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The Distributional Effects of Fiscal Consolidation

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Research Department

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Abstract

This paper examines the distributional effects of fiscal consolidation. Using episodes of fiscal consolidation for a sample of 17 OECD countries over the period 1978–2009, we find that fiscal consolidation has typically had significant distributional effects by raising inequality, decreasing wage income shares and increasing long-term unemployment. The evidence also suggests that spending-based adjustments have had, on average, larger distributional effects than tax-based adjustments.

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I. INTRODUCTION

The Great Recession of 2007-09 has led to a significant increase in public debt, in large part due to the collapse in tax revenues as incomes fell. Other contributors to the debt build-up were the costs of financial bailouts of banks and companies, and the fiscal stimulus provided by many countries to stave off a Great Depression. As a consequence, in advanced economies public debt has increased on average from 70 percent of GDP in 2007 to about 100 percent of GDP in 2011—its highest level in 50 years (IMF Fiscal Monitor, 2012). In the absence of significant consolidation measures, debt-to-GDP ratios in many advanced economies are likely to remain high over the medium term.[2]

Against this backdrop, many governments have been undertaking policies to reduce debt through a combination of spending and tax-based consolidation measures (IMF 2012). When British Prime Minister David Cameron announced his government's deficit reduction plans he said "Those who argue that dealing with our deficit and promoting growth are somehow alternatives are wrong. You cannot put off the first in order to promote the second." The challenge facing the United Kingdom and many advanced economies is how to bring debt down to safer levels in the face of a weak recovery. Will deficit reduction lead to stronger growth and job creation in the short run? What will be the distributional consequences?

While the effects of fiscal consolidation on output and unemployment have been extensively investigated in the literature[3], only a few studies have looked at their distributional effects. These studies suggest that fiscal consolidation measures are typically associated with an increase in poverty (Smeeding, 2000) and an increase in income inequality (Mulas-Granados, 2005;[4] Agnello and Sousa, 2012; Bova and others, 2013).

The aim of this paper is contribute to the literature on this topic and assess the short- and medium-term distributional effects of fiscal consolidation. Using episodes of fiscal consolidation for a sample of 17 OECD countries over the period 1978–2009, we find that fiscal adjustments have typically had significant distributional effects. In particular, we find that fiscal consolidation episodes have: (i) increased inequality by 0.1 percentage point

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[2] Financial crises are not only typically associated with sharp economic downturns but also with a substantial deterioration of fiscal positions (Reinhart and Rogoff, 2009). Declining revenues due to weaker economic conditions, higher expenditures associated with bailout costs and demand stimuli have historically led to a rapid deterioration of fiscal balances and a significant and long-lasting increase of public debt. In particular, looking at past historical episodes of severe financial crises, Furceri and Zdzienicka (2013) find that the debt-to-GDP ratio has typically increased by about 35 percentage points compared to pre-crisis trends, with the effect lasting for about 10 years.

[3] See, for example, Alesina and Perotti (1995, 1997), Alesina and Ardagna (2010), Broadbent and Daly (2010), and Guajardo et al. (2011).

[4] Mulas-Granados (2005) finds that while expenditure-based adjustments increase income inequality, revenue-based consolidations decrease it.

(about 0.4 percent) in the very short term, and by 0.9 percentage point (about 3.4 percent) over the medium term; (ii) led to a significant and long-lasting fall in the wage income share of about 0.8 percentage point of GDP; and (iii) raised long-term unemployment by about 0.5 percent over the medium term. Differentiating between spending versus taxes-based adjustments, the results suggest that spending-based programs have produced larger distributional effects.

The rest of the paper is organized as follows. The next section describes the data and presents some descriptive statistics. Section three presents the empirical methodology used to examine the effects of fiscal consolidation episodes on income inequality and on different types of income. Section four describes the results. Finally, section five concludes with the main findings and policy implications.

II. DATA

A. Inequality, Income Shares and Unemployment

The dependent variables used in our regressions are: (i) the Gini coefficient for disposable income taken from the Standardized World Income Inequality Database; (ii) the shares of wage and profit in GDP obtained from the OECD Analytical Database; and (iii) short (lasting less than six months) and long-term (lasting more than six months) unemployment rates taken from the OECD Analytical Database.[5]

B. Fiscal Consolidation Episodes

Fiscal consolidation episodes are taken from Devries et al. (2011) database. The database contains information on 173 episodes of fiscal consolidation for 17 OECD economies (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Spain, Sweden, the United Kingdom, and the United States) during 1978-2009. The magnitude of the fiscal consolidation episode ranges between 0.1 and about 5 percent of GDP, with an average of about 1 percent of GDP.

The measure of fiscal consolidation constructed by the authors is based on a narrative approach and focuses on *policy* actions—tax hikes and/or spending cuts—taken by governments with the intent of reducing the budget deficit. This approach differs from previous studies in the literature in which fiscal consolidation is measured by successful budget *outcomes* (e.g. Giavazzi and Pagano, 1990, and Alesina and Ardagna, 2010). Specifically, the cyclically adjusted primary balance (CAPB)—the primary balance adjusted for the estimated effects of business cycle fluctuations—is used as a measure of fiscal consolidation. The cyclical adjustment is needed because tax revenue and government

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[5] See Table A1 in the appendix for descriptive data statistics and sources

spending move automatically with the business cycle. The hope is that, after this cyclical adjustment, changes in fiscal variables reflect policymakers' decisions to change tax rates and spending levels. An increase in CAPB would therefore, in principle, reflect a deliberate policy decision to cut the deficit.

In practice, however, budget outcomes turn out to be an imperfect measure of policy intent. One problem is that the cyclical adjustment suffers from measurement errors. In particular, it fails to remove swings in government tax revenue associated with asset price or commodity price movements from the fiscal data, resulting in changes in CAPB that are not necessarily linked to actual policy changes. For example, in the case of Ireland in 2009, the collapse in stock and housing prices induced a sharp reduction in CAPB despite the implementation of tax hikes and spending cuts exceeding 4.5 percent of GDP.

