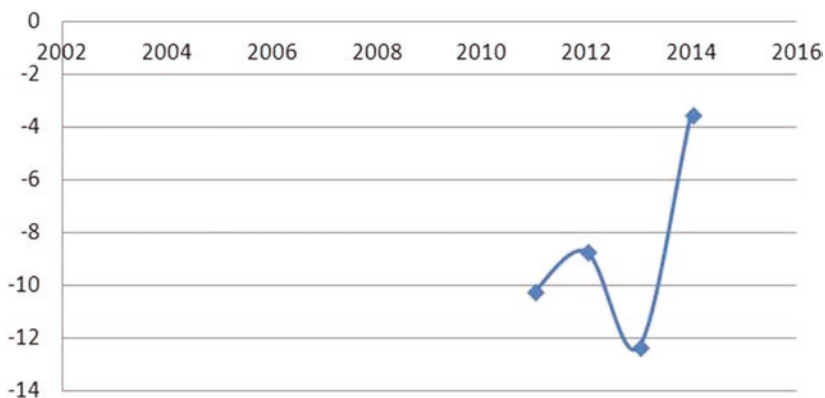


Fig. 6.5 General government deficit (% of GDP), annual data 2011–2013. *Source* Eurostat

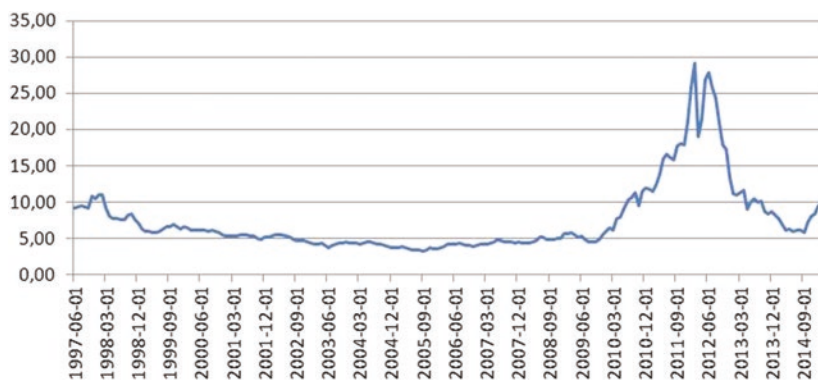


Fig. 6.6 Long-term government bond yields: 10-year for Greece, monthly data 1997:06–2015:02. *Source* OECD

Macroeconomic Indicators

Gross Domestic Product

After the announcement of the referral to the support mechanism by the ex Greek PM George Papandreou and the implementation of strict fiscal measures by the subsequent governments, the macroeconomic indicators of the Greek economy do not seem to have improved. In particular, GDP per capita growth (see Fig. 6.3) shrank on average by

5.85% in the period 2010–2013 and from 21,900 (in 2010) to around 18,100 (in 2013) US dollars (at constant 2005 prices, see World Bank 2015). In 2014, the Greek economy displayed some signs of improvement (the GDP per capita increased from 18,100 in 2013 to 18,400 US dollars in 2014), though at significantly lower levels than that of the pre-crisis period. Similarly, the country's GDP fell from 299.6 billion US dollars in 2010 to 238.5 billion US dollars in 2014 (World Bank 2015). Hence, over a period of four years Greek society's wealth was reduced by 20%. Stiglitz (2015a) cannot recall any other depression (like Greece's) that resulted in such a devastating impact.

Monetary Aggregates (M1, M2 and M3) and Inflation Rates

See Figs. 6.7, 6.8, 6.9 and 6.10.

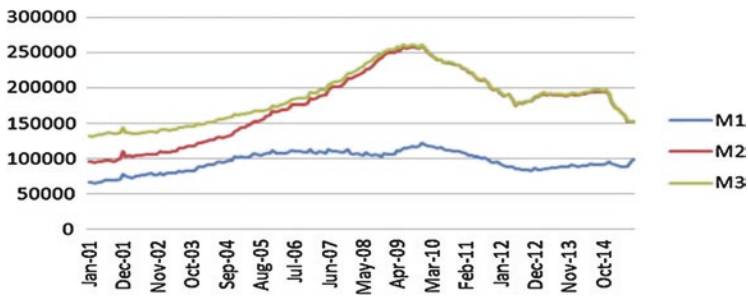


Fig. 6.7 Monetary aggregates (M1, M2 and M3), monthly data 2001–2015. Source Bank of Greece

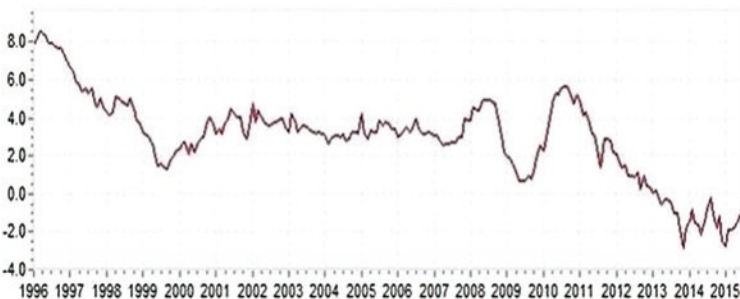


Fig. 6.8 Inflation rates for Greece, annual data 1996–2015. Source Inflation.eu

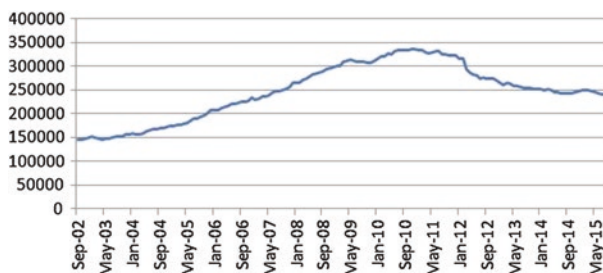


Fig. 6.9 Credit to domestic public and private sectors by domestic Monetary Financial Institutions (million euros), monthly data 2002–2015. *Source* Bank of Greece

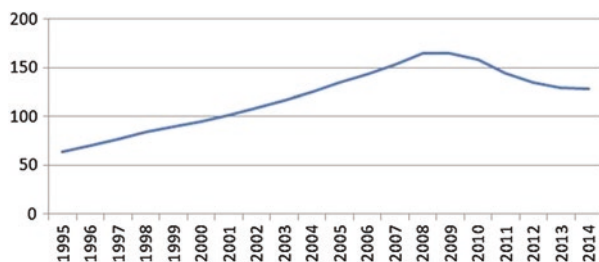


Fig. 6.10 Private final consumption expenditure in Greece (billion euros), annual data 1995–2014. *Source* OECD

Consumer Confidence Index

Figure 6.11 (European Commission 2015) reports the level of the trust that consumers have towards the Greek economy. The importance of this statistic lies in the fact that consumers are more willing to spend money since they feel more certain about their financial and career prospects. The trend (dashed line) shows that the consumers' confidence in Greece after 2010 fell sharply, which had a significantly negative impact on private consumption (see Fig. 6.10).



Fig. 6.11 Consumer confidence index for Greece, annual data 2006–2015. *Source* European Commission

Unemployment Rates

See Figs. 6.12, 6.13 and 6.14.

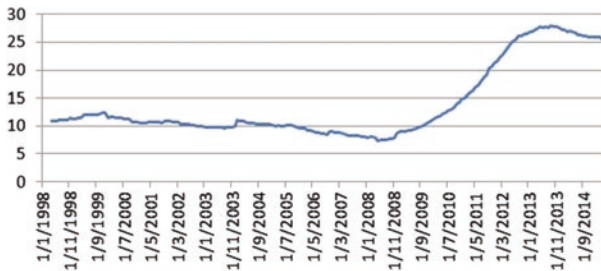


Fig. 6.12 Harmonised unemployment rate for Greece (as a percentage of the civilian labour force), monthly data 1998–2015. *Source* Eurostat

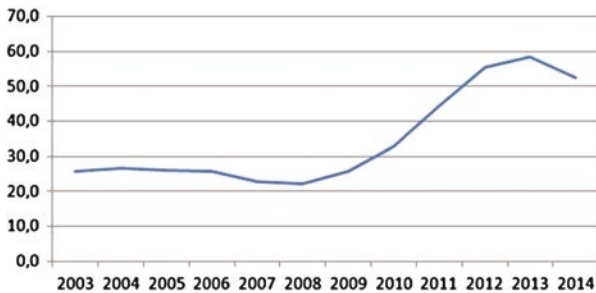


Fig. 6.13 Youth unemployment rate for Greece (15–24 years old), annual data 2003–2014. *Source* Eurostat

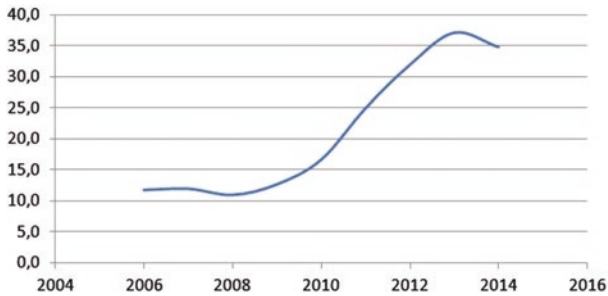


Fig. 6.14 Youth unemployment ratio for Greece (25–29 years old), annual data 2006–2014. Source Eurostat

Maastricht Criterion Interest Rates

See Fig. 6.15.

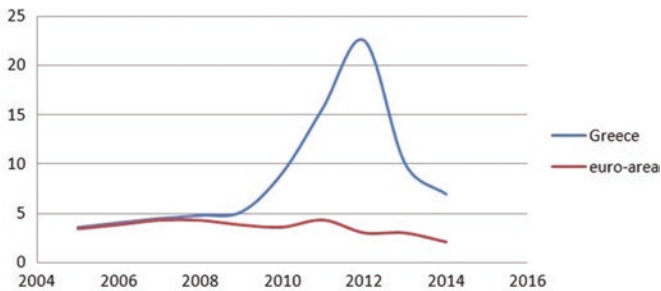


Fig. 6.15 Maastricht criterion bond yields for Greece, annual data 2005–2014

Athens Stock Exchange (ASE), Private Sector Credit Flow and Foreign Direct Investment (FDI)

See Figs. 6.16, 6.17 and 6.18.



Fig. 6.16 Greek stock market (ASE), daily data 2005–2015. *Source* Athens stock exchange (ASE)

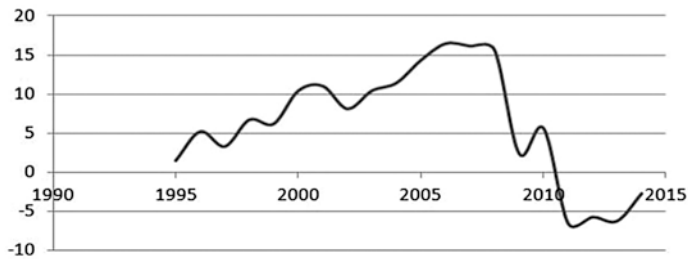


Fig. 6.17 Private sector credit flow, consolidated—% GDP for Greece, annual data 1995–2014. *Source* Eurostat

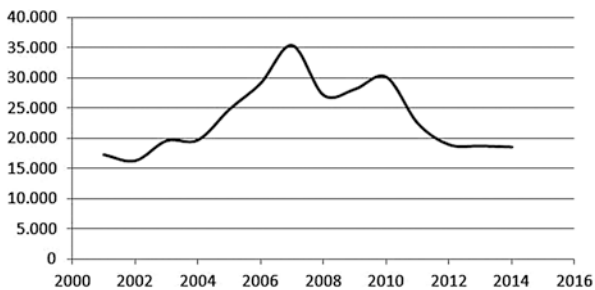


Fig. 6.18 Foreign direct investment in Greece (volume) million euros, annual data 2001–2014. *Source* Bank of Greece

Healthcare Access, Poverty Risks, Suicides and Birth Rates

See Figs. 6.19 and 6.20.

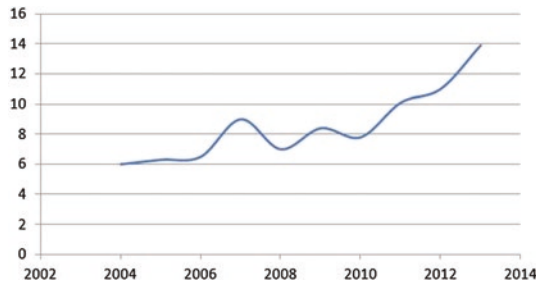


Fig. 6.19 Self-reported unmet needs for medical examination by sex, age, detailed reason and income quintile for Greece—% of visits, annual data 2002–2014 Main reason: Too expensive. *Source* Eurostat

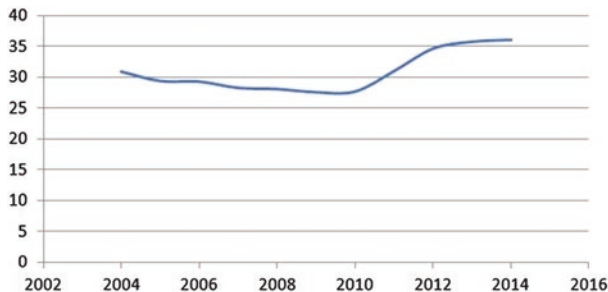


Fig. 6.20 People at risk of poverty or social exclusion—% of total population, annual data 2004–2014. *Source* Eurostat

Conclusions

At the same time, since much has been written about the problem of competitiveness of the Greek Economy, the latest ranking lists reveal that little has been achieved in this field (see Fig. 6.21). In particular, after five years of restrictive policies the position of the Greek economy

in the global rankings does not seem to have improved dramatically. In addition, the credit default swap (CDS) spread (at basis points) is still at high levels (see Fig. 6.22), just above the dam of two thousand basis points, suggesting that the risk of a credit event is too high (the cost of insuring against a Greek default). Verifying the lack of competitiveness and the high risk of bankruptcy of the Greek economy the Big Three rating agencies [namely, Standard & Poor's (S&P), Moody's and Fitch and the Rating and Investment Information Inc. (R&I)] negatively assessed the creditworthiness of the bonds issued by the Greek government (see Fig. 6.23) in the period covering 2009–2015.

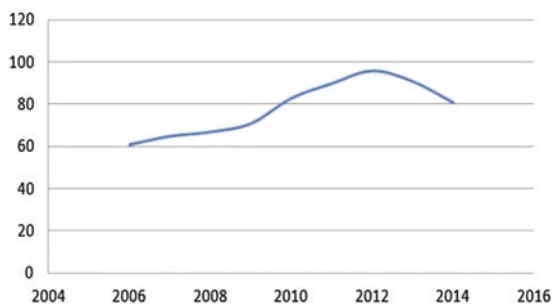


Fig. 6.21 Global competitiveness index for Greece, annual data 2006–2014. *Source* World Economic Forum



Fig. 6.22 Credit default swap spread, basis points for Greece. *Source* Markit

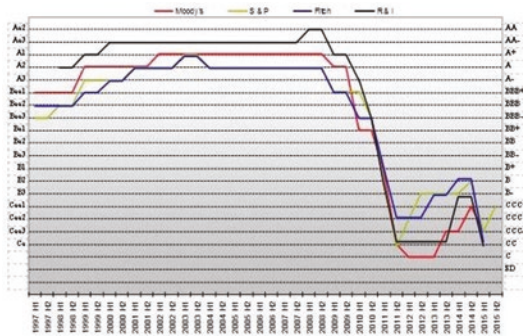


Fig. 6.23 Evolution of credit rating of Greece. Source PDMA

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Part II

Debt, Austerity and Credit Ratings

7

A Macroeconomic Perspective on the Greek Debt Crisis

Michael Wickens

7.1 Introduction: The Greek Debt Crisis

A debt crisis arises for a country when the holders of the debt doubt that the country either has the ability or the willingness to redeem its debt or to service the interest payments; both are forms of default. Credit ratings provide an assessment of the probability of default. Greece's rating in 2015 by the three main agencies was CCC (Fitch), Caa3 (Moody's), B- (S&P). This implies a probability of default over the rest of the life of a 10-year bond of at least 0.4. How did this state of affairs arise? What is needed to avoid default? Is it likely that this can be achieved? In this chapter, we consider each of these questions from a macroeconomic point of view.

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7.2 How Did the Greek Debt Crisis Arise?

(i) Public finances: some basics

Governments borrow by issuing debt when their expenditures exceed their revenues. The alternative is for the central bank to print new money, in effect, to give the government an overdraft. This tends to generate inflation and to devalue incomes and nominal assets, a form of taxation called seigniorage. Taken to extremes, this is how hyperinflation occurs, such as those in Germany in the 1930s, in the former Soviet countries immediately after 1989 and more recently in Zimbabwe. This option has not been open to Greece since it adopted the euro in 2001 because the European Central Bank determines the money supply and not the Greek Central Bank.

When a government borrows it is, in effect, asking future generations to pay for the fiscal excesses of the current generation as future generations must redeem and service the debt. One possible justification for doing what otherwise might seem to be selfish behaviour by the current generation is to stimulate the economy when in recession in order to restore full employment. This requires the fiscal multiplier—the response of GDP to a one unit increase in the fiscal deficit through higher expenditures or lower taxes—to be greater than unity. The multiplier might be greater than one in recession, but at full employment, the multiplier is likely to be close to zero and so crowd out private expenditures. In technical terms, the fiscal multiplier is state-dependent, something commonly overlooked by those who advocate a fiscal expansion no matter the state of the economy. Another justification for increased government expenditures is when they are for investment and are expected to increase the productive capacity of the economy. In both cases, the expectation is that the stimulus will more than pay for itself and so, although increasing debt in the short term, will lead to a fall in debt in the longer term.

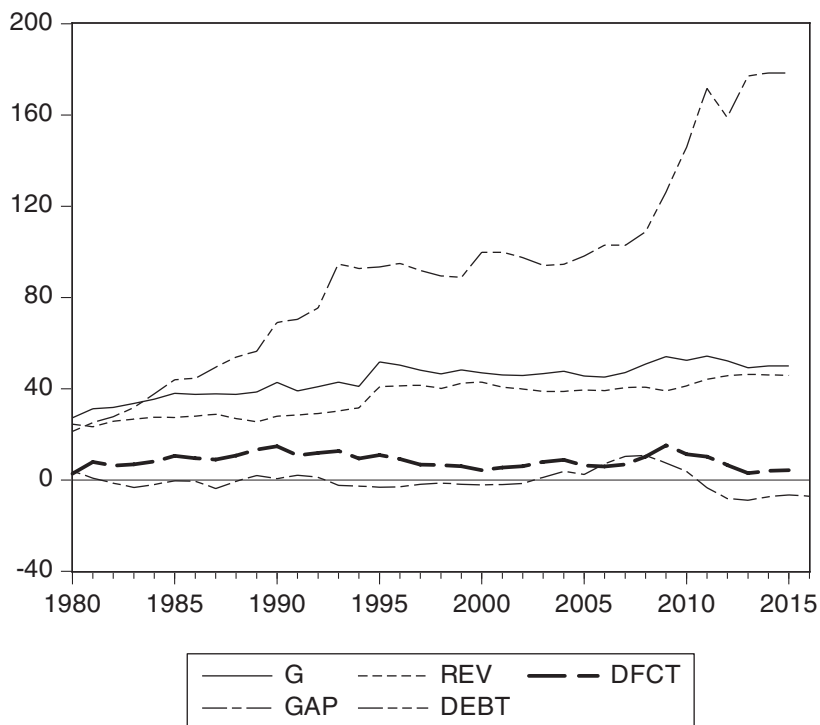


Fig. 7.1 Government expenditures, revenues, deficit, debt and the output gap (Percentage of GDP)

(ii) Public finances: Greece

Figure 7.1 shows the evolution of Greece's fiscal position since 1980. For the whole period both government expenditures and revenues have increased as a percentage of GDP; in 1980 they were 27% and 24%, respectively, and by 2015 they had increased to 50% and 46%. By comparison, over the same period, government expenditures in Germany fell from 47% of GDP to 44%. The size of the Greek public sector has therefore caught up with and overtaken that of Germany.

There appear to be three phases in the development of the Greek fiscal position. From 1980 to 1994 there was a steady increase in both expenditures and revenues as a percentage of GDP. In 1995, there was a sharp increase in both of roughly 10% of GDP. From then until the financial crisis both were fairly stable. Prompted by the severe fiscal retrenchment demanded by the Troika (the ECB, the EC Commission and the IMF), from 2009, there has been a remarkable change: government expenditures as a proportion of GDP have fallen by 4% points (i.e. by 8%) and revenues have increased by 7% points (i.e. by 29%).

Throughout the whole period expenditures exceeded revenues. The average fiscal deficit was 8.3%. It reached 14.7% in 1990 as a result of lower revenues and increased from 2007 to a peak of 15.2% in 2009 due to a combination of increased expenditures and falling revenues. Thereafter, the deficit fell by 11% points.

Three main factors determine a country's fiscal stance: government choices, the level of economic activity and the cost of financing debt. The lowest line in Fig. 7.1 is the output gap; a positive value is the percentage that output is below trend. Both expenditures and revenues (in effect, the average tax rate) vary with economic activity. Higher growth and a lower output gap tend to raise total revenues, while lower growth and a larger gap, which cause unemployment, tend to raise expenditures. It was only after the crisis that growth became negative. Figure 7.1 shows that the fall in revenues as a percentage of GDP between 2000 and 2009 coincides with the increase in the gap which reached over 10% in 2007 and 2008 due to the recession in the euro area. However, when in 2011, Greek growth reached its lowest value during the whole period, namely—9%, revenues as a percentage of GDP (the average tax rate) increased. Between 2008 and 2013 GDP fell by 30% which makes the increase in revenues and fall in the deficit since 2009 even more remarkable as it shows the extent of the austerity measures that were imposed.

In order to explain why the Greek fiscal stance changed so much and to determine how best to improve them, it is helpful to consider the causes. Was it due to discretionary policy changes or to economic forces beyond the control of policy makers? Some idea of the relative

Table 7.1 Economic and political influences on fiscal policy
 $y_t(i) = \alpha + \beta(i)gap_t(i) + \gamma(i)t + e_t(i)$

		Expenditures	Revenues	Primary revenues
1980–1994	α	30.61***	24.93***	18.46***
	$\beta(1)$	−0.265	−0.389**	0.090
	$\gamma(1)$	0.809***	0.304***	0.153*
1995–2009	$\beta(2)$	−0.549***	−0.683***	−0.309***
	$\gamma(2)$	0.790***	0.713***	0.681***
2010–2015	$\beta(3)$	0.407*	−0.250**	−0.409**
	$\gamma(3)$	0.679***	0.555***	0.576***
	R ²	0.869	0.962	0.976

* denotes the t-statistic is greater than 1

** denotes the t-statistic is greater than 2

*** denotes the t-statistic is greater than 3

importance of the effects on the fiscal deficit of the contributions of discretionary fiscal policy, economic activity and debt interest payments may be obtained from Table 7.1 in which expenditures, revenues and primary revenues (revenues less debt interest payments), all as a percentage of GDP, are related to the output gap and to the underlying upward trend in the role of government in the economy. Interest payments average 6.9% of GDP over the whole period; their maximum value is 12% in 1995 and there are further peaks in 1985 (10%) and 2011 (7%).

The gap variables reflect the effects of economic activity and the trend variables the effects of discretionary fiscal policy. The equation is estimated for the whole sample 1980–2015 but the effects of the output gap and discretionary policy are allowed to be different in each of the three sub-periods ($i = 1980\text{--}1994, 1995\text{--}2009, 2010\text{--}2015$). Multiplicative dummy variables on the coefficients are used to achieve this. While the coefficients are different in different sub-periods, all are significant, or highly significant, in nearly all sub-periods. Nonetheless, the trend variables explain at least three times more than the gap variables, especially in the first and third sub-periods. This shows that discretionary fiscal policy has had much more influence than fluctuations in economic activity on both expenditures and revenues. This is not surprising given the large expansion of the Greek public sector as it catches up with other European economies.

The main differences in the results are in the estimates of the coefficients of the output gap in the expenditure and primary revenue equations for the sub-period 1980–1994: neither is significantly different from zero. This may reflect the rapid growth of the public sector during this period and the high cost of borrowing both of which appear to have over-shadowed the state of economic activity. After 2009, primary revenues responded more strongly to economic activity than total revenues. This may be because Greece's costs of borrowing were reduced by the ECB's emergency measures.

These results suggest that the problem for the Greek public finances, although primarily due to discretionary policy, is not only the large expansion of the public sector, but also the failure of tax revenues to match expenditures. The resulting persistent deficits caused the debt-GDP ratio to increase from 21% in 1980 to 178% in 2015 and brought on the debt crisis.

(iii) The effect of the euro

A contributory factor to the indebtedness of several eurozone countries—such as Ireland, Italy, Portugal and Spain—has been the opportunity to borrow at much lower rates than previously. This is also true of Greece. Due to the euro, all of these countries were able to borrow at virtually the same rate as Germany. In Ireland and Spain, in particular, this resulted in massive private sector borrowing for construction. In Greece and Italy, the benefits were more for government borrowing. Cheap credit and high borrowing resulted in larger growth rates. This greater economic activity caused higher inflation which caused real interest rates to become negative and made borrowing even more attractive.

Figure 7.2 shows German and Greek short rates (GERIRS and IRS), the real interest rate in Greece (REAL) and the spread between Greek and German long rates (SPREAD). The convergence of Greek short rates to those of Germany after Greece joined the euro in 2002 is evident. Previously, the cost of borrowing for Greece was very high.

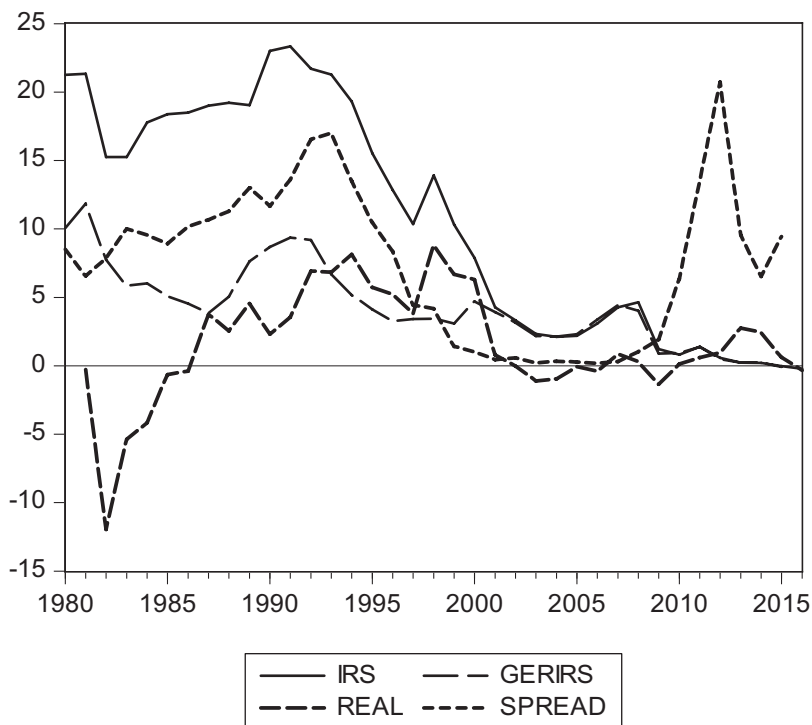


Fig. 7.2 Short term interest rates for Greece and Germany, the Greek real rate and the long spread between Greece and Germany

Moreover, as soon as Greece could borrow at German rates, its real interest rate became negative or close to zero.

In contrast, Greek long rates—10-year bond rates—have been very different from those of Germany. Figure 3 shows the spread between them. This peaks in 1993 and 2012, just after the Greek debt-GDP ratio is at its highest, when the spread is over 20%. The slope of the yield curve (the difference between long and short rates) mainly reflects expected future inflation and the risk premium (the average expected risk over the remaining life of the bond). As the difference between German and Greek inflation rates is at most 3% points, and

the German risk premium is low, the spread is mainly a measure of the Greek risk premium. It is clear from the graphs that the spread is strongly affected by the level and changes in the debt-GDP ratio.

This is confirmed by Gibson et al. (2015) who have carried out an econometric examination of which variables best explain the spread from 2000. The most significant is the debt-GDP ratio and the fiscal deficit; other significant variables include measures of fiscal news and political stability. They also find that their effect is stronger after the financial crisis than before. Although they provide no structural explanation of these findings, it is clear that these variables are largely capturing the Greek risk premium.

(iv) Fiscal sustainability

A central question in fiscal policy is whether the current fiscal stance is sustainable. The conventional way of determining this used by academics and by the IMF is to examine the past time series data on deficits and debts to determine whether or not they are stationary. If they are not stationary then the fiscal stance is deemed not sustainable, see, for example Hamilton and Flavin (1986) and the extension by Wickens and Uctum (1993). Trehan and Walsh (1991) argue that the fiscal stance is sustainable when government expenditure and revenue are non-stationary but cointegrated, i.e. they do not differ systematically. Bohn (1995) shows that sustainability occurs when there is negative feedback from debt on the deficit, i.e. when there is a fiscal policy rule that causes the deficit to decrease when debt increases. In effect, this means automatically reducing expenditures or raising tax rates.

The drawback with basing fiscal sustainability on past time series behaviour is that a government can always say that it intends to change policy in the future. Polito and Wickens (2012) attempted to address this problem by devising an index of sustainability that is forward looking. The index estimates the proportion of existing debt that a country can finance on the basis of current policy by calculating the ratio of the present value of current and future primary surpluses to current debt. A value less than one implies that on current policies the fiscal stance is not sustainable and needs to be tightened.

At no point since 1975 has the value of the index for Greece been above 1. The average value of the index for Greece since 1975 is 0.72. Its lowest values are in the 1980s when it was around 0.5. From 2000 until the financial crisis it was about 0.92. Immediately after the crisis, it dropped to around 0.78. These findings show that Greece's fiscal stance has not been sustainable since 1975, but in the years just before the financial crisis, it was close to being sustainable.

(v) Credit ratings

Financial markets measure the sustainability of fiscal policy through the cost of debt—especially CDS (swap) prices—and through credit ratings. The two are closely related. The cost of debt is determined by two factors: price risk and default risk. Price risk reflects the capital losses possible due to uncertainty about the future price of bonds. Default risk reflects the probability that a country will default on its sovereign debt and the bond holder will receive less than the face value of the bond. The greater the spread with a safe asset, the greater is the risk to buying and holding the bond. The higher the debt-GDP ratio, the greater the default risk premium as the more likely it is that financial markets will doubt the ability of a government to repay its debt and to default instead. This is reflected in a country's sovereign credit rating.

Greece's official credit rating fell from an average of just above Baa, prior to the financial crisis, implying a 0.15 probability of expected default, to its current value of around CCC, which implies a probability of default of 0.4. The lower is the Greek sovereign credit rating, the more costly it then becomes to finance the deficit, and the more likely it is that Greek debt will continue to grow.

Official credit ratings are provided by the three main credit rating agencies: Fitch, Moody's and S&P. The problem with these ratings, as noted by Polito and Wickens (2015), is how they reach their assessments is not transparent. In an attempt to improve transparency—as well as the cost of producing credit ratings—Polito and Wickens (2015) proposed a new measure of sovereign credit ratings based on what readily observable fiscal variables predicted would be the debt-GDP ratio in the future and the probability that a country could raise sufficient

(possibly additional) tax revenues to pay for its projected expenditures. They argue that due to Laffer curve effects, which limit the amount of tax that can be raised, there is a threshold (maximum value) to the level of debt that a country can finance. They calculate a credit rating based on the probability that forecast debt exceeds this threshold.

The credit rating for Greece calculated by Polito and Wickens for the period 1999—2015 is C. This contrasts with the official credit ratings which only fell from Baa to CCC after 2007. Hence, basing Greece's credit rating solely on the probable future evolution of its fiscal stance, indicates that, even before joining the euro in 2001, there were compelling grounds for thinking that it would face a debt crisis. This evidence therefore strongly supports the findings from the index of sustainability reported earlier.

7.3 What Is Needed to Avoid Default?

The aim must be to convince current and potential holders of Greek debt—especially the Greek non-bank private sector and foreign investors, including the ECB and the IMF—that Greece is able and willing to avoid default and to service its debt. So far Greece has clearly demonstrated a willingness not to default; does it also have the ability not to default? Possible alternatives are partial default, thereby reducing, but not eliminating, its debt obligations or deferring service payments.

The Greek government has proposed that its creditors write-down its debt. But its main creditors, Germany, the Netherlands and Finland, have for political reasons ruled this out. Although Greece recently missed payments to the IMF (part of the Troika), which caused the IMF to refuse to make further loans to Greece until they were paid, it is now siding with Greece on the issue of write-downs. It is recommending that creditors either write off part of the eurozone debt or allow Greece to make no payments for 30 years. In the short term, Greece needs to keep paying its bills by increasing its borrowing. The IMF has estimated that because of the steady deterioration of the Greek economy as much as €60 billion might be required. In July 2015, the European authorities agreed a rescue package amounting to a total of 86 billion euros to be paid gradually until June 2018. There was also an agreement to

disburse \$8.4 billion in fresh funds to Greece immediately to cover current payments.

Further loans to Greece, such as these payments depend on the longer term ability of Greece to repay them. As we have seen already in the index of fiscal sustainability and in the calculation of credit ratings, this is not easy to assess, not is it without controversy. Both of these measures were based on projecting the government budget constraint forwards. The government budget constraint expressed as proportions of GDP which relates the debt-GDP ratio to the primary deficit and the past debt-GDP ratio can be expressed as

$$\frac{B}{Y} = \frac{G - T}{Y} + \frac{1 + R}{1 + \pi + \gamma} \frac{B}{Y}(-1),$$

where B is nominal debt, G is nominal government expenditures excluding debt interest payments, T is nominal revenues, Y is nominal GDP, R is the average nominal interest rate on debt, π is the rate of inflation, γ is the rate of growth of GDP. The equation (an accounting identity) implies that if the rate of growth γ is greater than the real interest rate ($R - \pi$) then over time the debt-GDP ratio will decline steadily, eventually paying off debt. If there is a primary surplus ($T > G$) and the rate of growth is less than the real interest rate then again over time the debt-GDP ratio will decline steadily. But both could take a long time.

In 2015, Greece's debt-GDP ratio was $(B/Y) = 178\%$ and it had a primary surplus $((T-G)/Y) = 0.6\%$. Assuming in addition that $R = 3.8\%$ (the estimated official long-run rate of the IMF), $\pi = 2\%$ (the ECB target) and $\gamma = 1.5\%$ then after 30 years the debt-GDP ratio would have fallen to only 175%. In order to bring Greece's debt-GDP ratio down to 100% after twenty years, it would be necessary to have a primary surplus of just over 4%. Clearly, these calculations are extremely sensitive to assumptions about the interest rate, inflation and the rate of growth of GDP. For example, higher rates of inflation and growth would increase the speed with which the debt-GDP ratio falls. So far in 2016, the rate of inflation is zero. This shows the effects of austerity, but it makes reducing the debt-GDP ratio that much harder.

There are considerable economic and political difficulties in achieving and sustaining such policies over a long period of time. For example,

Polito and Wickens (2015) estimate that the maximum revenues that Greece could raise through income taxes would be little different from current levels. There are also considerable uncertainties surrounding interest rates, inflation and growth in the long term. Politically, there has already been much opposition to the austerity measures already introduced. Even harsher measures, in order to reduce the debt-GDP ratio faster, would be very likely to increase this opposition. In recognition of these problems, there have been proposals designed to make Greece's financial burden more bearable.

One solution would be for the ECB to buy Greek government debt and to do so at low interest rates. This would, of course, entail other euro area countries taking on part of Greece's financial risks. However, the ECB is precluded from buying debt directly from euro area governments; it can only buy debt indirectly from the private sector. In the case of Greece, this mainly means the Greek commercial banking system who are the principle holders of national debt. This is why a sovereign debt crisis in Greece has also become a banking crisis. Instead of buying Greek government debt, the ECB provides special loans to Greece. These loans are by the European Financial Stability Fund (EFSF), by the European Stability Mechanism (ESM) and are euro area bilateral country loans to Greece (GLF). The loans are designed to help replace (rollover) maturing bonds and to provide temporary assistance to help cover interest payments. Although not part of the stock of government bonds, they are an increasing component of Greece's sovereign debt.

The IMF (2016) has suggested three measures to relieve the Greek financial burden: maturity extensions of special loans, payment deferrals and fixing interest rates. The IMF has proposed an extension of maturities of up to 14 years for EFSF loans, 10 years for the ESM loans, and 30 years for the GLF loans. The IMF estimates that by 2060 this could reduce Greece's Financial Needs (GFN)—mainly its debt service payments—by about 7% of GDP and its debt-GDP ratio by about 25% of GDP. These numbers seem, however, to be quite large as interest payments in 2011 were only 7.2% of GDP and in 2015 were only 3.6%.

The IMF notes that these measures alone would be insufficient to restore sustainability, and that EFSF loans have already been extended

before, and ESM loans have been provided with long grace and maturity periods. Nonetheless, according to IMF estimates, extending the grace periods on existing debt ranging from 6 years on ESM loans to 17 and 20 years for EFSF and GLF loans, respectively, as well as an extending the current deferral on interest payments on EFSF loans by a further 17 years, together with interest deferrals on ESM and GLF loans by up to 24 years, could help reduce GFN by an extra 17% of GDP by 2040 and 24% by 2060. And by allowing Greece to benefit from low ESM interest rates for longer the debt-GDP ratio could be 84% of GDP lower by 2060. Even then GFN would exceed 20% by 2050, and debt would be on a rising path. To ensure that debt would remain on a downward path, the IMF thinks that official interest rates would need to be fixed at low levels for an extended period, and not exceed 1½% until 2040.

A fourth measure would be to write-down debt. If the write-down were large enough, this could remove Greece's financial problems at a stroke. In 2011, the ECB negotiated a 50% write down or "hair-cut" on Greek debt held by the private banking sector and in August 2015 an 86 billion euro bridging loan was agreed to by the European Commission under its ESM framework. However, neither the ECB nor the IMF would accept a write-down on the Greek debts that they held. One reason why there has been a reluctance in official circles to write off Greece's debt is that it is seen as removing the incentive for Greece to reform its fiscal policies to make them sustainable in the future. This has also been suggested as one reason why Greece did not unilaterally default on its debt for, had it done so, it would almost certainly have been required to leave the euro area. Another reason is that it might give the wrong message to other euro area countries with large debts and discourage them from reforming their fiscal stances.

7.4 Broader Considerations

In order to better understand the Greek financial crisis, it should be viewed in a broader context. We consider just two: the economic implications of the euro and how this has affected Greece; and what

economic theory has to say about how best to conduct fiscal policy and the implications of this for Greece. Another vital consideration, which will not be discussed in this chapter, which is a purely economic analysis, is the Greek political context.

(i) The euro

When Greece joined the euro (from 2001) it placed control of its monetary policy in the hands of the ECB. This meant among other things that it no longer had control of its exchange rate with other members of the euro area as the exchange rate was fixed—for ever. Given that subsequently, Greek prices rose faster than general euro prices it also meant that the only way that Greece could maintain competitiveness was through an internal depreciation brought about by reduced real wages and fiscal austerity. Between 2002 and 2010 the price level in Greece rose by 25% compared with 8% for Germany. Since 1980 Greek prices have risen 20-fold compared with German prices which merely doubled. Thus, unless Greece could achieve a major reform to the way prices had been rising, entering the euro was bound to have an extremely harmful effect on competitiveness and hence trade, the current account and growth.

Monetary policy in the euro area is based on keeping the average rate of inflation in the euro area below 2%. As the weights in calculating the average are based on the sizes of the euro economies, low inflation countries such as Germany have dominated. As a result, interest rates have been low and high inflation countries, such as Greece, Ireland, Italy, Portugal and Spain have been able to borrow at negative real interest rates. This was one of the attractions for Greece of joining the euro. It is also one of the main causes of the financial crisis in the euro area as, given such low costs of borrowing, all of these countries borrowed very heavily. When liquidity in the world banking system dried up following the world financial crisis in 2008, it immediately became very difficult for these countries to rollover their debts. Further, although this borrowing stimulated economic activity in these countries, it also caused higher rates of inflation which harmed their competitiveness.

Until the fundamental flaw in the euro system is solved, the EU will remain in crisis—a self-inflicted crisis. Rather than abandon the euro, in

order to make it sustainable, the European Commission is seeking more control over member countries' economic policies, especially fiscal policy. A blueprint for the future development of the euro area is provided by The Five Presidents' Report of 2015, Juncker (2015). This report has been prepared by the President of the European Commission, in close cooperation with the President of the Euro Summit, the President of the Eurogroup, the President of the European Central Bank, and the President of the European Parliament. Its main recommendations involve closer supervision of national fiscal policies, a banking union to spread national banking risks and a capital markets union to provide private financial sector support to ailing banks, Wickens (2017).

The key recommendation concerns fiscal policy. The aim is to avoid having to share financial risks among euro member countries by having to bailout member countries that get into financial difficulties. The likelihood is that this would result in the need for closer political integration. This entails member countries losing considerable independence in their own fiscal policies and possibly being asked to provide fiscal transfers to other members. Member countries would, therefore, want to have a say in how the fiscal rules are formulated and implemented.

Given the constraints imposed on Greece through its adoption of the euro, it could choose to leave the euro area, re-adopt the drachma—possibly by issuing one drachma for every euro. It would then have the option of reducing its debt burden at a stroke by defaulting. There would be both advantages and disadvantages to leaving. The advantages are likely to last a long time; the disadvantages are mainly short term. One advantage is that Greece could then restore its competitiveness as financial markets would almost certainly bring about a depreciation of the drachma. The increased trade and tourism that this would produce would give a huge boost to the economy and a permanent improvement in the current account. A disadvantage is that it would raise the price of imports and hence cause a temporary increase in inflation.

Greece is unable to default whilst in the euro area and would be forced to leave if it did default. But there would be no impediment to defaulting if it did leave the euro. As Greek debt is denominated in euros and output would be priced in a depreciated drachma, Greece's debt burden would rise further. This is why the default would be likely

to accompany leaving the euro. The main advantage to defaulting is that it would immediately reduce the tax burden on future generations through having to meet the debt obligations of past generations. There would, therefore, be an intergenerational transfer of wealth. A disadvantage of defaulting is that investors would be likely to take fright and either stop lending to Greece entirely, or demand a much larger risk premium. Such an investor response would, however, be illogical as after default Greece would be in a much better financial position to avoid future default and to service its debt. In order to persuade international investors that default would be unlikely in the future and hence to continue to lend to Greece, it would also be necessary to put in place sustainable fiscal rules. Hence fiscal reforms would be required whether or not Greece remains in the euro area.

(ii) Fiscal rules

Although it seems most likely that, in order to allow the euro to survive, member countries of the euro area will finish up in something close to a political union, this is neither necessary nor inevitable. All the countries need to do is to follow the fiscal rules set out by economists, e.g. Wickens (2012). This would enable them to retain both their fiscal and political independence.

In such a fiscal framework, current government expenditures should be tax-financed over the economic cycle. Any deficits due to economic downturns may be bond-financed in the short term provided there are surpluses at other times that be used to redeem this debt so that in the longer term debt does not accumulate. Capital expenditures, for example on infrastructure and other investments, may be bond financed. To avoid debt accumulating, capital expenditures would need to generate sufficient tax revenues in the future to pay off this debt and to service it in the meantime. In other words, these expenditures would need to have a fiscal multiplier greater than unity. This would depend on the cost of borrowing and may need to be possibly considerably greater than one.

Expansionary fiscal policy through higher current expenditures or tax cuts is often advocated in order to raise GDP. However, this should only

be considered if the fiscal multiplier is expected to be greater than unity when it will pay for itself through higher tax revenues. This is only likely to happen when an economy is in recession and there are unemployed resources available to increase output. Otherwise, a fiscal expansion will probably just result in government consumption replacing private consumption, i.e. private expenditures would be crowding out.

For these purposes, as they are made each period, expenditures on, for example, education, health, pensions and defence should be classified as current expenditures, and hence tax-financed, even though they are investments in human capital and welfare.

7.5 Concluding Comments

Since October 2009 Greece has shown a remarkable willingness to put its finances on a secure basis despite the huge economic cost and political distress this has entailed. Almost entirely due to the austerity programme that has been imposed, output has fallen by 30%, unemployment at the end of 2016 is 23%, inflation is eliminated and the current account is in balance. This shows both the success of the austerity programme and its economic cost. Even so, debt is still rising and further emergency loans are being sought.

As argued above, part of the problem has been a consequence of its political choices, part a failure of fiscal policy and part the result of being in the euro. The political choice over the last nearly forty years was to raise the size of the public sector in Greece's quest to become more like those of its northern European neighbours. The unfortunate fiscal failure was that its tax revenues did not keep pace with its public expenditures which resulted in a huge increase in its level of debt. This made Greece very vulnerable as it tried to refinance itself in the financial crisis of 2008.

