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**Fiscal policy and the youth  
labour market**

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**AC12: Jobs and Skills for Youth**

Employment and  
Labour Market  
Policies branch

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## Preface

The primary goal of the ILO is to work with member States towards achieving full and productive employment and decent work for all. This goal is elaborated in the ILO Declaration 2008 on *Social Justice for a Fair Globalization*,<sup>1</sup> which has been widely adopted by the international community. Comprehensive and integrated perspectives to achieve this goal are embedded in the Employment Policy Convention of 1964 (No. 122), the *Global Employment Agenda* (2003) and – in response to the 2008 global economic crisis – the *Global Jobs Pact* (2009) and the conclusions of the *Recurrent Discussion Reports on Employment* (2010 and 2014).

The Employment Policy Department (EMPLOYMENT) is engaged in global advocacy and in supporting member States in placing more and better jobs at the center of economic and social policies and growth and development strategies. Policy research and knowledge generation and dissemination are essential components of the Employment Policy Department's activities. The resulting publications include books, country policy reviews, policy and research briefs, and working papers.<sup>2</sup>

The *Employment Policy Working Paper* series is designed to disseminate the main findings of research on a broad range of topics undertaken by the branches of the Department. The working papers are intended to encourage the exchange of ideas and to stimulate debate. The views expressed within them are the responsibility of the authors and do not necessarily represent those of the ILO.

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<sup>1</sup> See [http://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/genericdocument/wcms\\_371208.pdf](http://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/genericdocument/wcms_371208.pdf)

<sup>2</sup> See <http://www.ilo.org/employment>.



## Foreword

Across the globe, young women and men are making an important contribution as productive workers, entrepreneurs, consumers, citizens, members of society and agents of change. All too often, the full potential of young people is not realized because they do not have access to productive and decent jobs. Although they are an asset, many young people face high levels of economic and social uncertainty. A difficult transition into the world of work has long-lasting consequences not only on youth but also on their families and communities.

The International Labour Office has long been active in youth employment, through its normative action and technical assistance to member States. One of the means of action of its Youth Employment Programme revolves around building and disseminating knowledge on emerging issues and innovative approaches.

In 2012, the International Labour Conference issued a resolution with a call for action to tackle the unprecedented youth employment crisis through a set of policy measures. The resolution provides guiding principles and a package of inter-related policies for countries wanting to take immediate and targeted action to address the crisis of youth labour markets. In follow-up action, the ILO's Youth Employment Programme (YEP) has been implementing knowledge building efforts under the ILO's Area of Critical Importance, Jobs and skills for youth.

Young people in high income countries have been particularly severely affected by the recent recession and the period of 'austerity' which has followed it. The analysis seeks to evaluate the potential that expansionary fiscal policy can have – and under which conditions – to ameliorate, and restrictive fiscal policy to worsen, conditions in youth labour markets. Through a panel econometric model applied to European countries, the analysis finds that a fully countercyclical fiscal policy is an instrument well-suited to ameliorating youth unemployment. Governments should increase expenditure and reduce taxation during recessions, whilst doing the opposite when the economy is expanding; expansionary fiscal policy during a downturn is most effective if preceded by a relatively conservative fiscal policy in non-recessionary circumstances.

The paper was authored by Monique Ebell of the National Institute of Economic and Social Research (NIESR) in London and Niall O'Higgins (ILO-YEP) who is also co-ordinating knowledge-building efforts for the Area of Critical Importance, Jobs and skills for youth. Useful comments were also provided by Sara Elder (ILO-YEP) and Gianni Rosas, Director of the ILO office in Rome as well as by Professor Torben Andersen of the University of Aarhus and other participants at the IZA/Ministry of Finance, Slovak Republic (IFP)/Council for Budget Responsibility (CBR)/CELSI Conference on Fiscal Policy Tools and Labor Markets during the Great Recession held in Bratislava on October 26th-27th, 2015.

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# 1. Introduction

One of the most consistent findings of the literature on the causes of youth labour market outcomes is that aggregate demand is a fundamental determinant of the state of the youth labour market. Recent research (ILO, 2013a) has also re-affirmed the importance of expansionary fiscal policy in counteracting, or at least mitigating, the negative effects of the global economic crisis, raising employment rates and reducing unemployment at the aggregate level. Thus far, little work has been undertaken looking at the potential for fiscal policy to ameliorate the effects of recessions on youth labour markets. This paper seeks to fill that gap.

Young people suffered disproportionately from the recent downturn in OECD economies. For example, in the EU between 2007 and 2014, the youth unemployment rate increased by 41% representing an 8 percentage point rise compared to 4 percentage points for ‘adults’ aged 25 or over<sup>3</sup>; of even more concern, the prevalence of long term unemployment amongst young people rose by 30% over the same period – compared to 9% for adults (O’Higgins, 2016).

It is also well established that extended periods of unemployment early on in one’s labour market experience has long-lasting repercussions; the effects of unemployment and/or joblessness early on are likely to be felt in terms of employment prospects and wages throughout a person’s life (e.g. Gregg, 2001, and Gregg and Tominey, 2005).<sup>4</sup> The regularity with which such scarring has been found, at least in the European context, as well as more recent attempts to control for these selectivity effects suggest that there really is a scarring effect that goes beyond unobserved individual heterogeneity (e.g. Cockx and Picchio, 2013); extended difficulties in the search for work early on are likely to have long-term negative consequences.<sup>5</sup> In the context of the current prolonged recession, this creates the spectre of a lost generation of young people who become permanently excluded from productive employment (Scarpetta et al., 2010).

This paper seeks to fill a gap in our knowledge; young people in high income countries have been particularly severely affected by the recent recession and the period of ‘austerity’ which has followed it. The analysis seeks to evaluate the potential that expansionary fiscal policy can have – and under which conditions – to ameliorate, and restrictive fiscal policy to worsen, conditions in youth labour markets.

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<sup>3</sup> It perhaps should be pointed out, however, that the percentage (as opposed to percentage point) increase was less for young people (41%) than for adults (53%).

<sup>4</sup> The cited paper provides perhaps the strongest case for duration dependence, looking at the effects of early unemployment on career prospects some ten-fifteen years later, controlling for observed heterogeneity.

<sup>5</sup> Gregg & Tominey (2005) identify a scarring effect on wages more than twenty years after unemployment episodes experienced during youth.

## 2. The context – countries' fiscal stance

In the period immediately following the onset of the recent global recession, many countries implemented some form of discretionary countercyclical fiscal policy in addition to the countercyclical response of automatic stabilizers. Amongst North American and European countries there was an initial almost universal response with the adoption of de facto expansionary fiscal policy<sup>6</sup>. Indeed, “the fiscal response of the advanced economies to the global financial crisis showed the importance of discretionary actions in mitigating the effects on activity of a severe and protracted slump,” (IMF, 2015, p.21)<sup>7</sup>. From 2010 on, the policy priority in many of these countries moved towards a concern with debt and deficit levels. By the third quarter of 2011, the majority of high income countries had adopted fiscal consolidation measures – that is ‘austerity’ as it has come to be known (ILO, 2013a). The ILO’s 2013 World of Work report inter alia argues plausibly that the consequences of reductions in public expenditure and increases in (primarily indirect) taxation during this period, along with the relaxation of employment protection legislation impeded recovery in many cases. Similarly, in the USA, Ball et al. (2014) have argued persuasively that, in the context of a liquidity trap with interest rates effectively at zero, in addition to – and partly because of – the positive effects of expansionary fiscal policy on economic and employment growth, properly designed fiscal stimulus is likely to reduce rather than increase the long-run debt burden. In the UK, a number of commentators have argued that the introduction of austerity measures was both unnecessary and counterproductive in that it prematurely interrupted the recovery from the recession (e.g. Sawyer, 2012).

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<sup>6</sup> One exception was Italy, where such discretionary fiscal expansion was notably absent. Perhaps not surprisingly, Italy was also one of the countries which suffered most from the recession in terms of GDP and employment losses, despite the fact that it was relatively unexposed to the financial crisis as such with its highly protected banking sector (O’Higgins, 2011).

<sup>7</sup> Although the text continues – quoting Blanchard et al. (2010) - “it also illustrated one of the limitations of discretionary fiscal measures, namely that “they come too late to fight a standard recession,”” (ibid., p. 21).

