

# Budget balances in OECD countries: what makes them change?

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Published online: 25 January 2007  
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**Abstract** Fiscal balances have deteriorated quickly in recent years, bringing back to the foreground the question what factors explain such sharp changes. This paper takes a broad perspective at the issue regarding countries included, the range of potential explanatory variables, and the time-span covered. The empirical analysis shows that changes in budget balances are affected by debt growth, macroeconomic developments and political factors. In particular, we find that the run-up to EMU induced additional consolidation in Europe and that budget balances deteriorate markedly in election years. Asset prices also affect budgets, but the impact remains limited in normal times.

**Keywords** Fiscal policy · Asset prices · Economic growth · Budget balance · Election cycle

**JEL classification** E61 · E62 · H61 · H62

## 1 Introduction

Budgetary balances deteriorated substantially in the early 2000s, both in Europe and in the US. Deficits in many European countries, including Germany, France and Italy, have surpassed the 3% of GDP reference value that the Maastricht Treaty contains for government deficits. Across the Atlantic, budgetary discussions in the US in the second half of the 1990s focused on consequences of a very low or even disappearing government debt. Only a few years later, the US again faces significant deficits. In Japan, much higher deficits than in Europe and the US already were reached by the end of the 1990s.

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Such events call for more insight in the factors that drive fiscal balances. Analysing these factors may contribute to signalling upcoming changes at an early stage. To the extent that large changes in fiscal deficits, and large deteriorations in particular, are deemed undesirable, it may also help finding appropriate remedies that focus on the determinants of changes instead of on the outcomes. Rather than focussing on a few factors as most other studies in this area do, we take a broad perspective in terms of time coverage, the span of countries involved, and explanatory variables.

The aim of our paper thus is to identify the main factors causing changes in fiscal balances. Apart from the set of OECD countries, we also separately consider the EU sample, as fiscal attitudes in Europe may differ from those elsewhere. Section 2 briefly provides a history of fiscal deficits in the OECD sample. After describing the various factors that may result in changes in fiscal balances (Sect. 3), we present our research strategy (Sect. 4) and the results (Sect. 5). The final section of the paper (Sect. 6) contains conclusions.

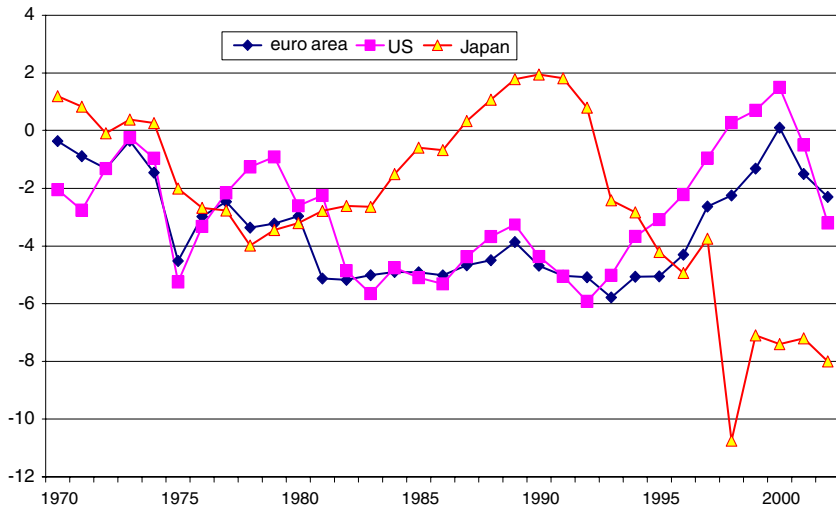
## 2 Fiscal balances in the past three decades

A look at fiscal developments in the last three decades in the three major currency areas is useful to detect similarities and differences in fiscal policies. Here and in the remainder of the paper, we focus on general government fiscal balances. A number of other fiscal measures have been used in empirical analyses, including cyclically adjusted balances and changes in government debt.

As to using nominal or cyclically adjusted data, the latter in principle may give a better measure of the policy-related part of the budget, and reduces the simultaneity bias that may arise as budgets and economic growth interact (Perotti and Kontopoulos 2002). However, there are serious caveats in estimating cyclically adjusted balances, notably defining trend/potential output. Taking (changes in) government debt, net or gross, has been advocated on the basis that it is a broader measure of government activities than the deficit (e.g. Roubini and Sachs 1989b; de Haan and Sturm 1997). However, governments usually define their annual budgetary targets in flow terms (deficits) rather than in stock terms (debt). In using annual deficit numbers, it needs to be taken into account that transitory effects are included as well.

