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# **IMF Working Paper**

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## **The (Subjective) Well-Being Cost of Fiscal Policy Shocks**

by Kodjovi M. Eklou  
Mamour Fall

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I N T E R N A T I O N A L M O N E T A R Y F U N D

**IMF Working Paper**

European Department

**The (Subjective) Well-Being Cost of Fiscal Policy Shocks \***

**Prepared by Kodjovi M. Eklou, and Mamour Fall**

Authorized for distribution by Rachel van Elkan

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**Abstract**

Do discretionary spending cuts and tax increases hurt social well-being? To answer this question, we combine subjective well-being data covering over half a million of individuals across 13 European countries, with macroeconomic data on fiscal consolidations. We find that fiscal consolidations reduce individual well-being in the short run, especially when they are based on spending cuts. In addition, we show that accompanying monetary and exchange rate policies (disinflation, depreciations and the liberalization of capital flows) mitigate the well-being cost of fiscal consolidations. Finally, we investigate the well-being consequences of the two well-knowns expansionary fiscal consolidations episodes taking place in the 80s (in Denmark and Ireland). We find that even expansionary fiscal consolidations can have well-being costs. Our results may therefore shed some light on why some governments may choose to consolidate through taxes even at the cost of economic growth. Indeed, if spending cuts are to generate a large well-being loss, they can trigger an opposition and protest against a fiscal consolidation plan and hence making it politically costly.

JEL Classification Numbers: D69; E62; H20; H5; I3; N10

Keywords: Fiscal Consolidations; Subjective Well-Being; Spending cuts; Tax hikes

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# The (subjective) well-being cost of fiscal policy shocks \*

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## Abstract

Do discretionary spending cuts and tax increases hurt social well-being? To answer this question, we combine subjective well-being data covering over half a million of individuals across 13 European countries, with macroeconomic data on fiscal consolidations. We find that fiscal consolidations reduce individual well-being in the short run, especially when they are based on spending cuts. In addition, we show that accompanying monetary and exchange rate policies (disinflation, depreciations and the liberalization of capital flows) mitigate the well-being cost of fiscal consolidations. Finally, we investigate the well-being consequences of the two well-known expansionary fiscal consolidations episodes taking place in the 80s (in Denmark and Ireland). We find that even expansionary fiscal consolidations can have well-being costs. Our results may therefore shed some light on why some governments may choose to consolidate through taxes even at the cost of economic growth. Indeed, if spending cuts are to generate a large well-being loss, they can trigger an opposition and protest against a fiscal consolidation plan and hence making it politically costly.

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“The relevance of economic performance is that it may be a means to an end. That end is not the consumption of beefburgers, nor the accumulation of television sets, nor the vanquishing of some high level of interest rates, but rather the enrichment of mankind’s feeling of well-being. Economic things matter only in so far as they make people happier.”  
, Oswald (1997)

## Introduction

The European sovereign debt crisis has triggered controversial fiscal consolidation plans. On November 14, 2012, the European Day of Action and Solidarity was marked by millions of workers that engaged in anti-austerity strikes in twenty-three countries across Europe.<sup>1</sup> The debate on the effects of fiscal consolidations is unsettled. The Keynesian view is that spending cuts and tax increases will have recessionary consequences. In this vein, Paul Krugman characterized fiscal consolidation plans as ‘economic blood-letting’.<sup>2</sup> However, there is also the so-called “anti-Keynesian” view suggesting that fiscal consolidations can have expansionary effects by raising the confidence of households.

There is widespread recognition that GDP measures or GDP per capita provides only limited understanding of households’ economic well-being, particularly, following Stiglitz, Sen and Fitoussi (2009). We thus go beyond the GDP to investigate the consequences of fiscal consolidations. This paper empirically investigates the subjective well-being costs of fiscal consolidations in Europe. Fiscal consolidations may have an effect on individual well-being both directly and indirectly. They can affect directly affect individual well-being by either reducing disposable income and thus consumption (when they are based on tax hikes) or either by reducing the provision of public goods (when they are based on spending cuts). These fiscal consolidations can also indirectly affect individual well-being via their effects on the macroeconomic environment. We take a novel approach to assess the effects of fiscal consolidations by exploiting microeconomic data on individual (subjective) well-being.<sup>3</sup> In addition, inspired by the seminal work of Giavazzi and Pagano (1990) on two historical expansionary fiscal consolidations in the 80s, we explore two issues. First, we analyze the role for potential mitigating policies and second, we investigate the well-being consequences of these two expansionary fiscal consolidations that took place in Denmark and in Ireland. To the best of our knowledge this paper is the first to investigate the well-being cost of fiscal consolidations.

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<sup>1</sup>Source:<https://www.rt.com/news/austerity-protests-eu-solidarity-727/>

More recently, in November 2018, a fuel tax increase has triggered the so-called yellow vest movement in France.

<sup>2</sup>Source: The New York Times, September 2011. <http://www.nytimes.com/2011/09/19/opinion/economic-bleeding-cure.html>

<sup>3</sup>In this paper we use interchangeably the terms ‘individual well-being’ and ‘individual life satisfaction’. The literature also refers to this measure as a happiness measure. See for instance Frey and Stutzer (2000).

Our empirical analysis combines subjective well-being data covering over a half million of individuals across 13 European countries, with macroeconomic data on fiscal consolidations over the period 1980-2007. We rely on the exogeneity of fiscal consolidations identified with the narrative approach (à la Romer and Romer, 2010) to investigate the well-being consequences of discretionary tax increases and spending cuts. We find that fiscal consolidations have a negative effect on individual well-being in the short run, especially when they are based on spending cuts. This finding brings a new perspective relative to the literature that shows that spending based fiscal consolidations have lower output cost compared to tax based fiscal consolidations (Alesina and Perotti, 1997; Alesina and Ardagna, 2010 among others). In addition, accompanying monetary policies (disinflation), exchange rate policies (devaluations or depreciations) and the liberalization of capital flows help in dampening the well-being cost of fiscal consolidations. Furthermore, we find that unemployed individuals are particularly vulnerable to fiscal consolidation shocks. Additional investigations using granular data on fiscal consolidation composition suggests that tax-based fiscal consolidations relying on property tax and indirect taxes may be the least costly for individual well-being.

Finally, we conduct a country-specific analysis on two countries (Denmark and Ireland), providing two main lessons. Firstly, even expansionary fiscal consolidations could generate well-being costs. In particular, an expansionary fiscal consolidation (that generated a 3.6% growth in real GDP) in Denmark led to a reduction in individual well-being. Secondly, spending cuts are not necessarily read as good news compared to tax hikes especially if the former entail cuts in public goods valued by households. Indeed, while the Irish case corroborates the expectation-based explanation of expansionary fiscal consolidations (the “anti-Keynesian” view), the Danish case shows that spending cuts are not always read as “good news”. The well-being consequences of fiscal consolidations may therefore also depend on country-specific culture and norms.<sup>4</sup>

Our results may therefore shed some light on why some governments may choose to consolidate through taxes (even at the cost of economic growth). Indeed, if spending cuts are to generate significant well-being loss, they can trigger an opposition and protest against a fiscal consolidation plan and hence making it politically costly. In this vein, Ponticelli and Voth (2017) demonstrate over 90 years (1918-2008) in a sample of 25 countries that spending cuts are particularly powerful in fueling protests or social unrest while tax hikes do not have any statistically significant effect. In addition, this effect of spending cuts doesn’t seem to be driven by economic downturn.<sup>5</sup>

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<sup>4</sup>Note however that our findings are subject to caveats related to the use of a subjective indicator in general.

<sup>5</sup>We also have suggestive evidence in this line as we find that country-years with high level of subjective well-being are negatively correlated with protests against the government. Given the aim of this paper, these results are not included but available upon request.

This paper is closely related to the literature on the macroeconomic of happiness (Di Tella et al. 2003; De Neve et al., 2018). For instance, Di Tella et al. (2003) show that movements in reported well-being are correlated with changes in macroeconomic variables such as the GDP. It is more closely related to the literature on the effect of fiscal policy on subjective well-being using mainly cross-sectional data (Bjørnskov et al, 2007; Ram, 2009 and Oishi et al, 2011). Bjørnskov et al (2007) find in a sample of 74 countries that government consumption decreases life satisfaction while they find no effect of public investment and social spending. Ram (2009) also investigates the effect of government spending in a larger sample of 138 countries and finds no effect on subjective well-being. Oishi et al (2011) investigate the role of taxation. They find a positive correlation between progressive taxation and subjective well-being. In addition they also show that this correlation is mediated through the satisfaction with public good provision, namely, education and public transportation.

While our paper is particularly related to the literature on the fiscal policy effects on subjective well-being, we depart from the aforementioned papers by two main aspects. Firstly, our focus is on fiscal consolidations. Second, on one hand, we exploit a cross-country panel data allowing us to account for cultural differences that may shape the relationship between fiscal policy and individuals' well-being as well as rich individual level data on the other hand. The paper also relates to the literature investigating the effects of fiscal consolidations (Alesina and Ardagna, 2010; Guajardo et al., 2014 and Jordá et al., 2016 among others). In a recent study, Jordá et al. (2016) show that fiscal consolidations are always recessionary. Finally, our paper is also related to a recent literature investigating the macroeconomic consequences of discretionary tax changes (Romer and Romer, 2010 ; Cloyne, 2013).

The remainder of the paper is organized as follows. Section 1 describes the data while Section 2 presents our empirical strategy to investigate the potential well-being costs of fiscal consolidations and the results. Section 3 explores the role for potential mitigating policies. Section 4 presents additional analysis using an event study approach and employing a granular data on the composition of fiscal consolidations. Section 5 presents a country-specific analysis aimed at the exploration of the well-being consequences of the well-knowns expansionary fiscal consolidations of the 80s that took place in Denmark and Ireland. Finally we conclude.

# 1 Data

To assess the empirical relevance of the impact of fiscal policy shocks on individual well-being, We use a macroeconomic panel dataset on 13 European countries over the period 1980-2007. We focus on this period in order to be able to identify the effect of fiscal consolidations. Indeed, on the one hand, the financial crisis triggered the need for fiscal consolidations. On the other hand, the crisis itself had also affected individuals' well-being (Deaton, 2012). Also, our focus on European countries is justified by the comparability of the data on individual life satisfaction. In addition to macroeconomic variables, we also have microeconomic information such as individual life evaluation and their characteristics. Table A<sub>1</sub> in the Appendix shows the summary statistics of the different variables used in the empirical work. Detailed informations about the variables used follow.

## 1.1 Macroeconomic variables

### Fiscal policy shocks

Our main macroeconomic variable is the measure of fiscal consolidations. We use the data on the size of fiscal consolidations as the main indicator of fiscal policy shocks from the “action-based” fiscal consolidations database (Devries et al., 2011; and Guajardo et al., 2014). This “action-based” fiscal consolidations database is constructed using different historical sources such as Budget Reports, Budget Speeches, Central Bank Reports, Convergence and Stability Programs, IMF reports and OECD economic surveys. In addition, the dataset includes only fiscal consolidations primarily motivated by the desire to reduce the budget deficit. This feature allows us to identify discretionary policy changes motivated only by policy makers' intentions to reduce the budget deficit and separate them from policy changes motivated by cyclical fluctuations.

The fiscal consolidations based on the intention to reduce budget deficit are induced by past decisions and therefore are unlikely to be correlated with prospective economic conditions (Romer and Romer, 2010). In other words, this approach allow us to separate “exogenous” fiscal consolidations from the “endogenous” ones. The dataset includes announced measures of fiscal consolidations only if they are confirmed as implemented by historical records. In addition, Devries et al. (2011) also record a fiscal consolidation preceding an adverse shock that leads to the adoption of a countercyclical policy that completely offsets the fiscal consolidation in the dataset. The inclusion of such consolidations ensures to not omit fiscal consolidations that are correlated with adverse shocks. The size of fiscal consolidations is defined as the budgetary impact in share of GDP. Finally, we also distinguish between fiscal consolidations that rely on spending cuts and those that rely on tax hikes. Indeed, a sizable part of the literature on the macroeconomic effects of fiscal consolidations show that the composition matters, more specifically that when they are based on spending cuts they are less likely to have recessionary effects (Alesina and

Perotti, 1997; Alesina and Ardagna, 2010). The dataset covers 17 OECD countries and records 173 fiscal consolidation episodes over the period 1978-2009 and as discussed earlier we will focus on the subset of 13 European countries over the period 1980-2007.

Figure 1 shows the average size of fiscal consolidations as well as their composition as proportion of GDP across countries in the sample. In this figure, we focus on consolidations with positive budgetary impact in the sample in order to gauge the magnitude of the phenomenon.<sup>6</sup> Focusing on positive budgetary impacts, Figure 1 shows that Finland stands out as the country with the largest size of fiscal consolidations followed by Ireland. Finally, for the majority of countries in the sample (eight over thirteen), spending cuts are on average larger than tax hikes.

