

# What do we know about the effects of austerity?

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The literature on fiscal multipliers is far from having reached an agreed upon conclusion about their size and how they might be state contingent.<sup>1</sup> There is so much debate about this issue, that Eric Leeper (2010) defined this literature as “alchemy”. One result, however, seems very robust: in OECD economies fiscal consolidations (austerity) based upon expenditure cuts are much less costly than those performed on the tax side. This result was originally shown by an early literature which studied episodes of austerity before the Great Recession. Alesina and Ardagna (2010) summarized and extended these results, which were then confirmed in IMF (2010) and Guajardo et (2014) using a methodology based upon the narrative method pioneered by Romer and Romer (2010). The purpose of this paper is twofold. First, we review more recent evidence based upon an extension of the narrative method which considers multi-year fiscal plans rather than year-by-year shifts in fiscal variables, like in Romer and Romer (2010) and Guajardo et al(2014). We shall also document cases of “expansionary austerity”, namely episodes in which even large reductions of government spending were associated on impact with increases in GDP growth<sup>2</sup>

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<sup>1</sup>For reviews of the literature on fiscal multipliers see Ramey (2016) and Alesina, Favero and Giavazzi (forthcoming) chapt. 4.

<sup>2</sup>Simply pointing to positive GDP growth to define an expansionary austerity is not enough. Note that a precise definition of expansionary austerity is rarely found in the literature. Alesina et al. (2018) in their descriptive analysis consider as cases of expansionary austerity those in which the GDP growth of a country that implemented a fiscal adjustment is higher than the average GDP growth in the other countries included in their sample of advanced economies. This definition is different from considering as expansionary austerity a positive impulse response of GDP growth to a fiscal adjustment in a dynamic model. As a matter of fact, the 90 per cent confidence intervals on the responses of GDP growth to a fiscal correction illustrated below lie in the negative quadrant. Impulse responses measure the difference between the paths leading the economy to its steady state in presence and in absence of the fiscal correction.

– a possibility first recorded by Giavazzi and Pagano (1990). Second, we illustrate alternative theoretical explanations for our findings about spending- versus tax-based consolidations,

## I. Austerity: recent evidence

When legislatures decide to launch a consolidation program, it is typically, a multi-year policy package designed to reduce the budget deficit. The first decision is by how much the deficit should be reduced<sup>3</sup>; then, and often after much discussion, which taxes to increase and which expenditure items to cut. This means that spending cuts and tax increases are not independent of each other. In addition, some measures are announced long before they are carried out, while other are implemented immediately. Thus the standard approach to evaluating fiscal policy — which consists of assessing the effects of year-by-year “isolated” shifts in taxes or spending — overlooks two important points. One is the multi-year nature of fiscal adjustments which affects the planning of consumers and investors. The other is the interdependence of the decisions about how much to cut spending and how much to raise taxes which cannot be studied in isolation. To construct fiscal consolidation plans<sup>4</sup> we started from detailed information on the consolidations implemented by 16 OECD countries between 1978 and 2014. We address the potential endogeneity of shifts in fiscal variables using the Romer and Romer (2010) “narrative” approach later applied to the countries in our sample by Devries et al (2011) and extended by Alesina et al (2015). The fiscal consolidation measures in the d&al dataset (both tax increases and spending cuts) are selected using the narrative approach. They are “exogenous” because their adoption was not motivated by the state of the economic cycle but

<sup>3</sup>In the case of EU countries this decision needs to be reviewed by the European Commission before being submitted to Parliament.

<sup>4</sup>Our database on fiscal plans is available at [www.igier.unibocconi.it/fiscalplans](http://www.igier.unibocconi.it/fiscalplans)

rather were geared towards reducing an inherited budget deficit or were meant to correct its long run trend, *e.g.* an increase in pension outlays induced by population aging. We have extended the D&A dataset adding the consolidation measures implemented between 2010 and 2014. In order to construct fiscal plans we have analyzed and identified the legislative source of about 3500 different fiscal measures adopted in these countries over our sample. This was necessary in order to use these measures to reconstruct fiscal plans, for instance discriminating between measures announced and measures immediately implemented. This disaggregation was not in the original D&A dataset. While doing this, we double checked their classifications. For example we exclude the Netherlands, which is included in the D&A sample, because the data were not exogenous to the cycle by our definition. We distinguish between several categories of fiscal measures. For the analysis in this paper, however, we group measures in just two broad categories: spending,  $g$ , and taxes,  $\tau$ . We classify as spending all measures related to government spending and investment: current expenditure for goods and services, public sector salaries, education, health care, government investment, among other. We include transfers in  $g$  because, theoretically, we expect a cut in transfers to be less distortionary than an increase in taxes – for instance transfers do not affect the marginal rate of substitution between consumption and leisure. Our choice is supported by the findings in Alesina et al 2017b who use a three-level disaggregation: tax-based plans, spending-based plans and transfers-based plans. We classify as taxes changes in direct taxes – *e.g.* income, profits, capital gains and property taxes – and indirect taxes – *e.g.* VAT, sales taxes, excise duties on goods, and stamp duties. We include both changes in tax rates and measures designed to broaden the tax base.