Another political choice was the decision to join the euro. As explained above, this has exacerbated the financial problems of Greece. Although the emphasis has been on the debt crisis, as it is of immediate concern, the longer term problem is Greece's competitiveness and the effect this has on economic growth and hence tax revenues. A high

debt-GDP ratio is not in itself disastrous. After the Napoleonic wars Britain had a debt-GDP ratio of 200%, and after World War II it was 250%, yet Britain did not default and was able to reduce its debt burden fairly rapidly. And Greece might take some comfort from a comparison with China which has a current debt-GDP ratio of 260% and is not in a financial crisis. Like several other euro area countries, the longer term economic problem it must solve is to find a way of restoring its competitiveness if it is not to suffer a prolonged period of austerity in order to achieve an internal devaluation.

To conclude, what are the economic choices facing Greece? At the height of its financial crisis, Greece railed against the Troika, and also against Germany. The irony is that because Greece was not economically more like Germany it found itself in such financial difficulties and, unless it becomes more like Germany, it will not be able to survive within the euro system. Greece has already done much to improve its fiscal stance by its large rise in tax revenues and cut in expenditures and has started producing primary surpluses (3.9% of GDP in 2016). It still needs to go further in making these large primary surpluses permanent: The current rescue package requires surpluses of the order of 3.5% of GDP for the medium term. This can be achieved by more cuts to expenditures and increased tax revenues. Having expanded the public sector very rapidly in recent years—but not being able to afford to do so—further reducing the size is an obvious step. Improvements in the rate of growth could generate much of the required additional tax revenues. The sort of assistance proposed by the IMF would help debt management in the short run. Write downs of debt would, of course, make the task of debt management easier.

In practice, the situation is very fluid—almost on a day-to-day basis. The IMF is increasingly extremely pessimistic about the prospects of the eventual success of the rescue effort. At the time of writing, emergency meetings are taking place which will determine whether the IMF pulls out of the rescue effort. To make matters worse, European loans depend critically on the agreement of Germany, and Germany's willingness to continue its support depends on the continued participation of the IMF.

The alternative is for Greece to leave the euro area and probably default on its debt. It would still need to carry out the same fiscal

reforms, and it would bring other short-term costs, but there would be considerable long-term benefits. These are tough choices but they are the only way that Greece can retake control of its economy.

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8

On the Role of the Credit Rating Agencies in the Euro Zone Crisis

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8.1 Introduction

Over the past few years, the debate for sovereign credit ratings has increased, as a result of their significance in the recent financial and Eurozone debt crisis. Sovereign credit ratings are forward-looking estimates of the probability of default put forward by rating agencies. In other words, they are a qualitative measure of a government's ability and willingness to repay both

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the debt and the corresponding interest on full and on time. In many cases, a government's willingness to pay could be as significant as its ability to pay. For instance, Argentina in 2013 refused to compensate an American that rejected participating in a haircut. Sovereign credit ratings are primarily determined by the three main credit rating agencies (CRAs), Fitch, Standard and Poor's (S&P) and Moody's that control more than 90% of the market. Sovereign ratings are considered to be a credible qualitative measure of a country's general performance. As a result, they represent a key factor of sovereign spreads a country faces in the international financial markets and consequently of its borrowing cost. Greece could be one characteristic example. Between the months of April and May 2010, the three leading rating agencies (S&P, Moody's, and Fitch) downgraded Greece a cumulative total of six notches. At the same period, sovereign spreads increased rapidly and forced the Greek Government to sign a memorandum with the International Monetary Fund, the European Central Bank and the European Commission to refinance its public debt. European Central Bank accepts only as collateral bonds that have at least BBB attributed by at least one of the major rating agencies when conducting open market operations.

In this study, we review the literature and assess the behavior of the Eurozone countries from 2002 (introduction of the Euro) until the end of 2013. The purpose of this chapter is to look into the macroeconomic variables that determine the sovereign credit ratings and investigate their role in the recent Eurozone debt crisis. Therefore, we employ a set of macroeconomic covariates often used in the relevant literature. Apart from this, we augment the model by adding one of the six aggregate governance World Bank indicators to capture the impact of the qualitative factors that are accounted for by the rating agencies. These cannot be captured by the quantitative variables. Moreover, following the discussion in Gros (2011) and Baghai et al. (2014) among others, three variables (government debt, current account and external balance) interact with the crisis dummy in order to examine the role of the external sector during the crisis. The latter would allow us to capture any differences that emerged during this 2007–2009 period.

8.2 Literature Review

The first systematic study on sovereign credit ratings can be attributed to Cantor and Packer (1996). They concluded that ratings can largely be explained by a small set of macroeconomic variables: per capita income, GDP growth, inflation, fiscal balance, external balance, external debt, economic development and default history are able to explain to a large extent (up to 92%) the variation in credit ratings. The study examines a group of industrial and emerging countries.

Haque et al. (1998) focus on the relative importance of economic and political variables in determining a country's credit rating. Explanatory variables are categorized into four classes. Measures of external shocks, measures of domestic economic performance, measures of external economic performance and political variables. They used three different measures of creditworthiness as a dependent variable: Institutional investors, Euromoney and the Economic Intelligence Unit. They concluded that political variables do not add additional information if economic factors have been accounted for.

Elliasson and Kreuter (2002) used both a static and a dynamic panel model to explain sovereign credit ratings. This study includes the same explanatory variables employed by Cantor and Packer (1996). The main result is that the explanatory power of the dynamic model was higher than the static one. Using static panel data model both spreads and short-term debt to reserves were found to be significant. Dynamic Panel Data Model analysis concluded that the rate of change of inflation and the growth rate of GDP per capita enter significantly and with the expected sign. The current account entered both specifications with an unexpected sign but it was statistically significant only in the dynamic model.

Bheenick (2005) used two different scales to describe rating grades: first, from 1 to 9 and second from 1 to 21. Furthermore, he estimated an ordered response model for the full sample of 95 countries, then another one for the 20 high-rated countries and then another for the 75

low-rated countries. An important result was that economic variables do not play an important role for the high rated sample of countries. For the full sample GNP per capita and inflation are the most significant factors. Apart from them, for the low-rated countries, current account balance and the level of foreign reserves do play an important role in the determination of sovereign ratings.

Rating grades are discrete. One way to deal with discrete dependent variables is an ordered logistic model. The idea underlying the use of a logistic transformation is that at the middle of the scale, ratings can rise rather quickly, as the sovereigns deliver some improvements. Both at the bottom and the top end of the rating scale, however, the increase of an additional notch is slower, since the requisites of sovereign debt quality are more demanding. For this reason, Mellios and Paget-Blanc (2003) examined the determinants of sovereign credit rating using not only OLS but also an ordered logistic model. They examined the importance of 13 explanatory variables. OLS suggested that eleven of them were statistically significant whereas the ordered logistic model only nine. Overall, the logistic model appeared to be statistically superior to the OLS model.

Afonso (2003) used both a linear and a logistic transformation of rating grades to examine the determinants of sovereign credit ratings. The results of the estimations using the logistic transformation turned out to be better for the overall sample, especially for the countries placed on the top end of the rating scale. GDP per capita, external debt, economic development, default history, real growth rate and the inflation rate explained a significant part of the variability of credit ratings.

Rowland (2004) followed the same econometric framework of Cantor and Packer (1996). His study differed mainly in the data set used. He estimated different regressions for sovereign credit ratings, sovereign spreads, and creditworthiness. GDP per capita emerged as the only significant explanatory variable in all regressions. Moreover, the inflation rate was found to have a significant impact on creditworthiness index, spreads and S&P rating. It was interesting to note that regression on the determinants of the creditworthiness index delivered the lowest adjusted R-squared.

Valle and Marin (2005) estimated linear regression models, initially with nine explanatory variables and then with five and four. The main outcome was that the model with the four explanatory variables had as

much power as the others. Not surprisingly, GDP per capita, GDP growth and inflation were found to be statistically significant and with the expected signs.

As the importance of CRAs has grown for capital markets, the emphasis was given not only to macroeconomic variables but also to other determinants. Bautler and Fauver (Butler and Fauver 2006) were the first ones to deal not only with the usual set of macroeconomic variables, but also with qualitative variables such as political institutions and legal environment. The theoretical background behind these qualitative variables is that the legal environment and political institutions affect a country's willingness to repay its debt. The legal environment was found to be statistically significant and its marginal effect in sovereign credit ratings was much stronger than macroeconomic variables.

Archer et al. (2007) examined the importance of political variables. They used panel-corrected standard errors estimation to deal with problems arising from OLS in a cross-sectional time series. All political variables, except from executive party tenure, were found to be statistically insignificant. One interesting outcome was that default history could explain part of the variability in sovereign credit ratings. As expected, inflation, growth rate and trade commitment were the most important among the economic determinants of sovereign credit ratings.

Afonso et al. (2007) used a panel of 130 countries from 1995 to 2005 and estimated it using pooled OLS, fixed effects, random effects, ordered probit and random effects ordered probit. A significant adjustment was the use of time year averages as additionally explanatory variables. The large sample let them differentiate across sub-periods and across rating levels. A core set of macroeconomic variables, including per capita GDP, real GDP growth rate, government debt, government effectiveness, external debt and external reserves were found to be relevant for the determination of credit ratings.

Including the same set of explanatory variables, Afonso et al. (2009) examined the fit of ordered response models for sovereign credit ratings. They found that random effects ordered probit was preferable than ordered probit and ordered logit for panel data, as it took into account the additional cross-section error.

Afonso et al. (2011) implemented again time year averages as additionally explanatory variables and estimated random effects and random effects ordered probit models. This innovative approach allowed them to differentiate between long-run and short-run effects on credit ratings. Per capita GDP, real GDP growth, government debt and government deficit had a short-run impact on a country's credit rating. On the other hand government effectiveness, external debt, foreign reserves, and sovereign default dummies had only a long-run impact.

Studies have demonstrated the differences among the ratings by the three biggest rating agencies, but little research has been undertaken on the ratings by other agencies. Zheng (2012) fills the gap in the literature by examining the differences between the sovereign credit ratings by S&P and Dagong. Dagong was founded in 1994 and is the biggest Chinese credit rating agent. Regression results show that the agencies use similar economic risk indicators: inflation, external balance and the dummies for economic development and default history come out statistically significant in both agencies' ratings. But the agencies assign different weights to these indicators.

More recently Garcia, Valle and Marin (2014) tried to explain rating agencies behavior by using not only macroeconomic variables but also six World Bank Indicators. Surprisingly, only three explanatory variables were found to be statistically significant, namely External Balance, Economic Development Indicator and Regulatory Quality Index. A worth mentioning result was that a model with these three variables seemed to explain a high percentage of credit rating variation.

Boumparis et al. (2015) examined the determinants of sovereign credit ratings within a panel framework for the Eurozone countries from 2002 to 2013. Their main contribution to the literature is the control for cross sectional dependence by including cross sectional averages as additional explanatory variables. They also found that CRAs assign more weight on the fiscal and the external sector in the post-2009 period. Boumparis et al. (2017) employ a panel quantile framework for Eurozone's sovereign credit ratings. Regulatory quality and competitiveness have a strong impact on low rated countries. Economic policy uncertainty has a strong negative impact on lower rated countries.

Table A1 in the Appendix summarizes the results of the existing literature concerning the determinants of CRA's.

8.3 Overview of the Rating Systems

Following most of the previous studies, we use sovereign credit ratings by the three main international rating agencies, Moody's, Standard & Poor's (S&P) and Fitch Ratings. Fitch and S&P use the same qualitative letters, beginning from the AAA for the highest quality to CCC— for the very high credit risk. There is only a small difference in letters for default and non-default with the possibility of recovery. Moody's sovereign credit rating starts from Aaa for the highest quality to C for default. The first significant step is to convert letters into numerical data. Several scales has been used in the previous studies. The table

Table 8.1 Sovereign rating grades

	Rating agencies			Rating grades				
	<i>Fitch</i>	<i>S&P</i>	<i>Moody's</i>	(1–21)	(1–17)	(1–9)	(1–24) (Fitch)	(1–8)
Highest quality	AAA	AAA	Aaa	21	17	9	24	8
High quality	AA+	AA+	Aa1	20	16	8	23	7.33
	AA	AA	Aa2	19	15		22	7
	AA–	AA–	Aa3	18	14		21	6.66
Strong payment capacity	A+	A+	A1	17	13	7	20	6.33
	A	A	A2	16	12		19	6
	A–	A–	A3	15	11		18	5.66
Adequate payment capacity	BBB+	BBB+	Baa1	14	10		17	5.33
	BBB	BBB	Baa2	13	9	6	16	5
	BBB–	BBB–	Baa3	12	8		15	4.66
Likely to fulfill obligations, ongoing uncertainty	BB+	BB+	Ba1	11	7		14	4.33
	BB	BB	Ba2	10	6	5	13	4
	BB–	BB–	Ba3	9	5		12	3.66
High credit risk	B+	B+	B1	8	4		11	3.33
	B	B	B2	7	3	4	10	3
	B–	B–	B3	6	2		9	2.66
Very high credit risk	CCC+	CCC+	Caa1	5			8	2.33
	CCC	CCC	Caa2	4		3	7	2
	CCC–	CCC–	Caa3	3			6	1.66
Non default with possibility of recovery	CC	CC	Ca				5	1.33
	C			2		2	4	
Default	DDD	SD	C				3	
	DD	D		1	1	1	2	1
	D						1	

Note The table above represents the rating grades for each CRA and the corresponding numerical rating scales that have been used in the literature

below represents the different rating scales. We use the larger rating scale (1–21), since it allows us to capture the larger part of the variation between ratings. The following table summarizes the different rating scales that have been used in the previous literature (Table 8.1).

8.4 Explanatory Variables

Following the existing literature, we use a set of macroeconomic variables often used in the previous studies.

- i. GDP per capita—positive impact: A high GDP per capita implies a large potential tax base and, therefore, also a greater ability of the government to repay its debt. This variable is also used as a measure of economic development.
- ii. GDP growth rate—positive impact: A higher GDP growth rate decreases government debt as a percentage of GDP. Therefore it suggests the country's ability to service debt becomes easier over time.
- iii. Government debt—negative impact: The higher the stock of government debt, the higher interest rates should be paid to service it. Therefore, more resources are required. Moreover, a higher government debt corresponds to a higher risk of default.
- iv. Cumulated current account balance—positive impact: It is the sum of current account surpluses and deficits. It is an alternative measure of external debt. A lower accumulated current account balance (a higher external debt) indicates a higher risk of default.
- v. Unemployment rate—negative impact: A country with lower unemployment has a well-functioning labour market. In addition, the lower is the unemployment, the greater is the relative number of people with income. As a result, lower unemployment increases the potential tax base and reduces the fiscal burden for unemployment subsidies.
- vi. Inflation rate—negative impact: A high rate of inflation is a sign of structural problems in the government's finances. (If we were dealing with debt in domestic currency, high inflation reduces the real stock of government debt in domestic currency which makes the impact uncertain).

- vii. External Balance—uncertain impact: On the one hand, a higher external deficit could reflect a country's tendency to over-consume, undermining long-term prosperity. On the other hand, it could signal rapid accumulation of fixed investment, which should lead to higher growth and improved prosperity over the short term.
- viii. Foreign reserves—positive impact: Higher foreign reserves suggest a great liquidity situation and protect from default on its foreign currency obligations.
- ix. Regulatory Quality—positive impact: A higher value of regulatory quality index reflects the ability of the government to formulate and implement regulations that would accommodate private sector development and increase investments and as a result increase GDP. Moreover, it can be seen as a qualitative measure of government's willingness to repay its debt.

Government balance is a macroeconomic variable that is often used in the previous literature. It has been examined and found to be statistically insignificant. A reasonable explanation for this result would be that countries that aim to improve their credit rating may opt for conservative fiscal policies, limiting their surplus. According to the literature, another significant variable is the ratio of External debt to exports of goods and services. Previous studies (Afonso et al. 2007, 2009, 2011) found a negative impact of External debt/exports of goods and services on sovereign credit rating. An issue that arises is that the dataset produced by the World Bank includes data only for developing countries. It was essentially a slope dummy. Thus, we cannot include that variable in this study. Moreover, we examined all six World Bank Governance Indicators (Government effectiveness, Corruption Index, Political Stability, Rule of Law and Voice and Accountability). The correlation among the six indicators is more than 95% and as the result, this raises the possibility of multicollinearity. Thus, we included the Regulatory Quality Index for two reasons. First, Regulatory Quality Index was found to be more often statistically significant and, second, it can reflect the government's willingness to repay its debt. The cumulated current account was calculated as following: as in Gros (2011) the numerator is the sum of previous current account balances in US dollars and is divided of the GDP

Table 8.2 Data definitions

Variable	Description	Source
Fitch rating	Sovereign rating attributed at 31st December of each year	Fitch
S&P rating	Sovereign rating attributed at 31st December of each year	S&P
Moodys rating	Sovereign rating attributed at 31st December of each year	Moodys
GDP per capita	Log GDP per capita, US dollars, constant 2005 prices	World Bank
GDP growth rate	Annual percent change of GDP	IMF WEO
Government debt	General government gross debt as a percent of GDP	IMF WEO
Cumulative current account	Sum of current account balances as a percent of GDP from 1995	IMF WEO
Unemployment rate	Unemployment rate as a percent of total labor force	IMF WEO
Inflation rate	Annual growth rate of Consumer Price Index	IMF WEO
External balance	External balance on goods and services as a percent of GDP	World Bank
Reserves	Log of total reserves (includes gold, constant 2005 prices)	World Bank
Regulatory quality index	Aggregate Government Indicator	World Bank

Note The table above represents the description of each variable used in the model and their sources

of each year. For instance, for 2013 is $[\text{current account}_{1995} + \text{current account}_{1996} + \dots + \text{current account}_{2013}]/\text{GDP}_{2013}$. The crisis dummy takes the value of 0 from 2002 to 2008 and the value of 1 from 2009 to 2013 and is multiplied by the three external sector variables. Thus, the impact of these variables on credit ratings is equal to a_i from 2002 to 2008 and $a_i + c_j$ from 2009 to 2013. The following table summarizes the sources of the data that are employed in this study (Table 8.2).

8.5 Methodology

The variation across rating levels allows us to estimate the different way explanatory variables affect low and high credit ratings. The point to consider here is the choice of the threshold. As was discussed above, rating grades display in scale from 1 to 21. So, one could possibly separate the sample from 1 to 10 (D to BB) and from 11 to 21 (BB+ to AAA).

The problem with this division is that the observations in the first part of the sample would be much less than in the second one. The entire sample consists of 216 observations. If we separate it into two equal groups, the higher rated sample includes observations from AA– and above and the lower rated A+ and below. In addition, due to the fact that countries enjoy different rating levels at a different time, it is not feasible to classify a country in high or low level of rating. Thus, the data are pooled and the cross section and the time series dimension are removed. So, we estimate the model below using OLS, first for the high rated sample, AA– and above, and second for the low-rated sample, A+ and below.

$$CRA_i = a_0 + \mu_i + \sum_{i=1}^9 a_i x_i + \sum_{j=1}^3 c_j D_{crisis} x_j + error_i,$$

8.6 Results

The regressions reveal some interesting results. First, the explanatory power for the high ratings is somewhat greater than for the lower ones. R^2 ranges from 0.77 to 0.83 for high ratings and from 0.75 to 0.81 for low ratings. However, the explanatory power of the individual regressions is somewhat lower than that found for the full sample (see Boumparis et al. 2015). Notice also that, although GDP per capita is significant, GDP growth rate is statistically insignificant in all regressions both for high and for low ratings (Tables 8.3, 8.4, 8.5 and 8.6).

In fact, a set of explanatory variables remains significant in all regressions for high ratings. These are GDP per capita, Government Debt, Cumulated current account, Reserves, External Balance, and Regulatory Quality Index. Unemployment rate was found to influence high ratings only for S&P and inflation rate only for S&P and Moody's.

One unexpected outcome is the negative sign of the coefficient of cumulated current account. A reasonable explanation is that high rated countries were capable of sustaining large cumulated current account deficits (high external debt) without being downgraded, because of the overall strong performance of their economies.

For low ratings, GDP per capita, Government Debt, Inflation Rate, Unemployment Rate, are statistically significant in all regressions and

Table 8.3 Regression results for Fitch

	High rated				Low rated			
	coef.	p-val	coef.	p-val	coef.	p-val	coef.	p-val
Log GDP per capita	6.287	0.000	6.482	0.000	12.270	0.000	10.676	0.000
GDP growth rate	0.004	0.801			0.055	0.186		
Government debt	-0.027	0.000	-0.027	0.000	-0.050	0.000	-0.052	0.000
Inflation rate	-0.020	0.595			-0.311	0.001	-0.303	0.000
Unemployment rate	-0.019	0.233	-0.022	0.118	-0.126	0.008	-0.184	0.000
Cumulative current account	-0.006	0.011	-0.005	0.004	0.002	0.840		
External balance	-0.050	0.000	-0.058	0.000	-0.044	0.201		
Log reserves	0.971	0.000	0.986	0.000	0.586	0.047	0.823	0.003
Regulatory quality index	0.484	0.015	0.521	0.004	0.742	0.384		
Government debt*D _{crisis}	0.001	0.380			-0.007	0.212	-0.012	0.031
Cumulative current account*D _{crisis}	0.003	0.510			0.014	0.207	0.015	0.021
External balance*D _{crisis}	-0.014	0.328			-0.180	0.001	-0.170	0.000
Constant	-16.619	0.000	-17.716	0.000	-36.826	0.000	-30.670	0.000
R ²	0.817		0.807		0.781		0.751	

Note Regression results based on pooled OLS estimates

Reserves and External Balance in three out of four. GDP growth rate, cumulated current account and Regulatory Quality Index are statistically insignificant in all regressions for low ratings.

Regarding the period 2009–2013, it seems that high rated countries have not been influenced by the global financial crisis. Crisis dummies were found to be statistically significant only for S&P. On the other hand, the statistical and economic significance of crisis dummies for low ratings provides sufficient evidence that rating agencies have become more conservative after 2009, by accounting more weight on the external and fiscal sector of low-rated countries (see also the discussion in Boumparis et al 2015). One possible explanation for this increasing conservatism of credit rating agencies is the fear of losing reputation by an unexpected default inside Eurozone. As a consequence, it can

Table 8.4 Regression results for S&P

	High rated				Low rated			
	coef.	p-val	coef.	p-val	coef.	p-val	coef.	p-val
Log GDP per capita	5.661	0.000	5.690	0.000	12.902	0.000	12.355	0.000
GDP growth rate	0.005	0.746			0.033	0.423		
Government debt	-0.019	0.000	-0.019	0.000	-0.060	0.000	-0.059	0.000
Inflation rate	-0.098	0.010	-0.095	0.009	-0.297	0.001	-0.268	0.001
Unemployment rate	-0.029	0.062	-0.029	0.054	-0.043	0.353	-0.076	0.044
Cumulative current account	-0.005	0.045	-0.005	0.046	0.000	0.980		
External balance	-0.043	0.001	-0.043	0.001	-0.055	0.109	-0.048	0.125
Log reserves	0.769	0.000	0.773	0.000	0.076	0.792		
Regulatory quality index	0.452	0.019	0.447	0.019	-0.348	0.680		
Government debt*D _{crisis}	-0.005	0.002	-0.005	0.001	-0.007	0.209	-0.008	0.103
Cumulative current account*D _{crisis}	0.008	0.050	0.007	0.050	0.020	0.075	0.018	0.003
External balance*D _{crisis}	-0.023	0.093	-0.024	0.085	-0.131	0.011	-0.113	0.010
Constant	-11.908	0.000	-12.050	0.000	-33.910	0.000	-30.924	0.000
R ²	0.802		0.801		0.761		0.789	

Note Regression results based on pooled OLS estimates

be argued that the rapid increase in Eurozone periphery bonds spreads after 2009 is not totally related to changes in macroeconomic and risk fundamentals but can also be partially explained by the increasing conservatism of credit rating agencies.

8.7 Discussion of Results and Conclusions

In this study, we examine the determinants of sovereign credit ratings using ratings from the three main international rating agencies for the Eurozone countries for the period 2002–2013. The empirical results indicate a statistically strong performance of the estimated models across agencies and across time. For high ratings, GDP per capita, Government Debt, Cumulated current account, Reserves, External

Table 8.5 Regression results for Moodys

	High rated				Low rated			
	coef.	p-val	coef.	p-val	coef.	p-val	coef.	p-val
Log GDP per capita	5.344	0.000	5.307	0.000	10.354	0.000	11.621	0.000
GDP growth rate	0.002	0.898			0.011	0.833		
Government debt	-0.020	0.000	-0.020	0.000	-0.058	0.000	-0.067	0.000
Inflation rate	-0.083	0.036	-0.085	0.010	-0.320	0.004	-0.301	0.002
Unemployment rate	0.006	0.702			-0.123	0.034	-0.149	0.003
Cumulative current account	-0.005	0.054	-0.005	0.010	0.009	0.429		
External balance	-0.046	0.001	-0.045	0.000	-0.113	0.009	-0.092	0.020
Log reserves	0.738	0.000	0.749	0.000	1.059	0.004	0.923	0.004
Regulatory quality index	0.780	0.000	0.762	0.000	1.208	0.250		
Government debt*D _{crisis}	-0.002	0.123	-0.002	0.076	-0.012	0.089	-0.013	0.041
Cumulative current account*D _{crisis}	0.000	0.937			0.014	0.310	0.018	0.017
External balance*D _{crisis}	0.002	0.878			-0.163	0.011	-0.145	0.010
Constant	-10.771	0.001	-10.633	0.001	-32.961	0.000	-35.118	0.000
R ²	0.773	0.772			0.747		0.782	

Note Regression results based on pooled OLS estimates

Balance and Regulatory Quality Index remain significant in all regressions. For low ratings, GDP per capita, Government Debt, Inflation Rate, Unemployment Rate, Reserves and External Balance are responsible for the observed variation. Most significantly, we found sufficient evidence that the fiscal and the external sector are of high importance after 2009 only for the low-rated economies.

Figures 8.1–8.5 provide an outline of the main political/economic events over 2009–2015 together with Moody's credit rating decisions in the case of Greece, Ireland, Portugal, Spain and Italy (see also the discussion in Dergiades et al 2015). We note that, since 2009, downgrades have come “thick and fast” for all peripheral economies. Figure 8.6

Table 8.6 Regression results for Average rating

	High rated				Low rated			
	coef.	p-val	coef.	p-val	coef.	p-val	coef.	p-val
Log GDP per capita	5.764	0.000	5.504	0.000	11.842	0.000	12.201	0.000
GDP growth rate	0.003	0.791			0.033	0.430		
Government debt	-0.022	0.000	-0.022	0.000	-0.056	0.000	-0.061	0.000
Inflation rate	-0.067	0.048			-0.309	0.001	-0.290	0.000
Unemployment rate	-0.014	0.317			-0.097	0.040	-0.124	0.002
Cumulatiive current account	-0.005	0.014	-0.004	0.018	0.004	0.691		
External balance	-0.046	0.000	-0.048	0.000	-0.071	0.043	-0.061	0.059
Log reserves	0.826	0.000	0.818	0.000	0.574	0.054	0.499	0.053
Regulatory quality Index	0.572	0.001	0.722	0.000	0.534	0.533		
Government debt*D _{crisis}	-0.002	0.154			-0.009	0.129	-0.010	0.054
Cumulative current account*D _{crisis}	0.003	0.313			0.016	0.157	0.017	0.007
External balance*D _{crisis}	-0.012	0.349			-0.158	0.003	-0.137	0.003
Constant	-13.099	0.000	-12.337	0.000	-34.566	0.000	-34.238	0.000
R ²	0.833		0.821	0.809	0.780		0.809	

Note Regression results based on pooled OLS estimates

compares the downgrades of the five countries. The very fast downgrades of the Greek bonds are evident.

Focusing on the case of Greece, we note that, according to International Monetary Fund (IMF) data, government debt rose from 126.2% of GDP in 2009 to an estimated 206.5% in 2016. Given the huge pile of Greek debt, the IMF (one of Greece's so-called "Troika" partners; European Commission and European Central Bank are the remaining ones) produced a sustainability report which raised the issue of "voluntary" haircut in the debt holdings of Greece's Eurozone partners (IMF 2015). Speaking in September 2015 to *The Wall Street Journal* (see <http://www.wsj.com/articles/-could-return-to-bond-markets-soon-after-a-restructuring-of-its-debt-tsipras-says-1443569735>), Alexis Tsipras (the

Sovereign Rating and Political Events 2009-2015

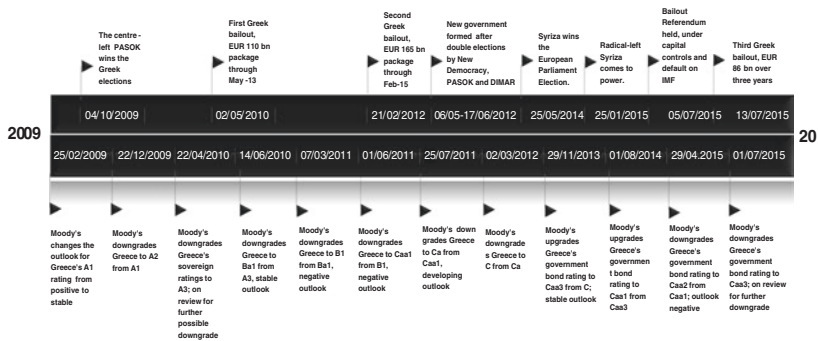


Fig. 8.1 Sovereign rating and political events in Greece 2009–2015

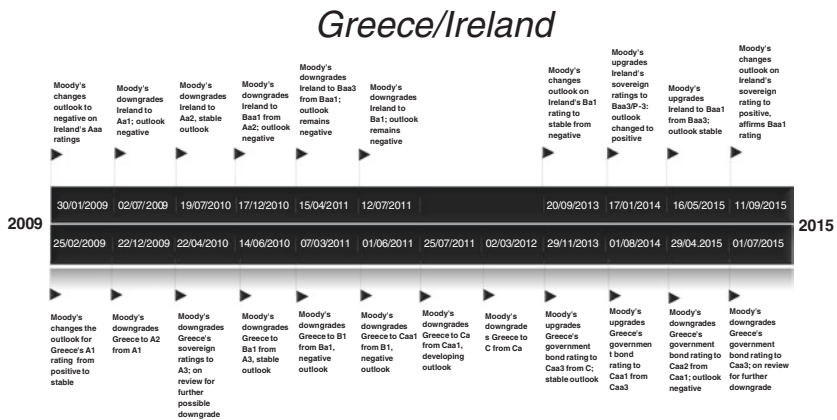


Fig. 8.2 Sovereign rating Greece vs Ireland 2009–2015

Greek Prime Minister) argued that a possible Greek debt restructuring will almost immediately be followed by access to international financial markets. This, however, is not certain since getting access to financial markets works through the credit scores assigned by credit rating agencies.

Greece/Portugal

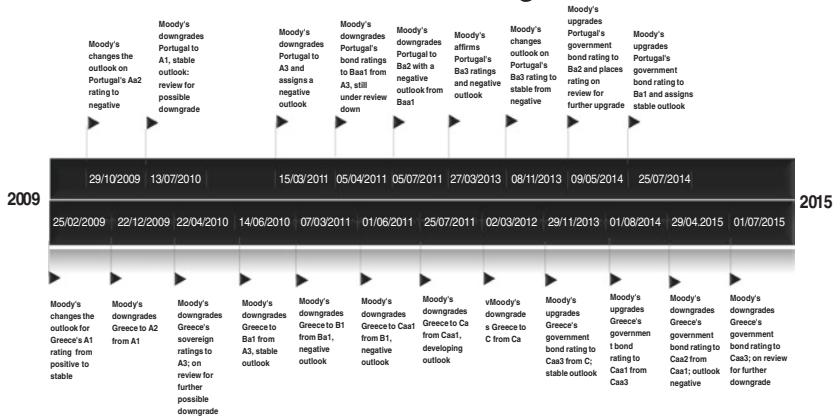


Fig. 8.3 Sovereign rating Greece vs Portugal 2009–2015

Greece/Spain

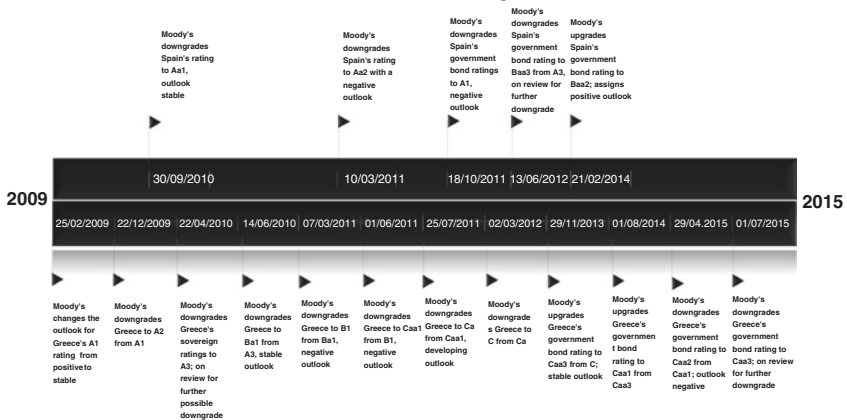


Fig. 8.4 Sovereign rating Greece vs Spain 2009–2015



Fig. 8.5 Sovereign rating Greece vs Italy 2009–2015

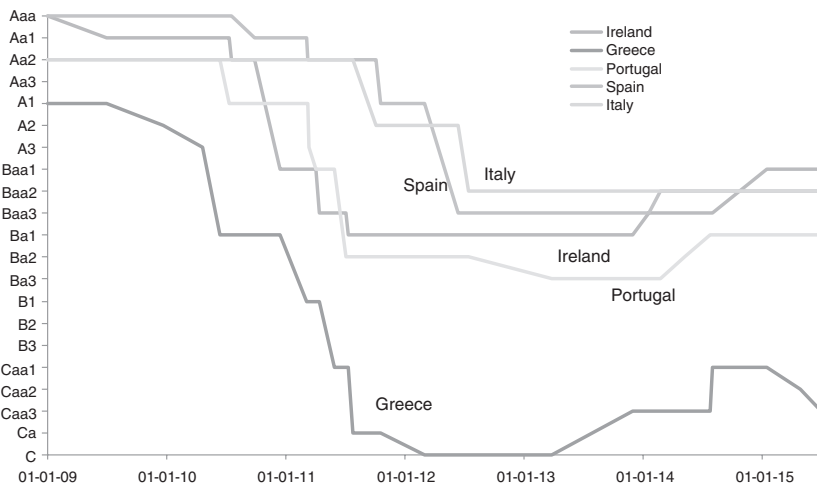


Fig. 8.6 Sovereign rating scale PIIGS 2009–2015

Let us elaborate on this very issue. Faced, at the end of 2015, with a Caa3 credit rating by Moody's, Greece needed an upgrade of 9 notches to “escape” the so-called “junk” territory. Using the estimates

in Table 8.6, a deep front “voluntary” haircut of as many as 40% points in the debt-to-GDP ratio (that is, from the current 206.5–166.5%) will raise Greece’s credit rating by around 3 notches (that is, 0.08 times 40 is approximately 3 notches). Although more than welcome, these credit upgrades are clearly not enough to take Greece out of the junk territory.

Undoubtedly, one of the main tensions among Greece and its creditors has to do with Greece’s failure to progress with structural reforms. A more realistic scheme of debt relief could be a “dual mandate” of debt repayment in terms of economic growth and governance improvement. World Bank’s regulatory quality index (which was discussed in Sect. 8.4) captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Among 215 countries, this index currently classifies Greece to the 69th percentile rank, much lower than (say) Spain and Portugal which are classified to the 85th and 80th percentile rank, respectively.

This regulatory quality index “captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development”. It includes issues like: (i) easy of starting a new business, (ii) tax inconsistency, competition policy, (iii) financial institutions’ transparency and (iv) public sector contracts are sufficiently open to foreign bidders. All these are known to be areas that require significant improvement.

Put simply, if Greece records positive economic growth but no improvement based on the World Bank’s regulatory quality index, the cost of servicing the Greek debt should be higher compared with the case where Greece records both positive economic growth and an improvement in the regulatory quality index. Such a proposal, put forward by the Greek policy-makers, would send a strong signal that Greeks “mean business” when referring to structural reforms and therefore provide a promising way forward to dealing with Greece’s huge pile of debt.

Appendix

Table A1

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Cantor and Packer (1996)	Moody's rating S&P rating	Per capita income GDP growth Inflation Fiscal balance External balance External debt Economic development Default history	49 countries in 29 September 2001. Moody's and S&P and its average. Cross-section OLS	Per capita income, inflation, external debt, economic development and Default History explain more than 90% of the variation of credit rating for Moody's, S&P and its average
Haque et al. (1998)	Institutional Investor Euro money Economic Intelligence unit	Economic variables: Terms of trade Export growth Current account/ GDP Reserves/Imports External debt/GDP Real exchange rate Growth Inflation Political variables Coups Assassination General strikes Guerilla warfare Government crises Purges	Cross section OLS	Credit rating appears to be determined mainly through the analysis of economic variables. Political variables do not add any additional explanatory power
Eliasson (2002)	S&P rating	Per capita income GDP growth Inflation Fiscal balance External balance External debt Economic development Default history Short-term currency Debt to foreign reserves Export growth Interest rate spreads	38 emerging countries from 1990 to 1999. Static and dynamic panel model	Dynamic model is more robust than the static one. Using static panel data model both spreads and short-term debt to reserves are significant variables. Current account entered in both models with an unexpected sign

(continued)

Table A1 (continued)

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Bissoondoyal Bheenick (2005)	S&P rating Moody's rating	Per capita income Inflation Govt financial balance/GDP Govt debt/GDP Real exchange rate Foreign reserve Net Exports/GDP Unemployment rate Unit labor cost Current account/GDP Foreign debt/GDP	95 countries from December 1995 to December 1999 Ordered Response Model. First using rating from 1 to 9 and then from 1 to 21. Estimated first full sample, second for high rated countries and third for low rated countries	Economic variables do not play an important role for the high rated sample of countries. GNP per capita and inflation are the most significant factors for the full sample. Moreover, current account balance and the level of foreign reserves do play an important role for low rated countries
Mellios and Paget-Blanc (2006)	S&P rating Fitch rating Moody's rating	Per capita income GDP growth Inflation Economic development Current account Default history Real exchange rate Foreign debt/GDP Ratio debt/GDP Ratio reserves/imports Ratio investment/GDP ² Corruption index Regulatory quality	86 countries in December 31 2003. Cross section OLS Ordered Logistic Model	OLS suggest that 11 explanatory variables are statistically significant. In contrast ordered logistic model suggest only nine. logistic model behaves better than the OLS model
Afonso (2003)	Moody's Rating S&P Rating	Per capita GDP Inflation rate GDP real growth rate Development indicator Default indicator External debt-exports ratio Government deficit as a percentage of GDP	Cross-section OLS using both a linear and a logistic transformation of the data. 81 countries in June 2001	Logistic transformation turned out to be better for the overall sample, especially for the countries placed on the top end of the rating scale. GDP per capita, external debt, economic development, default history, real growth rate and the inflation rate explained a big part of the variability of credit ratings

(continued)

Table A1 (continued)

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Rowland (2004)	Moody's rating S&P rating EMBI Global composite Institutional Investor's creditworthiness Index	GDP per capita Real GDP growth rate Fiscal balance as a percentage of GDP Current account balance as a percentage of GDP Debt-to-GDP ratio Debt ratio International reserves as a percentage of GDP Debt-service-to-GDP ratio Openness Inflation rate Default history	49 countries at the end of July 2003. Moodys and S&P OLS regression for sovereign credit ratings, sovereign spreads and creditworthiness	GDP per capita is a significant explanatory variable in all the regressions. Regression on the determinants of the creditworthiness index has by far the lowest adjusted R value
Valle and Marin (2005)	Moody's rating Fitch rating S&P rating	GDP per capita GDP growth Increase of the CPI Fiscal balance/GDP Balance of payments on current account/GDP Internal debt of the state/GDP Liquidity ratio Industrialization	80 countries dated 28 of March 2003. OLS regression using first 9 explanatory variables and the n 4 and 5	The model with 4 explanatory variables has as much power as the others. GDP per capita, GDP growth and inflation found to be statistically significant and with the expected signs
Bautler and Fauver (2006)	Institutional investor Moody's rating S&P rating Ten year sovereign bond yields	GDP per capita Inflation Underdevelopment Index Default dummy Voice of the people Political stability Government effectiveness Regulatory quality Rule of law Corruption control Legal environment composite Emerging market dummy Foreign debt/GDP Common law dummy	86 countries in March 2004 OLS for the full sample 2SLS using as instruments for legal environment the ethnolinguistic fractalization and French civil law origin. Differentiation across low and high debt countries	Using OLS legal environment found to be statistically significant and its marginal effect in sovereign credit rating is much stronger than macroeconomic variables. Using 2SLS the effect of legal environment on credit rating is smaller than OLS estimates indicate, although it is still quite large. Sovereign credit rating are more sensitive in legal environment in low-debt countries than high-debt

(continued)

Table A1 (continued)

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Archer et al. (2007)	S&P rating Moody's rating Fitch rating	Political factors: Presidential ideology Executive party tenure Undivided government Election cycles Honeymoon periods Economic Variables: Total external debt Inflation Gdpper capita Current account balance Default history Natural resources	50 developing countries from 1987 to 2003. Panel-corrected standard errors estimation using both annual bond ratings and two year moving average	All political variables, except from executive party tenure, are found to be statistically insignificant. The measure with the biggest impact is history of bond default in the previous five years. Inflation, Gdp growth rates and trade are highly accounted for the three rating agencies
Afonso et al. (2007)	S&P rating Moody's rating Fitch rating	Per capita income Real GDP growth Inflation Unemployment Government debt Fiscal balance Government effectiveness External debt Foreign reserves Current account balance Default history	130 countries from 1995 to 2005. Linear panel estimation using pool OLS, fixed effects and random effects. Differentiation across sub periods, 1996–2000 and 2001–2005. Differentiation across rating levels, BBB+ and above. Ordered probit estimation and random effects ordered probit estimation for the full sample	Per capita GDP, GDP real growth rate, government debt, government effectiveness, external debt and external reserves relevant for the determination of the sovereign credit ratings. For the low rating levels, external debt and external reserves are more relevant Inflation plays a bigger role for high rating levels. Moreover, after the Asian crisis, it seems there was a decline in the relevance of the current account variable in the specifications for Moody's and S&P

(continued)

Table A1 (continued)

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Afonso et al. (2011)	Fitch rating Moody's rating S&P rating	Per capita income Real GDP growth Unemployment Inflation Government debt Fiscal balance Government effectiveness External debt Foreign reserves Current account balance Default history European Union dummies' Regional dummies	130 countries from 1995 to 2005. Linear panel random effects estimation. Ordered probit random effects estimation	Per capita GDP, real GDP growth, government debt, and government deficit have a short-run impact on a country's credit rating. Government effectiveness, external debt, foreign reserves, and sovereign default dummies have only a long run impact
Zheng (2012)	S&P rating Dagong rating	GDP per capita Real GDP growth Inflation Fiscal balance External balance External debt Internal debt Economic development Default history	43 countries in 2011. Linear regression using Dagong, S&P their average and their difference in both local and domestic currency ratings as dependent variable	Agencies use similar economic risk indicators. Inflation, external balance, and the dummies for economic development and default history come out statistically significant in both agencies' ratings. But Dagong assigns different weights to these indicators
Bozic and Magazino (2013)	Moody's rating Fitch rating S&P rating	GNI growth Per capita GNI Current account balance Inflation Unemployment Fiscal balance Government debt Real Interest Rate Reserves Default history EMU membership Fiscal balance squared Government debt squared	139 countries in the period 1975–2010. Unbalanced Panel using pooled OLS, fixed effects, random effects and panel corrected standard errors. Differentiation across sub-periods 1975–1996 and 1997–2010 and on the development level	Per capita GNI, inflation, unemployment, fiscal balance, government debt and default history are statistically significant in almost all regressions and for all rating agencies. EMU membership increases rating and both fiscal balance and government debt square are strongly significant

(continued)

Table A1 (continued)

Authors	Dependent variables	Explanatory variables	Methodology/data	Important results
Garcia et al. (2014)	Moody's rating Fitch rating S&P rating	Per capita income GDP growth Inflation Fiscal balance External balance External debt Economic development Previous payment behaviour Control of corruption Government effectiveness Political stability and absence of violence Regulatory quality Rule of law Voice and accountability	82 countries 2004–2011 OLS. First with 14 explanatory variables and then only with the three statistically significant of the First regression	External balance, economic development and regulatory quality are statistically significant
Boumparis et al. (2015)	Moody's rating Fitch rating S&P rating Average rating	GDP per capita GDP growth rate Government debt Inflation rate Unemployment rate Cumulated current account External balance Reserves Regulatory quality	18 Euro zone countries from 2002 to 2013. Pooled OLS, fixed effects, random effects using cross sectional averages as additional explanatory variables	All variables except for cumulated current account are statistically significant government debt and cumulative current account exert a stronger positive impact on credit ratings post-2008. No remaining cross sectional dependence

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9

The Greek Great Depression: A General Equilibrium Study of its Drivers

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9.1 Introduction

Following the world financial crisis in 2008, most European Union countries have managed to pull out of recession since 2014. A distinct exception is Greece which has not yet entered a recovery mode (see European Commission 2016, and CESifo 2016). The Greek economy has been shrinking since 2009 and Greece has lost around 26% of its GDP over 2010–2015. Thus, the episode seems to satisfy all conditions of a “great depression” (see Kehoe and Prescott 2002).¹ Actually,

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and making it worse, the country is in a multiple crisis; public debt is around 177% of GDP, foreign debt is around 142% of GDP, unemployment is around 25% and there is still an environment of political uncertainty and polarization.