Another problem is that the standard approach ignores the motivation behind fiscal actions. Thus, it includes years in which governments deliberately tightened policy to restrain excessive domestic demand. For example, in Finland in 2000, there was an asset price boom and rapid growth, and the government decided to cut spending to reduce the risk of economic overheating. If a fiscal tightening is a *response to* domestic demand pressures, it is not valid for estimating the short-term effects of fiscal policy on economic activity, even if it is associated with a sharp rise in the CAPB.

It turns out that these problems with the CAPB bias the analysis toward downplaying contractionary effects and overstating expansionary ones. It tends to select periods associated with favorable growth outcomes but during which no consolidation measures were actually taken. It also tends to omit cases of fiscal consolidation associated with unfavorable growth outcomes.

C. Inequality and Fiscal Consolidation

On average, episodes of fiscal adjustments are associated with a sizeable increase in income inequality. In particular, looking at the cumulative change in the Gini coefficient before and after the beginning of a consolidation episode (Figure 1), it emerges that fiscal consolidation episodes, on average, have been typically associated with an increase of the Gini of about 0.3 percentage point in the short term (two years after the occurrence of a consolidation episode) and of about 1.5 percentage points in the medium term (8 years after the occurrence of a consolidation episode). Similarly, fiscal consolidation episodes have been also associated with a declining wage share. In fact, looking at cumulative changes in the share of wage income in GDP before and after the occurrence of a consolidation episode (Figure 2), it seems that, even though on a declining trend, the wage income share has decreased more rapidly after the occurrence of a consolidation episode.

III. EMPIRICAL METHODOLOGY

In order to estimate the distributional impact of fiscal consolidation episodes over the short and medium term, the paper follows the method proposed by Jorda (2005) which consists of estimating impulse response functions (IRFs) directly from local projections. In detail, for each future period k the following equation has been estimated on annual data:

$$G_{i,t+k} - G_{i,t} = \alpha_i^k + Time_t^k + \sum_{j=1}^{l} \gamma_j^k \Delta G_{i,t-j} + \beta_k D_{i,t} + \varepsilon_{i,t}^k \tag{1}$$

with $k= 1,..8$. Where G represents our measure of inequality; $D_{i,t}$ is a dummy variable that takes the value equal to 1 for the starting date of a consolidation episode in country i at time t and 0 otherwise; α_i^k are country fixed effects; $Time_t^k$ is a time trend; and β_k measures the distributional impact of fiscal consolidation episodes for each future period k. Since fixed effects are included in the regression the dynamic impact of consolidation episodes should be interpreted as compared to a baseline country-specific trend. The number of lags (l) has been chosen to be equal two, even if the results are extremely robust to different numbers of lags included in the specification (see robustness checks presented in the next section). Equation (1) is estimated using the panel-corrected standard error (PCSE) estimator (Beck and Katz, 1995).

Impulse response functions (IRFs) are then obtained by plotting the estimated β_k for $k= 0,1,..8$, with confidence bands for the estimated IRFs being computed using the standard deviations associated with the estimated coefficients β_k. While the presence of a lagged dependent variable and country fixed effects may in principle bias the estimation of γ_j^k and β_k in small samples (Nickel, 1981), the length of the time dimension mitigates this concern.[6]

Reverse causality is addressed by estimating the distributional effect in the years that *follow* a fiscal consolidation episode In addition, robustness checks for endogeneity confirm the validity of our results.

An alternative way of estimating the dynamic impact of fiscal consolidation episodes is to estimate an ARDL equation of changes in inequality and consolidation episodes and to compute IRFs from the estimated coefficients.[7] However, the IRFs derived using this approach tend to be sensitive to the choice of the number of lags thus making the IRFs potentially unstable. In addition, the significance of long–lasting effects with ARDL models can be simply driven by the use of *one-type-of-shock* models (Cai and Den Haan, 2009). This is particularly true when the dependent variable is highly persistent, as in our analysis. In

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[6] The finite sample bias is in the order of 1/T, where T in our sample is 32.

[7] This approach was initially proposed by Romer and Romer (1989) and then recently applied by Cerra and Saxena (2008).

contrast, the approach used in this paper does not suffer from these problems because the coefficients associated with the lags of the change in the dependent variable enter only as control variables and are not used to derive the IRFs, and since the structure of the equation does not impose permanent effects. Finally, confidence bands associated with the estimated IRFs are easily computed using the standard deviations of the estimated coefficients β_k, and Montecarlo simulations are not required.

IV. RESULTS

A. Gini Coefficient for Disposable Income

The results obtained by estimating the impact of fiscal consolidation on the Gini coefficient for disposable income using Equation 1 are presented in Figure 3. The figure presents the estimated effect of fiscal adjustments and the associated confidence bands (dotted lines). Looking at the figure it can be noted that fiscal consolidation episodes have long-lasting effects on income inequality In particular, the estimates suggest that consolidation episodes (on average of about 1 percent of GDP) have increased the Gini index by about 0.1 percentage point (equivalent to about 0.4 percent) in the very short term[8]—1 year after the occurrence of the consolidation episode—and by about 0.9 percentage point (equivalent to 3.4 percent) in the medium term—8 years after the occurrence of the consolidation episode.[9]

To check the robustness of the results, Equation (1) is re-estimated by including time fixed effects to control for specific time shocks, such as those affecting world interest rates. The results for this specification remain statistically significant and broadly unchanged (Figure 4, Panel B).

As shown by Teulings and Zubanov (2010), a possible bias from estimating Equation (1) using country-fixed effects is that the error term of the equation may have a non-zero expected value, due to the interaction of fixed effects and country-specific arrival rates of consolidation episodes. This would lead to a bias of the estimates that is function of k. To address this issue and check the robustness of our results, Equation (1) has been re-estimated by excluding country fixed effects from the analysis. The results reported in Panel C of Figure 4, however, suggest that this bias is negligible (the difference in the point estimate is small and not statistically significant).

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[8] This result is in line with Agnello and Sousa (2012), who find that fiscal consolidations lead to a short-term increase in the Gini of about 0.3 percent.

[9] The results, not reported here, also suggest that the effect decreases 8 years after the occurrence of the consolidation episode, and becomes statistically insignificant by the 10th year. This result, however, has to be treated with caution given the large uncertainty surrounding the estimates over the long term.

