

Fiscal consolidations

SUMMARY

We explore how fiscal consolidations affect private sector confidence, a possible channel for the transmission of fiscal policy that has received particular attention recently as a result of governments embarking on austerity trajectories in the aftermath of the crisis. Panel regressions based on the annual action-based datasets of Devries et al. (2011) and Alesina et al. (2014a) show that consolidations, and in particular their unanticipated components, affect confidence negatively. To obtain a more accurate picture of how consolidations affect confidence, we construct a monthly dataset of consolidation announcements, so that we can investigate the confidence effects in real time using an event study. The results suggest that consumer confidence falls around announcements of consolidation measures, an effect likely driven by revenue-based measures. Moreover, these effects are highly relevant for European countries with weak institutional arrangements, as measured by the tightness of fiscal rules or budgetary transparency. The effects on producer confidence are generally similar, but weaker than for consumer confidence. Long-term interest rates, as a measure of confidence in the sovereign, tend to fall around spending-based consolidation announcements. We have no evidence that the confidence effects of consolidation announcements are worse in slumps than in booms. Generally, strengthening institutional arrangements may help in mitigating adverse confidence effects of consolidations.

JEL codes: H60, H61, H62.

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The confidence effects of fiscal consolidations

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1. INTRODUCTION

During the recent economic and financial crisis public deficits and debt increased dramatically. As a result, concerns about the sustainability of the public finances have pushed many industrialized countries into implementing ambitious fiscal austerity measures. The consensus view among economists was always that such fiscal austerity has negative short-run effects on economic activity. While this standard view was challenged by [Alesina and Ardagna \(1998 and 2010\)](#), who claim that austerity measures can

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generate expansionary effects on the economy,² the IMF (2010) shows that the claimed expansionary effects of austerity may be the result of biases in the selection of fiscal consolidation episodes. Using the consolidations identified in the ‘action-based’ dataset constructed by Devries et al. (2011), Guajardo et al. (2014) find that the expansionary effects of fiscal consolidations tend to be exaggerated. Hence, *while the expansionary consolidation hypothesis seems to have become untenable, the debate has shifted towards the role of the composition of the consolidation strategy in affecting the macroeconomy*. For instance, Alesina and Ardagna (2013) show that spending-based adjustments cause less contractionary effects than revenue-based adjustments.

At present a lot is still unknown about the channels through which consolidations affect the economy and what accounts for the different effects associated with the composition of a consolidation. In this regard, commentators frequently point to the role of private sector confidence. In particular, they often argue that Europe’s difficulties in escaping from the crisis are to be blamed on a lack of demand resulting from weak confidence.

In this paper we study the effects of consolidations on private sector confidence. The topic is very timely, because many countries are now consolidating their public balances. While the key role of confidence in the fiscal transmission mechanism is often stressed—for example, Hemming et al. (2002) emphasize the dependence of consumption and investment on the attitudes of households and firms—the quantification of the effect of fiscal measures on confidence has attracted surprisingly little attention. An exception is Konstantinou and Tagkalakis (2011), who find evidence that expansionary fiscal policy can boost consumer and business confidence, which in turn stimulates private spending and economic activity. Other exceptions are Cimadomo et al. (2011), Alesina et al. (2014a) and Kalbhenn and Stracca (2014). The latter do not find much evidence that fiscal consolidations affect variables like confidence and trust.

To establish a link with the existing literature and as a stepping stone for the empirical analysis based on our new monthly consolidation announcements dataset, we first present annual panel regressions linking confidence to consolidations. The consolidation episodes are those that are identified on an annual basis in the ‘action-based’ dataset

² Ardagna (2004) points to the so-called ‘expectations channel’. If the general public sees the need for a consolidation, then an increase in current taxes or a reduction in public spending would reduce the need for future taxes and this could stimulate the economy. However, for this mechanism to work in a context in which consumption depends only on lifetime net income, postponing a current contraction requires a more than proportional future contraction, so that the present value of resource for consumption falls. A possible channel is that the budgetary crisis resulting from the postponement produces a disproportionate increase in the interest paid on the public debt. Bertola and Drazen (1993) develop a model in which a cut in public spending leads to significantly lower expectations of future spending and taxes, thereby stimulating current consumption. In the overlapping generations model of Sutherland (1997) an increase in the public deficit when debt is already high may lead to a contraction in consumption, because a rise in taxes becomes more likely. Generally, in a non-Ricardian world in which consumption depends only on current income, e.g. because of the presence of credit constraints, expansionary contractions are implausible.

constructed by Devries et al. (2011). Our analysis is thus based on their data for 17 OECD countries over the period 1978–2009. Generally, we find that consolidations affect consumer confidence negatively. We also explore separately the effects of the different components of consolidation plans, as identified in Alesina et al. (2014a), both through a split into revenues and expenditure measures and a split into anticipated currently implemented measures, unanticipated currently implemented measures and changes to planned future measures. The latter two play the largest role in affecting consumer confidence. This is consistent with a situation in which mostly new and credible information affects confidence. Further, the (negative) confidence effects running through the revenues component of consolidations are larger and more significant than those running through the spending component.

A more accurate and timely picture of how consolidations affect confidence can be obtained by reconstructing a more precise timing of the release of information of the consolidations. For example, the announcement of many of the unanticipated and currently implemented measures in Alesina et al. (2014a) can be traced back to the budget generally presented in the previous year. This way it becomes easier to exclude confounding events and to see in real time how such information affects confidence. Hence, based on the narrative account of the fiscal consolidation episodes identified by Devries et al. (2011) and on other institutional information and official documents, we enrich the available annual data further by identifying the specific month in which each consolidation measure is announced. The core of our empirical results comes from an event study based on the resulting monthly panel dataset—which covers the same 1978–2009 period and set of 17 OECD countries as in Devries et al. (2011)—and is aimed at exploring the real-time and higher-frequency (i.e., monthly) association between consolidation announcements and movements in confidence.

The main finding from the event study is that consolidation announcements are associated with a reduction in consumer confidence and that this fall is mostly driven by revenue-based announcements. This effect is especially strong for the European countries in our sample. European countries with weak fiscal rules and low transparency are accompanied by a strong and negative association between consumer confidence and consolidation announcements, while for countries with strong fiscal rules and high transparency there is no evidence of a significant relationship. Dissecting the observations on the basis of the state of the economy, we observe that announcements in booms have a negative effect on consumer confidence, which is possibly the result of a signal that the underlying fundamentals of the economy are weaker than perceived. Our findings on the effects of announcements on business confidence are generally weaker, but consistent with those for consumer confidence. Also in this case, revenue-based measures tend to harm confidence, while no such thing is observed for spending-based measures. In a final step, we investigate how consolidation announcements affect confidence in the sovereign—as measured by the long-term interest rate on the public debt—and the stock market. Spending-based consolidations cause a significant reduction in the interest rate. Such a reduction is also observed when the output gap is negative. Finally, stock prices fall for announcements taking place

when the output gap is positive, which may again point to a signal that the underlying economic fundamentals are weaker than originally perceived.

Our findings suggest some potentially useful policy implications. First, the confidence effects of spending-based consolidations appear to be less negative than those of revenue-based measures. Second, a slump period is not necessarily a worse moment to announce a consolidation than is a boom. Last, solid institutional arrangements in the form of tight fiscal rules and transparent budgets could help in mitigating any negative confidence effects of consolidations.

The remainder of this paper is structured as follows. Section 2 provides a brief literature review. Section 3 discusses the identification of consolidation episodes and the recent austerity measures adopted in the euro area and resulting from the crisis. Section 4 describes the dataset, and in particular the construction of the monthly data on consolidation announcements. Section 5 conducts the annual panel regression analysis investigating how consolidations affect confidence. Section 6 presents the event study, while Section 7 concludes the paper and offers some policy implications. The Appendix contains further details on the construction of the data, while the [Web Appendix](#) contains further details on the results. Finally, a separate [Data Construction Appendix](#) contains the case-by-case discussion of the construction of the monthly consolidation announcements. (Both the [Web Appendix](#) and [Data Construction Appendix](#) are available as Supplementary Data in the online version of this article).

2. LITERATURE REVIEW

Policy-makers and the media often stress the role of private sector confidence in the fiscal transmission mechanism. Confidence is important in this regard if fiscal policy decisions have a significant effect on confidence, which in turn can affect the real economy. We start by reviewing existing evidence on the first part of the transmission, which is the focus of this paper, and then we move on to discussing the second part of the chain.

2.1. The effect of fiscal shocks on confidence

Although many authors stress the key role of consumer confidence in the fiscal transmission mechanism, the quantification of the effect of fiscal measures on consumer confidence has attracted surprisingly little attention.

Giavazzi and Pagano (1990) were among the first to highlight the importance of confidence in the transmission of fiscal policies. The argument was that a drastic fiscal adjustment—as reflected in a sharp fall in long-term interest rates—tends to generate an increase in consumer and investor confidence. This is likely to compensate the depressive Keynesian effect of tax hikes and spending cuts, thus resulting in an overall economic expansion following an episode of fiscal consolidation. More specifically, the authors studied the experience of Denmark in the early eighties and Ireland at the end

of the same decade and argued that these episodes represent cases of ‘expansionary fiscal adjustments’. While [Giavazzi and Pagano \(1990\)](#) and the following literature on the ‘non-Keynesian effects’ of fiscal policy (see, e.g., [Giavazzi and Pagano, 1996](#); [Afonso, 2001](#)) attributed an important role to confidence in the transmission of fiscal shocks, these papers did not provide direct econometric evidence on the effects of fiscal policies on measures of consumer and producer confidence.

More recently, some authors have tested directly the effects of fiscal policies on consumer and producer confidence indicators in advanced economies. Focusing on the United States and on the period 1981–2008, [Cimadomo et al. \(2011\)](#) test the different effects of positive government spending shocks that are subsequently reversed, and of spending shocks that are followed by further spending growth. It is found that consumer confidence reacts positively to fiscal shocks with reversal, suggesting that a temporary fiscal stimulus with future fiscal restraint is considered to be beneficial for overall economic conditions. Instead, fiscal shocks accompanied by further future spending growth have a muted effect on consumer confidence. Using quarterly data for nine OECD countries covering the period 1970–2007, [Konstantinou and Tagkalakis \(2011\)](#) show that cuts in direct taxes and increases in non-wage government consumption stimulate both consumer and business confidence. In contrast, higher government wage consumption and investment reduce confidence. [Kalbhenn and Stracca \(2014\)](#) analyse the impact of fiscal consolidations on four measures of public opinion in EU countries, namely (1) life satisfaction, (2) consumer confidence, (3) trust in national institutions (government and parliament) and (4) trust in Europe and European institutions. Based on a panel of 26 EU countries over the period 1973–2013, they find that, overall, fiscal consolidation episodes have little or no impact on these measures of public opinion.

The two papers that are closest to ours are [Alesina et al. \(2014a,b\)](#). Based on a sample of 17 OECD countries over the period 1978–2009, [Alesina et al. \(2014a\)](#) find that both consumer and business confidence fall when a fiscal adjustment is started. The effects on consumer confidence are larger. Moreover, for both confidence measures, the effects of revenue-based consolidation are larger than for spending-based consolidation. [Alesina et al. \(2014b\)](#) expand the data constructed by [Devries et al. \(2011\)](#) up to 2013. Building on the approach in [Alesina et al. \(2014a\)](#), [Alesina et al. \(2014b\)](#) explore how fiscal austerity in the OECD over the years 2009–13 has affected output growth, again finding that spending reductions are less costly than revenue-based consolidation. The current paper extends in several ways the analysis of confidence effects in [Alesina et al. \(2014a\)](#), and other papers mentioned above. Our annual panel regression links confidence to the various components of the consolidation plan, while also distinguishing between revenues- and spending-based consolidations. We further extend the existing data to a set of monthly consolidation announcements. Using an event analysis this allows us to explore in real time the anticipation and reaction of confidence to those announcements, also conditioning the confidence effects on economic and institutional variables.

2.2. How confidence affects the real economy

The literature discusses various channels through which private sector confidence may affect the economy. The so-called ‘animal spirits’ view, which recently regained attention (see, e.g., [Akerlof and Shiller, 2009](#)), suggests that surprise fluctuations in beliefs may have (temporary) effects on economic activity. For example, [Blanchard \(1993\)](#) regards exogenous movements in consumer confidence as a cause of business cycles and, more specifically, of the 1991–2 recession. In such an environment, fiscal announcements may improve sentiment if they show the policy-makers’ commitment to macro-economic stabilization. This, in turn, would stimulate demand. The ‘information’ or ‘news’ view suggests that innovations to confidence largely reflect news about future fundamentals (see, e.g., [Beaudry and Portier, 2006](#)). The ‘news view’ has been tested with mixed outcomes. [Ludvigson \(2004\)](#) finds that consumer confidence predicts a relatively modest amount of variation in future consumer spending. However, recent research points to more sizeable effects. In particular, [Barsky and Sims \(2012\)](#) show that, for the US economy, confidence innovations are associated with a modest immediate response of real activity but with sizeable and prolonged subsequent consumption and income growth. Others focus on the possibility that households fail to perfectly observe fundamentals, but use observables like aggregate output to form beliefs about their true values (see [Lorenzoni, 2009](#)). After a recession, beliefs about improving fundamentals may be slow to catch up, thereby slowing down the recovery. Fiscal (and monetary) authorities may implement expansive policies to signal that fundamentals have improved. This, in turn, boosts confidence and helps the recovery to take off.

For the US economy, a direct test of the role of confidence in the transmission of fiscal shocks is provided by [Bachmann and Sims \(2012\)](#). They allow fiscal policy to have a direct effect on the economy, i.e., through the traditional Keynesian multiplier channel, and an indirect effect, i.e., through confidence. In their VAR framework, they use a counterfactual experiment to isolate the importance of this latter channel. They find that the endogenous response of confidence explains almost all of the fiscal-driven output expansion in recessions, whereas its role in normal times is minor. The positive responses of output and productivity to fiscal stimulus in times of slack are mild on impact, but tend to rise in a gradual and prolonged way. This also provides support to the ‘news’ hypothesis.

In this paper, we show that fiscal consolidations can have significant effects on confidence and that those effects depend on the economic and institutional situation. The findings described above suggest that these confidence effects of consolidations may have important consequences also for economic activity.

3. IDENTIFYING FISCAL CONSOLIDATIONS

Recent years have seen a substantial amount of research trying to identify fiscal shocks and exploring how fiscal consolidations affect the macroeconomy. The most common

way of identifying fiscal consolidations is to look at the cyclically-adjusted primary balance (CAPB), defined as the primary balance minus the component of the balance that is automatically, i.e., for given policies, driven by the business cycle.³ With the automatic effect of the business cycle taken out, swings in the CAPB must be the result of discretionary policy changes. Hence, fiscal consolidations are defined as periods in which the CAPB increases substantially.