Fiscal plans consist of a sequence of actions decided upon when a budget law is adopted, but some implemented immediately, other to be implemented in following periods. Plans are also a mix of measures, some affecting government expenditures, other affecting revenues. The design of plans thus generates inter-temporal and intra-temporal correlations among fiscal variables. The inter-temporal correlation is the one between the announced (future) and the un-

anticipated (current) components of a plan. The intra-temporal correlation is the one between the changes in revenues and in spending that determine the composition of a plan, given its size. The exogenous fiscal measures selected in our narrative analysis are thus classified in three categories: measures that were immediately implemented (“unexpected” measures), measures that were written in the legislation but whose implementation was deferred (“announcements”) and measures that were implemented in a given year but had been previously announced. We distinguish fiscal plans between those that are expenditure based (EB) and those that are tax based (TB) by first summing all fiscal measures (unanticipated, implemented but previously announced and announcements) and then labelling a plan TB if the largest component of the fiscal correction (measured as a fraction of GDP the year before the budget law is introduced) is an increase in taxes. Similarly for EB plans. To be able to simulate over time the effect of a plan we need to construct “artificial” announcements. We do so estimating the in-sample correlation between announcements and unexpected measures. Note that EB and TB plans are mutually exclusive and this gets around the problem posed by the intra-temporal correlation of individual changes in  $g$  and in  $t$ . Finally, measuring the macroeconomic impact of a plan requires modelling the relationship between plans and macroeconomic variables. This can be done either through Moving Average projections of macroeconomic variables on the different components of a plan, or by embracing such components in a VAR which includes both macroeconomic and fiscal variables as in Favero and Giavazzi, 2012. The MA approach has the advantage of being parsimonious; the VAR compensates the need for more degrees of freedom with several advantages. First using a VAR which includes changes in revenues and spending (as a fraction of GDP) and tracks the impact of the narratively identified shifts in fiscal variables on total revenues and total spending allows us to check the strength of our narratively identified instruments – for instance it allows us to verify if, following a positive shift in taxes, revenues indeed increase. Second, in a VAR the estimated coefficients on the narratively-identified shifts in fiscal variables measure the effect on output growth of the component of such adjust-

ments that is orthogonal to lagged included variables: thus the estimated multipliers are not affected by the possible predictability of plans on the basis of the lagged information included in the VAR. Finally, a VAR allows to compute multipliers in two different ways: with respect to an initial fiscal impulse and with respect to the cumulated change in fiscal variables.

### A. Empirical results

Alesina Favero and Giavazzi (forthcoming) uncover many strong regularities.<sup>5</sup>

1) There is a large and statistically significant difference between the effects on output of EB and TB plans. EB consolidations plans have, on average, been associated with a very small downturn in output growth: a spending based plan worth 1% of GDP implies a loss of about 1/2 of a percentage point relative to the average GDP growth of the country, which lasts less than two year. Moreover, if an EB plan is launched when the economy is not in a recession, the output costs are zero on average. This average small downturns are the result of cases of EB plans that were more recessionary and others that were associated with almost immediate surges in output growth, that is "expansionary austerity". Cases in which austerity was accompanied by growth in GDP higher than the average of other countries before the financial crisis include, amongst other, Austria, Ireland and Denmark in the eighties, Spain and Canada in the nineties. TB plans are associated with large and long lasting recessions. A TB plan worth 1% of GDP is followed, on average, by a 2% fall in GDP relative to its pre-austerity path. This large recessionary effect lasts several years. We report in Figure 1 the responses of output growth to an EB and TB plan worth 1% of GDP as shown in Alesina et al (2017a) within a plan-augmented multi-country panel VAR including output growth, the change of tax revenues as a fraction of GDP and that of primary government spending, also as a fraction of GDP.

<sup>5</sup>See also several papers by the same authors with co-authors Alesina et al (2015, 2016, 2107).