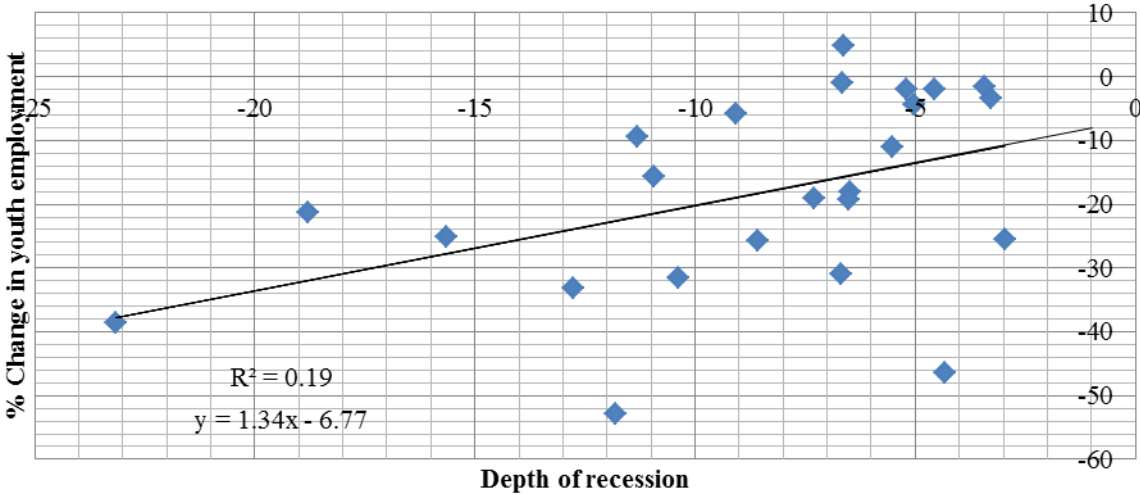
### 3. Previous work

#### 3.1. The causes of youth unemployment

It is firmly established that what happens in young people as they enter the labour market is very much dependent on what is going on in the economy as a whole<sup>8</sup>. In particular, youth unemployment and NEET rates are very closely related to aggregate labour demand. If there is one universal finding in all the studies of the causes of youth unemployment and the effects of various factors affecting youth labour market outcomes it is that aggregate demand plays a central role.

This is not to say that other factors are not important, indeed, figure 1 on the EU taken from O’Higgins (2012) illustrates that although there is a clear positive relation between changes in real GDP consequent on the economic and financial crisis and changes in youth employment, there is also much heterogeneity across countries in the youth employment response to the recession. Thus, although aggregate demand is the defining factor, it is also likely that *inter alia* the structure of macroeconomic and fiscal policies will be important in determining youth labour market outcomes.

Figure 1: The depth of the recession and the percentage change in youth employment in Europe.



Source: O’Higgins (2012, figure 6, p. 403).  
Note: The depth of the recession is defined here as the difference between the maximum and minimum values of real GDP over the period 2007Q1 and 2010Q4 using a four quarter moving average. The percentage change in youth employment is measured over the period, 2007Q1 and 2011Q1.

Recently, the literature on youth unemployment has tended to focus on the impact of the financial crisis and ‘Great Recession’. Bell and Blanchflower (2009, 2010) relate the cross-sectional pattern of youth unemployment in the wake of the

<sup>8</sup> There are many many studies confirming this. See, for example, World Bank (2006), O’Higgins (2001, 2010) and so on.

financial crisis to demographic factors, in particular to a bulge in the number of young people in some of the countries with the highest youth unemployment rates, including the UK and US.

Scarpetta, et. al. (2010) study youth unemployment in OECD countries and find that tertiary education has a positive impact both on the share of young people who are employed and on job quality. To improve the employment prospects of those with less than tertiary education, they advocate the introduction of dual apprenticeship systems like those found in the low youth unemployment countries Germany, Austria, Switzerland and Denmark. This policy recommendation is given empirical support by O'Higgins (2012), who performs time series rolling regressions and finds that a dummy variable accounting for the presence of a dual apprenticeship system is statistically significant and positively related with the youth employment rate, and negatively with the share of youth out of the labour force.

O'Higgins (2012) also finds that the elasticity of the youth employment rate to real GDP increased during the financial crisis. Matsumoto, et. al. (2012) has looked at the role of the macro-economy in determining youth employment and unemployment and have found that, as one might expect, GDP growth is strongly related to youth employment and inversely related to youth unemployment, however, they also find that a greater volatility of GDP is in itself damaging to youth labour market outcomes. That is, not only do growth rates matter but also the extent to which these vary over time. Choudhry, Marelli, & Signorelli (2012) on the other hand have found that different types of (negative or positive) economic shock have different effects on different types of person and in particular may impact the youth labour market differently from their general influence on labour demand.

Dolado, et. al. (2013) focus on the micro level determinants of youth unemployment in Spain. They find that the high Spanish rates of youth unemployment during the crisis are related to the higher worker turnover associated with the greater prevalence of temporary contracts in the Spanish labour market, and among young people in Spain in particular. Similarly, Bentolila, et. al. (2012) attribute the higher youth unemployment rates in Spain relative to France to the higher share of young people on temporary contracts in Spain at the time the crisis hit.

We are concerned here primarily with the association between fiscal policy and youth labour market outcomes. This can be separated into two key elements: a) the relationship between fiscal policy and GDP growth; and, b) the relationship between GDP growth and youth labour market outcomes<sup>9</sup>. In both cases, the specific mechanisms through which the relationships operate are also likely to be of some significance. For example, the multiplier effects of increased government

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<sup>9</sup> This in turn may be divided up into the effect of variations in GDP on aggregate employment and the relationship between variations in aggregate employment and youth employment and unemployment. Many studies have emphasized the greater responsiveness of youth (as opposed to adult) employment and unemployment to variations in economic growth. Certainly youth unemployment rates vary more or less proportionately with adult unemployment rates in response to shocks and, since youth unemployment rates are much higher than adult ones, this translates in to a larger percentage point variation (O'Higgins, 2001). O'Higgins (2012), on the other hand, has argued that this rather misses the point. The real problem for young people which has arisen vis-à-vis the economic crisis is the sustained increase in long-term unemployment and joblessness observable amongst young people and the consequent possibility of a lost generation mentioned in the introduction.

expenditure will depend on *inter alia* who receives the money; *ceteris paribus*, a higher proportion of transfers to low income families are likely to be consumed as opposed to saved compared to transfers to relatively well-off individuals or households. More generally, there is no particular reason to suppose that expenditure will have the same or similar effects as tax cuts, nor that tax cuts will be equivalent whether arising from reductions in direct or indirect taxation.

In any event, since the onset of the economic and financial crisis, numerous studies have estimated the size of traditional Keynesian multipliers; the relationship between expansionary policy and GDP. Rather fewer have considered the relationship between fiscal policy and employment and only one, to our knowledge, has explicitly considered the effects of fiscal policy on youth labour market outcomes<sup>10</sup>.

### 3.2. The Keynesian Multiplier

The idea that countercyclical expansionary fiscal policy could be used to stimulate GDP growth and consequently employment during a recession is of course closely associated with Keynes (and Kalecki), but its origins are rather older<sup>11</sup>. In the last two decades or so, there has been a steady growth in the literature looking at the size (and sometimes also the sign) of the fiscal multiplier, that is, the effect of expansionary fiscal policy on GDP. Such efforts have proliferated since the onset of the recession and the adoption of de facto discretionary countercyclical fiscal policy in most OECD countries. These have been neatly summarised in a recent meta-analysis (Gechert, 2015) which suggests that the fiscal multiplier is of the order of 1, with larger multipliers associated with increased government expenditure as opposed to reductions in taxation; and, fiscal expansion based on increased government investment expenditure appears to be the most effective of all. A further finding common in the literature is that fiscal expansion is particularly effective during recession, as was indeed suggested by Keynes (1936).

