Fiscal Consolidation - Impact on Labor Market Outcomes

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Abstract Recent global economic crisis and the concerns about long-term sustainability of public finances have resulted in stronger implementation of fiscal consolidation measures. In this context, consolidation has received a lot of attention in both theoretical and empirical literature with the large number of papers investigating its impact on different aspects of economy. Although fiscal consolidation has long been recognized as a hot issue, the literature does not offer a consensus on the impact of fiscal consolidation. Theoretical considerations offer a rationale for both contractionary and expansionary effect of fiscal consolidation on economic activity. Given this state of theoretical literature and quite ambiguous predictions, it is no wonder that the empirical literature has provided evidence supporting both of these views.

At the same time, investigation of fiscal consolidation on labor markets has received relatively little attention (IMF, Fiscal monitor-back to work: How fiscal policy can help, 2014). Given that one of the main goals of economic policy is labor market outcomes, we find this topic extremely relevant. The existing literature indicates that fiscal consolidation can result in long-lasting negative effects on the labor market (IMF, Fiscal monitor-back to work: How fiscal policy can help, 2014). In addition, the literature also recognizes possible positive effects of fiscal consolidation. This paper adds to the literature by tackling the issue of fiscal consolidation through an empirical investigation focusing on labor market. More precisely, it investigates the effects on a set of specific labor market outcomes: employment, unemployment, and activity. Given that the debate on labor market impact of expenditure-based versus revenue-based consolidations is not settled in the literature, the special attention in this paper has been dedicated to the effects of the design of fiscal consolidation on the labor market outcomes. Additional contribution of this paper relates to the usage of the relatively new database on fiscal consolidations (Devries et al., A new action-based dataset of fiscal consolidation (IMF Working Paper No. 11/128). International Monetary Fund, 2011) in 17 OECD

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countries covering the period 1978–2009. This new approach, following the narrative approach introduced by Romer and Romer (American Economic Review, 100 (3), 763–801, 2010), suggests that previous empirical literature has been contaminated by using the indicators for fiscal consolidation which may be subject to serious mismeasurement errors leading to a strong bias toward finding an expansionary effect of fiscal consolidation. Recognizing this as a serious obstacle, the present paper first provides a brief review on the problems in the previous literature and then applies the empirical investigation using the new database which successfully removes most of the problems in providing the representative indicators for fiscal consolidation. Using these new indicators, the paper next provides a thorough empirical investigation through the use of panel data analysis. The findings from this investigation provide novel empirical evidence concerning the effects of fiscal consolidation on labor market outcomes.

Keywords Fiscal consolidation • Labor market outcomes • Panel data

1 Introduction

Recent global economic crisis and the concerns about long-term sustainability of public finances have pushed a number of countries toward implementing fiscal consolidation measures. In this context, consolidation has once again started receiving a lot of attention in both theoretical and empirical literature with a large number of papers investigating its impact on different aspects of economy. Although fiscal consolidation has long been recognized as a hot issue, the literature does not offer a consensus on the impact of fiscal consolidation. Theoretical considerations offer a rationale for both contractionary and expansionary effect of fiscal consolidation on economic activity. Given this state of theoretical literature, it is no wonder that the empirical literature has provided evidence supporting both of these views. As a consequence, this amounts to quite a big problem for policy makers as they are on one side pushed toward fiscal consolidation, while on the other side, they lack a clear idea what these measures might be bringing about across the economy. Given that one of the main goals of economic policy is labor market outcomes, the current paper sheds additional light on this very important issue. It investigates the effects of fiscal consolidation on labor markets that has received relatively little attention (IMF 2014). More precisely, it investigates the effects on a set of specific labor market outcomes: employment, unemployment, and activity rate. Additional contribution of this paper relates to the usage of the relatively new database on fiscal consolidations (Devries et al. 2011) in 17 OECD countries covering the period 1978–2009. This new approach, following the narrative approach introduced by Romer and Romer (2010), suggests that previous empirical literature has been contaminated by using the indicators for fiscal consolidation which may be subject to serious mismeasurement errors leading to a strong bias toward finding an expansionary effect of fiscal consolidation.

Recognizing this as a serious obstacle, the present paper first provides a brief literature review and then applies the empirical investigation using the new database. The findings from this investigation provide novel empirical evidence concerning the effects of fiscal consolidation on labor market outcomes.

The paper is structured as follows: Sect. 2 provides the literature review and in doing so identifies the gaps/problems in previous literature on the topic of the effects of fiscal consolidations. Section 3 explains the modeling strategy and presents the most important findings from the empirical investigation. Section 4 concludes.