Figure 1 shows euro area and US deficit-to-GDP ratios moving broadly in parallel until 1994, after which US deficits lead euro area developments. In both monetary areas, 2001 saw a sharp reversal of fiscal improvements that had started around the middle of the 1990s. In Japan, developments were broadly in line with those in the two other major currency areas until 1980. After that, movements were contrary, with Japan reaching a record deficit of more than 10% of GDP in 1998, and staying at high levels unprecedented in the euro area and the US thereafter.

Fiscal developments thus are not evenly spread. As another example of different country-experiences, the number of sharp fiscal deteriorations—arbitrarily set at a decrease in the fiscal deficit of 2% of GDP or more in 1 year—over the 1970–2002 period ranges between 1 (Spain and the Netherlands) and 7 (Sweden). Using the same definition, it can also be seen that fiscal deteriorations are not evenly spread over time. As much as 14 countries in our sample of 22 suffered from a sharp fiscal deterioration in 1975. Other periods with many fiscal setbacks were 1990–1993, whereas in the last year of our sample (2002) five countries saw budget balances deteriorate by 2% of GDP or more.



**Fig. 1** Deficits in major currency areas, 1970–2002 (as a percentage of GDP)

### 3 Factors causing changes in fiscal balances

The analysis of budget deficits is all but a new topic in the economic literature. Increasing budget deficits and debts after the first oil crisis boosted economic research into the causes of budgetary changes. Initially, emphasis in such studies was on budgetary and economic factors explaining observed budgetary trends. Later, attention shifted to explaining cross-country variations as common economic circumstances coincided with divergences in countries' fiscal behaviour. Behavioural effects were taken into account, with particular attention paid to political–economy aspects, more or less starting with Roubini and Sachs (1989a). Political aspects included fragmentation, measured e.g. by the number of spending ministers or the number of political parties in government. The political orientation of governments equally has been taken into account (e.g. Carlsen 1997), as has the political business cycle. Also features of the budgetary process were examined in analysing differences in fiscal outcomes; Alesina and Perotti (1995) highlighted the role of budgetary procedures, while Hallerberg and Von Hagen (1999) emphasised the role of budgetary institutions in explaining budgetary outcomes. Extensions have been made regarding the countries covered, including countries from Central and Eastern Europe (e.g. Gleich 2003) and developing countries (e.g. Woo 2003).

While providing useful information on the determinants of changing budgetary positions, previous studies on this topic do not fully meet our demands. Many of them not being recent, they often do not include the creation of EMU in the countries of the European Union, and the period of deteriorating deficits around and after the turn of the century. Furthermore, the choice and specification of independent variables sometimes leaves room for improvement, with many studies focussing on one or a limited number of explanatory variables only. While often looking at political–economy aspects, other factors, such as asset price developments, tend to be ignored.

Our approach to identifying factors determining deficit developments therefore is a broad one, including budgetary, macroeconomic, political and other variables.

Below, we list the potential factors included, indicating the expected sign of the coefficient and report some earlier outcomes from the literature.

### 3.1 Budgetary variables

*Change in debt ratio.* The debt-to-GDP ratio captures concerns on the sustainability of fiscal policy. On that account, increasing debt ratios should lead to an improvement in the budget balance. On the other hand, a negative sign may also be plausible as a higher debt ratio automatically causes higher interest payments, resulting in a worsening of the fiscal balance. On the specification of the debt variable, Roubini and Sachs (1989a) use an interest rate–growth adjusted debt ratio, to reflect the fact that government debt ratios may not give rise to sustainability concerns if output growth exceeds the real interest rate.

*Lagged budget balance.* Lagged budget changes could be introduced in the estimation equations to reflect corrections to past budgetary imbalances. Large changes in budget deficits in the past may induce governments to undo part of it. Changes in fiscal balances may also result from budgetary inertia. This means that the past fiscal policy decisions such as the implementation of tax reforms and major spending reforms can affect public finances in the following years as well. However, as lagged dependent variables are known to produce inconsistent estimates, and considering that changes in the debt ratios already will be included, we excluded lagged changes in budget balances as a right-hand side variable.