The use of the CAPB to identify fiscal consolidations (and discretionary fiscal shocks in general) has been criticized for various reasons. First, changes in the CAPB typically include measurement errors that are likely to be correlated with other economic developments (IMF, 2010). Second, changes in the CAPB can be the result of discretionary reactions of fiscal policy to cyclical conditions. Third, as Wolswijk (2007) argues, the conventional way of calculating the CAPB wrongly assumes that the automatic response of tax revenues is constant over time, while tax elasticities may change over time, which can lead to inaccurate estimates of the CAPB at any moment.

To avoid these shortcomings, Devries et al. (2011) identify fiscal consolidations by using the ‘action-based’ approach of looking closely at the motivation behind the consolidation. Specifically, they identify consolidations as episodes of austerity measures that were primarily motivated by the intention to reduce budget deficits and not by a response to (prospective) economic conditions, for example a desire to restrain domestic demand. To this end they examine historical sources, such as Budget Reports, Budget Speeches, Central Bank Reports, EU Convergence and Stability Programs, IMF Reports, OECD Economic Surveys and country-specific sources.⁴ The IMF (2010) and Guajardo et al. (2014) show that identifying fiscal consolidations using the CAPB creates a bias towards finding that austerity is expansionary. In contrast, when the action-based identification is used, fiscal consolidations turn out to be associated with slumps. While the CAPB-method has its disadvantages, the narrative approach also has its weaknesses, which are mainly related to the difficulty in defining the benchmark of ‘unchanged policy’ against which to assess the impact of government actions.

³ There are various ways to operationalize the concept of the CAPB. For instance, Blanchard (1990) argues that public spending (revenues) is negatively (positively) related to GDP due to built-in stabilizers like unemployment benefits (the progressive tax system). A contraction causes the deficit to rise, because it leads to an automatic increase in public spending and an automatic reduction in tax revenues. To purge these automatic effects, Blanchard suggests to estimate spending and revenues had the unemployment rate remained constant at the level of the previous year. The OECD instead subtracts from the current primary deficit the primary deficit that would have prevailed had expenditure in the previous year grown with potential GDP and revenues with actual GDP. The IMF uses the same calculation except that they use as a benchmark not the previous year, but a year in which potential output close to actual output (see Alesina and Perotti, 1995).

⁴ Hence, this builds on the ‘narrative approach’ of Romer and Romer (2010), who investigate the macro-economic effects of tax changes selected on the basis of the motivation behind them. Specifically, based on the Economic Reports of the President, Presidential speeches and statements, Annual Reports of the Secretary of the Treasury on the State of Finances and the Budget of the United States Government, they select only those tax changes for which the motivation was not correlated with other developments that could affect output.

Box 1. Fiscal consolidation in the euro zone during the crisis

The global economic and financial crisis, which erupted in September 2008 with the collapse of Lehman Brothers, was accompanied by a rapid deterioration of public finances in the euro zone and led to a ‘sovereign debt crisis’ in some countries as of mid-2010. In response to the rapidly rising government deficit and debt-to-GDP ratios, in 2010 and 2011 most euro area governments announced ambitious multi-annual fiscal consolidations plans. The main motivation behind the approval of these adjustment plans was to address fiscal imbalances and market concerns regarding the sustainability of public finances. Therefore, as such, these adjustment plans could be considered to be exogenous with respect to the cycle, i.e., they were not implemented with a view of stabilizing cyclical fluctuations. Indeed, in most countries, fiscal consolidation packages were passed during a still depressed cyclical phase, with the output gap being in the negative territory for most countries during this period.

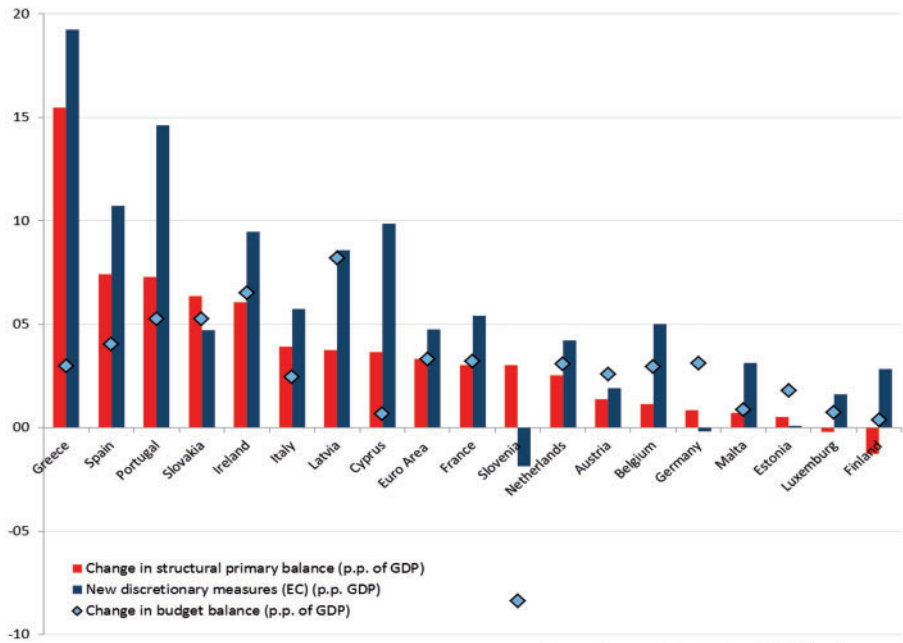
Figure 1 provides some summary statistics on the consolidation effort put in place by euro zone Member States between 2009 and 2013, together with the change in the overall government budget balance over the same period. The size of the fiscal consolidation effort is gauged in two ways. First, as typically done in the literature (see, e.g., [Galí and Perotti, 2003](#)), as the change in the government structural primary balance (SPB), i.e., the cyclically adjusted government primary balance net of temporary and one-off measures. Second, in terms of cumulated discretionary fiscal measures approved by governments in the same period. The budgetary impact of these measures has been recently evaluated by the European Commission based on a ‘bottom-up’ or ‘narrative’ approach (see [European Commission, 2013](#)). Under this approach, the discretionary fiscal effort is measured as the sum of the values that government authorities attributed to the measures in their budget at the time of adoption. Figure 1 suggests that the fiscal adjustment effort was very sizeable in many euro area countries, as reflected in both the improvement in the SPB (red bars) and the cumulated ‘narrative’ discretionary measures (green bars) over the 2009–13 period. For the euro area as a whole, the SPB improved by 3.3 percentage points of GDP, while the narrative discretionary measures indicate an improvement of 4.7 percentage points of GDP. The discretionary adjustment effort put in place in the euro zone countries generally led to an improvement in the overall government budget. For the aggregate euro area, the budget balance rose by 3.3 percentage points of GDP—i.e., from -6.3% of GDP to -3.0% of GDP—between 2009 and 2013. However, the developments in the overall balance were also driven by other factors. In particular, the economic cycle—through the operation of the automatic stabilizers—and one-off bank recapitalization operations played an important role. Therefore, for some

countries, the sizeable fiscal consolidation effort was not fully reflected in an equivalent improvement in the headline deficit.⁵

An important dimension of the debate on the fiscal consolidation process in the euro zone was related to the composition of the fiscal adjustment. Indeed, the composition of the fiscal consolidation may have implications for the success of the consolidation process, in terms of both its sustainability and its macroeconomic effects (e.g., von Hagen and Strauch, 2001). In fact, past consolidation episodes often show that spending-based adjustments tend to cause milder and shorter contractions than revenue-based ones (Alesina et al., 2002; Alesina and Ardagna, 2013): private investor confidence recovers faster if the consolidation relies more on expenditure cuts than on tax increases that tend to depress private investment and consumption. Against this background, Figure 2 sheds more light on the composition of the fiscal adjustment in the euro zone during the crisis. In particular, Figure 2 shows the contribution of structural revenue and primary expenditure to the change in the SPB over the 2009–13 period. It emerges that, for the euro area as a whole, the adjustment was rather balanced, although somewhat more tilted towards the revenue side: increases in structural revenues contributed by 1.8 percentage points of GDP of the total 3.3 percentage points of GDP improvement in the SPB, whereas cuts in expenditure contributed by 1.5 percentage points of GDP. Interestingly, for the most ‘vulnerable’ countries, which are also the ones that implemented the most sizeable consolidation effort, the adjustment was mostly expenditure-based (e.g., Greece, Spain, Portugal, Ireland, Cyprus), whereas for countries with a fiscal consolidation effort smaller than the euro zone average, the adjustment was predominantly revenue-based (e.g., France, Slovenia, Netherlands, Belgium, Austria). Hence, the design of the euro zone fiscal adjustments only partially reflected the principles put forward by the advocates of expenditure-based consolidations.

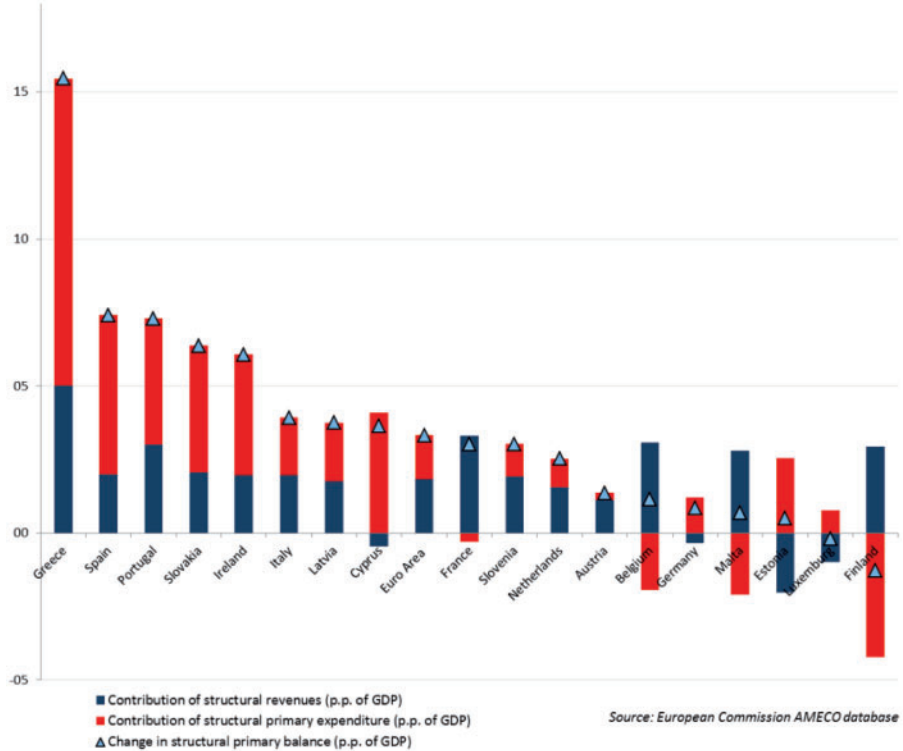
Our empirical analysis is based on the consolidation episodes identified by Devries et al. (2011). Because the Alesina et al. (2014b) data update has become available only recently, and we have not been able to transform these new data to complement our set of monthly consolidation announcements, our analysis is limited to the period up to 2009. Hence, we exclude consolidations in the aftermath of the Great Recession. In fact, Alesina et al. (2014b) show that adding the most recent years to their data does not

⁵ In Slovenia, for instance, the government balance deteriorated from -4.0% of GDP in 2012 to -14.7% of GDP in 2013, but this was mainly the consequence of one-off sizeable bank recapitalization costs (of about 10% of GDP).



Source: European Commission AMECO database

Figure 1. Cumulated discretionary measures over the period 2009–13 in the euro area and changes in the structural primary and actual balances



Source: European Commission AMECO database

Figure 2. Contribution of structural revenues and structural primary expenditure to the change in the structural primary balance over the period 2009–13

change the estimates of their model. Nevertheless, because our analysis may offer lessons for how the austerity choices of the euro-zone authorities in the aftermath of the Great Recession affect confidence, Box 1 discusses these choices. These would mostly fulfil the eligibility criteria for consolidations in [Devries et al. \(2011\)](#), because they are the result of the need to avoid exploding public debt/GDP ratios or they are directly motivated by the constraints imposed by the Stability and Growth Pact.

4. THE DATA

We make use of different datasets from various sources. We start from the action-based dataset of [Devries et al. \(2011\)](#), which dictates the sample. It spans 17 countries for the years 1978–2009. The countries included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Netherlands, Portugal, Spain, Sweden, the United Kingdom and the United States. The dataset contains the budgetary impact (as a percentage of GDP in the year of implementation) of fiscal policy measures adopted in a given year as part of a fiscal consolidation package. It only includes fiscal consolidation episodes that are not undertaken with a view to stabilizing output. Hence, the policy measures identified in the dataset should be independent of contemporaneous business cycle dynamics.

4.1. Construction of annual consolidation variables

The [Devries et al. \(2011\)](#) dataset has been augmented by [Alesina et al. \(2014a\)](#) by converting the set of consolidation measures into ‘fiscal plans’ that in each year consist of the combination of three elements: the anticipated measures CS^A that were announced in previous years and that are implemented in the current year, the unanticipated measures CS^U implemented in the current year, and the shifts in fiscal variables announced in the current year for implementation in the coming years.

Our precise construction of the latter component deviates slightly from that in [Alesina et al. \(2014a\)](#) and is given by $CS_{it}^P \equiv \sum_{j=1}^2 \left(CS_{i,t,j}^A - CS_{i,t-1,j+1}^A \right) / (1 + IRS)^j + CS_{i,t,3}^A / (1 + IRS)^3$. It consists of the discounted sum of changes to previously planned measures for future years plus new measures announced for implementation in future years. For the discount factor we use the short-term interest rate IRS taken from the OECD. Further, $CS_{i,t,j}^A$ captures the measures planned in year t for year $t+j$, so that $CS_{i,t,j}^A - CS_{i,t-1,j+1}^A$ is the change between what was planned in the previous year for year $t+j$ and what is planned this year for year $t+j$. In the data, planning is virtually always for a maximum of three years ahead. Hence, the final term in the expression for CS_{it}^P does not enter as a difference (i.e., $CS_{i,t-1,4}^A = 0$). In other words, CS_{it}^P is to be interpreted as the present discounted sum of all unanticipated *extra* (positive or negative) consolidation planned in year t for the future, up to year $t+j$.

[Alesina et al. \(2014a\)](#) also construct REV_{it}^A and EXP_{it}^A as the revenue and spending measures implemented in year t that were anticipated from announcements in previous years,

and REV_t^U and EXP_t^U as the unanticipated revenue and spending measures implemented in year t . Fully analogously to CS_t^P , we construct REV_t^P and EXP_t^P as the present discounted sum of all unanticipated additional consolidation through revenues (spending) planned in year t for the future. All these variables are expressed in shares of current GDP. The *current* implementation of consolidation measures is defined as $CS_t \equiv CS_t^A + CS_t^U$, where $CS_t^A \equiv CS_{t,0}^A$. We also have $CS_t \equiv REV_t + EXP_t$, where $REV_t \equiv REV_t^A + REV_t^U$ and $EXP_t \equiv EXP_t^A + EXP_t^U$. Obviously, $CS_t^j \equiv REV_t^j + EXP_t^j$ for $j = A, U$ and P .