Estimates of the impact of consolidation on inequality could be biased because of endogeneity, as unobserved factors influencing the dynamics of the Gini coefficient may also affect the probability of the occurrence of a consolidation episode. In particular, a significant deterioration in economic activity, which would affect unemployment and inequality, may determine an increase in the debt-to-GDP ratio via automatic stabilizers, and therefore increase the probability of consolidation. To address this issue, Equation (1) is augmented to control for: (i) contemporaneous and past crises episodes (banking and currency crises); (ii) change in economic activity (proxied by real GDP growth); and (iii) change in unemployment. The results of this exercise are reported in Panel D of Figure 4 and confirm the robustness of our results.

Finally, as an additional robustness check, Equation (1) has been re-estimated for different lags (*l*) of changes in the Gini coefficient. The results presented in Figure 5 confirm that the results are not sensitive to the choice of the number of lags. In particular, the medium-term effect ranges from 0.8 percentage point in the case of five lags to about 1 percentage point in the case of zero lags.

Spending versus taxes-based consolidation episodes

Does the composition of fiscal consolidation (spending versus taxes-based) matter for inequality? There is a broad consensus in the literature that taxes-based consolidations are typically more contractionary than spending-based consolidations, particularly over the medium term.[10] In particular, Guajardo el al. (2011) find that in the case of taxes-based programs the effect of a fiscal consolidation of one percent of GDP on output is -1.3 percent after two years, while in the case of spending-based programs is -0.3 percent after two years and not statistically significant. Similarly, their results also show that the effect of taxes-based consolidations on unemployment is about three times larger than spending-based consolidation and much more persistent. At the same time, however, most of the direct redistributive impact of fiscal policy in advanced economies has been achieved through the expenditure side of the budget—especially non-means-tested transfers (Bastagli et al. 2012). Therefore whether taxes-based or spending-based consolidations are more harmful for income inequality is not a priori clear.

To test for this hypothesis, Equation (1) is separately estimated for taxes and spending-based adjustments, by constructing starting date dummies of taxes and spending consolidation episodes.[11] The results presented in Figure 6 show that spending and tax-based programs have a similar effect over the short term and the medium term. This result, however, has to be

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[10] See, for example, Alesina and Perotti (1995, 1997), Alesina and Ardagna (2010), Broadbent and Daly (2010), and Guajardo and others (2011).

[11] The average magnitude of both spending and taxes-based consolidation is about 1 percent of GDP.

treated with caution given that most of past fiscal adjustments have involved both spending and taxes-based measures. In order to address this issue, and following Guajardo et al. (2011), Equation (1) is separately estimated for: (i) episodes where taxes-based adjustments have been larger than spending adjustments; and (ii) episodes where spending adjustments have been larger than taxes-based adjustments. The results obtained with this exercise suggest that spending-based consolidation tend to have larger effects. In particular, the medium-term effect of fiscal consolidations on income inequality is about 1 percentage point for spending-based consolidations and 0.6 percentage point for taxes-based measures.[12]

B. Wage vs. Profit and Rent Income

Another way to assess the distributional effects of fiscal consolidation measures is to look at the effect of fiscal consolidations on different types of income. A traditional way of splitting total income is into wages, profits, and rents. This harks back to times when the roles of workers, capitalists, and landlords were fairly distinct. While these distinctions have eroded somewhat over time, the split between wages and other forms of income represents a starting point for describing how income is divided between *Main Street* and *Wall Street*.

To assess the effects of fiscal consolidation on the distribution of income between wage-earners and others, Equation (1) is estimated for the share of wage income in GDP (*W*):

$$W_{i,t+k} - W_{i,t} = \alpha_i^k + Time_t^k + \sum_{j=1}^l \gamma_j^k \, \Delta W_{i,t-j} + \beta_k D_{i,t} + \varepsilon_{i,t}^k \qquad (2)$$

The results of this empirical exercise are reported in Figure 7, and suggest that fiscal consolidation measures typically reduce the slice of the pie going to wage earners.[13] This finding is consistent with the results reported in Figure 8, which suggest that fiscal consolidations have a larger negative effect on the level of (inflation-adjusted) wage income than on the level of (inflation-adjusted) profit and rent income.

Finally, by estimating Equation (2) for episodes where taxes-based adjustments have been larger than spending adjustments and episodes where spending adjustments have been larger than taxes-based adjustments, we find that the level of wage income has typically fallen more for spending-based consolidations (Figure 9).

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[12] It must be recognized that also this approach is imperfect. Indeed, to properly differentiate between spending versus taxes-based adjustments one should consider episodes characterized by only spending or taxes-based adjustments (for example, by focusing only on those episodes where the occurrence of spending-based adjustments does not overlap with the occurrence of taxes-based adjustments in a neighborhood of 5-7 years). This, however, would dramatically reduce the number of "pure" spending and taxes-based consolidation in our sample.

[13] The results are robust to all robustness checks presented in the previous section.

The reasons why wage income declines more than profits and rents have not yet been studied much in the literature. Some fiscal consolidation plans call for public sector wage cuts, thus providing a direct channel for this effect. But there could be indirect channel as well, for instance because consolidations increase unemployment, and particularly the share of long-term unemployed in the total (Morsy, 2011). This hypothesis will be tested in the next section.

C. Short vs. Long-term Unemployment

To assess the distributional effects of fiscal consolidation on unemployment, Equation (1) is separately estimated for short- and long-term unemployment:

$$Su_{i,t+k} - Su_{i,t} = \alpha_i^k + Time_t^k + \sum_{j=1}^{l} \gamma_j^k \Delta Su_{i,t-j} + \beta_k D_{i,t} + \varepsilon_{i,t}^k \tag{3}$$

$$Lu_{i,t+k} - Lu_{i,t} = \alpha_i^k + Time_t^k + \sum_{j=1}^{l} \gamma_j^k \Delta Lu_{i,t-j} + \beta_k D_{i,t} + \varepsilon_{i,t}^k \tag{4}$$

where *Su* and *Lu* represent short-term and long-term unemployment, respectively.

The results of this empirical exercise are reported in Figure10, and suggest that fiscal consolidations typically lead to a significant and long-lasting increase in long-term unemployment, while they do not have significant effects on short-term unemployment.[14]

Fiscal consolidations thus add to the pain of those who are likely to be already suffering the most—the long-term unemployed. This is a particular worry today since the share of long-term unemployed increased in most OECD countries during the Great Recession. And even in countries where it did not increase—such as Germany, France, Italy and Japan—the share had already been very high even before the recession.