### **Other macroeconomic controls**

Following the empirical literature on the macroeconomic determinants of individual well-being (Di Tella et al. 2003; De Neve et al., 2018), we control for potential confounding factors. In particular, fiscal consolidations may affect individual well-being through for instance their effects on macroeconomic conditions (eg: economic growth and employment). In order to address the potential omitted variable bias, the empirical analysis should include controls for the macroeconomic conditions.

We account for macroeconomic conditions, by controlling for real GDP per capita, real GDP per capita growth and inflation rate. We take real GDP per capita and real GDP per capita growth from World Development Indicators (WDI) which capture respectively income and economic cycle or aggregate fluctuations. Based on previous findings we expect income and economic growth to have positive effect on individual well-being (Di Tella et al, 2003; Oswald, 1997). We also control for inflation rate based on Consumer Price Index from OECD Statistics.

We control for the level of inequality and the unemployment rate in order to address a potential omitted variable bias. Indeed, fiscal consolidations may influence individual well-being through their impact on inequality and unemployment. A previous literature shows that fiscal consolidations raise unemployment and inequality (Mula-Granados, 2005; Ball et al., 2013; Agnello and Sousa, 2014 and, Agnello et al., 2014). In addition, high inequality and unemployment increase unhappiness (Clark and Oswald, 1994; Frey and Stutzer, 2000; Alesina et al, 2004 and Burkhauser et al., 2016). We take national unemployment rate, that is total unemployment as percentage of total labor force from WDI and the Gini coefficient (as a proxy for inequality) from the Standardized World Income Inequality Database (SWIID). We use the Gini index that captures inequality in household disposable post-tax and post-transfer income.

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<sup>6</sup>Note that negative values arise in the data when a temporary consolidation measure expires. For instance a one year increase in tax of \$1 has a budgetary impact of \$1 in the first year and -\$1 in the next year followed by no impact (Devries et al., 2011 ; Guajardo et al., 2014).

## 1.2 Microeconomic variables

### Individual well-being

Our main microeconomic variable is the individual life satisfaction as a proxy for individual well-being (Ferrer-i-Carbonell, 2005; Di Tella and MacCulloch, 2006; De Neve et al, 2018). The life satisfaction is a subjective measure of well-being that the literature also refers to sometime as a happiness measure (see for instance Di Tella et al, 2003 or Frey and Stutzer, 2000). More importantly, Oswald and Wu (2010) show that there is a strong correlation between life satisfaction and objective measures of quality of life, making it a reliable measure of well-being.

The data on self-reported subjective well-being or life satisfaction are from the Eurobarometer survey series (EB) between 1980 and 2007. The EB interviews a cross-section sample of Europeans each year ("repeated cross-section" design). Each survey consists of approximately 1000 face-to-face interviews per country. The countries have been contained in the sample since the year of EU accession.<sup>7</sup> Our measure of life satisfaction is the recoded categorical response based on the following question: "On the whole, are you very satisfied [4], fairly satisfied [3], not very satisfied [2], or not at all satisfied [1] with the life you lead?".

Figure 2 shows the average of individual life satisfaction by country over the period. In this figure, Danish appear to be the most satisfied with their lives among all the 13 countries while Portuguese are the least satisfied with their lives. In addition Figure 3 shows the distribution of individual life satisfaction in the sample. It shows that the majority of individuals interviewed report to be "fairly satisfied" with their lives.

### Individual characteristics

In addition to macroeconomic controls, we also include individual characteristics among our control variables following the literature (Clark and Oswald, 1994; Frey and Stutzer, 2000; Di Tella et al, 2003 and Alesina et al, 2004 among others). We control for age, gender, marital and employment status. Age has a nonlinear (U-shaped) effect on well-being (Kahneman and Krueger, 2006), men are less happier than women (Lucas and Gohm, 2000) and marriage has a positive effect on well-being. Regarding employment status we control for being retired and unemployed. Previous empirical evidence shows that being unemployed has a strong negative effect on individual well-being. For instance, Clark and Oswald (1994) show that "being unemployed is worse in term of loss 'utility' units, than divorce or marital separation". We take all these individual characteristics from the Eurobarometers.

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<sup>7</sup>This implies that for Finland, Sweden and Austria, data is available since 1995. While for Spain and Portugal, no observation is available until 1985. Eurobarometer is the only survey, to the best of our knowledge, to have annual data on subjective well-being over a long period.

## 2 Investigating the effects of fiscal policy shocks on individual well-being

### 2.1 Estimation strategy

We start by evaluating the effect of fiscal consolidations on individual reported life satisfaction. Our specification is motivated by the fact individual life satisfaction is a proxy for experienced utility. Hence, we investigate how contemporaneous fiscal policy shocks affect individuals' experienced utility. Let  $Y_{ict}$  be the reported life satisfaction of individual  $i$ , in country  $c$  and year  $t$ . Using an approach similar to De Neve et al (2018), we estimate the following equation :

$$Y_{ict} = \alpha_1 \text{Fiscal consol}_{ct} + \alpha_2 X_{ict} + \alpha_3 X'_{ct} + \delta_c + \text{trend}_c + \varepsilon_{ict} \quad (1)$$

Where  $\text{Fiscal consol}_{ct}$  is the size of fiscal consolidations;  $X_{ict}$  is a set of individual characteristics;  $X'_{ct}$  is a set of macroeconomic controls;  $\delta_c$  is a country fixed effect;  $\text{trend}_c$  is a country-specific linear time trend and  $\varepsilon_{ict}$  is the error term. Countries fixed effects help remove all time invariant unobserved countries heterogeneities such as culture or preferences for fiscal discipline, while country-specific trends control for all time-varying unobserved heterogeneity at country level. Country-specific trends also allow us to account for serial correlation.

$\alpha_1$  is the coefficient of interest that captures the effect of fiscal policy shocks on individual well-being.  $\alpha_1$  can be considered as (close to) the causal effect of fiscal consolidations for two main reasons. First, as previously discussed fiscal policy shocks identified based on the narrative approach are exogenous as they are based on the intention to reduce budget deficit and are induced by past decisions and therefore are unlikely to be correlated with prospective economic conditions (Romer and Romer, 2010; Cloyne, 2013). Second, it is difficult to argue that an isolated individual could influence the implementation of a macroeconomic policy such as a fiscal consolidation.

Owing to the absence of consensus regarding the effects of fiscal consolidations, it is difficult to anticipate the sign of  $\alpha_1$ . For instance, a seminal work (Giavazzi and Pagano, 1990) shows the existence of "expansionary fiscal consolidations" also known as "anti-keynesian effects" of fiscal consolidations. Indeed, a standard Keynesian framework would predict a contractionary effect of fiscal consolidation plans. This seminal finding has been supported by other authors such as Alesina and Ardagna (2010) who find that fiscal consolidations can have expansionary effects especially if they are based on spending cuts rather than on tax hikes. On the other hand, recent findings such as Guajardo et al. (2014) and Jordá et al. (2016) show that fiscal consolidations are always contractionary. Also, recent evidence shows that fiscal consolidations raise unemployment and inequality (Ball et al., 2013, Agnello and Sousa, 2014, Agnello et al., 2014) and that the latters have detrimental effects on individual well-being (Clark and

Oswaldd, 1994; Frey and Stutzer, 2000; Alesina et al, 2004 and Burkhauser et al., 2016).

In addition, fiscal consolidations can have direct effects on individual well being by reducing individuals' net income (through tax hikes) or by reducing public good provision and social transfers (through spending cuts). One can therefore expect fiscal consolidations to have well-being costs. That is fiscal consolidations may negatively affect individual well-being, meaning that we will test for  $\alpha_1 < 0$ .

## 2.2 Baseline results

We estimate Equation (1) by using weighted OLS.<sup>8</sup> Table 1 presents the results with columns (1) to (5) focusing on all fiscal consolidations and columns (6) to (10) distinguishing between spending cuts and tax hikes. In column (1) the estimate shows that fiscal consolidations lead to drop in well-being. This point estimate is robust across specifications including different controls for macroeconomic conditions from columns (2) to (5). The second part of Table 1 employs a specification allowing to test for a differential impact of tax hikes and spending cuts on well-being. Column (6) shows that an increase of 1 percentage point of GDP in spending cuts leads to a reduction in individual well-being three times larger than in column (1) while a tax hike does not have a statistically significant effect.

The main result in Table 1 is that fiscal consolidations induce a well-being cost or a well-being loss that is mainly driven by spending cuts. This result brings a new perspective relative to the macroeconomic literature showing that fiscal consolidations based on spending cuts have expansionary effects or have lower recessionary effects (Alesina and Perotti, 1997; Alesina and Ardagna, 2010). After controlling for growth and income, spending cuts still have a robust negative and statistically significant effect on well-being. Also, in column (7), tax hikes have a positive and statistically significant effect on well-being that doesn't seem consistent with this literature that shows that tax increases are contractionary.

This positive effect of tax hikes, is plausibly due to the redistributive opportunity of tax increases, as inequality has a well-known negative effect on individual well-being (Alesina et al., 2004 and Burkhauser et al., 2016). In addition, fiscal consolidations tend to raise inequality (Ball et al., 2013 and, Agnello and Sousa, 2014). Our finding is therefore consistent with Mula-Granados (2005) and Ball et al. (2013) who find that fiscal consolidations based on spending cuts have detrimental effects on inequality compared to

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<sup>8</sup>We use the European weights in order to adjust each national sample in proportion to its share in the total population of the European Union. European weights include also the post-stratification sample weighting factors. See Eurobarometers for more detail. Further, we do not cluster our standard errors as we have only 13 countries in our sample. Using cluster-robust standard errors for small number of clusters may lead to a worst statistical inference (see for instance Nichols and Schaffer, 2007 and, Cameron and Miller, 2010). Indeed, the cluster-robust standard errors converge to the true standard error when the number of clusters tends to infinity. It has been shown that more than 50 clusters are reasonable to use cluster-robust inference (Nichols and Schaffer, 2007 and, Kezdi, 2004). Further, as we use country-specific trends that allows to take care of serial correlation in the error term, our standard errors should be less affected by autocorrelation. Finally, our results are robust to using the wild cluster bootstrap developed for the case of small number clusters (Davidson and Mackinnon, 2010) but this routine does not allow the use of weighted OLS.

tax hikes. More recently, Ciminelli et al (2018) show that tax-based fiscal consolidations reduce income inequality, with indirect taxation having the largest effect. We will discuss this issue further in the robustness checks where we control for inequality.

## 2.3 Robustness checks

We carry out various robustness checks. First, we include additional controls. On the one hand we control for individual characteristics and on the other hand we control for inequality and unemployment rate. Fiscal consolidations, by raising unemployment and inequality (Mula-Granados, 2005; Ball et al., 2013; Agnello and Sousa, 2014 and, Agnello et al., 2014) could affect individual well-being. As our baseline estimates in Table 1 could therefore suffer from an omitted variable bias, we include inequality and unemployment rate in our empirical analysis. Second, we control for common shocks by including year fixed effects. Thirdly, we deal with the categorical nature of the data on life satisfaction by using a weighted Ordered Probit estimator. In addition, following the literature (Stevenson and Wolfers, 2008; Wolfers, 2003), we also use a predicted life satisfaction based on individual characteristics by a weighted Ordered Probit estimator.<sup>9</sup>

We present the robustness of the baseline results to the inclusion of other determinants of individual life satisfaction in Table 2.<sup>10</sup> Columns (1) to (4) are focused on individual characteristics, columns (5) to (8) show the inclusion of the two key macroeconomic potential confounding factors and finally columns (9) and (10) include all the controls. First, columns (1) to (4) show similar results to the baseline, that is, fiscal consolidations generate a well-being cost especially when they rely on spending cuts. More specifically column (1) shows a marginal effect of roughly the same magnitude. The individual characteristics have all the expected effect on life satisfaction with unemployment having the largest effect on well-being. For instance in column (1), being unemployed is associated with a 0.45 unit drop in life satisfaction. This result is consistent with the literature (Clark and Oswald, 1994).

In columns (5) to (8) we take into account both inequality and unemployment which have a negative and statistically significant effect on individual well-being. In addition, column (7) shows that once we control for inequality through the Gini coefficient, fiscal consolidations based on tax hikes have a negative and statistically significant effect. This suggests that once we account for the possibility that tax increases can be used for redistribution and therefore for reducing inequality (Mula-Granados, 2005 ; Ball et al., 2013 and Ciminelli et al, 2017), the former have a negative effect on well-being. This argument is con-

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<sup>9</sup>Table A<sub>2</sub> in the Appendix shows results of the baseline while controlling for common shocks. Table A<sub>3</sub> shows the results using a weighted Ordered Probit to account for the nature of the data on subjective well-being. In Table A<sub>4</sub> also in the Appendix, we present weighted OLS estimates using predicted values of life satisfaction. Overall these tables show that our results are robust both to using an alternative estimator and to the rescaling of the dependent variable.

<sup>10</sup> See Table A<sub>3</sub> in the Appendix for the results using weighted Ordered Probit.

vincing because we use a Gini coefficient that captures inequality in household disposable post-tax and post-transfer income. Finally, once we control for other macroeconomic determinants in column (8) and all the available controls, tax hikes do not have any statistically significant effect. Overall, Table 2 shows that the negative effect of fiscal consolidations on individual well-being is mainly driven by spending cuts.

