
Government size and macroeconomic stability¹

This article examines the potential role of government size in explaining differences in output volatility across OECD countries in the context of the latest recession. There is some evidence to suggest that government size as measured by the share of expenditure in GDP has a modest negative association with output volatility. Moreover, this link seems to have weakened further since the mid-1980s. Factors such as trade openness and exposure to terms-of-trade shocks as well as volatility of inflation appear important. Interestingly, the same set of factors seems to matter in explaining the severity of recession in OECD countries.

JEL classification: E6, E32, F41.

During the latest recession, output losses were large relative to those of past recessions and varied significantly across countries. Several factors were clearly at work, including the severity of the financial crisis and differences in exposure to external demand shocks. Even so, the decline in output appears to have been typically larger in countries where the size of the government was smaller. For instance, cumulative output losses between the third quarter of 2008 and the second quarter of 2009 were about 10% (not seasonally adjusted) in Hong Kong SAR, Mexico and Taiwan (China), which had a relatively smaller share of government expenditure in GDP (18–20%). By contrast, in Norway and France, where the share of government expenditure exceeded 40% and 50% of GDP, output fell by 2% and 1%, respectively. This has sparked a debate as to whether the size of the government has an influence on the depth of the recession.²

The link between government size and output volatility raises both conceptual and empirical issues. At the conceptual level, the stabilising role of fiscal policy could be traced to both automatic and discretionary effects. The former are linked to the share of the government sector in output. From this viewpoint, the larger the government size, the greater could be the automatic

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² For competing views, see eg Krugman (2009) and Reynolds (2009).

stabilising impact of fiscal policy. By contrast, provided it is conducted symmetrically during recessions and expansions, discretionary fiscal policy should neither be based on government size, nor should it affect the tax and expenditure shares in GDP across business cycles. Hence, an economy with a small government size should not have less capacity to dampen shocks. In addition, other policies – particularly monetary policy – can substitute for a countercyclical fiscal policy. And there may be situations where larger governments may contribute to increasing rather than reducing output volatility.

At the empirical level, the literature has generally found a negative relationship between government size and output volatility. Yet output volatility is affected by several factors, which may or may not be correlated with government size. Consequently, identifying an independent effect of government size on output volatility is not easy. And the impact found could vary depending on other variables in the model.

The purpose of this special feature is to examine the link between government size and output volatility in the light of the current recession. The focus is on 20 major OECD countries for which consistent time series are available since 1970. The article seeks to throw light on several issues. The first is whether government size is a major determinant of output volatility and, if so, how far. A second issue is whether there are other factors that are more important in determining output volatility than government size. A third issue is the extent to which government size may also matter for the severity of recessions as opposed to normal output volatility.

We find that although the share of government expenditure in GDP does in general stabilise the macroeconomy, the effect seems to have weakened since the mid-1980s. This is a period marked by a sharp reduction in output volatility across industrial economies (the Great Moderation) until the recent crisis and recession. Output volatility is significantly affected by the degree of exposure of economies to external shocks – particularly terms-of-trade changes – as well as the level and variability of inflation. Interestingly, the same set of factors seems to influence the severity of recessions. There is no clear evidence to suggest that government size has had a significant effect in terms of reducing the extent of output loss during major recessions.

The rest of this special feature is organised as follows. The first section provides a short theoretical review of why government size might matter. The second section presents some stylised facts regarding the relationship between output volatility and key fiscal variables. The third section provides a discussion of the empirical results. The fourth section concludes.

Why might government size matter?

There are two ways to measure the importance of the government in the economy: the GDP share of government expenditure and the average tax rate (or the GDP share of taxation). These two measures represent the most immediate counterpart to the variables appearing in most macroeconomic models. Distinguishing between the two is important because the channels through which they may affect output volatility are potentially different.

Measures of government size differ

A higher share of government expenditure in GDP may be associated with ...

... a larger component of stable demand ...

... and larger transfers to households and firms

A higher tax share can make disposable income less volatile

Government size could also have supply side effects

Government expenditure has a potentially important role in stabilising aggregate demand and hence output for at least two reasons. First, a higher share of government expenditure may be associated with a larger provision of public goods and services as well as a larger fraction of workers employed in the public sector. To the extent that government expenditure is more stable than other components of aggregate demand, it should reduce the overall volatility of aggregate income and output (a composition effect). And to the extent that a larger fraction of workers are public employees, it should also reduce the volatility of aggregate personal disposable income and aggregate private consumption, all else equal (a job safety effect).