Despite three bailout packages of around 300 billion euros so far (financed by the European Union, the European Central Bank, and the IMF), several structural reforms and the recent improvement in the international economic environment, Greece has not yet shown any sign of real recovery. Paradoxically, most of the policymakers, both in Greece and the EU, have been searching for engines of economic growth, without having first studied the determinants of the continuing depression. The present paper tries to fill this gap. Identifying the barriers to growth is a prerequisite for credibly suggesting potential engines of growth.²

In particular, the aim of the current paper is to decompose the above loss in output into its main drivers. Our main results are as follows. Using a medium-scale DSGE model carefully calibrated to the Greek economy, our simulations show that the fiscal policy mix adopted, jointly with developments in institutional quality, and specifically, in the degree of protection of property rights, can explain around 85% of the total loss in GDP between 2010 and 2015. In particular, when we use the tax-spending mix as it has been in the data since 2010, and we also assume that the observed deterioration in an index of property rights manifests itself into a decline in total factor productivity, our model can explain around 22% fall in GDP since 2010 (as said, the total loss in the data has been around 26%). We also show that the portion due to the fiscal policy mix is 14%, while the portion due to the deterioration in property rights is another 8%.

Two clarifications are necessary from the outset. The first is about fiscal consolidation. Our results should not be interpreted as saying that most of the Greek crisis is a consequence of fiscal austerity. A kind of fiscal austerity was necessary, given the imbalances inherited from the past; once sovereign risk premia emerged in 2010, Greek governments could not choose but undertake severe fiscal consolidation measures. Actually, as perhaps should be expected, when we simulate our model under the counterfactual scenario that fiscal policy had remained

unchanged as in 2010, the model cannot deliver a dynamically stable solution implying an unsustainable fiscal situation, which, in simple words, means that the continuation of the status quo was not possible anymore and that some kind of fiscal stabilization was necessary. What our results do hint, however, is that the recessionary effects of fiscal stabilization could perhaps have been milder, had the policy mix been different from that actually adopted; Greece's fiscal stabilization has been based on both spending cuts and tax rises but the increase in taxes has been particularly high (see, Sect. 9.3.1 below).³ The second clarification is about institutional quality. The importance of institutional quality, and especially of property rights, for economic growth is well-known in the growth literature (see, e.g., Acemoglu 2009, Chap. 4, for a review). It should be stressed that property rights may be affected by tax policy, but they are also affected by the quality of public order and safety, where the sharp deterioration of the latter is clearly documented in the Greek data since 2004 and, especially, after 2008 (see, Sect. 9.3.2 below). Thus, it should not come as a surprise, at least qualitatively, that this institutional deterioration is a driver of the Greek depression; on the other hand, our simulations show that its quantitative importance for the output loss is striking.

The way we work is as follows. We employ a medium-scale new-Keynesian DSGE model of a small open economy enriched with a number of real and nominal frictions so as to capture the main empirical features of the Greek economy.⁴ The model is calibrated to data up to and including the year 2009. We take 2009 as the pre-depression benchmark year because the first memorandum with the Troika (EU, ECB, and IMF) was agreed in 2010. This first memorandum, as well as the next two in 2012 and 2015, have provided financial assistance and have offered credit to the Greek economy at much more favorable terms than markets would have provided, but they have been “conditioned on” fiscal austerity measures (namely, measures to improve debt dynamics) and structural reforms that have been highly criticized and have led to political polarization and social unrest. Then, departing from 2010 and assuming an initial unanticipated shock to public debt as observed in the data during that year, we simulate the effects of the tax-spending mix, as it has been in the actual data during 2010–2015,

so as to quantify the portion of the output loss caused by this particular policy mix. In turn, we repeat the same exercise by adding the effects of the deterioration in the property rights index, again as it has been in the actual data up to 2015, by assuming that this deterioration affects the efficiency, or productivity, with which factor inputs are used (namely, it affects the so-called TFP).⁵ Quoting Acemoglu (2009, p. 105), “when countries have large drops in their income, due to political instability, etc., these drops are associated with corresponding declines in TFP”.

A paper close to ours is Gourinchas et al. (2016), who also use a micro-founded DSGE model to analyze the Greek crisis. In their paper, the crisis is driven by a large menu of shocks, including shocks to default rates, banks’ funding costs, etc. We, however, believe that such variables can hardly be considered as (extrinsic) shocks. Here, by contrast, we try to identify the primitive sources of “shocks”.⁶ We show that the particular fiscal policy mix adopted and the deterioration in institutional quality, both as documented in the actual time-series data, can explain most of the drop in output since 2010.

The rest of the paper is as follows. Section 9.2 introduces the model, explains its calibration and presents the steady-state solution. Section 9.3 presents simulations. Section 9.4 closes the paper. Technical issues are in a detailed Appendix, which is available in the companion working paper (see Economides et al. 2017).

9.2 A DSGE Model

In this section, we describe the model used and provide its numerical steady-state solution. The latter will serve as a point of departure for the simulations in the next section.

9.2.1 Description of the Model

Our quantitative results will be based on a medium-scale DSGE model of a small open economy calibrated to Greek data. The model is a variant of the model used by the Bank of Greece (see Papageorgiou 2014).

We choose to work with this particular model because it is used by an official institution, like the Bank of Greece, and because it is relatively detailed and hence can capture the main features of the Greek macroeconomy.

The model exhibits a number of real and nominal frictions so as to capture the key features of the Greek economy and thus provide a parameterized general equilibrium model suitable for policy simulations. These frictions include imperfectly competitive labor and product markets, the distinction between Ricardian and non-Ricardian households, real wage rigidity, Calvo-type short-term nominal fixities, habit persistence, various adjustment costs, a variety of firms so as to capture tradable, and non-tradable goods, a relatively rich public sector including the production of public goods/services by the use of public employees, loss of monetary policy independence since Greece is part of the euro zone and an imperfect world capital market where the interest rate at which domestic agents borrow from the world capital market rises with public debt.

The building blocks of the model, the optimization problems of economic agents and the final equilibrium system are presented in Appendix A. As shown there, the final equilibrium system consists of 89 equations in 89 endogenous variables. This is given the exogenously set policy instruments, initial conditions for the state variables and total factor productivity (TFP) in the two sectors, tradables, and non-tradables.

9.2.2 Numerical Solution of the Model

The above model is calibrated to data from the Greek economy. This means that (most of) its parameter values match average data values and that the exogenously set policy instruments are set as in the data. The data source is Eurostat, unless otherwise stated. The data are at an annual frequency and cover the period 2000–2015, although the period used for this calibration stage is up to and including 2009 (as explained in the Introduction, we use pre-crisis euro period data).⁷ Table A1 in Appendix A (which, as said in the introduction, can be found in the companion working paper of Economides et al., 2017) reports the calibrated parameter values and the average values of fiscal policy variables in the data.

Table 9.1 Steady-state solution and data averages 2000–2009

Variable	Data	Solution
Total private consumption-to-GDP	0.65	0.59
Private investment-to-GDP	0.18	0.17
Total work hours	0.26	0.26
Work hours in private sector	0.22	0.22
Total public debt-to-GDP	1.26	1.26
Lump-sum taxes/transfers	–	0.045
Economy's net foreign liabilities-to-GDP	0.77	0.66
Private net foreign liabilities-to-GDP	0.03	0
Exports-to-GDP	0.23	0.27
Total imports-to-GDP	0.34	0.24

Note (i) Average data over the euro period 2000–2009, with the exception of foreign liabilities which are over the period 2003–2009 and the public debt-to-GDP ratio which is set at its 2009 data value. The data source is Eurostat and the Bank of Greece. (ii) A positive value of the net foreign liabilities-to-GDP ratio means that the domestic country is a net borrower

Using these numerical values, the system is then solved using a Newton-type nonlinear method as implemented in DYNARE (see below for specification of transition dynamics). Its steady-state solution (at least for the key variables) is reported in Table 9.1. In this solution, we have exogenously set the debt-to-GDP ratio equal to the threshold level $\bar{d} \equiv 126\%$, which was the value of the public debt-to-GDP in 2009 (that was the year that risk premia emerged in Greece), so that one of the remaining fiscal policy instruments needs to be determined residually to satisfy the within period government budget constraint; we assume that it is lump-sum taxes that play this role. As Table 9.1 shows, the solution is in line with data averages over 2000–2009 and can thus provide a reasonable departure point for the changes that have been taking place since 2010 and are described in the next sections. In particular, the solution does a relatively good job at mimicking the position of the country (and its different sectors) in the international capital market, as well as the consumption-investment behavior of the private sector over the euro pre-crisis years.

Table 9.2 Changes in the main macro variables 2015–2009 (%)

Variable	Data	Simulated model with the fiscal package	Simulated model with the fiscal package plus institutional shocks
Real GDP	–26	–13.7	–22
Real private consumption	–27.7	–4.6	–9.1
Real private investment	–60	–19.1	–40.6
Real exchange rate	8	2.8	–2.5
Real exports	18.2	2.6	–6

Note (i) The changes in the actual time series are computed as log deviations between their 2015 and 2009 values, with the exception of real private investment that is computed as $(I_{2015} - I_{2009})/I_{2009}$. The data source is Eurostat. Changes in the simulated series correspond to log deviations from the initial steady state. (ii) A positive change for the real effective exchange rate means a real depreciation, i.e., an improvement in the country's competitiveness

9.3 Simulations

As said above, departing from the “steady-state” solution in Table 9.2, we will now simulate the above economy when fiscal policy and institutional quality change as observed in the data after 2010. To understand how the model works, we will start by assuming that only fiscal policy has changed and then we will add changes in institutional quality. That is, we study one dynamic driver at a time.

9.3.1 Effects of the Fiscal Austerity Mix as Adopted in Practice

In this subsection, we will examine, other things equal, the impact of fiscal consolidation policies as adopted in Greece since 2010.

We work as follows. We assume that in 2010 there was an initial shock/increase in the public debt-to-GDP ratio by 20 pp (as observed

in the data). We then set all exogenous fiscal (tax-spending) instruments as they have actually been in the data during 2010–2015 (to isolate the impact of actual fiscal policy, we switch-off the extra feedback reaction to the public debt during this sub-period). Besides, in order to mimic the memorandum package, we set the interest rate, at which the government borrows from abroad, as a weighted average of the risk-free world interest rate and the world interest rate that the economy would face if it had to borrow from the international capital market (the latter includes the country risk-premium as in the data).⁸ The private sector, on the other hand, continues to face the full world interest rate (that includes the country risk-premium) when it borrows from the international market. Recall that this premium is a function of the public debt gap, where, in this gap, the public debt threshold above which premia emerge is 126%.

We will assume that all the above features continue until the year 2015 (this is the year that this paper is being written in terms of data availability). Then, after 2015, the fiscal instruments are assumed to gradually return to their pre-crisis 2009 values. In particular, we assume that they follow an autoregressive process using as initial values the 2015 values and an autoregressive coefficient equal to 0.9. We allow one fiscal instrument to react to the public debt gap (see Eq. 27 in the companion working paper of Economides et al., 2017), where, in this gap, the public debt target in the policy rules is the pre-shock value of 126%. The interest rate at which the government borrows from abroad is now allowed to react fully to the degree of government's indebtedness.

Thus, in our first simulations, transition dynamics is driven by the above changes in fiscal policy. We solve the model under perfect foresight (as said above, we use a Newton-type nonlinear method as implemented in DYNARE).

The simulated impulse response functions are plotted in Fig. 9.1, while Table 9.2 summarizes the associated changes in the main macro variables vis-à-vis their values in the data. Inspection of the simulated results in the third column of Table 9.2, and comparison to the actual data in the second column, implies that the GDP decreases by around

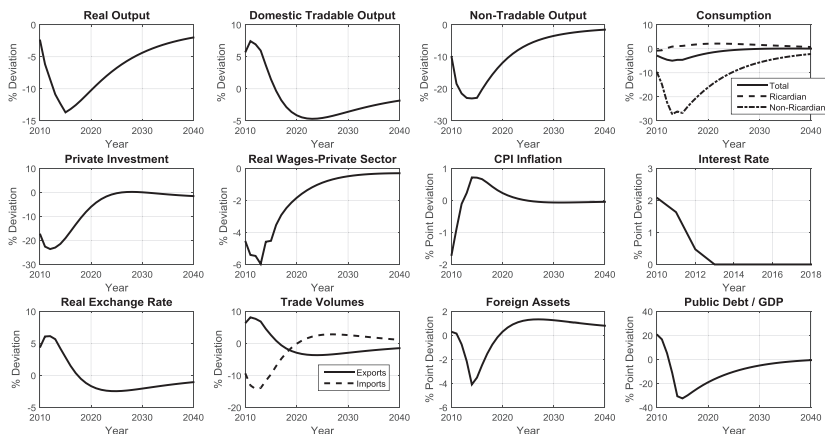


Fig. 9.1 Impulse response functions driven by the fiscal austerity package. *Note* All variables are expressed as percentage deviations from the steady state, with the exception of the CPI inflation, the interest rate, foreign assets, and the public debt-to-GDP ratio that are expressed as percentage point deviations

14% between 2009 and 2015. In the data, the actual decrease has been 26% during the same time interval. That is, the particular fiscal austerity package, which has been adopted between 2010 and 2015, can account for more than half of the big fall in output observed in the data during this period.

Figure 9.2 depicts the dynamic paths of fiscal policy instruments under this scenario. It thus confirms the well-recognized feature that the Greek fiscal consolidation program has been based on both spending cuts and tax rises (see, e.g., European Commission 2015), although the clear rise in all effective tax rates is particularly striking for a country suffering from a deep recession.

Finally, we close by reporting that the model would be dynamically unstable (meaning that there is no solution) if we had assumed that the independently set fiscal policy instruments remained as they were in the pre-2010 period. In other words, as said in the Introduction, the fiscal situation was not sustainable and hence some kind of fiscal policy adjustment was unavoidable in the aftermath of the 2008 world crisis.

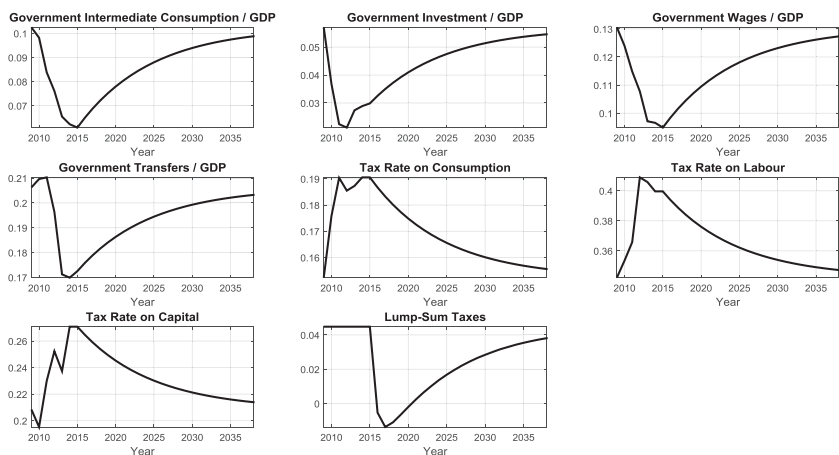


Fig. 9.2 Dynamic paths of fiscal policy instruments. *Note* Government intermediate consumption, investment, and the public sector wage bill are expressed as shares of the 2009 GDP. The effective tax rates are computed following the approach in Papageorgiou et al. (2012). The data source is Eurostat

9.3.2 Effects of the Deterioration in Institutional Quality

We will now add another driver of transition dynamics, namely, changes in institutional quality and, in particular, an index that measures the protection of property rights.

As said in the Introduction, we assume that developments in this index manifest themselves as shocks to TFP. This is a short cut and is similar to the methodology of Chari et al. (2007). In other words, as a short cut, we construct an “effective” TFP series, where the degree of effectiveness is shaped by changes in the degree of property rights protection. On the other hand, it should be stressed that it is straightforward to enrich our model so as, in the presence of weak property rights, atomistic agents find it to optimal to allocate effort to conflict and extraction, and, in equilibrium, this leads to resource misallocation that eventually reduces the effective TFP; in Appendix B, we provide a simple version of our full-fledged DSGE model that shows this equivalence formally.⁹ Chari et al. (2007) also work with a prototype economy

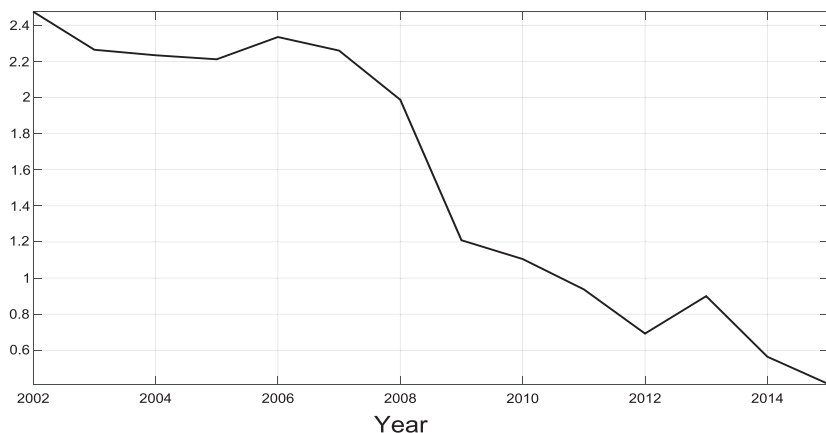


Fig. 9.3 Deterioration in property rights in Greece (2002–2015). Note The index is computed as the sum of the following three indicators: “rule of law,” “regulatory quality,” and “political stability and absence of violence/terrorism”. The data source is Worldwide Governance Indicators, World DataBank

with wedges, or adverse shocks, and then show that micro-founded frictions in a more detailed economy manifest themselves as such wedges, or adverse shocks, in the prototype economy.

We, therefore, proceed as follows. First, we construct a series of institutional quality. Then, using this, we will construct a corresponding series for the effective TFP and, finally, will feed this resulting TFP series into our theoretical model in Sect. 9.2. That is, now the model’s dynamics will be driven both by the fiscal austerity package and the effective TFP series.

To construct a measure of the quality of institutions that protect property rights, we use the World Bank’s “Worldwide Governance Indicators” dataset, which has been widely used in many empirical studies (see, e.g., Akitoby and Stratmann (2008) and Baldacci et al. (2011)). The institutional quality index is the sum of the following three indicators: “rule of law,” “regulatory quality,” and “political stability and absence of violence/terrorism”. These indicators are all closely related to issues concerning the protection of property rights.¹⁰ Figure 9.3 shows the evolution of this composite index over the period 2002–2015. Notice the remarkable

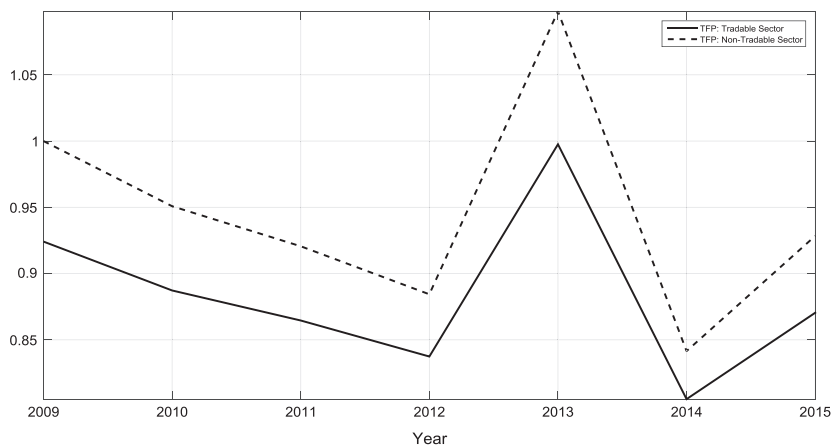


Fig. 9.4 TFP in tradable and non-tradable sectors “shaped” by the deterioration in property rights. *Source* Authors’ calculations. *Note* The path of the TFP levels is “shaped” by the changes in the institutional quality index according to the relative size of the respective sectors in the data

decline of institutional quality after 2008, which was a year of intense social and political turmoil in Greece. It should be stressed that these indicators are not linked (at least directly) to public finances.

In turn, as said above, we assume that changes in the TFP level are “shaped” by changes in the above index of institutional quality. In the model, there are two specific TFP levels, namely, in the tradable and the non-tradable sector. We allocate the changes over time in this index to the respective TFPs according to the relative size of the tradable and non-tradable sectors in the data (the ratio of the gross value added in the tradable sector to the non-tradable sector is 0.8). Thus, we obtain time series for the TFP levels in the two sectors and we normalize them so that their values in 2009 to be consistent with the calibrated values of the TFPs (equal to 1 for the non-tradable and equal to 0.9241 for the tradable sector). Figure 9.4 shows the two constructed effective TFP series.

Finally, using all the above, we repeat the same experiment as in Sect. 9.3.1 by setting the TFP levels of tradables and non-tradables over 2010–2015 equal to the constructed series. The new impulse response functions are plotted in Fig. 9.5, while the last column in Table 9.2, which was presented above, summarizes the associated changes in the

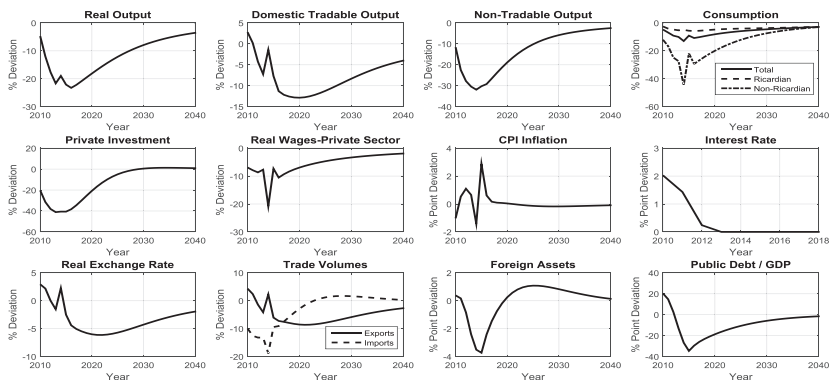


Fig. 9.5 Impulse response functions driven by the fiscal austerity package and the deterioration in property rights. *Note* All variables are expressed as percentage deviations from the steady state, with the exception of the CPI inflation, the interest rate, foreign assets, and the public debt-to-GDP ratio that are expressed as percentage point deviations

main macro variables. Notice that now the reduction in GDP in column 3 of Table 9.2 is 22%, as compared to only 14% without the TFP/institutional shock in column 2.

9.4 Conclusions, Discussion, and Extensions

In this paper, we studied the quantitative importance of the fiscal austerity program and the deterioration of institutional quality, both as observed in the recent data, for the Greek great depression since 2010. The main result is that the adopted fiscal policy mix and the deterioration in property rights are the main explanatory variables of the Greek great depression.

We close with acknowledging two caveats. First, here we did not explain why the specific fiscal policy mix has been chosen (which proves to be particularly distorting) or why the society has chosen to have weak and deteriorating property rights (which leads to misallocation of resources and hence to a relatively low TFP). In general, it is well recognized that the policies chosen and/or the way resources are (mis)allocated are an equilibrium outcome of a political process interacting with

institutions and distribution (see, e.g., Acemoglu (2009, Chap. 4) and Jones (2011)). In the case of Greece, there is no shortage of conjectures about the root causes of such choices which go back to the post-world war II history of the country. Second, our analysis here was only positive. One could search, for instance, for alternative fiscal policy mixes and/or institutional regimes that could perhaps mitigate the recessionary effects of debt consolidation. We leave these extensions for future research.

Notes

1. Namely, the drop in output is large, occurred rapidly and is sustained; this is defined as a “great depression”. See Gogos et al. (2014) for an application of this methodology to the Greek economy before the euro period.
2. There is a growing literature on the current Greek crisis. For instance, Bortz (2015) discusses where the financial assistance has gone offering a different view from that of Sinn (2015); Arellano and Bai (2016) study the Greek default; Papageorgiou and Vourvachaki (2016) study the implications of structural reforms in light of the crisis; Gourinchas et al. (2016) search for shocks that can account for the Greek crisis. See below for further details.
3. See, e.g., Philippopoulos et al. (2016) for the different implications of different fiscal policy mixes used for debt consolidation in Italy.
4. Alternatively, we could, for instance, use a VAR approach which requires a limited amount of theory to structure the data (see, e.g., Canova 2007, for methodology). We prefer to follow the DSGE approach so as to have well-defined micro-foundations that allow us to understand the behavioral channels through which exogenous changes affect macroeconomic outcomes.
5. There is a large literature that shows how weak institutions affect the efficiency with which factor inputs are used and, in particular, how weak property rights lead to distortive individual incentives, resource misallocation and eventually a lower level of total factor productivity. See e.g. Jones (2008, Chap. 4, and 2011) and Acemoglu (2009, Chapter 4) for reviews of the literature, while see below for further details and references. Here, working as in Chari et al. (2007), we will take a short cut by assuming that changes in property rights directly show up as shocks

to TFP; nevertheless, as argued in Sect. 3.2 below, this is equivalent to a richer model where the adverse effect of weak property rights on TFP works via the distortion of individual incentives.

6. See, e.g., Chari et al. (2007) for a methodology paper on business cycle accounting.
7. We focus on the period during which Greece is part of the euro area but before the debt crisis erupted in early 2010.
8. In particular, we assume that $R_t^G = mR_t^* + (1 - m)R_t^H$, where we set the value of m equal to 0.5.
9. In the same spirit, Economides et al. (2007, 2008) and Angelopoulos et al. (2009, 2011) also provide micro-founded dynamic general equilibrium models, where the presence of weak property rights distorts private incentives and, in equilibrium, this leads to resource misallocation which, in turn, maps into reductions in the effective TFP. All this belongs to a rich and still growing literature that endogenizes the TFP and hence endogenizes long-term growth.
10. The rule of law indicator captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence. The regulatory quality index captures perceptions of the ability of the government to formulate and implement sound policies and regulations, and the credibility of government's commitment to such policies. The political stability and absence of violence/terrorism indicator captures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violence means, including politically motivated violence and terrorism. For further details see Kaufman et al. (2010). We report that each one of these three subindexes is highly correlated with key macroeconomic variables, such as real GDP and real investment, in the Greek data.

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10

The Limits of Austerity: The Fiscal Multiplier and the 'Debt Laffer Curve'

Christopher Tsoukis

10.1 Introduction

The Greek crisis since 2009 has been above all a sovereign debt crisis. The conditionality accompanying the bailout funds the country has received from its creditors have had three broad aims: first, to bring public finances, the government deficit and debt, under control; second, to generate an internal devaluation (lowering domestic wages and prices) so as to achieve a higher competitiveness in the absence of an exchange rate instrument, the objective being to substitute foreign demand for domestic; and third, and not least, to impose supply-side reforms on the economy in order to assist the second aim and to ensure that economic activity would recover from the fiscal retrenchment required for the first aim. The overarching strategy is to bring public finances under control while restoring economic activity and growth as soon as possible. For all this, fiscal consolidation ('austerity') is central. But, aside of the

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ensuing deep recession, unprecedented in the western world since the 1930s (at the time of writing, real GDP is more than 25% down from its 2009 level, while disposable incomes have fallen by more as taxation has risen), it is increasingly evident that austerity is failing in (some of) its own terms. While the government has managed to bring its deficit under control (it has recorded primary surpluses since 2014 while in 2009 its overall deficit was 15.8% of GDP), it, however, has failed to bring the (accumulated) debt under control; this now stands at about 180% of GDP (from about 130% in 2009) despite the drastic 'Public Sector Involvement' (PSI) haircut of debt owed to private creditors in 2012.

The fact that the debt-GDP ratio has in fact grown despite, or maybe because of, austerity, has not gone unnoticed by commentators, e.g. Pisani-Ferry (2013) and Gourinchas, Philippon and Vayanos (2016). The immediate cause of this rise is simple: The fall in output due to austerity has been both dramatic and very persistent. The drop in GDP increases the debt-GDP ratio by reducing its denominator. This observation has prompted claims that the internal devaluation strategy and the related austerity is counterproductive in terms of debt reduction (e.g. Fatás and Summers, 2015; and in the comparative political economy literature Armingeon and Baccaro, 2012).

In this chapter, we take these arguments one step further by showing that there exists a Laffer Curve for government debt. Fiscal retrenchment ('austerity') exerts two effects: It reduces the deficit that feeds into debt in the first place; but it also increases the debt-GDP ratio through a reduction in GDP. We show that there is a critical value of the debt-GDP ratio beyond which the negative effect dominates and further austerity, in fact, increases the debt-GDP ratio. So, this critical value of the debt-GDP ratio is the peak of the Laffer Curve; it is also the maximum repayable debt, since if all austerity can do beyond this point is to increase debt further leading to a 'debt trap', there is no hope of repayment of any debt in excess of this threshold. Furthermore, we connect this critical threshold of the debt-GDP ratio to the effectiveness of fiscal policy on GDP (the fiscal multiplier) and we show that the two are inversely related by a simple formula: the greater the multiplier the lower is the maximum repayable debt, as fiscal policy will have a

stronger (negative) effect on GDP, precipitating the negative effect discussed above.

Thus, the core of this contribution is to propose a maximum payable debt criterion closely linked to the fiscal multiplier, and to suggest that there is a Laffer Curve around it. To our knowledge, the approach is novel and the resulting line of argument has not been pursued before in the literature. The analysis is relatively simple, based on a partial equilibrium model of the present value of government surpluses and a fiscal multiplier effect. We eschew here more elaborate setups based on the agent optimisation which may obscure the main point by burying it in deep structures. Instead, our approach has the advantage of tractability and transparency. At the same time, this analysis is a first pass at the issues, and further refinement is needed in the context of a more fully developed model.

In order to substantiate numerically the proposed criterion of maximum repayable debt, we need a plausible empirical estimate of the fiscal (spending) multiplier. As the literature does not speak in one voice about the matter, we then embark on a brief survey of findings. On the basis of this, and also of arguments made with reference to the current Greek situation, we argue that the multiplier applicable to Greece is likely to be at the top end of the estimates (quite possibly, even outside the range of the available estimates). As a result, the maximum repayable debt is for sure much lower than the current debt-GDP level. We also discuss structural and supply-side reforms, the second broad thrust of conditionality. As mentioned, the aim is that such reforms should compensate for fiscal retrenchment. On the basis of a brief review of the literature, however, we argue that this is very unlikely as the effects of such reforms will be long-run while in the short run they may plausibly even be recessionary. Thus, Greece's 'binding constraints' (Hausman et al. 2008) are almost entirely demand-side at the moment, validating our (entirely demand-based) setup.

The implications of this analysis can be quite dramatic: As fiscal consolidation beyond a certain level in fact adds to debt (as a ratio of GDP), and as in all likelihood we are way past the threshold in terms of existing debt, we argue here for a relaxation of austerity, not on a compassionate or humanitarian basis, but because austerity is counter-productive. In fact, plausible estimates suggest that by relaxing austerity,

the total debt that can be repayed to the European taxpayer (in present-value terms) will in fact rise; as well as giving the country a badly needed respite, of course. On the contrary, a continuation of austerity at this stage both prolongs recession, misery and dysfunctionality in the country, but also, importantly, keeps saddling it with debts that will not be repayed. This is not to argue for further loans in order to cover any primary deficit; in fact, a precondition is that the country should continue with the primary surpluses that it has managed to achieve (about 2% of GDP in 2016). But surpluses of 3.5% required for a number of years beyond 2018 by the creditors are both unprecedented (as the discussion below reveals) and based on unsound economic logic; they will simply prolong the vicious circle of recession and indebtedness. Nor is any debt forgiveness required. As we discuss below, debt is nominally high but with a long-term structure such that its repayment extends well into the future and servicing it is feasible if Greece's economy returns to growth. The corollary of these arguments is clear: Return to growth is now the paramount priority; and this can only be done by relaxation of austerity (and feasible required surpluses at the current levels). This is the road for both the debts to the European taxpayer to be re-paid and for the country to break out of the debt trap.

This chapter is structured as follows: Sect. 10.2 discusses the current state of the government debt sustainability literature with emphasis on the feasibility of some recent policy proposals, Sect. 10.3 has the model and forms the core of the paper, Sect. 10.4 has a critical discussion on conditionality and structural reforms, while Sect. 10.5 summarises and concludes with some brief policy proposals.

10.2 Debt Sustainability and Macroeconomic Structure: The State of Play

The government debt Laffer Curve is related as a concept to the tax Laffer curve, whereby an increase in the tax rate(s) fails to deliver an increase in tax revenues beyond a certain level, as the rising tax provides stronger disincentives that erode the tax base in various ways. Mendoza et al. (2013) and Trabandt and Uhlig (2011) construct estimates of

such a Laffer Curve. Conceptually, the analogy between the debt Laffer Curve proposed here and the standard tax Laffer Curve should be clear: The rise in the surplus (instead of the tax rate) erodes growth, and thereby, the feasible amount of debt reduction. Mendoza et al. (2013) is especially relevant for the present analysis as it highlights the difficulties of raising enough tax revenues to maintain debt sustainability, particularly, in open economies participating in a currency union.

In order to develop the debt Laffer Curve, we revisit the basic theory of government debt sustainability and debt dynamics. We argue that the basic theory on the issue provides rather little structure-based analysis of the sustainable level of government (or indeed any other) debt. For an assessment, first-generation analyses have looked at indicators such as the debt-GDP ratio and its stationarity properties, or cointegration between revenues and expenditures. Second-generation ‘model-based sustainability’ analyses by Bohn (2007) and Mendoza and Ostry (2008) consider both the repercussions of the deficit onto the rest of the economy as well as reaction functions of the primary deficit/surplus to the state of the economy, including debt. But the implications of these analyses for critical debt thresholds are not clear.¹ In attempting to offer more concrete guidance, Reinhart et al. (2012) argue that a debt-GDP ratio of 90% is a threshold, after which interest rates rise; but this empirical finding has been contested. Rule-of-thumb guidelines include the Maastricht Treaty and Stability and Growth Pact criteria, never strictly enforced, which include a stipulation that debt/GDP should be less than 60%; and the UK’s (now defunct) ‘golden rule’ that the same ratio should be less than 40%. However sensible, these numbers are not grounded in economic theory. Thus, the quest for theory-based concrete guidelines on acceptable and sustainable public debt carries on.

Ongoing concern about European sovereign debt has prompted more practical analyses of sustainability, in particular of the required primary surpluses: Since 2002, the IMF has developed a framework for conducting public and external debt ‘Debt Sustainability Analyses’ (DSA) taking into account the level of debt, but also its maturity structure, whether it is indexed, by whom it is held, etc. Based on such analyses, the April 2013 issue of the IMF’s publication *Fiscal Monitor* (IMF 2013, Statistical Table SA13a; see also 2015) has calculated the cyclically adjusted primary

surpluses required over the 2020–2030 horizon in order for debt to fall to sustainable levels (< 60% in advanced economies, < 40% in emerging economies) by 2030. The average over the G-20 biggest group of economies is (in %) 3.8, with a number of countries required to produce larger surpluses than that: Ireland 5.6, Italy 6.6, Portugal 5.9, Spain 4.0, UK 4.2, US 4.1, Greece 7.2. These are large surpluses and they are required for prolonged periods of time, putting the respective countries under tough austerity regimes for long. Eichengreen and Panizza (2014) show that episodes of such deep and prolonged fiscal tightening are the exception, not the norm, and investigate the conditions that may be favourable for such a process to occur. They conclude:

‘These are very large primary surpluses. There are both political and economic reasons for questioning whether they are plausible. [Our] findings do not provide much encouragement for the view that a[ny] country will be able to run a primary budget surplus as large and persistent as officially projected [NB: by the IMF].’ Eichengreen and Panizza (2014, p. 2n.)

The Kiel Institute for the World Economy, in its regular assessment of indebtedness among European countries (the ‘Eurobarometer’, February 2015 issue; The Kiel Institute 2015), is more optimistic about the required surpluses (smaller) but still pessimistic about their feasibility on both political and economic grounds.

The point remains that the insights of model-based analyses of sustainability (other recent examples include Martin and Philippon 2014; and those conducted by the ECB, e.g. 2012) are not integrated into the basic theory of debt sustainability. Our model does exactly that: We integrate this analysis with considerations of economic structure, particularly, the fiscal (‘Keynesian’ or otherwise) multiplier; so far, analyses of sustainability of government debt do not seem to relate much to analyses of this multiplier. Recognition of this point is only now emerging (see Blanchard and Leigh 2013; IMF 2015):

Program design should take into account the effects of fiscal consolidation on output.

IMF (2015, p. 5)

In a related vein, Denes et al. (2012) show that the effects of ‘austerity’ measures (cutting the deficit) depend on the entire fiscal regime in place and its effects of economic structure; badly designed or excessive austerity can be counterproductive. Our approach is in the spirit of all these analyses.

10.3 A ‘Maximum Revenue’ Approach

This section proposes a simple criterion of sustainable indebtedness linking the core of the above insights into a tractable framework. Taking a novel approach, we ask the question, how much is the maximum revenue (in a present-value sense) that a creditor can realistically expect from a government; if the actual debt is less than or equal to this maximum, it is sustainable, if higher it is not. This analysis yields a simple criterion of maximum, sustainable debt linked directly to the fiscal multiplier. This maximum payable (or sustainable) debt-GDP ratio is also the peak of the debt Laffer Curve.

10.3.1 A Sustainability Criterion

We ask how much revenue a government may realistically raise in order to repay its debts. For this to happen, a fiscal consolidation must be in place, in the form of a target primary surplus.² Since government primary surpluses, S_p , are effectively net revenue for creditors, any creditor will be interested in the present value of such surpluses getting maximised:

$$\text{Max}_s \sum_{i=0}^{\infty} (1+r)^{-i} S_i,$$

where r is the real interest rate, assumed constant. The policy instrument is the (permanent) primary surplus-GDP ratio, s , to be set once and for all.³ There is a trade-off: A direct effect of a higher primary surplus ratio is to yield more revenue; an indirect effect is that it negatively

affects economic activity and growth via the standard fiscal multiplier, hence it implies less revenue in the future; the 'optimal' (revenue-maximising) surplus ratio gets this right. We assume that the economy is on a balanced-growth path featuring a constant real growth rate, g ; this growth rate is amenable to fiscal policy via the fiscal multiplier. Therefore, the policy objective at time $t = 0$ becomes:

$$\text{Max}_s s \sum_{i=0}^{\infty} (1+r)^{-i} Y_i = s Y_0 \sum_{i=0}^{\infty} (1+r)^{-i} (1+g)^i,$$

where output has been substituted out by the trivial equation $Y_t = (1+g)Y_{t-1}$ and Y_0 is taken as given. The FOC is:

$$Y_0 \sum_{i=0}^{\infty} (1+r)^{-i} (1+g)^i + s Y_0 \mu \left[\sum_{i=1}^{\infty} (1+r)^{-i} (1+g)^{i-1} i \right] = 0,$$

where $\mu \equiv dg/ds < 0$ is the fiscal multiplier. This leads to:

$$Y_0 \sum_{i=0}^{\infty} (1+r)^{-i} (1+g)^i + s Y_0 \mu \frac{1}{r-g} \left[\sum_{i=0}^{\infty} (1+r)^{-i} (1+g)^i \right] = 0$$

Or simplifying

$$s^* = \frac{r-g}{-\mu} > 0, \quad (1)$$

where the star indicates the optimal value. The sign follows from standard assumptions ($r > g$, a maintained assumption, and the standard sign of the multiplier, $dg/ds < 0$).⁴ The maximum net revenue (as a share of GDP) that can be expected is equal to the growth-adjusted real interest rate, taking into account the fiscal multiplier. This is intuitive: A fiscal tightening aiming to produce greater surpluses will reach its limits earlier the more it hurts growth and therefore future tax-collection capacity.

The present value of the maximum debt repayments equals:

$$s^* Y_0 \sum_{i=0}^{\infty} (1+r)^{-i} (1+g)^i = s^* Y_0 \frac{1+r}{r-g} \equiv \bar{b} Y_0 \quad (2)$$

Hence, a critical value of the debt-GDP ratio emerges:

$$\bar{b} \equiv s^* \frac{1+r}{r-g}. \quad (3)$$

Debt is repayable in full provided that:

$$b_t \leq \bar{b}, \quad (4)$$

where b_t is the debt-GDP ratio. But $b_t < \bar{b}$ with strict inequality does not exploit to the full government's capacity to draw resources from the private sector; while $b_t > \bar{b}$ implies that debt will not be repaid in full.

10.3.2 Debt Dynamics, Debt Traps and the Debt Laffer Curve

We can now gain additional perspectives. From basics, the government budget constraint (in end-of-period notation) can be expressed in terms of GDP as:

$$b_{t+1} - b_t = d_{t+1} + (r-g)b_t/(1+g) \quad (5)$$

Where $d_t = -s < 0$ is the primary deficit-GDP ratio; it is assumed that it is set optimally according to (1). Using (1) and (3), we get:

$$b_{t+1} - b_t = \frac{r-g}{1+g} \left(b_t - \frac{1+g}{1+r} \bar{b} \right) \quad (6)$$

Considering that r and g are of the same order of magnitude (so that $\frac{1+g}{1+r} \bar{b} \approx \bar{b}$), and using the maintained assumption $r-g > 0$, we see that the debt-GDP ratio is stationary only if:

$$b_t = \bar{b}, \forall t \quad (7)$$

Otherwise, the debt will be unstable. Thus, this level of debt-GDP represents a threshold between two basins of attraction: For $b_t < \bar{b}$ (and with unaltered policy), debt withers away asymptotically to zero; if $b_t > \bar{b}$, then debt spirals out of control. The latter region then

represents a ‘debt trap’ that leads to default. In other words, \bar{b} coincides with the peak of the Laffer Curve, either side of which are the slippery slopes of withering away or ever-increasing debt-GDP ratio.

10.3.3 A Variant Model: A Fiscal Shock Having Effects of a Parametric Persistence

As mentioned, assuming a permanent surplus having permanent growth effects is a nod more towards simplicity than realism. In this sub-Section, instead, we shall consider a variant of this setup, namely the effects of an entirely transitory fiscal shock at time $t = 0$ (s_0). This transitory shock affects both the contemporaneous growth rate, but also future growth rates; the persistence of its effects is parameterised by $0 < \delta \leq 1$; various channels such as ‘time-to-build’ effects in investment or ‘habits’ and durability in consumption may deliver such persistent effects of a transitory fiscal shock. The effect (multiplier) of this shock is hypothesised to be $\mu_0 < 0$ on impact.

Here, a digression is required in order to defend the realism of this structure. Unlike the earlier assumption of a permanent shock having permanent effects, here a temporary fiscal shock is assumed to affect the growth rate (with a parametric decay). The alternative would have been to assume that a fiscal shock would affect the deviation of output from a trend parametrically; but that would have meant that when the effects are over, the output returns *to the same trend path* as before the fiscal shock occurred. Moreover, it would imply an immutable, supply side-determined trend. But for an economy, like currently Greece’s, to assume a recovery to the same trend after all these years of recession would be patently unrealistic. Equally, as we discuss in Sect. 10.4 below, the ‘binding constraints’ in Greece today are demand-related; and due to hysteresis, changes in demand can have long-lasting effects on output (see, e.g. Fatas and Summers 2015). The notion of a ‘cast-in-stone’ supply path seems entirely counterintuitive. The structure envisaged here is consistent with this hysteresis, as it assumes that *ultimately* the economy returns to the exogenous growth rate (but not trend path, as intermediate losses in output are permanent).

The maximum revenue that government can collect and repay following a fiscal shock is:

$$\begin{aligned} \text{Max w.r.t. } s_0 \quad & \sum_{t=0}^{\infty} (1+r)^{-t} s_t Y_t = Y_0 \sum_{t=0}^{\infty} s_t (1+r)^{-t} \prod_{v=0}^{t-1} (1+g_v) \\ & \text{With } \prod_{v=0}^{-1} (1+g_v) \equiv 1, \quad \prod_{v=0}^0 (1+g_v) = 1+g_0 \end{aligned}$$

Note that the fiscal shock is for one period only (t=0). The evolution of real GDP is given by: $Y_t = (1 + g_{t-1})Y_{t-1}$ and the growth rate is given by an autoregressive structure: $g_t = \delta g_{t-1} + \mu_0 s_t$; where $0 < \delta \leq 1$ regulates the persistence of the effects of the surplus on the growth rate.