### 3 Exploring heterogeneities and the role for mitigating policies

Having established that fiscal consolidations have well-being costs (especially if based on spending cuts), that is they have negative effects on subjective well-being, we investigate the role for potential mitigating policies. The rationale is that if fiscal consolidations can affect individual well-being through their effects on macroeconomic conditions, then there may be some role for accompanying macroeconomic policies that can mitigate their consequences. First, inspired by the literature on the nonlinear effects of fiscal policy pioneered by Giavazzi and Pagano (1990), we test for the role of accompanying macroeconomic policies such as monetary and exchange rate policies in dampening the well-being costs of fiscal consolidations.<sup>11</sup> In particular, we investigate the role of devaluations or depreciations and the liberalization of capital flows. Indeed, Giavazzi and Pagano (1990) document that devaluation, disinflation, the liberalization of capital flows and party orientation have played an important role in explaining expansionary fiscal consolidations that took place in Denmark and Ireland in the 80s.<sup>12</sup>

We take local currency units per unit of USD from OECD Statistics to capture devaluations and depreciations, an index of capital account openness from Chinn and Ito (2006) and a dummy for right government taking the value 1 if the party in power's orientation with respect to economic policy is defined as conservative, Christian democratic or right-wing from the Database on Political Institutions (Keefer, 2010). In addition, as a proxy for credible signal for low inflation, we use also a dummy capturing the membership of the European Monetary Union (EMU) that takes the value 1 starting in 1999 from the Comparative Political Data Set (CPDS).

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<sup>11</sup>We also test for the effect of the level of debt following Sutherland (1997) but we do not find any statistically significant effect. We do not include this result as we are primarily interested in policy tools that can help mitigate the well-being cost of fiscal consolidations. This result is however available upon request.

<sup>12</sup>Giavazzi and Pagano (1990) highlight the role of exchange rate policies that accompanied the fiscal consolidations. Both countries, by pegging their exchange rate to a low inflation currency (the German mark), have induced a sharp reduction in nominal and real interest rates. This effect stems from the fact that the credibility of the fixed exchange rate regime led domestic nominal interest rates to move toward the lower level of foreign nominal rates. In addition, the convergence of nominal rates occurred faster than the convergence of inflation because price rigidity prevented the goods market from adjusting at the same speed as the financial markets. Also, the response of foreign interest rates was accelerated by the removal of capital controls. It follows that real interest rates fell along with nominal rates. Finally in both cases, these consolidations were led by conservative parties.

In addition, our previous results show that being unemployed have a particularly detrimental effect on individual well-being, that is again consistent with previous findings (Oswald, 1994). Furthermore, fiscal consolidations can also affect individual well-being by raising unemployment (Ball et al., 2013 and, Agnello et al., 2014). We therefore investigate on one hand whether Active Labor Market Policies (ALMP) could dampen the effect of fiscal consolidations on individual well-being. We take ALMP expenditures as percentage of GDP from the CPDS. On the other hand, we test whether unemployed individuals are particularly affected by fiscal consolidations as compared to retired individuals that are out of the labor market.

### 3.1 Estimation strategy

In order to investigate the potential role of mitigating policies, we estimate the following equation that includes an interaction term to test whether the previously mentioned policies and individual characteristics play a role in the magnitude of the well-being costs of fiscal consolidations:

$$Y_{ict} = \alpha_1 \text{Fiscal consol}_{ct} + \beta_1 \text{Fiscal consol}_{ct} \times X + \alpha_2 X_{ict} + \alpha_3 X'_{ct} + \delta_c + \text{trend}_c + \varepsilon_{ict} \quad (2)$$

Where  $X$  is the conditioning factor that can be a macroeconomic accompanying policy  $X'_{ct}$  or an individual characteristic capturing the employment status (retired or unemployed)  $X_{ict}$ . The specification is similar to Equation (1) and the variables retain the same signification. Testing for a dampening effect implies  $\alpha_1 < 0$  and  $\beta_1 > 0$ , that is a given macroeconomic policy  $X'_{ct}$  may help mitigate the well-being costs of fiscal consolidations. In addition, note however that in exploring whether unemployed individuals are particularly vulnerable to fiscal consolidation shocks,  $\beta_1$  captures rather a potential amplification effect that implies testing for  $\beta_1 < 0$ .

### 3.2 Results

Table 3 presents our weighted OLS estimates of Equation (2).<sup>13</sup> Columns (1) to (5) are focused on exploring the role of potential mitigating macroeconomic policies and columns (6) to (7) explore whether unemployed individuals are more vulnerable to fiscal consolidations. Column (1) shows that depreciations dampen the well-being cost of fiscal consolidations. The dampening effect seems small but it varies with the level of depreciation. Figure 4 depicts the effect of a 1 percentage point of GDP increase in the size of a fiscal consolidation conditional on being accompanied by different level of depreciation in the sample. Figure 4 shows that for higher levels of depreciation, that is for ratios of at least 6 units of local currencies per USD, fiscal consolidations do not have any statistically significant effect on well-being.

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<sup>13</sup>Table A<sub>3</sub> in the Appendix shows similar results using a weighted Ordered Probit estimator.

In column (2), we focus on the role of the liberalization of capital flows by employing an index measuring the degree of the capital account openness. The estimates show that the capital account openness dampens the well-being cost of fiscal consolidations. Consistently, Figure 5 depicts the fact that a fiscal consolidation of a 1 percent point of GDP that is accompanied by a fully opened capital account will have a well-being cost of roughly 0.01 unit as opposed to 0.03 unit in the situation where the capital account is not opened at all. Evidently, conversely to the case of depreciation, the openness of the capital account cannot help absorb all the well-being cost of fiscal consolidations.

In column (3) we explore the role of credible disinflation policies by testing for a structural break since the EMU membership. The results support the fact that credible disinflation tend to overcome and neutralize the well-being cost of fiscal consolidations. In columns (4) and (5) we investigate the role of Active Labor Market Policies (ALMP) and the role for the party orientation of the government that implements fiscal consolidations. While ALMP appear to have a positive effect on individual well-being, in both cases (ALMP and party orientation) we do not find any statistically significant mitigating effect. Column (6) shows that individuals that are retired and therefore out of the labor market do not suffer from fiscal consolidations. In addition, unemployed individuals are particularly vulnerable to fiscal consolidation shocks.

Overall, Table 3 have two main policy implications regarding how to dampen the well-being cost of fiscal consolidations. First, accompanying monetary policies (disinflation), exchange rate policies (depreciation) and the liberalization of capital flows help in dampening the well-being cost of fiscal consolidations. This finding is consistent with Giavazzi and Pagano (1990). Second, as fiscal consolidations often raise unemployment (Ball et al., 2013 and, Agnello et al., 2014) and our findings show that unemployed individuals are particularly vulnerable in these events, policymakers should target them. In addition, it suggests that the labor market is an important channel of the well-being cost of fiscal consolidations. In this regard, our result does not support the fact that ALMP could help as we do not find any statistically significant estimate.

## **4 Further investigations: event study and granular data on fiscal consolidations**

In this section, we carry out additional investigations by using an event study approach as a different empirical strategy and by exploiting a recently developed granular data on the composition of fiscal consolidations.

## 4.1 An event study approach

We now investigate the dynamic pattern of the effect of fiscal policy shock using an event study approach.<sup>14</sup> The event study approach allows us to identify a treatment effect of a fiscal consolidation. We define an event as the implementation of the fiscal consolidation with the largest size within country. This approach has two main advantages. First, it allows us to verify whether there is any pre-existing trend that could lead to a spurious difference-in-differences estimates. Second, it shows the dynamic pattern of the treatment effect as outlined earlier, allowing us to distinguish short-run and medium-long run effects. We estimate the following equation:

$$Y_{ct} = \gamma E_{ct} + \alpha_2 X'_{ct} + \delta_c + \text{trend}_c + \varepsilon_{ct} \quad (3)$$

Where  $E_{ct}$  is a vector of dummy variables equal to 1 within 2-year period before or after the fiscal consolidation event and  $\gamma$  is a vector of coefficients corresponding to each 2 years period;  $Y_{ct}$  is the average life satisfaction (subjective well-being) in country  $c$  at time  $t$ . The other variables have the same definitions as in the previous sections. In this empirical specification, the identification comes from comparing the average subjective well-being at country level to the omitted 1–2 years before the event. Given our definition of the event, we identify the largest effect of fiscal consolidations on the average well-being at country level.

Figure 6 shows our results. It shows that the negative effect of fiscal consolidations is confined within the two years of the implementation as outside this time-frame, there is no statistically significant effect. The results are also shown in Table A7 in Appendix. This finding corroborates our empirical specification and results in our baseline investigations. In addition, it strengthens the case of the negative effect of fiscal consolidations on subjective well-being because as shown in Figure 6, our estimates does not capture a negative trend during pre-consolidation period in life satisfaction within country. We are therefore confident that we estimate the effect of fiscal consolidations as again, Figure 6 suggests that we do not pick up a negative trend in subjective well-being. Finally, these results complement the baseline estimates in showing that the effect of fiscal consolidations on subjective-well being are short-lived.

## 4.2 Using a new granular data on fiscal consolidations

In order to investigate in more depth the composition effect of fiscal consolidations and gain additional policy insights, we take advantage of a new database developed by Alesina et al (2017). Their dataset is an extension of the IMF action-based database (Devries et al, 2011). It provides granular data on the composition of spending cuts, tax hikes and public transfers. This dataset also identifies “exogenous” fiscal shocks based on the narrative approach.

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<sup>14</sup>Our approach is similar to Smith (2015).

In this dataset, public spending can be disaggregated between government consumption and public investments. Government consumption includes for instance, current expenditures (good and services), public sector salaries but also the managing cost of public services such as healthcare and education. Public investments are defined as government gross fixed capital formation expenditures and include for instance, construction of roads and railways. They also distinguish transfers, defined as disbursements of the government in favor of private entities and include for instance social assistance benefits. On the tax side, the two main components are direct and indirect taxes. Direct taxes are defined as those imposed on a property or a person and that do not involve any transaction. They include for instance property, income and capital gains taxes. Indirect taxes are those imposed relative to some transaction involving the purchase of goods or services such as VAT or sale taxes.<sup>15</sup>

Table 4 shows the results for a finer disaggregation of fiscal consolidations.<sup>16</sup> Columns (1) - (5) are focused on a higher level of disaggregation while columns (6) - (10) use a lower level of disaggregation on the most important components of either taxes or expenditures. First in columns (1)-(5), on the tax side, the results show that direct tax hikes have a detrimental effect on individual subjective well-being but no robust evidence for indirect taxes. On the spending side, public investment cuts have a sizable negative effect on subjective well-being but we find no statistically significant effect for cuts in total public consumption in most estimations. Transfer cuts, however, have a robust negative impact on subjective well-being. Indeed as transfers (which include components such as unemployment benefit and pensions) have direct impact on individual consumption, cutting them hurt individual well-being.

Second, in order to explore any potential role for sub-components, we turn to columns (6)-(10). The results show that the negative effect of direct tax hikes on subjective well-being is driven by personal income and corporate income taxes. Indeed, these two components have a negative and statistically significant effect on subjective well-being while property tax hikes and tax hike on goods and service have an opposite effect. This is an interesting finding and it is consistent with Ciminelli et al (2017) who show that these last two taxes may reduce income inequality. While they find a small effect for property tax, it is plausible that as this tax may affect only the rich, it may have some (at least perceived) redistributive potential. However, our findings suggest that direct income taxation by reducing individuals net income may hurt their well-being by reducing their consumption.

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<sup>15</sup>See Alesina et al (2017) for more detail on the fiscal components.

<sup>16</sup>We have also investigated the heterogeneous effect of announced fiscal consolidations versus unexpected ones on subjective well-being taking advantage of the dataset developed by Alesina et al (2017). Unexpected fiscal consolidations are those announced and implemented at the same time while the announced ones are those with a delay between the announcement and the implementation. First, we find that announced fiscal consolidations have a larger negative effect on individual subjective well-being than unexpected ones. Second, looking at the composition of fiscal consolidations, tax hikes have a large negative effect on subjective well-being when they were announced while unexpected spending cuts are those with a large negative effect. This finding is interesting and may reflect the (income) loss aversion related to tax hikes while in the context of spending cuts it may reflect the unexpected loss in public services that are valued by individuals.

On the spending side, Table 4 shows that salaries cut have a quite large detrimental effect on subjective well-being. Indeed, salaries cuts have the worst consequence on subjective well-being with a marginal effect ten times larger than the baseline effect.

Overall, these results have some additional policy implications for the design of fiscal consolidations in order to minimize well-being cost. In particular in the context of tax-based fiscal consolidations governments could rely on property tax and indirect taxes.