2 Theoretical Background and Literature Review

In theory, there are two main channels regarding fiscal consolidation effects on macroeconomic variables: the wealth effect and the confidence (trust) effect. The most important studies that have investigated these effects of fiscal consolidation are the following: Alesina and Ardagna (1998, 2012), Barrios et al. (2010), and Guajardo et al. (2011). The results of empirical studies that examine the effects of fiscal consolidation differ considerably. Exploring the period of fiscal consolidation in all OECD countries in the period from 1960 to 1994, Alesina and Ardagna (1998) concluded that the decrease in public expenditures is more effective for economic growth than tax increases. The same authors obtained similar results using a sample with an extended period of time (Alesina and Ardagna 2012). On the other hand, Guajardo et al. (2011) found evidence according to which fiscal consolidation results in contraction of economic activity. The IMF (2010) also points out that consolidation results in negative economic growth in the short-term but possible expansion in the long-term. Based on the estimated economic models, Barrios et al. (2010) have revealed the determinants of successful consolidations, considering the role of various preconditions: the impact of the financial crisis, the level of public debt and budget deficit, the adjustment of the exchange rate, effect on economic growth, and others. When it comes to the initial economic conditions for the implementation of the fiscal consolidation, the survey results also differ. While one group of authors argues that the fiscal adjustment is more successful if carried out during or immediately after periods of recession (Drazen and Grilli 1993), others believe that a period of expansion is the right time to consolidate (Von Hagen and Strauch 2001).

However, there is an important lack of studies dealing with the impact of fiscal consolidation on labor market. Several papers (Farmer 2009; Romer 2012) dealing with this issue are based on the impact of fiscal policy on labor market. The papers closely related to ours are Turrini (2013) and Bova et al. (2015). Turrini (2013) estimates the impact of fiscal consolidation on unemployment and job market flows across EU countries. His results show that the impact of fiscal adjustment on cyclical unemployment is temporary and significant mostly for expenditure measures. Bova et al. (2015) examine the role of fiscal policies in the dynamics of the

labor market. Through the lenses of the Okun's law, they try to estimate how fiscal policy instruments affect labor market outcomes, primarily employment. Using a panel of 34 OECD countries over the period 1985–2013, they find that fiscal consolidation has a sizeable, positive, and robust impact on the Okun's coefficient. Besides them, Dell'Erba et al. (2014) also examine the consequences of fiscal adjustments in times of persistently low growth and high unemployment. They find that cumulative fiscal multipliers related to output and employment at 5-year horizons are significantly above one during recession episodes.

Earlier presented papers (except Turrini 2013) identify periods of fiscal consolidation on the basis of changes in the cyclically adjusted primary balance. As mentioned in Introduction, this may be problematic, and one of the contributions of the present paper is that we focus on episodes of fiscal consolidations identified through the narrative approach introduced by Romer and Romer (2010). The literature review presented in this section suggests a lack of consensus on the impact of fiscal consolidation on economic activity. This may come as a surprise given the length of the continued research in economic science on this topic, as well as different approaches by many authors that have dealt with fiscal consolidations. In this context, one natural suspect comes to mind as to why this is so. How do you identify and measure fiscal consolidation? This becomes a crucial question in empirical investigation of fiscal consolidation and its effects. A usual approach in the literature (e.g., Giavazzi and Pagano 1990 or Alesina 2010) to identify fiscal consolidation has been to use the budget outcomes (primary balance) in the form of the cyclically adjusted primary balance. As argued by Ball et al. (2013), the cyclical adjustment is needed because tax revenue and government spending move automatically with the business cycle. Unfortunately, it may be shown that previous empirical literature has been contaminated by using these indicators for fiscal consolidation which may be subject to serious mismeasurement errors leading to a strong bias toward finding an expansionary effect of fiscal consolidation. Ball et al. (2013) argue that cyclical adjustment does not fix the problem as cyclical adjustment suffers from measurements errors. More specifically, it fails to remove swings in government tax revenue associated with asset price or commodity price movements from the fiscal data, resulting in the changes in cyclically adjusted primary balances that are not necessarily linked to actual policy changes. An additional problem is that this ignores the motivation behind fiscal measures. The recent narrative approach, introduced by Romer and Romer (2010), seems to provide a solution to the problems identified above. It requires the researchers to look directly at policy actions, where the researchers examine the accounts and records of what the countries actually did (IMF 2010). Although this may seem as a very complicated and tiresome task, it was exactly what Devries et al. (2011) did and obtained the new database which successfully removes most of the problems in providing the representative indicators for fiscal consolidation. This database includes 17 OECD countries covering the period 1978–2009, and it will be used in the empirical investigation in the present paper.

The above review points toward a lack of consensus concerning the impact of fiscal consolidation, allowing for both positive and negative effects on economic

activity. Without an ambition of resolving this conflict of theoretical points of views and the related empirical findings, the present paper attempts to add a modest contribution to the debate through an empirical investigation of the effects of fiscal consolidation on the variables that appear to be under-investigated. To this end, the next section focuses on the empirical investigation, particularly accounting for the effects of fiscal consolidation on the labor market outcomes, unemployment, employment, and activity rate.