The First-Order Conditions are:

$$Y_0 + Y_0 \sum_{t=1}^{\infty} s_t (1+r)^{-t} \sum_{v=0}^{t-1} \frac{dg_v}{ds_0} \prod_{q=0, q \neq v}^{t-1} (1+g_q) = 0$$

Therefore, evaluating at the benchmark (steady-state) surplus $s_t = s$, $g_q = g$, and $\frac{dg_v}{ds_0} = \delta^v \mu$, we get after tedious manipulations a new optimal surplus ratio (s^*):

$$s^{*'} = \frac{r - g}{-\mu_0} \frac{1 + r - \delta(1 + g)}{1 + r} \tag{8}$$

To gain intuition, we can consider two special cases: First, shocks have contemporaneous only effects ($\delta = 0$), in which case we get the earlier:

$$s^* = \frac{r - g}{-\mu_0}$$

This is completely symmetric to the case in sub-Sect. 10.3.1 in which we have a permanent shock having permanent growth effects. Second, implausible though it is, for illustration we may consider a completely transitory fiscal shock that has permanent effects ($\delta = 1$), in which case we get:

$$s = \frac{(r - g)^2}{-\mu_0(1 + r)}$$

In this case, as the fiscal shock has such powerful (permanent) effects, the maximum feasible surplus is commensurately smaller. In fact, smaller by an order of magnitude as $r-g$ is a small number.

In the general case, as the persistence of the effect of the shock (δ) increases, the maximum feasible surplus decreases, as the effects of the surplus on growth are longer lasting. To gain an idea of what is involved, with $r = 0.025$ and $g = 0.02$ (the assumptions of Martin and Philippon 2014) and $\delta = 0.5$ (with annual data, the effect next year will be half as much as the contemporaneous one, in line with empirical evidence), we have:

$$s^{*'} = \frac{r - g}{\mu_0} \frac{1 + r - \delta(1 + g)}{1 + r} \approx 0.5 \frac{r - g}{\mu_0} \quad (9)$$

The maximum feasible surplus (s^{*}) is about 50% of the baseline case, s^* in (1), and so will be the maximum repayable debt. Otherwise, there is very little change. The lesson is that the maximum feasible surplus and debt are very sensitive to even a relatively small change in the persistence of the effect of the fiscal shock (as they apply to growth rates which ‘work’ multiplicatively); and that it is important to account carefully for ‘time-to-build’, durability, and habit effects on private spending in the optimal design of fiscal policy.

10.3.4 Empirical Estimates of the Fiscal Multiplier and Implications

The sustainability criterion we propose (3) with either (1) or (9) relies critically on the magnitude of the fiscal multiplier. Most of the empirical work has focused on the expenditure side,⁵ therefore we focus on the expenditure multiplier here. Two approaches are relevant: The ‘Keynesian’ approach, that yields a greater-than-unity multiplier, is entirely demand-based, assuming no supply-side restrictions; this multiplier more readily applies under conditions of high unemployment, spare capacity and recession. The ‘neoclassical approach’ in contrast (Hall 2009; Mulligan 2011; Woodford 2011) assumes an economy that

faces predominantly supply constraints and yields a multiplier less than unity. Empirically, Ramey (2012) suggests a plausible range of multipliers from 0.8 to 1.5. DeLong and Tyler's (2013) wide-ranging review errs on the 'Keynesian' side. Taylor (2011) is more sceptical. More recent work based on the DSGE models offers a mixed picture. But there is growing consensus that the multiplier is 'Keynesian' (> 1) during recessions (DeLong and Summers 2012; Auerbach and Gorodnichenko 2012). On an even stronger Keynesian pitch, Fatás and Summers (2015) estimate a contemporaneous multiplier of 1.7 and a persistence parameter of 1 (in levels). They argue that these figures would be enough to make a fiscal expansion self-financing along the lines of DeLong and Summers (2012).

The conclusion of a high multiplier is reinforced by another consideration, hitherto ignored in the literature. The estimates of the multipliers are usually assumed symmetrical, equal whether the shock is expansionary or contractionary. Yet, this is unlikely: Fiscal expansions are much more likely to encounter supply-side constraints, except in deep recessions, hence the neoclassical multiplier becomes more relevant. In contrast, a fiscal consolidation may be more Keynesian in its effects, as there are less supply constraints when output declines. Thus, the fiscal retrenchment is likely to have quantitatively stronger effects than a fiscal expansion, something often overlooked.⁶ This may well be the explanation of the underestimation of the multipliers in the case of Greece by the IMF (Blanchard and Leigh 2013; IMF 2017); they applied multipliers estimated from fiscal expansions (therefore of a likely 'neoclassical' magnitude) to a fiscal consolidation (that will likely be much more 'Keynesian'). As the approach followed here concerns fiscal consolidations more than expansions (this is how more revenue is raised under strained public finances), the above argument suggests that one should err on the higher side of the multiplier in numerically fleshing out criterion (3).

There are additional, broader reasons why a fiscal retrenchment will take a higher multiplier (in absolute value) than an expansion, all applicable to Greece right now. The recession brings an accumulation of non-performing loans (NPLs), 44% of the total bank loans in June 2016, IMF (2016); it brings the point into sharp relief to be reminded

that NPLs were 4.5% of the total in 2009; Lane, 2012, emphasises the interplay between austerity-induced recessions and banking-sector weaknesses); asset and housing market collapses (the Athens Stock Exchange general index is currently stuck at around 600–650 points, down from about 1500 in 2009; the housing construction sector, long the motor of business and employment, has been dead since the onset of the crisis); social security financial difficulties (the social security funds were badly hit by the 2012 ‘PSI’ haircut); these effects can feed back into the public debt as banks need recapitalisation (as has happened several times, Wyplosz 2017) or the social security is in deficit. All these factors are present in Greece, and all depress spending further. Additionally, repeated income decreases and tax increases have exhausted savings, there are no ‘Ricardian’ consumers any longer; any further cuts that may be required for additional fiscal consolidation will hit spending almost one-for-one as there is no saving to cushion their effects.

To cap it all, and equally importantly, the two broad aims of any fiscal consolidation other than the control of public finances discussed in the Introduction, namely the internal devaluation strategy and the supply-side, structural reforms, both face serious difficulties as strategies for recovery. As far as internal devaluation is concerned, it may not be able to generate an adequate external market. Currently in stagnation, the European market cannot be a ready substitute for internal demand (Lane 2012); furthermore, the nature of many of Greece’s exports, in the primary and secondary sectors, may not be high, so export revenues may not rise when export prices drop (Blanchard 2016). Concerning ‘structural reforms’, the most used buzzword in the protracted negotiations between Greece and its creditors, there are long-standing criticisms reviewed in the next Section; the bottom line is that supply-side reforms cannot restore output in the short run. An additional concern may be the psychological and political effect of having to implement an unfeasible fiscal agenda; there may well exist a ‘conditionality Laffer Curve’ in the sense that austerity requirements that are too demanding end up inducing less fiscal effort (Ardagna and Caselli 2014). Thus, all lines of argument point to the fact that the fiscal multiplier applicable to Greece’s austerity will likely be very high.

With a typical Keynesian estimate of $-dg/ds = 1.5$, the baseline criterion (3) with (1) becomes: $\bar{b} \approx 67\%$, while a typical neoclassical estimate of 0.75 implies $\bar{b} \approx 133\%$. If fiscal consolidation in a recession has powerful effects, as argued, then $-dg/ds > 1.5$ and $\bar{b} < 67\%$. This is well below the OECD average of actual debt-GDP (89% in 2014)—and orders of magnitude smaller than Greece's 180%.⁷ Furthermore, (1) reveals that with realistic assumptions about the real interest rate (0.02–0.04), the real growth rate (≈ 0.02) and the fiscal multiplier (> 1), see Martin and Philippon (2014), the feasible primary surpluses fall short of the ones envisaged by IMF (2013), which average 3.8% for G-20 over 2020–2030 or the 3.5% required by Greece's creditors for 2018 and beyond. In an echo of the Eichengreen and Panizza (2014) critique, our analysis suggests primary surplus of the order of 2% may be the limit of what is *economically* feasible.

10.4 The Supply Side, Structural Reforms and Conditionality

We now turn to a critical discussion of supply-side, structural reforms that are one main pillar of conditionality. There are two reasons why this topic merits a separate, albeit brief, discussion. As alluded to above, 'structural reform' is a continuous theme in the negotiations regarding the Greek rescue programmes and the front on which Greece has always received the strongest criticisms as not doing enough. A second reason why we should emphasise this issue is that our model of the preceding Section has been entirely demand-side; we argued that fiscal consolidation will have a persistent effect on the real growth rate (the 'multiplier') without regard to the supply side. Might it be possible that appropriate supply-side measures enacted by structural reform and adjustment could mitigate, perhaps negate, the effects of fiscal consolidation on growth? The brief review below will conclude, as briefly mentioned above, that this is highly unlikely; the main reasons being that currently the 'binding constraints' (Hausman et al. 2008) that Greece faces are on the demand side (see Rodrik, Chap. 3 above) and that such reforms will

produce beneficial effects only in the long run while in the short run their effects will quite possibly be detrimental. Many of the criticisms made below are actually made by the IMF in its review of its practices in regard to the Greek crisis at about the time of finalising this Chapter (IMF 2017; see also Wyplosz 2017). A more holistic critique of structural reforms as part of the policy response to the crisis is by Grahl (Chap. 4 in this volume).

There is no denying that Greece's economy, public sector and socio-economic institutions would have, and indeed have, benefitted from rationalisation and modernisation. The agenda of structural reform is quite broad and often controversial: It arguably encompasses reform in labour and product markets aiming to break monopoly power and barriers to entry, reshaping of institutions aiming to promote openness, transparency and entrepreneurship, the rule of law, property rights and contract enforcement, reform of the public sector to increase efficiency and reduce red tape, reform of the social security and tax systems, privatisation of state assets, etc. (see, e.g. Rodrik, Chap. 3 above). As emphasised by both Rodrik and others (e.g. IMF 2017), in general, the recipes of structural reforms followed by Greece since 2009 were not designed in Greece itself; due to possibly two reasons, i.e. its very low bargaining position *vis-à-vis* its creditors (Ardagna and Caselli 2014) but also perhaps its inability to design and implement an agenda of its own, Greece just accepted the conditionality imposed by the 'Troika' of official creditors (EU, IMF, ECB). There are constant complaints that the country is not doing enough, it always lags behind implementing what it has agreed to implement. Against that, one may argue that, in addition to an unprecedented fiscal consolidation, the country has root-and-branch reformed social security, aspects of the public sector and the tax system, privatised state assets, liberalised markets, etc. The purpose of this Section is not to evaluate these claims (a ball-point answer would be that neither extreme claim of total inertia or enthusiastic drive and compliance are correct); nor to review the political economy of the conditionality imposed on Greece (on which Wyplosz, Chap. 2 above, offers a valuable critique); rather, the aim is to review whether such reforms are properly designed and whether they are expected to have beneficial effects on output and at what horizon.

It is a more or less widely shared conclusion that structural reforms produce beneficial effects in the medium to long runs (e.g. ECB 2014; Varga et al. 2014). At the same time, the short-run effects are uncertain and may well be detrimental for growth as the extensive panel data study of reforms-focused conditionality by Dreher (2006) shows. A wide-ranging critique on the structural adjustment-led conditionality imposed by the IMF is done by Barro and Lee (2005) who show that conditionality reduces the growth rate and that ‘... a typical country would be better off economically if it committed itself not to be involved with IMF loan programs’. At all horizons, such conditionality entails adverse distributional effects (Causa et al. 2016). The wide survey by Dreher (2009) shows that the evidence of the effects of the various aspects of conditionality (type, implementation) on growth is mixed. One critical factor that seems to affect the success of such programmes is ownership—design and drive by the country itself (Dreher 2009); and we have seen that this is not an aspect on which Greek conditionality scores high.

Granted that structural adjustment and conditionality have beneficial long-run effects, these effects, however, concern the *potential* GDP; but *actual* GDP will not approach that level if other, binding, constraints prohibit it. And these binding constraints currently are on the demand side; the point made by Rodrik (Chap. 3 above). This point is reinforced by the findings of Economides, Philippopoulos and Papageorgiou (Chap. 10 in this volume) which estimates that the loss in output since 2009 has been caused by austerity by about two-thirds, and only by about one third is it due to deterioration in institutional quality. Furthermore, the above arguments may be formalised with the theorem of the second-best; this is an argument that has not been made in the literature (to our knowledge). In a highly efficient economy, fixing a ‘local’ dysfunctionality with targeted supply-side reforms brings the economy closer to the ‘first-best’ (whatever that is) and may bring beneficial effects sooner rather than later; the ‘Agenda 2010’ reforms in Germany in the early 2000s comes to mind, which improved the competitiveness of an anyway highly efficient economy. But in an economy of multiple deviations from the first-best, fixing one element does not necessarily get us closer to it; and the problem is compounded

when many important missing pieces of the ‘efficient jigsaw’ are on the demand side, which is currently the case in Greece as discussed. Practically speaking, in this case, it is more likely that every supply-side reform (e.g. social security, public-sector downsizing, etc.) on its own worsens, rather than improves, the output for the foreseeable future by simply further choking demand.

Finally, the actual content of the reform agenda itself may be questioned. Here, once more we can take the lead of Rodrik (Chap. 3 above). His overall point, amply documented by the international experience, is that the reforms must be focused, driven by local knowledge, and targeted specifically at ameliorating some carefully pinpointed binding constraints; e.g. in the case of Greece, he cites specific export-promoting policies as a priority. One may argue that improvement of the quality of the public sector is also another area that could be targeted. But the main point is that there is little chance of success of armchair-designed, broad-brush, unfocused policies driven more by the tenets of the ‘Washington consensus’ or *ordo-liberalism* (but that is another discussion—see Bratsiotis and Cobham, Chap. 5 above) rather than knowledge on the ground. And—you’ve guessed it!—the conditionality required of Greece is of the first, wrong, kind, partly because it was not designed in the country.

On a more practical level, one may question the meaning of some of these reforms. For instance, in relation to the labour market where creditors require yet more liberalisation: With the wages as low as 300 euros per month as reported in the press, rampant casual employment, work hours that are routinely violated, businesses that delay payments or make part-payments or (illegal) payments in kind, one wonders what the objective of any further liberalisation of the labour market is; allowing lay-offs of 10% per month as is currently under negotiation will only exacerbate unemployment. On the social security front, Greece still makes high payments to social security (in excess of 10% of GDP) whereas the European average is of the order of 2–3% of GDP, so the situation is not sustainable. As explained in the Introduction, the country is experiencing the compounded effects of quite an abrupt demographic transition, together with the crisis and years of inaction. But with the progressive impoverishment of the pensioner generation

due to successive cuts, and with many supporting unemployed younger offspring, not only are there serious political and moral objections to further action; but additional reform will simply reduce demand further, worsening the binding constraints. Equally, there is no doubt that putting social security and pensions on a viable footing is at the top of the policy concerns of the country for the medium term. Fire-sale privatisation of state assets, particularly the most financially viable ones such as the main ports, also raises questions as the cash that will be raised for the public coffers is minimal, while it will generate a wave of layoffs in an already very stressed labour market. The high tax rates (VAT of 24%) negates the effects of the internal devaluation on improving competitiveness.

All this is not say that reforms should not be undertaken; it all points to the fact that the beneficial effects will only be realised in an uncertain horizon. Meanwhile, the main constraints are on the demand side, as our model above has hypothesised. The policy corollary once again is that amelioration of austerity is now the paramount objective; fanciful reliance on structural reforms as a method of offsetting the effects of austerity risks, in fact, having the opposite effects for the foreseeable future by worsening the demand constraints that are currently the binding ones.

10.5 Conclusions and Policy Implications

This paper re-visits the basic theory of government debt sustainability and proposes a positive criterion of maximum debt. The approach is simple and novel: It asks, how much revenue can a creditor expect to raise from an indebted government? Our proposed criterion of sustainability, (3), links the maximum repayable (hence sustainable) government debt (as a percentage over GDP) to the fiscal multiplier. Around this critical value, there exists a 'debt Laffer Curve' on both sides of which debt dynamics is unstable—either downwards to zero or upwards to infinity.

While the size of the multiplier and of the numerical value of our criterion is still open for debate, plausible estimates of the fiscal multiplier

imply sustainable debt limits well below the 100% threshold over GDP; so that the primary surpluses suggested by IMF (2013) are not only untenable but are also self-defeating. Our simple model is entirely demand-side, but as our brief review of supply-side reforms and conditionality has argued, currently in Greece, demand is the main ‘binding constraint’ and will likely remain such for the foreseeable future. So, while our framework would benefit from refinement from more detailed structure, the emphasis on demand is at the moment not grossly misleading. Thus, it seems safe to conclude that surpluses of the order of 3.5% of GDP as currently demanded from Greece for a number of years from 2018 on are not feasible. Their only effect will be a vicious circle of never-ending austerity and mounting debt.

Given that further austerity is self-defeating, what should be done from now on? We conclude with some brief thoughts on this ‘mother of all questions’. First, some observations on debt: In present-value terms, Greek debt is not as high as its nominal value (currently at about 180% of GDP). This is because Greece currently is benefitting from lower interest rates now (2.2% in 2016) than ever and one of the lowest in Europe and the percentage of GDP that goes to interest payments (3.9% in 2016) is also the lowest of the last 20 years (Christodoulakis 2016; IMF 2016). Moreover, debt is long-term with extensive grace periods and a considerable grant element (estimated at 54% of GDP by Schumacher and Weder di Mauro 2015). As a result, the percentage of GDP that is required for servicing the debt is on the low side in Europe and the maturity-adjusted debt-GDP ratio is about 100% (Schumacher and Weder di Mauro 2015).

As our model shows, growth is key in maximising the percentage of the debt that can be re-paid. Fiscal consolidation kills growth and reduces the feasibly repayable debt if the fiscal multiplier is high. For this reason, we argue that the priority now is not the reduction of debt but the resumption of growth via the cessation of austerity. For this, the required primary surpluses must not increase from the current 1.5–2% to 3.5% in 2018 as is envisaged. Growth-conditioned surpluses (a growth dividend *à la* Sachs 2011) can be used instead. The overall objective should be the return to vigorous growth; this will not

only help the return to healthy employment rates (see Christopoulos and Bournakis, Chap. 13 in this volume) but will also ensure that the maximum amount of funds will be returned to the European taxpayer in present-value terms.

Notes

1. The related, but distinct, literature on optimal government debt (e.g. Alesina and Passalacqua 2016) provides insights on whether debt ought to be smoothed or not and yields indirect implications on debt dynamics, but does not address the issue of solvency as such as that is built into the models as an assumption.
2. As discussed, the policies imposed by creditors ('conditionality') partly aim to ensure that the target primary surplus is indeed delivered.
3. In this sub-Section, we assume that there is a permanent primary surplus-GDP ratio that affects the real GDP growth rate permanently. The merits of such an assumption are more expositional than real. In sub-Sect. 10.3.3 below, we make a step towards more realism by considering a temporary change in the surplus (ratio) that has a parametrically persistent effect on growth.
4. The inequality $r > g$ implies 'dynamic efficiency' (Abel et al. 1989).
5. Taxes are analysed in the 'optimal fiscal policy' literature (Leith and Wren-Lewis 2005).
6. This piece had been finalised when I became aware of the very recent article by House, Proebsting and Tesar (2017) that shows that austerity-related multipliers can be as high as 2 and that such austerity can in fact bring about an increase in the debt; both points emphasised in this paper. In light of mounting evidence against austerity along these lines, the equally recent blog by Wren-Lewis (2017) argues that the continuing austerity in the Eurozone is politically motivated. It is encouraging that the IMF is beginning to realise the counter-productive nature of further austerity (see Hagan et al. 2017).
7. These measures concern nominal debt. Ideally, one should consider maturity-adjusted debt, see Schumacher and Weder di Mauro (2015).

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11

Fiscal Consolidation Policies and the Underground Economy: The Case of Greece

Evi Pappa, Rana Sajedi and Eugenia Vella

11.1 Introduction

The path of economic recovery from the recent global recession and the financial market crisis has been rather slow and fragile. Growth in advanced economies has been throttled by mounting government debt

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and the financial crisis has turned into a fiscal one. In the aftermath of this crisis, policy-making has mainly focused on the implementation of sizeable and long-lived fiscal consolidation plans, including cuts in various components of government spending and increases in taxation, so as to decrease government deficit and debt levels.

These developments in the economy have excited renewed interest in the strand of research examining the macroeconomic impacts of fiscal consolidations, a first wave of which was motivated by the implementation of the Maastricht Treaty.¹ Using multi-year fiscal consolidation data for 17 OECD countries over the period 1980–2005, Alesina et al. (2015), show that spending-based adjustments have been associated with mild and short-lived recessions, while tax-based corrections have been accompanied by prolonged and deep recessions. Erceg and Lindé (2013) demonstrate theoretically that, given the limited accommodation by the central bank and the fixed exchange rates under a currency union, an expenditure-based consolidation depresses output by more than a tax-based one, but this is reversed in the long-run as real interest and exchange rates adjust towards their flexible price levels.

While increasing attention is currently devoted to the effects of fiscal consolidations, the presence of a large underground economy in many countries undertaking such policies has been left unnoticed, despite the obvious implications for the government budget. The underground economy comprises *“all market-based, lawful production or trade of goods and services deliberately concealed from public authorities in order to evade either payment of income, value added or other taxes, or social security contributions”* (Buehn and Schneider 2012, p. 175–176).² A report by the technical staff of the Spanish Finance Ministry (Gestha 2014) indicates that the shadow economy increased by 6.8 percentage points between 2008 and 2012, reaching 24.6% of GDP. Using a model, calibrated to firm-level data for Greece, Pappadà and Zylberberg (2015) show that the increase in tax evasion can explain three quarters of the revenue leakages following the 2010 VAT hikes, when only half of the expected increase in revenue was realized. Colombo et al. (2016) also provide empirical evidence of a rise in the underground economy in recent years by focusing on the role of the banking crisis.

This chapter develops a theoretical model to revisit the macroeconomic effects of fiscal consolidation in the presence of underground activities. The economy is divided into a formal and an unofficial, or underground, sector. Firms can, therefore, hire labour in the underground sector to evade social security contributions. Households can also evade personal income taxation by reallocating their labour search towards the underground sector, but without being entitled to unemployment benefits. In each period of time, there is a positive probability that irregular employment is detected, in which case the match is dissolved. Following Erceg and Lindé (2013), we specify either labour tax rates or government consumption expenditure to react to the deviation of the debt-to-GDP ratio from a target value. Fiscal consolidation occurs when the target value of debt is hit by an exogenous negative shock.

Our model is calibrated for Greece. When the underground activities are absent from the economy, the model can confirm the empirical findings of Alesina et al. (2015). Spending cuts lead to output losses only in the short run, while tax hikes lead to larger and more prolonged recessions. When we allow for the presence of an underground economy, our findings suggest that the latter amplifies the negative effects of labour tax hikes on output and unemployment, while it mitigates those of expenditure cuts. Tax evasion implies that a larger increase in the tax rate is needed to reduce debt, and this exacerbates the distortionary effects of the consolidation. Moreover, after a tax hike, workers and firms reallocate resources to the less productive informal sector, increasing inefficiencies. On the other hand, government spending cuts reduce the size of the underground economy. The spending cut creates a positive wealth effect, which increases consumption and investment and reduces labour market participation. The increased capital accumulation raises the productivity of the more capital-intensive formal sector, and so agents reallocate their labour search towards the formal sector. Hence, the share of underground employment in total employment falls. Relative to standard models, tax evasion increases the size of this wealth effect, thereby, increasing the crowding-in of private

consumption, and amplifying output losses. Tax hikes are costly in terms of welfare, but spending cuts typically involve gains, since consumption increases and labour supply decreases. We also use our model to evaluate the impact of the recent consolidation policies in Greece. Despite the fact that the consolidation plans rely heavily on spending cuts, the model predicts an increasing size of the underground economy, prolonged recessions, and significant welfare costs.

The remainder of the chapter is organized as follows. In the next section, we provide an informal description of the model and discuss the main results. Section 11.3 presents the policy evaluation exercise and Sect. 11.4 concludes.

11.2 Predictions of the Model

We develop a New Keynesian model with unemployment, endogenous labour decisions, and sticky prices in the short run, following Pappa et al. (2015). There are two types of firms in the economy: (i) competitive firms that produce intermediate goods in either the formal or informal sector, and (ii) monopolistic retailers that use all intermediate varieties to produce differentiated retail goods, which are then costlessly aggregated into a final consumption good. Intermediate firms may choose to produce in the informal sector in order to evade the payroll taxes paid on formal employment. In each period, they face a probability of being inspected and convicted of tax evasion, in which case they pay a fine, and the employment match is terminated. The members of the representative household can be formal or informal employees, unemployed jobseekers and labour force non-participants. Jobseekers can choose to search in the informal sector in order to evade labour income taxes. The household rents out its private capital to the intermediate firms and purchases the final consumption good. The government collects taxes from the formal sector and uses them to finance public expenditures and the provision of unemployment benefits. The equations of the model are provided in the Appendix.

11.2.1 Results

In this section, we compare the effects of a 5% reduction in the desired long-run debt target, which is achieved after 10 years, either through a fall in government consumption expenditure, or a hike in labour tax rates.

11.2.1.1 Economy Without Underground Activities

We first provide some basic intuition from a standard model without underground activities. A consolidation implemented through a cut in government spending has two effects. First, there is a negative demand effect for firms, which leads, in the presence of nominal rigidities, to a fall in labour demand. Second, there is a positive wealth effect for the household, which increases consumption and investment and reduces labour force participation. Given the drop in both labour demand and supply, employment falls and the wage rate rises. Output falls in the short run, but increases afterwards because the rise in investment boosts capital accumulation. The unemployment rate falls on impact, reflecting movements in the fraction of jobseekers, but increases afterwards as employment and wages adjust.

When the fiscal consolidation is implemented through a labour tax hike, there is a negative wealth effect for the household, which leads to a fall in consumption and investment. However, as the return from employment decreases, there is a substitution effect that dominates the wealth effect, and leads to a fall in labour market participation. Firms contract their labour demand because of the fall in private demand. Employment and output fall more persistently than in the case of spending cuts, due also to the fall in investment.

These theoretical channels can explain the empirical evidence of Alesina et al. (2015) according to which spending cuts are accompanied by mild and short-lived recessions, while tax hikes lead to more prolonged and deep recessions.

11.2.1.2 Economy with Underground Activities

We can now analyze the responses of the main variables in the economy with underground activities, shown in Fig. 11.1. First, let us say that the response of the formal sector is qualitatively similar to the economy without underground activities. However, there is an additional channel at play. For the case of tax hikes, unemployed jobseekers reallocate their labour supply and the intermediate firms reallocate their labour demand towards the underground sector. There are direct incentives for jobseekers to search in the informal sector because of the higher tax rates in

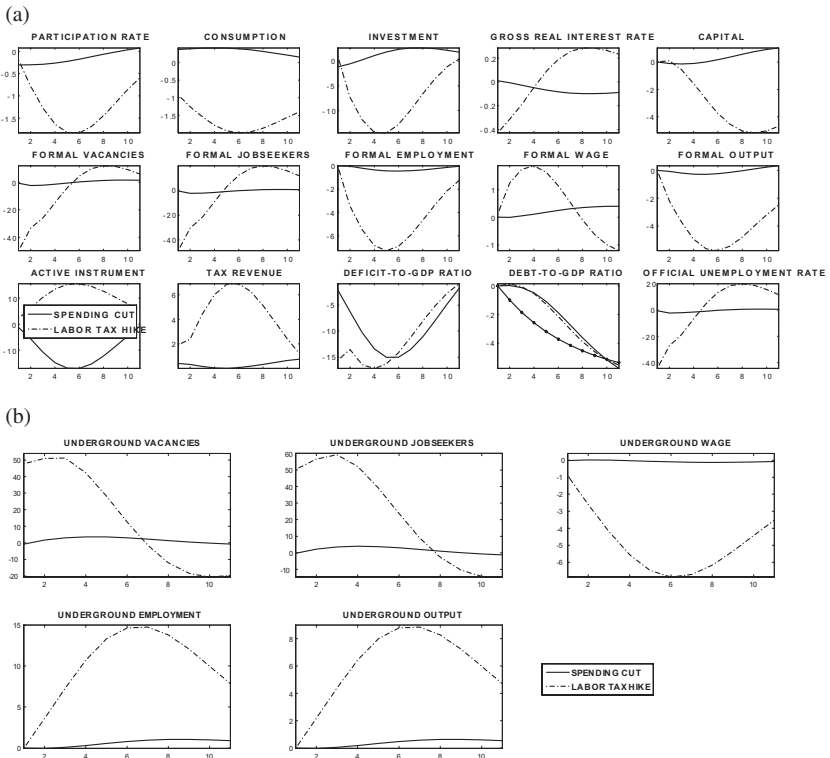


Fig. 11.1 Impulse response functions of the economy with underground activities

the formal sector. Intermediate firms have incentives to post vacancies in the informal sector because of the fall in the informal wage. The fall in investment, and hence the capital stock, lowers the productivity differential between the two sectors, and further increases incentives for reallocation towards the informal sector. Consequently, the share of underground employment in total employment increases.

Turning now to the case of expenditure cuts, the negative demand effect of the spending cut affects both formal and informal production, leading to a reduction in labour demand in both sectors. Similarly, as labour force participation falls, there is a reduction in unemployed jobseekers in both sectors. This leads to a fall in total employment. Moreover, there is a reallocation of labour towards the formal sector and the share of underground employment in total employment falls. This happens for the following reasons. First, we have assumed that the formal labour market is characterized by a higher matching efficiency and a lower job destruction rate. Second, the rise in the capital stock further increases the productivity of the formal sector relative to the informal sector. In the presence of these efficiency gains, and to mitigate the negative effects of the fiscal contraction, agents optimally choose to reallocate towards the formal sector.

11.2.1.3 Comparison

Figure 11.2 compares the responses of output, the unemployment rate and welfare in the two models.³ For spending cuts, shown in the top panel, the presence of tax evasion generates smaller losses in output, a drop in the unemployment rate at all horizons, and larger welfare gains. With tax evasion, the increases in taxation required to achieve a given change in deficit are larger, and, thus, following a spending cut, taxes in the future are expected to fall by more. In other words, there is an amplification of the positive wealth effect. Consequently, the rise in consumption and the fall in labour force participation become larger relative to the model without tax evasion, magnifying welfare gains. The increased crowding-in of private consumption mitigates the negative

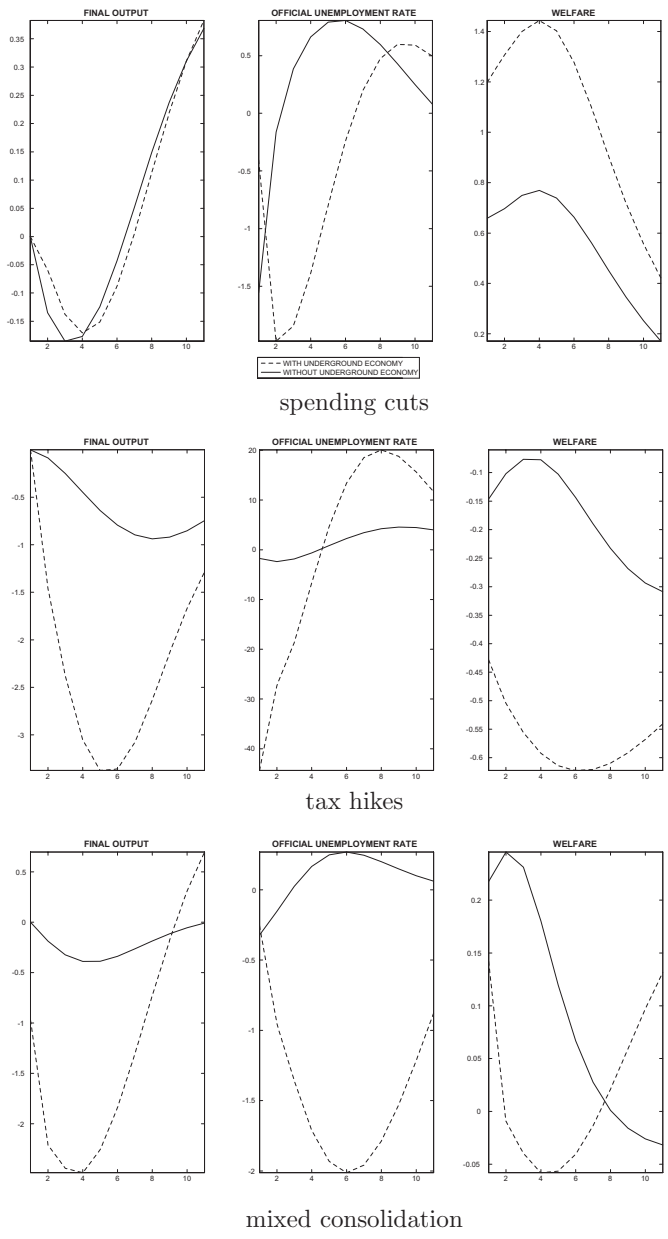


Fig. 11.2 Comparison with and without the underground economy

demand effect for the firms, which mitigates output costs. The larger reduction in labour force participation implies a fall in the number of jobseekers in the formal sector, which is reflected in the official unemployment rate.

For tax hikes, shown in the middle panel, the presence of the underground economy amplifies the output losses because of the lost tax revenue, implying that larger increases in tax rates are needed to reduce the debt-to-GDP ratio. This exacerbates the distortionary effects of the consolidation, leading to a larger drop in labour force participation, private consumption and investment. Thus, there is a larger contraction in the formal sector, which is reflected in the movement of the official unemployment rate: the initial fall is amplified as jobseekers drop out of the formal sector, and the long run rise is higher as firms post fewer vacancies in this sector. Additionally, the reallocation towards the less productive informal sector increases inefficiencies, further reducing final output. Furthermore, tax hikes lead to welfare losses, which are initially lower with tax evasion, but in the medium and long run, as consumption falls increasingly, they become higher.

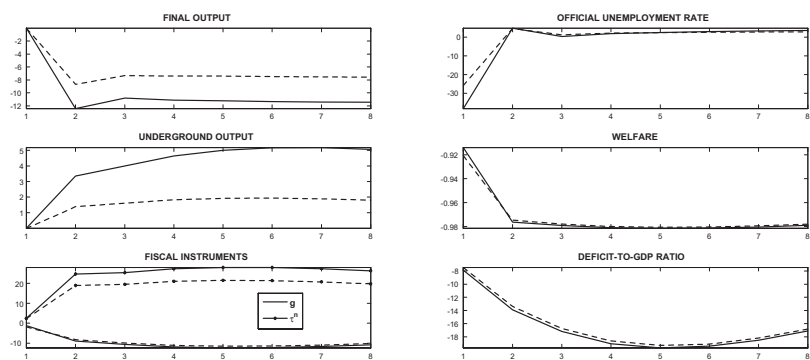
The bottom panel shows the responses when we allow both policy instruments to move simultaneously to reduce the deficit. We assume that a fraction 50% of the reductions in deficit come from expenditure cuts and an equal fraction of 50% from revenue increases. In this case, the responses of consumption and investment are determined by the competing positive and negative wealth effects from the two instruments. The presence of tax evasion matters crucially for determining the relative strength of the two opposite effects. In the absence of the underground economy, the positive wealth effect of the expenditure cut is dominant and consumption increases. When the underground economy is present, consumption and investment fall, as already seen. Consequently, as in the case of tax hikes, output and unemployment responses are amplified in the presence of tax evasion. Moreover, the welfare gains obtained from mixed consolidation packages in the case without an underground economy turn into welfare losses in the case with an underground economy.

11.3 Policy Evaluation

We employ our model to analyze the effects of the recent consolidation packages implemented in Greece. We adjust the size of the consolidation to match the information in OECD (2012).⁴ In the short run, we match the consolidation volume implemented in 2010, 7.8% of GDP, and in the long run, we match the announced consolidation volume that was planned to be implemented by 2015, 18.5% GDP. We allow both instruments to move simultaneously, fixing the expenditure share in the policy mix to 60%.

The simulation results are reported in Fig. 11.3 with solid lines. Despite the substantial share of spending cuts in the policy mix, we see that tax evasion, as represented by the output produced in the underground economy, increases. With the use of tax hikes in the consolidation mix, the incentive to produce in the underground sector dominates the efficiency gains from producing in the formal sector, which leads to a reallocation towards the underground sector. The model clearly predicts sizeable and persistent output, unemployment and welfare costs following the consolidation packages.

We also run a counterfactual exercise by repeating simulations for an economy, where the share of informal employment in total employment



Solid lines: baseline scenario, dashed lines: counterfactual (smaller underground economy)

Fig. 11.3 Simulation of fiscal consolidation mix in Greece

is reduced by half. As we can see by the dashed lines, implementing the same volume of consolidation in an economy with lower tax evasion implies smaller output losses and smaller increase of the informal sector. This is because labour tax hikes needed to achieve the same level of deficit reduction are now significantly smaller. The message of our analysis is therefore clear: carrying out fiscal consolidation without fighting tax evasion can lead to substantial recessionary effects and increase the size of the underground economy.

11.4 Conclusions

A New Keynesian model with unemployment and an informal sector demonstrates that the presence of the latter mitigates the effects of expenditure cuts, while it amplifies the contractionary effects of labour tax hikes. The theoretical results also suggest that the fiscal instrument used to achieve debt consolidation affects the incentives of agents to produce in the informal sector. Spending cuts reduce the size of the underground economy, while tax hikes increase it.

In this chapter, we also analyzed how recent fiscal consolidation plans in Greece affect tax evasion, output, unemployment and welfare. The model predictions point to increasing levels of tax evasion, and prolonged output and welfare costs following the consolidation. The severity of the austerity package implemented in Greece is associated with heavy costs. Furthermore, these welfare costs are exacerbated by the presence of the underground economy. Hence, reforms aimed at fighting informality should go hand-in-hand with austerity measures in order to mitigate the welfare costs of debt consolidations.

11.5 Appendix: Equations of the Model

11.5.1 Labour Markets

We account for the imperfections and transaction costs in the labour market by assuming that jobs are created through a matching function.

For $j = F, I$ denoting the formal and informal sectors, let v_t^j be the number of vacancies and u_t^j the number of jobseekers in each sector. We assume matching functions of the form:

$$m_t^j = \mu_1^j (v_t^j)^{\mu_2} (u_t^j)^{1-\mu_2} \quad (1)$$

where we allow for differences in the efficiency of the matching process, μ_1^j , in the two sectors. In each sector we can define the probability of a jobseeker being hired, ψ_t^{hj} , and of a vacancy being filled, ψ_t^{fj} , as follows:

$$\psi_t^{hj} \equiv \frac{m_t^j}{u_t^j}, \quad \psi_t^{fj} \equiv \frac{m_t^j}{v_t^j}$$

In each period, jobs in the formal sector are destroyed at a constant fraction, σ^F , and m_t^F new matches are formed. The law of motion of formal employment, n_t^F , is thus given by:

$$n_{t+1}^F = (1 - \sigma^F) n_t^F + m_t^F \quad (2)$$

In the informal sector there is an exogenous fraction of jobs destroyed in each period, σ^I , as well as a probability, ρ , that an informal employee loses their job due to an audit. The law of motion of informal employment, n_t^I , is given by:

$$n_{t+1}^I = (1 - \rho - \sigma^I) n_t^I + m_t^I \quad (3)$$

11.5.2 Households

The representative household consists of a continuum of infinitely lived agents. The members of the household derive utility from leisure, which corresponds to the fraction of members that are out of the labour force, l_t , and a consumption bundle, cc_t , defined as:

$$cc_t = [\alpha_1 (c_t)^{\alpha_2} + (1 - \alpha_1) (g_t)^{\alpha_2}]^{\frac{1}{\alpha_2}}$$

where g_t denotes public consumption, taken as exogenous by the household, and c_t is private consumption. The elasticity of substitution between the private and public goods is given by $\frac{1}{1-\alpha_2}$. The instantaneous utility function is given by:

$$U(cc_t, l_t) = \frac{cc_t^{1-\eta}}{1-\eta} + \Phi \frac{l_t^{1-\phi}}{1-\phi}$$

where η is the inverse of the intertemporal elasticity of substitution, $\Phi > 0$ is the relative preference for leisure, and ϕ is the inverse of the Frisch elasticity of labour supply.

At any point in time, a fraction n_t^F (n_t^I) of the household members are formal (informal) employees. Following Ravn (2008), the participation choice is modelled as a trade-off between the cost of giving up leisure and the prospect of finding a job. In particular, the household chooses the fraction of the unemployed actively searching for a job, u_t , and the fraction which are out of the labour force and enjoying leisure, l_t , so that:

$$n_t^F + n_t^I + u_t + l_t = 1 \quad (4)$$

The household chooses the fraction of jobseekers searching in each sector: a share s_t of jobseekers look for a job in the informal sector, while the remainder, $(1 - s_t)$, seek employment in the formal sector. That is, $u_t^I \equiv s_t u_t$ and $u_t^F \equiv (1 - s_t) u_t$.

The household owns the capital stock, which evolves over time according to:

$$k_{t+1} = i_t + (1 - \delta)k_t - \frac{\omega}{2} \left(\frac{k_{t+1}}{k_t} - 1 \right)^2 k_t \quad (5)$$

where i_t is investment, δ is a constant depreciation rate and $\frac{\omega}{2} \left(\frac{k_{t+1}}{k_t} - 1 \right)^2 k_t$ are adjustment costs.

The intertemporal budget constraint is given by:

$$(1 + \tau_t^c)c_t + i_t + \frac{B_{t+1}\pi_{t+1}}{R_t} \leq r_t k_t + (1 - \tau_t^n)w_t^F n_t^F + w_t^I n_t^I \quad (6)$$

$$+ \varpi u_t^F + B_t + \Pi_t^p - T_t$$

where $\pi_t \equiv p_t/p_{t-1}$ is the gross inflation rate, w_t^j , $j = F, I$, are the real wages in the two sectors, r_t is the real return on capital, ϖ denotes unemployment benefits, available only to formal jobseekers (see, e.g. Boeri and Garibaldi 2007), B_t is the real government bond holdings, R_t is the gross nominal interest rate, Π_t^p are the profits of the monopolistic retailers, discussed below, and τ_t^c , τ_t^n and T_t represent taxes on private consumption, labour income and lump-sum taxes respectively.

The household maximizes expected lifetime utility subject to (1) for each j , (2), (3), (4), (5), and (6). Taking as given n_t^j , they choose u_t , s_t (which together determine l_t) and n_{t+1}^j , as well as c_t , k_{t+1} and B_{t+1} .

It is convenient to define the marginal value to the household of having an additional member employed in each sector, as follows:

$$V_{n^F t}^h = \lambda_{ct} w_t^F (1 - \tau_t^n) - \Phi l_t^{-\phi} + (1 - \sigma^F) \lambda_{n^F t} \quad (7)$$

$$V_{n^I t}^h = \lambda_{ct} w_t^I - \Phi l_t^{-\phi} + (1 - \rho - \sigma^I) \lambda_{n^I t} \quad (8)$$

where $\lambda_{n^F t}$, $\lambda_{n^I t}$ and λ_{ct} are the multipliers in front of (2), (3) and (6) respectively.

11.5.3 Production

11.5.3.1 Intermediate Goods Firms

Intermediate goods are produced with two different technologies:

$$x_t^F = \left(A_t^F n_t^F \right)^{1-\alpha^F} (k_t)^{\alpha^F} \quad (9)$$

$$x_t^j = \left(A_t^j n_t^j \right)^{1-\alpha^j} \tag{10}$$

where A_t^j denotes total factor productivity in sector j . Following the literature, we assume that the informal production technology uses labour inputs only (see, e.g. Busato and Chiarini 2004).

Firms maximize the discounted value of future profits, subject to (2) and (3). That is, they take the number of workers currently employed in each sector, n_t^j , as given and choose the number of vacancies posted in each sector, v_t^j , so as to employ the desired number of workers next period, n_{t+1}^j . Here, firms adjust employment by varying the number of workers (extensive margin) rather than the number of hours per worker (intensive margin). According to Hansen (1985), most of the employment fluctuations arise from movements in this margin. Firms also decide the amount of private capital, k_t , needed for production. They face a probability, ρ , of being inspected by the fiscal authorities, convicted of tax evasion and forced to pay a penalty, which is a fraction, γ , of their total revenues. We assume that, once they are produced, there is no differentiation between intermediate goods from the different sectors. In other words, we assume that formal and informal goods are perfect substitutes, so that they are sold at the same price, p_t^x (see, e.g. Orsi et al. 2014). Hence the problem of an intermediate firm is summarized by the following Bellman equation:

$$Q(n_t^F, n_t^I) = \max_{k_t, v_t^F, v_t^I} \left\{ (1 - \rho\gamma) p_t^x (x_t^F + x_t^I) - (1 + \tau_t^s) w_t^F n_t^F - w_t^I n_t^I - r_t k_t - \kappa^F v_t^F - \kappa^I v_t^I + E_t \left[\Lambda_{t,t+1} Q(n_{t+1}^F, n_{t+1}^I) \right] \right\}$$

where τ_t^s is a payroll tax, κ^j is the cost of posting a new vacancy in sector j , and $\Lambda_{t,t+1} \equiv \beta \frac{U_{cc,t+1}}{U_{cc,t}} = \beta \left(\frac{cc_{t+1}}{cc_t} \right)^{-\eta}$ is a discount factor. The first-order conditions are:

$$r_t = (1 - \rho\gamma) p_t^x \left(\frac{\alpha^F x_t^F}{k_t} \right) \tag{11}$$

$$\frac{\kappa^F}{\psi_t^{fF}} = E_t \Lambda_{t,t+1} \left[(1 - \rho\gamma) p_{t+1}^x (1 - \alpha^F) \frac{x_{t+1}^F}{n_{t+1}^F} - (1 + \tau_{t+1}^s) w_{t+1}^F + \frac{(1 - \sigma^F) \kappa^F}{\psi_{t+1}^{fF}} \right] \quad (12)$$

$$\frac{\kappa^I}{\psi_t^{fI}} = E_t \Lambda_{t,t+1} \left[(1 - \rho\gamma) p_{t+1}^x (1 - \alpha^I) \frac{x_{t+1}^I}{n_{t+1}^I} - w_{t+1}^I + \frac{(1 - \rho - \sigma^I) \kappa^I}{\psi_{t+1}^{fI}} \right] \quad (13)$$

According to (11)–(13), the net value of the marginal product of private capital should equal the real rental rate and the expected marginal cost of hiring a worker in each sector j should equal the expected marginal benefit. The latter includes the net value of the marginal product of labour minus the wage, augmented by the payroll tax in the formal sector, plus the continuation value.