4.2. The confidence indicators and the control variables

Consumer confidence indices are collected from the OECD, which in turn obtains them from national statistical institutes, government agencies, banks and private and other research institutes. The indices have been standardized by the OECD to make them comparable across countries. The consumer confidence measures are based on questionnaires sent out to a random sample of the population. Each of the questionnaires contains four, sometimes five, questions on the current and expected future personal and general economic situation. For example, for the EU harmonized consumer confidence indicator the following information is collected:

- expected change in the *financial situation* of the household over the next 12 months;
- expected change in the *general economic situation* over the next 12 months;
- expected change in *unemployment* over the next 12 months; and
- expected change in the *savings of household* over the next 12 months.

Each of the questions has five possible answers: a lot better, a little better, the same, a little worse and a lot worse. The answers are balanced (positive over negative) and weighed to create an index.⁶ Although the specific questions may differ from country to country, the general format is the same. For business confidence, we use the OECD indicator based on business tendency surveys for manufacturing.⁷ The business confidence indicator is the arithmetic average of the balances (in percentage points) of the answers to the following questions:

- How do you expect your production to develop over the next three months? Possible answers are: it will increase, remain unchanged or decrease.
- Do you consider your current stock of finished products to be too large (above normal), adequate (normal for the season) or too small (below normal)?
- Do you consider your current overall order books to be sufficient (above normal), sufficient (normal for the season) or not sufficient (below normal)?

⁶ The EC assigns double weights to the extremes: a lot better/a lot worse get weight 1, a little better/a little worse get weight 0.5 and the same gets weight zero.

⁷ Other sectors (construction, retail trade and other services) were not included since data availability is scarce among non-European Union OECD member countries.

The OECD standardizes the series for consumer and producer confidence as follows. First, they are smoothed using the Hodrick–Prescott filter, where cycles shorter than six months are removed. Then, they are normalized by subtracting their mean and dividing this difference by their standard deviation. After the normalization, they are amplitude-adjusted to the de-trended indices of GDP, used as a proxy of the business cycle, and, finally, they are centred at around 100 (for further detail, see [OECD, 2006, 2014a](#)).

We obtain our macroeconomic variables from the OECD Economic Outlook. These include the output gap defined as the deviation of actual from potential GDP in percent of potential GDP, public debt in percent of GDP, per-capita real-GDP growth, inflation, the long-term interest, the unemployment rate and OECD-wide per-capita real-GDP growth. For Germany, we link all series of Western Germany for the first part of the sample with those for Germany for the second part of the sample.

Information that quantifies aspects of policy-making institutions comes from various sources. The index of the tightness of fiscal rules is obtained from the [European Commission \(2014\)](#) and it is described for example, in [Debrun et al. \(2008\)](#) and [Beetsma et al. \(2009\)](#). In short, the index combines the strength and coverage of all rules in force for the various government sectors (general, central, regional, local and social security). Strength is determined on the basis of the statutory or legal base of the rule, the nature of the bodies in charge of monitoring and enforcing the rule, the enforcement mechanism and the degree of media visibility. Tighter fiscal rules imply a higher value for the index. We also make use of the [Bernoth and Wolff \(2008\)](#) ‘Audit’ index for fiscal transparency. It is based on whether the fiscal book keeping of the governments is externally audited, the degree of independence of the auditing and the extent to which the obtained information is disseminated.

4.3. Construction of the monthly consolidation announcements

We create a new monthly dataset of announcements of action-based fiscal consolidation measures for each country in our sample. We *always* start from the [Devries et al. \(2011\)](#) dataset, which provides detailed descriptions of the consolidation measures that it records. If this dataset does not indicate that a consolidation took place for a specific country-year combination, we undertake no further action in this specific case. However, if a country implements a consolidation in a particular year, we try to establish the specific month when these measures were announced for that country. The description of the consolidation often contains some information regarding the specific month or occasion when the consolidation was announced. An example concerns Australia, ‘The August 1993 Budget [...] also announced a four-year consolidation plan to reduce the budget deficit [...] In FY 1994/95 fiscal consolidation amounted to 0.5 percent of GDP due to tax measures’ ([Devries et al., 2011](#), p. 9). In fact, in this case we also avail of the size of the consolidation. We confirm these announcement dates with the information provided in the Calendar of Economic Events of the OECD Economic Surveys. For the example given above the OECD Economic Surveys

(Australia 1994, p. 40 and 127) state: ‘The bulk of the saving measures over the four years were planned on the revenue side.’ Hence, this illustrates how the IMF and the OECD refer to the same budget for the fiscal year 1993/94 that was announced in August 1993. Both sources also describe the measures as taken on the revenue side.

When the Devries et al. (2011) dataset contains no information about the announcement date, we match the implementation information in Devries et al. (2011) with the announcement information provided in the Calendar of Economic Events, based on the description of the measures in the consolidation and on the budgetary process of the country. A concrete example for Austria is provided in the Appendix. The Calendar of Economic Events also codes implementations as events, and, when it does, it sometimes mentions when these were agreed upon or proposed. If Devries et al. (2011) or the Calendar of Economic Events provide no information regarding the date of the announcement, we use national sources, these being official documents and newspaper archives. Two concrete examples of such a situation for Germany and Spain are provided in the Appendix.

Using the description of the measures introduced with each announcement, based on what is indicated as their predominant character, we try to classify the announcements into revenue- and spending-based. In the above example on Australia this is thus possible. Further, using Devries et al. (2011) we try to infer the size of the announced consolidation. However, this is not always possible, so that the set of instances where we have the size is a subset of the set of announcements. Some further details on the construction of the new monthly consolidation announcement data are provided in the Appendix.

4.4. Summary statistics for confidence and consolidation announcements

Our monthly dataset, which spans the same countries and time period as the annual data, contains 217 announcements of new consolidation measures. In most cases, we were able to establish whether announcements were spending-based and revenue-based.⁸ Of the total identified consolidation announcements, 53% were spending-based, 32.7% were revenue-based and 1.4% were balanced between spending and revenues. Based on available sources, it was not possible to classify the remaining 12.9% of the observations. Figure 3 shows the frequency distribution of announcements over the 12 months of the year. While each month features a number of announcements (the

⁸ The cases where this was not possible were cases when commitment to consolidation was announced, but no precise measures were mentioned (and there was no impact recorded for the measures either). Examples are ‘The Treasurer announced the intention of the newly elected Government to return the budget to underlying balance’, ‘The Government announced a budget consolidation package comprising also measures to promote economic growth’ and ‘A corrective plan was announced to reduce the deficit.’

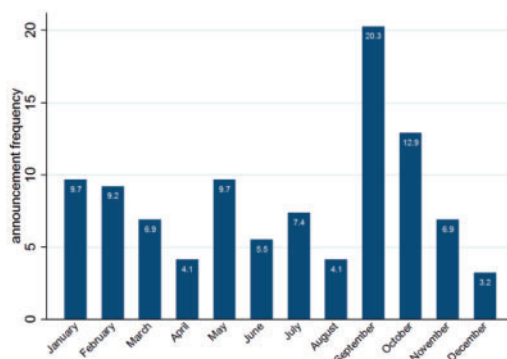


Figure 3. Monthly frequency of announcements

Table 1. Summary statistics of confidence variables

	<i>N</i>	Mean	st.dev	Min	Max
(a) Monthly frequency, values					
<i>CCI</i>	5,900	100.1	1.44	94.01	103.7
<i>BCI</i>	4,753	99.98	1.41	94.19	105.4
(b) Annual frequency, end-of-the-year values					
<i>CCI</i>	494	100.0	1.47	94.45	103.7
<i>BCI</i>	396	99.95	1.46	94.97	105.4

Note: 'st.dev' is 'standard deviation'.

minimum being nine for the month April), a relatively large part of the announcements are made in the fall (namely in the months of September and October) with the introduction of the new budget, which is generally discussed and approved in these months. Finally, even though the budgetary adjustments we consider are not motivated by the state of the economy, a large fraction of 66% of the announcements is made in a year when the output gap is negative.

Table 1 reports summary statistics for the consumer confidence index (*CCI*) and the business confidence index (*BCI*) pooled over all observations. For both indices some observations are missing. There are 18 consolidation announcements (about 8% of the total) for which *CCI* is missing and there are 71 announcements (33% of the total) for which *BCI* is missing. The average value of the indices over all observations is roughly 100. All values of *CCI* are located within an interval of 4% on either side from the mean. The observations of *BCI* are spread over a slightly wider interval.

Figure 4 shows the frequency distributions of *CCI* and *BCI* over all observations. Both distributions show slight evidence of negative skewness, but clearly for both *CCI* and *BCI* the large majority of the observations are located in an interval of $\pm 2\%$ from the mean. Further, Figure 5 shows the average (over all observations) per cent change in *CCI* and *BCI* in months with and without announcements. Despite the fact that the OECD has purged the confidence series of seasonality, we observe a slight amount of seasonality in

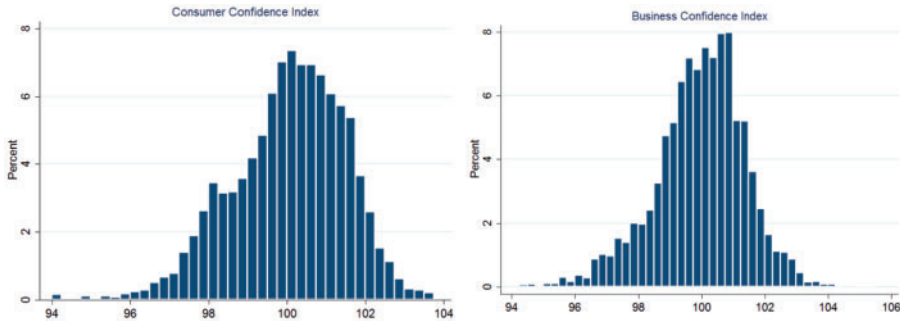


Figure 4. Histograms of confidence indices, pooled across countries

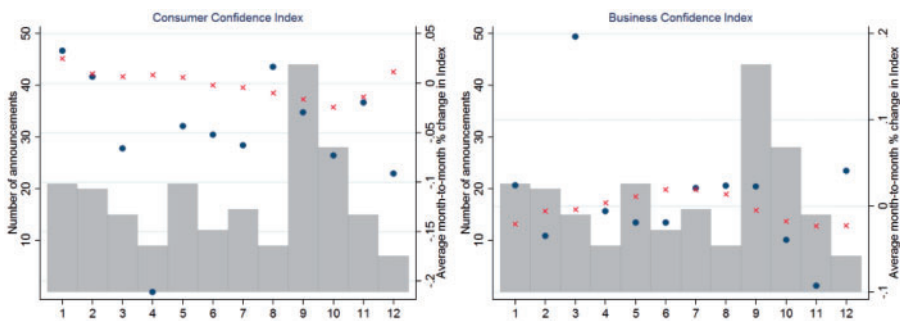


Figure 5. Monthly distribution of changes in confidence

Note: Dots and crosses correspond to months with and without announcements.

the data without announcement. On average, over all months, the changes seem to be close to zero. Switching to the subsample with announcements, we see that variation across the months is substantially larger, while, moreover, most (nine) months with announcements feature on average a deterioration of *CCI* and seven months feature on average a deterioration in *BCI*. For this subsample, the variation across months is most likely due to the announcements themselves, rather than seasonality in the confidence indicator.

5. ANNUAL PANEL REGRESSIONS

Using the consolidations narratively identified by Devries *et al.* (2011) and the fiscal plan decompositions by Alesina *et al.* (2014a), this section uses panel regressions to explore how consolidations affect confidence at the annual frequency. The analysis in this section will help to establish a link with the literature and serve as a stepping stone for the analysis based on our new monthly dataset in the next section. Fiscal consolidations can come in different formats. They can be (largely) based on revenue increases or on reducing expenditures. Hence, we will also investigate the role of the consolidation composition in this regard. The sample consists of our 17 OECD countries over the period 1978–2009.

We use the following panel regression framework for consumer and business confidence:

$$xCI_{it} = \mu_i + \lambda_t + \alpha xCI_{i,t-1} + \beta_1 CS_{it}^A + \beta_2 CS_{it}^U + \beta_3 CS_{it}^P + \gamma_1 GROWTH_{it} + \gamma_2 \Delta u_{it} + \gamma_3 INFL_{it} + \gamma_4 INT_t + \gamma_5 \Delta STOCK_{it} + v_{it}, \quad (1)$$

where subscript i (t) refers to the country (year) and xCI_{it} is ($xCI = CCI, BCI$) now the natural log of the confidence index. Specification (1) includes country- and year-fixed effects, a lag of the dependent variable and, following Konstantinou and Tagkalakis (2011), a set of macro controls capturing current country-specific economic conditions: per-capita real GDP growth in per cent ($GROWTH_{it}$), the change in the unemployment rate in percentage points (Δu_{it}) and the CPI inflation rate in per cent ($INFL_{it}$). The disadvantage of these controls is that they ignore the possibility that confidence might depend more on their expected future values than on their current or past values. Therefore, we also include forward-looking variables as the long-term interest rate in per cent (INT_{it}) and the (log) change in the stock price index in per cent ($\Delta STOCK_{it}$).⁹ The interest rate controls for the reaction of financial markets to fiscal consolidations, which could have a separate effect on confidence. The stock price index serves as a general proxy for private sector expectations about future economic conditions. Finally, v_{it} is mean-zero error term. Variables CS_{it}^A , CS_{it}^U and CS_{it}^P were defined earlier and are all in per cent of GDP of year t . We will also estimate variants in which we impose restrictions on the β -coefficients.

We estimate our model using ordinary least squares (OLS) with heteroskedasticity- and autocorrelation-robust standard errors.¹⁰ To avoid potential endogeneity biases resulting from a feedback of confidence onto the right-hand side variables, we use the end-of-year (e.g., December) indicator for confidence. We found, however, that using year-average instead of year-end confidence indicators hardly yields any differences.

Table 2 reports the estimation results. Following the more ‘traditional’ approach, Column (1) uses the CAPB as the variable measuring the amount of discretionary fiscal changes. There is a fair amount of persistence: the first lag of confidence enters

⁹ *A priori*, it is not obvious whether consumer confidence should depend on the level rather than the change of some of our control variables. This is in particular the case for the inflation rate, the unemployment rate and the long-term interest rate. We end up using the level of the inflation rate and the long-term interest rate and the change in the unemployment rate, because they have the best fit. However, our main results are robust to alternative transformations of the control variables.

¹⁰ As is well-known, OLS with fixed effects and a lagged dependent variable as regressor generally leads to the so-called Nickell-bias in the coefficient estimates. However, this bias is small when the number of observations in the time dimension is substantial, which is the case here. Using the least squares bias-correction based on Bruno (2005) indeed shows that the bias is marginal (results available upon request from the authors). Hence, we continue using OLS for our panel regressions.