Job loss is associated with persistent earnings loss, adverse impacts on health, and declines in the academic performance and earnings potential of the children of displaced workers (Dao and Loungani, 2010). These adverse impacts are exacerbated the longer a person is unemployed.

Moreover, long spells of unemployment reduce the odds of being rehired. For instance, in the United States (according to estimates as of March 2012), a person unemployed for over six months had only a 1 in 10 chance of being rehired in the next month, compared with 1 in 3 odds for a person unemployed less than a month. The increase in long-term unemployment thus carries the risk of entrenching unemployment as a structural problem because workers

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[14] The results, not presented here, also show that fiscal consolidation episodes are associated with a significant and persistent increase in overall unemployment.

lose skills and become detached from the labor force—a phenomenon referred to as "hysteresis" (Blanchard and Summers, 1986).

Long-term unemployment also threatens social cohesion. An opinion survey conducted in 69 countries around the world found that an experience with unemployment leads to more negative opinions about the effectiveness of democracy and increases the desire for a rogue leader. The effects were found to be more pronounced for the long-term unemployed.

V. CONCLUSIONS AND POLICY IMPLICATIONS

This paper examines the distributional effects of fiscal consolidation. Using episodes of fiscal consolidation for a sample of 17 OECD countries over the period 1978-2009, it shows that fiscal consolidation has typically led to a significant and persistent increase in inequality, declines in wage income and in the wage share of income, and increases in long-term unemployment.

These results here imply that governments should pay special attention to the fiscal measures that they adopt. In some cases governments may have the flexibility to design the fiscal adjustment in a way that lessens the distributional impact or they may be able to offset some of the distributional impact through other measures. In general, the distributional effects of consolidation must be balanced against the potential longer-term benefits that consolidation can confer benefits as interest rates decline and the lighter burden of interest payments permits cuts to distortionary taxes.

At the present juncture, fiscal measures that are approved now but only kick in to reduce deficits in the future—when the global recovery is more robust—would be particularly helpful. Examples include linking statutory retirement ages to life expectancy and improving the efficiency of entitlement programs. In contrast, fiscal consolidations that are unduly hasty pose risks to the recovery. So countries with the scope to do so should opt for a slower pace of consolidation, combined with policies to support growth.

Fiscal consolidation plans should also spell out how policies would respond to shocks, such as slower growth than envisaged in the plan. For instance, plans could specify that unemployment benefits would be shielded from cuts in the event of slower growth than assumed in the plan. History shows that fiscal plans succeed when they permit "some flexibility while credibly preserving the medium-term consolidation objectives" (IMF, 2011; Lagarde, 2011; see also Mauro, 2011).

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Teulings, Coen, and Nick Zubanov, 2010, "Economic Recovery a Myth? Robust Estimation of Impulse Responses," CEPR Discussion Paper 7300 (London: Centre for Economic Policy Research).

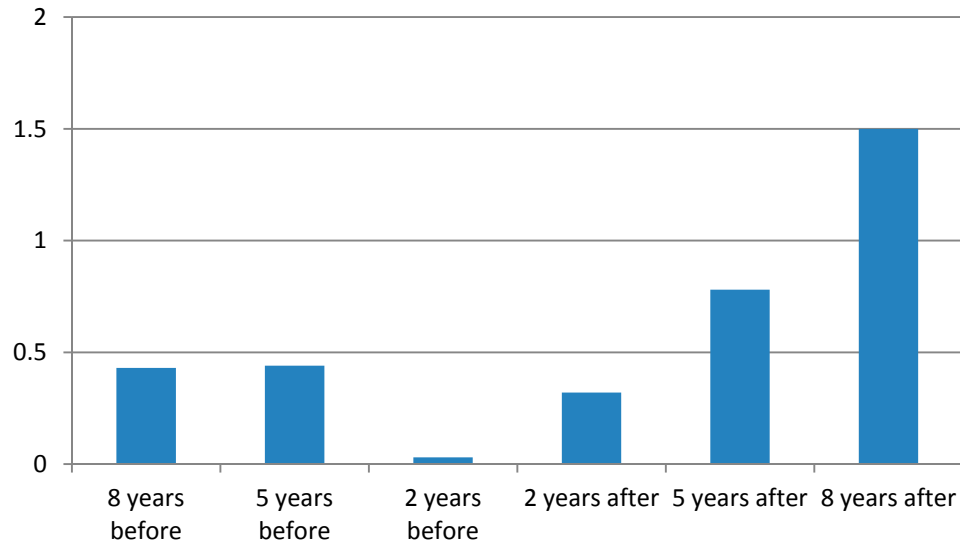Figure 1. Cumulative Change in the Gini Coefficient before and after Consolidation Measures