### 3.2 Macroeconomic variables

*Unemployment rate/output growth/output gap.* These variables measure the fiscal responsiveness to macroeconomic conditions. They operate mainly through automatic stabilisers, via tax revenues and unemployment-related expenditures. An additional effect could arise from discretionary fiscal fine-tuning efforts. In a recession, an anti-cyclical fiscal policy calls for additional deficits, while in a boom a contractionary budget helps avoiding overheating of economies. Literature points to possible asymmetries in fiscal responses to recessions and upturns (e.g. Mayes and Virén 2000): in recessions, governments pursue expansionary policies to combat the downturn, but in economic upswings the cyclical budgetary proceeds are partly used for cutting taxes or increasing spending rather than for reducing deficits.

*Long-term interest rate.* A high interest rate worsens the overall budget balance via increasing interest expenditure on newly issued debt and on rolling debt. On the other hand, higher interest rates signal higher opportunity costs of bond market financing, possibly urging governments to improve the fiscal balance. Overall, however, the first effect is expected to dominate, thus producing a negative correlation between interest rates and budget balances. An alternative measure could be interest expenditures as a percentage of GDP, on the ground that effects of high interest rates on fiscal policies depend on the prevailing debt level (e.g. Volkerink and de Haan 2001, Eschenbach and Schuknecht 2004). However, it would then enter the estimation equation being part of an accounting identity.

*Inflation.* Inflation often is included among the variables affecting the budget balance. It may have an automatic effect on government receipts and expenditures through nominal progression in tax rates and tax brackets, and via price-indexation of receipts and expenditures. In addition to this automatic effect, including this

variable may be justified by assuming governments to adjust policies in case of inflation, for instance because high inflation erodes competitiveness and causes pressures on fixed exchange rates if participating in an exchange rate agreement (Kontopoulos and Perotti 1999). On the other hand, governments might also welcome inflation as it erodes the real value of nominal government debt. Thus, the overall effect of inflation on budget balances is not a priori clear. The inflation measure we use is the change in national consumer price indices.

*Short-term interest rate.* In setting fiscal policy, the monetary policy stance may be an argument. The expected reaction, however, is ambiguous. High short-term interest rates to reduce inflationary pressures could be supported or countered by fiscal policy, depending on policy preferences, views on the operation of the economy, and the allocation of tasks among policymakers. Modelling monetary policy by an interest rate, moreover, is rather crude and may capture other elements such as the cost of government financing.

*Asset prices.* Experiences in a few Nordic countries in the early nineties and in the US in the second half of nineties demonstrated that equity and house prices may significantly affect government budgets, primarily via the following channels:<sup>1</sup>

- Directly, via budgetary revenues. For instance, high asset prices raise revenues of capital gains and property taxes.
- Indirectly, via second-round effects of asset prices on the economy, for instance high asset prices boosting consumer tax revenues due to higher private consumption.
- Via the fiscal costs of a budgetary bailout of financial institutions in trouble.

*Welfare level.* Real GDP per capita is a potential explanatory variable, under the assumption that low welfare levels lead to higher deficits for financing catching-up expenditures (Woo 2003).

### 3.3 Political variables

Many studies on causes of fiscal changes focus on cross-country differences in political institutions. The idea generally is that certain political aspects increase the likelihood of major changes in the fiscal policy course. Political factors increasing the deficit bias include the area of political instability (e.g. frequency of elections), political orientation (e.g. left-wing versus right-wing government), and the budgetary process (e.g. the competencies of the minister of finance). In specific, this study considers the following political variables.

*Election year,* to detect electoral fiscal cycles as suggested by the literature on political business cycles. Upcoming elections may cause politicians to spend more and tax less to increase the likelihood of being re-elected.

*Government composition index* (left-right wing parties in cabinet). It has been suggested that left-wing political parties are more deficit-prone than right-wing parties (e.g. Kontopoulos and Perotti 1999). Another hypothesis is that left-wing governments implement larger anti-cyclical programmes in recessions but undertake more consolidation during upswings (Carlsen 1997).

<sup>1</sup> Eschenbach and Schuknecht (2004) provide a more detailed description of the channels of impact of asset prices on fiscal variables.