Table 2. Baseline regressions using end-of-period CCI

<i>CCI</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>CCI(-1)</i>	0.498 ^{***} (0.053)	0.509 ^{***} (0.049)	0.495 ^{***} (0.055)	0.496 ^{***} (0.057)	0.489 ^{***} (0.057)	0.491 ^{***} (0.056)
<i>CAPB</i>	0.035 (0.021)					
<i>CAPB_IMF</i>		0.029 (0.033)				
<i>CS</i>			-0.120 [*] (0.057)			
<i>CS</i> ^A				-0.066 (0.166)	-0.050 (0.159)	-0.076 (0.160)
<i>CS</i> ^U				-0.125 ^{**} (0.050)	-0.144 ^{**} (0.065)	
<i>CS</i> ^P					-0.394 ^{**} (0.176)	
<i>CS</i> ^P + <i>CS</i> ^U						-0.163 ^{***} (0.054)
<i>GROWTH</i>	0.175 ^{**} (0.063)	0.169 ^{**} (0.059)	0.167 ^{***} (0.057)	0.166 ^{***} (0.058)	0.164 ^{**} (0.058)	0.166 ^{**} (0.058)
Δu	-0.038 (0.073)	-0.052 (0.069)	-0.050 (0.069)	-0.052 (0.070)	-0.051 (0.065)	-0.051 (0.067)
<i>INFL</i>	-0.058 (0.041)	-0.061 (0.039)	-0.070 [*] (0.040)	-0.071 (0.041)	-0.065 (0.044)	-0.074 (0.042)
<i>INT</i>	0.044 (0.053)	0.045 (0.054)	0.054 (0.053)	0.055 (0.054)	0.044 (0.055)	0.053 (0.053)
$\Delta STOCK$	0.020 ^{***} (0.003)	0.020 ^{***} (0.003)	0.021 ^{***} (0.003)	0.021 ^{***} (0.003)	0.020 ^{***} (0.003)	0.021 ^{***} (0.003)
Obs.	450	451	451	451	451	451
<i>R</i> ²	0.707	0.705	0.707	0.707	0.711	0.709
Countries	17	17	17	17	17	17
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are reported in parentheses. Further, * = significance at the 10% level, ** = significance at the 5% level and *** = significance at the 1% level. The number of observations in Column (1) is one less than in the other columns, because one observation of *CAPB* is missing (specifically, Ireland 1979).

with a highly significant coefficient of about 0.5. Of the controls, only GDP growth and the change in stock prices are significant. Both have the expected positive sign. An increase in growth by one percentage point raises consumer confidence by about 0.18 percentage points, while a one-percentage point higher growth in stock prices raises confidence by 0.02 percentage points. However, the *CAPB* plays no role in explaining confidence. Column (2) repeats the regression in Column (1), but setting the *CAPB* to zero for country-year combinations that are not identified in the [Devries et al. \(2011\)](#) dataset as consolidation events. All coefficient estimates are essentially unchanged. Column (3) replaces the *CAPB* with *CS*, which is the sum of the anticipated and unanticipated consolidation measures implemented in the current period. This corresponds to the original IMF action-based consolidation variable. We see that a one percentage point of GDP additional implementation of consolidation

measures results in a significant 0.12 percentage points reduction in consumer confidence.¹¹

Splitting current-period implementation into its anticipated and unanticipated components CS^A and CS^U (Column (4)) shows that the significance of the aggregate CS is driven by the unanticipated component. The component CS^A could potentially exert a significant effect, if its materialization contains a surprise, because the original consolidation announcement was less than fully credible. However, only the coefficient on CS^U is significantly negative, in contrast to that on CS^A , which, although negative, is insignificant and smaller in absolute magnitude. Indeed, to the extent that consolidations are credible and have confidence effects, the unanticipated component of the consolidation would affect confidence, but not the anticipated component. We also test formally whether the coefficients of CS^U and CS^A are equal. The results of this and other tests of the equality of coefficients are reported in [Web Appendix B](#). We cannot reject the hypothesis that the coefficients of CS^U and CS^A are equal. Column (5) adds to the specification in Column (4) the announced changes to the future consolidation measures (CS^P). The coefficient on CS^P comes out significantly, again suggesting that it is new information on consolidations that is driving confidence. Moreover, the coefficient on CS^P is substantially larger in absolute magnitude than the coefficients on CS^U and CS^A . An announced increase in future consolidation by one per cent of GDP reduces consumer confidence by almost 40 basis points. However, we cannot formally reject the equality of the coefficients for all the three variables CS^A , CS^U and CS^P , or for any pair among them. Column (6) restricts the coefficients on the latter two components to be identical. This way we enter the present value of all unanticipated consolidation effort as an independent variable. As expected, only this coefficient is (highly) significant, while the coefficient on CS^A is not. Again, a test for equality of the coefficients on CS^A and on $CS^U + CS^P$ does not reject the equality hypothesis.

The main concern with model (1) is the correct identification of consolidation events that are exogenous to the other variables in the model as well as the correct dating of these events. The dating of the release of new information about consolidations is likely to be inaccurate. For example, what is classified as new information in year t may have been announced in the context of the budget discussion in the fall of year $t - 1$. For this reason, we construct a monthly dataset of consolidation announcements, whose effects on confidence are studied in the next section. The IMF has been careful to narratively

¹¹ We did the same regression replacing the nominal interest rate and inflation with the *ex-post* real interest rate. Both the magnitude and the significance of the other coefficients are unchanged—we report them in [Web Appendix A](#). Here, we also report the estimates for the case in which we limit the sample to those observations for which business confidence is also available. The negative effect of consolidations on consumer confidence is not driven by the sub-sample of observations for which business confidence is not available—in fact, the effect become even more strongly negative. Finally, in [Web Appendix A](#) we report on the absence of possible spill-overs from consolidations abroad.

identify consolidation events that are not motivated by the state of the economy, but on the basis of ‘the objective of stabilizing or reducing the debt ratio’. Panel probit regressions reported in [Web Appendix C](#) show that the only variables in our model able to predict consolidations are lagged debt, inflation and the long-term interest rate. Higher debt and higher long-term interest rates negatively influence the long-run budgetary sustainability, making consolidation more likely, while higher inflation relaxes the government budget constraint, given the outstanding stock of public debt, and makes consolidation less likely.

To control for the potential predictability of consolidations, and thereby for potential ‘allocation bias’ ([Jordà and Taylor, 2014](#)), and feedback effects among variables, such as indirect effects of consolidations on confidence through stock prices or long-term interest rates, we estimate separately annual panel vector auto-regressions (PVAR) with $[CS^j, CCI, GROWTH, INFL, \Delta STOCK, INT]'$, for $j = A, U$ and P , as the vector of endogenous variables. As in the PVAR of [Guajardo et al. \(2014\)](#), we apply a Cholesky, triangular identification scheme, with the consolidation measure ordered first. As such, the relative ordering of the other variables is irrelevant ([Christiano et al., 1999](#)). Within this specification, we assume that anticipation effects of consolidations are absent and that there are no within-year feedback effects from these other variables onto the decision to consolidate. This assumption maybe tenuous, again providing a reason to consider consolidation announcements at the monthly frequency. We include country- and year-fixed effects and set the lag length to two. The detailed results are reported in [Web Appendix D](#). The impact effect of the anticipated component of a consolidation CS^A is insignificant, while those of a 1% of GDP unanticipated consolidation component CS^U and CS^P are significantly negative with impact effects of -0.23% and -0.44% , respectively. Hence, overall, the results on significance are in line with those reported in [Table 2](#), while the magnitude of the effects with a PVAR tends to be larger, though of the same order.

[Table 3](#) reports the estimates of (1) when we replace CS^j ($j = A, U$ or P) with its components, that is EXP^j and REV^j . Since the estimates of the coefficients of the control variables are very close to those in [Table 2](#), we do not report these estimates. The same is the case for the coefficient on the first lag of consumer confidence, which is always close to 0.5. Column (1) includes the full current implementation of revenues and spending measures and shows that both enter with a negative coefficient, but that only that of revenues is (highly) significant. A 1% of GDP increase in consolidation effort through revenues reduces consumer confidence by 0.22 percentage points. Statistically, the coefficients on revenues and spending measures do not differ, although the test is not far from significance at the 10% level. A split into anticipated and unanticipated measures in Column (2) shows that all four components enter with a negative sign, but that only the coefficient on unanticipated current revenues REV^U is statistically significant, a result in line with those reported in [Table 2](#) and in the previous column. The coefficient on REV^U is also statistically different at the 10% level from that on EXP^U . In Column (3), we add the changes to the planned future measures REV^P and EXP^P to the specification

Table 3. Baseline regressions for subcomponents using end-of-period CCI

<i>CCI</i>	(1)	(2)	(3)	(4)
<i>REV</i>	-0.216** (0.076)			
<i>EXP</i>	-0.050 (0.073)			
<i>REV</i> ^d		-0.023 (0.212)	0.013 (0.232)	-0.062 (0.193)
<i>EXP</i> ^d		-0.118 (0.255)	-0.121 (0.250)	-0.111 (0.251)
<i>REV</i> ^U		-0.246*** (0.073)	-0.291** (0.108)	
<i>EXP</i> ^U		-0.013 (0.095)	-0.013 (0.102)	
<i>REV</i> ^P			-0.437* (0.248)	
<i>EXP</i> ^P			-0.403 (0.404)	
<i>REV</i> ^P + <i>REV</i> ^U				-0.326** (0.125)
<i>EXP</i> ^P + <i>EXP</i> ^U				-0.069 (0.087)
Obs.	451	451	451	451
R-squared	0.708	0.708	0.713	0.710
Countries	17	17	17	17
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors are reported in parentheses. Further, * = significance at the 10% level, ** = significance at the 5% level and *** = significance at the 1% level.

in Column (2). Again, the coefficient on *REV*^U is significantly negative and statistically different at the 10% level from that on *EXP*^U. Finally, Column (4) only distinguishes between anticipated current measures and the sum of unanticipated current measures plus planned future changes. While all coefficients are negative, only that on the latter variable enters significantly.

We can summarize the main results from Tables 2 and 3 as follows. First, consolidations tend to affect consumer confidence negatively. Second, this negative effect is largely associated with the release of new information about the consolidations. Third, revenue-based measures exert a stronger negative effect on consumer confidence than spending-based measures.

Table 4 is the analogue of Table 2, but for business confidence. The first lag is always positive, but insignificant. As in the case of consumer confidence, the only relevant controls are real GDP growth and the change in stock prices, both entering with highly significant positive coefficients. The *CAPB* and *CAPB_IMF* measures have no effect on business confidence. Neither has *CS* or its subcomponents *CS*^d and *CS*^U. However, planned changes in future consolidation measures *CS*^P do exert a significantly negative effect—see Column (5). This is in line with their effect on consumer confidence, also in terms of order of magnitude. Moreover, the coefficient on *CS*^P is statistically different

Table 4. Baseline regressions using end-of-period BCI

<i>BCI</i>	(1)	(2)	(3)	(4)	(5)	(6)
<i>BCI(-1)</i>	0.029 (0.063)	0.034 (0.064)	0.034 (0.064)	0.040 (0.063)	0.044 (0.063)	0.041 (0.062)
<i>CAPB</i>	0.023 (0.027)					
<i>CAPB_IMF</i>		-0.007 (0.029)				
<i>CS</i>			-0.027 (0.058)			
<i>CS^d</i>				0.156 (0.142)	0.184 (0.131)	0.118 (0.118)
<i>CS^U</i>				-0.043 (0.068)	-0.058 (0.037)	
<i>CS^P</i>					-0.463** (0.196)	
<i>CS^P + CS^U</i>						-0.113* (0.054)
<i>GROWTH</i>	0.378*** (0.035)	0.378*** (0.037)	0.377*** (0.036)	0.375*** (0.036)	0.371*** (0.037)	0.371*** (0.037)
Δu	0.059 (0.071)	0.053 (0.074)	0.053 (0.072)	0.052 (0.074)	0.049 (0.071)	0.053 (0.073)
<i>INFL</i>	-0.026 (0.046)	-0.024 (0.046)	-0.026 (0.046)	-0.029 (0.046)	-0.022 (0.044)	-0.032 (0.048)
<i>INT</i>	-0.060 (0.035)	-0.059 (0.037)	-0.057 (0.037)	-0.050 (0.037)	-0.069* (0.037)	-0.047 (0.037)
$\Delta STOCK$	0.018*** (0.006)	0.018*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.018*** (0.005)	0.018*** (0.005)
Obs.	379	379	379	379	379	379
R^2	0.722	0.722	0.722	0.723	0.728	0.724
Countries	16	16	16	16	16	16
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are reported in parentheses. Further, * = significance at the 10% level, ** = significance at the 5% level and *** = significance at the 1% level.

from that on CS^d and CS^U at, respectively, the 5% and the 10% level. In Column (6) we restrict the coefficients on CS^U and CS^P to be equal. The common coefficient is significantly negative at the 10% level and it is also significantly different at the 10% level from that on CS^d . Analogous to Table 3, Web Appendix E reports how the revenues and spending components of consolidations affect business confidence. The results are not very clear-cut. We observe that EXP^d enters with a significant positive coefficient in Columns (2) and (3), while the coefficient of EXP^P in Column (3) is significantly negative.

Overall, the negative confidence effects are weaker for business confidence than for consumer confidence. Possibly, the business sector has a more sanguine view of consolidations, because it realizes better their necessity for the long-run health of the public finances. Most importantly, it is only the unanticipated components of consolidations that are driving both consumer and business confidence.

6. EVENT STUDY WITH MONTHLY DATA

The core of our empirical results is obtained with our newly constructed monthly dataset of consolidation announcements. Compared to our annual dataset, with our monthly dataset we can more precisely investigate the role of consolidations for confidence, because we can more exactly pinpoint the release of information about the consolidations and establish in real time how confidence reacts to this information. We perform our analysis on the full sample and a number of motivated sample splits. Concretely, we estimate the following regression:

$$xCI_{it} - xCI_{i0} = c_t + \varepsilon_{it}, \quad \text{where } t = -6, -5, \dots, 5, 6. \quad (2)$$

xCI_{it} is $(xCI = CCI, BCI)$ the natural logarithm of the confidence index in month t for country i , c_t is the constant to be estimated and ε_{it} is an error term.¹² We estimate (2) for each t relative to the month of the announcement 0.¹³ If $t < 0$ ($t > 0$), a positive and significant value of c_t indicates that confidence falls (rises) in the t months before (after) the announcement of a consolidation. Hence, we explore average movements of confidence in the half year before the announcement and the half year after.

