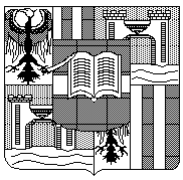

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by

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Government Size and International Consumption Risk Sharing

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Abstract

We investigate the influence of government size on the exposure of consumption growth to country-specific fluctuations in output growth using a sample of OECD countries. To the extent that governments are less constrained on international financial markets, it appears conceivable that governments diversify risks internationally on behalf of agents. Our results indicate that the extent of international risk sharing is unrelated to the size of the public sector.

Keywords: Government Size, International Risk Sharing

JEL codes: F30, H00

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1 Introduction

In this paper, we explore the role of the government for the international allocation of consumption risk. In principle, financial markets allow to diversify risks across countries by holding diversified portfolios. However, agents may not be able to participate on international financial markets directly due to transaction costs and borrowing constraints. Leibrecht and Scharler (2009) find that consumption growth adjusts faster after negative shocks, which they interpret as evidence in favor of borrowing constraints. Arreaza et al. (1998) point out that the government typically has better access to international financial markets. Consequently, the government may diversify risk internationally on behalf of agents who participate only to a limited extent on international financial markets. Put differently, fiscal policy may help to ease borrowing constraints.

More specifically, the government expenditure and tax system may allow to smooth fluctuations in country-specific output intranationally by shifting risk from the private sector to the government. The government, in turn, may reallocate risk internationally via borrowing and lending on financial markets. Thus, despite the fact that the government expenditure and tax system is primarily intended to help sharing risks intranationally or to smooth the impact of shocks over time, it may also help to reallocate consumption risk internationally.

It appears conceivable that this type of intermediary behavior is related to the size of the government. In countries with bigger government influence the role of fiscal policy for intranational risk sharing and consequently also the international diversification of risk might be more pronounced. The purpose of this note is to evaluate this hypothesis empirically.

We find that government size plays no significant role for the international diversification of consumption risk. A larger government does not reduce the exposure to fluctuations in country-specific output growth. Thus, we may conclude that although the government is likely to have a readier access to international financial markets, this easier access is not mirrored in the allocation of consumption risk across countries.

2 Empirical Strategy and Data

We apply the methodology introduced by Asdrubali et al. (1996) which is based on the benchmark of complete markets. Since complete markets allow to fully insure against country-specific risks, the growth rate of consumption has to equal the world average for any country i: $\Delta \log c_{it} = \Delta \log c_t$, where c_{it} is real per capita consumption in country i, c_t is a population weighted average across countries, and Δ is the difference operator. If full insurance cannot be achieved, then consumption growth deviates from average growth and may depend on idiosyncratic variables, such as idiosyncratic income growth, $\tilde{y}_{it} = \Delta \log y_{it} - \Delta \log y_t$, where y_{it} is per capita output in country i and y_t is average per capita output across countries. In this case we obtain: $\tilde{c}_{it} = \beta \tilde{y}_{it}$ with $\tilde{c}_{it} = \Delta \log c_{it} - \Delta \log c_t$. Asdrubali et al. (1996) show that β can be interpreted as the exposure to idiosyncratic risk, that is, β measures the fraction of idiosyncratic shocks which are not shared internationally. They run a panel regression of idiosyncratic consumption growth on idiosyncratic output growth to quantify the extent of risk sharing:

$$\tilde{c}_{it} = \zeta_i + \beta \tilde{y}_{it} + \epsilon_{it}, \tag{1}$$

where ζ_i denote country-fixed effects and ϵ_{it} is the remainder error term.

To explore the effect of government size we follow Sørensen et al. (2007) and allow β in (1) to depend on proxies for the size of the government which we denote by S_{it}: $\beta = \beta_0 + \beta_S S_{it} + \beta_A A_{it}$, where A_{it} denotes a proxy for a country's foreign asset and liability position. We control for the foreign asset and liability position since several authors find that countries with large values of A_{it} are less exposed to country-specific shocks (see e.g. Leibrecht and Scharler, 2008).

Since the public sector may only be able to smooth shocks when fiscal policy is anticyclical (see e.g. Arreaza et al., 1998), we split our sample into countries characterized by anti- and procyclical fiscal policies. To separate anti- and procyclical countries we follow Lane (2003) and regress, for each country separately, the growth rate of either real government expenditures or real tax revenues on the growth rate of real GDP, a constant, and lags of the dependent variable to allow for inertia in fiscal policy. The series are deflated using the GDP-Deflator with base year 2000 taken from the OECD's Economic

Outlook database.

In case of public expenditures we classify countries as anticyclical if the regression coefficient on real output growth is negative. In case of tax revenues we classify a country as pertaining to the anticyclical group if the regression coefficient on real output growth is greater than unity (see e.g. Lane, 2003).