*Type of government* (ranging from single party government to temporary caretaker government). A single party government may be more decisive than multi-party majority governments, let alone minority governments and caretakers, as there is less need for using deficits as grease for the coalition.

*Fiscal governance.* A minister of finance may have strong budgetary powers to withstand claims from spending ministers. This situation, labelled “delegation”, contrasts with a minister of finance merely enforcing a pre-existing contract between spending ministers (“commitment”), or a situation in which spending decisions are more or less made in isolation from other ministers (“fiefdom”). A mixture of delegation and commitment is also possible (“mixed”). The typology is based on Hallerberg (2004).

*Number of political parties.* The effective number of parties in parliament may affect the fiscal orientation as a high number of parties indicates a need for coalition governments, increasing the likelihood of higher budget deficits.

The *overall political constraint index* constructed by Henisz (2002) measures the quality of political institutions in a country. The higher the quality, the lower are the expected deficits.

### 3.4 Other variables

The *run-up to EMU* may have resulted in additional consolidation in European Union countries to qualify as early participants in the European monetary union. Compliance with the convergence criteria on the government debt (below 60% of GDP or, if above, sufficiently declining) and on the government deficit (at most 3% of GDP) was a necessary requirement to adopt the euro.

*Country dummies* are also considered. Country-specific year dummies for instance relate to the German unification (1990) and to financial rescue support for troubled banks in Finland and Sweden (1991–1993) and in Japan (1998).

## 4 Research strategy

The data range used in our estimations is 1970–2002, although it is somewhat shorter for some countries and variables, reflecting data availability. Including the 1970s is fruitful as it is a period with rapid changes in fiscal positions in nearly all OECD countries, providing a good opportunity to test which factors cause changes in fiscal balances. Including the most recent period in the sample not only adds another episode of quickly deteriorating fiscal balances, but also allows some preliminary testing on changed fiscal attitudes in European countries just before and after the start of EMU. Altogether 713 observations were used for 22 countries.

The dependent variable in our estimates below is the change in budget balances as per cent of GDP rather than the level of the deficit ratio, to arrive at stationary series. The data have been corrected for data-breaks to arrive at consistent series. Ideally, budget balance ratios should also be corrected for temporary measures (including accounting tricks) to arrive at a true and fully consistent measure of government finances. While progress in this area is under way (see e.g. Koen and van den Noord 2005), corrected series for fiscal balances for the entire time-period and all countries covered in this article are not available, while developing longer series for more countries lies outside the scope of this article. However, budget balances

have been corrected for UMTS receipts (receipts from auctioning the mobile telephone spectrum), which were particularly large in a few European countries in 2000 (around 1% of GDP). Other one-off measures may be captured by the country-specific year dummies included in the estimations. Nevertheless, some distortions to the outcomes may arise.

Estimates are based on panel regressions. All estimations reported below include fixed-country effects, accounting for country-specific characteristics not captured by other explanatory variables. Coefficient values, not shown in the tables, were close to zero in all countries. As cross-section panel estimates can be subject to heteroscedasticity, all estimates are based on White-heteroscedasticity-consistent standard errors and covariance.<sup>2</sup>

Year dummies have been included to capture cross-country related macroeconomic shocks that are not fully reflected in the macroeconomic variables included in the estimated equation, such as the oil price shocks in the 1970s, the ERM crisis in the early 1990s, the September 11th 2001 events and the second Iraq war in 2001/2002. As emphasised in Kontopoulos and Perotti (1999), not taking year-dummies into account may severely distort the results. Unit root tests for the main variables to be used in the empirical analysis revealed satisfactory outcomes.

## 5 Estimation results

In first instance, regressions were run for all OECD countries for which data were available for the key explanatory variables, being the former 15 EU countries, the United States, Japan, Australia, Canada, New Zealand, Norway and Switzerland. The main empirical findings are (see Table 1, second column):

– *Changes in the government debt ratio* in the previous year give rise to a correction in the budget balance ratio. It produces a statistically significant but small positive coefficient (0.04), indicating some budgetary correction when highly indebted. An alternative specification, the change in the growth–interest rate differential adjusted debt ratio, yielded no statistically significant results, possibly because it is a rather volatile measure. The net government debt ratio neither produced satisfactory outcomes.