Figure 2. Cumulative Change in the Share of Wage Income in GDP before and after Consolidation Measures (% of GDP)
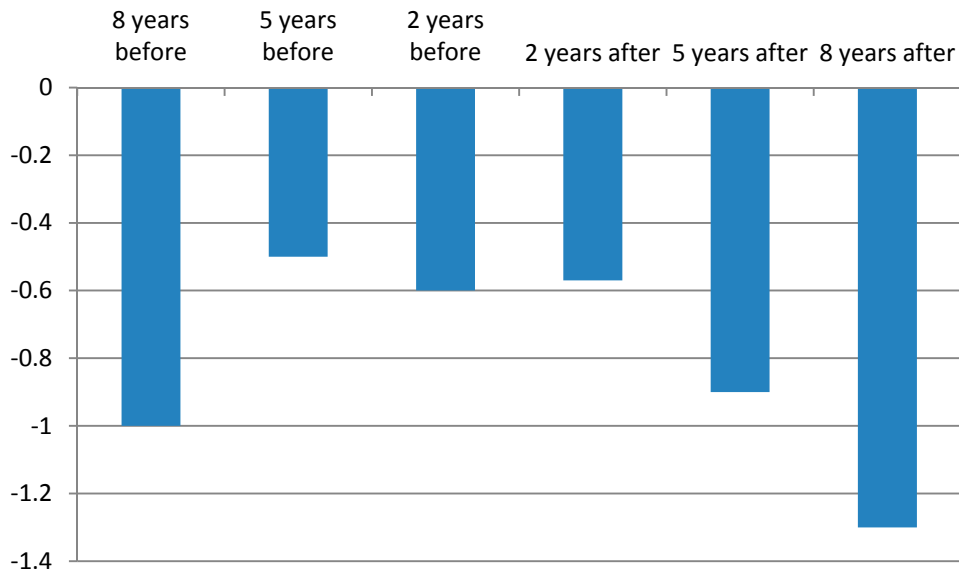
Figure 3. The Effects of Fiscal Consolidation on Inequality
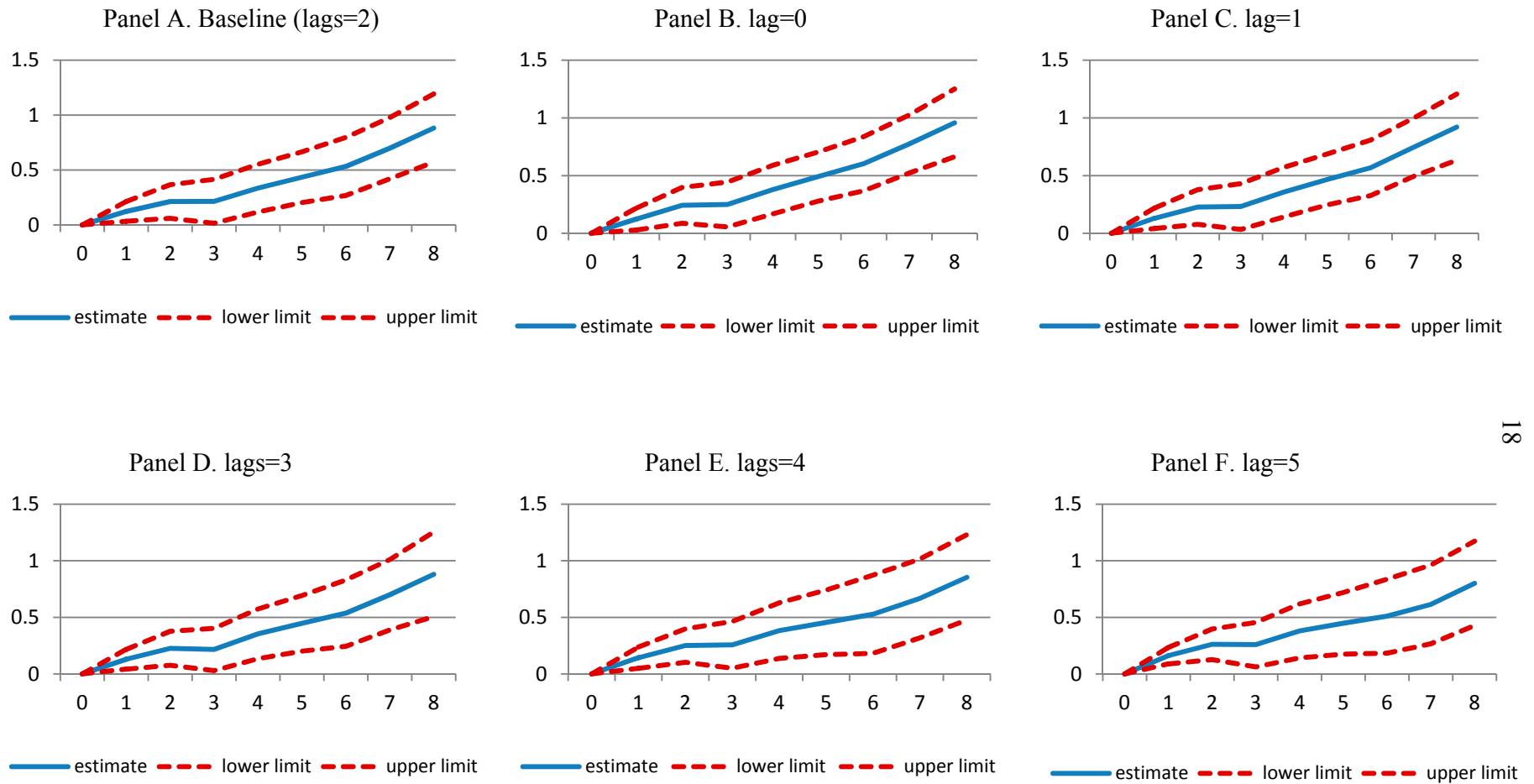
estimate — — — lower limit — — — upper limit
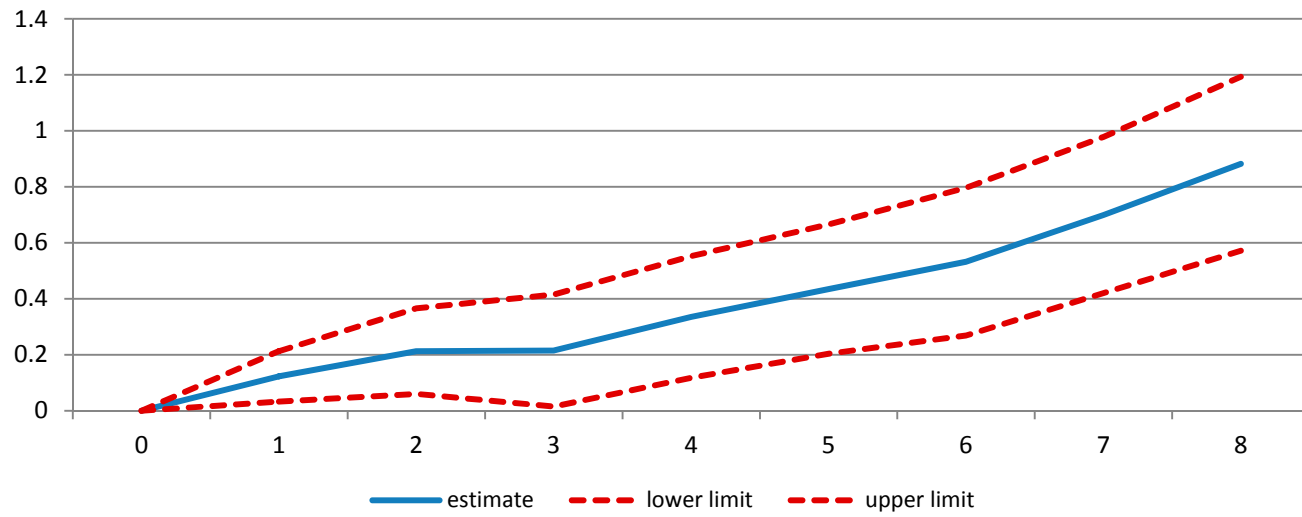
Note: dotted lines equal one standard error bands.