We estimate (1) with annual data ranging from 1970 to 2004 for 21 OECD countries.[1] Consumption and output series are obtained from the Penn World Table, release 6.2 by Heston et al. (2006). We use real per capita consumption and real per capita GDP measured in constant (2000) international prices as proxies for c_{it} and y_{it}. World aggregates are calculated as weighted averages: $y_t = \sum_{i=1\neq j}^{21} w_{it} y_{it}$ and $c_t = \sum_{i=1\neq j}^{21} w_{it} c_{it}$, with $w_{it} = pop_{it} / \sum_{i=1\neq j}^{21} pop_{it}$, where pop_{it} denotes population.

We apply four proxy variables for government size: Total disbursement minus interest payments, G_{it}, current disbursement less interest payments, CG_{it}, total tax revenues including social security contributions, TT_{it} and revenues from direct taxes, DT_{it}. Expenditure series are adjusted for interest payments as these payments are not available to governments for undertaking compensating fiscal policy. CG_{it} and DT_{it} are used in addition to G_{it} and TT_{it} as they capture more narrowly the most important expenditure- and tax-related automatic stabilizer, namely public transfers and subsidies and the personal income tax (Lane, 2003).

All fiscal variables are for the general government and are expressed as a percentage of GDP when used to put structure on β but are used in levels and denominated in national currencies when their cyclical property is isolated. Fiscal variables are obtained from the OECD Economic Outlook and Revenue Statistics databases. The foreign asset and liability position, A_{it}, is defined as international assets plus international liabilities over GDP. Data is taken from Lane and Milesi-Ferretti (2006).

A_{it} and the proxies for government size are log-transformed to reduce the influence of outliers. Moreover, we subtract the means from these variables which allows for a ready interpretation of the coefficients on the interaction of these variables with $\tilde{y}_{it}$. Throughout

[1] We include Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, the UK and the US.

the paper we use a Newey-West-HAC-robust Variance-Covariance matrix of the remainder error term ϵ_{it}. We choose a lag of 3 which roughly corresponds to $T^{1/3}$. Table 1 shows descriptive statistics for the main variables used in the analysis.

3 Estimation Results

Table 2 reports the results when we measure government size by public spending. Columns (1) and (2) show the estimated coefficients for the full sample when we proxy government size either by G_{it} or by CG_{it}. In the remaining columns we split our sample into countries with anticyclical fiscal policy in Columns (3) and (4) and procyclical fiscal policies in Columns (5) and (6).[2]

We find that regardless of the proxy for government size and the cyclicality of fiscal policy, the average exposure of consumption growth to country-specific output growth is rather pronounced. It ranges between 65 and about 80 percent. This result is in line with the literature (see e.g. Leibrecht and Scharler, 2008). What we are ultimately interested in is the effect of government size on this exposure. From Columns (1) and (2) we see that the interaction terms with G_{it} and CG_{it} enter with a positive coefficient, albeit insignificantely at the 10 percent significance level. Government size does not appear to reduce the exposure to country-specific risk.

Since these results might be due to procyclical fiscal policy, we now consider countries with anti- and procyclical fiscal policy separately. Turning first to the sub-sample of anticyclical countries, Columns (3) and (4) show that the coefficients of the interaction terms with G_{it} and CG_{it} remain positive and insignificant at the 10 percent significance level. According to (5) and (6) we obtain similar results for the procyclical countries. Thus, when operationalized via public expenditures a larger government size does not appear to reduce the exposure to country-specific risks, neither in countries with anticyclical nor in countries with procyclical fiscal policies.

Table 2 also signals that, in contrast to government size, the foreign asset and liability position tends to reduce the exposure to country-specific shocks as indicated by the

[2]The isolated cyclical properties are in line with the findings of Lane (2003). Specifically, in case of G_{it} Austria, Ireland, Japan, Luxembourg, New Zealand, Norway, Portugal, Spain and Switzerland are countries with procyclical fiscal policy. In case of CG_{it} the group of procyclical countries contains Germany, Ireland, Luxembourg, the Netherlands, New Zealand, Norway, Portugal and Spain.

negative sign of the interaction term, $\tilde{y}_{it} * A_{it}$. Although this effect is not significant in countries with anticyclical fiscal policy, our results suggest that cross-border holdings of financial assets increase the international sharing of risks.

Next, we turn to proxies for government size based on tax revenues. Table 3 shows our estimation results when we proxy government size either by total tax revenues including social security contributions, TT_{it}, or by revenues from direct taxes, DT_{it}, as share of GDP. We see from Columns (1) and (2) that neither higher values of TT_{it} nor of DT_{it} appear to reduce the exposure to country-specific output fluctuations. The interaction terms of $\tilde{y}_{it}$ with TD_{it} and DT_{it} are both insignificant. The remaining Columns split the countries by anti- and procyclical fiscal policy.[3] The coefficients on the interaction terms are again not statistically significant at the 10 percent significance level.