6.1. Consumer and business confidence

Based on the regression in (2), [Figure 6](#) depicts for the full sample the average movements of consumer confidence around announcement dates, i.e., the coefficient c_t , plus an error band of ± 1.645 standard deviations around the central line, so a 10% margin on either side of the confidence band. To read the figure, take as an example the value of 0.1 of the central line at $t = -5$, which says that five months before the consolidation announcement ($t = 0$), the confidence indicator is on average 0.1% higher than at the moment of the announcement. The figure reveals significant movement in the confidence index, both before and after the announcement, although the movement after the announcement is short-lived. The maximum overall movement within the window is on the order of 0.15%. This number seems to be rather small. However, the frequency distribution of consumer confidence in [Figure 4](#) showed that the overwhelming majority of

¹² Before estimating (2) we demean and de-trend the confidence indicator at country level. More specifically, we obtain the confidence indicator from a panel regression that includes country-specific fixed effects and time trends. There is essentially no trend visible in any of the confidence variables, hence the de-trending has virtually no effect on the results. In all instances the standard errors are robust to heteroskedasticity.

¹³ A potential caveat of our approach is the existence of contamination from the presence of other announcements in the event window. To check how serious this limitation is in practice we do the following. When subsequent announcements happen in consecutive months, we treat them as a block and estimate (2) for $t = -6, \dots, -1$ relative to the first announcement and for $t = 1, \dots, 6$ relative to the last announcement. This approach leads to marginal differences to what we report in the main text. On top of this, below we also show that our results are robust to more general forms of contamination effects within a regression analysis.

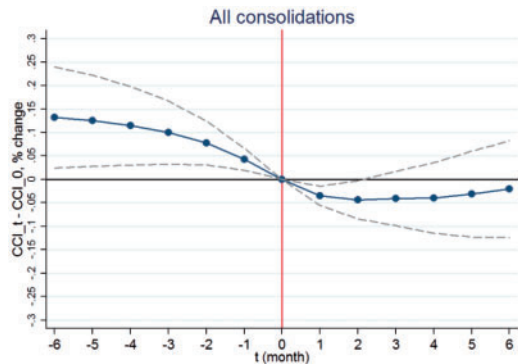


Figure 6. Effect on consumer confidence for full sample

Note: The figure depicts the average deviation in percent of consumer confidence relative to announcement date, plus an error band of ± 1.645 standard deviations around the central line.

Table 5. Average deviation consumer confidence from level at announcement

	$t = -6$	$t = -3$	$t = -1$	$t = +1$	$t = +3$	$t = +6$	$t = -6/+6$	eq.
all	0.132**	0.100**	0.043***	-0.035***	-0.041	-0.021	-0.153*	
exp	0.050	0.029	0.010	-0.002	0.037	0.111	0.062	6.11**
rev	0.249**	0.183**	0.093***	-0.093***	-0.161**	-0.168	-0.417***	
high debt	0.036	0.056	0.042*	-0.046***	-0.080*	-0.077	-0.113	0.09
low debt	0.203**	0.146**	0.048**	-0.028	-0.003	0.032	-0.170	
neg. gap	0.013	0.033	0.012	-0.004	0.049	0.161**	0.148	33.5***
pos. gap	0.366***	0.229***	0.103***	-0.095***	-0.218***	-0.380***	-0.746***	
Europe	0.119*	0.094**	0.044***	-0.043***	-0.072*	-0.080	-0.199**	
Europe, exp	-0.023	-0.003	0.003	-0.005	0.014	0.059	0.082	12.1***
Europe, rev	0.267**	0.173**	0.096***	-0.114***	-0.261***	-0.335***	-0.602***	
strong FR	0.024	0.070	0.030	-0.016	-0.008	0.012	-0.012	4.61**
weak FR	0.230**	0.123**	0.061**	-0.075***	-0.147***	-0.188**	-0.417***	
high transp	0.052	0.076	0.035*	-0.028	-0.022	0.011	-0.041	2.74*
low transp	0.188*	0.113*	0.054**	-0.059***	-0.123**	-0.173	-0.361**	
strong FR, high transp	-0.173	0.000	0.009	-0.003	0.013	0.034	0.207	6.17**
weak FR, low transp	0.123	0.075	0.054	-0.088***	-0.216***	-0.337**	-0.461**	

Notes: The table reports the average deviation of the consumer confidence index in percent relative to the moment of the announcement of the consolidation. It does this for various moments around the announcement moment: ‘ $t = -6$ ’ denotes six months before, etc. The column under header ‘ $t = -6/+6$ ’ gives the total average percent movement over the entire event window from six months before to six months after the announcement. Robust standard errors are reported in parentheses. Further, * = significance at the 10% level, ** = significance at the 5% level and *** = significance at the 1% level. The column under ‘eq.’ tests the difference in the total movement over the entire event window for the cases under consideration. It is always a chi-square test with two degrees of freedom. Finally, ‘rev’ is ‘revenue’, ‘exp’ is ‘expenditures’, ‘neg.’ is negative, ‘pos.’ is ‘positive’, ‘FR’ is ‘fiscal rules’ and ‘transp’ is ‘transparency’.

the observations is within $\pm 2\%$ of the mean. Hence, a confidence movement of 0.15% around a consolidation cannot be considered particularly small. Of particular relevance is the overall movement of confidence over the event window. On the one hand, a movement that fully reverses itself within a couple of months is likely to be less consequential for the economy than a more permanent movement. On the other hand, if we make the event window wider, the likelihood of other factors affecting the movement of confidence becomes larger. Hence, we consider as a reasonable compromise an event window of ± 6 months. The final column of [Table 5](#) reports the average movement of confidence over the entire window. The overall fall is 0.15%. The figure is close to significance at the 10% level.

Proper identification of consolidation announcements is again the most important issue. One concern is that the consolidations are not exogenous, because they are anticipated as the downward movement in the index. However, some anticipatory movements of confidence should not be too surprising if consolidations do indeed affect confidence. Many of the announcement months coincide with the presentation of next-year's budget, while the budgetary process is closely followed by the media. In addition, there may be discussions in parliament, hints by politicians and leakages to the press. Such anticipation effects do not by themselves invalidate the assumption that the consolidation is exogenous. The exogeneity assumption would be invalid if confidence itself influenced the choice to consolidate, but that would mean that consolidation decisions are made within a couple of months after an initial movement in confidence. However, it is extremely implausible that confidence movements of the magnitude that we observe by themselves trigger consolidations and, moreover, that consolidation decisions take place so quickly after an initial movement in confidence.

Nevertheless, following our annual investigation, we explore in [Web Appendix C](#) the predictability of consolidations at the monthly level. Because the macro variables are not available at such high frequency, we need to limit ourselves to confidence, stock prices and the interest rate. There is one instance in which the lagged change in confidence has some predictive power. However, as argued above, this is unlikely to be a causal effect. Changes in confidence over longer periods have no predictive power.

A second concern is our timing of the moment that new consolidation information is released. This timing is more accurate than for the annual dataset. Still, consolidation information may be released before the official announcement date. Indeed, we observe instances of announcement moments in the data after which confidence falls abruptly (e.g., Italy in September 2003) and instances with confidence (mainly) falling prior to the announcement (e.g., Austria in March 1996). However, we stick to the official announcements, because prior confidence movements may be partly caused by confounding factors and they may be the result of a gradual release of new information, which would make it impossible to assign one specific month in which all relevant consolidation information is released. If the mis-measurement of the exact timing of the consolidation information is random, then attenuation bias actually drives the estimated constants in

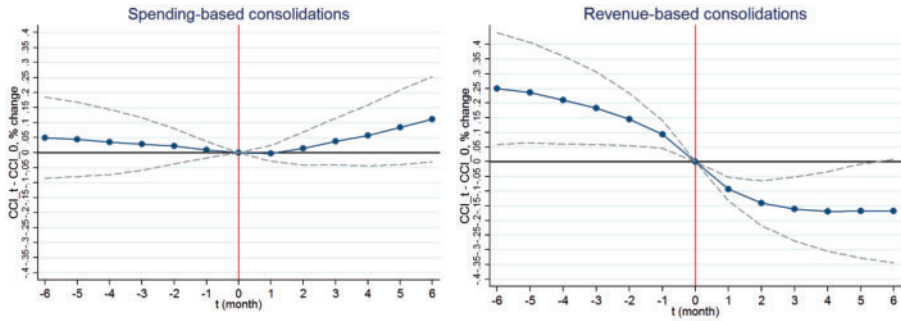


Figure 7. Spending and revenue-based consolidations

Note: See Note to Figure 6.

(2) towards zero and thus works against finding significant effects of consolidations on confidence.

To explore the role of the timing of announcements further, we implement two experiments. In one we purposefully mis-time all announcements to one month earlier or later than our coding. Indeed, in the former (latter) case a stronger deterioration becomes visible after (before) the assumed announcement date (see [Web Appendix F.1](#)). In the second experiment for each country we take out of the sample the month with the most observations. The deterioration of confidence around announcements tends to strengthen (see [Web Appendix F.1](#)). This may not be too surprising: the month with most observations is the month in which the budget is most likely to be presented. Hence, what is left over are mostly extraordinary measures not taken in the context of the regular budgetary procedure. The need for consolidation in those instances may be particularly high.

Figure 7 depicts the outcomes of a split of the full sample of announcements into subsets of spending-based and revenue-based announcements. The former do not harm confidence. In contrast, announcements of revenue-based consolidations produce a significantly negative confidence effect. Relative to the overall sample, the maximum confidence deterioration over the full event window more than doubles to 0.4%—see also [Table 5](#). Based on the estimation of (2) as a system for spending and revenues, the final column in [Table 5](#) shows that the test that the full-window movements of confidence for spending and revenues are equal rejects at the 5% level. If confidence indeed plays a role in transmitting the effects of consolidations to economic activity, the combination of these findings is consistent with the findings of [Alesina et al. \(2014a\)](#) and related papers that spending-based consolidations have less adverse effects on the economy than revenue-based consolidations. We have repeated the exercise reported in [Figures 6 and 7](#) by obtaining the confidence indicator from a panel regression that includes not only country-specific fixed effects and time trends, but also fixed effects for each month in the sample. The significance in [Figure 6](#) and that for revenue-based consolidations even strengthens somewhat.

Two further concerns with our event study are (1) the presence of multiple announcements in the event window, so that confidence movements cannot be attributed to one specific announcement or the other (see Footnote 13), and (2) that we give all announcements the same weight irrespective of the size of the consolidation.¹⁴ To address these concerns, we estimate a panel distributed lag model of the log-difference in confidence, where on the right-hand side we include lags and leads of the announcement dummies to address concern (1), or values of the announcements to address concern (2). In the latter case, because we cannot assign values to all announcements, we lose about one-third of the identified consolidations. Based on the announcement dummies, as in Table 5, we find no effect of a spending-based consolidation on consumer confidence, while a revenue-based consolidation leads to a significant decline in confidence with a magnitude of over 0.3% over the event window. As regards to the use of the values of the consolidations, we find that the effect of a 1% of GDP consolidation announcement on consumer confidence over the 12-month event window is close to zero. If we focus on spending- and revenues-based consolidations we obtain qualitatively the same results as for the event study. Over the full window, a 1% of GDP spending contraction raises confidence by about 0.3%, while an equally-sized revenue-based consolidation produces a fall in confidence of about 0.5%. The full set of results is provided in Web Appendix H.

Table 5 also reports confidence movements based on a dissection of the observations into those associated with lower- and higher-than-average public debt over the sample period. For the low-debt observations confidence falls significantly in the period before the announcement, while for the high-debt observations there is a significant movement of confidence around the announcement date. However, the overall movement of confidence over the entire window is very similar and the equality test does not reject.

Recently, a substantial number of contributions (e.g., Auerbach and Gorodnichenko, 2012; Owyang et al., 2013; Jordà and Taylor, 2014) have investigated whether fiscal multipliers depend on the state of the economy. If confidence plays a role in the transmission of fiscal shocks to the economy, it is important to explore whether the effects of announced consolidations on confidence differ depending on the state of the economy. We observe that that is indeed the case, where we split the sample according to whether the output gap is negative or positive in the year when the consolidation announcement takes place. When the output gap is negative an announcement does not have a significant effect on confidence. This contrasts with the case of a positive output gap, where the announcement of a consolidation on average leads to a highly significant reduction

¹⁴ A potential final concern is that the observed negative confidence effect of consolidations is actually the result of the severe contractions at the end of the sample and their effect on confidence. However, the plots in Web Appendix G show that there is relatively little consolidation activity in the last two sample years 2008 and 2009, i.e., the crisis years. Hence, this possibility can be refuted.

in confidence both before and after the announcement. The fall in confidence over the entire window is 0.75%, which is statistically different from the confidence movement when the output gap is negative. A possible explanation for our finding could be that the announcement of a consolidation during a boom signals that the underlying fundamentals of the economy are weaker than perceived thus far.¹⁵ Overall, the results suggest that potential worries that the confidence channel of a consolidation may negatively affect an already ailing economy may be misplaced for spending-based consolidations.

We can also dissect the sample into country sub-samples. The most obvious dissection is a split into European and non-European countries. For the non-European sub-sample, most likely due to the presence of too few observations, there is no significant movement in confidence and, hence, we do not report the results. This suggests that the effect of the announcements is largely confined to the European countries. For the European subsample we find indeed a 5% significant deterioration of confidence by 0.2% over the full event window. If we split further into revenue-based and spending-based consolidations for the European sub-sample, we do not observe significant confidence movements associated with spending-based consolidations, but we observe (highly) significant negative movements associated with revenue-based consolidations, both before and after the announcement. The deterioration over the full window is 0.6% and this is (highly) significantly different from the confidence movement in the case of spending consolidations.

Now we turn to the role of the institutional variables. We lose observations for four countries (Australia, Canada, Japan and the United States) because we have these data only for the European countries. We split the remaining 13 European countries into a group that on average over the years have a fiscal rules index higher than the average over all European countries and a group with an index lower than the average. The former group consists of Denmark, Finland, Germany, the Netherlands, Spain, Sweden and the United Kingdom, while the latter group includes Austria, Belgium, France, Ireland, Italy and Portugal. We see from [Table 5](#) that countries with a relatively strong fiscal rules index exhibit no movement in confidence, while countries with relatively weak fiscal rules exhibit a highly significant decline in confidence both before and after the announcement. The difference in movement over the entire window for the two sub-samples is also significant. A potential explanation for the confidence behaviour in the group with weak fiscal rules is that private agents do not expect the consolidation to credibly address fiscal imbalances, but only to harm their own economic situation, for

¹⁵ It is conceivable that, even in the absence of consolidation announcements, consumer confidence behaves systematically differently depending on the state of the economy. Therefore, we also explored a variant in which, before estimating (2) for the subsamples of negative and positive output gap observations, we orthogonalize the confidence indicator with respect to the country-specific real GDP growth rate in addition to demeaning and de-trending it at the country level. However, the pattern of confidence movements around announcements remains the same in terms of significance, though slightly smaller in magnitude.

example by reducing their disposable income or by causing more unemployment. To see whether the findings for this group depend on the presence of specific EU periphery countries, in [Web Appendix I](#) we drop one periphery country at a time from the weak-rules group. However, the figures for the movement of confidence around the announcement date are always unaffected.