For convenience, we define the value of the marginal formal and informal job for the intermediate firm:

$$V_{n^F t}^f = (1 - \rho\gamma) p_t^x (1 - \alpha^F) \frac{x_t^F}{n_t^F} - (1 + \tau_t^s) w_t^F + \frac{(1 - \sigma^F) \kappa^F}{\psi_t^{fF}} \quad (14)$$

$$V_{n^I t}^f = (1 - \rho\gamma) p_t^x (1 - \alpha^I) \frac{x_t^I}{n_t^I} - w_t^I + \frac{(1 - \rho - \sigma^I) \kappa^I}{\psi_t^{fI}} \quad (15)$$

11.5.3.2 Retailers

There is a continuum of monopolistically competitive retailers indexed by i on the unit interval. Retailers buy intermediate goods and differentiate them with a technology that transforms one unit of intermediate goods into one unit of retail goods, and thus the relative price of intermediate goods, p_t^x , coincides with the real marginal cost faced by the retailers. Let y_{it} be the quantity of output sold by retailer i . The final consumption good can be expressed as:

$$y_t = \left[\int_0^1 (y_{it})^{\frac{\varepsilon-1}{\varepsilon}} di \right]^{\frac{\varepsilon}{\varepsilon-1}} \quad (16)$$

where $\varepsilon > 1$ is the constant elasticity of demand for retail goods. The final good is sold at a price $p_t = \left[\int_0^1 p_{it}^{1-\varepsilon} di \right]^{\frac{1}{1-\varepsilon}}$. The demand for each intermediate good depends on its relative price and on aggregate demand:

$$y_{it} = \left(\frac{p_{it}}{p_t} \right)^{-\varepsilon} y_t \quad (17)$$

Following Calvo (1983), we assume that in any given period each retailer can reset its price with a fixed probability $(1 - \chi)$. Hence, the price index is given by:

$$p_t = \left[(1 - \chi)(p_t^*)^{1-\varepsilon} + \chi(p_{t-1})^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \quad (18)$$

Firms that are able to reset their price choose p_{it}^* so as to maximize expected profits given by:

$$E_t \sum_{s=0}^{\infty} \chi^s \Lambda_{t,t+s} (p_{it}^* - p_{t+s}^x) y_{it+s}$$

The resulting expression for p_{it}^* is:

$$p_{it}^* = \frac{\varepsilon}{\varepsilon - 1} \frac{E_t \sum_{s=0}^{\infty} \chi^s \Lambda_{t,t+s} p_{t+s}^x y_{it+s}}{E_t \sum_{s=0}^{\infty} \chi^s \Lambda_{t,t+s} y_{it+s}} \quad (19)$$

11.5.4 Government

Government expenditure consists of consumption purchases and unemployment benefits, while revenues come from the collected fines and the payroll, consumption, and labour income taxes, as well as the lump-sum taxes. The government deficit is therefore defined by:

$$DF_t = g_t + \varpi u_t^F - TR_t - \rho \gamma p_t^x (x_t^F + x_t^I) \quad (20)$$

where $TR_t \equiv (\tau_t^n + \tau_t^s) w_t^F n_t^F + \tau_t^c c_t + T_t$ denotes tax revenues.

The government budget constraint is given by:

$$B_t + DF_t = R_t^{-1} B_{t+1} \pi_{t+1} \tag{21}$$

We assume that T_t , τ_t^s , and τ_t^c are constant and fixed at their steady state levels, and we do not consider them as active instruments for fiscal consolidation. In our model, the effects of payroll taxes are very similar to labour income taxes. Consumption taxes can have different effects, but they generally constitute a relatively small source of tax revenues. Thus, in line with Erceg and Lindé (2013), the government has two potential fiscal instruments, g and τ^n . We consider each instrument separately, assuming that if one is active, the other remains fixed at its steady state value. For $\Psi \in \{g, \tau^n\}$, we assume fiscal rules of the form:

$$\psi_t = \psi^{(1-\beta_{\psi 0})} \psi_{t-1}^{\beta_{\psi 0}} \exp \{ (1 - \beta_{\psi 0}) [\beta_{\psi 1} (b_t - b_t^*) + \beta_{\psi 2} (\Delta b_{t+1} - \Delta b_{t+1}^*)] \} \tag{22}$$

where $b_t = \frac{B_t}{y_t}$ is the debt-to-GDP ratio, and b_t^* is the target value for this ratio, given by the AR(2) process:

$$\log b_{t+1}^* - \log b_t^* = \mu_b + \rho_1 (\log b_t^* - \log b_{t-1}^*) - \rho_2 \log b_t^* - \varepsilon_t^b \tag{23}$$

where ε_t^b is a white noise shock representing a fiscal consolidation.

11.5.5 Closing the Model

11.5.5.1 Monetary Policy

There is an independent monetary authority that sets the nominal interest rate as a function of current inflation according to the rule:

$$R_t = R \exp\{\zeta_\pi (\pi_t - 1)\} \tag{24}$$

where R is the steady state value of the nominal interest rate.

11.5.5.2 Goods Markets

Total output must equal private and public demand. The aggregate resource constraint is thus given by:

$$y_t = c_t + i_t + g_t + \kappa^F v_t^F + \kappa^I v_t^I \quad (25)$$

The aggregate price index, p_t , is given by (18) and (19). The return on private capital, r_t , adjusts so that the capital demanded by the intermediate goods firm, given by (11), is equal to the stock held by the household.

11.5.5.3 Bargaining Over Wages

Wages in both sectors are determined by ex-post (after matching) Nash bargaining. Workers and firms split rents and the part of the surplus they receive depends on their bargaining power. We denote by $\vartheta^j \in (0, 1)$ the firms' bargaining power in sector j . The Nash bargaining problem is to maximize the weighted sum of log surpluses:

$$\max_{w_t^j} \left\{ (1 - \vartheta^j) \log V_{n_t^j}^h + \vartheta^j \log V_{n_t^j}^f \right\}$$

where $V_{n_t^j}^h$ and $V_{n_t^j}^f$ are defined in Eqs. (7), (8), (14) and (15). The resulting expressions for wages are given by:

$$w_t^F = \frac{(1 - \vartheta^F)}{(1 + \tau_t^s)} \left((1 - \rho\gamma) p_t^x (1 - \alpha^F) \frac{x_t^F}{n_t^F} + \frac{(1 - \sigma^F) \kappa^F}{\psi_t^{fF}} \right) + \frac{\vartheta^F}{\lambda_{ct}(1 - \tau_t^n)} \left(\Phi l_t^{-\phi} - (1 - \sigma^F) \lambda_{n^F t} \right) \quad (26)$$

$$w_t^I = (1 - \vartheta^I) \left((1 - \rho\gamma) p_t^x (1 - \alpha^I) \frac{x_t^I}{n_t^I} + \frac{(1 - \rho - \sigma^I) \kappa^I}{\psi_t^{\bar{I}}} \right) + \frac{\vartheta^I}{\lambda_{ct}} \left(\Phi l_t^{-\phi} - (1 - \rho - \sigma^I) \lambda_{n^I t} \right) \quad (27)$$

Notes

1. For example, see the survey in Perotti (1996).
2. We treat the underground or informal economy as synonymous to tax evasion throughout the chapter.
3. Welfare is computed as per-period steady state consumption equivalents.
4. We refer to Table 1 on page 138 of OECD (2012), which can be accessed directly at the following link: <http://dx.doi.org/10.1787/888932698965>.

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Part III

Sectoral Views

12

Output and Unemployment: Estimating Okun's Law for Greece

Ioannis Bournakis and Dimitris K. Christopoulos

12.1 Introduction

Unemployment in Greece in the period of the severe recession, 2010–2017, has tripled. Okun (1962)—in his seminal study—has correlated cyclical GDP movements and changes in unemployment to what has since been known as the “Okun's Law”. The Okun's Law integrates the demand with the supply side of the economy as it associates aggregate demand shocks with labour market outcomes. Accordingly, below-normal output growth leads to an increase in unemployment (job losses) while above-normal output decreases unemployment (job creation). The evolution of unemployment in the short-run determines the rate of inflation; this is the main relation of the Phillips curve.

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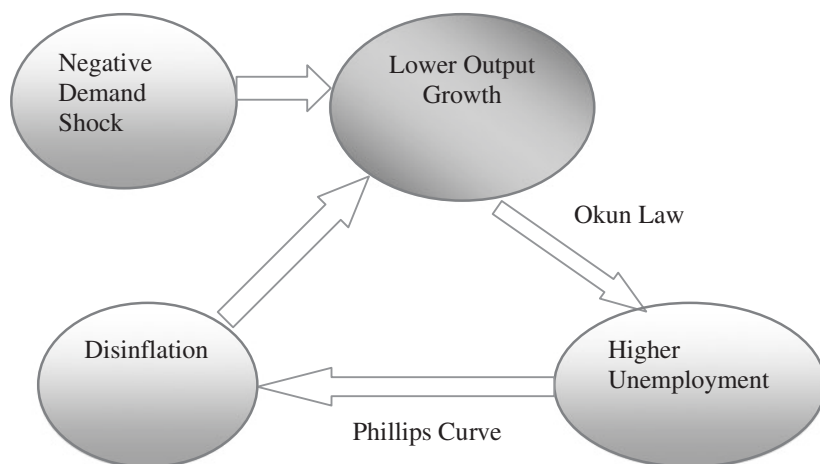


Fig. 12.1 The effects of an adverse demand side shock

Figure 12.1 illustrates the sequence of effects in the short-run followed from an adverse demand shock in the economy. The lower demand for output means that firms hire less labour, which decreases demand for labour and leads to lower wages and disinflation. The Greek economy has entered such a spiral since 2010 when the first bailout programme was offered to save the country from a disorderly bankruptcy.¹ The external financial assistance came at the cost of severe austerity necessary for the consolidation of public finances. As expected, austerity caused adverse demand shocks that impacted on unemployment. The present study—to the best of our knowledge—is the first attempt to understand how well the Okun’s Law can explain what has happened to Greece since the latter become, in essence, insolvent and under continuous fiscal contraction due to the conditionality imposed from its external creditors.

Macroeconomic forecasting relies on Okun’s Law predictions while the design of successful policies presupposes that policy makers can

¹By the end of 2009, Greece’s external borrowing became too costly and further debt servicing was impossible. The only solution available to Greece in May 2010 was a trilateral system of finance from IMF, ECB and European Commission.

obtain accurate measures regarding the correlation between GDP and unemployment changes. In the case of Greece, there was a GDP loss close to 25% since the first bailout in 2010. During the same period, unemployment reached the historic high of 27.5% in 2013, which is mainly attributed to the severe shrinkage of aggregate demand resulting from the implementation of austerity measures. During this period, the real effect of austerity measures on GDP and unemployment has been a much debated issue.² The dominant perspective in this debate is that fiscal multipliers in Greece are demonstrably stronger than initially assumed, so policies of fiscal consolidation have led to lower than expected growth rates (Blanchard and Leigh 2013).³ IMF trajectories about recovery in the Greek economy over the period 2010–2014 were subject to similar forecasting errors, which caused a huge and unexpected jump in unemployment. Admittedly, unemployment is the most crucial macroeconomic fundamental that policy makers need to accurately model in order to recommend the right mix of economic policy. IMF and Greece's EU Partners have designed an extremely ambitious programme of economic adjustment that underestimates the severe implications of recession on unemployment, causing serious problems of social and political cohesion. The main goal of this chapter is to shed light on the GDP-unemployment relationship as described in Okun's original paper, contributing to the agenda about the economic implications of the austerity programs implemented in Greece over the last seven years. The remainder of the paper is organized as follows: Sect. 12.2 provides an overview of the Okun's Law literature, touching upon some descriptive evidence about Greece's unemployment in the pre and post crisis period; Sect. 12.3 discusses our methodological approach in estimating the Okun's Law for Greece; Sect. 12.4 discusses the results and Sect. 12.5 offers our concluding remarks.

²The debate is still ongoing and the core element in the dispute between the Greek Government and its creditors is the percentage of fiscal surpluses as a share to GDP that Greece needs to maintain after the end of the third bailout programme in 2018. The degree of stringency in fiscal policy is highly associated with public investment hence aggregate demand. Therefore, very tight fiscal conditions can be potentially harmful for unemployment.

³Similar evidence for strong fiscal multipliers is also found for other advanced economies.

12.2 Brief Overview of the Okun's Law Literature

The Okun's Law is regarded as an empirical regularity and it is commonly used as a "rule of thumb" for predicting changes in unemployment after cyclical GDP movements. Nonetheless, the robustness of this empirical regularity has been under scrutiny both for the magnitude and the linear form of the output—unemployment relationship. The existing literature focuses on the structural stability of the Okun's law (Lee 2000; Apergis and Rezitis 2003) while there is another more recent strand of literature that seeks to explore the existence of a non-monotonic and asymmetric output—unemployment relationship (Cuaresma 2003; Huang and Chang 2005; Canarella and Miller 2016). These studies seek to investigate whether the responsiveness of unemployment in absolute terms is identical in expansionary and recessionary phases. This type of analysis also focuses on whether there are structural breaks that might affect the monotonicity of the unemployment—output relationship. A non-monotonic Okun's Law implies that the elasticity of unemployment after changes in output varies above and below certain critical values (i.e. thresholds) of GDP growth.

Lee (2000), working within a static formulation of the Okun equation, finds substantial cross-country differences for a group of OECD countries attributing this country heterogeneity to differences in the degree of labour market protection between the USA and European countries. Acemoglu and Scott (1994), operating within a framework of Markov-switching models, find that the output—unemployment relationship in the UK is nonlinear. Bodman (1998) applies a similar modelling approach providing evidence of nonlinearities for Australian data while Cuaresma (2003) supports the existence of regime-dependent Okun parameters for the USA, revealing also that the growth effect on unemployment is significantly higher in recessions. A non-monotonic Okun's Law is also found in Chinn et al. (2014) for the USA in the post-2007 depression period. This study shows that only 1% of employment is below the long-run employment level as predicted from the output unemployment relationship, the remaining amount of

Table 12.1 Unemployment and growth rate in Greece in the before and after 2009

Time period	Unemployment rate (%)	Growth rate (%)
1990–2000	9.2	1
2000–2009	9.7	1.16
2010	12.7	-2.4
2011	17.9	-4.2
2012	24.5	-3.3
2013	27.5	-1.4
2014	26.5	0.003
2015	25.7	-0.006

Notes Data obtained from AMECO database

unemployment is attributed to more structural (long-term) characteristics of the labour market. On the other hand, Sögner (2001), examining Austrian data, identifies a linear stable relationship—without structural breaks—in which a 4.16% growth rate is required for an 1% decrease in unemployment.

Turning to the characteristics of unemployment in Greece, Table 12.1 indicates a stable unemployment rate of just over 9% during the 1990 and 2000s. The Non-Accelerating Inflation Rate of Unemployment (NAIRU) in Greece was estimated at 9.6% in 1999 (Zonzilos 2000), which is very close to the EU average for the 1990s (i.e. 10.1%, OECD (2000)). The NAIRU rate is similar to the “natural rate of unemployment” concept, which mainly attributes steady state unemployment to non-cyclical factors (i.e. adverse demand shocks), such as long-term conditions in the labour market (i.e. employment protection legislation, bargaining rules between employers and trade unions, minimum wage policies, wage settlement etc.). Figure 12.2 shows the evolution of unemployment and growth over the period 1960–2015. This graph indicates clearly that these two variables are negatively correlated while in the period of interest when growth becomes negative unemployment has a sharp increase of about 50% points within three years.

Table 12.1 displays average values for growth and unemployment for 1990 and 2000s, followed by a rapid increase in unemployment and recession after the first bailout agreement and during the whole period 2010–2015. From this descriptive evidence, it is undeniable that the

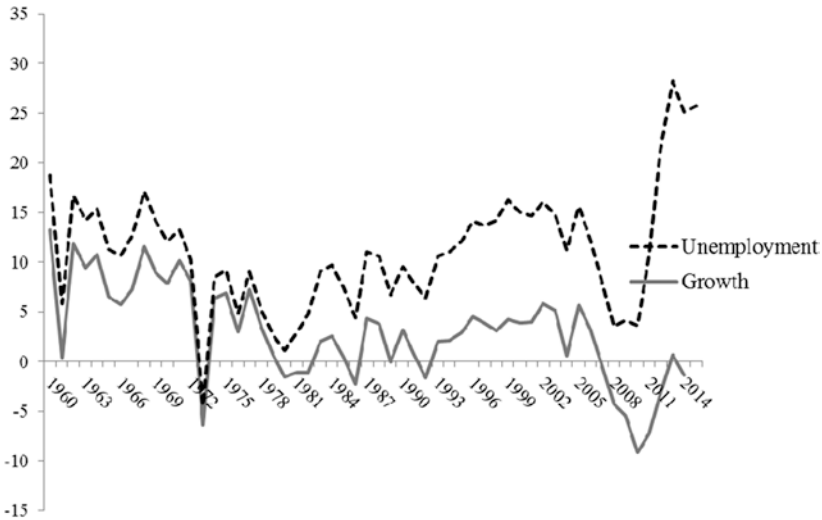


Fig. 12.2 Growth and unemployment rates in Greece, 1960–2015. Note Authors' own calculations

massive jump of unemployment in the post-2009 period has a strong cyclical component. The consolidation of public finances resulted in austerity measures that affected private consumption and government spending—the most substantial components of aggregate demand—which resulted in a sharp increase in unemployment.

12.3 Methodology

The underlying mechanism of the original Okun's Law suggests that increases in aggregate demand make firms to hire more workers in order to meet the increasing demand for goods and services. This causes output and employment to increase while unemployment rate to move towards the opposite direction. The original Okun relationship can be described by the following two equations:

$$N_t - N^* = \lambda(y_t - y^*) + w_t, \quad (12.1)$$

$$u_t - u^* = \xi(N_t - N^*) + v_t, \quad (12.2)$$

where N , y and u represent the current log values of employment, output and unemployment while values with $*$ stand for the natural levels of these variables. w_t and v_t are error terms. If we combine (12.1) and (12.2), then we get the original Okun equation:

$$u_t - u^* = \mu(y_t - y^*) + \eta_t, \quad (12.3)$$

where parameter μ stands for the “Okun coefficient” that attributes unemployment gaps to deviations of output from full capacity levels. In estimating (12.3), there is a measurement issue which is associated with the approximation of the natural level of output and unemployment. A standard approach for obtaining estimates of the natural level of output and unemployment is to use the Hodrick–Prescott and Kalmar filters (Cuaresma 2003; Huang and Chang 2005). In the present paper, we prefer to assume that the natural level of unemployment is constant while potential output grows at a constant rate. In other words, we assume that the economy is already in the steady-state condition where all markets clear; thus changes in current unemployment are deviations from the natural level. In this case, we can take first differences of the original Okun's Law Eq. (12.3):

$$\Delta u_t = \alpha + \beta \Delta y_t + \varepsilon_t, \quad (12.4)$$

where t indexes time, Δ is the first difference operator, α is a constant term (i.e. $\alpha = -\mu \Delta y^*$), β is the parameter of interest (the Okun coefficient), which is expected to be negative as it captures the adverse relationship between changes in output and changes in unemployment and ε_t is a white noise error term (i.e. $\varepsilon_t = \Delta \eta_t$). Equation (12.4) relies on the reasonable assumption that u^* is constant. Greek data strongly support this assumption as unemployment rate were for almost twenty years around, 9–9.5% (Table 12.1). Therefore, we avoid the tricky steps of measuring the unobservables u^* and y^* which can lead us to imprecise measures of output and unemployment gaps.

Furthermore, Eq. (12.4) can lead to misguided inference as it is a purely static specification, which ignores the dynamics between Δu_t and Δy_t (Sögner and Stiasny 2002; Knotek 2007). To account for hysteresis in unemployment (Blanchard and Summers 1987; Mortensen and

Pissarides 1994; Christopoulos and Leon-Ledesma 2007), we specify a more dynamic form of (12.4) that includes past values of both y and u . In light of this adjustment, Eq. (12.4) is now rewritten as follows:

$$\Delta u_t = \alpha + \sum_{k=0}^K \beta_k \Delta y_{t-k} + \phi \Delta u_{t-1} + \varepsilon_t \quad (12.5)$$

where $\sum_{k=0}^K \beta_k$ measures the total short-run effect while the long-run effect of output changes on unemployment is calculated as: $\frac{\sum_{k=0}^K \beta_k}{1-\phi}$. Although Eq. (12.5) accounts for dynamics, still it is not very insightful about nonlinearities in the unemployment-output relationship. Under a nonlinear scenario, the dynamic Okun Eq. (12.5) can introduce asymmetric effects as follows:

$$\Delta u_t = \alpha + \sum_{k=0}^K \beta_k \Delta y_{t-k} + \sum_{j=0}^J \beta_j^* \Delta y_{t-j} F(\gamma, \theta; \Delta y_{t-l}) + \phi \Delta u_{t-1} + \varepsilon_t \quad (12.6)$$

$$F(\gamma, \theta; \Delta y_{t-l}) = \frac{1}{1 + e^{-\gamma(\Delta y_{t-l} - \theta)}} \quad \gamma > 0, l = 0, 1, \dots, L. \quad (12.7)$$

Equation (12.5) is a Logistic Transition Function (LSTAR), which captures asymmetric positive and negative effects of output on unemployment *ala* Granger and Terasvirta (1993). LSTAR can be thought as a regime-switching model that allows for two regimes associated with extreme values of the transition function, $F(\gamma, \theta; \Delta y_{t-l}) = 0$ and $F(\gamma, \theta; \Delta y_{t-l}) = 1$. Parameter γ is the speed of adjustment from one regime to the other, θ is the location parameter and Δy_{t-l} is the transition variable. The restriction $\gamma > 0$ is an identifying restriction while the logistic function is increasing at Δy_{t-l} . The higher the value of γ , the faster is the change from one regime to the other $\beta_k + \beta_k^*$. If γ tends to zero, then model (12.6) is reduced to a linear model, which no asymmetries between output and unemployment while if γ tends to infinity then there are more than one regimes in the economy with $F(\gamma, \theta; \Delta y_{t-l})$ to become an indicator function (i.e. $F(\Delta y_{t-l}; \infty) = 1$).

In model (12.6) and (12.7), the total short run effect of output on unemployment when the economy stays in the lower regime is: $\sum_{k=0}^K \beta_k$ is while the total short run effect when the economy crosses the threshold and moves to the upper regime is: $\sum_{k=0}^K \beta_k + \sum_{j=0}^J \beta_j^*$. The corresponding long run effects for the low and upper regime are calculated as $\frac{\sum_{k=0}^K \beta_k}{1-\phi}$ and $\frac{\sum_{k=0}^K \beta_k + \sum_{j=0}^J \beta_j^*}{1-\phi}$, respectively.

12.4 Data and Empirical Results

The data set used in the analysis consists of annual observations over the period 1961–2015. The variables used in the analysis are real GDP (y), and unemployment rate (u). Both variables are differences of natural logarithms and are obtained from the AMECO database.

Table 12.2 provides estimates for three different types of models. All models report the expected negative sign for the Okun's law coefficient confirming the adverse relationship between output and unemployment. Model I estimates the original linear and static version of the Okun's Law as specified in Eq. (12.4), Model II estimates a model with dynamics, Eq. (12.5) and model III—our preferred specification—captures dynamics and asymmetries through the existence of different regimes in the output–unemployment relationship, Eq. (12.6). According to Model I, a 1% increase in real GDP growth is associated with a decrease in the unemployment rate by 1.87% points, over the period 1960–2015. Estimates from model I find a smaller coefficient than the one found in the original paper of Okun (1962) (i.e. 3%), Sögner (2001) (i.e. 2.47%) and Ball et al. (2015) (i.e. 3.1%). Despite the different methodological approach used in the current paper, our Okun coefficient is close to Cuaresma (2003)⁴ (i.e. 1.6%).

The dynamic Model II includes two lags of output and one lag of unemployment as right-hand side regressors. The contemporaneous

⁴Cuaresma (2003) estimates a level equation with the use of Hodrick-Prescott filter in calculating the potential levels of unemployment and output.

Table 12.2 Estimation of the Okun's Law for Greece, 1960–2015. Dependent variable is the growth rate of unemployment $\Delta \ln u_t$

Variables	Model I	Model II	Model III
Constant	0.081 [0.001]	0.025 [0.211]	0.027 [0.125]
$\Delta \ln y_t$	-1.872 [0.001]	-1.192 [0.003]	-2.271 [0.02]
$\Delta \ln y_{t-1}$		-0.588 [0.155]	-0.422 [0.782]
$\Delta \ln y_{t-2}$		1.224 [0.001]	2.208 [0.001]
$\Delta \ln u_{t-1}$		0.610 [0.001]	0.601 [0.001]
$\Delta \ln y_t \times F(\gamma, \theta; \Delta y_{t-1})$			1.566 [0.08]
$\Delta \ln y_{t-1} \times F(\gamma, \theta; \Delta y_{t-1})$			-0.370 [0.985]
$\Delta \ln y_{t-2} \times F(\gamma, \theta; \Delta y_{t-1})$			-1.300 [0.100]
θ			0.010 [0.020]
γ			253.500 [0.001]
<i>SR</i>		-0.556	
<i>LR</i>		-1.429	
<i>SR</i> ^{Upper Regime}			-0.589
<i>LR</i> ^{Upper Regime}			-1.472
<i>SR</i> ^{Lower Regime}			-0.485
<i>LR</i> ^{Lower Regime}			-1.212
F_{46}^2			39.94
Durbin-Watson	1.187 [0.01]		
Durbin's <i>h</i> statistics		0.821 [0.411]	0.813 [0.422]
Schwarz B.I.C	-33.205	-42.489	-43.242

Note The optimal lag order for all models featured in the Table is determined optimally using the Schwarz Bayesian Criterion. Durbin–Watson statistic tests for serial correlation in the residuals of the OLS regression (Model I); under the null hypothesis the error term is serially uncorrelated. *SR*: Short-run; *LR*: Long-run. Figures in Brackets are *p*-values associated with the tests

value of output is 1.19%, smaller than the one reported in Model I. The coefficient of the one year lag of unemployment is positive and statistically significant, which is evidence of persistent unemployment effects in Greece. The results show that the total short run (*SR*) effect of output on unemployment is -0.556 while the long run (*LR*) effect is -1.429. This means that in the long-run a stronger relationship exists between unemployment rate and output growth. The weaker short-run effect shown in Model II highlights the high degree of protection in the Greek labour market over the last fifty-five years. The use of temporary contracts has not been a common practice in Greece, implying that employers were unable to adjust employment quickly after changes in

output. Hiring new workers has always been a lengthy and expensive process. The degree of stringency in the labour market becomes even more noticeable if one takes into consideration the fact that public sector was a major employer for many years in the Greek economy where job permanency is a constitutional right.

Before we proceed to the estimation of Model III we have to test for the adequacy of the nonlinear form of the Okun model. To test for the predominance of a nonlinear versus a linear model, we implement a formal test of the null hypothesis that the estimated parameter γ in the transition function, Eqs. (12.6) and (12.7) is significantly different from zero. However, γ is not identifiable under the null hypothesis (Davies 1987), thus we approximate the transition function $F(\gamma, \theta; \Delta y_{t-j})$ around zero with a first order Taylor series. A first order Taylor series leads to the following auxiliary regression:

$$\Delta u_t = \alpha + \sum_{k=0}^K \beta_k \Delta y_{t-k} + \sum_{j=0}^J \beta_j^* \Delta y_{t-j} \Delta y_{t-l} + \phi \Delta u_{t-1} + \varepsilon_t$$

The null hypothesis of linearity is formulated as: $H_0 : \sum_{j=0}^J \beta_j^* = 0$, which can now be tested with a standard F -test. Results of the nonlinear test are shown at the lower part of Table 12.2. According to the F -Test, the null hypothesis of a linear model is rejected at high statistical levels of significance. This signifies that a nonlinear relationship governs output and unemployment in Greece. The estimation of a nonlinear model like those specified in (12.6) and (12.7) is not a trivial task. The main challenge is that the joint estimation of parameters γ and θ in the transitions function (12.7) leads to several identification problems, which makes the convergence of nonlinear algorithms questionable. To overcome this problem we follow Saikkonen and Choi (2004) in using a grid search method for estimating the values of γ and θ . Within this context, the values of γ and θ correspond to the smallest sum of squared residuals. We search for the value of γ between 0.01 and 150 using increments of 0.01. The value of θ is selected from the ordered values of $|\Delta y_{t-l}|$ after having discarded the highest and lowest 15% of the observations following the methodology of Caner and Hansen

(2001). Finally, we use bootstrap to compute the standard errors of γ and θ (Efron and Tibshirani 1986). After implementing all these steps, the value of the threshold parameter θ yielded is 1%, which indicates that unemployment respond differently when the economy grows at a rate above or below 1%. Based on this value we define the lower regime (below 1% growth rate) and the upper regime (above 1% growth rate). The short-run effect of the lower regime shows an Okun coefficient of 0.48 while the long-run effect in the lower regime is 1.2. These figures suggest that as long as the economy experiences a growth rate below 1% then unemployment is expected to decrease by 1.2% points. In an analogous way, we interpret results from the upper regime.

From estimates in Table 12.2, we are able to make predictions for the number of years required to restore unemployment to the natural level. Given the prediction of anemic growth for 2016 and 2017, Greece is currently within the lower regime. To calculate how many years are required to close the current unemployment gap we take as NAIRU the level of 9.6% reported in Zonzilos (2000) and as current unemployment rate the level of 2015, 25.7%. Based on these figures, Greece needs approximately 13.4 years to close the unemployment gap of 16.1% points caused during 2010–2016. If we now assume that growth will accelerate over the next few years at rates above the 1% threshold then estimates for the upper regime suggest that Greece needs about 11 years to bring unemployment back to the 2009 level. Using data from the last year of our sample, 2015, we can infer that an annual growth rate of 1% or above creates 17,537 new jobs while an annual growth rate below 1% is translated into 14,435 new jobs. We should place a general caveat here regarding the interpretation of results from Model III. This specification captures asymmetries but in its current format identifies only two regimes. The output—unemployment series is likely to have more than two regimes thus the time needed to close the unemployment gap might take shorter if we hypothesize that there is a second critical threshold of growth rate, say 3%. The estimation of such a nonlinear multi-regime switching model is rather complicated and more crucially requires a richer sample with a larger number of cross-sections. We leave this as a path for future research. Table 12.3 summarises the findings of the Okun's Law for Greece as derived from the dynamic nonlinear specification III in Table 12.2.

Table 12.3 Jobs created and years for recovery based on Okun's law estimates

Growth regime	Okun coefficient	New jobs	Years for recovery
>1%	1.47	17,537	11
<1%	1.21	14,435	13.4

Notes The figures displayed regarding the number of jobs to be created with a growth rate above or below 1% use as benchmark information data of 2015

12.5 Concluding Remarks

The present study estimates Okun's Law for Greece using data for a long period of 55 years. Our model identifies an asymmetric structure of the employment—output relationship with the existence of two regimes, below 1% annual growth rate unemployment decreases by 1.21% while for growth rates above 1% unemployment decreases by 1.47%. Although these percentage figures do not differ much, in absolute terms being in the lower growth regime means almost 3000 job vacancies less annually based on unemployment figures of 2015. A clear lesson that can be taken from the present study is that almost 16% of unemployment in Greece in the last 6–7 years has demand deficient characteristics without being related to labour market conditions. Based on these facts, arguments that only stress the need of intensifying reforms as the path for reducing unemployment are at least inaccurate if not unrealistic. Reforms in the labour market matter only for about 9–9.5% of unemployment, which is the NAIRU rate. Admittedly, this rate has been high in the pre-crisis period but close to the EU average. In a very optimistic scenario, further deregulation in Greece's labour market might tackle 50–60% of the natural rate of unemployment, which practically means a fall in overall unemployment by 4–5 percentage points (i.e. roughly close to 20%). This gain is minimal as 65% of current unemployment is cyclically oriented and cannot be effectively reduced if Greece is not given the chance to benefit simultaneously from policies of demand stimulus.

At present, economic conditions in Greece are rather stagnant. Growth rates are marginally negative and the prospect of reducing unemployment substantially in the near future is limited. Fundamentally, the most crucial aspect of this debate is how Greece can return to positive growth rates so as to start reducing unemployment. In

fact, growth is the cause for many current problems in the Greek economy and remains one of the most crucial stakes in this struggle. Having said this, one should be skeptical about the uneven attention that public policy agenda pays to the need for reforms (including those referred to the labour market). In the present gloomy status of the Greek economy, a further deregulation in the labour market will only feed up uncertainty leading into lower consumer confidence and further shrinkage of aggregate demand. The labour cost is already low while many labor market rigidities (i.e. collective wage determination, minimum wages and employment insurance) have removed over the period 2010–2014 in exchange of the first two bailout programs. It is difficult one to see how the economy can extract substantial gains from further policy reforms of this sort, only flows of foreign and domestic investment can reboot the economy and build up confidence; regrettably this scenario does not seem a very feasible target at this stage.

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13

On the Determinants of NPLs: Lessons from Greece

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13.1 Introduction

Since the onset of the financial crisis academics and practitioners have shown renewed interest in the credit quality of loan portfolios. Average bank asset quality has deteriorated, sharply, due to the global financial crisis that began at the end of 2008. The rapid increase

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in non-performing loans (hereafter, NPLs) has increased banks' vulnerability to further shocks and, at the same time, has limited their lending operations with major consequences for economic activity. The deterioration of the ratio of NPLs to total bank loans can be attributed to macroeconomic and bank-specific factors [see, e.g. Berger and DeYoung (1997); Louzis et al. (2012)]. Empirical evidence suggests that NPLs exhibit anti-cyclical behaviour. A deterioration in the macroeconomic conditions, with a fall in GDP and high unemployment rates, have negative effects on NPLs, as it reduces the ability of borrowers to service their debt. Among the bank-specific factors that have been found in the literature to affect NPLs are size, cost efficiency and management performance, credit conditions, market power and banks' risk profile.

Based on the aggregate data from the Greek banking system, in this study, we focus on the factors that affect NPLs during recessions. Answering this question has important implications for banking policies trying to mitigate the effects of recession on NPLs. The Greek economy constitutes an interesting case to study the factors determining NPLs, given the pervasive recessionary conditions that have characterized the economy since 2008. In 2009, the economy entered into an economic recession phase leading to a fall in GDP of around 3% in the year 2009 and an increase in the NPL ratio by 3.5% points. In 2010, financial markets start to lose faith in Greece's ability to service its public debt and, after some months of negotiations between the country and the EU leaders, Greece received its first bailout from the European union and the IMF to ensure debt servicing and prevent a default. Greece committed to adopt a sharp fiscal consolidation which led to further recessionary conditions of the economy and rapidly raised NPLs. The undervaluation of the assets in the banking sector along with a loss of deposits and a high ratio of NPLs to total bank loans caused liquidity problems to the Greek banks. Therefore, the need for substantial recapitalizations was inevitable. The increase of NPLs also opened a vicious cycle between them and unemployment (or other macroeconomic variables reflecting recessionary conditions).

The data used in our analysis consists of three different categories of loan portfolios: mortgages, business and consumer loans. The relationship between NPLs of these three categories of loans and their

determinants (bank-specific or macroeconomic variables) was estimated based on the seemingly unrelated regressions (SUR) framework. Using SUR estimation method, we properly address endogeneity by allowing for cross-correlation across the error terms of the equations of the system of NPLs and possible sources of heterogeneity in the slope coefficients of the estimated regressions. Also, estimation and inference can be drawn based on the time-dimension of our data, which is reasonable and much larger than its cross-section one. One innovation of our econometric analysis is that the SUR framework is extended to allow for a common break in the relationship between NPLs and their determinants. The existence of such a break may capture the influence of exogenous events (i.e. deterioration of the economic conditions, sovereign debt crisis, political events, etc.) on the relationship between NPLs and their determinants, and if this applies to the bank-specific or the macroeconomic conditions.

The results of the paper lead to a number of interesting conclusions. They show that responsible for the sharp rise in NPLs of the Greek banking system, that began with the aftermath of the global economic and financial crisis in the year 2008, is the severe deterioration of the recession conditions of the economy and the political uncertainty occurred in the first quarter of the year 2012, i.e. 2012:Q1. These conditions changed, structurally, the relationship between NPLs and their determinants after that period. In particular, we find that unemployment and inflation determine the NPLs of the Greek banking system, over the whole sample, but their effects become stronger after 2012:Q1, due to the above conditions. From the bank-specific variables examined, we find that only changes in the return on assets can explain NPLs changes after 2012:Q1. Bank-specific variables, like changes in equity and the loans-to-deposits, are found to determine, significantly, the NPLs of the Greek banking system only during the period before the year 2012. Summing up, our results support the view that the abrupt shifts to the NPLs of the Greek banking system can be mainly attributed to macroeconomic deterioration and political uncertainty.

The paper is organized as follows. Section 13.2 presents the model that we will employ to estimate the relationship between NPLs and their determinants, and it discusses hypotheses of interest that can be tested regarding

the bank-specific variables employed in our analysis. Section 13.3 describes the data and econometric analysis. Section 13.4 concludes.

13.2 The Model

Our empirical analysis is based on the following reduced form model for non-performing loans (denoted as NPL_{it}):

$$\begin{aligned} \Delta NPL_{it} = & (c_i + b_1 \Delta ROA_{t-1} + b_2 \%EQTY_{t-1} + b_3 \Delta LTD_{t-1} \\ & + \gamma_1 \Delta UNPL_{t-1} + \gamma_2 INFL_{t-1}) * DUM_{t-1} + (c_i^* + b_1^* \Delta ROA_{t-1} \\ & + b_2^* \%EQTY_{t-1} + b_3^* \Delta LTD_{t-1} + \gamma_1^* \Delta UNPL_{t-1} + \gamma_2^* INFL_{t-1}) * DUM_{t-1}^*, \\ & + \rho \Delta NPL_{it-1} + u_{it} \end{aligned} \quad (1)$$

where Δ denotes first-difference, $\%$ denotes percentage change of a variable, $i = 1, 2$ and 3 denote the three aggregate categories of loans (i.e. business, mortgages and consumer, respectively), $t = 1, 2, \dots, T$ denotes the time series observations of our sample, and DUM_{t-1} is a dummy variable which takes the value of 1 when $t - 1 \leq T_0$, where a structural change in model (1) occurs, and unity otherwise. DUM_{t-1}^* is the complementary variable to DUM_{t-1} , which takes the value of 1 when $t - 1 > T_0$, and zero otherwise. The definitions of the bank-specific and macroeconomic variables included in the RHS of (1) are as follows.

Bank-specific:

ΔROA_t is the first-difference of ROA, defined as earnings before interest and taxes divided by total assets. ROA is a measure of bank profitability. We use this variable as a proxy for quality of management to investigate the bad management hypothesis. In particular, a less profitable bank is more likely to exhibit poor performance in credit scoring, appraisal of pledged collaterals and monitoring borrowers which in turn leads to higher NPL_{it} ratios. Therefore, we expect a negative effect of profitability on NPLs; see, for example, Berger and DeYoung (1997), Podpiera and Weil (2008), Louzis et al. (2012).

$\%EQTY$ is the percentage change (%) in equity (denoted $EQTY$). This variable can capture the effects of bank capitalization on NPLs. According to the moral hazard hypothesis, low capitalization of banks increases NPLs, as bank managers tend to increase the riskiness of the bank's loan portfolio when the bank is weakly capitalized and, as a result, NPLs will increase; see, for example, Berger and DeYoung (1997) and Salas and Saurina (2002). We thus expect a negative relationship between $\%EQTY_{it-1}$ and ΔNPL_{it} . Apart from the empirical literature, the moral hazard problem in the banking sector has received increasing attention in recent theoretical DSGE models; see, for example, Gertler, Kiyotaki and Queralto (2012) and Borio (2014). Note that we do not employ the ratio of Equity-to-Assets (ETA) in our analysis to capture the effects of capitalization on NPLs, due to the sharp devaluations of the bank assets occurred during our sample.

ΔLTD is the first-difference of the loan-to-deposit ratio, which is considered as a proxy for liquidity risk. One would expect that an increase in ΔLTD will increase NPLs, as it increases the banks' probabilities of default; see, for example, Louzis et al. (2012), Makri et al. (2014) and Anastasiou et al. (2016).

Macroeconomic:

$\Delta UNPL_{t-1}$ is the change in the unemployment rate of the economy. This variable captures the business and macroeconomic conditions in the economy, at any point of time. Instead of this variable, we could have used the real GDP growth rate. As in Monokroussos and Thomakos (2016), we find that choosing one of these two macro variables is sufficient to capture the macroeconomic conditions in the economy. Changes in unemployment may be thought as a better indicator of how deep and persistent the recession in an economy is. As expected a priori, an increase in $\Delta UNPL_{t-1}$ leads to an increase in NPLs, for all categories of loans. The positive effect of the unemployment has also been documented in Quagliariello (2007), Louzis et al. (2012) Anastasiou et al. (2016) and Monokroussos et al. (2016).

$INFL_{t-1}$ is the quarter inflation rate. The effect of inflation on NPLs should be positive, since an increase in inflation leads to a fall in the real income of borrowers. This is in line with prior evidence; see, among others, Beck et al. (2013), Klein (2013).

In addition to the above variables, note that in the RHS of the model, we have also included variable ΔNPL_{it-1} to capture the own dynamic (trend) effects of NPLs on ΔNPL_{it} , over time.

Model (1) can be employed to test a number of hypotheses about NPLs. It can test for a regime change in the relationship between NPLs and their determinants associated with a structural change in the financial, banking, and economic conditions of the economy, after break point T_0 . These changes could be associated with exogenous events, which can be identified by the data through model (1). Given the existence of such a change, the model can reveal if the effects of bank-specific or macroeconomic variables on NPLs are asymmetric across the different regimes identified by the data. Although one may argue that bank-specific variables, like ΔROA and changes in equity or credit, constitute valid explanatory variables of NPLs, these effects may considerably change across the different economic conditions after break point T_0 . Similar arguments can be applied to the macroeconomic variables of the model.

In our analysis, T_0 will be treated as an unknown quantity and it will be estimated, endogenously, from the data. This can shed light on the particular conditions of the economy (or the banking sector) triggered a structural change in the relationship between NPLs and their determinants, after this point. To identify T_0 , we rely on a search procedure [see, e.g., Andrews (1993); Dendramis et al. (2014; 2017)] solving the following optimization problem:

$$T_0 = \arg \sup_{T_0 \in Q} \log L(\theta|T_0),$$

where Q is the set of possible structural break points of the sample such that $Q \subseteq \{1, 2, \dots, T\}$, and $L(\theta|T_0)$ is the likelihood function of model (1) conditional on T_0 , where θ denotes the vector of parameters. In words, the above procedure will select the break point T_0 which maximizes the log-likelihood function of the model, over all possible break points in the sample.

Before proceeding to estimation of the model, a number of final remarks are necessary in order to justify its econometric specification. First, both dependent and independent variables of the model are

expressed in first differences (or percentage rates) to become stationary series. This is done in order estimation procedure and inference to rely on standard asymptotic results, holding over the time (T)-dimension of our data. Second, a number of bank-specific or macroeconomic variables, like the size of banks and loan interest rates, are not present in analysis. These variables were found to be insignificant, for our sample, either when allowing for a common break in the model or not. Third, the lag specification of the model is chosen based on the Akaike information criterion. The inclusion of lagged values of the regressors in the model also helps to avoid inference and estimations problems that could arise from the contemporaneous correlation between the explanatory variables and the error terms of the model.