3 Data and Empirical Investigation

As suggested above, this paper uses the new database on fiscal consolidation provided by Devries et al. (2011). This database has got the advantage of successfully avoiding the problems that contaminated much of the previous empirical literature. The newly obtained data by Devries et al. (2011) reports the data on fiscal consolidations in the OECD countries. The sample of our countries thus includes the following countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, Portugal, Spain, Sweden, the United Kingdom, and the United States. The data on fiscal consolidations as provided by Devries et al. (2011) is reported in Appendix. A brief look at the data indicates a rich database providing the identified fiscal consolidations by country and by the year it was taking place amounting to an overall number of 173 fiscal consolidations. In consequence, this allows then a serious econometric investigation in the form of panel data analysis. Another careful look at the data reveals another advantage for our investigation as the data on fiscal consolidations are categorized in three categories: total, tax, and spending. This allows us to test all three aspects of fiscal consolidations and in particular to investigate the differences between the tax- and spending-based fiscal consolidations and their effects on economic activity.

Section 2 has through a literature review identified several gaps in previous empirical literature. One of those is of particular relevance for the present paper. Namely, most of the studies investigate the effects of fiscal consolidation by focusing on economic growth, sometimes in pair with unemployment, but the effects on broader labor market outcomes appear to be under-investigated. It is exactly here where the present paper attempts to fill in a gap, and it does it in way that in addition to the effects of fiscal consolidation on unemployment, it also investigates the effects on employment and activity rate. Focusing further on labor market outcomes, we in particular investigate the effects of fiscal consolidation on employment but this time testing it across different age groups, and this is an aspect which has not been analyzed in previous literature. In order to test the abovementioned links, we collected the data from different sources (OECD database and AMECO database). The full dataset used in our empirical investigation is available upon request.

Our empirical strategy rests upon the model used by Turrini (2013) who investigated the impact of fiscal consolidation on unemployment on the sample of 13 EU countries. Thus, following Turrini (2013), we specify the following model:

$$u_{i,t} = \alpha u_{i,t-1} + \beta u_{i,t-2} + \gamma FC_{i,t} + \theta_i + \eta_t + \varepsilon_{i,t}$$

where i denotes country, t year, $u_{i,t}$ denotes unemployment, $FC_{i,t}$ is a fiscal consolidation variable as identified by Devries et al. (2011), θ_i and η_t are country and year fixed effects, and $\varepsilon_{i,t}$ is a standard white-noise error.

In order to avoid repetition, when testing the effects of fiscal consolidation on variables other than unemployment, the model is modified to include employment and activity rate replacing the unemployment variable.

After presenting the data and the model to be estimated, we next present the main findings from our empirical investigation. The models are estimated econometrically using the panel data estimation, in particular the dynamic panels based on the Arellano–Bond dynamic estimator. The reason for using the dynamic version is due to the expected strong persistence in our dependent variables, and this is a usual approach in the empirical literature of this sort. Admittedly, given the nature of our investigation and many different models to be estimated, presentation of our results may become a complicated and difficult task. In order to keep the things as simple as possible, we report our main findings in six tables, with each table comprising of a number of columns corresponding to different models tested and different fiscal consolidation indicators used. At the bottom of each column reporting the model and estimated coefficients, we report the number of observations and diagnostics related to the model tested.

Table 1 presents the estimated effects of fiscal consolidation on unemployment in OECD countries. To allow easy tractability of the evidence presented, in this but also in later tables, let us first explain what is presented in column 1 (titled Option 1) in Table 1. In that option, the Arellano–Bond dynamic panel estimator is used to estimate the impact of fiscal consolidation on unemployment. As we are particularly interested in this relationship, we will refrain from commenting on the other estimated coefficients in this column. Thus, we can see that fiscal consolidation exerts a statistically significant (at 1% level of significance) and positive impact on unemployment. The diagnostic tests (Sargan test and Arellano–Bond test for autocorrelation), reported in rows at the bottom of Table 1, suggest that the estimated models are well specified. The same model is estimated in Option 3 and 5, but instead of the fiscal consolidation variable including both the tax and spending aspect together, in Option 3 we tested only the tax aspect (fiscal consolidation on the revenue side), and in Option 5, we tested only the spending aspect (fiscal consolidation on the cost side). Concerning the tax aspect of consolidation, the effect is positive but statistically insignificant, while the spending aspect results in a significant coefficient suggesting that fiscal consolidation increases unemployment. A similar exercise is repeated in Options 2, 4, and 6, with a modification to the underlying models in the form of adding also a lag of fiscal consolidation to the specification. The results (Option 2) suggest that both the current and lagged fiscal

Table 1 Effects of fiscal consolidation on unemployment (Arellano–Bond dynamic estimator)