## 5 Exploring the well-being consequences of two well-known expansionary fiscal consolidations of the 80s: The case of Denmark and Ireland

As mentioned earlier, in a seminal paper, Giavazzi and Pagano (1990) document two expansionary fiscal consolidations in Denmark (1983-1985) and in Ireland (1987-1988). On the one hand, they report that the severe fiscal contraction in Denmark was accompanied by an average growth of 3.6% in real GDP over the period 1983-1985. On the other hand, in Ireland, Charles Haughey, leader of the newly elected government in February 1987 has launched “the toughest austerity program the country has witnessed”.<sup>17</sup> These two episodes have one important thing in common: the fiscal consolidations are based on spending cuts rather than on tax hikes.<sup>18</sup> The aim of this section is to investigate the effect of these two well-known expansionary fiscal consolidations on citizens’ well-being. Did these expansionary fiscal consolidations spur individual well-being? What can we learn from these two experiences regarding the effect of fiscal consolidations on well-being?

### 5.1 Estimation strategy

We address the previous questions by estimating a country-specific version of Equation (1) in each of these two countries (Denmark and Ireland) as follows:

$$Y_{it} = \gamma_1 \text{Fiscal consol}_t + \gamma_2 \text{Fiscal consol}_t \times \text{Exp consol} + \gamma_3 \text{Exp consol} + \gamma_4 X_{it} + \gamma_5 X'_{it} + \varepsilon_{it} \quad (4)$$

Where, *Exp consol* is a dummy taking the value 1 for the years of expansionary fiscal consolidations reported by Giavazzi and Pagano (1990). In particular, this dummy takes the value 1 for the years 1983

<sup>17</sup>Financial Times, Survey on Ireland, September, 24, 1987; quoted by Giavazzi and Pagano (1990).

<sup>18</sup>We take the following information from the deficit-driven fiscal consolidation database (Devries et al., 2011): In Ireland, the fiscal consolidations of 1987 and 1988 are based on spending cuts of the sizes of 1.12% and 1.95% of GDP respectively. In Denmark, the fiscal consolidations of 1983, 1984 and 1985 are based on spending cuts of the sizes of 1.85%, 1.71% and 0.77% of GDP respectively. In addition, the other fiscal consolidations recorded in the database are based on tax hikes.

to 1985 in Denmark and, for the years 1987 and 1988 in Ireland. The other variables have the same definitions as in the previous sections. The coefficients of interest are  $\gamma_1$  and  $\gamma_2$ . Giavazzi and Pagano (1990) proposed an explanation of “expansionary fiscal consolidations” or the so-called “German view” of fiscal policy that is based on the role of expectations. If households perceive spending cuts as a signal of a permanent reduction in government consumption, they will expect also that, taxes will be permanently lower and this will lead to an increase in their lifetime income. In their mechanism, spending cuts are read as “good news”. This resulting wealth effect on consumption could outweigh the Keynesian recessionary effect. If this is the case then, our estimates should show that  $\gamma_2 > 0$  in both countries, meaning that these expansionary fiscal consolidations have increased citizens’ well-being consistently with the mechanism.

## 5.2 Results and discussion

We present the result in Table 5 with the first two columns focusing on Denmark while the last two relate to Ireland. Recall that the two expansionary fiscal consolidations that are our focus are both based on spending cuts. We start with the Irish case as the results are straightforward. In column (3), the result shows that fiscal consolidations reduce individual well-being. This marginal effect is roughly equal four times the baseline finding. However, once we introduce the interaction term capturing the period of expansionary fiscal consolidations (1987 and 1988) in column (4), we find that the latter have a sizable positive effect on life satisfaction.

These expansionary fiscal consolidations have a positive and sizable effect on individual well-being in Ireland. In addition, column (4) shows also that the other fiscal consolidations that are based on tax hikes had a negative effect on individual well-being. Figure 7 shows the trend in the average subjective well-being that is consistent with our finding. Giavazzi and Pagano (1990) documents a strong sensitivity of current disposable income to current consumption in Ireland over the period that is consistent with our finding. The other fiscal consolidations based on tax increases may have reduced individual well-being because they reduced disposable income and therefore consumption. On the other hand, spending cuts had a positive effect on subjective well-being through a wealth effect that is consistent with the mechanism of expansionary fiscal consolidations based on expectations as discussed earlier.

The first two columns that show the results for the Danish case tell a different story. First of all, in column (1) the point estimate implies that a one percentage point increase in the size of fiscal consolidations in Denmark leads to a drop in individual well-being that is roughly twice the baseline effect. However, once we introduce the interaction term capturing the period of expansionary fiscal consolidations (1983 to 1985) in column (2) we find a surprising result. Conversely to the Irish case, expansionary fiscal consolidations (based on spending cuts) in Denmark had a negative effect on individual well-being.

Figure 8 shows for Denmark that the fall in well-being was especially at beginning of the period.<sup>19</sup> This finding begs the question about what makes the Danish case different from the Irish case? In order to understand, we build on the role for public spending in Denmark. In their attempt to explain the rise in private consumption that characterized this period of expansionary fiscal consolidations, Giavazzi and Pagano (1990) examined a potential role for the substitution between public and private goods. They document significant reduction in health care, education, entertainment and provision of public transportation but then dismissed a potential key role for the substitution hypothesis as “the empirical magnitude of this factor seems modest relative to the total surge in consumption”.<sup>20</sup>

We argue that it is plausible that the valuation of public goods in the Danish case is the reason why an expansionary fiscal consolidation ends up reducing individual well-being. For instance, Kleven (2014) argues that one of the reasons why Scandinavian countries can afford high tax rates is the fact that the government has large social expenditures (in areas such as child care, elderly care, transportation and education). In a Scandinavian country such as Denmark where citizens are used to large public spending (and high taxes), spending cuts are not necessarily read as “good news”.<sup>21</sup>

The aforementioned substitution effect suggests that Danish value these public goods. This substitution effect might therefore have a negative effect on individuals’ well-being as they will need to sacrifice the consumption of other goods in order to compensate for the low level of public goods. In addition, Kleven and Schultz (2014) estimate and find modest elasticities to taxable income in Denmark that suggest that tax increases may have a limited or no well-being cost. Consistently, we find a positive effect of fiscal consolidations based on tax hikes. Furthermore, our finding is consistent with Oishi et al (2011) who find that the positive effect of taxation on subjective well-being mediates through citizens’ satisfaction with public good provision such as education and public transportation. The valuation of public goods (that were cut during the expansionary fiscal consolidation) appears therefore as a convincing explanation of the negative effect of expansionary fiscal consolidations (based on spending cuts) on individual well-being.

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<sup>19</sup>Note also that the average well-being recovered as the size of fiscal consolidation decreases in Denmark. In addition, while there was also a tax component, the expenditure component was dominant which makes the previous literature focused on the latter. See also our discussion on the low elasticity of taxable income in Denmark.

<sup>20</sup>Note that in the Irish case, based on data from Alesina et al. (2017), fiscal consolidations were based mainly on public consumption and public investment cuts).

<sup>21</sup>Over the period 1980-2007, the average tax revenues were respectively 45% of GDP and 31.7% of GDP in Denmark and Ireland. The average in OECD countries over the period is 32.6% of GDP. Source: OECD Stat (Data accessed on 23rd November 2018).

Overall, these two case studies provide two key lessons regarding the effect of fiscal consolidations on well-being.<sup>22</sup> First, spending cuts are not necessarily read as good news compared to tax hikes especially if the former induce a reduction in public goods that are valued by households. Second, even an expansionary fiscal consolidation can entail well-being costs. Indeed, our findings for Denmark with an expansionary fiscal consolidation (that generated a 3.6% growth in real GDP) which has led to a reduction in individual well-being, are interesting. This raises the importance of culture and social norms (or social contracts) in explaining the outcome of public policies. Indeed, as mentioned by Layard (2006), a key finding regarding the psychology of well-being is that “the happiness [well-being] we get from what we have is largely culturally determined”.

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<sup>22</sup>While the results may bear more historical contribution as the two countries may have changed significantly since the 1980s, they suggest that the effect of fiscal consolidation on subjective wellbeing is complex.

## Conclusion

This paper shows that fiscal consolidations have a short-run well-being cost. It also suggests policy tools that may help mitigate this well-being cost. Our empirical analysis combines microeconomic level data covering more than half a million of individuals on subjective well-being across 13 European countries and macroeconomic data on fiscal consolidations over the period 1980-2007. In addition, we also investigate the well-being consequences of two well-known fiscal consolidation episodes of the 80s that took place in Denmark and Ireland.

First, we find that fiscal consolidations have a negative effect on individual well-being especially when they are based on spending cuts. More specifically, salaries cut have the worst effect on subjective well-being. This finding brings a new perspective to the literature that shows that spending based fiscal consolidations have lower output cost compared to tax based fiscal consolidations. In this regard, policymakers may face a trade-off between output loss and political cost of fiscal consolidations. Second, accompanying monetary policies (disinflation), exchange rate policies (depreciation) and the liberalization of capital flows help in dampening the well-being cost of fiscal consolidations. Furthermore, we find that unemployed individuals are particularly vulnerable to fiscal consolidation shocks.

Additional investigations using granular data on the composition of fiscal consolidations suggest that tax-based fiscal consolidations relying on property tax and indirect taxes are not costly for individual well-being. Third, we conduct a country-specific analysis on two countries (Denmark and Ireland) and we find that even an expansionary fiscal consolidation could generate well-being costs. In addition, spending cuts are not necessarily read as good news compared to tax hikes in particular if the former entail cuts in public goods valued by households. While the Irish case corroborates the expectation-based explanation of expansionary fiscal consolidations, the Danish case shows that spending cuts are not always read as “good news”. The well-being consequences of fiscal consolidations may therefore depend on country-specific culture and norms.

While there is a large macroeconomic literature on the consequences of fiscal consolidations, this paper is the first to the best of our knowledge to investigate their well-being costs. We take a novel approach in investigating the consequences of fiscal consolidations and contribute also to the literature on the determinant of individual well-being. Our paper provides interesting findings that may contribute to how policymakers can design fiscal consolidations in order to minimize well-being costs. After all, the ultimate objective of economic policy is to maximize social well-being. Also, designing fiscal consolidations with the aim of minimizing well-being loss would reduce their political cost and the chances of protests.

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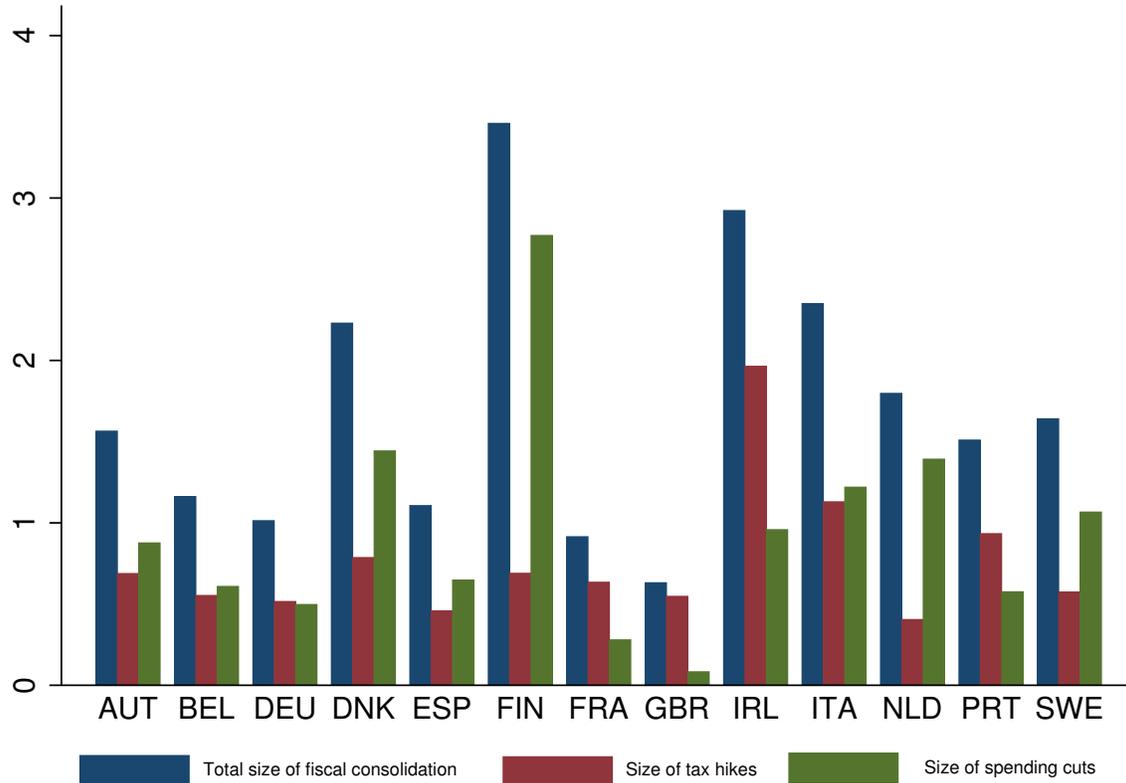
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# Figures