The aforementioned paper by Gechert (op. cit.) along with a number of other analyses may be contrasted with a view, put forward by Feldstein (1982) and which subsequently found empirical support in papers by Giavazzi & Pagano (1990, 1996) and more recently also by Alesina and others in a series of papers during the 1990s and early 2000s (Alesina & Perotti, 1995; Alesina & Ardagna, 1998; Alesina et al. 2002). The basic idea is that traditional Keynesian stimuli can be contractionary and, vice versa, that austerity can be expansionary. The intuition underlying these papers concerns the effects of specific government policy changes on individuals' expectations; thus, for example, business and consumer confidence may be boosted by reduced government expenditure because the reduction is seen as an indicator of future long-term reductions in the tax burden. Increased private consumption and investment will consequently more than offset the contractionary reduction in government expenditure (or taxation).

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<sup>10</sup> Albeit in passing; see, IMF (2014).

<sup>11</sup> See, for example, Barber (1985) for a review of pre-Keynesian work which advocated fiscal stimulus to counteract a recession. Closely related under-consumption theories go back further to the Birmingham School of economists in the first half of the 19<sup>th</sup> century. The Birmingham School argued that economic downturn was caused by the end of the stimulus associated with war spending from the Napoleonic wars.

This view, whilst apparently popular amongst governments in recent years, has now been refuted by numerous studies; for example, the IMF (2010, chapter 3) has demonstrated convincingly, in its examination of fiscal consolidations in high income countries between 1980 and 2009, that fiscal consolidation were in fact contractionary with a deficit reduction equal to 1% of GDP leading to a contraction of 0.5% in output and an increase in unemployment of 0.3 percentage points.

It has also been observed by several commentators that whereas in the past fiscal consolidation was typically mitigated by expansionary monetary policy, such an option – with real interests at zero or close to it – is not available today. Moreover, a number of authors have pointed to the endogeneity bias inherent in the approach of Alesina et al. based on analysis of the cyclically adjusted primary balance (CAPB); during a period of strong economic growth, governments faced by labour and capacity constraints may well opt to reduce the budget deficit which would lead to an association between CAPB and contractionary policy, however, with the direction of causation pointing in the opposite direction (Baker & Rosnick, 2014). It has also been observed that the cyclical adjustments of the CAPB will not take into account changes in asset values with consequent effects on capital gains taxation, here too leading to a direct association between consolidation and expansion but with once again causation running in the opposite direction (Guajardo et al., 2011).

To summarise the currently available evidence, it is reasonable to suggest that there is room for expansionary fiscal policy to be used to increase GDP. The second question which arises is the effect this may have on employment and – of specific concern here - on youth employment and unemployment. Over the last decade or so, and more particularly following the onset of the crisis, a number of papers produced by the ILO have looked at the relationship between economic and employment growth (e.g. Kapsos, 2005; ILO 2012, 2013) and the potential for and advisability of using expansionary fiscal policy to increase employment has recently be re-affirmed in the ILO's Work of Work 2014 report (ILO, 2014)<sup>12</sup>. The analysis in IMF (2014) provides further evidence of the negative effects of fiscal consolidation on employment, although these are weaker when the reduction in the deficit is the result of reduced government expenditure (as opposed to increased taxation), and the adjustment does not take place following a protracted recession, with positive (non-Keynesian) employment effects discernible after three years. Indeed, the analysis finds that following a protracted recession (of two years or more), reduced government expenditure has greater negative effects on employment than does increased taxation.

Often papers have adopted a structural vector autoregression (SVAR) approach to estimate the 'employment' multiplier' associated with fiscal policy. Monacelli et al. (2011) estimate a SVAR model using quarterly US data on GDP, government consumption, private consumption, the 3-month T-bill rate, the average marginal income tax rate, the employment rate and the unemployment rate over the period 1954:I to 2006:4. In response to a Blanchard-Perotti identified positive government spending shock<sup>13</sup>, Monacelli et. al. (op. cit.) find that employment rises by 1.5% at

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<sup>12</sup> The ILO work is based on the ILO's Global Economic Linkages model.

<sup>13</sup> That is, the authors identify the government spending shock using the methodology of Blanchard and Perotti (2002), which assumes a decision lag of 1 quarter, and that government spending cannot react to output or other shocks contemporaneously.

its peak after 10 quarters. In contrast, Wilson (2012) takes a different approach by approximating a 'jobs multiplier' that estimates the number of jobs created by a given increase in government stimulus. Wilson (2012) also uses a different methodology, employing an instrumental variables strategy which exploits cross-state variation in US federal stimulus spending from the American Recovery and Reinvestment Act (ACCA) of 2009 that depended on the number of federal highway miles lying within each state's borders. Wilson (2012)'s headline result is that \$1 million in stimulus spending led to the creation of 8 jobs.

Several studies have also looked at the impact of fiscal stimulus or tightening on the unemployment rate. Monacelli et al. (op. cit.) find that a one percentage point shock to government spending results in a peak 0.6 percentage point decline in the unemployment rate after 10 quarters. In a similar vein, earlier work by Ravn and Simonelli (2008) identify government spending shocks in a SVAR using quarterly US data between 1959:1 and 2003:4, and find that unemployment declines by 1.5% about 3 years after a 1% shock to government spending.

Holden and Sparrman (2012) extend their VAR analysis to a panel data set covering 20 OECD countries between 1960 and 2007. They find that increasing government purchases by 1% of GDP is associated with a decrease in unemployment of 0.25 percentage points after one year, rising to 0.35 percentage points in a recession. Brueckner and Pappa (2012) also perform a panel VAR analysis on a set of 10 OECD countries, using as much data as available for each country. They find that a positive shock to government spending increases both employment and unemployment rates, and trace this seemingly contradictory behaviour to an increase in the participation rate.

Auerbach and Gorodnichenko (2011) differentiate between the impact of government spending shocks in expansions and recessions. Their VAR analysis covers a large set of OECD countries beginning in 1985, and they find that a 1% increase in government spending increases private sector employment by 0.9%, and decreases unemployment by about 0.2% during recessions. However, only the decrease in unemployment is (marginally) statistically significant, and they find no statistically significant effect of government spending on employment or unemployment during expansions. Turrini (2012) differentiates between the impacts of fiscal policy shocks on high and low employment protections law (EPL) countries, finding that the impact of fiscal policy shocks on job separation is stronger for countries with weak employment protection. In high EPL countries, in contrast, fiscal policy mainly affects the rate of job creation. However, none of these papers consider the youth unemployment rate separately.

Notwithstanding the headline seeking results of Wilson (2012) and, to a lesser extent one or two other papers, the balance of the evidence clearly points towards a role for fiscal expansion in combatting unemployment and increasing employment; with a more nuanced picture emerging regarding the differential impacts of expenditure and revenue base changes with increased government expenditure being more effective as a stimulus (and conversely reduced government expenditure being particularly deleterious) during a recession. A second important general result is that the effects of fiscal policy may well depend on the existing level of debt. A consideration which is taken up below.



As yet, as we have already observed, little work has been done on the relation between fiscal policy and youth labour market outcomes. One partial exception is the recent IMF (2104) analysis which suggests that reduced government expenditure may be associated with a fall in youth unemployment after 5 years, whilst increased taxation is associated with a long-term increase in youth unemployment with no rebound.

## 4. Empirical analysis

### 4.1. Description of the Data and Econometric model

The data employed here are quarterly, covering the period from 2001:I to 2013:IV, and includes data for 19 European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden and the United Kingdom. With the exception of Norway, all the countries are members of the European Union. The specific choice of countries was determined by the availability of data; only European countries with a complete set or almost complete set of observations were included.