Dependent variable unemployment						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	5.791932*** (0.8923713)	5.994694*** (1.859413)	5.607295*** (0.8740674)	3.849789 (3.915829)	7.125029*** (0.478839)	11.46042*** (2.644995)
Dependent V ($t-1$)	1.003827*** (0.1025896)	0.5739935*** (0.1318721)	1.029934*** (0.0505612)	0.7296456*** (0.279322)	0.8351207*** (0.0554164)	0.6558817*** (0.2055181)
Dependent V ($t-2$)	−0.421165*** (0.0394213)		−0.431436*** (0.0405102)		−0.3479888*** (0.0251514)	−0.4695329*** (0.1083004)
Fiscal consolidation	0.0294341*** (0.0037329)	0.0474889*** (0.0083123)	0.0039595 (0.0032131)	0.0082768 (0.0120139)	0.032991*** (0.0038865)	0.050016 (0.0483149)
Fiscal consolidation ($t-1$)		0.0506645*** (0.0059216)		0.0695314*** (0.0251587)		0.0454608*** (0.0182207)
Number of observations	84	57	60	34	70	45
Sargan test[a] (p-value)	0.8465	0.9775	0.8777	0.9691	0.8597	0.7645
m2 test[b] (p-value)	0.4321	0.7028	0.3477	0.2181	0.2817	0.7233

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

consolidations (total) increase unemployment with the estimated coefficient being positive and statistically significant and with the impact on unemployment being stronger as compared to the case where only the current fiscal consolidation was included in the model. In Option 4 (lagged fiscal consolidation added), the current fiscal consolidation is still insignificant, but the coefficient on the lagged variable seems to suggest that now even the tax-based FC may be increasing unemployment but with a lag. A similar result can be observed with the spending-based FC. A look at the diagnostics across different models indicates that all of the models are well specified.

We next present the estimated effects of fiscal consolidation on employment.

Table 2 reports the estimated effects of fiscal consolidation on employment. Again different models were tested, as well as different consolidation indicators (total, tax, and spend), resulting in six options (columns). The results in Option 1 suggest that fiscal consolidation (total) exerts a negative and statistically significant effect on employment. We can also observe a negative effect of fiscal consolidation when using the tax-based FC indicator (Option 3), as well as when using the spending-based FC indicator (Option 5), but note that only the latter is statistically significant. Options 2, 4, and 6 (all of which allow the inclusion of the lagged fiscal consolidation in the model) follow a similar pattern as before concerning the negative impact of fiscal consolidation on employment, with an addition that in the case of tax-based fiscal consolidation, the lagged variable now turns statistically significant (Option 4). The diagnostics at the bottom of Table 2 suggest that all the models are well specified. Overall, based on the results in Table 2, it can be concluded that fiscal consolidation decreases employment. The effect on employment will be further tested across different age groups in Tables 4, 5, and 6, but let us first check the effects of FC on the activity rate in Table 3.

As for the impact of fiscal consolidation on the activity rate, the evidence in Table 3 may be summarized as indicating a negative and statistically significant impact of fiscal consolidation. The estimated effects of lagged FC are statistically insignificant with an exception of the spending-based FC (Option 6) which is surprisingly found to be positive.

In Table 2, we established a negative impact of fiscal consolidation on employment, or to be more precise, the effect was found to be significant in cases where we used the FC indicator including both the tax and spending aspects of fiscal consolidation (total), as well as the FC-based on spending. The tax-based FC was found to have a significant effect only in the case of a lagged FC indicator. Given these findings, we next set to investigate the effects of fiscal consolidation on employment, but this time, we test the effects on employment across three different age groups: 15–24, 25–54, and 55–64. In this way, we want to check whether the impact of fiscal consolidation may be different over these groups. Thus, Table 4 reports the estimated effects of fiscal consolidation on employment (age group 15–24), while Tables 5 and 6 report the effects on employment in age groups 25–54 and 55–64, respectively.

The results in Table 4 indicate that fiscal consolidation (total) exerts a significant negative impact on employment in the age group 15–24. The same appears to be the

Table 2 Effects of fiscal consolidation on employment (Arellano–Bond dynamic estimator)