[Table 5](#) also reports the results for a similar split of the countries into groups featuring higher-than-average and lower-than-average fiscal transparency over the sample period. Transparency is based on the ‘Audit’ index from [Bernoth and Wolff \(2008\)](#). The high-transparency group is Austria, Belgium, Denmark, Finland, Ireland, the Netherlands and Sweden, while the low-transparency sample is France, Germany, Italy, Portugal, Spain and United Kingdom. The results are very similar to those for the split into countries with weak and strong fiscal rules. This is not surprising, since the country groups overlap to a substantial extent.¹⁶ [Web Appendix I](#) shows also here that the behaviour of confidence for the low-transparency group does not depend on the inclusion of specific periphery countries.

Finally, we also construct a country group with both strong rules and high transparency and a country group with both weak rules and low transparency. The first group consists of Denmark, Finland and the Netherlands, while the second group consists of France, Italy and Portugal. [Table 5](#) shows that the pattern of changes in confidence for the second group is similar to those for the countries with either weak rules or low transparency.

[Table 6](#) reports the results for business confidence around a consolidation announcement. Looking at the full sample, there appears to be no systematic behaviour in business confidence around consolidation announcements. However, if we split into spending- and revenue-based announcements, we obtain a pattern similar to that for consumer confidence: there is no systematic effect for spending-based consolidations, while revenue-based consolidations exhibit a fall in confidence before and after the announcements. The fall over the entire event window is more than 0.4% and it is highly significant. It is also significantly different from the full movement of confidence under spending-based consolidations.

Splitting the sample into high- and low-debt observations reveals little difference between the two groups. In contrast, when we split the sample into on the basis of the sign of the output gap in the year when the announcement takes place, there is a substantial difference with confidence not significantly moving when the output gap is negative and confidence exhibiting a significant deterioration both before and after the announcement when the output gap is positive. The full-window deterioration of confidence is about 0.6%.

¹⁶ We also did a split based on the index constructed by [Hallerberg et al. \(2005\)](#). Here, the high transparency group was Finland, France, Germany, Ireland, the Netherlands, Spain and United Kingdom, while the low transparency group was Austria, Belgium, Denmark, Italy and Portugal. The resulting figures look similar to those for the Bernoth–Wolff index.

Table 6. Average deviation business confidence from level at announcement

	<i>t</i> = −6	<i>t</i> = −3	<i>t</i> = −1	<i>t</i> = +1	<i>t</i> = +3	<i>t</i> = +6	<i>t</i> = −6/+6	eq.
all	0.086	0.038	−0.006	0.006	−0.030	−0.048	−0.134	
exp	−0.033	−0.025	−0.029	0.029	0.059	0.133	0.166	4.59**
rev	0.215*	0.128*	0.039	−0.040	−0.142*	−0.215*	−0.430**	
high debt	0.086	0.031	0.021	−0.021	−0.065	−0.073	−0.158	0.01
low debt	0.100	0.046	−0.021	0.023	−0.033	−0.088	−0.188	
neg. gap	0.021	−0.019	−0.046*	0.053**	0.094	0.175	0.154	11.0***
pos. gap	0.193**	0.133**	0.061***	−0.073***	−0.236***	−0.419***	−0.613***	
Europe	0.136	0.055	−0.005	−0.001	−0.070	−0.121	−0.257*	
Europe, exp	0.010	−0.031	−0.037	0.033	0.039	0.067	0.077	5.86**
Europe, rev	0.290**	0.183***	0.063**	−0.073***	−0.221***	−0.358***	−0.648***	
strong FR	0.010	0.037	−0.021	0.019	−0.079	−0.243	−0.343	0.33
weak FR	0.172	0.072	0.012	−0.022	−0.060	0.001	−0.172	
high transp	0.129	0.087	−0.021	0.019	−0.097	−0.211	−0.340	0.16
low transp	0.140	0.035	0.005	−0.014	−0.053	−0.067	−0.208	
strong FR, high transp	−0.037	0.043	−0.044	0.053	−0.153	−0.500*	−0.463	0.35
weak FR, low transp	0.092	0.037	0.014	−0.021	−0.075	−0.070	−0.162	

Note: See Notes to Table 5.

Focussing on European countries only, there is a significant deterioration of business confidence around announcement dates. Splitting the European sample further into spending- and revenue-based consolidations, we observe that this deterioration can be attributed entirely to the subsample of revenue-based announcements, which produce on average a full-window decrease of confidence by about 0.65%. We also split the European sub-sample into countries with strong and weak fiscal rules and with high and low transparency. However, now there is not much action in confidence in any of the sub-samples.

Summarizing, consolidation announcements are associated with a fall in confidence. The effect is primarily observed for revenue-based measures, when the output gap is positive and for European countries. For the latter group, the negative announcement effect is stronger for countries with weak fiscal rules or low budgetary transparency. The effects on business confidence are quite similar to those on consumer confidence, though they are generally slightly weaker. They differ specifically for the institutional splits, which do not seem to matter for business confidence.

6.2. Broadening the concept of confidence

In this subsection, we broaden the concept of confidence by analysing what are the consequences of consolidation announcements for financial markets. In particular, we focus on sovereign debt markets and stock markets.

Table 7. Average deviation long-term interest rate from level at announcement

	$t = -6$	$t = -3$	$t = -1$	$t = +1$	$t = +3$	$t = +6$	$t = -6/+6$	eq.
all	0.044	0.006	0.039	-0.053**	-0.113**	-0.187**	-0.231**	
exp	0.062	0.042	0.056	-0.083***	-0.158***	-0.214**	-0.276*	0.73
rev	0.005	-0.053	0.017	-0.021	-0.031	-0.086	-0.090	
high debt	0.004	0.002	-0.001	-0.036	-0.122*	-0.167	-0.171	0.00
low debt	0.053	-0.033	0.039	-0.060*	-0.052	-0.130	-0.183	
neg. gap	0.060	0.007	0.050*	-0.076***	-0.171***	-0.259***	-0.319**	1.63
pos. gap	0.008	0.003	0.014	-0.002	0.018	-0.026	-0.034	
Europe	0.010	0.010	0.040	-0.076***	-0.181***	-0.267***	-0.277**	
Europe, exp	0.035	0.038	0.054	-0.124***	-0.221***	-0.291***	-0.326**	1.72
Europe, rev	-0.123	-0.105	-0.017	0.011	-0.027	-0.112	0.011	
strong FR	-0.077	-0.043	0.023	-0.107***	-0.177**	-0.218*	-0.142	1.45
weak FR	0.114	0.075	0.061	-0.039	-0.186*	-0.326***	-0.441**	
high transp	-0.011	0.039	0.084*	-0.120***	-0.286***	-0.437***	-0.426**	1.48
low transp	0.031	-0.018	-0.004	-0.032	-0.074	-0.095	-0.125	
strong FR, high transp	-0.103	-0.057	0.066	-0.149***	-0.263**	-0.423**	-0.321	0.00
weak FR, low transp	0.124	-0.008	0.017	0.004	-0.058	-0.201	-0.325	

Note: See Notes to Table 5.

More confidence in the sovereign implies lower borrowing costs, so a lower real debt burden and, hence, more resources for consumption. This form of confidence may also impact on economic activity. This became particularly clear during the recent European sovereign debt crisis, when for some vulnerable countries financial markets priced in a higher likelihood of default as reflected in higher sovereign yields. This eventually resulted in higher private sector lending rates and an overall credit contraction in this period (e.g., see Bofondi et al., 2013, and Popov and van Horen, 2013).

Here, we explore the behaviour of the long-term public debt interest rate around announcements of consolidations. The impact of fiscal policies on sovereign yields and spreads has been investigated by a number of authors, but with mixed findings. For example, based on a dataset including 17 advanced economies over the 1989–2012 period, Dell’Erba and Sola (2013) find that fiscal consolidations tend to be associated with a decline in long-term interest rates. Moreover, after an increase in the public deficit, long-term interest rates increase more in countries characterized by macroeconomic or institutional weaknesses. Based on a panel of advanced and emerging countries for the period 1990–2013, Born et al. (2014) indeed find that cuts in government consumption tend to reduce spreads, but only during expansions. Instead, fiscal consolidations tend to trigger increases in public interest spreads during recessions and periods of fiscal stress.

We proceed as follows. First, we linearly de-trend the long-term interest rate. Then, we estimate Equation (2) where the confidence indicators are replaced by the long-term rate. The results are reported in Table 7. For the full sample, we observe a significant

fall in the long-term interest rate following a consolidation announcement. A split of the sample into spending- and revenue-based consolidations shows that there is no systematic movement of confidence around revenue-based announcements, while there is a highly significant and long-lasting fall in the interest rate after the announcement of a spending-based consolidation. This suggests that financial markets are confident that a spending-based consolidation produces a fall in sovereign risk, while this is not the case for a revenue-based consolidation.

Splitting the sample into high- and low-debt observations yields very similar confidence dynamics for the two groups. In contrast, a split of the sample into observations with negative and positive output gaps reveals a significant fall in the long-term interest rate of almost 0.4% following a consolidation announcement in the former case, while no effect is detected in the latter case. This finding seems to deviate from [Born et al. \(2014\)](#), where spending cuts in the form of reduced government consumption exert a negative effect on spreads when the economy is expanding. A likely explanation for our finding is that in situations when the output gap is negative the financial position of the government is generally weak and, hence, a consolidation may inspire some confidence in investors that the financial problems will be tackled and that the default risk on their debt holdings becomes smaller.

Confining ourselves to the European countries we find again a significant decline in the long-term interest rate over the full window. Splitting the European observations into spending- and revenue-based observations, we confirm what we find for the full sample: spending-based consolidations produce a significant decline (of more than 0.3%) over the entire window, while revenue-based consolidations lead to hardly any movement in confidence over the window. The difference in overall movement for the two consolidation regimes is also significant. Finally, we split the European sample on the basis of the tightness of the fiscal rules and the degree of transparency. The picture that emerges is not very clear-cut. The decline in the long-term interest rate over the full window is significant in the case of weak fiscal rules and of high transparency. Probably, when fiscal rules are weak, confidence in the sovereign is low, implying substantial potential room for a reduction in the interest rate. If we consider only countries with both strong fiscal rules and high transparency and countries with both weak fiscal rules and low transparency, we observe for both groups a reduction in the long-term interest rate over the full window. However, these reductions are not statistically significant.

The format of our investigation of stock prices—whose results are reported in [Table 8](#)—is the same as for confidence and long-term interest rates. For the full sample of consolidation announcements, there is no effect on stock prices, and neither is there for a split into spending- and revenue-based consolidations or a split into high- and low-debt observations. A consolidation announcement when the output gap is positive produces a significant fall in the stock index. This seems consistent with the deterioration in consumer and business confidence and it may signal that the economy's fundamentals are weaker than perceived before. Confining ourselves to the European countries, for a

Table 8. Average deviation stock price index from level at announcement

	$t = -6$	$t = -3$	$t = -1$	$t = +1$	$t = +3$	$t = +6$	$t = -6/+6$	eq.
all	1.39	0.98	0.50	-0.74	-0.52	0.52	-0.87	
exp	1.20	0.46	-0.04	-1.27	-0.46	2.00	0.80	0.89
rev	2.40	2.25	1.42**	-0.64	-0.78	-0.10	-2.50	
high debt	-0.24	0.03	0.37	-0.82*	-0.16	0.95	1.19	2.37
low debt	3.93*	2.18*	0.79	0.04	-0.86	-0.15	-4.07	
neg. gap	0.63	0.62	0.22	-0.15	0.76	2.85*	2.22	9.81***
pos. gap	2.85*	1.68	1.03**	-1.88**	-3.00**	-3.97**	-6.82***	
Europe	2.41*	1.69*	0.74	-0.57	-0.79	0.50	-1.91	
Europe, exp	1.73	1.05	0.25	-0.72	-0.38	3.03	1.29	2.89*
Europe, rev	4.43	3.66**	1.86**	-0.94	-1.69	-1.40	-5.83*	
strong FR	1.50	1.03	0.64	0.06	-0.12	0.89	-0.61	0.51
weak FR	3.52	2.50*	0.87	-1.33*	-1.61	0.03	-3.50	
high transp	3.66	2.12	0.90	-1.06	-1.15	0.23	-3.42	0.64
low transp	1.07	1.23	0.57	-0.04	-0.40	0.79	-0.28	
strong FR, high transp	1.25	1.19	0.57	-0.57	-1.11	0.03	-1.21	0.01
weak FR, low transp	0.30	1.64	0.41	-0.94	-1.97	-0.42	-0.72	

Note: See Notes to Table 5.

split into revenue- and spending-based measures, we observe that the former are associated with a significant deterioration in confidence. Finally, splitting the sample on the basis of the quality of institutions does not yield specific differences.

Summarizing, announcements of consolidations lower long-term interest rates on the public debt, in particular when the output gap is negative and when they are spending based. Stock prices exhibit a negative movement when the output gap is positive.

7. CONCLUDING REMARKS AND POLICY IMPLICATIONS

This paper has explored how fiscal consolidations affect consumer and business confidence. For this purpose, we have expanded the annual ‘action-based’ consolidation dataset by Devries et al. (2011) into a dataset of monthly consolidation announcements. In our view, studying how fiscal consolidations affect confidence is important, because confidence may affect economic activity. It has been regularly argued that a lack of confidence hampers the Eurozone economies in escaping from their current stagnation.

As a stepping stone for the analysis based on our monthly data, we present the results from annual panel regressions, in which we link confidence to consolidation plans and their components, i.e., anticipated and currently implemented measures, the unanticipated and currently implemented measures, and the planned changes to future measures. We establish that with annual data the largest role in affecting consumer

confidence is reserved for the latter two components. This may not be surprising, as these components capture the release of new information.

The core of our empirical analysis is the study of the real-time reaction of confidence to consolidation announcements from our monthly dataset. Generally speaking, announcements are associated with a reduction in consumer confidence. Consistent with previous studies on the composition of consolidations, we find that the negative association of consumer confidence with consolidation announcements is driven by the announcements of revenue-based consolidations. This negative association is particularly strong for the European countries. Dissecting the European countries according to the tightness of their fiscal rules or the transparency of their budget reveals that weaker fiscal rules and lower transparency are driving the negative association between consumer confidence and consolidation announcements. Our findings for the association of announcements with business confidence are generally slightly weaker, but largely in line with those for consumer confidence, in that the more negative effect for revenue-based relative to spending-based consolidations is preserved. Finally, we explore how consolidation announcements affect confidence in the sovereign, as measured by the interest rate on long-term government securities, as well as stock price indices. Spending-based consolidations produce a significant reduction in the interest rate, especially for European countries.