13.3 Empirical Analysis

In this section, we estimate model (1) and we discuss the estimation results. In our analysis, we also compare the estimates of the model to those of a version of it which does not allow for a structural break. The estimation of both these models is carried out using maximum likelihood (which is asymptotically equivalent to three stage least squares based on the SUR framework of the model, for $i = 1, 2$ and 3 equations (categories of loans)). This estimation method allows for the disturbance terms u_{it} to be cross-sectionally correlated, across i , as is assumed in SUR equations. To formally test, if there is a structural break in the model, we will carry out a likelihood ratio test (denoted as LR -stat), with the null hypothesis:

$$H_0 : c_i = c_i^*, b_1 = b_1^*, b_2 = b_2^*, b_3 = b_3^*, \gamma_1 = \gamma_1^*, \gamma_2 = \gamma_2^*$$

against its alternative

$$H_a : c_i \neq c_i^*, \text{ or } b_1 \neq b_1^*, \text{ or } b_2 \neq b_2^*, \text{ or } b_3 \neq b_3^*, \text{ or } \gamma_1 \neq \gamma_1^*, \text{ or } \gamma_2 \neq \gamma_2^*$$

Testing the above null hypothesis is a crucial step to examining if there is a break in model (1) and, hence, the model constitutes a consistent specification with the data. The test statistic LR -stat is defined as

$LR\text{-stat} = 2(\log L(\theta|T_0) - \log L(\theta_0))$, where $L(\theta_0)$ is the likelihood function of the model under the null hypothesis H_0 (i.e. without a break; θ_0 is the vector of parameters of this version of the model, without a break).¹ Since T_0 (and, hence, the slope coefficients of the model) is not identified under the null hypothesis, the significance levels (probability values) of $LR\text{-stat}$ will be obtained based on the bootstrap statistical technique. The steps of this procedure are described below.

First, we estimate model (1) without a structural break and obtain estimates of its vector of slope coefficients θ_0 and its residuals, denoted as \hat{u}_{it} . Based on these estimates and the values of our explanatory variables, next we generate bootstrap values of ΔNPL_{it} by replacement from the residuals \hat{u}_{it} . We generate B bootstrap samples of size $3 \times T$. For each bootstrap sample, we estimate the model with and without a break at T_0 and calculate statistic $LR\text{-stat}$, defined above. The above procedure is repeated $B = 1000$ times. Based on these repetitions, we then compute the 5% (or 1%) quantile value of the empirical distribution of $LR\text{-stat}$, which constitutes its 5% (or 1%) critical value. The null hypothesis is rejected for values of $LR\text{-stat}$ bigger than the above 5% (or 1%) level.

13.3.1 The Data

Our data set consists of quarterly observations of the macroeconomic and bank-specific variables of the model covering the period from 2005:Q1 to 2015:Q4, implying $T = 44$ observations. They are obtained from the Bank of Greece. Regarding NPLs data, these consist of three different type of loans: business, mortgage and consumer and they also include restructured loans. Pagratis et al. (2017) provide a more detailed analysis on the new loan restructuring framework. The inclusion of restructured loans is important. It measures more accurately

¹Note that, since the intercepts of the model c_i are not found to differ across i , in the implementation of test statistic $LR\text{-stat}$ we assume that under the null hypothesis $c = c^*$, for all i .

the size of NPLs. In particular, the NPL ratio excluding the restructured loans at the last quarter of 2015 was 35.6% whereas the NPL ratio including the restructured loans was 43.5% for the same period. The sample period of the study captures different phases of the business cycle in the Greek economy. It refers to the pre-sovereign debt crisis period, i.e. 2005–2010 and to its aftermath, i.e. 2010–2015. Thus, it can provide useful insights into the determinants of the NPLs before, or after, the crisis.

Figures 13.1, 13.2, 13.3 and 13.4 present graphs of the dependent and explanatory variables of model (1). In particular, Figs. 13.1 and 13.2 present graphs of the three different NPL series, NPL_{it} , and their first differences ΔNPL_{it} , used in the estimation of the model, respectively. Figure 13.3 presents the bank specific variables ΔROA_t , $\%EQTY_t$ and ΔLTD_t , while Fig. 13.4 the macroeconomic variables $UNPL_t$ and $INFL_t$, in levels. In Table 13.1, we present correlation coefficients across the above variables, as defined in the model, i.e. the independent variables are lagged one period. A number of comments can be drawn from an inspection of the above figures and table. First, the ratio of the

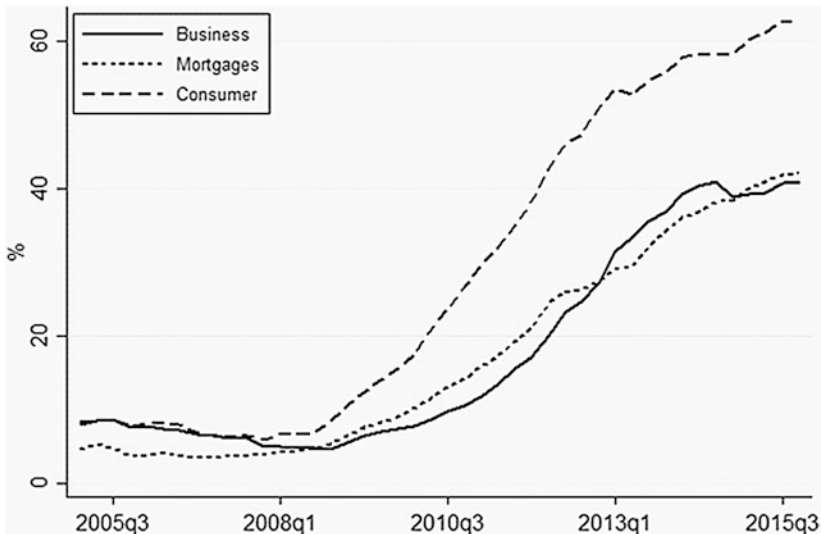


Fig. 13.1 Evolution of NPLs by type of loans. Source Bank of Greece

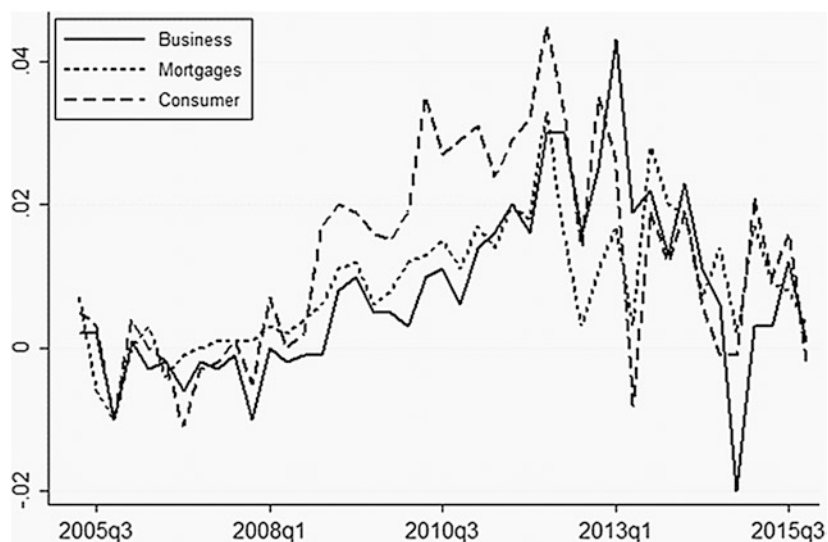


Fig. 13.2 Changes in NPLs by type of loans. *Source* Bank of Greece

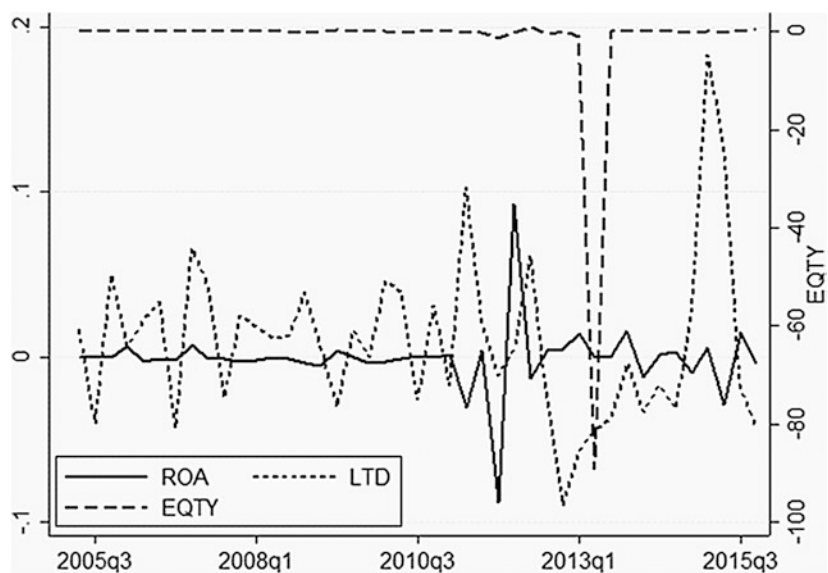


Fig. 13.3 Change in ROA and LTD, and equity growth rate. *Source* Bank of Greece

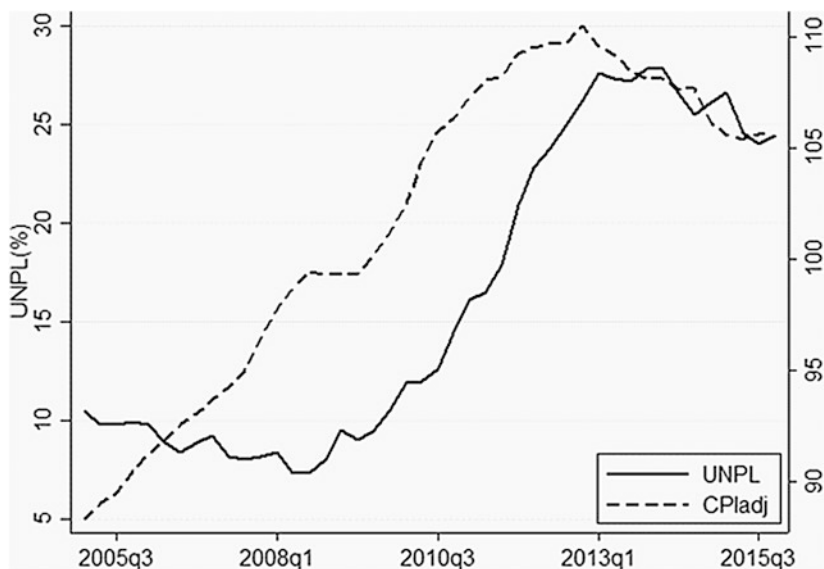


Fig. 13.4 Unemployment rate and CPI seasonally adjusted. *Source* Bank of Greece

Table 13.1 Correlation coefficients

	ΔNPL_{Bt}	ΔNPL_{Mt}	ΔNPL_{Ct}	ΔROA_{t-1}	$\%\text{EQTY}_{t-1}$	ΔLTD_{t-1}	ΔUNPL_{t-1}	INF_{t-1}
ΔNPL_{Bt}	1							
ΔNPL_{Mt}	0.79	1						
ΔNPL_{Ct}	0.75	0.80	1					
ΔROA_{t-1}	-0.001	-0.21	-0.15	1				
$\%\text{EQTY}_{t-1}$	-0.19	-0.35	-0.08	0.09	1			
ΔLTD_{t-1}	-0.15	-0.06	0.08	-0.35	-0.12	1		
ΔUNPL_{t-1}	0.58	0.50	0.64	-0.02	-0.23	-0.008	1	
INF_{t-1}	-0.004	-0.047	0.10	-0.43	0.11	0.36	-0.15	1

Notes The table presents correlation coefficients among all the variables of the model

non-performing to total loans rocketed to its highest level in 2015:Q4 from its low in 2005:Q1. From 2010 to 2015, there was a 45% increase in the NPLs on consumer loans. The NPLs ratio of business and mortgage loans increased by 33 and 31.8%, respectively. Figure 13.2 shows that the biggest quarter on quarter increase in NPLs for consumer and

mortgage loans occurred from 2011:Q4 to 2012:Q1. For NPLs on business loans, the highest increase in this ratio was from 2012:Q4 to 2013:Q1.

An inspection of the unemployment rate in Fig. 13.4, indicates that the dramatic increase in NPLs within the above period can be attributed to the need to eliminate the unsustainable fiscal and current account imbalances in the Greek economy appeared in the year 2009. The elimination of fiscal and current account deficits came at the expense of growth and unemployment. Greece lost more than a quarter of its GDP within 2009–2015 period. Figure 13.4 indicates that the unemployment rate has been increasing since year 2008, with a sharp increase of this rate occurred, immediately, after the implementation of the first fiscal stabilization program in the year 2010. This trend in unemployment was stabilized in the year 2013 and it was reverted after the year 2014, where the real economy exhibited a slight positive growth rate. Note that the high levels of unemployment after the year 2013, were associated with deflation of the economy. Greece lost more than a quarter of its GDP within 2009–2015 period.

Turning our discussion on the bank-specific variables (see Fig. 13.3), we observe that the sharpest drop in profitability in the banking sector occurred in the second quarter of 2012. This was the outcome of a heavy loss in the banking system incurred, mainly, by the implementation PSI (Private Sector Involvement) program of debt restructuring. In particular, in the period between January and September of the year 2012, the Greek banking groups listed in the Athens stock exchange recorded after tax losses of 5.1 billion euros, which, on the one hand, reflect additional write-downs on their Greek government bonds as a result of the PSI, and, on the other hand, impairment charges on loans to the private sector. For more details, please see the Annual Report of Bank of Greece (2012). The change in the loan to deposit ratio (LTD) is highly volatile during our sample period. The ultimate increase in LTD ratio occurred in the second quarter of 2012 can be attributed to the massive bank deposits withdrawal, which in turn can be due to the political uncertainty (double elections) and the fears of exit of Greece from the Eurozone (known as GREXIT). From 2012:Q3 to 2014:Q4, there was a drop in the LTD ratio, which can be attributed to reduced

new lending. At the last quarter of 2014, the LTD ratio raised again owing to deposit outflows triggered by the heightened political risk, the failure of the Parliament to elect a new President of the Republic and the need, thus, for elections in January 2015. Note that, due to the fears of GREXIT, the change in the LTD ratio remained positive until the imposition of capital controls at the end of June of the year 2015. Finally, looking at the change of the equity growth, Fig. 13.3 indicates that, from 2012:Q1 to 2013:Q3, there was an impairment in the capital base of the Greek banking system mainly due to the restructuring of public debt occurred in March 2012, due to the PSI program, and the continuous deposit outflows due to the high economic and political uncertainty of Greece since the start of the sovereign debt crisis.

Finally, the correlation coefficients between the dependent and independent variables of the model indicate that there is a positive and very high correlation among the three different categories of NPLs ratio changes. This is not surprising, given that NPL_{it} or ΔNPL_{it} seem to move very closely, over the whole sample (see, Figs. 13.1 and 13.2). As expected, we find a negative correlation between ΔNPL_{it} and ΔROA_{t-1} , and ΔNPL_{it} and $\%EQYTY_{t-1}$, for all i , but their degree is not big enough. The only explanatory variable which exhibits the highest degree of correlation with ΔNPL_{it} , for all i , is the change in unemployment rate. As it was expected this is positively associated with ΔNPL_{it} . Another interesting finding of the table is that there is a low degree of correlation between the bank-specific and macroeconomic sets of variables used in the estimation of the model. Thus, these two groups of variables can be taken to reflect different sources of information. This also holds within the variables of each of these groups. It may attributed to the fact that the variables of both of these groups are appropriately transformed (e.g. differenced) to remove any common trend driving them.

13.3.2 Estimates

Maximum likelihood (ML) estimates of the model (1) and its alternative versions, without a break and/or the macroeconomic variables, are reported in Tables 13.2, 13.3 and 13.4 respectively. Table 13.2

Table 13.2 Single equation estimates of the model without a break

	Const	ΔROA_{t-1}	%EQTY _{t-1}	ΔLTD_{t-1}	$\Delta UNPL_{t-1}$	$\Delta UNPL_{t-1}$	ΔNPL_{t-1}	ΔNPL_{t-1}	\bar{R}^2	loglik
<i>All explanatory variables</i>										
Business	-0.0001 (-0.007)	-0.0056 (-0.10)	-0.0001 (-1.32)	0.0206 (0.83)	0.5284 (4.16)	0.2317 (2.64)	0.5891 (5.32)	0.64	150.21	
Mortgages	0.0019 (1.48)	-0.1091 (-2.60)	-0.0003 (-4.38)	0.0056 (0.32)	0.3008 (3.16)	0.0662 (1.02)	0.5432 (4.97)	0.63	163.09	
Consumer	0.0031 (1.39)	-0.0785 (-1.08)	-0.0002 (-2.14)	0.0397 (1.28)	0.5628 (2.89)	0.1396 (1.25)	0.4909 (3.55)	0.57	139.88	
<i>Only bank-specific variables</i>										
Business	0.0017 (0.90)	-0.0644 (-0.96)	-0.0001 (-0.84)	0.0231 (0.74)			0.7185 (5.70)	0.44	139.90	
Mortgages	0.0022 (1.55)	-0.1396 (-3.15)	-0.0003 (-3.85)	-0.0005 (-0.02)			0.6669 (6.15)	0.54	157.64	
Consumer	0.0023 (0.95)	-0.1358 (-1.82)	-0.0003 (-2.23)	0.0303 (0.91)			0.7408 (6.35)	0.49	135.23	

Notes The table presents single equation estimates of the model (1) without a common break, for all categories of loans *i* (business, mortgages and consumer). Panel A presents estimates of the model with all explanatory variables, while Panel B excludes the set of macroeconomic variables (namely, $\Delta UNPL_{t-1}$ and ΔNPL_{t-1}). \bar{R}^2 is the adjusted coefficient of determination and loglik denotes the maximum likelihood value of the model, at the optimal estimates of the model

Table 13.3 System (SUR) estimates of the model without a break

	A: With all explanatory variables	B: Only with bank-specific variables
Const	0.0012 (1.22)	0.0023 (2.17)
ΔROA_{t-1}	-0.095 (-2.53)	-0.1419 (-3.48)
$\%\text{EQTY}_{t-1}$	-0.0003 (-4.44)	-0.0003 (-4.28)
ΔLTD_{t-1}	0.0056 (0.34)	-0.0045 (-0.24)
ΔUNPL_{t-1}	0.3098 (3.82)	
INFL_{t-1}	0.0934 (1.61)	
ΔNPL_{it-1}	0.5959 (9.32)	0.6380 (9.83)
	$\begin{matrix} u_{Bt} & u_{Mt} & u_{Ct} \\ \Sigma = & \begin{matrix} u_{Bt} & 1 \\ u_{Mt} & 0.48 & 1 \\ u_{Ct} & 0.51 & 0.57 & 1 \end{matrix} \end{matrix}$	$\begin{matrix} u_{Bt} & u_{Mt} & u_{Ct} \\ \Sigma = & \begin{matrix} u_{Bt} & 1 \\ u_{Mt} & 0.68 & 1 \\ u_{Ct} & 0.63 & 0.68 & 1 \end{matrix} \end{matrix}$
loglik	462.30	456.74

Notes The table presents SUR estimates of the model (1) without a common break in its slope coefficients. Panel A presents results of the full specification of the model, with all explanatory variables considered, while Panel B excludes the set of macroeconomic variables (namely, ΔUNPL_{t-1} and ΔNPL_{it-1}). Σ is the correlation matrix across error terms u_{it} , where denotes the three categories of loans (Business, Mortgage and Consumer, denoted as B, M and C, respectively). t -ratios are in parenthesis and loglik denotes the maximum value of the likelihood function, at the optimal estimates of the model

presents results for the model without a break based on single equation ML estimates, for each category of loans (i.e., business, mortgages and consumer). These estimates can reveal if there is high degree of heterogeneity in the slope coefficients estimates of the model, across i . This table also reports the adjusted coefficient of determination \bar{R}^2 and the maximum likelihood value of the model (denoted loglik), at its optimal estimates. These can be used for model comparison and to show how well the model fits into the data.

Tables 13.3 and 13.4 present ML estimates of the model without and with the break, respectively. This is done based on the SUR framework, assuming homogeneity in the slope coefficients of the model, across the different categories of loans i . This assumption can improve upon the efficiency of the estimates of the model, given the small number of degrees of freedom available, for all i . It can be justified, empirically, by the single equation estimates of the model without a break, reported in

Table 13.4 System (SUR) estimates of the model with a break

	A: All explanatory variables	B: Only with bank-specific variables
	Before break point $T_0 = 2012:Q1$	Before break point $T_0 = 2012:Q3$
Const	-0.0006 (-0.72)	0.0022 (2.06)
ΔROA_{t-1}	0.0058 (0.20)	-0.0699 (-1.68)
$\%EQTY_{t-1}$	-0.0083 (-3.76)	-0.0116 (-3.72)
ΔLTD_{t-1}	0.0476 (2.54)	0.0384 (1.40)
$\Delta UNPL_{t-1}$	0.3489 (4.55)	
$INFL_{t-1}$	0.1084 (2.06)	
	After break point $T_0 = 2012:Q1$	After break point $T_0 = 2012:Q3$
Const	0.0073 (6.37)	0.0028 (1.61)
ΔROA_{t-1}	-0.2029 (-2.22)	-0.1061 (-0.85)
$\%EQTY_{t-1}$	-0.0001 (-1.62)	-0.0003 (-4.38)
ΔLTD_{t-1}	0.0121 (0.87)	-0.0097 (-0.46)
$\Delta UNPL_{t-1}$	0.8031 (7.59)	
$INFL_{t-1}$	0.5572 (7.56)	
ΔNPL_{it-1}	0.5169 (7.12)	0.6000 (9.38)
loglik	480.97	462.56
LR-stat	37.33 (p -value = 0.01 (1%))	

Notes The table presents SUR estimates of the model (1), with a common break in its slope coefficients. Panel A presents results of the full specification of the model, with all explanatory variables considered, while Panel B excludes the set of macroeconomic variables (namely, $\Delta UNPL_{t-1}$ and $INFL_{t-1}$). Σ is the correlation matrix across error terms u_{it} , where denotes the three categories of loans (Business, Mortgage and Consumer, denoted as B, M and C, respectively). t -ratios are loglik denotes the maximum value of the likelihood function, at the optimal estimates of the model. LR-stat is the likelihood ratio statistic testing null hypothesis $H_0: c_i = c_i^*, b_1 = b_1^*, b_2 = b_2^*, b_3 = b_3^*, \gamma_1 = \gamma_1^*, \gamma_2 = \gamma_2^*$ against its alternative $H_a: c_i \neq c_i^*,$ or $b_1 \neq b_1^*,$ or $b_2 \neq b_2^*,$ or $b_3 \neq b_3^*,$ or $\gamma_1 \neq \gamma_1^*,$ or $\gamma_2 \neq \gamma_2^*,$ where c_i and c_i^* are assumed to be the same across i . Critical and p -values of this statistic are calculated based on the bootstrapping procedure described in the paper

Table 13.2, which indicate that there is not a high degree of heterogeneity in the slope coefficient estimates, across i . Note that, where there is some degree of heterogeneity, the estimates of the slope coefficients of the model tend to be insignificant, at the 5% level. To see if there is evidence of cross-correlation of error terms u_{it} , across i , both Tables 13.3 and 13.4 present estimates where u_{it} are assumed to be correlated across i . The correlation matrix across u_{it} is denoted as Σ .

The values of \bar{R}^2 , reported in Table 13.2, indicate that the full specification of the model, with the set macroeconomic variables, fits better into the data, compared to that without. The relationship between ΔNPL_{it} and $\Delta UNPL_{t-1}$ is positive as was expected by the theory. This is true for all different sets of estimates reported in Tables 13.2, 13.3 and 13.4. ΔNPL_{it} is also positively related to $INFL_{t-1}$, but this relationship is less strong, compared to that between ΔNPL_{it} and $\Delta UNPL_{t-1}$. For the SUR-based estimates, reported in Table 13.3, the slope coefficient of $\Delta UNPL_{t-1}$ becomes significant at 10% level. The positive relationship between ΔNPL_{it} and $INFL_{t-1}$ can be attributed to the fact that an increase in inflation reduces the real income of borrowers. Regarding the relationship between NPLs and the bank-specific variables, the single equation results of Table 13.2 indicate that, although the sign of the slope coefficients of these variables is consistent with the theory, they are not always significant, at 5 or 10% level, across the three equations. Note that the estimates of the slope coefficient of ΔLTD_{t-1} are not found to be significant, for all i , at the 10, or 5%, level. This is true even for the SUR based estimates of the model, reported in Table 13.3. The SUR-based estimates of the model clearly indicate that the relationship of ΔROA_{t-1} and $\%EQTY_{t-1}$ with ΔNPL_{it} is negative and significant, as predicted by the bad management and moral hazard hypotheses, respectively.

Turning the discussion on the estimates of the model with a break, the results of Table 13.4 leads to a number of very interesting conclusions. First, they provide clear cut evidence that there is a structural change (break) in the relationship between ΔNPL_{it} and its fundamentals, for the Greek economy. This occurs in the first quarter of the year 2012 (i.e., 2012:Q1). Note that, for the specification of the model without the macroeconomic variables, it occurs two quarters later (i.e., at 2012:Q3). This can be obviously attributed to omitting the unemployment rate variable from the model. The values of \loglik and statistic LR -stat, reported in the table, indicate that the full specification model (1), with the bank-specific and macroeconomic variables, as well the break point considered, is more consistent with the data, compared to its version without a break and/or the macroeconomic variables as

explanatory variables. The p -value of statistic LR -stat, reported in the table, clearly rejects the null hypothesis H_0 that there is no structural change in the slope coefficients of the model against its alternative H_a , which assumes that there exists. We have found the better fit of the model with the break into the data, compared to its version with no break, can be also confirmed by the values coefficient of determination \bar{R}^2 of all SUR of the model estimated. These results are not reported in the table for reasons of space.

The existence of a structural change in the NPLs and its determinants, at point 2012:Q1, may be associated to the deepening of the recession, the political uncertainty and instability, and the strong fears for GREXIT in this year, as mentioned before. As the results of Table 13.4 indicate, the effects of $\Delta UNPL_{t-1}$ on ΔNPL_{it} become stronger and more significant in the subsample after the break point 2012:Q1, rather than that before. The same is true for inflation rate $INFL_{t-1}$. Figure 13.4 shows that inflation was rising in the year 2012, despite the severe recession of the Greek economy in this year. This had negative effects on the real income of borrowers and, hence, on NPLs, for all loan categories considered. The positive effect of the unemployment rate on NPLs is consistent with prior empirical evidence [see Louzis et al. (2012); Monokroussos et al. (2016)].

The results of Table 13.4 also indicate that, apart from the macroeconomic variables, there is also a structural change in the relationship between NPLs and the bank-specific variables of the model, after break point 2012:Q3. The change in NPLs, ΔNPL_{it} , becomes negatively and significantly related to ΔROA_{t-1} only after this break point. This is the only bank-specific variable which can explain future NPLs changes after the break point. Its effects on ΔNPL_{it} are consistent with the bad management hypothesis. The change in LTD ratio (ΔLTD_{t-1}) and the percentage change in equity ($\%EQTY_{t-1}$) are found to have no and little (less significant) effect on ΔNPL_{it} , respectively, after point 2012:Q1. Comparing the results of Table 13.4 to those of 13.3 (which do not consider a break point), one can see that the significant effects of ΔLTD_{t-1} and $\%EQTY_{t-1}$ on ΔNPL_{it} are present only in the period before point 2012:Q1, where the economy was not yet suffering from a severe

recession and political uncertainty. The positive relationship between ΔNPL_{it} and ΔLTD_{t-1} found for the period before this point is consistent with the liquidity risk hypothesis, while the negative relationship between ΔNPL_{it} and $\%EQTY_{t-1}$ is consistent with the moral hazard hypothesis.

13.4 Conclusion

In this paper, we investigate whether bank-specific or macroeconomic factors determine NPLs using loan portfolios data from the Greek banking sector. Our econometric analysis is based on a SUR (seemingly unrelated regressions) framework which allows for cross-correlation across the error terms of the different categories of loans considered. We have extended this framework to allow for a common structural break in the relationship between NPLs and their determinants. This break can be justified by changes in institutional factors and/or exogenous events, including political uncertainty.

The results of the paper lead to a number of interesting conclusions, with banking or macroeconomic policy implications. They show that political instability and the severe deterioration of the macroeconomic conditions constitute the key factors explaining abrupt shifts of the NPLs of the Greek banking system, over the recent years. Under these conditions, we found that the key factors that can explain movements in NPLs are changes in unemployment and inflation rates. With exception of the earning to assets variable, which reflects bank management conditions, bank-specific variables like changes in equity and loan-to-deposit ratio seems that have no significant effect on NPLs under the above conditions. This is a lesson learned from the recent economic crisis Greece.

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14

Who Exports High-Quality Manufacturing Products? Some Empirical Regularities From Greek Exporting Firms

Sarantis Kalyvitis

14.1 Introduction

Export performance is a key factor in building sustainable growth. A number of recent studies have attempted to examine the patterns of Greek exports in terms of the Greek crisis and have related it to the poor performance of the economy. Böwer et al. (2014) show that, despite the closing of the trade balance gap from its 14.5% of GDP peak in 2008 and the significant reduction in nominal unit labour costs after 2010, the observed rise in the export to output ratio masks the effect of falling output with the narrowing of gap taking place mainly through falling imports. Arkolakis et al. (2017) estimate that the poor performance of Greek exports is responsible for one-third of the drop in GDP between 2007 and 2012. In terms of the structural characteristics of Greek exports, de la Maisonneuve (2016) reports that they are concentrated in low-technology products, which face strong competition

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from countries with lower labour costs, whereas high- and medium technology products, which have higher world market growth rates, account for only 20% of total Greek exports.

This chapter highlights the role of an, up to now, unidentified margin of export performance in Greece, namely export quality, for the performance of Greek exports and relates it to key characteristics of Greek exporters. Several papers have pointed out the importance of the quality of goods produced and exported for economic outcomes. In particular, product quality is a key feature that affects both how countries specialize in production and the direction of trade between countries, as higher quality varieties of existing products help build on existing comparative advantages to boost productivity and export revenues (see, among others, Schott 2004; Hallak 2006; Hausmann et al. 2007; Sutton and Trefler 2016). Hummels and Klenow (2005) infer quality by adopting the premise that if large exporters systematically sell high quantities at high prices, this is consistent with these exporters producing higher quality goods, and show that richer countries export higher quality goods at modestly higher prices. Fontagné et al. (2008) report that, on average, Japanese unit values are 2.9 times higher than for China, for the same products, shipped to the same markets, within the same year. They analyze unit prices of HS 6-digit products for 200 countries and find that the products of developed countries are not directly competing with those of developing countries. Crozet et al. (2012) obtain direct measures of quality for one industry and show that firms with higher measured quality have a higher ratio of consumer benefits to producer costs and are more likely to export higher quantities at higher prices.

As pointed out by Harrigan et al. (2015), these stylized facts are broadly supportive of models where consumers value quality, but quality is expensive to produce. Consumers choose goods on the basis of “quality-adjusted” prices and are willing to pay a higher price for an expensive, high-quality good. In turn, the marginal firm sells low-quality goods at a low price. Market entrants charge lower prices and thus *average* unit value in a market will fall. When markets differ in their level of competition, more entry implies lower average prices in less competitive markets. Yet a simple comparison of average nominal prices across markets will have misleading implications for the assessment of

quality, since the quality-adjusted price index can be lower when the average nominal price is higher. Johnson (2012) checks if the quality is “homogeneous” (meaning there is no difference in quality and thus firms compete only on price) or heterogeneous (meaning quality varies and thus firms compete on quality-adjusted price), and shows that heterogeneous quality is dominant.

This chapter uses Greek export data to provide new elements in understanding the relation between export quality and firm characteristics by investigating whether key attributes at the firm level are related to the estimated quality of exported products. To this end, I obtain a measure of the quality of Greek exports at the product level based on a modified version of the rationale followed by Khandelwal (2010) for US imports, who develops an estimation strategy that utilizes both unit value and quantity information to infer quality and has a straightforward intuition extensively used in the industrial organization literature: “*conditional on price, [...] higher market shares are assigned higher quality*” (Khandelwal, p. 1451). The measure of export quality is based here on the choice of ‘consumers’ (destinations) between alternative varieties within an exported Greek product category, after controlling for differences in price. Hence, it largely avoids the shortcomings of using unit values to proxy quality.¹ I use disaggregated trade data covering the period 1998–2012 to obtain the quality of Greek exports based on estimated regressions for 71 manufacturing products. Export quality in manufacturing is estimated to have fallen by 1% per year on average for the period 1998–2010, but recovered in 2011 and 2012 when it displayed a cumulative rise of 25.7%, yielding a cumulative rise of 9.2% for the entire period 1998–2012.

To get then a sense of how closely the quality estimates of exports at the product level are related to the characteristics of exporting firms, I examine how product quality in the Greek manufacturing sector is correlated with the labour structure of exporting firms. The empirical findings indicate that firms with higher wage-bill skill premia (higher wage bill ratios of skilled to unskilled labour) export higher quality products. When the wage-bill skill premia are decomposed into the skilled to unskilled employment ratios and the wage-rate skill premia, I find that firms with more skilled relative to unskilled labour export higher quality products, whereas there is no correlation with the skill premium based on the wage rate. When I look at the interaction of these variables with

destinations characteristics, I find that the positive correlations between the wage bill ratio and the ratio of skilled to unskilled workers with product quality are mainly driven by large and rich destinations.

The results extend the well-known in the international trade literature that examines how export unit values (prices) vary with destination characteristics, like size, income per capita and distance. Schott (2004, 2008) has documented a large difference in product prices within the most disaggregated level of product classification and that US consumers pay less for similar goods that are “Made in China” than for those “Made in OECD”. Manova and Zhang (2012) establish that Chinese export prices are higher in richer and larger destinations, and support the empirical relevance of trade models with endogenous product quality. Bastos and Silva (2010) and Baldwin and Harrigan (2011) find that export unit values within products increase systematically with distance, tend to be higher in shipments to richer nations and are negatively related to market size. In line with the findings presented here, their estimated relationships also reflect a ‘quality sorting’ of heterogeneous firms across markets: within product categories, higher productivity firms tend to ship greater quantities at higher prices to a given destination, consistent with higher quality. I stress that the estimated correlations are identified across firms within products and the fact that highly productive, skill-intensive Greek firms export higher quality products corroborates and extends the aforementioned evidence in the micro-exporting literature.

The rest of the chapter is structured as follows. Section 14.2 reviews the related empirical literature on the quality of exports and derives the quality estimates of Greek exports. Section 14.3 links the quality estimates at the product level with the labour structure of exporting firms and Sect. 14.4 draws the main conclusions.

14.2 Estimating the Quality of Greek Exports

14.2.1 Related Empirical Literature

The importance of export quality in analyzing the determinants of trade flows sparked an interest in estimating export quality. The main

challenge faced by this literature is that product quality is unobserved. Research in the international trade literature has attempted to exploit the availability of trade data at a highly disaggregated level for many countries and has used readily observable prices (or unit values), defined as the ratio of export value over quantity for a given product category, as a proxy for export quality. However, this strategy is not viable to study the relationship between quality and firm characteristics, because unit values suffer from several shortcomings generated by differences in the composition of goods and their production costs, or pricing strategies within a given product category across exporters. If, for instance, exporters that use lower cost inputs are systematically less productive than competitors they will sell more expensive varieties, by measuring relative quality with relative prices we may wrongly attribute to lower cost inputs a positive effect on output quality. Moreover, standard supply or demand shocks will affect equilibrium prices, and hence unit values, without necessarily affecting product quality. Indeed, some recent papers, which have developed strategies for quality estimation using explicit microeconomic foundations, have established that observed unit values can be a poor approximation for export quality (Khandelwal 2010; Hallak and Schott 2011; Feenstra and Romalis 2014; Henn et al. 2015).

In the context of a cross-country setup, Hallak and Schott (2011) rely on trade balances to identify quality: holding observed export prices constant, countries with trade surpluses are inferred to offer higher quality than countries running trade deficits. Consumers are assumed to care about price relative to quality in choosing among products and hence two countries with the same export prices but different global trade balances must have products with different levels of quality. Among countries with identical export prices, the country with the higher trade balance is revealed to possess higher product quality. This procedure requires extensive data on tariffs, which is unavailable even for many relatively large countries before 1989. Feenstra and Romalis (2014) exploit supply-side features of trade data to decompose available unit values of internationally traded goods into quality and quality-adjusted price components using an endogenous quality decision. Based on two different unit-value observations for each product, derived

from import and export data, they are able to aggregate individual products to industry-level indexes of export quality and prices covering the period 1984–2011. Vandebussche (2014) develops an export quality indicator based on Di Comité et al. (2014), which disentangles quality from cost and taste effects, to generate quality ranks of EU manufacturing products at the EU Combined Nomenclature *classification* level (CN8) over the period 2007–2011. His rankings suggest that quality upgrading results in a higher willingness to pay by consumers and therefore offers a way to escape cost competition.

In terms of country time-series estimates of export quality, Henn et al. (2015) use reduced-form quality-augmented gravity equations based on Hallak (2006), to estimate export quality indices for 178 countries covering the period 1962–2010 at the product and aggregate levels. In a single-country setup Khandelwal (2010) exploits price and quantity information to estimate the quality of US imports, where higher quality is assigned to products with higher market shares conditional on price. He finds that the estimated qualities reveal substantial heterogeneity in product markets' scope for quality differentiation ("quality ladders") and that markets characterized by relatively short quality ladders are associated with larger employment and output declines resulting from low-wage competition.

14.2.2 The Empirical Model for the Quality of Greek Exports

The empirical identification of export quality relies on the assumption that, conditional on export price, $price_{hd}$, measured by the unit values of variety h (captured by their CN8 classification), shipped to destination d , varieties with higher shares in export markets at the product level (captured by their Standard International Trade Classification; henceforth SITC) are assigned higher quality. To assess product quality the following specification is estimated:

$$\ln(S_{hdt}) = \alpha x \ln(price_{hdt}) + \beta x \ln(pop_{dt}) + \gamma x \ln(NS_{hdt}) + \lambda_{1,h} + \lambda_{2,t} + \lambda_{3,ht} \quad (1)$$

where S_{hdt} denotes the share of shipments of variety h to destination d in aggregate shipments of product p (e.g. cotton shirts exported to Germany relative to total Greek exports of shirts) at time t , and NS_{hdt} denotes the ‘nested’ share of variety’s h shipments to destination d in aggregate shipments of variety h (e.g. cotton shirts exported to Germany relative to total Greek exports of cotton shirts) at time t . Both S_{hd} and NS_{hd} are measured in terms of quantities. Notice that a larger market share of a product may reflect that exports include more ‘hidden’ variables, due to the aggregation of more finely classified products that are unobserved (Khandelwal 2010). Suppose that exports to Germany and the Netherlands split the market of Greek exports in shirts equally at a non-observed disaggregation level (e.g. colour of shirts), yet exports to Germany are larger as they include more colours. Aggregation to the observed level (shirts) would assign a larger market share at identical prices to Germany and yield an upwards biased estimate of quality. To account for this potential caveat, destination population pop_d obtained from World Development Indicators, is also included in the estimated regression to proxy for destination size.

The quality of variety h to destination d at time t , λ_{ht} , is defined using the estimated parameters $\lambda_{ht} \equiv \lambda_{1,h} + \lambda_{2,t} + \lambda_{3,ht}$. Since the trade data do not record detailed characteristics of varieties, I exploit the panel dimension of the data by specifying a time-invariant component of quality $\lambda_{1,h}$ with variety fixed effects (some products have a better quality than others) and a common quality component $\lambda_{2,t}$ with year-fixed effects (quality might vary through time). The third component of quality, $\lambda_{3,ht}$, is unobservable (for instance, quality might change because of some upgrading of plant and equipment) and plays the role of the estimation error.²

Similarly to Khandelwal (2010), specification (1) allows for the plausible correlation structures among consumer preferences through the nest share, NS_{hdt} . Consider for instance two varieties, wool shirts exported to France and cotton shirts to Italy. Suppose that they are identical in every dimension (including price) and evenly split the market of Greek exports in shirts. We would infer their qualities also to be equal. Now suppose a cotton shirt is exported to Germany: the new market shares for both cotton shirts would *ceteris paribus* be

one-fourth each and the wool shirts exported to France would capture the remaining half. In other words, we might expect the market share of cotton shirts exported to Italy to adjust more than the market share of wool shirts exported to France, because shirts exported to Germany are also cotton. However, we do not want the inferred quality of the existing varieties to fall simply because varieties within nests are closer substitutes than varieties across nests. The nested specification alleviates this concern preferences by placing varieties into appropriate nests, with the nest share, NS_{bd} adjusting to account for changes in market shares.³

It should be stressed that a major difference with Khandelwal's (2010) approach is that he assesses the quality of US imports with the dependent variable being the market share of a country's imports to the US in total consumption of the product in the US (including domestic versions of the product). In contrast, Eq. (1) looks at Greek exports with the dependent variable being the share of Greek exports of product p to destination d in total Greek exports of the product. The approach adopted here looks across destinations by assuming that Greek exports of a product form a 'market' with destinations acting as 'consumers'. Hence, it neglects the concept of the market defined in terms of a German consumer who has a choice of Greek versus domestic products, Italian products, etc. However, it avoids the pitfalls associated with the spurious impact of domestic developments in the assessment of export quality. For instance, the recession in Greece after 2010 has shifted Greek exports upwards due to the lack of domestic demand, an outcome that would spuriously attribute higher shares of Greek exports in world markets to higher quality.

Given these insights, an alternative interpretation of λ_{bt} is that it represents a shift parameter in the variety's demand schedule: a variety's quality will rise if its price in a market (destination) can rise without losing market share (Sutton 1991). Quality here represents any attribute that encompasses consumers' willingness to pay for a variety (valuation for quality or 'perceived quality') and the technology of the variety ('technical efficiency'). The associated quality estimate does therefore not compare the quality of a single country's exports relative to competitors, which would require access and processing of disaggregated global trade flows as in Feenstra and Romalis (2014) and Henn et al. (2015),

but rather assesses changes in market (destination) shares of a country's products that cannot be attributed to price changes.

14.2.3 Trade Data

The empirical definition of an exported product follows the SITC classification system, which is a product classification of the United Nations used for external trade statistics (export and import values and volumes of goods), allowing for international comparisons of commodities and manufactured goods. The groupings of SITC reflect the production materials, the processing stage, market practices and uses of the products, the importance of the goods in world trade, and technological changes. I analyze the following manufacturing categories: *chemicals* (SITC 5), *machinery and transport equipment* (SITC 7), *other manufactured goods* (SITC 6 and SITC 8), and exclude the homogeneous goods defined by Rauch (1999) since these products, by definition, exhibit no quality differentiation. Given the noise in monthly exports, the data are trimmed along three dimensions. The first trim excludes varieties (defined as CN8 classifications) that are exported for less than 6 months and also those that are exported for less than 3 months to a single destination. Unit values are then calculated as ratios of export value to quantity.⁴ The second trim removes varieties with extreme unit values that exceed 10 times, or fall below 10% of, the median product (SITC) price. The third trim allows for variation across nested shares (CN8) within a product category; only products with three or more CN8 classifications per SITC are used in the estimation.⁵

14.2.4 Quality Estimates

Equation (1) is run separately for 71 SITC categories in the manufacturing sector, which fulfill the criteria described in the previous section. The results of these regressions show that 68 of the regressions, or 97% of the total 37,688 observations in the entire sample, have a negative and statistically significant price coefficient (see also Kalyvitis 2015). The average OLS price coefficient in manufacturing amounts

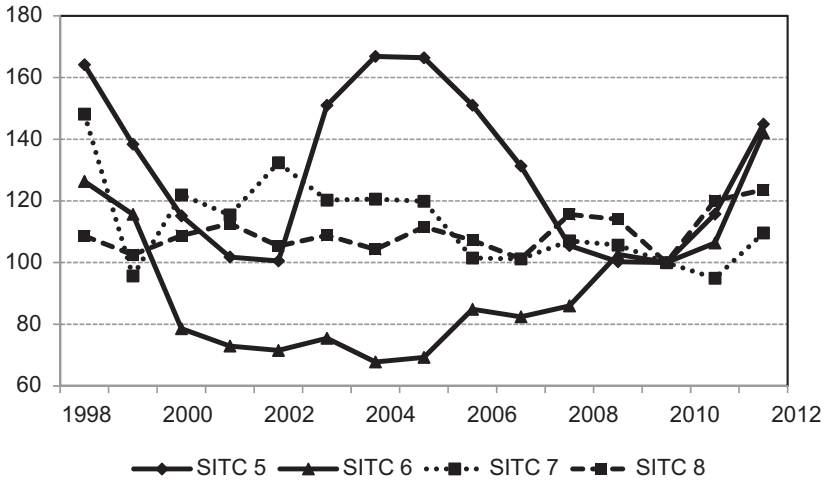


Fig. 14.1 Quality of Greek manufacturing exports by sector, 1998–2012. Note SITC 5 includes chemicals and related products, SITC 6 includes manufactured goods classified chiefly by material, SITC 7 includes machinery and transport equipment, and SITC 8 includes miscellaneous manufactured articles

to -0.61 and the median to -0.55 . The average coefficients on the conditional market share and the population also have the expected positive signs, amounting to 0.72 and 0.03 respectively, and are also statistically significant.