Dependent variable employment						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	5.205126*** (0.7178731)	6.707366*** (0.9155334)	3.667859*** (0.8772788)	4.740696** (2.009844)	6.784409*** (0.2017053)	6.752147*** (1.668751)
Dependent V ($t-1$)	1.194301*** (0.0351341)	1.082695*** (0.0685778)	1.033363*** (0.0923081)	0.9352273*** (0.1009191)	1.203119*** (0.0253038)	0.8528598*** (0.1796153)
Dependent V ($t-2$)	−0.5136437*** (0.0489292)	−0.4933395*** (0.0550972)	−0.257557*** (0.0984591)	−0.2238606 (0.1418898)	−0.6202656*** (0.0324979)	−0.2694261 (0.226159)
Fiscal consolidation	−0.0051981*** (0.0009972)	−0.0072419*** (0.0013288)	−0.0018032 (0.0011626)	−0.0030992 (0.002042)	−0.0024775** (0.0010032)	−0.0046867** (0.0023313)
Fiscal consolidation ($t-1$)		−0.0018471 (0.0024677)		−0.0061782*** (0.002146)		−0.0032093*** (0.0037335)
Number of observations	84	57	60	34	70	45
Sargan test[a] (p-value)	0.8581	0.9963	0.8617	0.9975	0.7655	0.9791
m2 test[b] (p-value)	0.2712	0.4846	0.3370	0.5699	0.4410	0.3591

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

Table 3 Effects of fiscal consolidation on activity rate (Arellano–Bond dynamic estimator)

Dependent variable activity rate						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	2.190789*** (0.2865957)	3.296054*** (0.6778555)	2.203683*** (0.7110117)	0.5547892 (1.627043)	2.145212*** (0.2143885)	2.90743*** (0.6069668)
Dependent V ($t-1$)	0.8675033*** (0.0711558)	0.5857864*** (0.1691412)	0.6560753*** (0.2245697)	0.3996939* (0.244811)	0.9043244*** (0.078878)	0.5934345*** (0.1802293)
Dependent V ($t-2$)	−0.3983545*** (0.067851)	−0.3850361*** (0.0625159)	−0.1872354 (0.2816125)	0.467543 (0.5717907)	−0.4229258*** (0.0620966)	−0.2981163*** (0.0663358)
Fiscal consolidation	−0.0010498* (0.0005729)	−0.0028799** (0.0014398)	−0.0008466** (0.0004154)	0.000911 (0.0012578)	−0.0009474** (0.0004464)	−0.0046275** (0.0023284)
Fiscal consolidation ($t-2$)		−0.0001456 (0.0007855)		0.000448 (0.000526)		0.003429** (0.003429)
Number of observations	84	57	60	34	70	45
Sargan test[a] (p-value)	1.0000	1.0000	1.0000	0.9627	0.7976	0.9999
m2 test[b] (p-value)	0.0562	0.1324	0.6674	0.0597	0.0678	0.3927

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

Table 4 Effects of fiscal consolidation on employment 15–24 (Arellano–Bond dynamic estimator)

Dependent variable employment 15–24						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	1.544737*** (0.0787395)	3.252319*** (0.3391369)	1.921832*** (0.0292444)	4.312538*** (0.7140215)	1.59823*** (0.1110235)	3.631713*** (0.3265688)
Dependent V ($t-1$)	0.8599381*** (0.0300821)	0.3296272*** (0.1195112)	0.5718963*** (0.0176842)	0.2022859 (0.1739482)	0.9941935*** (0.1427493)	−0.0336992 (0.2546313)
Dependent V ($t-2$)	−0.2707237*** (0.0403896)	−0.1935742*** (0.0614362)	−0.079499*** (0.0197666)	−0.335986*** (0.0727312)	−0.4198863*** (0.1148805)	0.0587852 (0.1760611)
Fiscal consolidation	−0.0025965*** (0.0003444)	−0.0062577*** (0.0022552)	0.0010031*** (0.0000869)	0.00343 (0.0040179)	0.0014207 (0.0030082)	−0.0232088* (0.012487)
Fiscal consolidation ($t-1$)		−0.0096793*** (0.0013882)		−0.0060075* (0.0035509)		−0.0156319** (0.0069727)
Number of observations	82	57	58	34	66	42
Sargan test[a] (p-value)	0.8817	0.9896	0.8843	0.9940	0.7760	0.8510
m2 test[b] (p-value)	0.7750	0.4154	0.4724	0.4678	0.9751	0.3952

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

Table 5 Effects of fiscal consolidation on employment 25–54 (Arellano–Bond dynamic estimator)

Dependent variable employment 25–54						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	1.595123*** (0.1791257)	2.545103*** (0.4841269)	−0.0627576 (0.549951)	3.136475* (1.76266)	2.236618*** (0.0344661)	3.582083*** (0.6441161)
Dependent V ($t-1$)	0.9584046*** (0.0484792)	0.7894828*** (0.1339726)	1.016582*** (0.1048056)	0.6563632* (0.3964535)	0.9244183*** (0.036956)	0.5605743*** (0.1736503)
Dependent V ($t-2$)	−0.3288359*** (0.0694883)	−0.3786964*** (0.0628469)	−0.0011784 (0.0902332)	−0.3842671 (0.4010255)	−0.4431429*** (0.0366196)	−0.3892392*** (0.0537845)
Fiscal consolidation	−0.0010823 (0.0012152)	0.002077 (0.0036814)	0.0011326 (0.0004142)	−0.0005729 (0.0034373)	−0.0018732** (0.0008057)	−0.0049442 (0.0053319)
Fiscal consolidation ($t-1$)		0.0013006 (0.0014202)		−0.0018415 (0.0044663)		−0.0039359* (0.0021168)
Number of observations	82	57	58	34	66	42
Sargan test[a] (p-value)	0.9284	0.9929	0.9835	0.9796	0.6983	0.9354
m2 test[b] (p-value)	0.3129	0.8202	0.4730	0.8403	0.7811	0.2789