We employ five indicators of youth labour market outcomes, all obtained from the Eurostat labour market statistics database<sup>14</sup>:

- The youth unemployment rate, defined as the unemployment rate of 16-24 year olds;
- The youth employment rate, defined as the employment rate of 16-24 year olds;
- The ratio of youth to prime age unemployment rates, where the prime aged unemployment rate refers to 25-54 year olds;
- The prevalence of long-term (over 12 months) unemployment amongst unemployed young people; and,
- The prevalence of temporary employment amongst young employees

The key explanatory variables are indicators designed to capture different aspects of a country's fiscal policy stance. Four measures related to fiscal policy are used, all obtained from the Eurostat quarterly government statistics database<sup>15</sup>:

- Budget Balance: the government's net lending as a percentage of GDP
- Government Expenditure as a percentage of GDP
- Government Revenue as a percentage of GDP
  - Government debt as a percentage of GDP, using gross government debt, the Maastricht measure

The regressions also include three variables in order to take account of difference across countries in the regulation of employment; specifically, variables are included representing the OECD's employment protection sub-indices for the regulation of temporary contracts, for regular (individual) contracts and for collective dismissals respectively. As noted above, young people are increasingly working in temporary employment; in the EU as a whole, for example, by 2014, whether despite or because of the crisis, over 43% of employed young people were in temporary contracts, compared to less than 13% of prime age workers<sup>16</sup>. It is not clear, either

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<sup>14</sup> <http://ec.europa.eu/eurostat/web/lfs/data/database>

<sup>15</sup> <http://ec.europa.eu/eurostat/web/government-finance-statistics/data/database>

<sup>16</sup> In Slovenia and Poland the percentage of young workers in temporary contracts in 2014 was over, and in Spain just under, 70%. The corresponding rates for prime age adults were 15% in Slovenia, 27% in Poland and 25% in Spain.

theoretically or empirically, whether stronger employment protection of temporary contracts will increase or reduce employment, however, it is evident that young people are more likely than prime age adults to be affected by such regulations and hence any such effects are likely to be magnified for young people

An important issue which arises in relating fiscal policy to labour market outcome variables concerns the endogeneity of fiscal policy with respect to these outcomes. During recessions, government expenditure rises and tax revenues fall as a direct consequence of the lower aggregate demand. A common identifying assumption for fiscal multipliers in the context of VARs is - following Blanchard and Perotti (2002) - to assume that government consumption does not simultaneously react to a contemporaneous change in economic activity; however, as has been pointed out by some authors, and of particular relevance here, this will not be true for social transfers arising for example from variations in unemployment. Alternatives suggested have been sign restrictions<sup>17</sup> or alternatively an identifying strategy based on narrative events<sup>18</sup>.

Here we employ a different more direct approach. In order to distinguish discretionary fiscal policy from variations in governmental current expenditures and revenues caused by the cycle or persistence, we follow the method used by, *inter alia*, Fatás and Mihov (2003, 2006), Afonso et al. (2010) and, in particular, Agnello et al. (2013). This involves a first stage in which the relevant fiscal variables - in our case, government expenditure, revenue and the budget balance, respectively - are regressed on their own lagged value, real GDP, the inflation rate and its square, public debt and a linear time trend, for each country separately. The purpose is to distinguish between persistence, automatic responsiveness and discretion in fiscal policy. Specifically, employing this approach, the residual from the first stage country specific regressions can be employed as a measure of discretionary fiscal policy<sup>19</sup>.

The second stage involved regressing the relevant labour market indicator on the resultant measures of discretionary fiscal policy, real GDP and government debt as well as the three main components of the OECD employment protection index in order to take some account of cross-country institutional differences likely to influence youth labour market outcomes. Both real GDP and public debt (as a percentage of GDP) were included in Hodrick-Prescott filtered form<sup>20</sup>; that is, they were de-trended using the methodology named after Hodrick & Prescott (1980, 1997). Apart from removing the trend component and hence avoiding problems of spurious correlation arising from common trends, the resultant HP-filtered index of GDP may be interpreted as a measure of the output gap. The purpose here is to identify the short-run impact of discretionary fiscal 'shocks' on youth labour market outcomes.

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<sup>17</sup> See, for example, Mountford and Uhlig (2009).

<sup>18</sup> This approach has been adopted by a number of authors, but is most usually associated with Ramey and Shapiro (1998).

<sup>19</sup> At an earlier stage of this work we employed a HP-filter also to the fiscal policy variables which arguably accounts for persistence in fiscal policy, but not automatic stabilizers. Using this approach, the results were qualitatively similar although coefficients were less well defined.

<sup>20</sup> To be precise, the data are Hodrick-Prescott filtered using Ravn and Uhlig (2002)'s smoothing parameter of 1600 for quarterly data.

In what follows, we draw a further distinction between positive (surplus) and negative (deficit) budget balances to allow for differences in the reaction of youth labour market indicators to variations in fiscal policy according to whether the budget is in deficit or surplus<sup>21</sup>; thus, we allow for the possibility that the reaction of youth labour market indicators to fiscal policy is different when, for example, a surplus is increased as opposed to when a deficit is reduced. The expenditure and revenue to GDP ratios are intended to allow for the possibility – which, as noted above, has been commonly observed in the fiscal multiplier literature – of a differential impact of a tightening (or expansion) implemented via an increase in taxes versus a cut in spending. The government debt to GDP ratio is used as a further indicator of the fiscal stance, one that also captures the impact of debt servicing. Again, it was noted above that the size of government debt has been identified as a significant factor in determining the effects of fiscal policy; we suppose that this may be especially relevant during the period of the Euro zone crisis, when increasing interest rates on government borrowing contributed to increases in government debt not captured in the primary budget balance.

Finally, in order to allow for a (presumably) larger effect of fiscal stimulus during a recession each of the fiscal policy variables was also interacted with a business cycle or ‘recession’ dummy taking the value of one whenever the output gap was negative (i.e. with GDP below trend GDP), and zero otherwise.

Table 1 reports summary statistics of the variables used in the second stage regressions. Note that the means of all five fiscal variables (the three measures of discretionary fiscal policy and HP –filtered GDP and Debt) all have, by construction a zero mean.

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<sup>21</sup> Or rather, to be precise, whether or not the discretionary component of the budget was above or below its mean value.

**Table 1: Summary descriptive statistics for the variables included in the analysis**

Variable	Mean	Std. Dev.	Min	Max
Youth Unemployment rate	19.47	10.04	4.2	60
Youth Employment rate	37.79	14.41	11.5	72
Youth/adult unemployment ratio	2.64	0.62	1.1	5.8
Prevalence of long-term unemployment	26.66	14.63	2	64.3
Prevalence of temporary employment	36.44	16.74	6.9	70.2
(Discretionary) Budget balance	0	3.09	-25.1	14.2
(Discretionary) Expenditure	0	2.9	-13.8	22.6
(Discretionary) Revenue	0	2.69	-7.1	40.1
REAL GDP	0	5.05	-31.2	33.7
GOVDEBT	0	3.1	-17.9	18.3
EP TEMP	1.73	0.96	0.3	4.8
EP IND	2.41	0.66	1	4.6
EP COLL	3.16	0.76	1.63	5.13

## 4.2 Results

For each labour market outcome considered, eight regressions are reported comprising four different specifications; in each case, in versions without and with time fixed effects respectively. Specifications I and II use the Budget balance measure for discretionary fiscal policy, allowing for heterogeneity in the response of labour market outcomes according to whether the budget is in surplus (the default) or in deficit; as noted above, the regressions also include HP filtered government debt and real GDP (the output gap) as well as the additional institutional controls. The distinction between the two specifications is that II includes further interaction terms of the business cycle with the fiscal policy variables. That is, we allow the possibility of a different (presumably larger) effect of discretionary fiscal policy when the

economy is contracting (so that the output gap is negative) as opposed to when the economy is in expansion (and the output gap is positive). Specifications III and IV use the government expenditure and revenue measures of discretionary fiscal policy, in addition to the controls. Specification IV includes the business cycle interactions, while specification III does not. Finally, the first part of each table reports results without time fixed effects, whilst the second part includes them, in order to verify the robustness of the results.

#### **4.2.1. Youth Unemployment Rates**

The results of the youth unemployment rate regressions are presented in Tables 2a and 2b. Note that for specifications I and II, the default (named in bold) coefficient refers to the budget in surplus (specification I) or in surplus during expansion (specification II). The coefficients associated with variable names reported in italics (or bold and italics) are (double) interaction terms<sup>22</sup>. For the regressions including terms for government expenditure and revenue (specifications III and IV), the variable names in bold refer to their estimated effects during expansion and in italics to any difference in the effect arising during recession.

In all of the four specifications using the budget balance (surplus) and deficit variables, there is clear support for the idea that expansionary (contractionary) fiscal policy is associated with an improvement (worsening) of conditions in the youth labour market so long as the starting point is a relatively conservative one; an expansion which occurs through a reduction in the discretionary government budget surplus is associated with a reduction in youth unemployment. As one might expect, the effect is significantly stronger during recession. A reduction in the ‘discretionary’ surplus of one percentage point leads to a reduction in youth unemployment of the order of 0.2 percentage points during expansion and roughly twice that, around 0.5 percentage points, during a recession.