The patterns of the export quality for manufacturing exports at the sectoral level are depicted in Fig. 14.1, which displays the estimated export quality indices per SITC broad category (5–8), obtained from the residuals of these regressions according to the definition of λ_{bt} and weighted by the shares of annual revenues for each product. Export quality at the sectoral level reveals substantial heterogeneity, with SITC industries 5 (Chemicals and Related Products) and 6 (Manufactured Goods Classified Chiefly by Material) displaying a drop in the estimated export quality after 1998, although a sharp recovery period is observed in years 2003–2005 for SITC 5 and after 2004 for SITC 6. In contrast, SITC industries 7 (Machinery and Transport Equipment) and 8 (Miscellaneous Manufactured Articles) display a stagnant pattern for the whole period.

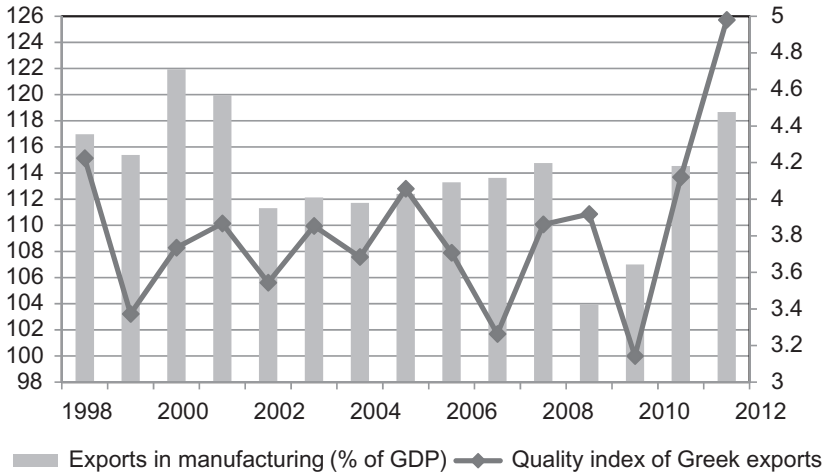


Fig. 14.2 Aggregated quality index of Greek manufacturing exports and manufacturing exports as % of GDP, 1998–2012. *Source* World Bank (World Development Indicators) and author's calculations

Figure 14.2 displays the quality estimates for the manufacturing sector aggregated in index form. Notably, average export quality, which had a slight negative trend over the period 1998–2010 falling by 1% per annum, appears to follow a sharp positive trajectory after 2010, climbing by 13.7% in 2011 and 10.6% in 2012. To highlight the potential implications of these findings, the relationship between Greek exports in the manufacturing sector and export quality is also examined by plotting manufacturing exports as % of GDP (obtained from World Development Indicators). Manufacturing exports have remained stagnant until 2008, ranging from 4% to 4.3% of GDP, with the exception of years 2000 and 2001 when they amounted to 4.7% and 4.6% of GDP, respectively. After the large drop in 2009, when exports fell to 3.4% of GDP, they have picked up sharply over the next years reaching 4.5% of GDP in 2012, a rise that is partly due to the slump in GDP after 2009. Export quality shows a mild correlation with the share of exports over the 1998–2012 period that amounts to 0.36 and, notably, accompanies the strong rise of exports in years 2011 and 2012. Although this relationship does not necessarily indicate a causal

association, the rise in export quality is noteworthy when viewed in conjunction with the parallel strengthening of the export sector in 2011 and 2012.

14.3 Linking Product Quality with Firm Characteristics

In this section, I use the quality estimates to study (1) how product quality relates to key aspects of firm characteristics and (2) the interplay between foreign market characteristics and the relationship of product quality and firm characteristics.

14.3.1 Data and Empirical Specification

To address the questions posed in the Introduction, I use a newly compiled dataset on Greek exporting firms that merges data from two main sources, both available via the Greek Statistical Agency (ELSTAT). Trade data at the firm-product-destination level are obtained from the Intrastat databank, which collects information and produces statistics on dispatches and arrivals of goods in European Union countries and replaced customs declarations as the source of trade statistics. Export data at the firm level are combined with survey data available through the Annual Manufacturing Survey (AMS), which is carried out annually and contains data related to the economic activity of medium-scale and large-scale manufacturing firms. The firm survey is collected at the plant level, but export and financial information are recorded at the firm level. Specifically, the survey provides figures on types of expenses and labour force variables (like number of employees and remuneration per type of worker).⁶ A key limitation of these data is, therefore, sample size in some regressions, depending on the number of firms for which data via the AMS are available.

Although the AMS data are available for the period 2001–2010, I focus on the relationship between export quality at the product level and firm characteristics in a single year in the panel, 2007. This strategy,

also adopted by Manova and Zhang (2012), is motivated by a number of considerations. First, the aim to establish stylized facts that obtain in the cross-section of firms and not in export dynamics. Due to the structure of the survey, there is no information on whether a firm is not included in one or more years because it has exited from the export market, or because it was omitted from the sample. By focusing on a single year I abstract from these issues and, also, concerns on nominal frictions, such as sticky wages and prices, and related firm or sectoral dynamics. Second, I avoid using data for years 2008 and 2009 due to the global trade crisis that might have affected the nature of exporting in a small open economy like Greece (Behrens et al. 2013). Third, because data for one year denominated in Euros are examined, the analysis is not sensitive to possible adjustments in the quality of exports by Greek firms related to the adoption of the Euro in the year 2001. Finally, from a technical point of view, when I explore how the interaction of firm and destination market characteristics relates to export quality, time-invariant (bilateral distance) or strongly persistent (GDP, GDP per capita) variables are used. If the outcome variable were at the panel dimension, the standard errors could be misleadingly low because the number of observations would be effectively multiplied without necessarily introducing new information. Also, outliers are likely to be of greater concern in a panel dataset extending over several years, as there is a lot of lumpiness because many firms do not export a given product to a given market in every year.

Formally, the estimating equation for year 2007 is given by (time index is omitted):

$$\ln(\lambda_h) = c + \delta_1 \times \ln(\text{firm_var}_f) + \delta_2 \times [\ln(\text{firm_var}_f) \times \text{dest}_d] + \theta \times \ln(W_f) + \varepsilon_{fhd} \quad (2)$$

The l.h.s. variable, λ_h , denotes quality at the product level obtained through Eq. (1). On the r.h.s., firm_var_f denotes the firm characteristic under consideration and parameter δ_1 captures its conditional association with product quality. Here, I consider variables capturing the labour structure at the firm level, like the wage bill and the number of persons employed to calculate the ratio of the wage bill for skilled to

unskilled employees, the ratio of skilled to unskilled employees, and the wage rate skill premium.⁷ The term $\ln(\text{firm_var}_\rho) \times \text{dest}_d$ interacts these firm characteristics with destination characteristics, like size, income and distance, proxied by gdp, gdp per capita and bilateral distance respectively.⁸ The interaction term between the destination characteristics and the firm variable captures, through parameter δ_2 , the extent to which the correlation between product quality and firm characteristics is associated with these characteristics. I also take as regressors a vector of firm characteristics, W_ρ that proxy for the various conjectures to explain product quality at the firm level through the parameter θ . In the empirical specification, W_f translates into the (logs of) age and export intensity (measured as exports to total revenues). These variables, obtained from the ICAP database, account for the size and productivity performance, as more productive firms are expected to be more export oriented (Melitz 2003; Berman et al. 2012). Finally, the term ε_{fbd} denotes the firm-product (or firm-product-destination depending on the specification used) error term.

The primary interest is in the signs and significance levels of δ_1 and δ_2 in each regression, which reflect the conditional correlations between export quality at the product level and characteristics across firms that export the corresponding products. It should be emphasized that δ_1 and δ_2 cannot be given a causal interpretation because product quality and many firm attributes are both affected by unobserved firm characteristics. Moreover, in many recent models of heterogeneous firms, they are the joint outcome of firms' profit maximization and, hence, are simultaneously determined (Verhoogen 2008; Feenstra and Romalis 2014).

14.4 Results

Panel A in Table 14.1 presents the estimates of Eq. 2 for the 2007 cross section with two regressions run for each firm variable, namely without and with control variables. Turning first to the control variables, they are almost always significant with robust signs: higher product quality is associated with more export-oriented and younger firms. Concerning the variables of interest, columns (1) and (2) of Table 14.1 display the

coefficients for the wage bill skill premium (ratio of the wage bill for skilled to unskilled employees). In both specifications the coefficient turns out positive and significant, indicating that firms that spend relatively more on skilled labour export higher quality products. In the next four columns, the wage bill is decomposed into the number of employees and the wage rate. Specifically, columns (3) and (4) use the ratio of skilled to unskilled workers as a r.h.s. variable and show that firms with relatively more skilled labour export higher quality products. Interestingly, the conditional correlations of product quality with the wage-bill skill premium and the ratio of skilled to unskilled employees are larger when the regressions control for export intensity and age, which implies that the outcomes do not hide a spurious association of higher productivity firms producing higher quality products by spending relatively more on skilled labour or employing relatively more skilled workers. In contrast, the coefficients on the skill premium based on the wage rate do not show any relation with product quality. To assess the sensitivity of these findings, Panel B in Table 14.1 presents the results from estimating Eq. 2 in first differences using data for years 2007 and 2005. As can be readily seen, the main patterns persist for all specifications. The coefficients for the wage bill skill premium and the ratio of skilled to unskilled workers are significantly positive, and also larger in magnitude for the specification that controls for export intensity. In contrast, the coefficients on the wage rate skill premium are insignificant. The findings from Table 14.1 can, therefore, be summarized as:

Fact 1. The share of skilled employees in total employment is positively related to the product quality of exports, whereas the wage rate ratio of skilled to unskilled labour is not.

As a next step in the analysis of the association between firm characteristics with product quality, Table 14.2 summarizes the results from including interaction terms of labour characteristics at the firm level with destination size, income and distance. Specifically, the first two rows in Panel A of Table 14.2 display the direct coefficient of the wage-bill skill premium and its interaction with destination size, captured

Table 14.1 Export quality and firm-level labour structure

Dependent variable: Product quality						
	(1)	(2)	(3)	(4)	(5)	(6)
A. cross Section (2007)						
<i>skill premium</i>	0.113***	0.254***				
<i>(wage bill)</i>	(0.028)	(0.049)				
<i>skilled/</i>			0.101***	0.227***		
<i>unskilled</i>			(0.029)	(0.047)		
<i>workers</i>						
<i>skill premium</i>					0.124	0.054
<i>(wage rate)</i>					(0.083)	(0.081)
<i>export</i>		0.225***		0.227***		0.198***
<i>intensity</i>		(0.035)		(0.036)		(0.031)
<i>age</i>		-0.213***		-0.187***		-0.242***
		(0.051)		(0.048)		(0.049)
<i>R-sq.</i>	0.002	0.122	0.001	0.119	0.001	0.104
<i>#observations</i>	3699	3106	3680	3087	3680	3087
<i>#firms</i>	501	360	499	358	499	358
<i>#destinations</i>	120	109	120	109	120	109
B. first-differenced panel (2007–2005)						
<i>skill premium</i>	0.209**	0.455***				
<i>(wage bill)</i>	(0.090)	(0.108)				
<i>skilled/</i>			0.207**	0.440***		
<i>unskilled</i>			(0.104)	(0.164)		
<i>workers</i>						
<i>skill premium</i>					0.077	0.254
<i>(wage rate)</i>					(0.200)	(0.225)
<i>export</i>		0.078		0.070		0.034
<i>intensity</i>		(0.060)		(0.064)		(0.063)
<i>R-sq.</i>	0.002	0.007	0.002	0.005	0.000	0.001
<i>#observations</i>	1485	1231	1463	1214	1463	1214
<i>#firms</i>	251	193	248	191	248	191
<i>#destinations</i>	83	76	83	76	83	76

Notes All variables are in logs. All regressions include a constant term with destination clustered standard errors (*t*-statistics are in parentheses and * denotes $p < .10$, ** denotes $p < .05$, *** denotes $p < .01$). The regressions in Panel A also include product fixed effects

by its gdp. The coefficient on the wage-bill skill premium is now negative and insignificant, whereas the interaction is positive and significant indicating that the positive association with product quality increases for larger destinations. In the next two regressions, the effects are decomposed in the ratio of skilled to unskilled employees and the wage

Table 14.2 Export quality and interactions of labour structure with destination characteristics

Dependent variable: Product quality	coefficient	(std. error)	R-sq.	# obs.	# firms	# destinations
A. destination size						
<i>skill premium (wage bill)</i>	-0.157	(0.151)				
<i>skill premium (wage bill) X size</i>	0.034***	(0.012)	0.124	3035	357	97
<i>skilled/unskilled workers</i>	-0.114	(0.155)				
<i>skilled/unskilled workers X size</i>	0.027**	(0.012)	0.120	3016	355	97
<i>skill premium (wage rate)</i>	0.084	(0.418)				
<i>skill premium (wage rate) X size</i>	-0.001	(0.034)	0.105	3016	355	97
B. destination income						
<i>skill premium (wage bill)</i>	-0.738*	(0.390)				
<i>skill premium (wage bill) X income</i>	0.100**	(0.039)	0.124	3035	357	97
<i>skilled/unskilled workers</i>	-0.782**	(0.378)				
<i>skilled/unskilled workers X income</i>	0.102***	(0.037)	0.120	3016	355	97
<i>skill premium (wage rate)</i>	1.960*	(1.054)				
<i>skill premium (wage rate) X income</i>	-0.190*	(0.108)	0.102	3016	355	97
C. destination distance						
<i>skill premium (wage bill)</i>	-0.304	(0.441)				
<i>skill premium (wage bill) X distance</i>	0.076	(0.062)	0.126	3035	357	97
<i>skilled/unskilled workers</i>	-0.384	(0.407)				
<i>skilled/unskilled workers X distance</i>	0.083	(0.057)	0.120	3016	355	97
<i>skill premium (wage rate)</i>	0.953*	(0.492)				
<i>skill premium (wage rate) X distance</i>	-0.120*	(0.067)	0.100	3016	355	97

Notes The regressions are from the 2007 cross section. Each regression is presented in a set of two rows and includes logs of export intensity and firm age as control variables. See also Notes to Table 2

rate skill premium. The correlation of the ratio of skilled to unskilled workers with product quality is negative and insignificant, but is significantly positive for larger destinations. The coefficient on the wage rate skill premium is positive and its interaction with size is negative, but both effects are insignificant. The corresponding rows in Panel B of Table 14.2, which contain the specifications with the interactions with destination income (gdp per capita), show that the coefficients on the wage bill skill premium and the ratio of skilled to unskilled workers are negative and significant, whereas the corresponding interactions with destination income are positive and significant. In contrast, these effects become insignificant when the interactions with distance are considered. The wage rate skill premium is positive and its interactions with income and distance are negative, but only marginally significant (see fifth and sixth rows of Panels B and C). The findings from Table 14.2 can, therefore, be summarized as:

Fact 2. The positive correlation between product quality and the ratio of skilled to unskilled workers is mainly driven by large and rich destinations.

Overall, Facts 1 and 2 are consistent with the idea that there is a ‘quality sorting’ of Greek exporters across destinations based on their labour structure. The estimated correlations could be largely explained by unobservable differences in the quality of inputs, which are in turn reflected in output quality as in Kugler and Verhoogen (2012). There are various reasons why quality in exporting may demand relatively more skilled employment. For instance, international marketing and commercialization, transportation and distribution, advertising require expertise in international businesses, languages, foreign technologies, and in the social idiosyncrasies of foreign markets. Verhoogen (2008) develops a model where exporting allows for quality upgrading and skill-intensive services, a channel that might be particularly relevant if it involves accessing high-income destinations with higher valuation for quality (Brambilla et al. 2012). In a related vein, exporting may require varying levels of skills due to “skilled-bias globalization”, in which international trade activities use skill-intensive resources (Matsuyama 2007).⁹

14.5 Conclusions

Empirical research in trade models has consistently found that product quality influences cross-border trade; richer countries consume and export higher quality products than developing countries, with most studies using observable unit prices as proxies for quality. This chapter presented some estimates of the quality of Greek exports based on the premise that a product's quality will rise if its price in a market can rise without losing market share. A specification that relates market shares to prices and other determinants was estimated using Greek export data in manufacturing over the period 1998–2012. Export quality is estimated to have fallen by 1% per year on average for the period 1998–2010, but recovered in 2011 and 2012 when export quality displayed a cumulative rise of 25.7%, yielding a cumulative rise of 9.2% for the entire period 1998–2012. Linking the quality estimates at the product level with exporting firms shows that skill-intensive firms export higher quality products, an effect that is more pronounced in large and rich destinations.

Looking ahead, the implications of the findings presented here are relevant from a policy perspective. The promotion of quality as a dimension of international competitiveness is an objective of high-income economies facing price competition from low-wage countries. Given that the treatment of the product-quality-related characteristics, like skilled employment, is sensitive to policy parameters, the nexus between export quality and the skilled to unskilled employment ratio should be considered when evaluating the implications of policies that may affect a firm's composition of employment and provides a potentially fruitful avenue for future research.

Notes

1. See Sect. 14.2 for a more detailed survey of related empirical literature.
2. The identification of coefficients relies on the assumption that prices are exogenous. Khandelwal (2010) points out that this assumption may not hold if exporters choose prices and quality simultaneously, and

instruments prices with transportation costs (captured by the distance of the destination country) and the ‘nested’ share with the number of destinations per variety. A similar identification strategy for Greek exports did not prove successful, as both instruments contained little information for the variables of interest.

3. In addition, the nest share, NS_{hd} , accounts for trade redirection that is important for quality. Estimated export quality will not change simply because exports to a certain destination are adjusted due e.g. to an external shock, as the nest part will adjust as well. Thus the assessed impact can be considered as a proxy of ‘non-price’ effects.
4. Notice that this approach implies that the observed unit values are averages across firms.
5. The Data Appendix in Kalyvitis (2015) summarizes the products used in the estimation process after excluding those values that are not exported for all data years over the sample period considered here (1998–2012).
6. For a more detailed description of the external sector statistics and the Annual Manufacturing Survey, see Theofilakou and Stournaras (2013) and Tsakanikas and Vassiliadis (2013).
7. Skilled employees comprise full and part-time employees on a monthly payroll and unskilled employees comprise respectively full and part-time employees paid on a daily salary. The wage rate for skilled and unskilled workers is calculated by dividing the corresponding wage bills to the numbers of employees. Denoting the wage bill, employment the wage rate by wb , n and w respectively, we get that $\frac{w^s}{w^u} \equiv \left(\frac{wb^s}{n^s}\right) / \left(\frac{wb^u}{n^u}\right) = \left(\frac{wb^s}{wb^u}\right) \left(\frac{n^u}{n^s}\right)$, where s and u denote skilled and unskilled labour. The detailed description of the variables and their source codes are is given in Kalyvitis (2015).
8. Data on GDP and GDP per capita are obtained from the World Bank’s World Development Indicators and bilateral distances is obtained from CEPII.
9. In the extended version of the paper (Kalyvitis 2015), I report the corresponding correlations with various types of firm expenses related to product quality. Notably, higher spending for advertising and promotion expenditures is associated with higher-quality products, but the association becomes weaker in larger and richer markets. These findings are consistent with diminishing returns of product quality with respect to marketing, in line with Arkolakis (2010) who has shown that the marginal cost of marketing in firm exporting increases with the market

size, proxied by the number of consumers, reached. The pattern found for Greek exporters implies that the marginal cost of marketing also increases with the income of consumers reached.

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15

Spatial Structure and Spatial Dynamics of Regional Incomes in Greece

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15.1 Introduction

The almost decade-long crisis in—and of—Greece has unveiled a number of structural problems and asymmetries in the country's economy—some of which are discussed in the other chapters of this book. Especially issues of market regulation, wage-setting, productivity, trade competitiveness, current account and fiscal imbalances, have attracted much attention in public, policy and academic debates. Little attention, however, has been placed on the economic geography of the country and on issues that have to do with spatial asymmetries and the spatial structure of the economy at large.

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This is somewhat surprising, at least for two reasons. On the one hand, because Greece is known—albeit almost anecdotally—to have significant spatial asymmetries: an over-concentration of population and economic activity in and around the capital region of Athens; persistent disparities in incomes and employment opportunities across its regions; and generally weak connectivity across its small-and medium-sized cities, in part owing to its physical geography. On the other hand, because Greece has been in the past anything but under-represented in the literature examining regional disparities in Europe, especially within the so-called neoclassical convergence tradition.

Indeed, following on from the early study on the topic by Siriopoulos and Asteriou (1998), a number of studies have examined regional growth and convergence/divergence in Greece over the last twenty years. For example, Petrakos and Saratsis (2000), Ioannides and Petrakos (2000), Michelis et al. (2004), Christopoulos and Tsionas (2004) and Benos and Karagiannis (2008) have all examined various versions of the conditional and unconditional beta-convergence equation in cross-sectional data (mostly covering the 1980s and up to the mid-1990s), typically finding evidence of neoclassical convergence, which is stronger at the prefectural (NUTS 3) than the regional (NUTS 2) levels. Similar results have been reached by Lolos (2009) in a panel-data application of conditional convergence as well as by papers utilising alternative techniques, such as artificial neural network estimations (Papadas and Eustratoglou 2004) and time-series nonstationarity tests (stochastic convergence—Liontakis et al. 2010; Arvanitopoulos et al. 2017).

Only a handful of studies have examined the differentiation in spatial dynamics underneath the aggregate patterns of convergence. Tsionas (2002) applied a Markov chain analysis to explore the distributional dynamics of regional incomes in Greece at the prefectural level over the periods 1971–1981 and 1982–1993, finding evidence of polarisation (and thus of club formation) concurrently with the evidence of beta-convergence. Direct evidence of club-convergence has been offered by Alexiadis and Tomkins (2004), in their study covering the period 1970–2000; but in a more recent study covering the period 1980–2000 and using non-parametric techniques (stochastic kernel approach) Fotopoulos (2006) found no strong evidence of

either convergence or divergence (polarisation). The recent crisis gave a new impetus to research in the field, with a number of papers examining the ‘regional footprint’ of the crisis, i.e. how the crisis played out across the heterogeneous economic space of the country (Monastiriotis 2011; Monastiriotis and Martelli 2013; Psycharis et al. 2014a, b; Monastiriotis 2014). Still, attention to questions of spatial structure and spatial dynamics, even in this literature, has been at best weak. On the whole, despite the body of past and more recent work on regional disparities in Greece, a detailed analysis of the regional and spatial dynamics in the country is lacking from the literature.

In this chapter, we attempt to fill this gap by offering a detailed examination of the extent and evolution of spatial association across the Greek prefectures (NUTS3 regions) over the full historical period for which data at this spatial scale are available and until the eruption of the recent crisis (1980–2008).¹ Given our interest in questions of spatial disparity more generally, we start in the next section by looking simultaneously at the extent of global spatial association, the evolution of regional disparities and the speed of cross-regional convergence, seeking to examine how spatial structure and dynamics (spatial association) condition these processes. In Sect. 15.3, we implement a detailed analysis of local spatial association, not only identifying spatial clusters (of above- and below-average performing regions) and spatial outliers, but also examining the persistence of such clusters over time and the dynamics underpinning these clusters by means of a principal component analysis. We discuss the implications of our results in the concluding section.

15.2 Regional Disparities and Spatial Association: Aggregate Patterns and Evolution Over Time

As noted already, our interest in this chapter is with the nature of the spatial association of regional incomes in Greece and its evolution over time (spatial structure and dynamics). A starting point in this analysis is to examine the extent of so-called global spatial association, i.e. the

extent to which local values (here, in regional GDP per capita) correlate with those of neighbouring localities (in our case, prefectures). To perform this analysis we rely on the Moran's I statistic, which is the most commonly used measure in this type of analysis (Anselin 1995). The statistic can be understood as a correlation coefficient, which measures the association between the observed series of regional incomes and a hypothetical series of 'neighbouring' regional incomes, constructed on the basis of a fixed definition of the neighbourhood (typically using either a contiguity criterion or a distance-based criterion).² At the same time, however, we want to investigate how the extent of spatial association links to, or even conditions, the extent of regional disparities and their temporal dynamics. To do so, we implement two pieces of analysis. First, descriptively, we compare visually the evolution of spatial association with that of regional disparities—the so-called sigma convergence analysis—using alternative measures of the latter, for completeness. Second, through econometric analysis, we examine the influence that space and 'neighbourliness' (i.e. spatial proximity) exert on the process and speed of so-called beta convergence.³ For this, we run a series of convergence models (unconditional, conditional, spatially autocorrelated, etc.), as described below, and compare the size and patterns of the obtained 'convergence coefficients'.

The results for the measurement of the extent of spatial association over the full period of analysis (1980–2008) are presented in summary form in Fig. 15.1. As can be seen, the Moran's I statistic (solid line) starts from a reasonably high value (0.386 in 1980) but follows a secular declining trend, reaching a value of 0.167 in 2008. The trend is interrupted by two periods of substantial cyclical decline and recovery, first in the early-to-mid-1980s and then again in the period 1994–2001. Although it is impossible to make any causal inferences by simple observation of these patterns, it is worth noting perhaps that the first period coincides with the early years of Greece's accession to the European Union while the latter period coincides with the period of structural adjustment in Greece in the run-up to the country's accession to the Eurozone. Both of these periods represented a form of a structural break for the Greek economy and they may well have influenced how the distribution of regional incomes correlated across space. In any case, the

level of spatial association in the country appears very low, especially in the post-2000 period. This suggests limited spatial clustering or, in other words, a certain (and increasing) degree of ‘randomness’ in the spatial distribution of regional incomes in the country.

Staying with our descriptive analysis, Fig. 15.1 depicts additionally the evolution of two measures of regional income dispersion. Both measures follow a similar pattern, which broadly mirrors the evolution of the Moran’s I statistic. The coefficient of variation (dashed line) experiences small episodes of relative increase during the 1990s but overall declines by around 30% between the first and last three years of the sample period. A similar pattern is found on the basis of the Theil index (not shown—decline by 40% in the same period), while the decline on the basis of the Gini coefficient (dotted line) is somewhat lower (14%). The co-movement of the Moran’s I with the regional disparity measures is consistent with trends identified for other samples and countries

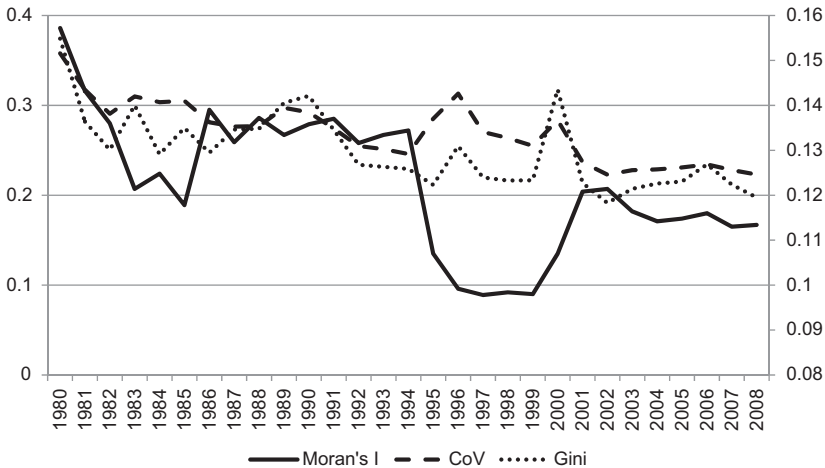


Fig. 15.1 Evolution of regional disparities and spatial association. *Notes* Authors’ calculations. Moran’s I is the statistic of global spatial association, as explained in the text (footnote 2). The Gini coefficient is a general measure of inequality. The coefficient of variation is a standardised measure of the standard deviation of the distribution of regional incomes. See Dunford (1993) for further explanation of these measures.

(see, inter alia, Rey and Montouri 1999) and seems to suggest that the observed pattern of ‘sigma convergence’ is underpinned by a decline in structural/systemic differences in regional incomes—as there is at the same time a decline in spatial clustering of regions with high (or low) incomes. This is also corroborated from an analysis of disparities within and across NUTS2 regions (not shown), which shows that regional disparities have become over time more localised (within NUTS2 regions).

To take a closer look at how space and spatial associations condition the evolution of regional disparities, we move on to the analysis of beta-convergence, the results of which are depicted in Table 15.1. Here, we run a series of spatial and non-spatial models and compare the derived convergence coefficients, using the unconditional convergence model as

Table 15.1 Regional convergence and spatial conditioning, by period

Model	1980s	1990s	2000s
Non-spatial			
Unconditional	−0.022***	−0.038***	−0.015***
Conditional	−0.012	−0.044***	−0.030***
Spatial			
SAR	−0.017**	−0.035***	−0.015**
SEM	−0.018**	−0.038***	−0.016**
GWR			
Mean	−0.022***	−0.039***	−0.015***
Min	−0.033	−0.048	−0.031
Lower quintile	−0.022	−0.046	−0.016
Median	−0.018	−0.043	−0.013
Upper quintile	−0.017	−0.034	−0.012
Max	−0.017	−0.025	−0.011
Variability test	−30.409	−54.116	−205.082

Notes *, ** and *** show statistical significance at the 10%, 5% and 1% levels, respectively. Reported estimates concern the ‘convergence coefficient’ for different periods and across different models: unconditional (simple OLS), conditional (controlling also for initial characteristics), SAR (controlling for spatial autocorrelation in the dependent variable), SEM (controlling for spatial autocorrelation in the regression residuals), and GWR (estimating region-specific coefficients based on each region’s spatial field). For the GWR estimations, only the key ‘moments’ (minimum, maximum, mean, median, etc.) of the distribution of estimates are reported. Variability Test is a joint Akaike Information Criterion test for the explanatory power of the GWR model (region-varying estimates) against the standard model (regionally uniform convergence coefficients)

the benchmark and splitting our sample years into three periods. The conditional convergence model conditions the speed of convergence on local-specific characteristics.⁴ The two spatial models (SAR and SEM) control instead for the presence of spatial spillovers (spatial association) in regional growth (the dependent variable) and in regional shocks (the residuals), respectively, examining whether the observed convergence coefficient is driven by such localised spillovers (see, *inter alia*, Arbia et al. 2005; Arbia and Piras 2005; Dall'erba and Le Gallo 2008; Ramajo et al. 2008). In turn, the GWR model allows for spatial heterogeneity in the convergence coefficients more broadly, by estimating region-specific coefficients of convergence using spatial weights to define a 'neighbourhood' for each individual region (see Fotheringham et al. 2002, for demonstration of the method; and Eckey et al. 2007 and Artelaris 2015, for empirical applications in a similar context).

As can be seen, consistent with findings for Greece elsewhere in the literature, there is universal evidence of convergence across prefectures in all periods. However, the speed of convergence is not constant over time. In all models, we observe the convergence coefficient to be highest in the 1990s and lowest in the 2000–2008 period. Reading across rows, spatial conditioning seems to make an overall little difference in these results. Conditioning on initial characteristics renders the convergence coefficient insignificant in the 1980s and produces twice as high a convergence coefficient in the 2000s (suggesting that in that period growth trajectories were significantly hampered by initial disadvantage). Controlling for spatial spillovers, however, reduces only marginally (in the 1980s), if at all (in the 2000s), the size of the obtained convergence coefficients—suggesting in turn that spatial association does not impede on the process of convergence.⁵

As is shown in the lower part of Table 15.1, however, these aggregate patterns of convergence mask some substantial heterogeneity in local-level convergence dynamics, which is, in fact, increasing over time (see the Variability statistic). In the 1980s, the fastest-converging region had a speed of convergence near twice as high as that of the slowest-converging region (and similar to the global convergence coefficient of the 1990s). This ratio remained in the 1990s, even though in that period speeds of convergence rose sizeably. In the 2000s, in turn, convergence

rates slowed down and dispersion increased (almost to 3-to-1). It is interesting to note that this heterogeneous convergence has its own geography: in the 1980s the fastest-converging regions were in the east of the country (Aegean islands, Thrace and Crete); in the 1990s convergence was speedier in the north (including Ipeiros); while in the 2000s convergence became mainly a central and south-eastern phenomenon (Athens, Attica, Aegean islands and Crete). Thinking about these three periods in terms of the corresponding national growth trajectories, one can see that the period of EU accession, which coincided with modest growth and rising indebtedness, seemed to benefit most the rural and island economies of the east of the country; that the period of fiscal consolidation, which included episodes of anaemic growth but also of recession, benefited more the less developed regions of the north; but that the post-EMU period, which was characterised by very fast growth nationally and credit expansion, benefitted most the most developed regions around the capital and in the tourist economies of the Aegean islands.

15.3 Spatial-Temporal Dynamics

The analysis of the previous section revealed that the degree of overall (global) spatial association in the Greek prefectures is rather weak and has been declining over time. It also showed, however, that spatial clustering is a significant factor affecting the dynamics of GDP per capita growth (and thus of convergence—divergence) for different regions—not so much in the sense of conditioning the global speed of convergence but certainly in the sense of conditioning the speed at which individual regions converge to the global average. In this section, we want to examine more closely the local dynamics of spatial association and their evolution over time. We do so by applying a LISA analysis (Anselin 1995) on the full set of our data and subsequently drawing on exposition techniques implemented previously by Rey and Montouri (1999), Monastiriotis (2009) and Monastiriotis and Psycharis (2014), which we adapt and amend for our case of analysis.⁶

We are interested in three aspects in particular. First, we are interested in the extent of spatial clustering and its persistence and locational consistency over time. Specifically, we want to investigate to what extent spatial clusters are stable over time, both in the sense that hotspots and/or outliers remain consistently located in the same regions and in the sense that the overall spatial distribution of local spatial clustering (as measured by the LISA scores) remains stable over time. Second, we want to investigate the factors underpinning the evolution of (local) spatial association. We do this by implementing a principal component analysis of the region-specific LISA scores for each year (i.e. each year-specific cross-section of LISA scores is treated as a separate variable), as we explain below. Third, we are interested in unveiling how the different regions group together in terms of the temporal evolution of their spatial-clustering dynamics. The clustering of the regions is done by means of a principal-component factor analysis with the orthogonal rotation of the first three principal factors. Based on this, we use the criterion proposed by Dunteman (1989) to cluster our regions into groups which are characterised by a similar evolution of their local LISA scores over time.

15.3.1 Persistence of Local Spatial Association

Consistent with the evidence of limited global spatial association, analysis of local indicators of spatial association (LISAs) reveals that there is a rather limited number of spatial hotspots and spatial outliers that are statistically significant. Given the time-span of our analysis, it is, of course, impossible to present here the full picture of local spatial association (clustering, via LISA maps) for each of the 29 years in our data. Instead, we present a summary of the hotspots and outliers (LISA groups—see footnote 6) by listing the regions that appear to belong to a significant LISA cluster (at the 5% confidence level) for at least one year in the period 1980–2008 (Table 15.2). As can be inferred, there are 19 regions which have never had a statistically significant LISA over the period; while statistically significant LISAs are found for 19.27% of the total population of cases (51 regions times 29 years). The number of significant LISAs appears to have increased somewhat over time, from

Table 15.2 Incidence and location of significant LISA clusters

Region	Significant LISAs		LISA quadrants				LISA quadrant (main)
	No of years	% years	H-H	H-L	L-H	L-L	
Viotia	29	100	29	0	0	0	HH
Arta	22	76	0	0	0	22	LL
Dodekanissos	17	59	17	0	0	0	HH
Ilia	15	52	0	0	0	15	LL
Evia	15	52	15	0	0	0	HH
Fokida	14	48	14	0	0	0	HH
Lakonia	14	48	0	0	0	14	LL
Attiki	13	45	13	0	0	0	HH
Rodopi	12	41	0	0	0	12	LL
Fthiotida	12	41	12	0	0	0	HH
Messinia	12	41	0	0	0	12	LL
Thesprotia	11	38	0	0	0	11	LL
Lefkada	11	38	0	0	0	11	LL
Korinthia	11	38	11	0	0	0	HH
Zakynthos	9	31	9	0	0	0	HH
Evrytania	9	31	0	0	0	9	LL
Kyklades	9	31	9	0	0	0	HH
Serres	7	24	0	0	0	7	LL
Kozani	7	24	7	0	0	0	HH
Ioannina	7	24	0	0	0	7	LL
Trikala	5	17	0	0	0	5	LL
Preveza	5	17	0	0	0	5	LL
Kavala	4	14	4	0	0	0	HH
Kastoria	3	10	0	0	0	3	LL
Karditsa	3	10	0	0	0	3	LL
Kefalinia	2	7	0	0	0	2	LL
Lassithi	2	7	2	0	0	0	HH
Xanthi	1	3	0	0	0	1	LL
Thessaloniki	1	3	1	0	0	0	HH
Chalkidiki	1	3	1	0	0	0	HH
Grevena	1	3	0	0	0	1	LL
Etolioakarnania	1	3	0	0	0	1	LL

Notes Numbers in the 'LISA quadrants' columns show the number of years a region has been estimated to be in any particular quadrant. H-H concerns regions with above-average local incomes surrounded by regions with above-average neighbouring incomes ('hot spots'). Inversely, L-L concerns below-average regions neighboured by below-average regions ('cold spots'). L-H and H-L correspond to cases of below-average regions neighboured by above-average regions and above-average regions neighboured by below-average regions, respectively ('spatial outliers'). All LISAs have been estimated in GeoDa using the inverse distance criterion. See also footnote 6

6–9 in the 1980s to 10–12 in the 2000s, following in this sense a different trend than that found for the global statistic, although showing the same dipping and bounce-back in the period 1994–2000.

As is shown in Table 15.2, only one region (Viotia, the industrial heartland of the capital region Athens) belongs to a statistically significant cluster (which is a ‘High-High’ one) throughout the period. Of the four regions that appear to belong in statistically significant clusters for the majority of the years (15 +), two have always belonged to a H-H cluster and two to a L-L cluster. Regions that appear frequently (e.g. over 30% of the years) in a H-H cluster are either in the broader area surrounding the capital city Athens (Attiki, Viotia, Evia, Fokida, Fthiotida, Korinthia) or are island regions (Dodekanisa, Zakynthos, Kyklades). In contrast, regions that appear with similar frequency in a L-L cluster are all peripheral, belonging mainly in the western and south-western periphery (Arta, Ilia, Lakonia, Messinia, Thesprotia, Lefkada, Evrytania) or in the north-eastern periphery of the country (Rodopi). In that, it appears that a substantial degree of spatial heterogeneity (spatial asymmetry) characterises indeed the Greek economy at the prefectural level: a core-periphery pattern with the core, showing clustering of above-average performing regions, extending southeast to the tourist-based economies of the southern Aegean islands.

Perhaps most interesting, however, are the following two observations. First, there are virtually no regions acting as ‘spatial outliers’, i.e. regions of high (low) values surrounded by relatively poor (rich) regions. This suggests that, despite the limited degree of spatial clustering across space, spatial clustering is nevertheless the dominant (i.e. the only statistically significant) form of spatial association in the country.⁷ Second, and perhaps following from the above, our results reveal a pattern of exceptional stability of the spatial clusters: in none of the cases do we see a region moving from one statistically significant cluster to another; regions move between significance and non-significance in terms of the clusters they belong to, but when they are found to belong to a statistically significant cluster this is always of the same type. This, in turn, suggests a high degree of ‘stickiness’ in the spatial structure characterising the Greek prefectures over the last three decades.

To recap, Table 15.2 shows that the incidence of significant LISAs is ‘persistent’ in the sense that it applies more or less to the same regions throughout the period. Given, however, that only a minority of regions return statistically significantly LISAs at an acceptable frequency, it is perhaps more interesting—and more informative—to look at the whole population of regions, and their LISA scores, irrespective of whether these are statistically significant in any one year or not. This allows us to examine additionally the temporal persistence of the overall spatial pattern in the country, by means of a correlation analysis of the regional LISA scores between different years, which measures the extent of persistence in the spatial pattern observed in each year of our sample over different time horizons. Based on this analysis (results available upon request), it appears that temporal persistence of spatial patterns is rather high. Year-on-year persistence is almost always over 95% (with the exception of a break occurring in 1999, which we can tentatively associate with Greece’s entry into the Eurozone⁸), suggesting that on a year-to-year basis the spatial structure hardly changes (if anything, it tends to become more ‘sticky’ over time). Persistence over longer time-periods (5, 10, 15 and 20 years) is lower, although still quite high.⁹ Notably, however, persistence over longer time-periods generally declines over time suggesting that, albeit slowly (i.e. not too evidently on a year-to-year basis), spatial association patterns have shifted somewhat in more recent years and especially after the 1990s.

15.3.2 Principal Components of Local Spatial Association

As shown, spatial patterns at the prefectural level in Greece are modest but highly persistent, at least in the medium-run. In this subsection, we want to go beyond this simple—but so far undocumented—observation and dig deeper into the LISA scores trying to identify (a) the key patterns (‘simple structures’—Jackson 2003) characterising the movement of region-specific LISA scores over time and (b) groups of regions with common temporal evolutions in their LISA scores. To do so, we follow an innovative approach (first implemented by Monastiriotis 2009) which uses principal component analysis to derive some principal

factors that can be used to reduce the multitude of region-specific LISAs into a set of core (principal) components.

Starting first from the identification of common structures in the temporal dimension of local spatial association, we apply the principal component analysis on each annual cross-section of LISA scores (i.e. treating each yearly cross-section as a separate variable). This allows us to reduce the 51 LISA scores of each year in our sample into a limited set of principal factors which describe the underlying structure of the full set of regional series, representing essentially a decomposition of the global Moran's I into a set of uncorrelated (orthogonal) constituent components. The analysis retains three principal components, which represent 96.28% of the full-sample variance (of all LISA scores across regions and years). We present the derived factor loadings (eigenvalues) for these components, plotted for comparison against the per-year average value of the LISAs, in Fig. 15.2.

The first component has positive and rather stable values for all years. This can thus be interpreted as a measure reflecting the overall spatial 'associativeness' of the prefecture-level economic space in Greece.

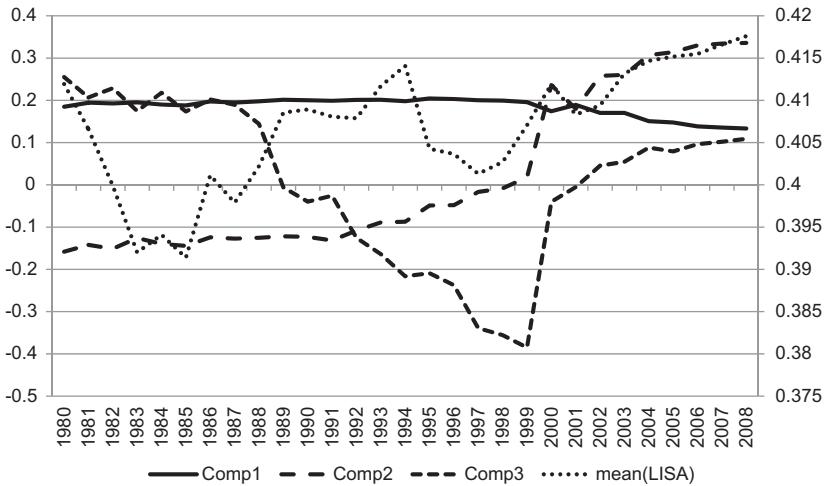


Fig. 15.2 Decomposition of LISA scores and their evolution over time. *Note* Each line shows the factor loadings (unrotated) corresponding to the first three factors of a principal components analysis as described in the text.

Despite its overall stability, this measure seems to have been declining quite fast since 2000, the period coinciding with the time of Greece's entry into the Eurozone—which can be taken to suggest that the latter has been associated with a gradual decline in spatial association in terms of GDP per capita. The second component follows a very different path. It is negative for the first part of the period under study but starts rising steadily since 1992 and jumps quite remarkably in 1999, following an upward trend thereafter. The jump in this measure corresponds temporally to the structural break of 1999 seen earlier. Plausibly, one could link this measure to financial liberalisation and interest rate developments, especially in relation to the process of Greece's accession to the Eurozone: this component contributed negatively to spatial clustering in the period before the country's financial liberalisation and convergence to the Maastricht targets but has been making increasingly positive contributions to spatial clustering ever since—and especially so after Greece's entry into the Eurozone. The third component also presents a structural break at the time near Greece's entry into the Eurozone, but the pattern seen for the period prior to this (declining since the mid-1980s and turning negative in the 1990s) makes this component more readily associated with the efforts during that period for strengthening spatial cohesion in the country—for example through the allocation of Cohesion Funds from the European Union. The fact that the downward trend for this component starts exactly at the period when funds from the first Integrated Programmes were channelled into Greece, gives more confidence in this interpretation.

Thus, overall, the principal component analysis presented in Fig. 15.2 shows three main 'simple structures': one that concerns the overall 'natural' level of spatial association in the country, which has been rather constant throughout the period; a second one that is probably related to the gradual financialisation of the economy, which seems to have pushed towards greater spatial clustering; and a third, which seems to relate more to efforts to instigate regional cohesion and convergence, which were more intensive in the late 1980s and the 1990s but somehow became less targeted in the 2000s as the country switched its focus more toward national development programmes and core-area projects, including ones related to the 2004 Athens Olympics.