– *Real GDP growth* has a positive impact on budgets, the income elasticity of the budget being 0.15.<sup>3</sup> Using changes in the unemployment rate and output gap gave rather similar results as when using changes in GDP.<sup>4</sup> In view of the relatively high correlation between the real GDP growth rate and the change in the unemployment rate (–0.5 across all countries), we only included the real GDP growth rate. We also preferred this over changes in the output gap because of the problems and uncertainties related to output gap computations.

<sup>2</sup> In addition, we also re-estimated equations using SUR, providing another way to deal with cross-country correlations (e.g. an oil shock) and cross-time correlations (e.g. social-cultural features specific to one country) than estimates based on White-heteroscedasticity-consistent standard errors and covariance with country-specific intercepts and time-dummies. SUR results broadly confirm the outcomes reported in the main text, but comparability is limited on account of a reduced number of observations.

<sup>3</sup> As explained later in the main text, the reported elasticity is the elasticity applying in economic upswings as we include a dummy variable in the equation measuring the elasticity in downswings.

<sup>4</sup> Trend GDP growth has been estimated using a HP-filter with lambda value of 100.

**Table 1** Determinants of changes in fiscal balance-to-GDP ratios: results for 22 OECD countries, 1970–2002 and sub-periods, ex- and including house price changes

	1970–2002	1970–1986	1987–2002	1970–2002
$\Delta$ Debt ratio (–1)	0.04 (2.4)**	0.03 (0.9)	0.08 (3.8)**	0.03 (2.0)**
Real GDP growth	0.15 (4.6)**	0.12 (2.9)**	0.24 (4.1)**	0.16 (2.8)**
Negative output gap dummy*real GDP growth	–0.06 (–2.1)**	–0.06 (–1.9)*	–0.07 (–1.5)	–0.06 (–1.5)
$\Delta$ L-T interest rate (–1)	–0.14 (–3.3)**	–0.17 (–1.6)	–0.02 (–0.4)	–0.20 (–4.3)**
Stock price increase (–1)	0.004 (2.1)**	–0.001 (–0.4)	0.009 (2.9)**	0.003 (1.3)
Election dummy	–0.34 (–2.6)**	–0.31 (–1.7)*	–0.39 (–2.6)**	–0.30 (–2.2)**
EMU-dummy	0.79 (3.7)**		0.54 (2.1)**	0.80 (3.5)**
House price increase (–1)				0.02 (2.6)**
Adjusted R-squared	0.34	0.30	0.44	0.40
Number of observations	713	361	352	539

Fixed country-effects, time-dummies and country-specific year dummies are not shown. The relevance of the time-dummies and of the country-specific year dummies is confirmed by Wald-tests on their joint significance, indicating *F*-values of respectively 15.6 and 4839.4

\*\* = significant at the 5% significance level, \* = significant at the 10% significance level

The income elasticity reported is rather low compared to standard income elasticities of budget deficits: the OECD (van den Noord, 2000) reports income elasticities around 0.5 for the average of European countries<sup>5</sup> and somewhat lower values for most non-European countries, like in the US (0.25), Japan (0.26) and Australia (0.28). Méliitz (2000), in an overview of the literature on income elasticities, concludes that values around 0.25 are not uncommon in empirical estimates. Virén (2000) studies income elasticities using various approaches (single equations, VAR-models, and structural macro economic model simulations) and also concludes values in the order of 0.2–0.3 for EU countries.

Factors that may account for the relatively low value of our income elasticity include the year dummies. These prove to be significant especially in years with negative economic shocks, thus likely picking up some income effect. In addition, the coefficients in our estimation may not only reflect the automatic effect, but also pro-cyclical fiscal policies: governments using cyclical proceeds in upturns for additional spending, while in a recession the deterioration in the deficit is counteracted by consolidation measures. The European Commission (2001) and Hallerberg and Strauch (2002) indeed conclude pro-cyclical policies for the last three decades, at least for the EU.<sup>6</sup> Feedback effects, reflecting effects of budget changes on GDP, can also not be excluded.

– *Asymmetrical fiscal responses* to a negative output gap were also tested. A dummy variable was included in the estimated equation, taking value 1 in case of a negative output gap. The interaction of this dummy with the real GDP growth rate produced satisfactory results at the 5% significance level when lagging the dummy by one year (denoted “negative output gap dummy” in the tables). The negative value (–0.06) indicates that in recessions the income elasticity of the budget balance ratio is lower than in upswings. This lower responsiveness of budgets to a 1%

<sup>5</sup> This corresponds to the income elasticities used by the European Commission (2000).