These magnitudes are broadly in line with (albeit a little smaller than) the estimates of Monacelli, et. al. (2011), although their analysis refers to the response of overall unemployment to a one percentage point increase in government spending. A point we shall return to below. If the budget is in deficit however, the positive expansionary effects are essentially cancelled out and may even become negative (although one may observe that the estimated negative effect is not statistically significant)<sup>23</sup>.

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<sup>22</sup> Thus, looking at specification II in table 2a, the estimated effect of a 1 percentage point reduction in the budget surplus will be to reduce youth unemployment rate by 0.19 percentage points during an expansion and 0.51 (= 0.19 + 0.32) during a recession.

<sup>23</sup> For example, again using specification II from table 2a, the estimated effect of a 1 percentage point increase in the budget deficit is to *increase* youth unemployment by 0.25 percentage points during expansion and by 0.24 during recession although in neither case is the estimated difference from zero statistically significant at conventional levels.

Table 2a: Youth Unemployment Rate regression; GLS, no time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.33***</b>	0.19		
	[0.112]	[0.118]		
- <i>BB in Deficit</i>	<b>-0.56***</b>	<b>-0.44**</b>		
	[0.181]	[0.184]		
- <i>BB during Recession</i>		<b>0.32***</b>		
		[0.085]		
- <i>BB in Deficit &amp; Recession</i>		<b>-0.31***</b>		
		[0.117]		
<b>Expenditure</b>			0.10	0.12*
			[0.063]	[0.069]
- <i>EXP during recession</i>				-0.09
				[0.081]
<b>Revenue</b>			0.08	-0.01
			[0.068]	[0.078]
- <i>REV during recession</i>				<b>0.17**</b>
				[0.072]
<b>REAL GDP</b>	-0.39	-0.25	-0.39	-0.45
	[0.355]	[0.365]	[0.356]	[0.356]
<b>GOVDEBT</b>	<b>0.41***</b>	<b>0.38***</b>	<b>0.42***</b>	<b>0.40***</b>
	[0.059]	[0.059]	[0.059]	[0.059]
<b>EP TEMP</b>	<b>-3.90***</b>	<b>-3.84***</b>	<b>-4.06***</b>	<b>-4.05***</b>
	[0.559]	[0.556]	[0.560]	[0.559]
<b>EP IND</b>	<b>-17.45***</b>	<b>-16.84***</b>	<b>-17.75***</b>	<b>-17.73***</b>
	[1.221]	[1.204]	[1.225]	[1.224]
<b>EP COLL</b>	1.62*	1.35	1.70*	1.73*
	[0.934]	[0.923]	[0.936]	[0.935]
Intercept	<b>62.34***</b>	<b>61.60***</b>	<b>63.69***</b>	<b>63.57***</b>
	[4.111]	[4.017]	[4.126]	[4.124]
Time FEs?	No	No	No	No
Observations	947	947	947	947
R <sup>2</sup>	0.343	0.352	0.341	0.345

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

Table 2b: Youth Unemployment Rate regression, GLS, time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.28**</b>	0.16		
	[0.108]	[0.114]		
- <i>BB in Deficit</i>	<b>-0.39**</b>	-0.28		
	[0.174]	[0.177]		
- <i>BB during Recession</i>		<b>0.27***</b>		
		[0.085]		
- <i>BB in Deficit &amp; Recession</i>		<b>-0.33***</b>		
		[0.117]		
<b>Expenditure</b>			0.07	0.07
			[0.065]	[0.071]
- <i>EXP during recession</i>				-0.01
				[0.079]
<b>Revenue</b>			0.09	0.03
			[0.066]	[0.076]
- <i>REV during recession</i>				0.11
				[0.068]
<b>REAL GDP</b>	-0.35	0.42	0.38	0.35
	[0.387]	[0.388]	[0.389]	[0.389]
<b>GOVDEBT</b>	<b>0.18**</b>	<b>0.16**</b>	<b>0.19***</b>	<b>0.19***</b>
	[0.071]	[0.071]	[0.071]	[0.071]
<b>EP TEMP</b>	<b>-4.14***</b>	<b>-4.18***</b>	<b>-4.24***</b>	<b>-4.25***</b>
	[0.522]	[0.519]	[0.522]	[0.521]
<b>EP IND</b>	<b>-12.19***</b>	<b>-12.04***</b>	<b>-12.19***</b>	<b>-12.23***</b>
	[1.253]	[1.249]	[1.253]	[1.256]
<b>EP COLL</b>	<b>3.30***</b>	<b>3.12***</b>	<b>3.35***</b>	<b>3.35***</b>
	[0.883]	[0.880]	[0.883]	[0.883]
Intercept	<b>48.95***</b>	<b>49.42***</b>	<b>49.40***</b>	<b>49.49***</b>
	[4.156]	[4.136]	[4.162]	[4.173]
Time FEs?	Yes	Yes	Yes	Yes
Observations	947	947	947	947
R <sup>2</sup>	0.46	0.466	0.458	0.46

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.



The results for discretionary government expenditure and revenue are weaker; indeed, with time fixed effects their estimated impacts are never statistically significant and in table 2a, specification IV, increased government expenditure is associated with an increase in youth unemployment. The estimated effect is, however, small and weak; of more significance, both statistical and economic, appears to be the variations in revenue which, during recessions, appear to provide a statistically significant stimulus during recessions (although the effect is not robust to the inclusion of fixed time effects).

Overall, the results are broadly consistent with previous findings on the aggregate labour market; expansionary fiscal policy is particularly effective during recession, when the government budget is in surplus and when it is achieved through a reduction in taxation rather than through increased expenditure. Thus, the results suggest that countercyclical fiscal policy is effective for countries that are already running surpluses at the onset of the recession. Put another way, countries which also use countercyclical fiscal policy in the sense of running surpluses in good times are most able to benefit from reducing those surpluses when a recession hits.

#### ***4.2.2. Ratio of Youth to Prime Aged Unemployment Rates***

The results of the regressions presented in Tables 3a and 3b estimate the effects of fiscal policy on the relative unemployment rates of young people compared to prime-age (25-54) adults. The small size of the coefficients across the board suggests that fiscal policy affects youth and prime-aged unemployment in broadly similar ways and the results are fairly consistent across all specifications. The small, positive and statistically significant coefficient on budget balance implies that expansionary fiscal policy is a little more effective for young people than for prime age adults. A similar conclusion may be drawn from the small, positive and statistically significant coefficient on government revenues. This notion is further supported by the small negative coefficient on government debt which, however, loses statistical significance with the inclusion of time fixed effects.

As for the controls, an increase in the level of employment protection for temporary contracts consistently raises youth unemployment rates relative to those of prime aged workers. This is intuitive, as young people are more likely to be reliant on temporary contracts, and their stricter regulation might cause these jobs to disappear altogether. In contrast, the negative coefficient on the collective dismissals index suggests that stronger regulation of collective dismissals weakens the relative position of adults. This too is intuitively plausible.