With this observation at hand, we move on to the last piece of our analysis, trying to identify groups of regions which have a similar behaviour in terms of the evolution of their local spatial association intensity (LISA scores) over time. Our approach is similar to that followed above. This time we use a principal-component factor analysis on the time-series dimension of the panel of LISA scores (so that each variable corresponds to a prefecture). We restrict our analysis to the first three components (explaining cumulatively 68.41% of the total sample variance), which we subsequently rotate orthogonally.¹⁰ The rotated factors are meant to represent a clearer 'simple structure', allowing us to separate the prefectures according to the principal component in which they have their higher factor loading. In our analysis, we combine this criterion with the one proposed by Dunteman (1989) and also used in a similar analysis by Monastiriotis (2009; see also Arbia 2011), which classifies variables (in our case, regions) into a cluster if the corresponding rotated factor loading is greater than 0.5 (see also Jackson 2003).

The groupings produced from this analysis¹¹ seem to present a much less clear structure than was the case in our previous pieces of analyses. Generally, all three clusters seem to include prefectures of different types both in terms of economic structure (e.g. urban/metropolitan *and* agricultural, or remote *and* central, or north *and* south) and in terms of spatial structure (e.g. the second cluster includes Dodekanissos, which belongs to a 'persistent' H-H cluster; Arta, which belongs to a 'persistent' L-L cluster; and Lesbos, which returns no significant LISA in any of the years under study). This makes it difficult to classify our derived clusters analytically into regional *types*. It thus appears that the evolution of local spatial clustering across the prefectures is rather random or at least driven by factors which are difficult to discern without a more structured analysis. We defer such an analysis to future work. For now, we simply note that, as with the standard Exploratory Spatial Data Analysis (i.e. identifying the significant LISA clusters), our more innovative analysis of the LISAs using the principal component technique offers little in terms of helping to identify clear regional groupings of temporal-spatial dynamics. Although changes in these spatial dynamics over time were easier to associate to time-related factors (see our discussion around Fig. 15.2)

and although the static (and rather persistent in time) patterns of local spatial clustering had a clearer geography (see our discussion around Table 15.2), the region-specific *evolutions* of local spatial clustering seem to be more randomly distributed across space.

15.4 Discussion and Conclusions

As has been shown in numerous studies previously, the historical data on regional per capita incomes in Greece examined here show a continuous—almost uninterrupted—decline in regional disparities since records began and up to the period leading to the crisis. This is corroborated by the evidence of beta-convergence, which appears strong throughout the period, albeit more intensively so in the adjustment period prior to Greece's entry into the Eurozone and less so in the years of fast growth in the 2000–2008 period. Underneath this—rather satisfying—evidence of a secular trend towards regional equalisation, however, lies evidence of spatial asymmetries and of a generally adverse spatial structure—both in the sense of limited spatial connectivity and in the sense of weak spatial associations. Documentation of such evidence in the literature is at best fragmented if not practically non-existent.

Responding to this apparent gap in the literature, and motivated by a broader question about the extent of spatial asymmetries in Greece, especially in relation to concerns about the issues that need addressing for Greece's viable recovery from its prolonged crisis, in this paper we implemented a detailed—and in many respects innovative—examination of spatial dynamics at the prefectural level, examining not only the extent of global and local spatial association but also a series of further questions related to this. In a first step, we looked at how patterns of global and local spatial association correlate with, or even condition, the evolution of regional disparities in the country. Our descriptive analysis revealed that the secular decline in regional disparities (sigma convergence) has coincided with a similar decline in the global spatial association, suggesting a simultaneous rise in the localisation of regional disparities. Our econometric analysis of beta convergence showed in

turn that (the limited degree of) spatial association does not impede on the global speed of convergence; but that, nevertheless, (local) spatial clustering is important in determining the speed of convergence for particular regions, reflecting sizeable and systemic—and, if anything, increasing over time—heterogeneity in the pace at which different regions converge to the common steady state. Changes in the geographical manifestation of this heterogeneity seemed consistent with changes in the macroeconomic and institutional environment of Greece, for example with speeds of convergence being higher in the north during the low-growth macroeconomic adjustment period of the 1990s and higher in the centre and southeast during the fast expansion period of 2000–2008.

Our further analysis of spatial association dynamics revealed a series of interesting findings. Consistent with the evidence of weak spatial association globally, the local indicators of spatial association revealed only a small number of ‘hotspots’ (clusters of high-income regions neighboured by other high-income regions) and virtually no spatial outliers. Although persistence in the patterns of spatial association was found to be rather high (very high year-on-year and reasonably high over longer time horizons), suggesting a rather ‘sticky’ geography for the spatial distribution of incomes in the country, statistically significant clusters were found only in a small minority of cases. Still, in a static sense these clusters seemed to reflect a clear geographical divide, along a core-periphery pattern, with ‘hot spots’ located in the island regions of the south Aegean and in the regions surrounding the capital Athens; and ‘cold spots’ located mainly in the western and south-western periphery of the country. Dynamically, however, i.e. with regard to the temporal evolution of local indicators of spatial association, there was a much less clear geography: region-specific evolutions of local spatial clustering appeared to be rather randomly distributed across space, suggesting that some churning of spatial dynamics across regions does occur over time.

More importantly, analysis of the ‘common structures’ in these spatial dynamics over time revealed that these are driven by three underlying trends (components), which correspond to three separate influences: one, concerning a low, and more recently declining, trend of spatial

association overall; a second, concerning a trend towards increasing spatial association which seems to follow broadly national developments regarding financial liberalisation, fiscal stabilisation and monetary convergence linked to Greece's membership to the Eurozone and which—interestingly—is not directly observable in the raw data; and a third, showing declining spatial association until the late 1990s and rising spatial association thereafter, which seems to reflect the history of policy efforts towards regional equalisation (regional policy) and the reversal of these in the more recent period and prior to the crisis.

Overall, then, our results offer an intimate—and unseen before—picture of spatial structures and spatial dynamics in Greece. Low spatial association, reflecting weak spatial spillovers and thus also weak diffusion mechanisms, is combined with a rather sticky geography of spatial associations and a geographically heterogeneous picture of spatial clusters and more recently of convergence, along with a core-periphery pattern. National dynamics do not appear particularly conducive to strengthening or integrating the spatial structure of Greece, as they seem to reinforce spatial clustering around the dominant region of Athens (and the islands of the south Aegean) but to maintain, if not reinforce, spatial randomness—and thus also spatial non-connectivity—in the rest of the country. This suggests, on the whole, a rather fragmented economic space for Greece, with increased localisation of regional disparities combined with spatial heterogeneity at wider spatial scales. The implication of this is that, despite an overall trend of subsiding regional disparities, achieving harmonious regional development in the country may require more—and more targeted—policy efforts. Improving spatial connectivity across the Greek regions, e.g. through further investments in infrastructure, may be a key component in this; but raising spatial 'associativeness' will most probably require much more, for example policies that will harness the formation of industrial clusters outside the capital and sectoral links that will encompass existing geographical lines. This, in turn, requires the design of a spatial development plan, which will integrate with existing regional policy as well as sectoral (industrial) policies nationally. Despite the understandable focus of policy in the current juncture on national and fiscal priorities, it appears to us that attention to spatial structure—and to the spatial

asymmetries revealed here— is equally important for the viable recovery—and harmonious development—of the Greek economy.

Notes

1. All data are from the Cambridge Econometrics database.
2. Formally, the Moran's I statistic is given by
$$I = \frac{n}{\sum_i \sum_j w_{ij}} \frac{\sum_i \sum_j w_{ij} (x_i - \bar{x})(x_j - \bar{x})}{\sum_i (x_i - \bar{x})^2}$$
, where w_{ij} is an indicator measuring the 'connectedness' between regions i and j (i.e., an element of the 'spatial weights matrix' W), n is the number of regions, and x is the variable of interest (with \bar{x} symbolising the sample mean). In the analysis that follows we present results based on the inverse distance criterion. The results are similar with alternative definitions of 'neighbourhood' (queen continuity, two and four nearest neighbours, etc.).
3. The notion of beta-convergence derives from the neoclassic production function with diminishing marginal factor productivities (Solow 1956) and has been formalised as a growth-dynamics hypothesis by Barro and Sala-i Martin (1992) showing an inverse relationship between the initial income level of each region with its average annual growth rate over a fixed time interval. This is analytically independent from the notion of sigma convergence, which corresponds to a reduction in the dispersion of the (cross-sectional) distribution of regional incomes between two periods.
4. The models reported here condition on the initial level of gross fixed capital formation (as a share of regional GDP) and on the initial share of population with tertiary education.
5. Note, however, that the specification tests on the two models suggest that spatial spillovers are statistically significant. The weak impact of these on the estimated convergence coefficients is rather similar to Rey and Montouri (1999), who report a marginal decline for the speed of convergence with the SAR model for the USA, but somewhat at odds with Arbia et al. (2005) and Arbia and Piras (2005) who find a sizeable fall in the speed of convergence with the SAR model for the cases of Italy and the European Union, respectively.

6. LISA is the analysis of Local Indicators of Spatial Association which is based on a localised version of the Moran's I statistic. LISA analysis allows us to classify regions into four groups, depending on their own position in the distribution of regional incomes (High or Low) and the position of their neighbours in the distribution of 'neighbouring' incomes (High or Low). Regions with above-average local incomes surrounded by regions with above-average neighbouring incomes form the High-High cluster. Similarly, we can define regions belonging to the High-Low, Low-Low and Low-High groups—with the HL and LH groups showing spatial outliers (negative spatial association) and the HH and LL groups showing, respectively, 'hot spots' and 'cold spots' of positive spatial association (spatial clustering).
7. The results shown are based on a definition of neighbourhood using the inverse distance criterion. When we repeat this analysis using an alternative criterion of neighbourliness (four nearest neighbours) we do actually obtain one region (Kozani) which forms a consistent spatial outlier (in 43% of the years) of High-Low values. This can be explained by the disproportionate role that (national) energy production plays in the region within a broader area of relatively low incomes (see Monastiriotis 2011 for a discussion of this).
8. Greece actually joined EMU in 2001. However, the country locked its exchange rate to the euro in June 2000.
9. Especially, for the first half of our sample period (1980–1995), stability remains very high (the correlation coefficient is above 0.8) even in the 15-year horizon. But even in the last year of our sample (2008), some 40% of the distribution of LISA scores in that year can be accounted for by the distribution of LISA scores in 1988 (twenty years earlier).
10. The three first components represent a proportion of 68.41% of the total sample variance. We have also used alternative rotation methods (non-orthogonal/oblique rotation) and experimented with the retention of more principal factors. The results are very consistent across methods, producing essentially the same classification of regions as the one reported here (full results are available upon request).
11. These are as follows. Group 1: Attiki, Chania, Drama, Etoloakarnania, Evrytania, Iraklio, Karditsa, Kerkyra, Korinthia, Kyklades, Pella, Rethymno, Serres, Zakynthos. Group 2: Arta, Dodekanissos, Ilia, Lakonia, Lassithi, Lesvos, Messinia, Pieria, Preveza, Thessaloniki.

Group 3: Argolida, Arkadia, Kastoria, Kefalinia, Kilkis, Larissa, Magnissia, Rodopi, Samos.

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16

Greece's Competitiveness: A Survey and Concluding Remarks

Ioannis Bournakis and Christopher Tsoukis

16.1 Introduction

In Greece as elsewhere, the competitiveness debate is dominant in both the public policy domain and popular discourse. The issue is beset with a number of misconceptions that prevent us from extracting the right lessons for the causes of Greece's low international competitiveness in the decades before the crisis. An accurate diagnosis of the "competitiveness problem" is required in order for policy-makers to prioritise policies so as to improve competitiveness in a continuously globalised environment. Greece's significant losses in export market shares of goods in the 1990s

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and 2000s (Xiao et al. 2008)¹ resulted in accumulated deficits in the current account that have also affected the evolution of government budget deficits. Correcting these imbalances is a prerequisite for rebalancing the economy, making it once again independent of foreign financial assistance and guardianship. The present chapter endeavours first to identify the specialisation pattern of the Greek economy in the years prior to the crisis, second to analyse the various conceptual dimensions of competitiveness and third to argue that improving competitiveness is a far more complex process than simply reducing the cost of labour, as proposed by Greece's lenders with the strategy of the internal devaluation (Gros 2011). The chapter is structured as follows: Sect. 2 identifies Greece's specialisation pattern; Sect. 3 surveys the literature of empirical export studies focusing on key determinants of export activity and Sect. 4 assesses how bad domestic governance as well as the EU's architecture impacted on Greece's continuous decline in international competitiveness.

16.2 Export Patterns and Specialisation

Serving an expanded international market remains a vital source of demand stimulus and the associated key policy objective is to find ways to maintain and increase shares in foreign markets. In that respect, the natural question is: what are the drivers of international competitiveness for a small open economy of the European periphery? In an environment where labour-abundant developing countries have fully integrated into global trade, a small economy on the European periphery can improve competitiveness only if it manages to move upward in the product quality ladder.² Greece has failed to do so, as is evident from the low score of economic complexity over the last forty years (Hausmann et al. 2014). The index of economic complexity demonstrates the ability of a country to hold and embody tacit knowledge in the production process. The amount of tacit knowledge embedded in production is shown to be highly correlated—in a broad sense—with the macroeconomic performance, thus with the level of income per capita. As expected, the index of economic complexity contains information about a country's export profile. Greece ranks as 53rd in economic complexity in 2008

(Hausmann et al. 2014) and with Portugal (35th) comprises the two Western World economies whose persistently high levels of income per capita could not match their low score of economic complexity. High growth rates in income per head in Greece for about a decade³ did not reflect a transformation from a low-to-medium or high technological industrialised country; Greece remained a country with almost one third of its total manufacturing exports in low-tech sectors while only a tenth (12.5%) was in high-tech industries in 2009.

As shown in Table 16.1, Greece's exports are traditionally focused on products with little scope for diversification such as Food and Beverages, Textiles and Basic Metals. Exports from these three sectors over the period 1980–2009 account for nearly 50% of Greece's total exports. Only 4.8% of total exports are on average from high-tech manufacturers while the vast majority (38% + 26.5%) is on average from

Table 16.1 Composition of total exports of goods in Greece, 1980–2009

ISIC Revision 3	Description	Mean	1980	2009
C01T02	Agriculture	11.2	12.5	9.6
C15T16	Food beverages and tobacco	15.5	14.7	15.2
C17T19	Textiles	20.1	18.9	9.4
C20	Wood	0.4	0.4	0.4
C21T22	Pulp and paper	1.1	1.2	1.7
C23	Coke	8.3	15	8.9
C24	Chemicals	6.8	6.6	13.1
C25	Rubber and plastics	1.9	1	3.2
C26	Other non-metallic	3.9	5.3	2.8
C27	Basic metals	10.1	10.6	10.3
C28	Fabricated metals	1.9	2.1	2.4
C29T33	Machinery	5.8	3.4	10.3
C34	Motor vehicles	1	0.7	1.1
C35	Other transport	1.2	0.1	3.4
C36T37	Other Manufacturing	0.8	0.4	1.2
	High-Tech manufactures	4.8	0.8	12.5
	Low-Tech manufactures	38	35.6	27.9
	Medium–High-Tech manufactures	10.6	10	14.9
	Medium–Low-Tech manufactures	26.5	33.9	28.2
	ICT manufacturers	3.2	1.06	4.01
	Energy producing activities	8.7	5.18	9.45

Notes OECD STAN indicators and Author's own calculations. Numbers denote percentages to total exports

Table 16.2 Value-Added shares to GDP (%) of aggregate sectors in Greece

Industry	1970–1980	1980–1990	1990–2000	2000–2010
Agriculture	11.61	10.99	8.60	4.75
Mining and quarrying	0.69	0.89	0.58	0.48
Manufacturing	18.13	16.32	12.45	9.95
Electricity gas and water supply	2.10	2.96	2.90	2.50
Construction	8.69	6.97	6.51	6.35
Wholesale and retail trade— Restaurants and hotels	21.33	21.70	22.25	23.76
Transport, storage and communications	6.39	6.57	5.99	9.37
Finance, insurance, real estate and business services	16.34	15.45	19.94	19.53
Community, social and per- sonal services	14.72	18.16	20.78	23.30

Notes OECD STAN indicators and Author's own calculations

low and low-to-medium-tech manufacturers. The only high-tech sectors that increased export shares over the same period are chemicals and machinery but these are still below 10%.

Another type of evidence for Greece's pattern of specialisation is shown in Table 16.2. We provide shares of value added to GDP of 9 aggregate sectors for four different time periods over 1970–2009 that illustrate the evolution of Greece's production structure. Accordingly, Greece has gone through a continuous process of de-industrialisation with manufacturing production falling gradually, concurrent with a tendency to increase the transfer of resources towards public, social and personal services. Additionally, Greece has experienced a substantial shrinking of the agricultural sector which contributed almost 11.5% in 1970–1980 and only 4.75% in 2000–2010. Output in finance and real-estate sectors has steadily increased from 1980s onwards; likewise with output in wholesale and retail sectors. The share of GDP of the latter sector in the last sub-period is close to one-fifth. In the period before the crisis, the two major contributors of Greece's GDP are Wholesale and Retail Trade (including tourism) and Community and Social services that jointly account for 47% of GDP. The share of the manufacturing sector fell to half while it was the second most important sector of the national economy forty years ago.

Table 16.3 Export and R&D intensity (%) of aggregate sectors, 1970–2009

Industry	Export	R&D
Agriculture	11.17	0.02
Mining and quarrying	16.81	0.55
Manufacturing	18.41	0.79
Electricity gas and water supply	0.12	0.09
Construction		0.04
Wholesale and retail trade—Restaurants and hotels		0.03
Transport, storage and communications		0.04
Finance, insurance, real estate and business services		0.23
Community, social and personal services		0.01

Notes OECD STAN indicators and Author's own calculations. Export is the share to total production and R&D is the share to value added

This evidence indicates a systematic shift of resources towards sectors that are by definition less tradeable and away from innovation and R&D, implying a reduction in the economy's potential to acquire a competitive edge. Table 16.3 shows that agriculture and manufacturing sectors, the two more rapidly declined ones, export on average 11% and 18.4% of their output, more than anyone else. A similar pattern is evident in column (2) of the same Table, suggesting that at the beginning of the 2009 crisis, the major contributor to GDP spends almost next to nothing for R&D as a percentage to value added. The R&D spending is traditionally low in Greece and once again it is mainly conducted by the manufacturing sector. The three Tables of this section imply that before analysing the evolution of labour cost one needs to ascertain that production in Greece has moved to non-tradeable sectors with little scope for exports and innovation, which essentially indicates a highly introvert economy.

16.3 Competitiveness: Price Versus Non-Price Factors

This section surveys the literature of empirical export studies that mainly employ data at country and industry level. The evidence draws from OECD, EU and Greece. The analysis seeks to identify the methodological approaches used to understand export behaviour as well to investigate export determinants beyond simple measures of cost competitiveness.⁴

16.3.1 Competitiveness: A Definition

A standard measure of price competitiveness is an index of Unit Labour Cost (ULC). This is a composite ratio of labour cost—usually measured as the ratio of real wages per unit of input—over labour productivity approximated by output per hour worked. To preamble, although informative, this index produces controversial and (or) weak results when it is used as the only explanatory variable of competitiveness in exports functions.

Before identifying other non-price factors of competitiveness, we should first mention an inherited problem of ULC as a measure cost competitiveness. In perfectly competitive labour and product markets, wages are endogenous and responsive to productivity shocks. If productivity shocks are permanent, increases in wages will follow. As wages mainly represent consumers' income, those increases might not be proportionate due to multiplier effects, which implies that overall ULC will rise. In fact, looking at EU 27 countries, Greece has a RULC below EU average, which cannot be linked at all to an increase in EU export shares (Gros 2011). Diaz Sanchez and Varoudakis (2013) use 13 Eurozone countries over the period 1975–2011 and find that RULC changes can only explain 3% of changes in current account imbalances. Increase in ULC is the symptom rather than the cause of export losses, which is mainly driven by a continuous restructuring of peripheral countries towards non-tradeable sectors. On the other hand, Belke and Dreger (2013) identify a competitiveness effect in current account deficits of the EU periphery that are mainly due to real exchange rate appreciations. Although this can be viewed as evidence in favour of ULC downward adjustments, it does not provide a causal explanation for what drove up ULCs in countries with accumulated current account deficits.⁵

These considerations suggest that ULC as a sole measure of export competitiveness leads to biased inference⁶ as it neglects all other factors of production (such as fixed capital and human capital) that can potentially be more informative about the quality of final output. Arguably, a more comprehensive indicator of competitiveness is directly derived from the foundations of economic analysis such as the framework of

an aggregate production function. Specifying a production function of the national economy allows the derivation of Total factor Productivity (TFP), which is compatible with the concept of disembodied technical change. In a broad sense, TFP increases account for product differentiation, which is a core non-price determinant of exports. For that purpose, we show in Table 16.4 the average growth rates of TFP and ULC for EU-14 countries over the period 1980–2009 comparing them with growth rates of export market shares. Export shares capture the exports of each country to the rest of the world relative to total exports of the whole group (OECD-STAN 2014). Greece, France, Finland and UK are the four economies that experience the most substantial losses over time in export shares within the EU-14 group. Greece is the country with the lowest rate of TFP growth over the period while Ireland, a country of a similar size, experienced on average a TFP growth rate eleven times higher than Greece's. Unsurprisingly, this rapid technical change is correlated with a growth rate in export shares of 3.54%.

Table 16.4 Technical change, Unit labour costs and export market shares in EU14, 1980–2009

Country	TFP	ULC	Export Share
Austria	0.77%	2.03%	1.24%
Belgium	0.84%	2.56%	1.01%
Germany	0.69%	1.07%	0.17%
Ireland	2.06%	3.15%	3.54%
Greece	0.18%	5.09%	−0.58%
Spain	0.44%	5.70%	1.94%
France	0.81%	3.02%	−1.04%
Italy	0.50%	2.15%	−0.49%
Portugal	0.97%	9.34%	0.01%
The Netherlands	0.93%	1.8%	0.33%
Sweden	1.03%	2.14%	0.93%
UK	1.22%	3.7%	−1.80%
Denmark	1.00%	3.5%	−0.35%
Finland	1.47%	3.4%	−0.56%

Notes AMECO, OECD STAN (Bilateral Trade Database) and author's own calculations. TFP, ULC and Export market shares are average growth rates over the period 1980–2009. Export market share is the each country's exports to total EU-14 group exports to the world

A similar pattern is also evident for Spain whose share in export markets grew at a rate of 1.94% while Spain's ULC is higher than Greece's. Portugal, with almost a double growth rate of ULC compared to Greece, has managed to maintain a positive growth rate in export market shares, more likely due to a fastest rate of technical change, almost five times higher than Greece's. Table 16.4 shows that all countries exhibit positive ULC growth rates but this does not always entail a lower rate of international expansion. Despite the aggregate pattern of this descriptive evidence, the message is clear. Cost competitiveness is only a component of international competitiveness and often not the most important one. Concluding this subsection, one needs to incorporate productivity as a key part of the "competitiveness puzzle"⁷ as it is conceptually closer to productive efficiency and computationally superior to ULC indices.⁸

16.3.2 Understanding the Drivers of Export Activity

It is often argued that Germany, the Eurozone role model, has managed to become successful in global export markets simply by virtue of effective wage moderation in the post-reunification period (Stockhammer 2011; Bibow 2013). Although this statement is true to some extent, it overlooks other significant dimensions that added to Germany's international competitiveness being unrelated to cost performance.⁹ The notion that lower labour costs resulting from labour market deregulation and horizontal fiscal cuts can merely restore competitiveness in Greece (Storm and Naastepad 2015a; Bista et al. 2015) is overly simplistic and ignores key findings of the empirical trade literature. Below, we survey this literature.

A standard macroeconomic approach is to specify exports as a function of relative prices and foreign income. Measures of ULC and Real Effective Exchange Rate (REER) serve as proxies for relative prices while weighted measures of the level or the growth rate of GDP per capita are used to proxy foreign income. From a methodological point of view, an increase in the volume of exports does not necessarily capture gains in competitiveness; what matters for competitiveness is an increase in exports relative to the exports of another country (or group

of countries) (i.e. this is to say that higher export shares show competitiveness gains).

Amendola et al. (1993) find that technological factors are crucial determinants of export shares in the long-run while adjustments in labour costs for gaining higher export shares are effective only in the short run. Amable and Verspagen (1995) estimate an error correction model (ECM) of export shares for 5 industrialised countries (USA, UK, Germany, Italy and Japan) and 18 industries for 22 years. The study includes 3 explanatory variables, a measure of average wages to control for ULC while investment and the number of patents are used as proxies of non-price competitiveness. All coefficients have the expected sign; wages have a negative impact while investment and relative patent counts impact positively on export shares. Carlin et al. (2001) present evidence from 14 OECD countries over the period 1970–1992 showing that relative ULC (RULC) and foreign income measures cannot fully explain the variation in export performance. The overall goodness of fit in the baseline specification did not exceed 0.067. Country-fixed effects are found to be highly statistically significant indicating the existence of idiosyncratic country characteristics that matter for competitiveness. The authors attribute these characteristics to factors such as schooling, disembodied technical change and ownership concentration. In a study with more up-to-date data coverage, European Commission (2010) finds that external demand and a standard proxy of competitiveness account only for 55% of total variation in exports over the period 1998–2008 while the remaining exports variation is unexplained. Although the estimate of ULC in these studies is negative and statistically significant, the low overall fit of the data point towards the existence of other export determinants equally important to price. Bournakis and Tsoukis (2016), examining a group of 18 OECD countries over the period 1982–2005, formulate a similar export share function with RULC and R&D expenditure as key drivers of competitiveness but they also allow for state and institutions to play a role. In particular, they find a non-linear (inverted U-shape) effect for the size of the state, while the effectiveness of R&D in promoting export shares increases when the economy adopts market-oriented policies for competition, entrepreneurship and FDI.

Another approach is to model the level of exports (not shares) in an attempt to distinguish between short- and long-run effects with the use of co-integration techniques. Within this econometric framework, Bournakis (2014) investigates the determinants of exports for 13 Greek manufacturing industries for 1987–2007. The main findings are that export losses are driven from higher ULC that increased by 50% in the period under study. The ULC index used compares Greece's ULC in an industry with the average ULC in the same industry from a group of Greece's eight EU major trading partners. To provide further insight about the relationship between ULC and export shares the author decomposes ULC into labour costs (LC) and labour productivity (LP). Co-integration analysis shows that changes in LC impact only on short-run changes of exports while the most crucial export determinant in the long-run remains LP. Koukouritakis (2006) estimates a simultaneous system of import and export demand functions with annual data for 1962–1997 finding that the price elasticity of the demand for Greek exports in the long-run is -1.20 . The interpretation is that as Greece is a small economy mainly specialising in low tech manufacturing its products are under severe competition in international markets. Arghyrou (2000) and Arghyrou and Bazina (2003) find Greek exports to be more sensitive to the income of its trading partners in the 1990s, stressing that Greece was unable to generate export gains from its accession into the EU market mainly due to specialisation in low value-added activities.

Madsen (2008), for a group of 18 OECD countries over the period 1966–2001, estimates an exports equation in differences including the following measures: an index of price competitiveness (i.e. export prices or ULC), a weighted index of foreign income and five different indices of non-price competitiveness (i.e. domestic patents, foreign patents, real R&D expenditure, trademarks and product designs). The study performs a number of sensitivity tests concluding the following: (i) once technology variables are included in the model, income elasticities take much lower values, (ii) large cross-country exports variation within OECD in 1990s can be explained by innovation activity and (iii) one-third of exports growth is due to technology and product variety. Murata et al. (2000) estimate an export equation for the entire group

of OECD countries including only determinants of price competitiveness and foreign demand; the results indicate that export models without non-price competitiveness leave the fitted equations with very large residual values. Algieri (2011) augments an export function for the Euro Area with an unobserved component in the form of a stochastic time trend. The structural modelling confirms that stochastic trends exist and are driven by technical change and other exogenous factors; failing to account for these factors leads to biased, over-estimated long-run export price elasticities. Verheyen (2015) employs a panel of 27 countries (including Greece) for 1980–2011 augmenting the aggregate demand functions with patent applications, as a proxy for the quality of exports in an attempt to unveil the importance of non-price competitiveness. Although the size of the elasticity with respect to patents is smaller than unity, the coefficient is statistically significant.¹⁰ Algieri (2014) estimates an extended export demand function including non-price competitiveness for Greece and other EU peripheral economies over the period 1984–2012, revealing that the link between export demand and cumulative investments is the most significant. The price elasticity of exports for Greece is between -1.24 and -1.72 with the non-price elasticity of exports being positive and almost double in magnitude, between 2.31 and 3.81. Similarly, Athanasoglou and Bardaka (2010) stress the importance of augmenting the demand function for Greek exports and use capital stock as an approximation of non-price competitiveness.¹¹ Their analysis shows that without capital stock the price determinant (i.e. REER) is upward biased. Greek exports are found to be elastic in proxies of non-price competitiveness with a long-run coefficient of the order of 1.265.

Another aspect of product quality is the proportion of skilled employment in total labour input. Kalyvitis in Chap. 15 of the present volume shows that Greek exporters have managed to achieve export quality gains during the crisis. Unsurprisingly, these gains are mainly derived from firms that exhibit a high wage bill to skilled workers. Bournakis (2014) finds that there are export gains from R&D expenditure in Greek manufacturing industries over the period 1987–2007 and that these gains are in no way negligible. In that context, R&D represents the producer's ability to invest in product differentiation. According to Algieri (2014), Greece's

and Italy's exports are the most dependent on foreign income and non-price factors among southern European countries. The same study concludes that exports are highly sensitive in foreign income only in the short run while the evolution of exports in the long-term is jointly determined by prices, capital stock and foreign income.

All in all, the recent empirical trade literature suggests that lower ULC can bring export gains, especially for a country that competes at the low segment of the product quality ladder. This evidence is in line with New Trade theories (Krugman 1983; Grossman and Helpman 1995; Fagerberg 1996) which emphasise increasing returns to scale, product differentiation and consumer preference for variety and indicate that exports are mainly driven by non-price factors. Empirical export functions show the relevant non-price factors to be capital stock, R&D and other technological indicators. In light of these findings, Greece should rebuild its export and trade profile fostering mainly the non-price aspects of competitiveness as this seems to be the way to gain export shares in medium to high-tech products. From a broader perspective, the EU periphery can benefit from EU integration at least as far as trade is concerned only if technologically lag-gard countries manage to upgrade production and maintain high rates of technical change. Sutton (2007) expresses this idea by modelling the globalisation process within a framework of quality and productivity differential across firms. This model identifies a "low quality" regime in which firms (unable to advance in quality) do not survive regardless how competitive they are in terms of price. Between "low" and "high" quality regimes, firms experience welfare gains from globalisation as long as they manage to upgrade technological and production capabilities. Analogously, countries with very low degree of economic complexity (i.e. specialisation in products of low knowledge intensity) suffer from competitiveness losses, deterioration in exports shares and accumulation of current account deficits. The literature surveyed above provides a clear message: Greece's economic recovery should be promoted mainly by investment in product differentiation quality and the development of skills and competencies. A corollary is that industrial regeneration should be instrumental in this process.

16.4 Concluding Thoughts: Past Mistakes, the Reform Agenda and the Road Ahead

In March 2011, not long after Greece signed the first bailout agreement, with Ireland and Portugal also hit from a similar debt crisis, 23 EU members approved the Competitiveness Pact (Gros 2011; Storm and Naastepad 2015a). This was an agreement that set specific quantitative targets on what countries should implement as an antidote to current account imbalances and competitiveness losses. A core objective of the Competitiveness Pact was to impose on deficit Eurozone countries the implementation of reforms as a strategy for export-led growth and—more crucially—to prevent future imbalances in public finances.

This Pact is mainly motivated by one-sided economic policy recipes, briefly based on two pillars: (a) fix (relative) wages as an automatic stabiliser to correct government deficits and regain competitiveness and (b) reduce labour costs (welfare provisions inclusive) as a means for improving productivity and restoring export growth. Although these two hypotheses seem sensible, a closer look reveals that both rely on simplistic if not flawed economic arguments. We have already explained that ULC is endogenously associated with wages, so increases in productivity will coincide with higher wages. There is robust evidence that countries with productivity gains are also those experiencing rapid export growth despite high ULCs (Danninger and Joutz 2008; Felipe and Kumar 2014). Second, high ULCs in Greece and other EU peripheral countries are the symptoms, not the causes of competitiveness losses. Greece's low competitiveness originates first, in the failure of domestic political and economic governance to channel the large capital inflows in the period 2002–2009 into the appropriate high value-added economic activities and second to a lesser extent in the broader architecture of the Eurozone, which arguably suits best the core (i.e. France and Germany) (Kool 2006; Arnold 2006), rather than serving the long-term cohesion of the entire EU.

16.4.1 Allocation of EU Structural Funds in Greece

The existence of very low interest rates in the euro era triggered borrowing and a period of unsustainable consumption boom (including central government consumption and imports) without generating long-lasting effects in terms of productivity and real convergence for the Greek economy.¹² This is to say that in a period of capital inflow abundance (mainly from the banks of the EU core), Greece has failed to use these resources optimally as well not showing enough eagerness to modernise public administration, to reform the pension system, to enhance competition in product markets, to liberalise a number of labour markets.¹³ These structural adjustments can be more easily implemented without undermining social cohesion in a climate of economic bliss like the period from mid-1990s to end of 2000s.

Apart from private capital inflows, EU has offered the opportunity of Structural Funds (SF).¹⁴ These funds are part of EU's cohesion policy aiming primarily at helping the less developed regions of EU countries. Greece has been allocated in total an amount of 64bn euros in SF since 1989, the highest amount in the EU in per capita terms (Besley and Personn 2013; Karvounis and Zaharis 2015). Historically, these funds were set to serve the following four objectives: (a) improve business environment (b) stimulate entrepreneurship (c) promote innovation and (d) complete the energy system. Development and growth are promoted with the fulfilment of these objectives accelerating convergence within and across countries. In fact, investment in (non-environmental) infrastructure has absorbed the largest proportion of SF in Greece while investment in innovation, human capital and business extroversion were low in the agenda.¹⁵ The tendency to generously fund the infrastructure sector from SF indicates first that Greece's infrastructure gap in the pre-1990 period has been huge, requiring intensive investment, and second that Greece's administration was totally unprepared in distributing SF widely, which would be a key condition for generating multiple benefits (Batterbury 2006). The lack of strategic planning in using SF is also manifested in Greece's sole concern to increase the absorption rate of these funds without evaluating the true needs of the economy;

which usually led in financing projects politically influenced without any assessment of the long-term impact on growth and development (Karras 2012). Christodoulakis and Kalyvitis (1998a, b) provide an initial macroeconomic assessment of the Delors' II Package (part of the 2nd SF) and find that SF had a significant impact on output in Greece but funds failed to generate multiple productivity externalities sufficient to restructure the productive base of the economy. Taking into consideration the prolonged and deep recession after 2009, one can conclude that SF in 1990s and 2000s only brought temporary effects on national income components without boosting competitiveness. It should be noted that investing in infrastructure cannot be regarded as fundamentally wrong given the role of this sector in generating various supply side spillovers (Yeaple and Golub 2007) but in the case of Greece investment in infrastructure has proved counterproductive in the long-run while the opportunity cost was high as other equally important activities such as support of innovative companies, labour training, modernisation of institutional and public services (Spilanis et al. 2013) were neglected.¹⁶ The failure of economic governance in allocating SF more efficiently also impacted negatively on export orientation of small- and medium-sized enterprises that have traditionally been the backbone of Greece's private sector (Liargovas 1998; Voulgaris et al. 2005). Shortly after the terminal period of the 3rd SF, there was a hard landing for the Greek economy that almost coincided with the global financial crisis and the beginning of the Eurozone debt crisis. To sum up, the chronic incompetence of Greece's political and economic elite to manage more constructively the cumulative funds flowed into the country since its participation in the EU has cost severely in terms of foregone international competitiveness.¹⁷

16.4.2 EU and Structural Asymmetries

Econometric evidence in the form of a Granger causality test shows that the link runs from capital inflows to ULC, not the other way around (Gabrisch and Staehr 2014). In other words, current account deficits in Greece (and other European peripheral countries) preceded the increases in ULCs. Therefore, at the moment there is no conclusive

evidence to support the hypothesis that growing current account imbalances are due to excessive labour costs. Instead, the central cause of the unsustainable external imbalances was a positive demand shock mainly triggered by an over-optimistic capital inflow (Storm and Naastepad 2015b). The existence of euro relaxed borrowing constraints for the state, banks, firms and individuals (Blanchard and Giavazzi 2002; Chen et al. 2013). Capital inflows stimulated internal demand that mainly led to a shift of production towards non-tradeable sectors as shown in Sect. 2. This is mainly what brought an imports boom and Greece's growing current account imbalances.

The Eurozone integrated financially in a way that spurred an unsustainable and disproportionate credit boom in the periphery during 2002–2007.¹⁸ The ECB decided to lower interest rates in the absence of inflationary pressure in the core of Eurozone. The ECB has followed a “one size fits all” Taylor rule that proved to be well below the beneficial long-run interest rate for EU peripheral countries like Greece (Lee 2009). The ECB set interest rates tracking the macroeconomic fundamentals of the core (Germany and France) without equally weighting the needs of other EU countries (Kool 2006; Arnold 2006). Similarly, markets expected very low default risks in the bonds of Eurozone debtor countries making borrowing a very convenient path for expanding government consumption. Consequently, long-term interest rates in Greece remained unnecessarily low and stable for almost a decade until the onset of the crisis.¹⁹ The above features can be regarded as standard problems encountered in all common currency areas highlighting the fundamental issue of policy synchronisation and symmetry.

The credit boom after 2002 further harmed the Greek economy that was already weak in terms of international competitiveness after two decades of continuous de-industrialisation. Easy access to credit encouraged low value-added entrepreneurial initiatives without any export orientation. Econometric evidence shows that 20% of the Greece–Germany growth gap during 2000–2007 (Storm and Naastepad 2007) is explained in terms of real interest rate differentials. The loss of monetary autonomy and the existence of centrally controlled interest rates were beneficial for eight years but after 2009 Greece had to pay

an extremely high price for the unregulated consumption and imports boom of the period 2002–2009.

16.4.3 The Road Ahead

It can be reasonably argued that temporary policies of fiscal consolidation are unavoidable for rebalancing public finances; nonetheless, it would be rather risky—if not entirely flawed—to argue that the map for the road ahead is sign-posted “expansionary austerity”. Admittedly, Greece’s degrees of freedom are rather limited at the moment and any policy design can only have medium to long-run effects as conventional policy actions associated with short-run stimulus of output are not available in the policy toolkit. Greece’s impending challenge is to accommodate the creditors’ preoccupation that supply side reforms solely are sufficient to restore growth. This is wrong, supported by neither theory nor empirics, as Rodrik in Chap. 3 convincingly argues. As Chap. 13 shows, 60% of current unemployment is demand-deficient, which can only be tackled with a different mix of policies. Reforms in labour and product markets are necessary for the efficient allocation of national resources but they will only affect the NAIRU. The NAIRU is close to 9.5% and if we accept a very optimistic scenario that supply side reforms (mainly in the form of labour market deregulations) will tackle 50% of this rate, then the total unemployment will be reduced to 20%, which is still enormous and three times higher than OECD average (6.3% for 2016).

With these considerations in mind, one should also question the appropriateness of internal devaluation as a pre-condition for export growth and economic recovery. Bista et al. (2015) find that fiscal consolidation can increase exports approximately by 7 to 17% but these gains are mainly derived from real exchange rates. The majority of Greece’s trading partners are other members of the Eurozone that simultaneously implement austerity policies; in this case positive gains from fiscal consolidation are almost non-existent. At this stage, insistence by Greece’s creditors to austerity policies looks like more a moral punishment to Greece for creating an “example of avoidance” for

other countries that might find themselves in a similar position in the future rather than a sound, economically justified policy.²⁰ The strategy of internal devaluation coupled with fiscal austerity over the last seven years has rebalanced the current account through shrinking imports and not because of an export boom.²¹

Given that abandoning austerity policies and implementing a system of fiscal transfers from core to the periphery are not in the EU agenda at the moment (and more likely will not even be in the near future), Greece's anticipation in the next half a year or so is participation in the Quantitative Easing (QE) programme of ECB, which is subject to the completion of the 2nd evaluation of the 3rd bailout programme. The QE will increase liquidity and transfer funds to the real economy but this should not be taken as granted given that banks' financial positions are still problematic after the rapid evolution of non-performing loans (see Chaps. 1, 14).

It is always nice to conclude with some optimism, looking at Janus's good face, but it is more useful to be pragmatic even at the risk of being accused of cynicism. From this point of view, Greece is trapped in its own pathologies and the heavy-handedness of its EU partners. Our previous discussion has highlighted some of Greece's pathologies while Chaps. 3–6 have criticised the conditionality imposed on the country. For the purposes of this volume, it suffices to say that the creditors have only urged and imposed a strategy of internal devaluation while not helping the country to restructure its industrial base, strengthen its technological competitiveness and upgrade its knowledge economy. In other words, they have arguably ignored all the crucial objectives specified ten years ago in the Lisbon Treaty (2007).

Notes

1. Greece experienced a 36% decrease in export market share of goods and an increase of 68% of services mainly attributed to a substantial shift towards transport and tourism (Table I.2, p. 8 in Xiao et al. 2008).
2. Greece suffered export market share losses due to crowding out from Chinese exports, Chen et al. (2013).

3. See Chaps. 1 and 11 for summary statistics of Greece's macroeconomic indicators.
4. Cost competitiveness and price competitiveness are identical terms given that any change in the cost of production is passing through to price.
5. Schmitz and Von Hagen (2011) attribute the causes of external imbalances to a massive credit boom in the European periphery in early 2000s.
6. Neary (2006) focuses on some new measures of real effective exchange rates (REER) as measures competitiveness to overcome inherited difficulties from consumer prices and export unit values. Again, these indices are basically price indices and do not capture the non-price dimensions of competitiveness.
7. The productivity exports nexus is also subject to endogeneity bias due to potential feedback effects. Exporting is usually associated with learning and scale effects that might feedback positively on TFP. To disentangle these effects, the literature is using various econometric techniques in order to separate the self-selection effect from the learning by exporting effects. We refer to Wagner (2007) for a survey of the related literature.
8. See also Gros (2011) for further evidence on how countries that experience high productivity also manage to rebound in EU export shares.
9. Germany's ULC declined in 2000s only 7.4% relative to the rest of the Eurozone. This decline is not associated at all with wage restraints in Germany. To the contrary, nominal wages in Germany increased relative to Eurozone but ULC fall due to outstanding productivity performance which is resulted from strong technological capabilities.
10. Exports found to be more responsive to REER (the REER elasticity of exports is 1.457 for EMU countries) rather than number of patents.
11. Apart from producers' ability to compete on product differentiation and product innovation, capital stock here also account for the potential of domestic producers to exploit economies of scale that will allow reducing average production cost.
12. See Chaps. 1, 2 and 11 in this volume for a more detailed discussion about consumption and interest rates in Greece in the post-euro period.
13. See Chap. 1 of the current volume for a more insightful discussion of Greece's chronic pathologies and Chap. 3 for the reforms debate.
14. Up to 2013, Greece has been a recipient of 5 Structural Funds programmes starting with the Integrated Mediterranean Programmes

- (1986–1989) and progressing as follows: 1st Community Support Framework (CSF), 1989–993; 2nd CFS1, 994–999; 3rd CFS, 2000–2006 and the 1st National Strategic Reference Programme, 2007–2013.
15. Investment in transport infrastructure as a share of total funding from the four SF is on average 25% while investment in R&D is just 3.8% (Plaskovitis 2006). We refer to Karvounis and Zaharis (2015) for a more detailed decomposition of SF across different sectors.
 16. The obsession to spend the lion's share from CF only in infrastructure projects deserves a further explanation. One reason is that Greece had only the appropriate managerial know-how to run infrastructure projects while lacking expertise in projects covering other categories. Another possible explanation is that the distribution of SF follows the standard norm, which dictates that “money properly spent” are only those directed into projects with a clear tangible output such as infrastructure. Finally, no one can rule out the possibility that channeling funds towards infrastructure increased the chances of corruption between government officials and private suppliers. Having said this, in the period under consideration (especially 1996 onwards) there were many incidents of public resources mismanagement.
 17. We refer to Featherstone (2011) for a thorough discussion about Greece's failures to address on time all the necessary challenges for modernising the state and transforming the economy.
 18. See Chaps. 1, 5 and 11 of this volume for a more detailed exposition of weaknesses associated with the EU architecture including the role of ECB.
 19. Markets mistakenly perceived Greek bonds as close substitutes to German bonds without recognising the possibility of a fiscal crisis in Greece as indeed happened in 2010. Additionally, ECB totally ignored the possibility of a systemic banking crisis within the EU relying on a speculation (rather than a fact) that there might be a collective action for rescuing banks when needed.
 20. Requesting from Greece high budget surplus, latest news report 3 to 3.5% of GDP for 8 years (these are not final figures) also reflects the creditors' admission that Greece's debt is unsustainable. Therefore, high budget surplus is the collateral needed to guarantee that Greece will repay the highest possible amount.

21. The average growth rate of imports over the period 2009–2016 was –4.4% while exports grow only by 0.1% (AMECO).

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