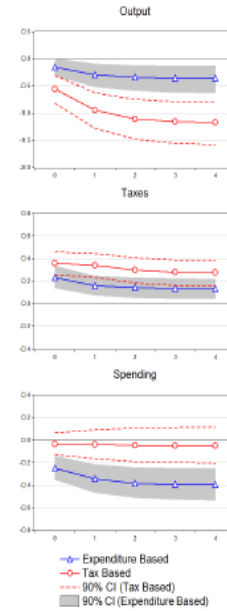


Figure 1: The effect of fiscal consolidation plans (source Alesina et al. (2017a))

2) The effects of reductions in entitlement programs and other government transfers are very different from those of tax increases. They are accompanied by mild and short lived downturns, probably because these cuts are perceived as permanent, leading to a lower expected tax burden. Thus the evidence suggests that transfers are not akin to negative taxes.

3) Amongst the components of private demand, investment growth responds very differently following the introduction of the two types of austerity plans. It responds positively to EB plans and negatively to TB plans. Business confidence behaves consistently with private investment. Consumption and net exports, on average do not differ during the two types of adjustments.

4) The recent episodes of austerity which occurred after the financial crisis, and started during a recession, were not significantly different from previous cases. The sheer size of some of these austerity plans was exceptional, not only in Greece but also in Spain, Portugal, Ireland, and to a lesser extent Italy and the UK. These episodes confirm the major asymmetry in the effects of the two types of plans. Countries that chose TB austerity suffered deeper recessions compared to those that decided to adopt EB plans. Amongst the latter are Ireland, despite a massive bank bailout program and the

UK, which posted a much more successful economic performance than the IMF had predicted when the country announced its spending based plan in 2010 (eventually the IMF apologized for having severely criticized the UK government).

5) Whether or not fiscal consolidations, on both the tax side and the spending side, are more costly when started during an economic downturn is a difficult point to discern. The answer depends on a variety of issues regarding the measurement of the dynamic pattern of the economy before and during the adjustment (see Auerbach and Gorodnichenko 2012, Ramey and Zubairy 2014). However, the asymmetry between EB and TB austerity is robust to the adoption of a model that allows for different effects of fiscal adjustment in an expansion and a downturn (Alesina et al 2017a). The only exception is observed when the Zero Lower Bound is also considered, although data from periods at the ZLB are still too few to draw clear conclusions.

## II. What could explain these findings ?

How can we explain these results which are empirically quite striking? We can think of four arguments.

### A. *Accompanying policies.*

One "theory" is that the difference between TB and EB plans is simply due to a systematic difference in accompanying policies. The most obvious candidate is monetary policy. Guajardo et al (2014) argue that indeed differences in the response of monetary policy are substantially responsible for these findings. Alesina, Favero and Giavazzi (forthcoming) instead show that only a small fraction of the heterogeneous effects of EB and TB adjustments is related to monetary policy. Their simulations show that the heterogeneous effect of TB and EB plans on output is mitigated somewhat by the absence of a monetary policy response, but it remains highly significant.

A second and related possibility could be that the difference is explained by the behavior of the exchange rate. Note that exchange rate movements *during* a fiscal plan are clearly endogenous to it; but a devaluation prior to the introduction of a plan may not be and thus might explain the lower output cost of EB plans. Alesina

Favero and Giavazzi (forthcoming) show that this is not the case. On average there is no systematic difference in the behavior of the exchange rate before fiscal adjustments based upon tax increases or spending cuts. The authors exclude from their sample all episodes of fiscal consolidation that are preceded by a devaluation of at least 3% to at least 10% over the previous three years (which is approximately the 10th percentile of the distribution of the three-year cumulative change in the exchange rate). The results were unchanged. In addition if the exchange rate had been an important explanation of the difference between TB and EB plans, the difference between the two cases in terms of GDP growth, should be associated to a different behavior of net exports. This is not the case: the driving force is domestic private investment.

Finally, large fiscal adjustments are often periods of "deep" structural reforms which may include products and/or labor market liberalization. The latter may stimulate growth and if they were systematically occurring at the time of spending cuts, they may explain the finding. The answer is no: these reforms do not occur systematically during periods of spending cuts. Note that this result is not inconsistent with the evidence and the case studies reported in Perotti (2013) and Alesina and Ardagna (1998, 2013). What these papers show is that amongst all fiscal adjustments, the least costly were those accompanied by supply side reforms and by wage moderation. Our robustness check is different: we check whether the adoption of EB and TB adjustments can be explained by supply side reforms, and we find that it cannot.