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

Table 6 Effects of fiscal consolidation on employment 55–64 (Arellano–Bond dynamic estimator)

Dependent variable employment 55–64						
Explanatory variables	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
	Total	Total	Tax	Tax	Spend	Spend
Constant	1.125599*** (0.1220568)	2.622206*** (0.7264626)	−0.4256588 (0.3710614)	0.8968122 (0.8976832)	1.918245*** (0.0711759)	3.723808*** (0.7734369)
Dependent V ($t-1$)	1.206743*** (0.0289089)	0.697447*** (0.1599674)	0.819489*** (0.1181091)	0.1983807 (0.1938711)	0.984529*** (0.1158917)	0.4720795** (0.2063673)
Dependent V ($t-2$)	−0.5124704*** (0.0465313)	−0.4016553*** (0.118879)	0.2930916*** (0.0427155)	0.562798*** (0.1486746)	−0.5036243*** (0.0977799)	−0.4765849*** (0.0712689)
Fiscal consolidation	−0.0103787* (0.0064182)	−0.0065273** (0.0034069)	−0.0005359 (0.0005237)	0.0011972 (0.0018403)	−0.0037944*** (0.0005089)	−0.0100593 (0.0095827)
Fiscal consolidation ($t-1$)		−0.0014482 (0.0037357)		0.0006373 (0.002855)		−0.0078652* (0.0041981)
Number of observations	82	57	58	34	66	42
Sargan test[a] (p-value)	0.9002	0.9263	0.9195	0.9559	0.6812	0.8220
m2 test[b] (p-value)	0.5706	0.1464	0.8823	0.5185	0.2033	0.0560

Source: Calculation by authors

*, **, ***Significant at the level of 10%, 5%, and 1%; standard errors are reported in parentheses

[a]Sargan test of overidentifying restrictions (validity of instruments)

[b]Arellano–Bond test for zero autocorrelation in first-differenced errors

case with spending-based FC but only in the model where the lagged FC indicator is added. A surprising effect is found for the tax-based FC (Option 3) which is positive and highly significant, suggesting that in this age group fiscal consolidation may be increasing employment. Note, however, this finding is not confirmed when a lagged FC indicator is added to the model (Option 4) and where the current FC indicator loses significance and the lagged one is negative but significant at only 10%.

The results in Table 5 suggest a very weak impact of fiscal consolidation on employment in the age group 25–54. The estimated effects are mainly statistically insignificant, and only spending-based FC is found to have some effect on employment in this age group.

The estimated effects for the age group 55–64 in Table 6 again suggest no impact of tax-based FC on employment in this age group, while the FC indicator accounting for both tax and spending aspect exerts a negative impact (at 10% and 5% level of significance). The statistically most significant effect (1%) is found for spending-based FC (Option 5), and it is negative but loses significance when a lagged FC indicator is added to the model.

Overall, the investigation of fiscal consolidation on employment across different age groups seems to suggest that the effects may be different across these groups. While the detailed discussion why this is so is out of the scope of the present study, the evidence presented here provides an important avenue for future research, and these effects should be further empirically tested, and also a theoretical elaboration should be looked for.

4 Conclusion

This paper investigated the effects of fiscal consolidation on labor market outcomes. While the topic of the effects of fiscal consolidation has been extensively explored, the focus on its effects on the labor market outcomes has been rare in previous literature. The paper thus contributes to the empirical literature by investigating this important issue on the sample of 17 OECD economies covering the period 1978–2009. After explaining as to why the previous empirical literature has been contaminated by using inappropriate fiscal consolidation indicators, we conduct our empirical investigation using the recently provided database on fiscal consolidation by Devries et al. (2011). A particular advantage of application of this database is to do with the classification of FC indicators into three categories: FC accounting for both the tax and spending aspects (total), the tax-based FC (tax), and spending-based FC (spend).

Our empirical investigation provides novel evidence by testing the impact of FC on unemployment, employment, and activity rate. The findings suggest that fiscal consolidation increases unemployment in OECD countries, while the effects on employment and activity rate appear to be negative. Our analysis also suggests that the spending-based FC is more effective than the tax-based FC. These findings also have important policy implications for fiscal authorities. An additional contribution

of the paper is the investigation of the impact of FC on employment across three different age groups: 15–24, 25–54, and 55–64. It is interesting to note that FC exerts significant effects only in the 15–24 and 55–64 age groups which are mainly negative. We can also notice that the tax-based FC consolidations are rarely found to have a significant effect. While the findings from this exercise may be taken as preliminary and with caution, they provide an important avenue for future research.