A second reason is that a higher share of government expenditure may also reflect the existence of a more generous social security system, which involves providing transfers to a larger number of citizens – eg unemployment benefits and state pensions. Similarly, a more comprehensive (and costly) system can also be associated with a larger role for automatic transfers to companies. Normally, automatic transfers to workers and companies are designed, alongside taxes, to reduce the volatility of their disposable income (automatic stabilisation). Stabilising disposable income matters for output volatility to the extent that households and firms respond more to current income than to the expectation of future income. This may happen, for example, if a significant fraction of households or firms are liquidity-constrained or likely to become so when income falls and therefore unable to smooth consumption or investment through borrowing.³

The tax share could also contribute to stabilising output volatility. Indeed, a higher tax share, other things equal, reduces the volatility of households' disposable income and firms' cash flows in the face of fluctuations in their gross incomes. Through this channel, it dampens the effect of shocks on output. This effect is larger, the more progressive the tax system, and the more sensitive private expenditure is to current cash flows.

The above arguments are intuitively appealing. Other, perhaps less intuitive arguments emphasise the role of supply side rather than demand side effects. These may strengthen, weaken or even reverse the previous theoretical negative link between government size and output volatility. Notably, higher taxes or government expenditure could alter the responsiveness of labour and investment decisions (besides the traditional negative impact on efficiency and potential output).⁴ A controversial feature is the possible impact of progressive taxes on labour supply decisions. One mechanism, emphasised by the real business cycle literature, is that taxes reduce after-tax labour productivity and lead to an increase in the

³ Regardless of liquidity constraints, consumers and firms may also respond more to current income for other reasons, which include myopia, inconsistent preferences and limited rationality. For example, some consumers may not be able to estimate their future income due to lack of adequate information or cognitive ability, and hence could rely more heavily than other consumers on current and past income to do so.

⁴ By raising distortions, a higher tax share could also reduce the impact of discretionary tax changes (see eg Caldara and Kamps (2008)).

responsiveness of labour supply and accordingly of output, other things equal.⁵ However, according to Auerbach and Feenberg (2000) progressive taxation could have stabilising effects on output through the labour supply of similar magnitudes to those that work through aggregate demand.

Demand and supply side effects aside, there could be limits to the stabilising role of government size. An important factor that could partially or fully offset the stabilising properties of higher expenditure and taxes highlighted above is a high level of public debt (normally associated with large governments). If the public debt is sufficiently high, a recession could lead to the expectation of discretionary fiscal tightening or an unfavourable change in the rules governing long-term benefits and taxes (a change in built-in stabilisers). This could lead consumers and firms to further rein in expenditure when it is most needed. Moreover, unsustainable public debt levels may unsettle financial markets and raise long-term interest rates. Hence, large governments – to the extent that they are funded with high public debt – could be expected to increase rather than reduce output volatility.

Limits to government size in stabilising the economy

A first glance at the data

A key stylised fact is that in the post-World War period, at least until the recent recession, output volatility had been declining in many countries. This phenomenon has often gone hand in hand with a significant increase in the size of the government and a growing participation in international trade and finance. In the case of the United States, for instance, De Long and Summers (1986) attribute the decline in the post-World War output volatility until the early 1980s to the introduction of a progressive tax system and countercyclical entitlements, such as unemployment insurance in the 1930s.⁶

Output volatility has fallen sharply ...

What does recent evidence suggest about the link between government size and output volatility? Graph 1 looks at this relationship over time in each of the two major economic areas – the United States and Europe. The two variables are measured, respectively, by the standard deviation of GDP growth and the shares of taxes and expenditure in GDP. The graph does not suggest any consistent relationship between the size of the government and output volatility.