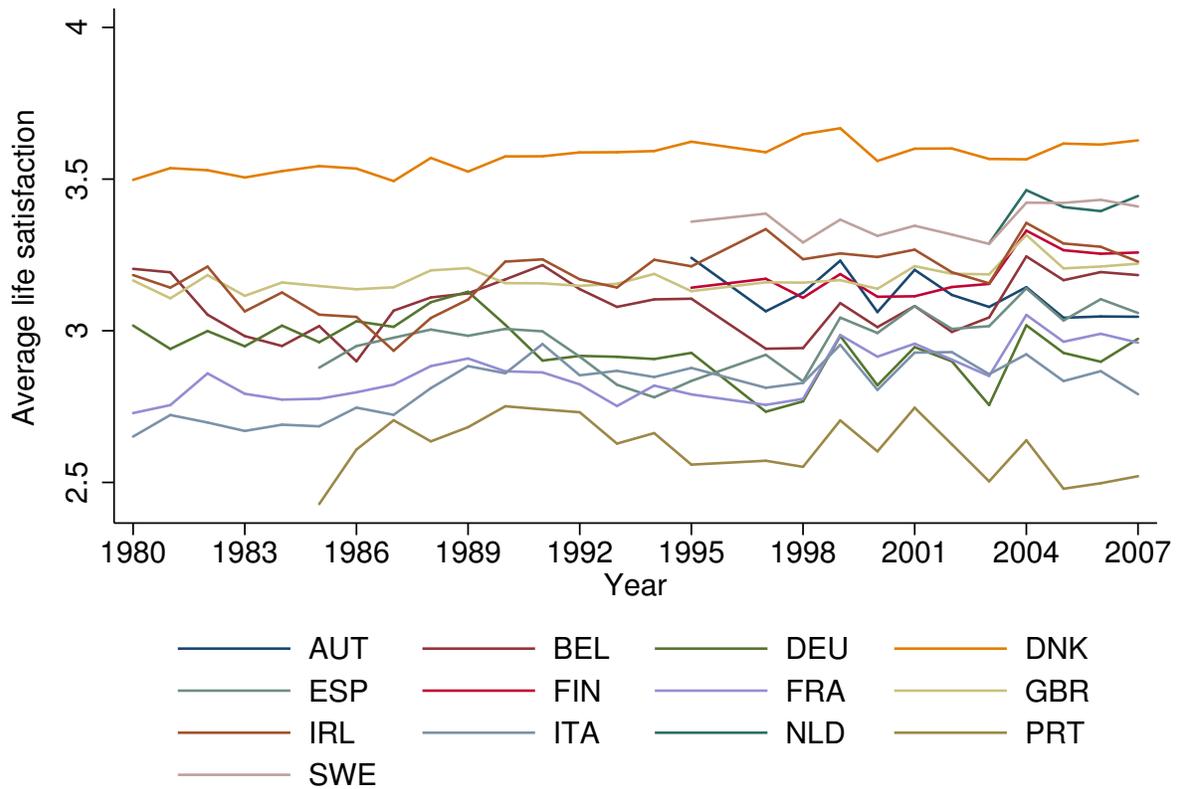
Figure 1:  
Average size of fiscal consolidations (as % of GDP) in the sample



Notes: Austria (AUT); Belgium (BEL); Germany (DEU); Denmark (DNK); Spain (ESP); Finland (FIN); France (FRA); Great Britain (GBR); Ireland (IRL); Italy (ITA) Netherlands (NLD); Portugal(PRT); Sweden (SWE).

Data source: Guajardo et al. (2014), IMF staff calculations.

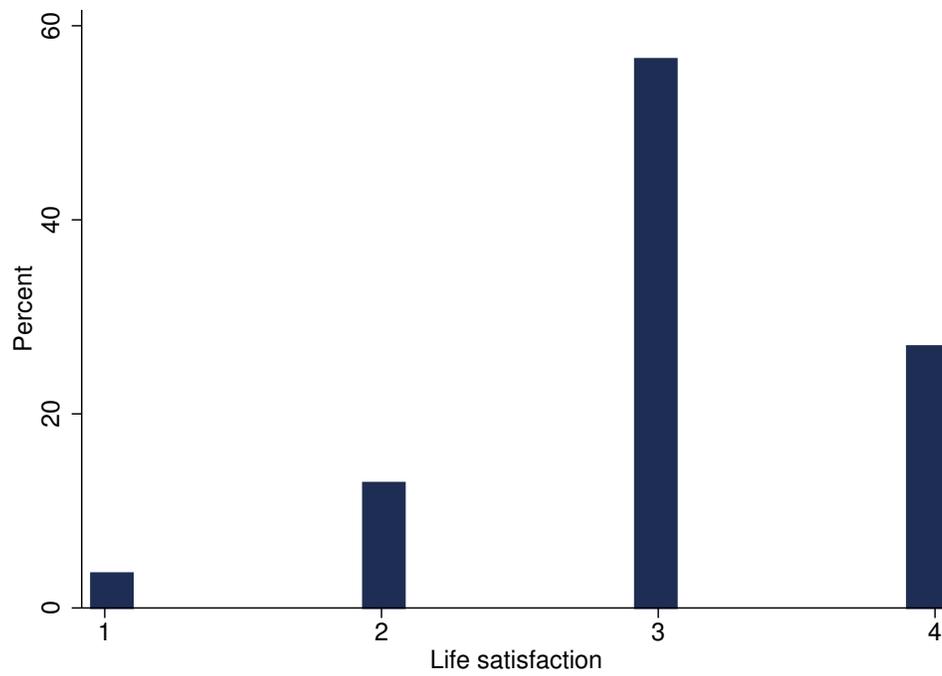
Figure 2:  
Individual life satisfaction across countries



Notes: Austria (AUT); Belgium (BEL); Germany (DEU); Denmark (DNK); Spain (ESP); Finland (FIN); France (FRA); Great Britain (GBR); Ireland (IRL); Italy (ITA) Netherlands (NLD); Portugal(PRT); Sweden (SWE).

Data source: Guajardo et al. (2014), IMF staff calculations.

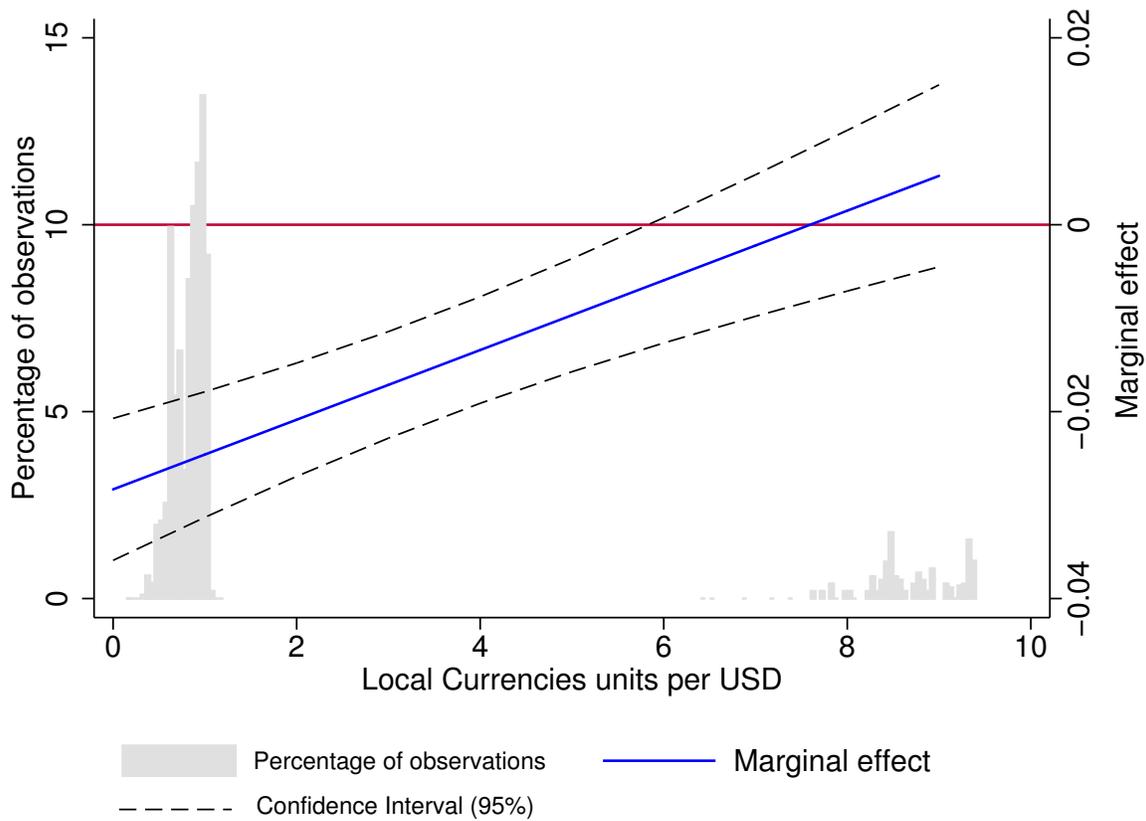
Figure 3:  
Distribution of individual life satisfaction in the sample



Notes: Very satisfied [4], fairly satisfied [3], not very satisfied [2], not at all satisfied [1]  
Data source: Eurobarometers, IMF staff calculations.

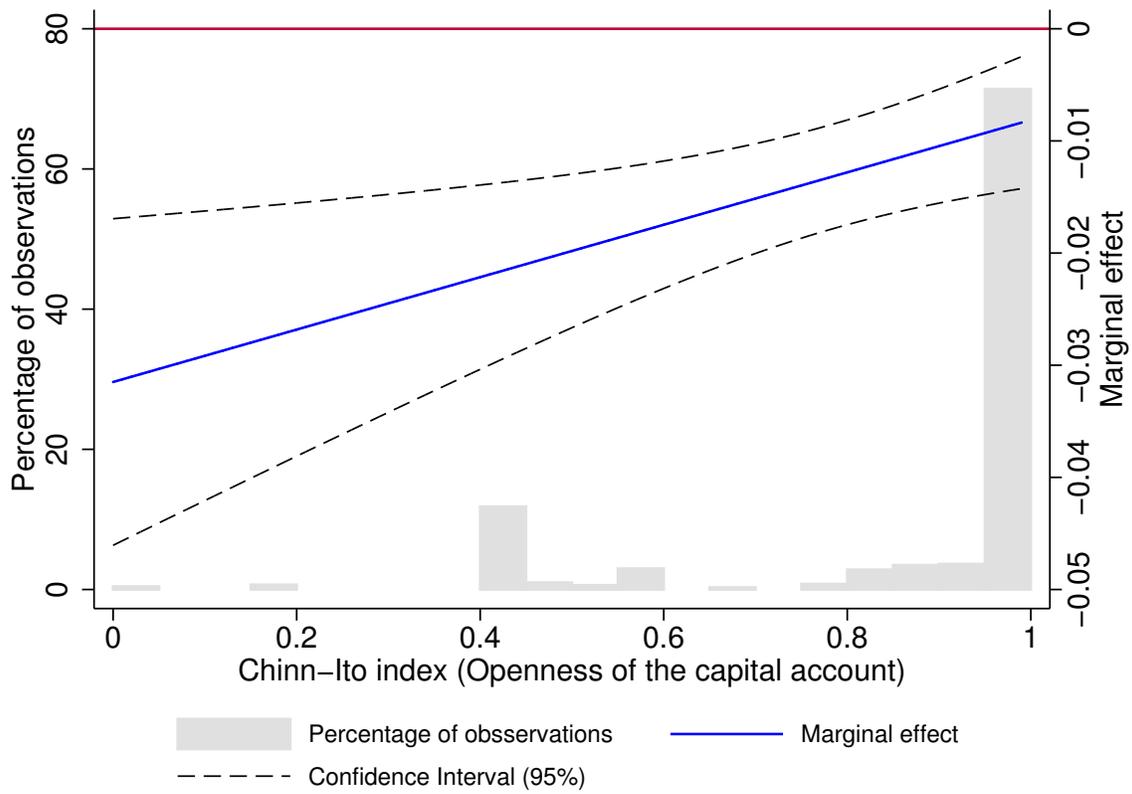
Figure 4:

Marginal effect of fiscal consolidations on individual life satisfaction conditional on exchange rate depreciation