Appendix: Deficit-Driven Fiscal Consolidation (Percent of GDP)

Country	Year	Total	Tax	Spend	Country	Year	Total	Tax	Spend
AUS	1985	0.45	0.00	0.45	DEU	1984	0.18	−0.41	0.59
AUS	1986	1.02	0.17	0.85	DEU	1991	1.11	1.08	0.03
AUS	1987	0.90	0.19	0.71	DEU	1992	0.46	0.27	0.19
AUS	1988	0.10	−0.27	0.37	DEU	1993	0.11	−0.07	0.18
AUS	1994	0.25	0.25	0.00	DEU	1994	0.91	0.08	0.83
AUS	1995	0.50	0.50	0.00	DEU	1995	1.08	0.84	0.24
AUS	1996	0.62	0.34	0.28	DEU	1997	1.60	0.50	1.10
AUS	1997	0.70	0.18	0.53	DEU	1998	−0.10	0.00	−0.10
AUS	1998	0.37	0.05	0.32	DEU	1999	0.30	0.30	0.00
AUS	1999	0.04	−0.04	0.07	DEU	2000	0.70	−0.05	0.75
AUT	1980	0.80	0.11	0.69	DEU	2003	0.74	0.74	0.00
AUT	1981	1.56	0.50	1.06	DEU	2004	0.40	−0.70	1.10
AUT	1984	2.04	1.30	0.74	DEU	2006	0.50	0.00	0.50
AUT	1996	2.41	0.88	1.53	DEU	2007	0.90	0.50	0.40
AUT	1997	1.56	0.44	1.12	DNK	1983	2.77	0.92	1.85
AUT	2001	1.02	0.90	0.12	DNK	1984	2.38	0.67	1.71
AUT	2002	0.55	0.00	0.55	DNK	1985	1.54	0.77	0.77
BEL	1982	1.66	0.00	1.66	DNK	1986	−0.72	−0.72	0.00
BEL	1983	1.79	0.69	1.10	DNK	1995	0.30	0.30	0.00
BEL	1984	0.69	0.28	0.41	ESP	1983	1.90	1.90	0.00
BEL	1985	1.61	0.73	0.88	ESP	1984	1.12	0.37	0.75
BEL	1987	2.80	0.00	2.80	ESP	1989	1.22	0.98	0.24
BEL	1990	0.60	0.40	0.20	ESP	1990	−0.40	−0.25	−0.15
BEL	1992	1.79	0.99	0.80	ESP	1992	0.70	0.30	0.40
BEL	1993	0.92	0.43	0.49	ESP	1993	1.10	0.80	0.30
BEL	1994	1.15	0.55	0.60	ESP	1994	1.60	0.00	1.60
BEL	1996	1.00	0.50	0.50	ESP	1995	0.74	0.00	0.74
BEL	1997	0.91	0.41	0.50	ESP	1996	1.30	0.20	1.10
CAN	1984	0.27	0.27	0.00	ESP	1997	1.20	0.10	1.10
CAN	1985	1.03	0.53	0.50	FIN	1992	0.91	0.00	0.91
CAN	1986	0.99	0.84	0.15	FIN	1993	3.71	0.00	3.71

(continued)