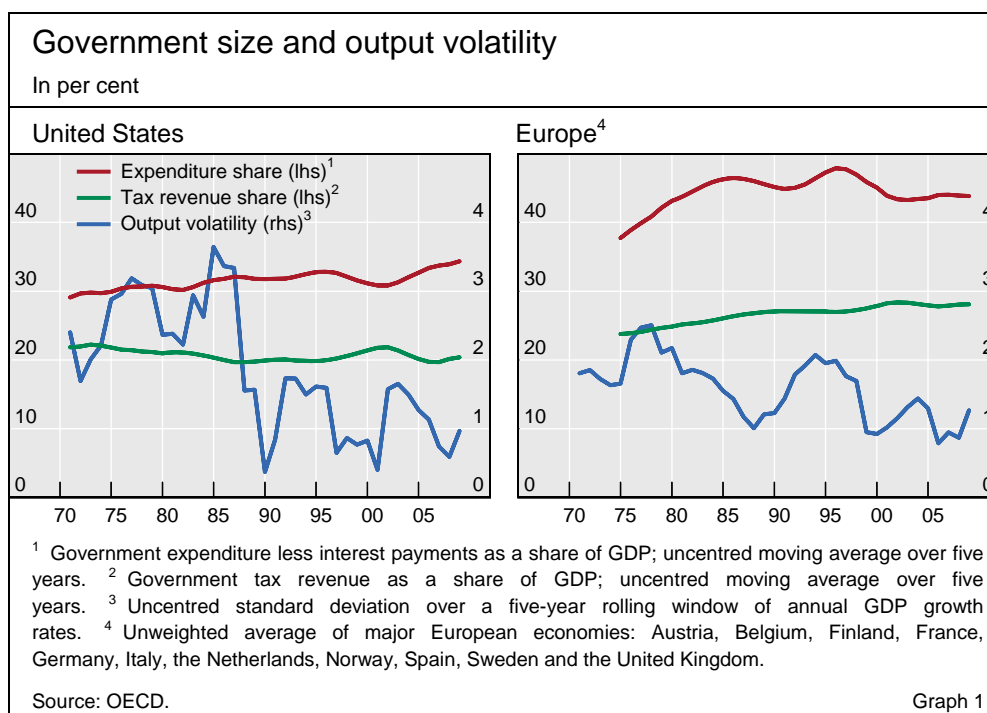
... but it does not seem to be associated with an increase in government size ...

While US output volatility has declined the most since the mid-1980s – a period usually referred to as the Great Moderation – there has not been a concomitant rise in the share of government expenditure in GDP, at least until

... in the United States ...

⁵ See Galí (1994) for an explanation of the effects of the tax share and the government expenditure share on labour elasticity and the income multipliers in the context of an otherwise standard real business cycle model. More recently, Andres et al (2008) have shed further light on the theoretical link between government size and output volatility, emphasising the role of nominal rigidities and the role of consumers that respond to current income (as opposed to their income expectations). Another study stresses the role of real wage resistance by workers (Buti et al (2003)).

⁶ Romer (1999) provides more direct evidence about the role of automatic stabilisers in reducing the fluctuations of US GDP. Her estimates suggest that in periods of extreme output volatility automatic stabilisers reduced the absolute value of the US growth rate by 1 to 2 percentage points, and in years of moderate output fluctuations by 0.5 percentage points.



the early 2000s. Time series evidence reported by many studies seems to confirm the fact that automatic stabilisers tend to be rather weak, not least because state governments follow a balanced budget rule. For instance, Auerbach and Feenberg (2000) show that, despite significant changes to the US economy, the automatic stabilising role of the tax system remained weak, and may have become even weaker since the early 1980s.⁷ This may also explain why the reliance on discretionary fiscal policy tends to be high in the United States.

... or in Europe

The reduction in output volatility in Europe has, in fact, been associated with a decline in the average share of government expenditure in GDP – particularly since the adoption of the Stability and Growth Pact in the second half of 1990s. But the share of taxes appears to have increased. Even so, the smoothing effects of automatic stabilisers differ across countries depending on the nature of shocks. For instance, estimates by the European Commission (2001) suggest that automatic stabilisers may smooth about 30% of GDP fluctuations in case of a consumption shock in Denmark and Sweden, which have a relatively high share of consumption taxes in GDP, compared with less than 20% in Germany, Spain and the United Kingdom. By contrast, the automatic smoothing effect of a private investment shock or an export shock is much smaller than that of a consumption shock.

Have economies with larger governments expanded their budget balance more during the recent financial crisis and recession? Graph 2 suggests that changes in cyclical budget deficits between 2007 and 2009 (projected) have indeed been positively correlated with government size across OECD countries