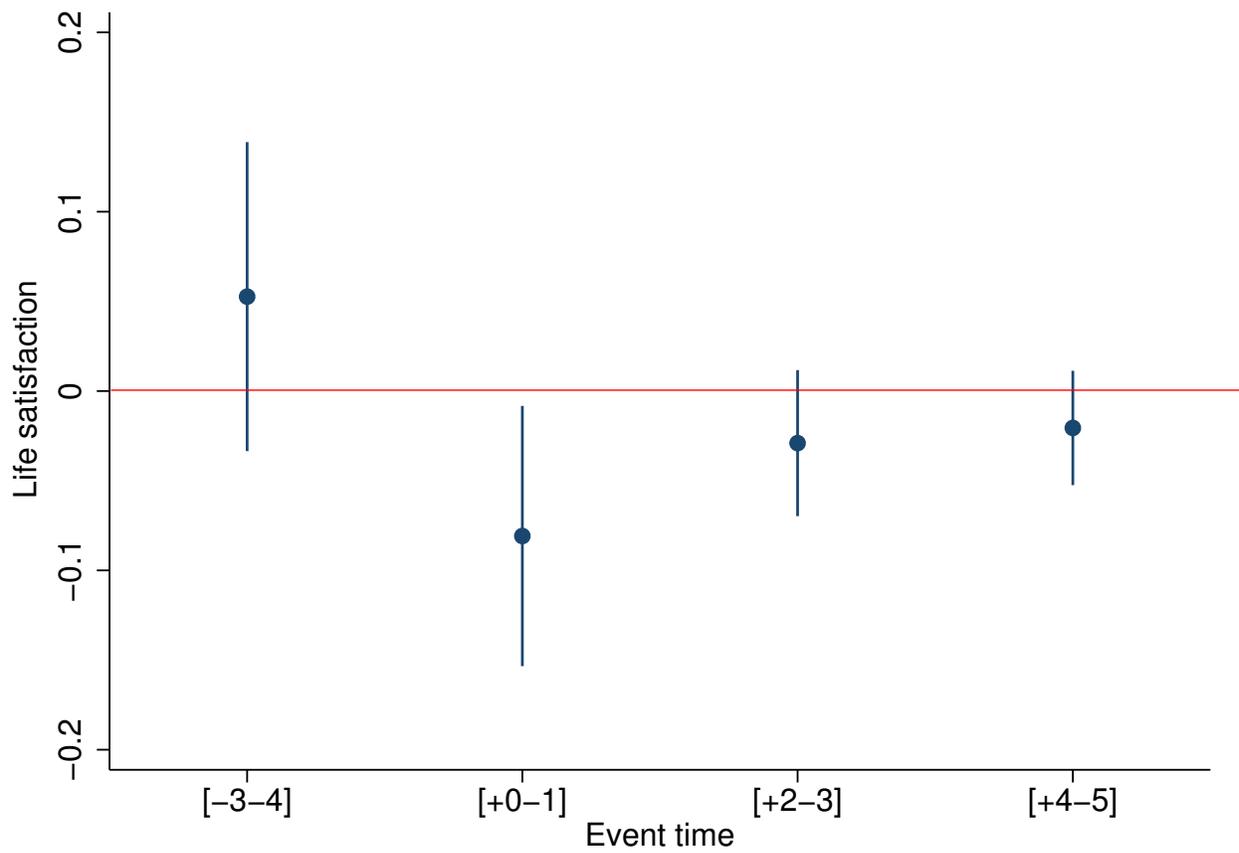
Notes: This figure shows the marginal effect of fiscal consolidations on individual life satisfaction from estimates in Table 2 column (1)

Figure 5:  
 Marginal effect of fiscal consolidations on individual life satisfaction conditional on the degree of capital account openness



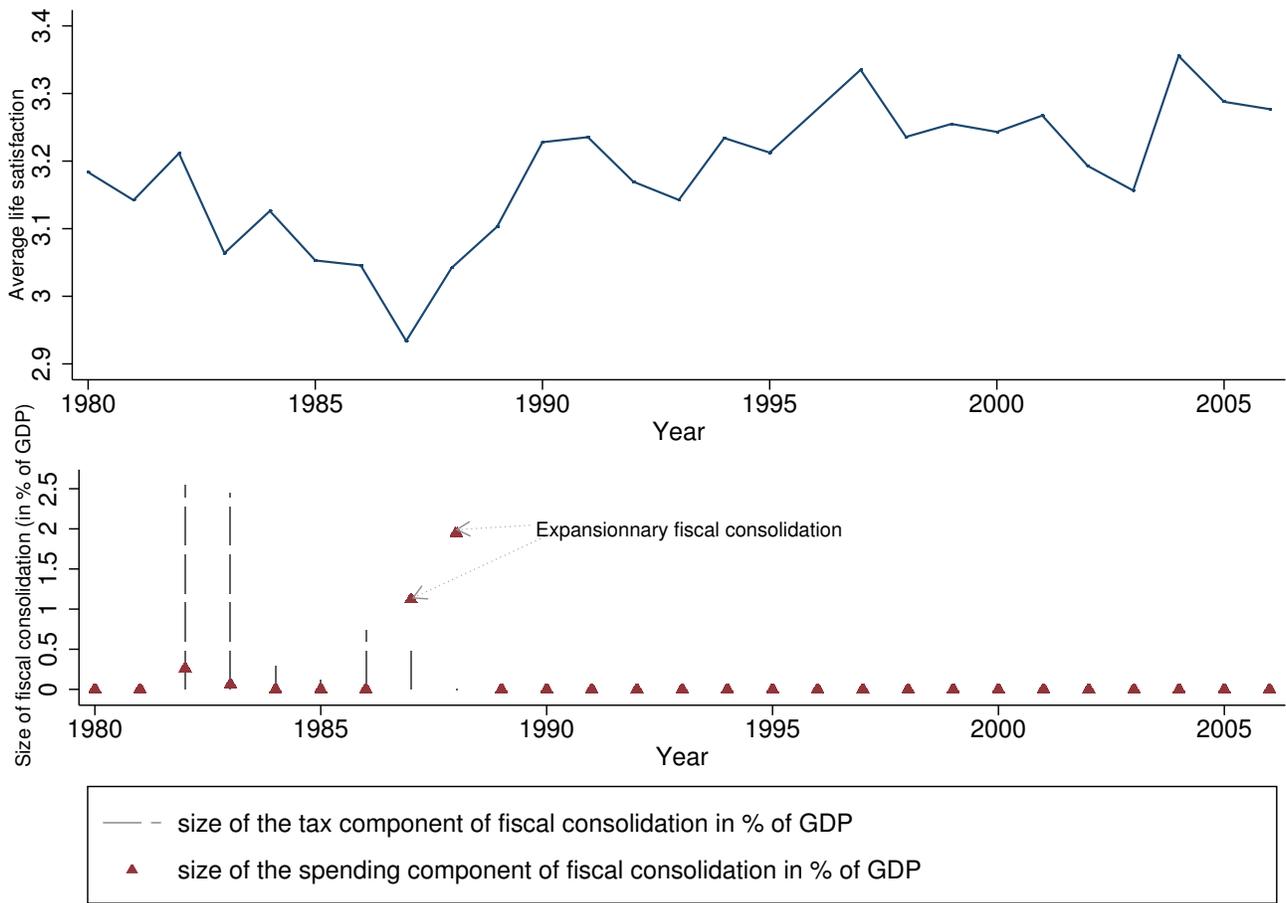
Notes: This figure shows the marginal effect of fiscal consolidations on individual life satisfaction from estimates in Table 2 column (2)

Figure 6:  
Event study: Fiscal consolidation and subjective well-being



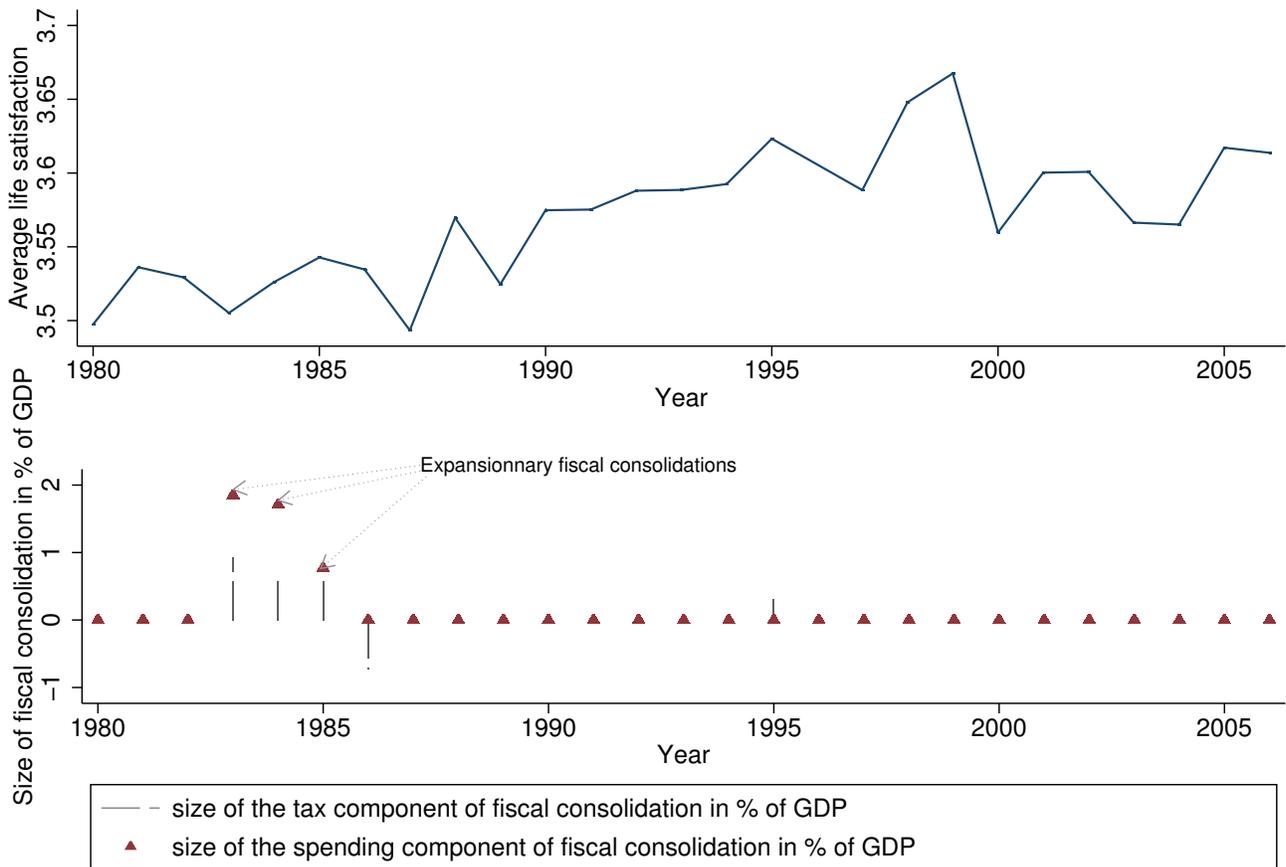
Notes: This Figure describes the dynamic effect of fiscal consolidation on subjective well-being (life satisfaction). It shows a treatment effect of an event defined as the fiscal consolidation of the largest size within country. Event time is a vector of indicator dummies for being within 2-year period before or after the fiscal consolidation event. The identification comes from omitting the 1-2 years before the event. The Figure displays coefficients (in dots) derived from regressions shown in Table A7 in Appendix. The blue lines around the dots represent 95% confidence interval.

Figure 7:  
Time series of fiscal consolidation and life satisfaction : Ireland



Notes: Expansionary fiscal consolidation in Ireland covered the period 1987-1988

Figure 8:  
Time series of fiscal consolidation and life satisfaction : Denmark



Notes: Expansionary fiscal consolidation in Denmark covered the period 1983-1985

# Tables

**Table 1:**  
The well-being consequences of fiscal policy shocks in Europe

	All fiscal consolidations					Type of fiscal consolidations				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.013*** (0.003)	-0.012*** (0.003)	-0.012*** (0.003)	-0.014*** (0.003)	-0.011*** (0.003)					
<b>Spending cut size</b>						-0.032*** (0.004)	-0.037*** (0.004)	-0.023*** (0.004)	-0.029*** (0.004)	-0.028*** (0.004)
<b>Tax hike size</b>						0.005 (0.005)	0.013*** (0.005)	-0.002 (0.005)	0.001 (0.005)	0.006 (0.005)
Real GDP per capita growth		0.004*** (0.001)			0.004*** (0.001)		0.006*** (0.001)			0.005*** (0.001)
Real GDP per capita (Log)			0.425*** (0.037)		0.305*** (0.037)			0.395*** (0.038)		0.270*** (0.038)
Inflation rate (CPI)				-0.005** (0.002)	-0.006*** (0.002)				-0.007*** (0.002)	-0.008*** (0.002)
Inflation rate (CPI) <sup>2</sup>				0.001*** (0.000)	0.001*** (0.000)				0.001*** (0.000)	0.001*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565499	565499	565499	565499	565499	565499	565499	565499	565499	565499

Notes: The dependent variable is individual life satisfaction. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 2:**  
The well-being consequences of fiscal policy shocks in Europe: Additional controls