<sup>6</sup> If this explanation holds, the coefficient on the interaction variable of the recession—dummy and real GDP growth (see below) measures whether a policy is more or less pro-cyclical in recessions.



increase in GDP may reflect more expansionary policies in or just after economic downswings, causing slower revenue growth or higher expenditure growth than would be expected if the fiscal stance were neutral. This asymmetric cyclical response is in line with Virén (2000).

– *Interest rates.* The 1-year lagged change in nominal long-term interest rates has a negative effect on the budget balance ratio. A 1% point increase in the interest rate results in a deterioration in the government budget balance ratio in the order of 0.14% of GDP next year. The obtained results seem fairly plausible in the light of the prevailing government debt levels and the debt structures. Using overall budget balance ratios as dependent variable rather than primary balance ratios, does not enable us to distinguish between automatic effects of interest rates on budgets and any discretionary government response to higher borrowing costs. Inclusion of the real long-term interest rate, with and without inclusion of a separate consumer price index in the equation, did not produce satisfactory results.

– Lagged changes in *stock market prices* are positively related to budgetary balance ratios, though the effect is rather small (0.004). The lagged effect may reflect delayed private sector responses to changes in wealth as well as tax collection lags. The size of the effect does not appear unrealistic, taking into account generally low effective tax rates on capital gains, their low share in total government tax revenue and also low propensities to consume out of wealth.

– Fiscal balance ratios on average deteriorate by about 0.3% of GDP in *general election* years, as shown by the “election-dummy” in the table.<sup>7</sup> As far as budgets are ‘not managed’ because of the changeover to a new government, the coefficient not only measures deliberate fiscal expansions to gain electoral support, but also the lack of parliamentary backing for government actions in case of adverse macroeconomic or budgetary developments. In addition, it could reflect strategic attempts of an outgoing government to limit the room for manoeuvre for a new government with another ideology (Beetsma and Bovenberg, 1999).

– Effects of *EMU-entry* are evident for the EU countries, given the significant influence of the EMU-dummy. Over the period 1994–1998, when the dummy had value 1, the additional improvement in budget balance ratios was 0.8% of GDP per year. The significant effect is in line with Volkerink and de Haan (2001). Bussemeyer (2004) reported EMU-effects for 1992–1997. Extending our EMU-variable to include years after 1998 did not produce statistically significant results. This would confirm the idea that consolidation efforts accelerated in many EU countries with the prospect of an early EMU-entry but not on a permanent basis.<sup>8</sup> However, the budget balance series are not corrected for all temporary measures and creative accounting, as mentioned before. In as far as resort to such measures increased in the run-up to EMU to comply with the fiscal convergence criteria, as argued by Koen and van den Noord (2005), this would also be reflected in the coefficient on the EMU-variable. The EMU dummy variable could also partly

<sup>7</sup> Buti and van den Noord (2003) and Clark and Hallerberg (2001) provide evidence that the political business cycle has not disappeared in Europe after the start of EMU.

<sup>8</sup> Beetsma and Bovenberg (1999) argue that EMU may well have strengthened the deficit bias, as expansionary fiscal policies in one euro area country are no longer counteracted by exchange rate developments. They also reason that interest rate reactions will be smaller than before as short-term ECB interest rates set are based on euro area average conditions, and long-term interest rates are less responsive to national fiscal developments owing to increasingly integrated European capital markets.

capture cross-country effects that for other years are included in specific year-dummies.

– A few country-specific year-dummies were also included in the estimates, reflecting bank bailout costs in Finland, Sweden (1991–1993) and Japan (1998) (not shown in the tables). While bailout costs typically are related to fierce asset price developments, and thus might be reflected in the stock market coefficients, the emergence of financial problems of a corporation or financial institution usually follows a boom-bust pattern that is difficult to include in macroeconomic variables. We found no significant effect for a German unification dummy. Possibly, its negative impact on public finances in Germany is captured by the ERM crisis-related common macroeconomic shock dummy in the beginning of 1990s.

– Significant year-dummies were included in the estimation equation for the years 1974, 1975, 1976, 1978, 1981, 1990, 1991, 1992, and 2002 (not shown in the tables). To improve the comparability of the results, these year-dummies were also included in all subsequent estimation equations.