### B. *Confidence*

With this (admittedly vague) term we identify situations in which a fiscal consolidation removes uncertainty and stimulates demand by making consumers and especially investors more optimistic about the future. Imagine a situation, for instance as described in Alesina and Drazen (1991) in which an economy is on an unsustainable path with an exploding public debt. Sooner or later a fiscal stabilization has to occur. The longer one waits, the higher the taxes that will need to be raised (or spending to be cut) in the future. When the stabilization occurs it removes the uncertainty about further de-

lays which would have increased even more the costs of the stabilization. Blanchard (1990) provides a simple model which illustrate this point. A stabilization which eliminates the uncertainty about higher fiscal costs in the future stimulates demand today — especially, we may add, demand from investors, who are more sensitive to uncertainty about the future given the long run nature of their plans. Blanchard (1990) and Alesina and Drazen (1991) do not distinguish between stabilizations occurring on the tax or spending side. However it is quite likely that the beneficial effects associated with the removal of uncertainty are more likely to occur in the presence of EB rather than TB consolidation plans: if the automatic increase of spending is not addressed, taxes will have to be continually increased to cover the increase in outlays.

Alesina and Ardagna (2010) and several papers reviewed therein, present evidence on the dynamics of government budgets consistent with this interpretation: spending based adjustments lead to more long lasting debt stabilization. Alesina, Favero and Giavazzi (forthcoming) present results on business confidence which support this view. They show that, at least in their sample of OECD countries, business confidence increases immediately at the start of an EB consolidation plan, much more so that at the beginning of a TB plan.<sup>6</sup>

#### C. *The supply side: labor supply*

Thus far we have not considered the supply side of the economy, but clearly tax hikes and spending cuts have different effects on labor supply. Consider the effects of TB and EB plans in the context of a basic neo-Keynesian model with tax distortions. Alesina et al (2017b) show that EB plans are the least recessionary the longer lived is the reduction in government spending. Symmetrically, TB plans are more recessionary the longer lasting is the increase in the tax burden and thus in distortions. When persistence increases, the demand shift due to a cut in government expenditure starts to be dominated by the supply shift due to lower labor

supply. The demand effect falls faster than the supply effect, so that the government spending multiplier decreases with persistence. Symmetrically, in the case of an increase in labor taxes, the multiplier increases with persistence. To put it simply, a persistent increase in labor taxes makes the static substitution effect between labor and leisure more permanent and this increases the wage tax multiplier. To the extent that fiscal adjustments are perceived to be permanent, and are on the supply side, a standard neokeynesian model thus implies that spending cuts are (much) less recessionary than tax hikes.

#### D. *The supply side: network effects*

Following a different line of thought Acemoglu et al (2016) study the role of networks linking different sectors in the economy and the propagation of shocks across such networks. Network based analysis of the transmission of macroeconomic shocks starts from the observation that input-output linkages can neutralize the law of large numbers. Studying the propagation of adjustments through input-output linkages it is shown that supply-side shocks propagate downstream more powerfully than upstream: downstream customers of sectors that are hit by a supply shock are affected more strongly than upstream suppliers. The converse is true for demand shocks: they propagate more powerfully upstream. The reason for this asymmetric pattern lies in the fact that supply side shocks change the prices faced by customer industries, while demand side shocks have much smaller effects on prices and propagate upstream.

How are these results related to the evidence illustrated in the previous paragraph? Fiscal adjustments based on increasing taxation have a strong supply-side component, while EB adjustments are one of the benchmark cases of demand-side adjustments. Because their propagation is totally different, the size of the final effect on output of the two different types of fiscal adjustments depend on different elements of the input-output matrix. EB adjustments, being mainly demand shocks, have a network effect that goes through the connection of industry  $i$  with its customers. Symmetrically, TB adjustments, being mainly supply shocks, have a network effect that goes through the connection

<sup>6</sup>Croce et al (2012) examine the effects of corporate taxation on firms' decisions, and hence on asset prices. Shocks to government expenditure generate tax risk for firms, and the extent of this uncertainty depends on the government's financing policy and on its ability to pin down long-run tax dynamics.

of industry  $i$  with its suppliers. The empirical model for the measurement of the effect of a fiscal adjustment on value added growth is thus a global VAR model in which the effect of EB and TB adjustments are the sum of a direct effect and an indirect effect driven by a sector and an adjustment specific global variable, *i.e.* a weighted average of added value growth in all the other sectors with weights that are specific to each sector and to the nature of the adjustment.<sup>7</sup>

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<sup>7</sup>Briganti et al (2017) show that the simulation of such a model produces output effects of TB and EB adjustments that reproduce the asymmetry documented in the previous paragraph.