Figure 4. The effects of Fiscal Consolidation on Inequality - Robustness Check for Different Set of Controls
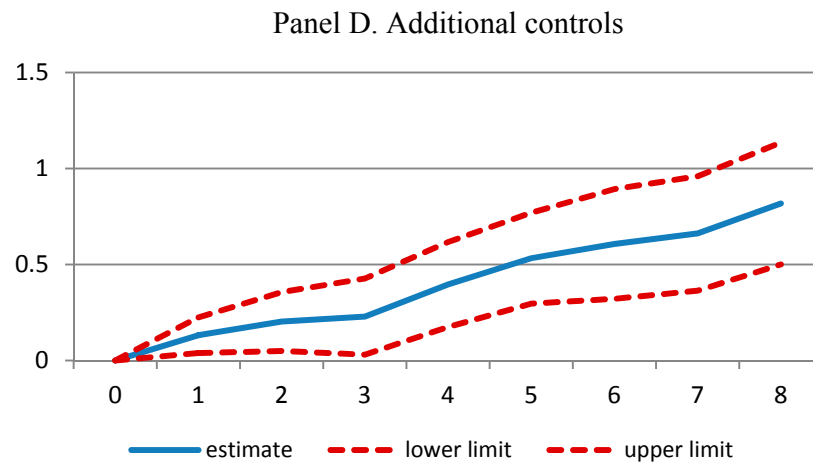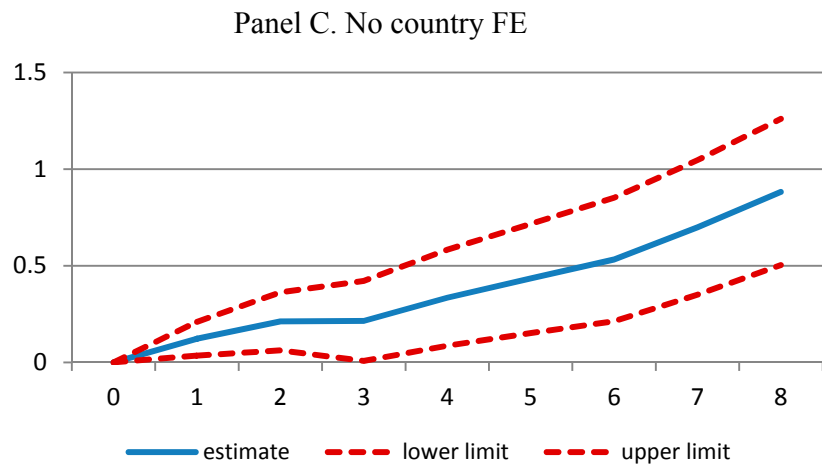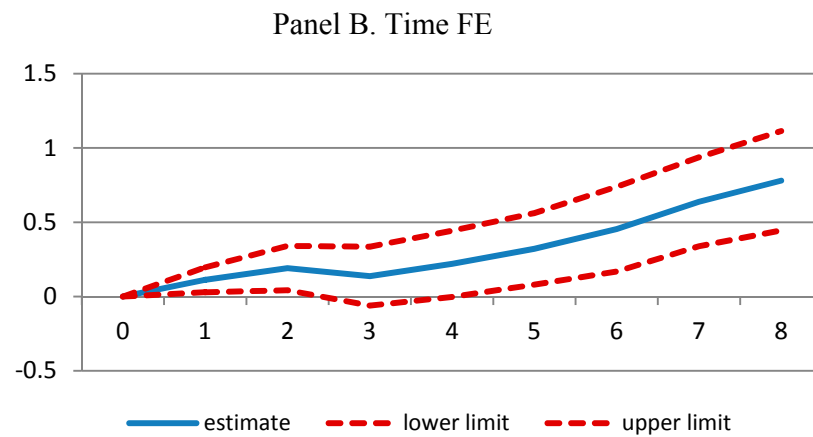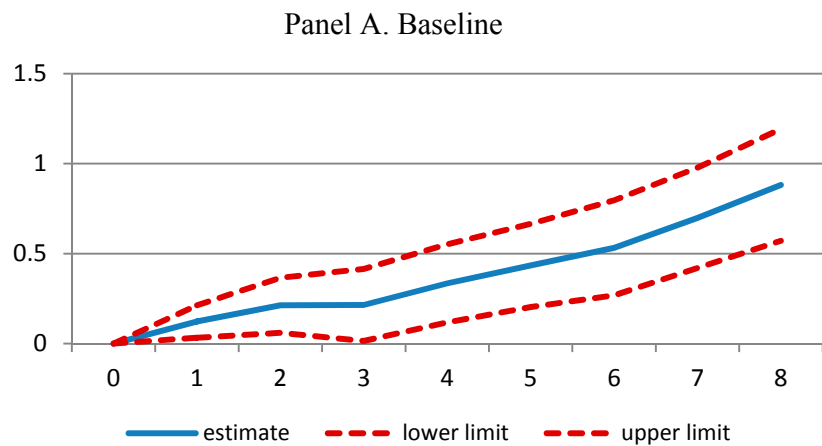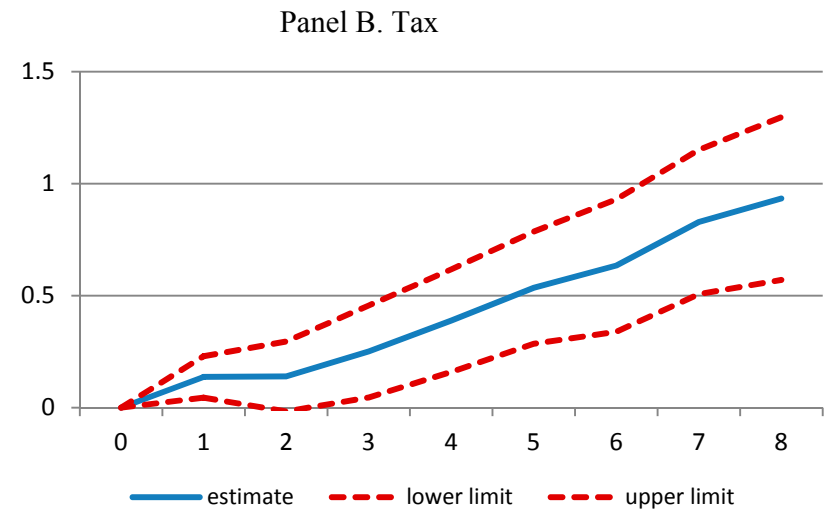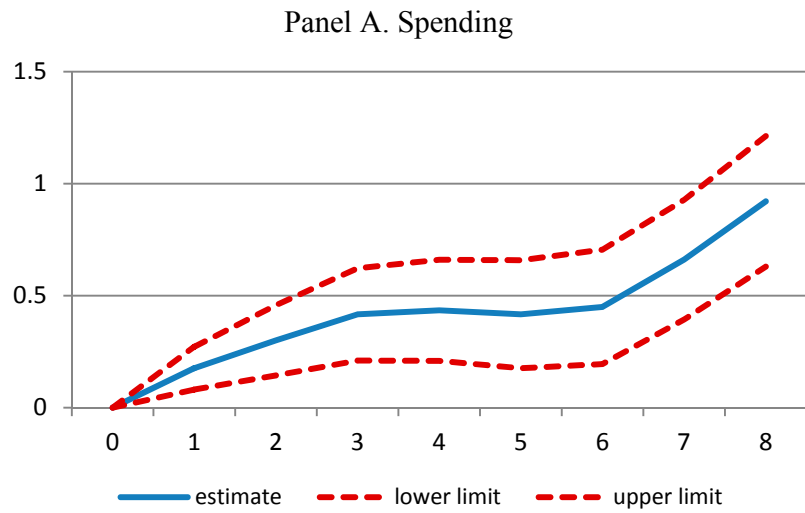
Note: dotted lines equal one standard error bands.