	Microeconomic controls				Macroeconomic potential confounding factors				Full controls	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.012*** (0.002)	-0.010*** (0.003)			-0.021*** (0.003)	-0.016*** (0.003)			-0.016*** (0.003)	
<b>Spending cut size</b>			-0.033*** (0.004)	-0.028*** (0.004)			-0.018*** (0.005)	-0.021*** (0.005)		-0.023*** (0.004)
<b>Tax hike size</b>			0.006 (0.005)	0.009* (0.005)			-0.025*** (0.006)	-0.009 (0.006)		-0.006 (0.006)
Unemployed	-0.452*** (0.007)	-0.449*** (0.007)	-0.452*** (0.007)	-0.450*** (0.007)					-0.449*** (0.007)	-0.449*** (0.007)
Male	-0.040*** (0.003)	-0.040*** (0.003)	-0.040*** (0.003)	-0.040*** (0.003)					-0.037*** (0.003)	-0.037*** (0.003)
Married	0.131*** (0.003)	0.131*** (0.003)	0.132*** (0.003)	0.131*** (0.003)					0.129*** (0.003)	0.129*** (0.003)
Retired	-0.080*** (0.005)	-0.080*** (0.005)	-0.080*** (0.005)	-0.080*** (0.005)					-0.079*** (0.005)	-0.079*** (0.005)
Age	-0.012*** (0.000)	-0.012*** (0.000)	-0.012*** (0.000)	-0.012*** (0.000)					-0.013*** (0.000)	-0.013*** (0.000)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)					0.000*** (0.000)	0.000*** (0.000)
Real GDP per capita growth		0.001 (0.001)		0.002*** (0.001)		0.003*** (0.001)		0.004*** (0.001)	0.000 (0.001)	0.001 (0.001)
Real GDP per capita (Log)		0.306*** (0.037)		0.269*** (0.037)		0.019 (0.046)		0.021 (0.046)	0.109** (0.046)	0.112** (0.046)
Inflation rate (CPI)		-0.009*** (0.002)		-0.011*** (0.002)		-0.010*** (0.002)		-0.011*** (0.002)	-0.012*** (0.002)	-0.013*** (0.002)
Inflation rate (CPI) <sup>2</sup>		0.001*** (0.000)		0.001*** (0.000)		0.000*** (0.000)		0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
Gini coefficient					-0.004*** (0.001)	-0.003** (0.001)	-0.004*** (0.001)	-0.003** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
Unemployment rate					-0.008*** (0.001)	-0.009*** (0.001)	-0.008*** (0.001)	-0.009*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565454	565454	565454	565454	545270	545270	545270	545270	545225	545225

Notes: The dependent variable is individual life satisfaction. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 3:**  
The well-being consequences of fiscal policy shocks in Europe: Heterogeneity

	Macroeconomics and policies					Individual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fiscal consolidation size</b>	-0.028*** (0.004)	-0.031*** (0.007)	-0.017*** (0.003)	-0.034*** (0.005)	-0.019*** (0.004)	-0.020*** (0.003)	-0.012*** (0.003)
<b>Fiscal consolidation size × Exchange rate (LCU-USD)</b>	0.004*** (0.001)						
Exchange rate (LCU-USD)	-0.071*** (0.019)						
<b>Fiscal consolidation size × Capital account open.</b>		0.023*** (0.009)					
Capital account openness		0.100*** (0.015)					
<b>Fiscal consolidation size × EMU</b>			0.013** (0.006)				
EMU			-0.025*** (0.007)				
<b>Fiscal consolidation size × ALMP</b>				0.002 (0.004)			
ALMP				0.034*** (0.007)			
<b>Fiscal consolidation size × Right government</b>					0.007 (0.005)		
Right government					-0.023*** (0.005)		
<b>Fiscal consolidation size × Retired</b>						0.022*** (0.006)	
<b>Fiscal consolidation size × Unemployed</b>							-0.055*** (0.012)
Real GDP per capita growth	-0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)
Real GDP per capita (Log)	0.162*** (0.049)	0.081* (0.047)	0.141*** (0.044)	0.065 (0.052)	0.134*** (0.046)	0.114** (0.046)	0.112** (0.046)
Inflation rate (CPI)	-0.014*** (0.002)	-0.009*** (0.002)	-0.012*** (0.002)	-0.021*** (0.002)	-0.011*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)
Inflation rate (CPI) <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Unemployed	-0.449*** (0.007)	-0.449*** (0.007)	-0.449*** (0.007)	-0.432*** (0.007)	-0.449*** (0.007)	-0.449*** (0.007)	-0.428*** (0.008)
Male	-0.037*** (0.003)	-0.037*** (0.003)	-0.037*** (0.003)	-0.033*** (0.003)	-0.037*** (0.003)	-0.037*** (0.003)	-0.037*** (0.003)
Married	0.129*** (0.003)	0.130*** (0.003)	0.129*** (0.003)	0.130*** (0.003)	0.129*** (0.003)	0.129*** (0.003)	0.129*** (0.003)
Retired	-0.079*** (0.005)	-0.079*** (0.005)	-0.079*** (0.005)	-0.082*** (0.005)	-0.079*** (0.005)	-0.085*** (0.006)	-0.078*** (0.005)
Age	-0.013*** (0.000)	-0.013*** (0.000)	-0.013*** (0.000)	-0.013*** (0.000)	-0.013*** (0.000)	-0.013*** (0.000)	-0.013*** (0.000)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Gini coefficient	0.001 (0.001)	-0.005*** (0.001)	-0.004*** (0.001)	0.001 (0.001)	-0.003** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
Unemployment rate	-0.007*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	545225	545225	545225	498214	545225	545225	545225

Notes: The dependent variable is individual life satisfaction. Exchange rate (LCU-USD) measures the units of local currency per USD. An increase in Exchange rate (LCU-USD) captures a depreciation. EMU is a dummy capturing the European Monetary Union starting in 1999. ALMP is Active Labor Market policy expenditures as % of GDP. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ . \*\*  $p < 0.05$ . \*\*\*  $p < 0.01$ .

**Table 4:**  
The well-being consequences of fiscal policy shocks in Europe: Disaggregating Spending and Taxes

	First level of disaggregation					Second level of disaggregation				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Direct tax hike</b>	-0.010*** (0.004)	-0.010*** (0.004)	-0.011*** (0.004)	-0.006* (0.004)	-0.007* (0.004)					
<b>Indirect tax hike</b>	0.007 (0.006)	0.017** (0.007)	-0.005 (0.006)	-0.003 (0.007)	0.002 (0.007)					
<b>Public consumption cut</b>	0.013 (0.014)	0.009 (0.014)	0.026* (0.014)	0.011 (0.014)	0.017 (0.014)					
<b>Public investment cut</b>	-0.099*** (0.019)	-0.101*** (0.019)	-0.098*** (0.019)	-0.089*** (0.019)	-0.095*** (0.019)					
<b>Transfers cut</b>	-0.024*** (0.005)	-0.026*** (0.005)	-0.014*** (0.005)	-0.025*** (0.005)	-0.019*** (0.005)					
Real GDP per capita growth		0.006*** (0.001)			0.005*** (0.001)		0.007*** (0.001)			0.006*** (0.001)
Real GDP per capita (Log)			0.416*** (0.039)		0.293*** (0.039)			0.378*** (0.038)		0.249*** (0.037)
Inflation rate (CPI)				-0.007*** (0.002)	-0.008*** (0.002)				-0.007*** (0.002)	-0.007*** (0.002)
Inflation rate (CPI) <sup>2</sup>				0.001*** (0.000)	0.001*** (0.000)				0.001*** (0.000)	0.001*** (0.000)
<b>Property tax hike</b>						0.062*** (0.023)	0.084*** (0.023)	0.064*** (0.023)	0.083*** (0.023)	0.102*** (0.023)
<b>Personal income tax hike</b>						-0.027*** (0.010)	-0.034*** (0.010)	-0.024** (0.010)	-0.029*** (0.010)	-0.032*** (0.010)
<b>Corporate income tax hike</b>						-0.048** (0.022)	-0.048** (0.022)	-0.049** (0.022)	-0.036 (0.022)	-0.038* (0.022)
<b>Tax hike on goods and services</b>						0.015** (0.007)	0.027*** (0.007)	0.003 (0.007)	0.005 (0.007)	0.011 (0.007)
<b>Salaries cut</b>						-0.132*** (0.014)	-0.143*** (0.014)	-0.114*** (0.014)	-0.123*** (0.014)	-0.124*** (0.014)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	556386	556386	556386	556386	556386	565499	565499	565499	565499	565499

Notes: The dependent variable is individual life satisfaction. Fiscal consolidation components are measured as % of GDP. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table 5:**  
A tale of two expansionary fiscal consolidations and their well-being consequences :  
The case of Ireland and Denmark

	Denmark		Ireland	
	(1)	(2)	(3)	(4)
<b>Fiscal consolidation size</b>	-0.020*** (0.004)	0.072*** (0.021)	-0.044*** (0.005)	-0.025*** (0.005)
<b>Fiscal consolidation size × Exp consol Denmark</b>		-0.087*** (0.028)		
Period of Exp consol Denmark		-0.024 (0.044)		
<b>Fiscal consolidation size × Exp consol Ireland</b>				0.345*** (0.115)
Period of Exp consol Ireland				-0.763*** (0.201)
Constant	3.700*** (0.020)	3.709*** (0.020)	3.404*** (0.023)	3.406*** (0.023)
Unemployed	-0.299*** (0.017)	-0.300*** (0.017)	-0.651*** (0.018)	-0.649*** (0.018)
Male	-0.043*** (0.006)	-0.044*** (0.006)	-0.067*** (0.007)	-0.067*** (0.007)
Married	0.078*** (0.007)	0.078*** (0.007)	0.134*** (0.011)	0.137*** (0.011)
Retired	-0.156*** (0.012)	-0.156*** (0.012)	-0.019 (0.016)	-0.020 (0.016)
Age	-0.009*** (0.001)	-0.009*** (0.001)	-0.016*** (0.001)	-0.016*** (0.001)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes
Observations	51945	51945	51501	51501

Notes: Dependent variable is individual life satisfaction. "Period of Exp consol Denmark" and "Period of Exp consol Ireland" represent respectively the periods of expansionary fiscal consolidations reported by Giavazzi and Pagano (1990) in Denmark (1983, 1984 and 1985) and Ireland (1987 and 1988). These regressions are country-specific. Robust standard errors are in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

# Appendix

Table A<sub>1</sub>  
Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
<b>Macroeconomic level data</b>					
Fiscal consolidation size	195	0.305	0.677	-0.75	3.5
Spending cut size	195	0.182	0.438	-0.29	2.8
Tax hike size	195	0.123	0.399	-0.75	2.54
Direct tax hike	195	0.106	0.0461	-1.831	2.561
Property tax hike	195	0.006	0.085	-0.368	1.16
Personal income tax hike	195	0.021	0.173	-0.916	1.116
Corporate income tax hike	195	0.02	0.101	-0.372	0.949
Indirect tax hike	195	0.068	0.241	-0.193	2.676
Taxes on goods and services	195	0.068	0.241	-0.193	2.676
Public consumption cut	195	0.044	0.138	-0.005	1.188
Salaries cut	195	0.028	0.117	-0.064	1.199
Pub investment cut	195	0.021	0.117	-0.128	1.359
Transfers cut	195	0.132	0.385	-0.522	3.022
Real GDP per capita (Log)	195	10.269	0.32	9.324	10.877
Real GDP per capita growth	195	2.363	1.746	-2.163	8.966
Inflation rate (CPI)	195	3.96	3.327	-0.1	18.2
Unemployment rate	188	9.113	4.177	3.2	24.2
Gini coefficient	195	28.886	4.029	20.415	36.824
Exchange rate (LCU-USD)	195	1.815	2.647	0.374	9.378
Capital account openness	195	0.814	0.264	0.165	1
EMU	195	0.354	0.479	0	1
ALMP	168	0.827	0.357	0.163	2.21
Right government	195	0.533	0.5	0	1
<b>Microeconomic level data</b>					
Life satisfaction	565454	3.065	0.731	1	4
Unemployed	565454	0.062	0.241	0	1
Male	565454	0.477	0.499	0	1
Married	565454	0.771	0.42	0	1
Retired	565454	0.199	0.399	0	1
Age	565454	44.261	18.222	18	99

**Table A<sub>2</sub>**  
The well-being consequences of fiscal policy shocks in Europe : Controlling for year effects

	All fiscal consolidations					Type of fiscal consolidations				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.006** (0.003)	-0.005 (0.003)	-0.009*** (0.003)	-0.007*** (0.003)	-0.007** (0.003)					
<b>Spending cut size</b>						-0.015*** (0.004)	-0.019*** (0.004)	-0.011** (0.004)	-0.018*** (0.004)	-0.017*** (0.004)
<b>Tax hike size</b>						0.004 (0.005)	0.011** (0.005)	-0.006 (0.005)	0.004 (0.005)	0.005 (0.005)
Real GDP per capita growth		0.005*** (0.001)			0.003** (0.001)		0.007*** (0.001)			0.004*** (0.001)
Real GDP per capita (Log)			0.431*** (0.048)		0.591*** (0.054)			0.423*** (0.049)		0.568*** (0.054)
Inflation rate (CPI)				-0.008*** (0.002)	-0.015*** (0.002)				-0.010*** (0.002)	-0.016*** (0.002)
Inflation rate (CPI) <sup>2</sup>				0.001*** (0.000)	0.000*** (0.000)				0.001*** (0.000)	0.000*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565499	565499	565499	565499	565499	565499	565499	565499	565499	565499

Notes: The dependent variable is individual life satisfaction. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A<sub>3</sub>**  
Baseline estimates (Ordered Probit)