Table 3a: Ratio of youth (15-24) unemployment rates to prime-age (25-54) adult unemployment rates, no time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b><i>0.03</i></b> <sup>***</sup>	<b><i>0.02</i></b> <sup>***</sup>		
	[0.007]	[0.008]		
- <i>BB in Deficit</i>	<b><i>-0.02</i></b> <sup>**</sup>	<i>-0.02</i> <sup>*</sup>		
	[0.011]	[0.012]		
- <i>BB during Recession</i>		0.01		
		[0.005]		
- <b><i>BB in Deficit &amp; Recession</i></b>		-0.01		
		[0.007]		
<b>Expenditure</b>			-0.00	-0.00
			[0.004]	[0.004]
- <i>EXP during recession</i>				0.00
				[0.005]
<b>Revenue</b>			<b><i>0.01</i></b> <sup>***</sup>	<b><i>0.01</i></b> <sup>**</sup>
			[0.004]	[0.005]
- <i>REV during recession</i>				-0.00
				[0.005]
<b>REAL GDP</b>	<b><i>0.09</i></b> <sup>***</sup>	<b><i>0.09</i></b> <sup>***</sup>	<b><i>0.09</i></b> <sup>***</sup>	<b><i>0.09</i></b> <sup>***</sup>
	[0.023]	[0.023]	[0.023]	[0.023]
<b>GOVDEBT</b>	<b><i>-0.01</i></b> <sup>***</sup>	<b><i>-0.01</i></b> <sup>***</sup>	<b><i>-0.01</i></b> <sup>***</sup>	<b><i>-0.01</i></b> <sup>***</sup>
	[0.004]	[0.004]	[0.004]	[0.004]
<b>EP TEMP</b>	<b><i>0.15</i></b> <sup>***</sup>	<b><i>0.14</i></b> <sup>***</sup>	<b><i>0.14</i></b> <sup>***</sup>	<b><i>0.14</i></b> <sup>***</sup>
	[0.036]	[0.036]	[0.036]	[0.036]
<b>EP IND</b>	-0.04	-0.04	-0.05	-0.05
	[0.078]	[0.079]	[0.078]	[0.079]
<b>EP COLL</b>	<b><i>-0.19</i></b> <sup>***</sup>	<b><i>-0.20</i></b> <sup>***</sup>	<b><i>-0.19</i></b> <sup>***</sup>	<b><i>-0.19</i></b> <sup>***</sup>
	[0.059]	[0.060]	[0.059]	[0.060]
Intercept	<b><i>3.06</i></b> <sup>***</sup>	<b><i>3.05</i></b> <sup>***</sup>	<b><i>3.11</i></b> <sup>***</sup>	<b><i>3.10</i></b> <sup>***</sup>
	[0.261]	[0.267]	[0.261]	[0.268]
Time Fes?	No	No	No	No
Observations	947	947	947	947
R <sup>2</sup>	0.069	0.07	0.059	0.059

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

Table 3b: Ratio of youth (15-24) unemployment rates to prime-age (25-54) adult unemployment rates, time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.03<sup>***</sup></b>	<b>0.02<sup>***</sup></b>		
	[0.007]	[0.008]		
- <i>BB in Deficit</i>	-0.02	-0.01		
	[0.012]	[0.012]		
- <i>BB during Recession</i>		0.01		
		[0.006]		
- <b><i>BB in Deficit &amp; Recession</i></b>		<b>-0.01<sup>*</sup></b>		
		[0.008]		
<b>Expenditure</b>			-0.00	-0.00
			[0.004]	[0.005]
- <i>EXP during recession</i>				0.00
				[0.005]
<b>Revenue</b>			<b>0.02<sup>***</sup></b>	<b>0.02<sup>***</sup></b>
			[0.004]	[0.005]
- <i>REV during recession</i>				-0.00
				[0.005]
<b>REAL GDP</b>	<b>0.11<sup>***</sup></b>	<b>0.11<sup>***</sup></b>	<b>0.11<sup>***</sup></b>	<b>0.11<sup>***</sup></b>
	[0.026]	[0.026]	[0.026]	[0.026]
<b>GOVDEBT</b>	-0.01	-0.01	-0.01	-0.00
	[0.005]	[0.005]	[0.005]	[0.005]
<b>EP TEMP</b>	<b>0.15<sup>***</sup></b>	<b>0.14<sup>***</sup></b>	<b>0.15<sup>***</sup></b>	<b>0.15<sup>***</sup></b>
	[0.035]	[0.035]	[0.035]	[0.035]
<b>EP IND</b>	0.05	0.07	0.07	0.08
	[0.084]	[0.085]	[0.085]	[0.086]
<b>EP COLL</b>	<b>-0.11<sup>*</sup></b>	<b>-0.12<sup>**</sup></b>	<b>-0.11<sup>*</sup></b>	<b>-0.11<sup>*</sup></b>
	[0.059]	[0.060]	[0.060]	[0.060]
Intercept	<b>2.50<sup>***</sup></b>	<b>2.51<sup>***</sup></b>	<b>2.49<sup>***</sup></b>	<b>2.47<sup>***</sup></b>
	[0.278]	[0.282]	[0.283]	[0.291]
Time Fes?	Yes	Yes	Yes	Yes
Observations	947	947	947	947
R <sup>2</sup>	0.165	0.169	0.157	0.158

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by **\*\*\***;  $p < .05$  is indicated by **coefficients reported in bold** AND by **\*\***; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by **\***.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

### **4.2.3. Youth Employment Rates**

The results of the youth employment rate regressions are presented in tables 4a and 4b. In the regressions which use which use the deficit and surplus variables – that is, specifications I and II without time fixed effects – a fiscal expansion which occurs through a reduction in the government budget surplus is associated with higher rates of youth employment. The effects are consistent with the estimated effects of fiscal expansion on youth unemployment reported above although these are somewhat weaker in this case, possibly due to educational participation effects. Expansionary fiscal policy increases employment so long as the budget is in surplus; and the effect is particularly pronounced during recessions.

Thus, the evidence suggests also here that there is value in truly countercyclical fiscal policy. Increasing the deficit is on average harmful to youth employment rates, as evidenced by the positive and statistically significant coefficient on the deficit variable. This suggests that entering a recession in fiscal surplus better places one to benefit from countercyclical fiscal policy, as cutting surpluses is beneficial to youth employment rates. While the results using measures of government deficits and surpluses are broadly supportive of countercyclical fiscal policy, the coefficients on the expenditure and revenue to GDP variables in specifications III and IV are less so. The estimated effects are much weaker when time fixed effects are included, however, the estimated effects of increasing expenditure and reducing revenue are damaging to youth employment during expansion and rather weakly supportive during recessions.

As for the controls, strengthening employment protection for both temporary and individual contracts increases youth employment rates across all specifications, whilst strengthening the regulation of collective dismissals tends to reduce youth employment although, in this case, the effects are only statistically significant when time fixed effects are included.

Table 4a: Youth employment rates, no time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>-0.19**</b>	-0.03		
	[0.080]	[0.082]		
- <i>BB in Deficit</i>	<b>0.48***</b>	<b>0.37***</b>		
	[0.128]	[0.128]		
- <i>BB during Recession</i>		<b>-0.37***</b>		
		[0.059]		
- <i>BB in Deficit &amp; Recession</i>		<b>0.19**</b>		
		[0.081]		
<b>Expenditure</b>			<b>-0.15***</b>	<b>-0.20***</b>
			[0.045]	[0.048]
- <i>EXP during recession</i>				<b>0.22***</b>
				[0.057]
<b>Revenue</b>			0.06	<b>0.21***</b>
			[0.049]	[0.055]
- <i>REV during recession</i>				<b>-0.29***</b>
				[0.050]
<b>REAL GDP</b>	0.15	0.14	0.15	0.25
	[0.253]	[0.253]	[0.253]	[0.249]
<b>GOVDEBT</b>	<b>-0.28***</b>	<b>-0.24***</b>	<b>-0.28***</b>	<b>-0.25***</b>
	[0.042]	[0.041]	[0.042]	[0.041]
<b>EP TEMP</b>	<b>1.06***</b>	<b>1.09***</b>	<b>1.21***</b>	<b>1.20***</b>
	[0.407]	[0.397]	[0.408]	[0.400]
<b>EP IND</b>	<b>12.58***</b>	<b>12.75***</b>	<b>12.87***</b>	<b>12.84***</b>
	[0.942]	[0.922]	[0.945]	[0.930]
<b>EP COLL</b>	0.00	0.05	-0.08	-0.11
	[0.710]	[0.694]	[0.712]	[0.700]
Intercept	6.22	5.57	5.03	5.16
	[4.249]	[4.353]	[4.361]	[4.506]
Time FEs?	No	No	No	No
Observations	947	947	947	947
R <sup>2</sup>	0.261	0.299	0.257	0.285

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.  
2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