Our findings point to a number of potentially useful policy insights on the ‘optimal’ design of fiscal consolidations in terms of timing, composition and institutional factors. First, taking the need for consolidation as given, spending-based consolidations appear to have less harmful effects on (consumer) confidence than revenue-based measures. This may be a consideration when deciding about the design of a fiscal consolidation package. Second, since the confidence effects seem mainly driven by unanticipated measures, as our annual panel regressions suggested, a careful release of the information on prospective consolidations may be important. Third, while it is often asserted that periods of boom are more suitable for consolidation than slump periods, this is not borne out by our monthly sample. In fact, consolidations do not seem to harm private sector confidence in slump periods, while they do seem to produce negative confidence effects when the output gap is positive, possibly the result of a signal that the underlying fundamentals of the economy are weaker than perceived before. Moreover, when the output gap is negative consolidation announcements push the long interest rate downward. These findings may rationalize the consolidation packages announced and adopted in many European countries during the recent crisis. In this context, consolidation announcements are likely to have signalled commitment by governments to restore financial markets’ trust in the long-term sustainability of the public finances, which could have triggered a reduction in the financing cost for these countries. Fourth, the quality of institutions may be important in mitigating negative confidence effects of consolidations. There seems to be a high correlation of the different dimensions of institutional quality, but tight fiscal rules in particular may be conducive in this regard. Since fiscal consolidations may be inevitable from time to time, for example because of the adverse

developments in financial markets, governments of countries with no or weak fiscal rules would do well to consider the adoption of tighter rules. When credible, these reduce the chances of a need for consolidation and, if this need emerges nevertheless, then the macroeconomic consequences via negative confidence effects are likely to be smaller.

Discussion

Martin Ellison

University of Oxford

In his Mansion House speech on 10th June 2015, the United Kingdom's Chancellor of the Exchequer, The Rt. Hon. George Osborne MP, announced a commitment that:

... in normal times, governments of the left as well as the right should run a budget surplus to bear down on debt and prepare for an uncertain future. In the Budget we will bring forward this strong new fiscal framework to entrench this permanent commitment to that surplus, and the budget responsibility it represents.

Commonly referred to as the 'Budget surplus law', it is a clear example of a fiscal consolidation. What then might be its effects? The paper by Beetsma et al. is an excellent starting point for predicting one particular impact, namely the effect of the fiscal consolidation on consumer and producer confidence. Using historical evidence from 17 developed countries for the period 1978–2009, they predict that the announcement is likely to have a negative effect on both consumer and business confidence. However, the fall in confidence is likely to be tempered if the announcement was expected or if the surplus is more likely to be achieved through expenditure-based than revenue-based measures. The commitment to publish a new Charter for Budget Responsibility was already revealed in the Chancellor's Autumn Statement on 3rd December 2014, so it is likely that the announcement in the Mansion House speech was expected. With many commentators also interpreting the Conservative Party Manifesto 2015 pledge of 'cutting income tax for 30 million people' and putting a 'cap on overall welfare spending' as signalling a preference for expenditure-based measures, the results of Beetsma et al. therefore predict only a small effect on confidence.

The results in Beetsma et al. are based on how consumer and business confidence has historically responded to announcements of fiscal consolidations. Two examples are shown in [Figure 8](#). The first is from Italy in 2003, when the authorities announced a new three-year deficit reduction plan following the lira's exit from the Exchange Rate Mechanism in September 1992. The second is from Austria in 1996, when fiscal consolidation was motivated by deficit reduction and achieving the Maastricht deficit criteria for participation in EMU.

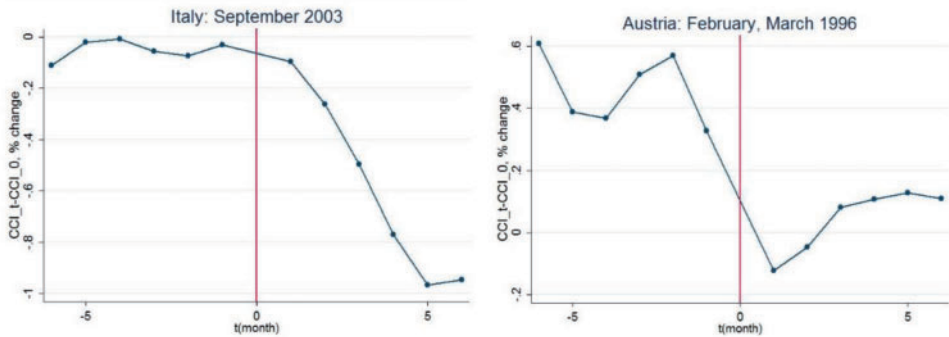


Figure 8. Response of consumer confidence to fiscal consolidation

The examples show the power and limitations of the approach. The experience in Italy suggests that the announcements of the fiscal consolidation was only fully reflected in consumer confidence with a delay, perhaps because consumers needed time to digest the news or because consumers initially doubted the announcement's credibility. The figure for Austria shows a different dynamic, with consumer confidence falling even before the announcement is made, then overshooting before eventually recovering part of the fall. That confidence falls before the announcement is made calls into question whether there were leaks or whether the announcement was already expected. In either case, the assumption that fiscal policy consolidations are unexpected exogenous events is questionable.

There is also another potential explanation, namely that the fiscal consolidations have been dated incorrectly. If information is leaked in advance then consolidations will be dated too late; if information needs digesting, then consolidations will be dated too early. Figure 9 shows what happens when the confidence effects of misdated fiscal consolidations are aggregated. The average effects in the far right-hand panel mirror closely those reported in Figure 6 of Beetsma et al. It could be that the apparent predictability of fiscal consolidations in the data is driven more by dating errors than by leaks or anticipation of announcements.

The effects of fiscal consolidations are hugely important, so it is crucial to fully understand what exactly is being estimated in Beetsma et al. Looking at the panel regression equation (1), the key parameter of interest is the contemporaneous effect of expenditure-based and revenue-based consolidations on consumer and business confidence, subject to a set of controls. The controls include contemporaneous values of the standard macroeconomic variables, real GDP growth, the change in the unemployment rate, CPI inflation, the long-term interest rate and the change in the stock price index. While including controls may appear innocuous, it does subtly alter the interpretation of the parameter being estimated. Because controls are included contemporaneously, the parameter of interest is the effect on confidence of that part of a fiscal consolidation that does not move contemporaneous macroeconomic variables. One might refer to this as

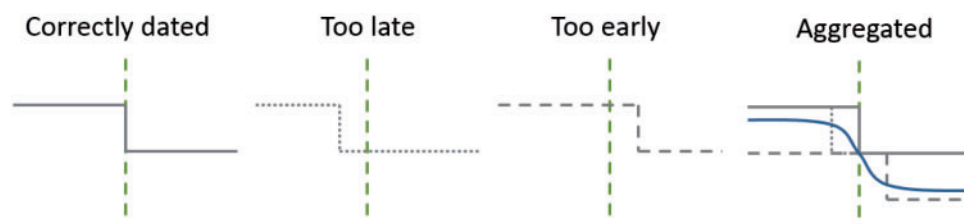


Figure 9. Misdated fiscal consolidations

the direct effect. However, it is likely that fiscal consolidations also have indirect effects through their impact on macroeconomic variables. It is reasonable to argue that real GDP growth, the change in unemployment and CPI inflation will not react within the month of a fiscal consolidation, but it is more difficult to believe that stock markets and long-term interest rates are unaffected. The UK FTSE 100 index rose 1.04% on 10th June 2015, the day of the Chancellor's Mansion House speech. The yield on 20-year UK treasuries rose by 7 basis points that day.

Beetsma et al. counter the presence of indirect effects by showing in Section 5 that the estimated effect of a fiscal consolidation on confidence is robust to controlling for indirect effects through a PVAR approach. More specifically, in results unreported in the paper they performed annual panel regressions of the change in the log stock price index on the components of their consolidation measures, controlling for the same variables as they control for in their baseline panel regression. They find no effect of the various components of their consolidation measures on the change in the log of the stock price. This is a surprising result, which raises several new questions. What is to be made of consumer and business behaviour if fiscal consolidations have an effect on confidence but no effect on stock prices? Assuming that stock markets are a good predictor of future economic developments, how should one react to the result that fiscal consolidations appear to have no predictive power for future developments? The latter is important since the impact of fiscal consolidations on consumer and business confidence is not of interest in itself, only insofar as it helps explain future macroeconomic developments. The results of the PVAR exercise in the Web Appendix D are not generous in this respect. Why should one be interested in the confidence effects of fiscal contractions if they have no significant effect on stock market prices or future macroeconomic variables?

The extended results showing where and when fiscal consolidations are likely to have most impact provides welcome additional food for thought. They will provide comfort to the Chancellor, with the UK economy classified as having relatively strong fiscal rules and higher-than-average fiscal transparency, both of which reduce the estimated impact of fiscal consolidations on confidence. One caveat relates to the subset of estimates of the effect of fiscal consolidation conditional on the level of the output gap. The finding that fiscal consolidations are less likely to have a negative effect on confidence when the output gap is negative is appealing, but may be an artefact of confidence being close to

its historic lower bound at such a time. If confidence is already weak then it is likely to rise, with or without a fiscal consolidation, which may bias estimates. An attempt is made to control for this by conditioning on macroeconomic variables, but an alternative would be the Inverse Probability Weighting approach of [Jordà and Taylor \(2013\)](#).

Lutz Kilian

University of Michigan, CEPR

Fiscal consolidation involves a retrenchment of government expenditures and/or the imposition of higher taxes often with the objective of reducing the share of government spending in GDP and/or of reducing the debt-to-GDP ratio to more acceptable levels. Fiscal consolidation is a recurring theme in policy circles. Although there are historical examples of successful fiscal consolidations such as the reduction in US fiscal debt during the Clinton years, the mere fact that calls for fiscal consolidation resurface time and again suggests that governments find it hard to implement and sustain fiscal consolidations. Often it is only the threat of imminent economic collapse from events such as the Euro crisis that forces governments to tackle the challenge of fiscal reform. Even in the latter case, governments have shown great creativity in delaying or at least minimizing fiscal austerity.

How then did Clinton succeed in turning a sizeable US budget deficit to a budget surplus? [Feldstein \(2001\)](#) suggests that the primary source for eliminating the budget deficits was higher tax revenues resulting from increases in economic growth rather than changes in tax policies or government expenditures. If there was a role for policy, then simply that Republicans in Congress blocked spending increases that would have dissipated the increased tax funds, while the president blocked Republican initiatives to cut taxes.

It is not hard to see why governments would be reluctant to reduce their expenditures, given that much of their power derives from being able to allocate these expenditures. It is also not surprising that there are limits to a government's willingness to raise taxes. The concern is not only that tax increases are unpopular and may undermine the government's success at the next election, but it is well understood that either form of fiscal consolidation involves a fiscal multiplier that may bring the economy closer to a recession. This is a particular concern when the economy is already weak at the time when calls for fiscal consolidation mount. How large this fiscal multiplier is and how its magnitude differs depending on the mix of expenditure reductions and tax increases is an active area of research.

From the conventional macroeconomic point of view, there is a trade-off between the economic pain inflicted by fiscal consolidation in the short run and its longer-run benefits. Traditional static textbook models of aggregate demand predict that a cut in government spending (or an increase in taxes) inevitably depresses real output. This view has been questioned by some researchers, however. For example, [Bertola and Drazen](#)

(1993) show that a fiscal contraction may paradoxically generate an economic expansion when the public expects that a failure to contract now would be followed by an even more severe contraction later. Their point is that a cut in government spending may stimulate current private sector spending, if it causes expectations that future government spending and hence future taxes will be lower. If the increase in private spending more than offsets the reduction in government spending, real output actually increases. Somewhat more pointedly, one might argue that the economy could be stimulated by budget cuts, if these cuts help avoid an even larger fiscal crisis in the future. Indeed, there is an empirical literature dating back to the late 1990 that has suggested that austerity measures can generate expansionary effects on the economy, although there is some disagreement among researchers about whether this result may be believed. In sharp contrast, many EU governments in recent years have made the case that the growth of their economies is held back by fiscal austerity measures, rather than being helped along.

The study by Beetsma et al. re-examines this controversy. Rather than studying the response of private spending (or the response of the economy at large), they focus on the effects of fiscal reform on measures of consumer confidence and business confidence. The central question is whether fiscal reforms undermine confidence in the economy or strengthen it. Increased confidence in the economy may be viewed as a precondition for an increase in private spending without which a positive response of the economy to a budgetary tightening cannot be explained. In order to answer this question, we need to identify exogenous variation in government spending and/or government taxes.

In the first part of the analysis, Beetsma et al. rely on a data set developed by Devries (2011) that includes all measures aimed at reducing the government deficit in 17 OECD countries between 1978 and 2009 that represent a response to past policy decisions and economic conditions. This classification is based on an evaluation of official documents in conjunction with information about the institutions in each country. The approach employed by Devries et al. (2011), known more generally as the *narrative approach* to identification, is intended to make sure that these actions are not correlated with prospective economic conditions and can be used to infer to causal effects of fiscal consolidations on the economy. The fact that the sample ends in 2009 is an advantage in the current context in that otherwise the results may be driven by the unique experience of the Euro crisis.

As their starting point, the authors specify an annual panel regression model for all countries in their sample attempting to explain variation in consumer confidence. Consumer confidence is smoothed using an HP filter. It is not clear why this smoothing is required or how the results would be affected if one focused on changes in consumer confidence instead. The baseline regression model allows for country- and year-fixed effects, includes lagged dependent variables, and conditions on each country's current economic growth, inflation, stock returns, long-term nominal interest rates and changes in unemployment. Interest centres on the coefficients of a measure of *unanticipated* fiscal

policy changes in the current period (CS_t^u), a measure of *anticipated* fiscal policy changes in the current period (CS_t^a), and CS_t^p , which refers to the present value of all unanticipated future consolidations as of the current period. The baseline specification makes no distinction between expenditure and revenue based fiscal plans. All coefficients but the fixed effects are constrained to be the same across countries. It is clear that this assumption is helpful in making the model more parsimonious and perhaps necessary for obtaining any empirical results. It is less clear how realistic this assumption is.

The implicit premise is that a correlation between the fiscal regressors and the consumer confidence (as reflected in non-zero coefficients of these regressors) implies a causal effect. The reason for focusing on the impact effect only presumably is that the effects occurring within the current year are what a policy-maker would care about most. There are six distinct concerns with this approach.

One concern is that fiscal shocks usually refer to unanticipated changes in fiscal policy. If a change is anticipated it is not a shock and should not have causal effects. It is not clear how to interpret the coefficient on CS_t^a therefore. The authors hint at this point when stating that the implementation of anticipated measures should not affect confidence, because such effects should have occurred already at the moment the measure was first announced. Of course, by this logic it is not clear why this regressor was included at all.

Another concern is that after aggregating the data to annual frequency there is plenty of room for two-way causality in the model, even when there is none at monthly frequency. The only reason for relying on annual data is presumably that the macroeconomic aggregates that the panel regression conditions on are not available at monthly frequency. It may be possible to ameliorate these concerns by switching to quarterly rather than annual data. My suggestion would be more radical. It seems to me that these so-called controls are redundant because the fiscal shocks were explicitly constructed not to reflect current economic conditions and expected future conditions. Thus, there is no need to include any of these macroeconomic aggregates and we could return to monthly specifications of the model without loss of generality.