4 Conclusions

In this paper we empirically investigate the effect of government size on the extent to which countries are exposed to idiosyncratic fluctuations in country-specific output growth. Since direct financial market participation may be limited, the government may take advantage of its readier access to international financial markets and diversify risks internationally on behalf of agents. As the role of fiscal policy may be more relevant in countries with large public sectors, we relate the exposure to risk to government size. Overall, however, we find no evidence in favor of this hypothesis. According to our estimates, the exposure to country-specific shocks does not appear to depend on government size.

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[3] In case of TT_{it} the group of procyclical countries contains Austria, Belgium, Canada, Finland, France, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Switzerland and the UK. In case of TD_{it} Austria, Belgium, Canada, Ireland, Italy, Luxembourg, Switzerland and the UK are included.

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Table 1: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max
$\tilde{c}_{it}$	overall	-0.003	0.020	-0.091	0.084
	between		0.005	-0.013	0.005
	within		0.020	-0.099	0.079
$\tilde{y}_{it}$	overall	0.000	0.021	-0.091	0.072
	between		0.006	-0.012	0.017
	within		0.020	-0.091	0.061
G_{it}	overall	40.998	7.961	19.871	66.238
	between		6.659	30.166	54.620
	within		4.302	26.329	56.578
CG_{it}	overall	38.176	8.343	16.123	62.184
	between		7.092	24.883	52.152
	within		4.287	23.073	53.923
TT_{it}	overall	35.089	7.645	15.921	52.191
	between		6.764	25.683	47.114
	within		3.686	23.135	43.572
DT_{it}	overall	16.196	5.308	4.252	32.080
	between		5.008	7.307	28.711
	within		2.033	9.203	21.466
A_{it}	overall	320.187	1537.903	18.69708	20643.72
	between		3872.428	68.99938	17927.8
	within		260.507	-2850.903	3036.11

Table 2: Spending and International Risk Sharing

	Full Sample				Anticyclical				Procyclical			
	(1)		(2)		(3)		(4)		(5)		(6)	
$\tilde{y}_{it}$	0.688	***	0.697	***	0.681	***	0.649	***	0.746	***	0.789	***
	(0.035)		(0.035)		(0.048)		(0.044)		(0.057)		(0.059)	
$\tilde{y}_{it} * G_{it}$	0.218				0.198				0.358			
	(0.140)				(0.188)				(0.227)			
$\tilde{y}_{it} * CG_{it}$			0.151				0.205				0.192	
			(0.120)				(0.138)				(0.207)	
$\tilde{y}_{it} * A_{it}$	-0.093	***	-0.089	**	0.020		-0.070		-0.175	***	-0.152	***
	(0.034)		(0.035)		(0.065)		(0.060)		(0.035)		(0.040)	
G_{it}	-0.019	***			-0.018	**			-0.021	*		
	(0.007)				(0.007)				(0.012)			
CG_{it}			-0.015	**			-0.021	***			-0.004	
			(0.007)				(0.007)				(0.012)	
A_{it}	0.001		0.001		0.000		0.000		0.003		0.003	
	(0.001)		(0.001)		(0.001)		(0.001)		(0.002)		(0.002)	
Obs	625		625		388		423		237		202	

Notes: The endogenous variable is $\Delta\widetilde{c}_{it}$; All specifications include country-fixed effects; Newey-West-HAC-robust standard errors based on a lag-length of 3 are shown in parenthesis; *** / ** / * = significant at 1 / 5 / 10 percent significance level.

Table 3: Taxes and International Risk Sharing

	Full Sample				Anticyclical				Procyclical			
	(1)		(2)		(3)		(4)		(5)		(6)	
$\tilde{y}_{it}$	0.711	***	0.708	***	0.769	***	0.757	***	0.670	***	0.650	***
	(0.032)		(0.031)		(0.045)		(0.034)		(0.043)		(0.060)	
$\tilde{y}_{it} * TT_{it}$	0.076				0.171				-0.026			
	(0.121)				(0.179)				(0.163)			
$\tilde{y}_{it} * DT_{it}$			-0.073				-0.115				0.080	
			(0.071)				(0.077)				(0.198)	
$\tilde{y}_{it} * A_{it}$	-0.081	**	-0.072	**	-0.068		0.009		-0.066		-0.096*	
	(0.035)		(0.035)		(0.072)		(0.057)		(0.044)		(0.055)	
TT_{it}	-0.000				0.002				-0.003			
	(0.008)				(0.008)				(0.013)			
DT_{it}			0.007				0.012	**			-0.003	
			(0.005)				(0.006)				(0.006)	
A_{it}	-0.000		-0.001		0.002		-0.000		-0.002		-0.002	
	(0.001)		(0.001)		(0.002)		(0.001)		(0.002)		(0.002)	
Obs	664		664		286		421		378		243	

Notes: The endogenous variable is $\Delta\widetilde{c}_{it}$; All specifications include country-fixed effects; Newey-West-HAC-robust standard errors based on a lag-length of 3 are shown in parenthesis; *** / ** / * = significant at 1 / 5 / 10 percent significance level.