Figure 5. The Effects of Fiscal Consolidation on Inequality - Robustness Check for Different Lags

Panel A. Baseline (lags=2)

Panel B. lag=0

Panel C. lag=1

Panel D. lags=3
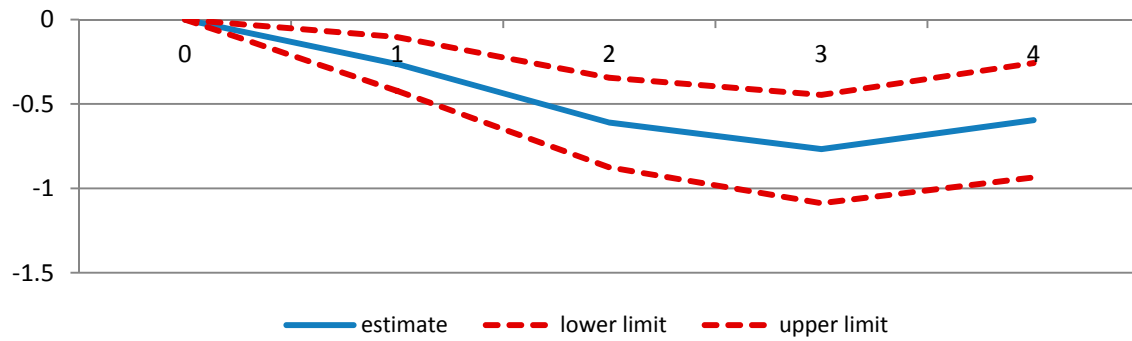
Panel E. lags=4

Panel F. lag=5

Note: dotted lines equal one standard error bands.

Figure 6. The Effects of Fiscal Consolidation on Inequality- Spending vs. Taxes-based Measures
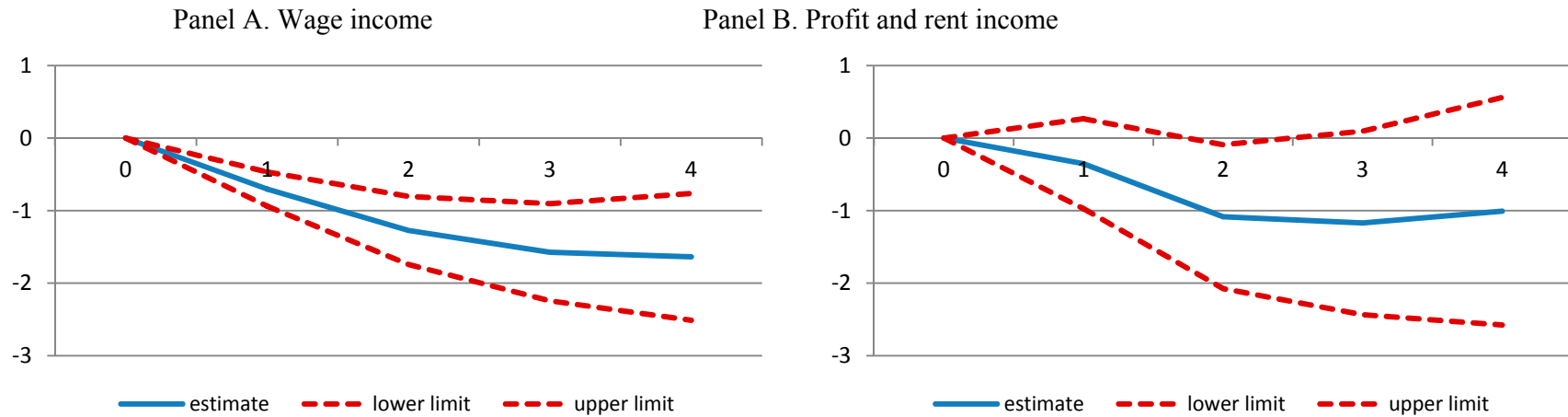
Note: dotted lines equal one standard error bands.