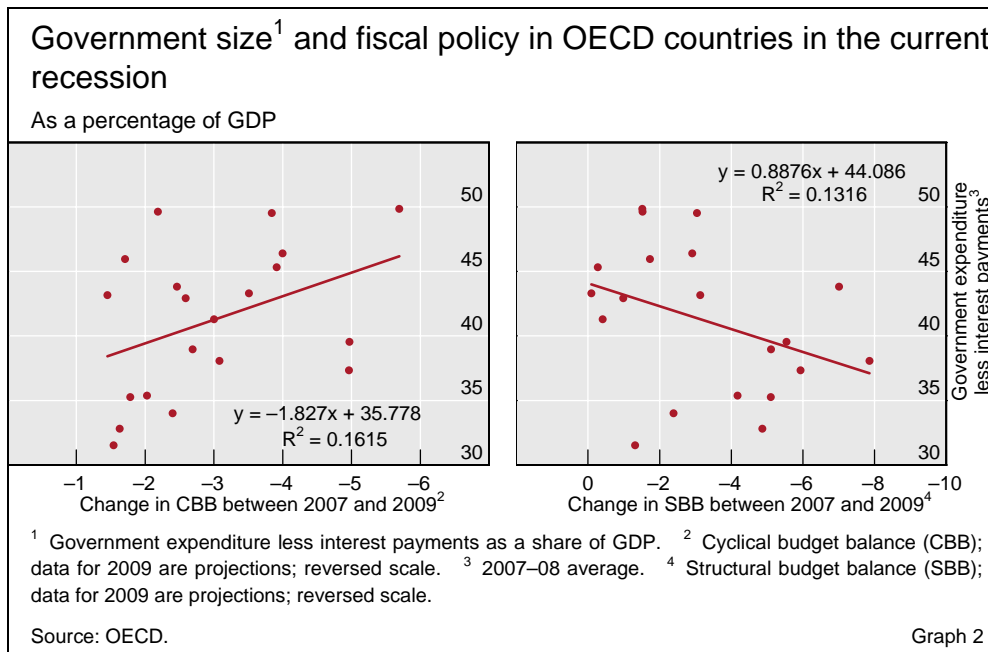
⁷ Their estimates suggest that automatic stabilisation of US aggregate demand is most significant through tax-induced consumption responses, which offset around 8% of the initial shock to US GDP. Cohen and Follette (2000) reach a similar conclusion for the United States.

(Graph 2, left-hand panel). At the same time, countries with smaller governments have sharply expanded their discretionary budget deficits in the current recession (Graph 2, right-hand panel). Hence, government size is unlikely to have constrained the ability of countries to implement a countercyclical fiscal policy.

Another way of looking at the same issue is to ask whether government size has had any impact on the severity of recessions. If government size indeed matters, recessions should have become less severe – in terms of both depth and duration – in countries with bigger governments. Measuring the severity of recession is, however, difficult without a universal definition for all countries, as business cycle dates are available only for the US economy.⁸

Low correlation of severity of recession and government size

Table 1 presents evidence on the severity of recessions for major OECD countries based on a common definition of a recession as a peak in output followed by at least two consecutive quarters of decline. Similarly, a trough is reached if followed by at least two consecutive quarters of growth.⁹ As a measure of the severity of recession, the third and fourth columns of Table 1 show the average peak-to-trough decline in output in all episodes of GDP contraction between 1960 and 1984 and those between the mid-1980s and the second quarter of 2009. The next two columns report the average number of quarters that elapsed between peaks and troughs over the two periods as a measure of the length of recession.



⁸ Going by the NBER recession dates, the average postwar US recessions up to the early 2000s lasted about 10 months compared with 18 months in the period 1919–45 and 22 months in the period 1854–1919. The current US recession has already lasted longer than any other postwar recession.

⁹ Wherever the mechanical application of the criterion gives an ambiguous answer as to when the peaks and troughs occur (eg when the sign of the growth rate switches from positive to negative and then to positive again), we made a subjective decision. The number of times we needed to do this was, however, relatively small and should have only limited effects on the reported statistics.

Government size ¹ and severity ² and duration ³ of recession						
Period average						
	Government size		Severity of recession		Duration of recession	
	1960–84	1985–2009 ⁴	Q1 1960–Q4 1984	Q1 1985–Q2 2009 ⁵	Q1 1960–Q4 1984	Q1 1985–Q2 2009 ⁵
Sweden	45.2	55.9	-2.5	-4.2	2.0	4.0
Denmark	46.5	50.3	-3.3	-1.9	3.3	3.1
Austria	43.6	49.5	-1.1	-1.6	2.3	3.0
France	42.8	49.4	-1.4	-2.3	2.5	4.0
Norway	38.5	45.6	-0.0	-0.8	2.0	2.5
Germany	40.4	43.8	-1.9	-1.9	3.0	3.0
Italy	33.5	42.4	-2.1	-2.0	2.8	3.6
New Zealand		40.1	-5.4	-2.3	2.9	3.7
United Kingdom	41.6	40.0	-3.2	-4.0	4.0	5.0
Spain	27.2	38.4	-0.6	-3.5	2.3	5.0
Canada	32.8	37.6	-2.6	-3.3	4.0	3.5
Australia	26.0	33.2	-1.8	-1.7	3.2	5.0
Japan	24.2	32.9		-3.7		3.8
Switzerland		32.9	-4.2	-1.0	3.5	2.9
United States	29.6	32.8	-2.2	-2.6	2.8	3.5

¹ Government expenditure less interest payments as a percentage of GDP. ² Severity is defined as the period change in real GDP during the recession, in per cent; recession is defined as at least two quarters of consecutive decline in real GDP. ³ Duration is defined as the number of quarters during the recession. ⁴ Data for 2009 are projections. ⁵ For the current recession, the trough is assumed to be the second quarter of 2009.