**Table 4b: Youth employment rates, with time fixed effects (standard errors in parentheses).**

Variable	I	II	III	IV
<b>Budget balance</b>	-0.06	0.03		
	[0.070]	[0.073]		
- <i>BB in Deficit</i>	<b>0.23**</b>	0.19*		
	[0.112]	[0.113]		
- <i>BB during Recession</i>		<b>-0.22***</b>		
		[0.054]		
- <i>BB in Deficit &amp; Recession</i>		0.08		
		[0.075]		
<b>Expenditure</b>			<b>-0.09**</b>	<b>-0.11**</b>
			[0.042]	[0.045]
- <i>EXP during recession</i>				0.10*
				[0.050]
<b>Revenue</b>			0.08*	<b>0.20***</b>
			[0.043]	[0.048]
- <i>REV during recession</i>				<b>-0.23***</b>
				[0.043]
<b>REAL GDP</b>	-0.13	-0.08	-0.11	-0.03
	[0.249]	[0.248]	[0.251]	[0.247]
<b>GOVDEBT</b>	<b>-0.19***</b>	<b>-0.18***</b>	<b>-0.19***</b>	<b>-0.18***</b>
	[0.046]	[0.045]	[0.046]	[0.045]
<b>EP TEMP</b>	<b>1.08***</b>	<b>1.09***</b>	<b>1.16***</b>	<b>1.16***</b>
	[0.345]	[0.340]	[0.345]	[0.339]
<b>EP IND</b>	<b>6.71***</b>	<b>6.82***</b>	<b>6.76***</b>	<b>6.72***</b>
	[0.890]	[0.882]	[0.890]	[0.878]
<b>EP COLL</b>	<b>-1.60***</b>	<b>-1.53**</b>	<b>-1.66***</b>	<b>-1.60***</b>
	[0.608]	[0.602]	[0.608]	[0.599]
Intercept	<b>20.87***</b>	<b>20.26***</b>	<b>20.45***</b>	<b>20.35***</b>
	[4.058]	[4.156]	[4.087]	[4.278]
Time FEs?	Yes	Yes	Yes	Yes
Observations	947	947	947	947
R <sup>2</sup>	0.506	0.52	0.505	0.521

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and **in bold and in italics** indicates a double interaction.

#### **4.2.4. The prevalence of long-term unemployment amongst young people**

Another area of specific concern during the recent recession has been the rapidly growing rates of long-term unemployment amongst young people. As noted above, between 2007 and 2014 the prevalence of long-term unemployment amongst young people increased by 30% whilst for prime-age (25-49 year old) adults the corresponding increase was less than 10% (O'Higgins, 2016). As with youth unemployment rates as a whole, the results (tables 5a and 5b) suggest that expansionary fiscal policy is supportive of a reduction in long-term unemployment so long as the budget is in surplus, although, in contrast to youth unemployment rates per se, the effects of fiscal policy on long-term unemployment does not seem to vary much over the cycle. The results also suggest that increasing expenditure and reducing revenue both tend to reduce the prevalence of long-term unemployment amongst young people although the effect is rather weak and tends to disappear when time fixed effects are introduced. The effect sizes are, in absolute terms, a little smaller than the effects on youth unemployment; this, along with lack of difference in the effects over the cycle suggest that discretionary fiscal policy is likely to be a rather weak tool to deal with longer-term 'lost generation' effects of recessions. Certainly there is room for additional targeted interventions specifically aimed at reducing long-term unemployment amongst young people. In other words, discretionary fiscal policy is no substitute for the Youth Guarantee currently being implemented throughout Europe although it may play a useful complementary role.

Table 5a: Prevalence of long term (over one year) unemployment amongst young people, no time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.26**</b>	<b>0.26**</b>		
	[0.118]	[0.124]		
- <i>BB in Deficit</i>	<b>-0.42**</b>	<b>-0.46**</b>		
	[0.189]	[0.192]		
- <i>BB during Recession</i>		-0.01		
		[0.089]		
- <i>BB in Deficit &amp; Recession</i>		0.18		
		[0.122]		
<b>Expenditure</b>			-0.12*	-0.11
			[0.066]	[0.072]
- <i>EXP during recession</i>				-0.04
				[0.085]
<b>Revenue</b>			0.11	0.08
			[0.072]	[0.083]
- <i>REV during recession</i>				0.06
				[0.075]
<b>REAL GDP</b>	0.10	-0.06	0.11	0.09
	[0.367]	[0.377]	[0.368]	[0.369]
<b>GOVDEBT</b>	<b>0.40***</b>	<b>0.40***</b>	<b>0.42***</b>	<b>0.42***</b>
	[0.064]	[0.064]	[0.064]	[0.064]
<b>EP TEMP</b>	<b>-1.60***</b>	<b>-1.58***</b>	<b>-1.66***</b>	<b>-1.66***</b>
	[0.588]	[0.588]	[0.588]	[0.589]
<b>EP IND</b>	<b>-7.80***</b>	<b>-8.02***</b>	<b>-7.77***</b>	<b>-7.92***</b>
	[1.362]	[1.365]	[1.358]	[1.368]
<b>EP COLL</b>	<b>5.00***</b>	<b>5.13***</b>	<b>5.17***</b>	<b>5.19***</b>
	[1.140]	[1.143]	[1.136]	[1.144]
Intercept	<b>30.72***</b>	<b>30.90***</b>	<b>30.67***</b>	<b>30.97***</b>
	[5.038]	[5.065]	[4.967]	[5.144]
Time FEs?	No	No	No	No
Observations	878	878	878	878
R <sup>2</sup>	0.113	0.117	0.112	0.113

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, *indented in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.



Table 5b: Prevalence of long term (over one year) unemployment amongst young people, time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	0.11	0.10		
	[0.117]	[0.123]		
- <i>BB in Deficit</i>	-0.35*	<b>-0.38**</b>		
	[0.188]	[0.191]		
- <i>BB during Recession</i>		0.03		
		[0.091]		
- <i>BB in Deficit &amp; Recession</i>		0.10		
		[0.127]		
<b>Expenditure</b>			-0.02	-0.01
			[0.070]	[0.076]
- <i>EXP during recession</i>				-0.03
				[0.086]
<b>Revenue</b>			-0.00	-0.04
			[0.072]	[0.082]
- <i>REV during recession</i>				0.07
				[0.074]
<b>REAL GDP</b>	<b>-0.87**</b>	<b>-0.94**</b>	<b>-0.88**</b>	<b>-0.90**</b>
	[0.414]	[0.415]	[0.417]	[0.416]
<b>GOVDEBT</b>	<b>0.30***</b>	<b>0.30***</b>	<b>0.31***</b>	<b>0.30***</b>
	[0.079]	[0.079]	[0.079]	[0.079]
<b>EP TEMP</b>	<b>-1.80***</b>	<b>-1.80***</b>	<b>-1.89***</b>	<b>-1.91***</b>
	[0.569]	[0.570]	[0.570]	[0.571]
<b>EP IND</b>	<b>-3.77**</b>	<b>-4.14***</b>	<b>-3.98***</b>	<b>-4.30***</b>
	[1.489]	[1.516]	[1.495]	[1.531]
<b>EP COLL</b>	<b>4.62***</b>	<b>4.63***</b>	<b>4.85***</b>	<b>4.79***</b>
	[1.112]	[1.128]	[1.115]	[1.135]
Intercept	<b>28.06***</b>	<b>28.83***</b>	<b>28.29***</b>	<b>29.22***</b>
	[5.377]	[6.109]	[5.478]	[7.273]
Time FEs?	Yes	Yes	Yes	Yes
Observations	878	878	878	878
R <sup>2</sup>	0.236	0.239	0.232	0.233

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

#### **4.2.5. The prevalence of temporary employment amongst young people**

A final area of investigation concerns the possible effects of fiscal policy on temporary employment amongst young workers. The prevalence of temporary employment forms has been steadily rising in the EU certainly since the mid-1990s; this is particularly so in countries characterized by dual labour markets such as Italy and Spain. Although the recession slowed the upward trend, by 2014, over 43% of young European Union were in temporary contracts as compared to, for example, less than 13% of prime-aged (25-49 year old) workers.

The estimation of the prevalence of temporary employment amongst young workers produces perhaps the clearest results thus far. With a budget in surplus and the economy in expansion, expansionary (contractionary) fiscal policy is clearly associated with a reduction (increase) in the prevalence of temporary employment amongst young people. Under these conditions, a reduction of 1 percentage point in the budget surplus is associated with a reduction of between .20 and .34 percentage points in the prevalence of temporary employment. Similarly an increase in government expenditure or a reduction in government revenue are associated with a reduction in temporary employment, always on condition that the economy is expanding. Here too the entity of the effect is similar to the budget surplus as a whole. A one percentage point increase in expenditure or reduction in revenue leads to a reduction of around 0.1 – 0.2 percentage points in temporary employment. The effect all but disappears when the economy is in recession and/or when the budget is in deficit.