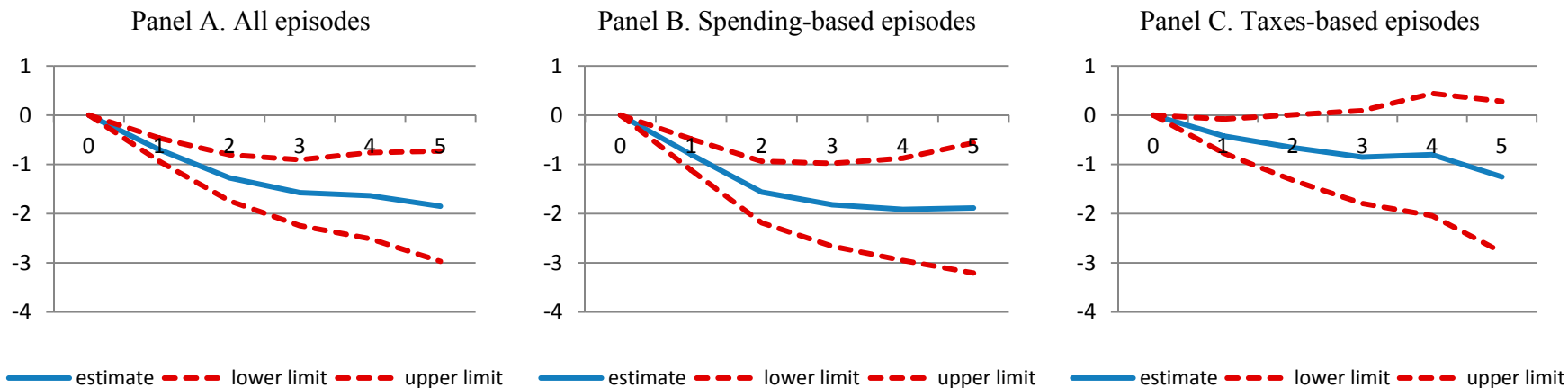Figure 7. The Effects of Fiscal Consolidation on Wage Income (% of GDP)

Note: dotted lines one standard error bands.

Figure 8. The Effects of Fiscal Consolidation on Wage vs. Profit and Rent Income (percent change)

Panel A. Wage income   Panel B. Profit and rent income

Note: dotted lines equal one standard error bands.

Figure 9. The Effects of Fiscal Consolidation on Wage Income-spending vs. Taxes Based Measures (percent change)

Panel A. All episodes   Panel B. Spending-based episodes   Panel C. Taxes-based episodes

estimate   lower limit   upper limit   estimate   lower limit   upper limit   estimate   lower limit   upper limit

Note: Note: dotted lines equal one standard error bands.
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Figure 10. The Effects of Fiscal Consolidation on Short and Long-term Unemployment

Panel A. Long-term unemployment

Panel B. Short-term unemployment
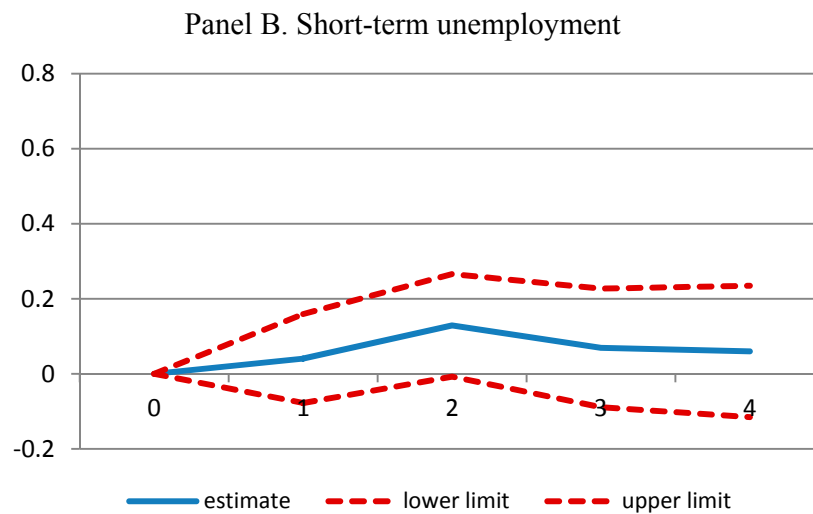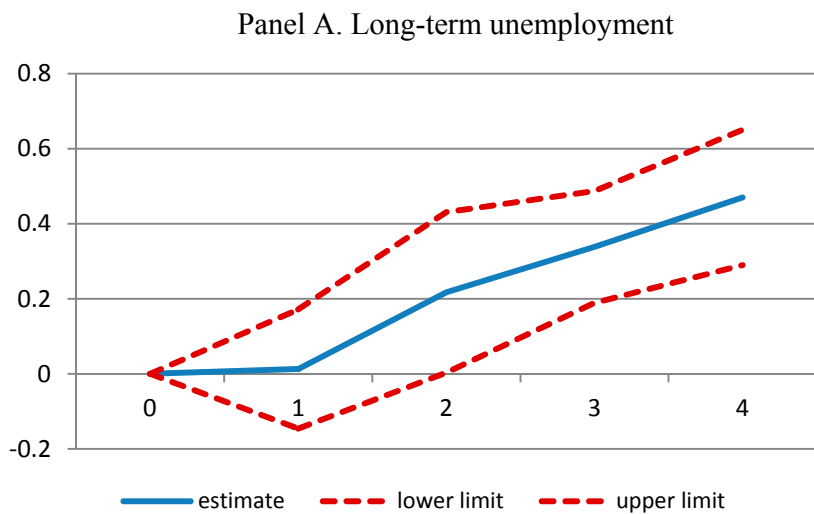
Note: dotted lines equal one standard error bands.

Appendix

Table A1. Descriptive Statistics and Sources

	N	Average	SD	Min	Max	Source
Gini	563	25.3	9.0	19.7	37.3	SWIID
Wage (% of GDP)	680	52.3	4.2	38.3	66.4	OECD
Short-term unemployment (%)	453	3.6	1.6	0.6	8.4	OECD
Long-term unemployment (%)	458	4.0	3.3	0.3	17.6	OECD