While the above arguments contributed to explaining changes in budget balance ratios in our sample of OECD countries, a few others did not.

Most *other political variables* did not produce statistically significant results. The variable measuring the type of government sometimes produced significant effects, but with a counter-intuitive sign. Theory suggests that caretaker governments are less decisive than single party governments because of lack of parliamentary support. Our empirical results, however, indicate otherwise, which is why it has been excluded.<sup>9</sup> There was also lack of empirical support for the assumption that left-wing parties are more deficit-prone than right-wing parties, which finding is in line with Alesina et al. (1997).<sup>10</sup> They explain their result by pointing out that left-wing governments may be more prone to increase both expenditure and taxes, leaving deficit positions relatively unaffected. Interacting the political variables with macro economic variables, especially economic growth, also did not give satisfactory results. However, given that we did not fully explore all possible political variables but also partly were guided by data availability, further research may throw additional light on the relevance of these factors.

*Short-term interest rates* did not have a significant effect on budget balance ratios. This interest rate is a limited indicator for monetary policy, as it also reflects financing costs for short-term debt. One study finding a significant effect of short-term interest rates on fiscal balances is Mélitz (2000). He reports macroeconomic policies moving in opposite directions; a tight monetary policy induces a loose fiscal policy, and vice versa.

*Inflation* did not prove to have a significant effect on budgets. One reason for this could be differences in indexation mechanisms in the sample of countries. In some countries, there is no full and immediate indexing of tax brackets for inflation, causing tax revenues to rise with inflation. On the other hand, a number of countries link government expenditures explicitly to inflation, e.g. when targeting real expenditure growth, causing expenditures to increase directly and proportionally with the inflation rate. Virén (1998) indeed reports both positive and

<sup>9</sup> Kontopoulos and Perotti (1999) argue that the case for single-party governments to be stronger is not clear-cut. Furthermore, they point to classification difficulties, and also suggest that effects on expenditures may be more likely than effects on budget balances.

<sup>10</sup> In Volkerink and de Haan (2001), government ideology only matters in the 1970s.

negative significant effects of inflation on the fiscal balance in a sample of OECD countries.

*Real GDP per capita* did not enter the equation satisfactorily. Possibly, income differences within our country-sample were not large enough to detect such an effect. Alternatively, at least for the European countries, EU capital transfers to countries with large physical investment programmes may leave the overall national budgetary effect too small to detect.

### 5.1 Result robustness: testing for sub-periods

Table 1 also shows the estimation outcomes when splitting the sample into two: 1970–1986 (column 3) and 1987–2002 (column 4). Apart from allowing detecting changes over time, such a split can be justified by a change in economic paradigm around the middle of the 1980s. The disadvantages of Keynesian-inspired fine-tuning policies became more evident, and concerns about sustainability received priority with mounting government debt. Thus, the mid-1980s represents the period in which deficits peaked in many countries, and started falling thereafter. The exact timing of this change, however, differs markedly across countries.

Comparing results across the two sub-samples, it is clear that outcomes are more robust for the recent period than for the 1970s and the first half of the 1980s. The debt coefficient increases in size (from 0.03 to 0.08) and significance, likely reflecting increasing concerns on debt sustainability given high debt ratios and possibly rising awareness regarding the adverse impact of ageing populations on public finances. The income elasticity of the budget also increases markedly over time, which could reflect the rise in the tax burden and in the size of automatic stabilisers in most countries. It could also signal a move to a more counter-cyclical (or less pro-cyclical) policy over time, as observed by Galí and Perotti (2003). Interest rates are the main exception to the observation that the magnitudes and significance of variables increase over time, being insignificant over both sub-periods. Stock market effects increase over time, both in size and significance, possibly related to higher asset market volatility during the more recent period, and to increasing and more diversified asset ownership. Finally, the election cycle is more clearly present in the recent period.

### 5.2 Including house prices

Next, house price changes were included in the estimation-equation. They have not been included in the results shown so far on account of limited data-availability, both regarding the period covered and the countries included. Furthermore, definitions of house prices are not harmonised, calling for more than usual caution when drawing conclusions. Inclusion of house price changes (1-year lagged) in the above equation for the entire time-period (1970–2002) produces a small (0.02) but significant effect, as shown in the last column of Table 1. Significance levels of other coefficients, however, decrease somewhat, as for instance for stock price increases, turning insignificant at the 10% level. Correlation coefficients between house prices, stock markets and interest rates are below critical levels, indicating no serious correlation.