Sources: OECD; national data; BIS calculations. Table 1

Output recessions have become deeper and longer

The table illustrates several interesting aspects of modern recessions. First, with a few exceptions, the average loss of output in a typical recession has increased in many OECD countries since the mid-1980s. This implies that the decline in overall output volatility does not appear to have reduced the depth of boom and bust economic cycles in OECD countries. However, this finding is dominated in several countries by the latest recession.¹⁰ Second, recessions have also become considerably longer in the past quarter of a century, perhaps for similar reasons. Third, there does not seem to be an obvious relationship between government size and the severity of recessions. The average loss of output is smaller in some countries with larger governments (eg Denmark and Norway), but several countries with large governments have also suffered more severe recessions (eg Sweden).

Looking at the econometric evidence

As several variables in addition to government size are likely to influence output volatility or the severity of recessions, looking at simple correlations may be uninformative (and, at worst, misleading). Econometric studies therefore attempt to control for other influences on output volatility.

¹⁰ Namely, in 10 out of 15 countries the average loss of output is lower as from the mid-1980s than in the previous period once the latest recession is excluded from the sample.

Econometric evidence has thus far provided support for the existence of a negative relationship between measures of government size and output volatility. Among the prominent studies, Galí (1994) is the first to document a negative link using cross-sectional data for 22 OECD countries over the period 1960–90. The main characteristic of Galí’s study is that it assumes that the observed cross-country differences in expenditure and tax shares are mainly determined by differences in institutions, preferences and histories, which are taken to be mostly exogenous to output volatility. In addition, the study controls for the possibility that government size may be related to a more active use of discretionary fiscal policy. In this case, a negative relationship between output volatility and government size could simply reflect the more successful use of countercyclical policy rather than a larger government. Controlling for these various aspects of short-term policy variability (by including standard deviations of government size and their correlations with output), Galí (1994) finds support for the assumption that government size reduces output volatility.

Previous studies show a negative relationship between government size and output volatility

A subsequent study by Fatás and Mihov (2001), which employs a set of 20 OECD countries over the period 1960–97, also finds a negative relationship, but using different econometric specifications than Galí (1994). In particular, Fatás and Mihov (2001) address a criticism that could be levelled against the earlier analysis of Galí (1994), namely the absence from the analysis of some potentially important control variables such as measures of trade openness and exposure to external risk. These variables have been found to be associated with higher output volatility as well as government size (Rodrik (1998)). Unlike Galí (1994), however, Fatás and Mihov (2001) do not consider measures of short-term policy or fiscal variability. Furthermore, the empirical relationship uncovered in their study is non-linear and implies that an increase in government size from, say, 10% to 20% has a larger impact on output volatility than an increase from 40% to 50%.¹¹

In the remainder of this section, we revisit the empirical evidence regarding the stabilising impact of government size using the latest available data from OECD countries. Our main aim is to examine whether the significant relationship found in earlier studies still holds or, instead, has changed in more recent times. For this purpose, we carry out two types of empirical exercise. In the first exercise, we consider a number of panel regressions where we control for a number of factors that could be important determinants of both output volatility and government size. We employ a more recent dataset (1970–2008) than previous studies (which also partly covers the current recession).¹² We also exploit the time dimension of the data besides cross-country

This article re-examines the evidence in favour of this relationship ...

¹¹ Specifically, Fatás and Mihov (2001) regress measures of output volatility on the log of government expenditure (and tax share in GDP). The log transformation could be too extreme a way of capturing the non-linearity in the data. It is therefore possible that their study, while confirming a negative relationship, may give too much weight to relatively smaller-government countries at the expense of larger-government countries.

¹² Following changes in the statistical criteria with which OECD data are collected and compiled, the earlier date from which data are available on a consistent basis is 1970 and the number of countries is 20. This explains the difference between our study and the ones cited herein.

heterogeneity, which allows the inclusion of a greater number of observations and hence may lead to more precise estimates.