One could of course make the case that the effects of fiscal consolidation on consumer confidence are non-linear and depend on the state of the economy. This would provide a rationale for including additional macroeconomic aggregates in the regression model. The problem is that the current panel specification does not allow for this type of non-linearity. A crude way of allowing for such non-linearities would have been to interact the coefficients on the fiscal consolidation variables in the panel model with the variables capturing the state of the economy.

A related issue that also could have been avoided by using monthly data is how to aggregate monthly fiscal shocks to annual frequency. There is no explicit discussion of this point in the paper. For example, it is not clear how to convert an unanticipated shock measured at monthly frequency to a shock measured at annual frequency. Intuitively, it matters at what time within the year the unanticipated shock occurs. It also matters how many unanticipated fiscal shocks there are within a given year. There is

also the issue of how to define the information set relative to which this shock is defined. A very similar problem arises in measuring monthly monetary policy shocks using changes in daily interest rate futures data at dates of policy shifts (e.g., D'Amico and Farka, 2011).

Moreover, the fact that CS_t^u , CS_t^a and CS_t^b are correlated means that the individual coefficients for each of these regressors do not measure the marginal causal effect of each type of fiscal shock. Perhaps one could report instead by how much these three regressors jointly lower or raise consumer confidence, which would also provide a measure of the economic significance of these effects? Likewise, it is not clear why the authors report t -tests for CS_t^u , CS_t^a and CS_t^b rather than testing the joint significance of the regressors, given that these regressors are necessarily correlated. One concern is that a Wald test of joint significance is unable to discriminate between positive and negative effects on consumer confidence under the alternative hypothesis. This fact suggests that addressing the question of interest in a panel model setting is inherently difficult. A final concern is that the effects of fiscal consolidations are likely to last longer than one year, but the panel model allows only for impact effects.

For these reasons, the estimates of this panel regression model should be taken with a grain of salt. The second part of Beetsma et al.'s study actually addresses some of these concerns. The authors create a new data set for the monthly dates of fiscal consolidations, extending the analysis of fiscal policy shifts in Devries et al. (2011). This new data set then is used to conduct an event study. The event study approach simply involves comparing the level of consumer confidence for a given country before and after dates at which a fiscal policy shift takes place, possibly dropping some observations near the date of the policy change to control for leakage from policy announcements. This approach allows formal tests of the hypothesis that the change in consumer confidence is zero against the alternative that it is positive. The event study suggests that fiscal consolidations on average tend to be followed by declines in consumer confidence, although the decline is barely statistically significant. This preliminary evidence supports the position of many EU governments that fiscal retrenchment is contractionary and suggests that the countervailing forces discussed in Bertola and Drazen (1993) are not quantitatively important on average. This evidence does not, however, speak to the question of whether fiscal reform should be delayed, as maintained by many politicians.

The authors then proceed by dividing these fiscal events further into tax increases and expenditure reductions and repeating the event study. This additional classification is based on work by Alesina et al. (2014) who quantify the extent to which each fiscal event in Devries et al. (2011) was predominantly based on reducing expenditures or based on raising government revenue. This exercise suggests that the earlier results were driven by tax increases. If we focus on tax increases only, fiscal consolidations are followed by statistically significant reductions in consumer confidence. If we only focus on reductions in spending, in contrast, fiscal consolidations tend to be followed by increases in consumer confidence, consistent with Bertola and Drazen (1993), although these increases are not distinguishable from zero at conventional significance levels. This result is

consistent with the interpretation that only reductions in government spending are viewed as a signal that the government is serious and committed to sustaining fiscal reforms, whereas tax increases are viewed as a signal that the government intends to conduct business-as-usual. It is important to keep in mind, however, that this analysis does not answer the question of whether the stimulus arising from reductions in government spending is strong enough to lift the entire economy, which is what ultimately matter to policy-makers.

Beetsma et al. refine their classification of fiscal events even further in the remainder of the event study. While there is no important difference between spending-based and tax-based fiscal consolidations during an economic boom (both being associated with declining confidence in the economy), during recessions only tax increases are associated with lower confidence, while reductions in government spending are associated with increased confidence in the economy. This result is interesting as far as it seems to remove the rationale for delaying fiscal reform until the economic recovers. In fact, it suggests that there is advantage to such a delay and a possible disadvantage. It also would be useful to understand at least intuitively why this difference arises.

It also seems to matter whether the country in question is European or not. There is no evidence of fiscal consolidations being followed by declines in consumer confidence in other countries. In fact, outside of Europe both revenue-based and tax-based reforms tend to be followed by statistically insignificant increases in consumer confidence. Within Europe only, revenue-based reforms have statistically insignificant positive effects on consumer confidence, while tax-based reforms have statistically significant negative effects. No results are provided that control for the state of the economy in addition.

With regard to the European countries specifically, there is evidence that without fiscal transparency and without tight fiscal rules, fiscal consolidation tends to be followed by declines in consumer confidence. In contrast, there is no evidence of a decline and sometimes there is evidence of an increase in confidence in other countries, especially countries with credible policy regimes. I found it hard to interpret these results because they do not make allowance for the state of the economy, which was earlier shown to be important in assessing the effects of fiscal reform.

The question is what these increasingly disaggregated results add to the paper. The authors suggest that examining the effectiveness of fiscal consolidations for consumer confidence, while conditioning on the state of the economy, on institutions and on political conditions is helpful to policy-makers in deciding when to undertake reforms. Even ignoring the fact that it may be hard to separate competing explanations if there is not enough variation across countries, I am not persuaded by this argument because most governments which pursue fiscal reform do so because they feel that they have no choice. For example, the timing of fiscal reform commonly is not a choice variable. For example, governments in countries affected by the Euro crisis cannot very well postpone fiscal reform until the economy expands again, although they may be able to drag their feet. Likewise, credibility and good institutions may be helpful in implementing fiscal

reforms, but are hardly a choice variable for policy-makers. A more interesting use of these disaggregate results might be to think about what they tell us about the design of theoretical models of the transmission of fiscal policy shocks.

Leaving aside these quibbles, does this event study resolve the controversy in the literature about the effects of fiscal consolidations? The answer is not quite. The reason is that event studies in general suffer from the limitation that they treat all events as being essentially the same. This premise is unrealistic in the current context, first, because one fiscal event may involve a small spending reduction and another event a large spending reduction, and, second, because the mix of spending reductions and tax increases will differ from one event to the next. In addition, each fiscal event involves a different mix of unanticipated and anticipated fiscal measures. As emphasized by Alesina et al. (2014), every fiscal consolidation involves a plan that combines different elements that are necessarily correlated and should not be thought of as mutually independent tax shocks or spending shocks. Plans consist of the unanticipated announcement of a sequence of fiscal actions, some to be implemented within the same year as the announcement and some to be implemented in the following years. There also are anticipated fiscal measures that were already announced previously. In fact, a fiscal plan may involve twice as many distinct components, once we differentiate between government expenditures and revenues.

If there were just one fiscal shock, the standard approach would be to trace out the causal effects of fiscal policy shocks by regressing monthly changes in consumer confidence on current and lagged values of the fiscal shock. The regression coefficients of this distributed lag model will capture the causal effects of unanticipated changes in policy, provided these changes are not systematically correlated with other variables over the sample in question. A natural generalization of this approach would be to simulate the path of consumer confidence first with the vector of all the components of the fiscal shock and then again after setting this vector to zero. The difference between the implied paths of consumer confidence would represent the response to the fiscal plan. A closely related approach is also discussed in Alesina et al. (2014).

Ideally, this approach should be applied to each country one at a time to allow for differences in the responses across country, although a case could be made for pooling the data in the interest of greater parsimony. Pooling indeed may be necessary, given the small number of fiscal consolidations in each country. Although such cross-country restrictions could be tested, an obvious concern in this context would be that such regressions do not allow for possible non-linearities in the response of consumer confidence, depending on the state of the economy.

Where does this leave us? The authors clearly have made some progress in quantifying the response of consumer confidence to fiscal consolidations. The main substantive conclusions of this paper relate to the findings of an event study. This event study makes no allowance for differences in the composition of fiscal reforms across events, but it provides some intriguing tentative evidence about the relationship between fiscal austerity and consumer confidence. For now this may be all that we can learn from these data,

given that the number of fiscal consolidations in the historical data is small, and the differences across countries and over time are numerous.

Panel discussion

Sergei Guriev stated that if one observes that bond markets react to an announcement, it was probably an unexpected and credible event. Thus, bond markets give information on to what extent the announcement about austerity is unexpected. He also asked whether the authors look at the heterogeneity across consumers who participate in the survey. He thought that this point is important because consumers' confidence may or may not affect their spending depending on their characteristics such as assets, liquidity constraints, etc. He believed that studying different subsamples of consumers would provide more insights. Josep Pijoan-Mas suggested allowing heterogeneity in confidence by separating the saving capacity of households and the general economic conditions in the construction of consumer confidence variable since these may lead to different responses. Massimo Giuliadori indicated that the comment on heterogeneity of consumer confidence indicators was a very relevant point but the identification was not possible because the individual measures were extremely noisy.

Tommaso Monacelli contributed to the debate on confidence and fiscal consolidations by asking about the economics of confidence. He requested an explanation on how the idea of confidence can be implemented in a theoretical model. He argued that it is hard to implement confidence as an animal spirit type of idea endogenously in a model. Monacelli also commented on non-linearity in the source of crisis, noting that fiscal consolidations have the possibility to boost confidence when the crisis originates from fiscal profligacy, but not if the crisis is due to the profligacy of banks.

Jan Pieter Krahnen referred to the event-study literature in finance that concentrated on the abnormal returns and asked whether the authors had something similar to that. He thought the authors should have a model for the changes in the confidence index rather than the level of it. As a response to Krahnen, Beetsma said that they analysed the stock market in event-study and found flat responses. Giuliadori emphasized that it was very difficult to work with the monthly frequency of observations due to noise in low frequencies. He said that while they were concerned about endogeneity, they thought the end-of-the-year (December) confidence presumably did not affect stock prices before.

Commenting on Martin Ellison's discussion, Roel Beetsma explained that it was difficult to pin down the point when the information became available. He pointed out that the confidence moved before the official announcement due to the information leakages to the press before the event.

SUPPLEMENTARY DATA

Supplementary data are available at *Economic Policy* online.

APPENDIX: DETAILS ON THE CONSTRUCTION OF THE DATA

Construction of confidence indicators

The consumer confidence indicator is constructed from national-level consumer opinion surveys. For OECD members which are not part of the EU, confidence indicators are compiled according to national definitions. For OECD members that are also part of the EU, the harmonized consumer confidence indicator is used. The harmonized European series are seasonally adjusted by the European Commission using the DAINTRIES software, applied to aggregated national unadjusted series. In case seasonality remains in the data, the OECD performs an in-house adjustment using Demetra+. For OECD countries where survey-based data were not available at the monthly frequency the confidence series was created at the desired frequency using simple linear interpolation of the quarterly data. In our sample, this was the case for Australia and Japan.

Panel of monthly consolidation announcements

Regarding *what* is considered the announcement of a new consolidation, we have taken the following decisions:

- If a newly government explicitly signals its commitment to an existing fiscal plan, we consider this an announcement, the idea being that this should provide information on the likelihood that the plan will be carried out.
- We do not treat EU convergence plans as announcements involving a consolidation.
- Because the OECD data do not explicitly distinguish between the announcement and the implementation of measures, we have to interpret some verbs as signalling one or the other:
 - ‘*a new tax is introduced*’ is treated as the implementation of a measure introduced in the budget for that year and the corresponding moment of announcement is the moment that the budget for that year was presented.
 - ‘*Excise duties are increased*’ is treated as the implementation of an earlier announced measure.
 - ‘*The Government takes additional fiscal measures*’ is treated as the announcement of a new measure.

Regarding the *exact timing* of announcement, we have taken the following decisions:

- We base the timing on the existing budgetary process in the country. The dating of the announcement of measures that are part of a new budget is the moment the government presents the budget to the parliament.

- The date the Parliament votes about the budget is not considered an announcement, unless the Parliament significantly modifies the plan of the Government. The dating of the announcement of such amendments is the moment of the vote on the budget in parliament or the moment they are reported if that is earlier.
- If the Parliament adopts the budget with ‘minor modifications’ (as is commonly stated in documents), we do not consider this a separate announcement.

The Data Construction Appendix includes the description of each consolidation from the OECD Economic Surveys. We document the classification we have applied to the elements of the consolidation and the timing, i.e., the identification of the precise month for each year.

Example 1: match of implementation in Devries et al. (2011) with OECD announcement information (Austria 1981):

Devries et al. (2011, p. 13) discuss the fiscal consolidation implemented in Austria in 1981, ‘the spending cuts fell on the pensions, while the tax hikes included a hike in the VAT rate on energy, a new tax on credit institutions and gasoline stations, and the suspension of part of the savings incentive system.’

The OECD describes the draft Budget for 1981, introduced in Parliament in October 1980. This comprises, among other measures, ‘the cancelling of the interest subsidy scheme for investment, raise of VAT rate for energy from 8 to 13 per cent, introduction of special taxes on petrol stations and branch offices of credit institutions’ (OECD Economic Surveys, Austria 1981, p. 58).

Based on the composition of measures (VAT rise, taxes on gasoline stations and credit institutions), we identify that the policies mentioned by Devries et al. (2011) had first been proposed in the draft Budget for 1981, presented in October 1980.

Example 2: information from newspaper archives or national sources (Germany, 1993):

Devries et al. (2011, p. 41) mention (in the description of the 1993 consolidation) the implementation of a VAT increase: ‘there was an increase in the VAT rate from 14 to 15%, with an estimated impact of 0.39% of GDP in 1993.’ This was, in fact, proposed in September 1991. See the documentation from the German Parliament: <http://dip21.bundestag.de/dip21/btd/12/011/1201108.pdf>

Example 3: information from newspaper archives or national sources (Spain, 1992):

‘The central government budget for 1992 projects a marked reduction in the deficit to almost 2 per cent of GDP. Budget consolidation is planned to be achieved by raising revenues in relation to GDP, with expenditure remaining at the level of 1991 (about 23 per cent of GDP) [...] The Budget includes large increases in indirect tax rates, notably the increase in the standard VAT rate by 1 percentage point to 13 per cent’ (OECD Economic Surveys, Spain 1992, p. 40).

We have checked the *El Pais* newspaper archives and in an article released on 7 October 1991, we found information that a reform involving an increase in VAT was initiated in October 1991. This was expected according to the regular budgetary procedure and we used this information to assign the announcement of the 1992 Budget to October 1991 (see http://elpais.com/diario/1991/10/07/economia/686790014_850215.html).

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