### 5.3 EU countries

European fiscal attitudes differ from those in other countries, as suggested by Virén (1998) for continental Europe. Therefore, we also restricted the sample of countries

to the former 15 EU countries. Another reason for doing so is that splitting the country-sample provides insight in the sensitivity of the results described to the countries included. Table 2 shows some results for the entire time-span (1970–2002), for the moment again ignoring house prices.

The results for the EU countries very much resemble those for our OECD sample, regarding both the size and the significance of coefficients. While similarities prevail, a few differences can be pointed at. The stock market effect in the EU is not significant, which may be attributed to smaller stock market capitalisation in the EU compared to Anglo-Saxon countries outside the EU, or to less private ownership, causing smaller macroeconomic effects. On the other hand, the electoral cycle effect appears to be somewhat stronger in the EU countries.

Results when splitting the period in two sub-periods, 1970–1986 and 1987–2002, are broadly comparable to those for the entire set of countries, and are not reported here. Finally, we also included lagged house price changes in the equation (column 3). House price increases in the EU have a significant but small effect on the budget, similar in size to the one for our sample of OECD countries.

## 6 Conclusions

Insight into the causes of changes in fiscal balances improves the understanding of budgetary processes, and may help in selecting tools to avoid the occurrence of unsustainable large public deficits and debts. Given this aim, we adopted a broad approach regarding countries included, the time-span covered, and the variables incorporated in the estimation equations.

Our analysis shows that fiscal outcomes are shaped by sustainability considerations (last year's change in the debt ratio), macroeconomic conditions, the election cycle, EMU-entry, and asset price developments. The role of the initial budgetary conditions points to some self-correcting budgetary mechanism, although rather weak. Macroeconomic growth affects budgets via automatic stabilisers. Discretionary fiscal policies, however, have been used more to stimulate economies in downswings than to restrict economic growth in upswings. Higher interest rates affect

**Table 2** Determinants of changes in fiscal balance-to-GDP ratios: results for 15 EU countries, ex- and including house price changes, 1970–2002

	1970–2002	1970–2002
$\Delta$ Debt ratio (–1)	0.03 (1.7)*	0.04 (2.1)**
Real GDP growth	0.13 (3.3)**	0.17 (2.3)**
Negative output gap dummy*real GDP growth	–0.07 (–1.8)*	–0.13 (–1.8)*
$\Delta$ L-T interest rate (–1)	–0.13 (–2.7)**	–0.19 (–3.4)**
Stock price increase (–1)	0.003 (1.6)	0.003 (1.0)
Election dummy	–0.41 (–2.6)**	–0.41 (–2.5)**
EMU-dummy	0.85 (3.7)**	0.92 (3.8)**
House price increase (–1)		0.02 (2.1)**
Adjusted <i>R</i> -squared	0.37	0.45
Number of observations	490	349

Fixed country-effects, time-dummies and country-specific year dummies are not shown. The relevance of the time-dummies and of the country-specific year dummies is confirmed by Wald-tests on their joint significance, indicating *F*-values of respectively 15.2 and 430.7

\*\* = significant at the 5% significance level, \* = significant at the 10% significance level

budgets negatively, as expected. Election years are clearly reflected in larger budget deficits. For the EU countries, approaching the decision-day on early EMU participation spurred fiscal consolidation, but effects have subdued since. There is some evidence that asset market prices (house prices and stock markets) also affect budgetary outcomes, though their effect normally is limited and not always statistically significant.

These results are fairly robust. Specific results to some extent depend on the time period covered. Generally, results improve in terms of significance the more recent the period that is considered. This applies in particular to budgetary effects of asset price variables. The main exception concerns interest rates, whose effects decline over time. Compared to the OECD sample, the estimation results for changes in budget balances in EU countries generally reveal lower stock price effects and a stronger impact of the election cycle.

**Acknowledgements** We would like to thank Jürgen von Hagen, ECB colleagues and anonymous referees for their comments. The opinions expressed are those of the authors and do not necessarily reflect the views of the ECB.

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