... and also the link between government size and the severity of recessions

In the second exercise, we run a number of cross-sectional regressions of the average severity of recession (as measured by the peak-to-trough output loss) on the measures of government size and other control variables.¹³ To the best of our knowledge, there is no study that focuses on the severity of recession specifically, even though policymakers and the public may be more interested in avoiding the consequences of recessions rather than avoiding the volatility of output outside recessionary episodes. To the extent that the former is the variable of interest, it is better to measure it directly rather than using measures of output volatility as proxies. Another related reason is that the severity of recession, unlike measures of output volatility, is not affected by measurement problems such as the choice of the detrending method.

Output volatility: panel data evidence

The regressions are estimated using two different measures of output volatility – namely, the standard deviation of: (i) the cyclical fluctuations of per capita GDP and (ii) the growth rates of per capita GDP.¹⁴ Government size is represented, alternatively, by the GDP share of taxes (both direct and indirect) or the GDP share of government expenditure (excluding interest payments). All the regressors, including the control variables, are five-year centred moving averages of the respective variables.¹⁵

The empirical study uses several control variables

We rely on three sets of control variables. The first includes the standard deviation of the tax or government expenditure shares to control for short-term policy variability. The second captures the potential influence of other variables, such as measures of trade openness, external risks (eg terms of trade) and the share of the primary sector in total production. These variables are usually found to be positively associated with both output variability and government size. So omitting them is likely to lead to significant biases. The third set controls for other potential determinants of output volatility, which may or may not be correlated with government size. Including them in the regression provides a test of the relative importance of government size vis-à-vis other possibly more important determinants and may reduce potential biases. The variables are: the average public debt/GDP ratio; the average CPI and its standard deviation; and the private credit/GDP ratio. The level of public debt, which should be positively correlated with government size, could a priori increase output volatility. This possibility may arise, for example, if the government has to engage in procyclical fiscal policy (eg raise taxes or cut back spending) in order to stabilise the debt level when output growth slows or

¹³ For the definitions of recession in output and severity of recession, see Table 1.

¹⁴ Unlike Galí (1994), who uses deviations from a linear trend, we estimate the cyclical component of per capita GDP using the band pass filter developed by Christiano and Fitzgerald (2003). For both measures of output volatility, we use five-year centred standard deviations.

¹⁵ Because we are using overlapping observations, we estimate standard errors that are robust to arbitrary serial correlation.

interest rates rise. The level of private credit is meant to capture the financial development and sophistication of a country. On the one hand, to the extent that agents are able to smooth their consumption through credit markets, financial depth may reduce the need for automatic stabilisers and hence substitute for government size. On the other hand, a higher level of private indebtedness may also indicate that the economy is more vulnerable or prone to boom-bust cycles and therefore more volatile, all else equal. Under this interpretation, the need for automatic stabilisers remains. Finally, both the mean and the volatility of inflation are a crude way to capture the effectiveness of monetary policy. To the extent that monetary policy is more effective in stabilising output, there could be less need for the stabilising effects of a large government.

We report panel estimation results for the expenditure share in Table 2 (results for the tax share are available on request). Table 2 shows results for the full sample along with the results for two subsamples: 1970–84 and 1985–2008. These two subsamples correspond roughly to the pre- and post-Great Moderation period in the US context, as confirmed by Graph 1.

From Table 2 it is difficult to establish whether government size has a consistent relationship with output volatility. There is some evidence that the government expenditure share is negatively related to per capita output volatility for the entire sample period (1970–2008). This relationship appears to

The government expenditure share is found to be negatively associated with output volatility ...