Country	Year	Total	Tax	Spend	Country	Year	Total	Tax	Spend
CAN	1987	0.28	0.14	0.14	FIN	1994	3.46	0.69	2.77
CAN	1988	0.30	0.33	−0.03	FIN	1995	1.65	−0.63	2.28
CAN	1989	0.31	0.24	0.08	FIN	1996	1.47	0.00	1.47
CAN	1990	0.86	0.57	0.29	FIN	1997	0.23	−0.70	0.93
CAN	1991	0.40	0.13	0.27	FRA	1979	0.85	0.85	0.00
CAN	1992	0.21	−0.01	0.22	FRA	1987	0.26	−0.50	0.76
CAN	1993	0.35	−0.01	0.36	FRA	1989	−0.20	−0.20	0.00
CAN	1994	0.49	0.04	0.45	FRA	1991	0.25	0.00	0.25
CAN	1995	0.99	0.18	0.81	FRA	1992	−0.10	0.00	−0.10
CAN	1996	0.97	0.09	0.88	FRA	1995	0.28	0.43	−0.15
CAN	1997	0.47	0.01	0.47	FRA	1996	1.33	0.86	0.47
DEU	1982	1.18	0.56	0.62	FRA	1997	0.50	0.41	0.09
DEU	1983	0.87	0.30	0.57	FRA	1999	−0.10	−0.10	0.00
FRA	2000	−0.20	−0.20	0.00	NLD	1982	1.71	0.00	1.71
GBR	1979	0.27	−0.45	0.72	NLD	1983	3.24	0.49	2.75
GBR	1980	0.08	−0.13	0.21	NLD	1984	1.76	0.00	1.76
GBR	1981	1.58	1.43	0.16	NLD	1985	1.24	0.00	1.24
GBR	1982	0.53	0.48	0.05	NLD	1986	1.74	0.00	1.74
GBR	1994	0.83	0.68	0.15	NLD	1987	1.48	1.48	0.00
GBR	1995	0.28	0.23	0.05	NLD	1988	0.06	−0.69	0.75
GBR	1996	0.30	0.00	0.30	NLD	1991	0.87	0.87	0.00
GBR	1997	0.69	0.53	0.16	NLD	1992	0.74	−0.58	1.32
GBR	1998	0.31	0.30	0.01	NLD	1993	0.12	−0.16	0.28
GBR	1999	0.21	0.21	0.01	NLD	2004	1.70	0.40	1.30
IRL	1982	2.80	2.54	0.26	NLD	2005	0.50	0.20	0.30
IRL	1983	2.50	2.44	0.06	PRT	1983	2.30	1.35	0.95
IRL	1984	0.29	0.29	0.00	PRT	2000	0.50	0.00	0.50
IRL	1985	0.12	0.12	0.00	PRT	2002	1.60	1.20	0.40
IRL	1986	0.74	0.74	0.00	PRT	2003	−0.75	−0.75	0.00
IRL	1987	1.65	0.53	1.12	PRT	2005	0.60	0.52	0.08
IRL	1988	1.95	0.00	1.95	PRT	2006	1.65	1.10	0.55
IRL	2009	4.74	2.35	2.39	PRT	2007	1.40	0.50	0.90
ITA	1991	2.77	1.69	1.08	SWE	1984	0.90	0.21	0.69
ITA	1992	3.50	1.60	1.90	SWE	1993	1.81	0.42	1.39
ITA	1993	4.49	2.00	2.49	SWE	1994	0.78	0.19	0.59
ITA	1994	1.43	−0.27	1.70	SWE	1995	3.50	1.40	2.10
ITA	1995	4.20	2.41	1.79	SWE	1996	2.00	0.80	1.20
ITA	1996	0.34	−0.74	1.08	SWE	1997	1.50	0.60	0.90
ITA	1997	1.82	0.89	0.93	SWE	1998	1.00	0.40	0.60
ITA	1998	0.68	0.01	0.67	USA	1978	0.14	0.14	0.00
ITA	2004	1.30	0.67	0.63	USA	1980	0.06	0.06	0.00
ITA	2005	1.00	0.40	0.60	USA	1981	0.23	0.23	0.00
ITA	2006	1.39	0.50	0.89	USA	1985	0.21	0.21	0.00

(continued)

Country	Year	Total	Tax	Spend	Country	Year	Total	Tax	Spend
ITA	2007	1.03	1.32	−0.29	USA	1986	0.10	0.10	0.00
JPN	1979	0.12	0.12	0.00	USA	1988	0.85	0.39	0.46
JPN	1980	0.21	0.21	0.00	USA	1990	0.33	0.26	0.07
JPN	1981	0.43	0.43	0.00	USA	1991	0.58	0.29	0.29
JPN	1982	0.71	0.31	0.40	USA	1992	0.52	0.24	0.28
JPN	1983	0.42	0.06	0.37	USA	1993	0.32	0.08	0.23
JPN	1997	1.43	0.98	0.45	USA	1994	0.90	0.40	0.50
JPN	1998	0.48	0.33	0.15	USA	1995	0.53	0.20	0.33
JPN	2003	0.48	0.00	0.48	USA	1996	0.29	0.08	0.22
JPN	2004	0.64	0.19	0.45	USA	1997	0.30	0.06	0.24
JPN	2005	0.28	0.06	0.22	USA	1998	0.15	0.00	0.15
JPN	2006	0.72	0.45	0.27					
JPN	2007	0.15	0.15	0.00					
NLD	1981	1.75	0.53	1.22					

Source: Devries et al. (2011, pp. 86–87)

Note: Table records budgetary impact of fiscal consolidation measures. Positive values indicate budgetary savings, negative values indicate budgetary costs. See text for details. *AUS* Australia, *AUT* Austria, *BEL* Belgium, *CAN* Canada, *DEU* Germany, *DNK* Denmark, *ESP* Spain, *FIN* Finland, *FRA* France, *GBR* United Kingdom, *IRL* Ireland, *ITA* Italy, *JPN* Japan, *NLD* Netherlands, *PRT* Portugal, *SWE* Sweden, *USA* United States

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