	All fiscal consolidations					Type of fiscal consolidations				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.007*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)	-0.008*** (0.001)	-0.006*** (0.001)					
<b>Spending cut size</b>						-0.017*** (0.002)	-0.019*** (0.002)	-0.012*** (0.002)	-0.015*** (0.002)	-0.015*** (0.002)
<b>Tax hike size</b>						0.002 (0.002)	0.006** (0.003)	-0.001 (0.002)	0.000 (0.003)	0.003 (0.003)
Real GDP per capita growth		0.002*** (0.000)			0.002*** (0.000)		0.003*** (0.000)			0.003*** (0.000)
Real GDP per capita (Log)			0.206*** (0.020)		0.141*** (0.021)			0.190*** (0.021)		0.122*** (0.021)
Inflation rate (CPI)				-0.003** (0.001)	-0.003*** (0.001)				-0.004*** (0.001)	-0.004*** (0.001)
Inflation rate (CPI) <sup>2</sup>				0.000*** (0.000)	0.000*** (0.000)				0.000*** (0.000)	0.000*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565499	565499	565499	565499	565499	565499	565499	565499	565499	565499

Notes: The dependent variable is individual life satisfaction. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A<sub>4</sub>  
Baseline estimates (Predicted life satisfaction)

	All fiscal consolidations					Type of fiscal consolidations				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.015*** (0.001)	-0.014*** (0.001)	-0.014*** (0.001)	-0.016*** (0.001)	-0.015*** (0.001)					
<b>Spending cut size</b>						-0.031*** (0.001)	-0.035*** (0.001)	-0.024*** (0.001)	-0.026*** (0.001)	-0.028*** (0.001)
<b>Tax hike size</b>						0.001 (0.001)	0.007*** (0.001)	-0.004*** (0.001)	-0.007*** (0.001)	-0.001 (0.001)
Real GDP per capita growth		0.003*** (0.000)			0.004*** (0.000)		0.004*** (0.000)			0.005*** (0.000)
Real GDP per capita (Log)			0.332*** (0.010)		0.115*** (0.011)			0.303*** (0.010)		0.088*** (0.011)
Inflation rate (CPI)				-0.003*** (0.001)	-0.002*** (0.001)				-0.004*** (0.001)	-0.003*** (0.001)
Inflation rate (CPI) <sup>2</sup>				0.001*** (0.000)	0.000*** (0.000)				0.001*** (0.000)	0.001*** (0.000)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565454	565454	565454	565454	565454	565454	565454	565454	565454	565454

Notes: The dependent variable is the predicted value of life satisfaction derived from an ordered probit regression of life satisfaction on individual control variables with country fixed and year effects. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A5  
Additional controls estimates (Ordered Probit)

	Microeconomic controls				Macroeconomic potential confounding factors				Full controls	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>Fiscal consolidation size</b>	-0.007*** (0.001)	-0.006*** (0.001)			-0.011*** (0.002)	-0.009*** (0.002)			-0.008*** (0.002)	
<b>Spending cut size</b>			-0.017*** (0.002)	-0.015*** (0.002)			-0.010*** (0.002)	-0.012*** (0.002)		-0.013*** (0.002)
<b>Tax hike size</b>			0.003 (0.002)	0.005* (0.003)			-0.013*** (0.003)	-0.004 (0.003)		-0.003 (0.003)
Unemployed	-0.223*** (0.003)	-0.222*** (0.003)	-0.223*** (0.003)	-0.222*** (0.003)					-0.221*** (0.003)	-0.221*** (0.003)
Male	-0.023*** (0.002)	-0.023*** (0.002)	-0.023*** (0.002)	-0.023*** (0.002)					-0.021*** (0.002)	-0.021*** (0.002)
Married	0.072*** (0.002)	0.072*** (0.002)	0.073*** (0.002)	0.072*** (0.002)					0.070*** (0.002)	0.071*** (0.002)
Retired	-0.043*** (0.003)	-0.043*** (0.003)	-0.043*** (0.003)	-0.043*** (0.003)					-0.042*** (0.003)	-0.042*** (0.003)
Age	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)					-0.007*** (0.000)	-0.007*** (0.000)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)					0.000*** (0.000)	0.000*** (0.000)
Real GDP per capita growth		0.001 (0.000)		0.001*** (0.000)		0.002*** (0.001)		0.002*** (0.000)	0.000 (0.000)	0.001 (0.000)
Real GDP per capita growth		0.146*** (0.020)		0.125*** (0.021)		0.016 (0.026)		0.018 (0.026)	0.063** (0.026)	0.065** (0.025)
Inflation rate (CPI)		-0.005*** (0.001)		-0.006*** (0.001)		-0.005*** (0.001)		-0.006*** (0.001)	-0.006*** (0.001)	-0.007*** (0.001)
Inflation rate (CPI) <sup>2</sup>		0.000*** (0.000)		0.000*** (0.000)		0.000*** (0.000)		0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Gini coefficient					-0.002*** (0.001)	-0.002** (0.001)	-0.002*** (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)
Unemployment rate					-0.003*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	565454	565454	565454	565454	545270	545270	545270	545270	545225	545225

Notes: The dependent variable is individual life satisfaction. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A<sub>6</sub>  
Heterogeneity effects (Ordered Probit)

	Macroeconomics and policies					Individual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Fiscal consolidation size</b>	-0.014*** (0.002)	-0.018*** (0.004)	-0.009*** (0.002)	-0.016*** (0.003)	-0.010*** (0.002)	-0.010*** (0.002)	-0.007*** (0.002)
<b>Fiscal consolidation size × Exchange rate (LCU-USD)</b>	0.002*** (0.000)						
Exchange rate (LCU-USD)	-0.049*** (0.012)						
<b>Fiscal consolidation size × Capital account open.</b>		0.015*** (0.005)					
Capital account openness		0.054*** (0.008)					
<b>Fiscal consolidation size × EMU</b>			0.010*** (0.003)				
EMU			-0.015*** (0.004)				
<b>Fiscal consolidation size × ALMP</b>				-0.001 (0.002)			
ALMP				0.017*** (0.004)			
<b>Fiscal consolidation size × Right government</b>					0.004 (0.003)		
Right government					-0.013*** (0.003)		
<b>Fiscal consolidation size × Retired</b>						0.012*** (0.003)	
<b>Fiscal consolidation size × Unemployed</b>							-0.020*** (0.006)
Real GDP per capita growth	-0.001 (0.001)	0.000 (0.001)	0.000 (0.000)	-0.000 (0.001)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Real GDP per capita (Log)	0.086*** (0.027)	0.051* (0.026)	0.084*** (0.025)	0.036 (0.029)	0.076*** (0.026)	0.065** (0.026)	0.064** (0.026)
Inflation rate (CPI)	-0.007*** (0.001)	-0.004*** (0.001)	-0.006*** (0.001)	-0.011*** (0.001)	-0.005*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
Inflation rate (CPI) <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Unemployed	-0.221*** (0.003)	-0.221*** (0.003)	-0.221*** (0.003)	-0.214*** (0.003)	-0.221*** (0.003)	-0.220*** (0.003)	-0.213*** (0.004)
Male	-0.021*** (0.003)	-0.021*** (0.003)	-0.021*** (0.003)	-0.019*** (0.003)	-0.021*** (0.003)	-0.021*** (0.003)	-0.021*** (0.003)
Married	0.071*** (0.002)	0.071*** (0.002)	0.071*** (0.002)	0.071*** (0.002)	0.070*** (0.002)	0.071*** (0.002)	0.071*** (0.002)
Retired	-0.043*** (0.003)	-0.042*** (0.003)	-0.042*** (0.003)	-0.044*** (0.003)	-0.043*** (0.003)	-0.046*** (0.003)	-0.042*** (0.003)
Age	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)	-0.007*** (0.000)
Age <sup>2</sup>	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Gini coefficient	0.000 (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	0.000 (0.001)	-0.001** (0.001)	-0.002** (0.001)	-0.002** (0.001)
Unemployment rate	-0.003*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country specific trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	545225	545225	545225	498214	545225	545225	545225

Notes: The dependent variable is individual life satisfaction. Exchange rate (LCU-USD) measures the units of local currency per USD. An increase in Exchange rate (LCU-USD) captures a depreciation. EMU is a dummy capturing the European Monetary Union starting in 1999. ALMP is Active Labor Market policy expenditures as % of GDP. All specifications include country fixed effects and country-specific trends. Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

Table A7  
Dynamic effects of fiscal shocks: Event study approach

	Coef	SE
	(1)	(2)
Largest consolidation year – 3-4	0.053	(0.039)
<b>Consolidation year + 0-1</b>	-0.081**	(0.033)
Largest consolidation year + 2-3	-0.029	(0.018)
Largest consolidation year + 4-5	-0.021	(0.014)
Country fixed effects	Yes	
Country specific trends	Yes	
Observations	133	

Notes: The dependent variable is the country level average of individual life satisfaction. All specifications include country fixed effects, country-specific trends and all macroeconomic controls. The identification comes from omitting the 1-2 years before the event. An event is defined as the fiscal consolidation of the largest size over the period (largest tax hike or largest spending cut) within country over the period. The number of observation corresponds to a regression over 9 years period (4 years period before consolidation and 5 years period after). Robust standard errors in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

**Table A<sub>8</sub>**  
**Description of variables.**

Variable	Description	Source
<b>Macroeconomic level data</b>		
Fiscal consolidation size	The size of fiscal consolidations is defined as the budgetary impact in % of GDP. This variable is based on fiscal consolidations primarily motivated by the desire to reduce the budget deficit.	(Devries et al., 2011; Guajardo et al., 2014).
Spending cut size	Spending cut size identifies size of the spending component of fiscal consolidation in % GDP	(Devries et al., 2011; Guajardo et al., 2014).
Tax hike size	Tax hike size captures the size of the tax component of fiscal consolidation in % GDP	(Devries et al., 2011; Guajardo et al., 2014).
Direct tax hike	Direct tax hike represent the size of the direct tax component of fiscal consolidation in % GDP. Direct tax defined as direct tax imposed on person, property and corporations that does not involve a transaction (income tax, property tax hike, corporate income tax, personal income)	(Alesina et al., 2017)
Property tax hike	Property tax is the size of the property tax component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Personal income tax hike	Personal income tax identifies the size of the personal income component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Corporate income tax hike	Corporate income hike is the size of the corporate income component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Indirect tax hike	Indirect tax hike captures the size of the indirect tax hike component of fiscal consolidation in % GDP. Indirect taxes represent taxes imposed on certain transactions involving the purchases on goods and services	(Alesina et al., 2017)
Taxes on goods and services	Taxes on goods and services is the size of the taxes on goods and services component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Public consumption cut	Public consumption cut is defined as government current public expenditures (goods and services) component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Salaries cut	Salaries cut is the size of public sector salaries and other employees compensation component of fiscal consolidation in % GDP	(Alesina et al., 2017)
Public investment cut	Public investment cut captures the size of Public investment cut in % GDP. Public investment includes government gross fixed capital formation expenditure	(Alesina et al., 2017)
Transfers cut	Transfers cut is the size of the Transfers component of fiscal consolidation in % GDP. Transfer is defined as every payment made by the government to private entities	(Alesina et al., 2017)
Real GDP per capita	Real GDP per capita in \$ constant 2005	World Development Indicators (WDI)
Real GDP per capita growth	The growth of real GDP per capita (in \$ constant 2005)	World Development Indicators (WDI)
Inflation rate (CPI)	The inflation rate is based on Consumer Price Index	OECD Statistics
Unemployment rate	Unemployment rate represents the share of unemployed in total labor force (%)	World Development Indicators (WDI)
Gini coefficient	Estimate of GINI index based on households' disposable net income (post-tax and post-transfer ) inequality	Standardized World Income Inequality Database (SWIID)
Exchange rate (LCU-USD)	Local currency units per unit of USD to capture devaluations and depreciations	OECD Statistics
Capital account openness	Index of capital account openness	Chinn and Ito (2006)
EMU	Dummy capturing the membership of the European Monetary Union (EMU) that takes the value 1 starting in 1999	Comparative Political Data Set (CPDS)
ALMP	Active Labor Market Policies (ALMP) captures active labour market programs' expenditure as percentage of GDP	Comparative Political Data Set (CPDS)
Right government	Dummy for right government taking the value 1 if the party in power's orientation with respect to economic policy is defined as conservative, christian democratic or right-wing	Database on Political Institutions (Keefer, 2010).
<b>Microeconomic level data</b>		
Life satisfaction	Life satisfaction is a proxy for individual well-being or well-being. This variable is a recoded categorical response based on the following question: "On the whole, are you very satisfied [4], fairly satisfied [3], not very satisfied [2], or not at all satisfied [1] with the life you lead?".	Eurobarometer survey series (EB)
Unemployed	Dummy that takes the value 1 if the respondent is unemployed	Eurobarometer survey series (EB)
Male	Dummy that takes the value 1 if the respondent is male	Eurobarometer survey series (EB)
Married	Dummy that takes the value 1 if the respondent is married	Eurobarometer survey series (EB)
Age	Age of respondent	Eurobarometer survey series (EB)
Retired	Dummy that takes the value 1 if the respondent is retired	Eurobarometer survey series (EB)