Panel regression – effects of government expenditure						
	Dependent variable: standard deviation of:					
	Cyclical component of per capita GDP (Christiano-Fitzgerald filter)			Growth rate of per capita GDP		
	1970–2008	1970–84	1985–2008	1970–08	1970–84	1985–2008
Average government expenditure share	–0.0146** (0.0064)	–0.0348** (0.0159)	–0.0033 (0.0062)	–0.0113* (0.0060)	–0.0263 (0.0170)	–0.0081 (0.0062)
Standard deviation of government share	0.1044*** (0.0301)	0.2132*** (0.0529)	0.0754 (0.0474)	0.2639*** (0.0615)	0.2024*** (0.0701)	0.2977*** (0.0743)
Average degree of openness	0.4643*** (0.1320)	0.1176 (0.5145)	0.4958*** (0.1686)	–0.0886 (0.1136)	0.0897 (0.5681)	–0.0443 (0.1290)
Average change in terms of trade	–0.0552* (0.0326)	–0.0305 (0.0397)	–0.0441 (0.0306)	–0.0592** (0.0260)	–0.0476 (0.0393)	–0.0560** (0.0241)
Average share of primary sector in GDP	–0.0242 (0.0256)	–0.0385 (0.0474)	–0.0059 (0.0383)	0.0195 (0.0291)	–0.0495 (0.0333)	0.0692 (0.0438)
Average public debt/GDP ratio	–0.0038* (0.0021)	–0.0012 (0.0043)	–0.0039 (0.0025)	0.0002 (0.0014)	–0.0023 (0.0046)	0.0014 (0.0017)
Average CPI inflation	0.0052 (0.0223)	–0.0052 (0.0448)	–0.0619* (0.0336)	0.0114 (0.0187)	0.0083 (0.0467)	0.0439* (0.0260)
Standard deviation of CPI inflation	0.1833*** (0.0465)	0.1376*** (0.0396)	0.1325** (0.0614)	0.2214*** (0.0533)	0.2129*** (0.0597)	0.1010 (0.0847)
Average private credit/GDP ratio	0.0044* (0.0024)	0.0014 (0.0057)	0.0052* (0.0027)	0.0011 (0.0015)	0.0020 (0.0051)	0.0024 (0.0015)
R ²	0.23	0.32	0.18	0.39	0.34	0.30

All regressions include a constant term. White period robust standard errors are between brackets. *, ** and *** indicate that a coefficient is statistically significant at the 10%, 5% and 1% level, respectively. Number of cross sections: 20. Number of periods: 35. Total panel (unbalanced) observations: 538.

Table 2

... but less so in recent years

be robust to alternative measures of output volatility (eg growth rate of per capita GDP). Yet, splitting the sample between two different periods reveals that the stabilising effect is largely confined to 1970–84 and to the cyclical measure of output volatility. Since the mid-1980s, the impact has not been statistically significant. When it is significant, the coefficient indicates that a 10 percentage point increase in the government share is associated with a reduction in cyclical output volatility of about 15 basis points (or 11%) in the period 1970–2008 and of about 35 basis points (or 21%) in the subsample 1970–84; and with a reduction in the volatility of the growth rate per capita of output of about 11 basis points (or 7%) in the period 1970–2008.¹⁶

Other variables are important

Some of the control variables turn out to have a statistically significant relationship with output volatility. In particular, the volatility of the expenditure share is statistically significant in all regressions with a positive coefficient, pointing to the possibility that discretionary fiscal policy on average increases output volatility (procyclical fiscal bias).¹⁷ Average trade openness and the average change in terms of trade, as expected, increase output volatility, although they do not appear to be statistically significant in all periods. Inflation volatility is found to be statistically significant and positive in most regressions. This result is consistent with the evidence that monetary policy has become more effective (at least until the start of the current recession) in several countries, as highlighted by the recent literature on the Great Moderation of inflation (see eg Cecchetti et al (2005)). Finally, both the level of public debt and that of private credit are found to be marginally statistically significant in regressions of cyclical output volatility (but not in regressions of growth rate volatility). However, contrary to our prior, the coefficient on public debt is negative, suggesting a stabilising effect, although it is relatively small. The positive coefficient on the average private credit/GDP ratio is consistent with the hypothesis that economies with a more leveraged private sector are more vulnerable to shocks and hence more volatile, all else equal.

No evidence of a negative link for the tax share

When the tax share is employed as a measure of government size, no consistent results are found across specifications and subsamples (the regressions' numbers are not reported but are available on request). We cannot rule out the hypothesis that the tax share has no empirical association with output volatility (regardless of how this is measured) during the period 1970–2008. In particular, the coefficient on the tax share is found to be negative and (weakly) statistically significant only during the subsample 1970–84 (when output volatility is measured by the standard deviation of the

¹⁶ These findings are in line with those of Viren (2005). Using a World Bank dataset that includes 208 countries, Viren (2005) finds that the relationship is either non-existent or weak.

¹⁷ Adding the correlation of government share with output as a control variable has only a modest effect on the estimates and does not change the overall conclusions from the analysis. The only notable difference is a slightly smaller coefficient (in absolute value) on the average government share in the cyclical output equation in the period 1970–84 (ie -0.0282).

cyclical component of output). And its impact is actually perverse in the second subperiod, 1985–2008 (regardless of how output volatility is measured).¹⁸

Severity of recessions: cross-sectional evidence

We next test whether greater government size is empirically associated with smaller output losses from peak to trough during recessionary episodes. The findings of the corresponding cross-sectional regressions of recession severity on government expenditure shares, along with a number of control variables, are reported in Table 3 (the results for the tax share are available on request).