Table 6a: Prevalence of temporary employment amongst young workers, no time fixed effects (standard errors in parentheses).

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.20**</b>	<b>0.34***</b>		
	[0.100]	[0.104]		
- <i>BB in Deficit</i>	-0.24	<b>-0.35**</b>		
	[0.160]	[0.162]		
- <i>BB during Recession</i>		<b>-0.31***</b>		
		[0.075]		
- <i>BB in Deficit &amp; Recession</i>		<b>0.26**</b>		
		[0.103]		
<b>Expenditure</b>			-0.10*	<b>-0.16***</b>
			[0.056]	[0.061]
- <i>EXP during recession</i>				<b>0.19***</b>
				[0.072]
<b>Revenue</b>			0.11*	<b>0.17**</b>
			[0.061]	[0.070]
- <i>REV during recession</i>				<b>-0.14**</b>
				[0.063]
<b>REAL GDP</b>	0.03	-0.06	0.04	0.08
	[0.315]	[0.320]	[0.315]	[0.314]
<b>GOVDEBT</b>	0.09*	<b>0.12**</b>	0.10*	<b>0.11**</b>
	[0.052]	[0.052]	[0.052]	[0.052]
<b>EP TEMP</b>	<b>1.38***</b>	<b>1.39***</b>	<b>1.36***</b>	<b>1.34***</b>
	[0.508]	[0.504]	[0.508]	[0.505]
<b>EP IND</b>	<b>-9.98***</b>	<b>-10.11***</b>	<b>-9.99***</b>	<b>-10.12***</b>
	[1.185]	[1.179]	[1.185]	[1.183]
<b>EP COLL</b>	0.72	0.86	0.78	0.78
	[0.885]	[0.880]	[0.884]	[0.882]
Intercept	<b>55.87***</b>	<b>55.71***</b>	<b>56.01***</b>	<b>56.34***</b>
	[5.216]	[5.412]	[5.231]	[5.435]
Time FEs?	No	No	No	No
Observations	939	939	939	939
R <sup>2</sup>	0.093	0.111	0.094	0.102

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

**Table 6b: Prevalence of temporary employment amongst young workers, time fixed effects (standard errors in parentheses).**

Variable	I	II	III	IV
<b>Budget balance</b>	<b>0.19**</b>	<b>0.27***</b>		
	[0.089]	[0.094]		
- <i>BB in Deficit</i>	-0.14	-0.18		
	[0.144]	[0.146]		
- <i>BB during Recession</i>		<b>-0.19***</b>		
		[0.070]		
- <b>BB in Deficit &amp; Recession</b>		0.08		
		[0.096]		
<b>Expenditure</b>			-0.05	-0.08
			[0.054]	[0.058]
- <i>EXP during recession</i>				0.09
				[0.065]
<b>Revenue</b>			<b>0.13**</b>	<b>0.22***</b>
			[0.055]	[0.063]
- <i>REV during recession</i>				<b>-0.17***</b>
				[0.056]
<b>REAL GDP</b>	-0.30	-0.27	-0.27	-0.21
	[0.319]	[0.319]	[0.321]	[0.320]
<b>GOVDEBT</b>	<b>0.13**</b>	<b>0.13**</b>	<b>0.13**</b>	<b>0.14**</b>
	[0.059]	[0.059]	[0.059]	[0.059]
<b>EP TEMP</b>	<b>1.45***</b>	<b>1.45***</b>	<b>1.45***</b>	<b>1.43***</b>
	[0.442]	[0.439]	[0.442]	[0.440]
<b>EP IND</b>	<b>-4.53***</b>	<b>-4.66***</b>	<b>-4.39***</b>	<b>-4.55***</b>
	[1.145]	[1.145]	[1.143]	[1.140]
<b>EP COLL</b>	<b>2.37***</b>	<b>2.50***</b>	<b>2.36***</b>	<b>2.43***</b>
	[0.777]	[0.775]	[0.776]	[0.773]
Intercept	<b>41.33***</b>	<b>41.13***</b>	<b>41.16***</b>	<b>41.31***</b>
	[4.961]	[5.550]	[4.807]	[4.981]
Time FEs?	Yes	Yes	Yes	Yes
Observations	939	939	939	939
R <sup>2</sup>	0.364	0.372	0.363	0.37

Notes: 1) Statistical significance of the coefficients is indicated as follows:  $p < .01$  is indicated by **coefficients reported in bold and italics** AND by \*\*\*;  $p < .05$  is indicated by **coefficients reported in bold** AND by \*\*; and,  $p < .10$  is indicated by *coefficients reported in italics* AND by \*.

2) variable names **in bold** indicate base coefficient estimates, indented *in italics* indicates an interaction term and ***in bold and in italics*** indicates a double interaction.

## 5. Conclusions and Policy Recommendations

The results presented here provide clear evidence that countercyclical fiscal policy is an instrument well-suited to ameliorating youth unemployment; although they also suggest that the instrument is more effective if preceded by a relatively conservative fiscal policy in non-recessionary circumstances – if one likes, a fully countercyclical fiscal policy with fiscal expansion during recessions and contraction during periods of growth. Decreasing the budget surplus, particularly during a recession, leads to substantial reductions in youth unemployment rates. Reducing the discretionary surplus by one percentage point is associated with an immediate decrease in youth unemployment of between 0.33 and 0.51 percentage points. Equally importantly, decreasing the budget surplus by one percentage point relative to trend is also associated with an increase in the rate of youth employment of between 0.19 and 0.34 percentage points. Thus, the traditional Keynesian prescription of countercyclical fiscal policy is upheld. In order to reduce youth unemployment and increase youth employment, governments should increase expenditure and reduce taxation during recessions, whilst doing the opposite in when the economy is expanding.

On a slightly more nuanced note, increasing an existing deficit is much less effective than reducing an existing surplus in combatting youth unemployment or promoting youth employment rates; countercyclical fiscal policy is clearly more effective for countries that are already running surpluses at the onset of recession. That is, countries which also stabilise by running surpluses in good times are most able to benefit from reducing those surpluses when a recession hits.

The impact of fiscal policy on the youth/prime-age unemployment ratio is rather less marked; this suggests that the impact of fiscal policy does not differ very much between the youth labour market and the labour market for prime age adults. There is a positive and statistically significant effect implying that expansionary fiscal policy is *slightly* more effective for young people; although statistically significant, the size of the coefficient is very small. This does imply, however, that since youth unemployment is higher in absolute terms (especially in recession), any positive impacts will be larger (in absolute terms) for young people. Perhaps more detail – in terms of the destination of expenditure and the source of revenue might change this picture, however, on the basis of the evidence presented here, youth unemployment rates are responsive to fiscal policy (slightly more than) proportionately to adult rates; this is consistent with the empirical regularity noted above that youth and adult unemployment rates respond more or less proportionately to the business cycle. Perhaps of equal importance in this context, stronger regulation of temporary employment contracts is also associated with a higher youth/adult unemployment ratio.

The analysis also went onto examine the effects of discretionary fiscal policy on long-term unemployment and temporary employment forms. Here the evidence suggests that expansionary fiscal policy can reduce the prevalence of long-term unemployment, again so long as the budget is in surplus, although in this case the

effect does not vary with the cycle. It would moreover appear that expansionary fiscal policy tends to reduce the rate of temporary employment at least during periods of expansion (and budget surplus).

All-in-all, the picture is one in which fiscal policy can play a useful role in ameliorating problems in youth labour markets due to insufficient aggregate demand. The results suggest that expansionary policy during recession is at least as effective for young people as it is for adults, and may also go some way to mitigating some of the specific problems facing European youth labour markets today such as the increasing duration of unemployment and the falling duration of employment contracts. However, it is clear that such demand management policies can complement but cannot replace action also at the microeconomic and institutional levels. The moderate size of the effects of fiscal policy on youth labour market outcomes and, in particular, on long-term youth unemployment, are clearly supportive of the idea that direct intervention in youth labour markets through, for example, Active Labour Market Programmes (ALMPs) in general and the Youth Guarantee in particular is also called for.

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