A number of findings are evident from these tables. First, government size does not appear to reduce the depth of recessions. The expenditure share is found to be negative across specifications but it is not statistically significant.¹⁹ And there is no statistical evidence that the tax share is correlated with the depth of recession. Indeed, the standard errors on the tax share’s coefficient are very large across all regressions.

Second, some of the control variables turn out to be significant across all specifications. Specifically, the degree of trade openness is positively associated with the severity of the recession – the more open the country, the greater the output loss it suffers, on average. In addition, a country that experiences a larger deterioration in its terms of trade tends to suffer a larger output loss. Finally, the volatility of the inflation rate is positively associated with output losses, pointing to a potential role for successful monetary policy.

No clear evidence that the severity of recessions is negatively related to government size ...

... but strong link with trade openness, exposures to terms-of-trade shocks and inflation volatility

Cross-sectional regression, 1970–2009 (OLS)							
Severity	Government expenditure	Standard deviation of government expenditure	Trade openness	Change in terms of trade	Standard deviation of inflation	Private credit to GDP	R ²
(1)	-0.075 (0.063)		3.86 (1.367)**	-1.253 (0.546)**	0.552 (0.222)**		0.54
(2)	-0.063 (0.061)	-0.522 (0.340)	3.436 (1.339)**	-1.075 (0.535)*	0.752 (0.250)***		0.60
(3)	-0.078 (0.067)		3.84 (1.42)**	-1.251 (0.565)**	0.538 (0.255)*	-0.003 (0.0200)	0.54
(4)	-0.066 (0.065)	-0.522 (0.353)	3.417 (1.395)**	-1.073 (0.555)*	0.738 (0.279)**	-0.003 (0.019)	0.60

*, ** and *** denote significance at the 10%, 5% and 1% level, respectively. Standard errors are reported in brackets. GDP losses are averages of quarterly observations up to Q2 2009. Other variables are averages of annual observations up to 2008. Whenever a variable’s observations are not available for the entire sample period, we take averages over a shorter period.

Source: Authors’ calculations. Table 3

¹⁸ A higher tax share may have contributed to increasing output volatility rather than reducing it. A possible interpretation is that the negative supply side effects of tax shares were perhaps more important than their stabilising effect on demand.

¹⁹ Were the coefficients statistically significant, they would indicate that the magnitude of the empirical link is somewhat larger than found in the panel regressions of Table 2. Indeed, a 10 percentage point increase in the government expenditure share would be associated with a reduction of average output losses of 63–78 basis points (or about 20–25% of the cross-sectional average over the full sample).

Broadly speaking, these findings confirm those obtained in the panel regressions. The empirical association between government size and output volatility or the severity of recession appears absent or relatively small in magnitude.

Conclusion

This article has examined the potential role of government size in explaining cross-country differences in the observed output losses in the context of the latest recession. Although it might seem, from simple correlations, that government size may have played a role in mitigating the loss of output, the empirical analysis based on the historical record does not find evidence of a strong link with output volatility. The results for the period 1970–2008 indicate that a 10 percentage point increase in the GDP share of government expenditure is associated with a reduction in (average) output volatility of 7–11% depending on the measure of output volatility. Such a relationship is found to be stronger in the period 1970–84 and weaker and statistically insignificant after 1985. Furthermore, there is no clear evidence that the severity of recessions is negatively associated with government size, although further investigation to account for possible endogeneity and non-linearities could shed more light on the relationship.

Factors other than government size might have been more important. In controlling for the effects of several variables that could influence both government size and output volatility, we find that the role of external risks (eg the decrease of openness and terms-of-trade changes) and inflation volatility has been particularly important. A similar conclusion arises from the analysis of the average loss of output experienced during recessions. In the latest recession, such factors are also likely to have played a major role, consistently with the historical experience, given the large and sharp drop in international trade experienced worldwide. The strong coefficient on inflation volatility suggests that on average during the period, to the extent that monetary policy has succeeded in stabilising inflation, it has also played a key role in explaining differences in output volatility both between countries and over time.

The evidence of a weak link between government size and output volatility suggests at least two possibilities. The first is that the measures of government size that we used have become less and less valid as proxies for the stabilising properties of the government sector. For example, this could be the case if the composition of the public budget varies across countries and over time in a way that does not increase the size of the government but only its effectiveness in stabilising output. Governments may have become more aware that simply increasing the tax and expenditure shares has costs in terms of efficiency and potential output even when it achieves a given reduction in output volatility. Another possibility is that the improvement in the stabilising properties of monetary policy has to some extent reduced the need for larger government (at least until the start of the latest recession).

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