Do more open economies have bigger governments? Another look

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Abstract

We reconsider the evidence of a positive relationship between openness and the size of government recently established by Rodrik [Rodrik, D., 1998. Why do more open economies have bigger governments? Journal of Political Economy 106, 997–1032] and others. While the existing literature focuses on expenditure based measures of government, we consider non-budgetary measures such as government ownership of enterprises, price controls, asset expropriation. Each of these may have little impact on government expenditures, yet can make the role of government sizable. We demonstrate that the scope of government is much larger in less open economies when considering non-budgetary measures. Additionally, we show that higher levels of non-budgetary government are positively correlated with trade barriers. Finally, we provide further evidence on the hypothesis that larger governments provide social insurance in open economies subject to terms of trade shocks. Although we find that greater terms of trade risk is weakly associated with larger government in all forms, these interventions include price controls and greater risk of asset expropriation which are hard to reconcile with a pure insurance motive.
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1. Introduction

The relationship between the size of government and openness to trade has been examined extensively in the recent literature. Conventional wisdom suggests that smaller governments will be associated with more openness since both indicate less intervention in the economy. In addition, open economies may have smaller governments as intervention is either less effective in more open economies or interventionist policies reduce competitiveness on global markets. However, government size could increase in response to greater openness. Larger governments may occur in more open economies to compensate those groups which lose from trade.[1]

Empirically, the existence of a strong, positive correlation between openness and the size of government among the OECD countries has been established in the literature for some time.[2] More recently, a series of papers by Rodrik (1997a,b, 1998) demonstrates that this correlation exists for a broad sample including both developed and developing countries. These papers have generated renewed interest in the literature as authors have sought explanations for the correlation.[3] In the present paper, we pursue a different route and investigate whether or not the correlation between openness and the size of government is robust to the *measure* of government.

Although there are a variety of ways in which the size of government is measured in the literature, they are almost exclusively expenditure based. However, the influence of government in an economy goes beyond its spending and tax collections. State ownership of enterprises, price controls, mandates, and restrictions on competition are examples of government intervention that can have profound effects on an economy yet have little impact on the government budget. Thus, government may be "large" with a relatively small expenditure.[4] In fact, our prior expectations are that non-budgetary aspects of government are very important in understanding the link between government size and openness because, in a broad sample of countries, differences in institutions and the relative size of the budgetary and non-budgetary components of government are likely to be significant.

In the current paper, we examine the relationship between openness and both budgetary and non-budgetary measures of the size of government. Our results indicate that focus on strictly budgetary measures of government misses much of the picture regarding the relationship between the scope of government and openness. We demonstrate that, in many respects, the scope of government is much larger is less open economies. In addition, we show that much of the association between the various forms of government and openness is explained by per capita GDP. Lower income economies tend to have more non-budgetary intervention and more closed economies while high income countries are more open and have greater government expenditure. As a corollary, we demonstrate that higher levels of non-budgetary government, in all forms, are positively correlated with

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[1] Garrett (2001) classifies these competing explanations as the "efficiency" or "compensation" hypotheses.

[2] Cameron (1978) provides an early analysis of this relationship.

[3] Notably, Rodrik (1998), Alesina and Wacziarg (1998), Garrett (2001), and Iversen (2001).

[4] Hillman (2003, p. 604) makes a clear statement of the importance of non-budgetary aspects of government. Also, see Peacock and Scott (2000) and Saunders and Klau (1985).

trade barriers, providing evidence of the link between types of government and degree of openness.

The motives of government may be important in understanding the association between government size and openness. Indeed, Rodrik (1998) presents evidence to support the hypothesis that larger governments provide social insurance in more open economies facing higher terms of trade risk. As Hillman (2003) indicates, this can arise with a government benevolently maximizing a social welfare function that encompasses risk aversion.[5] If openness is associated with greater risk, we expect greater openness to be related to greater ex post public expenditures to provide greater ex ante social insurance.

However, in contrast to this idea, another of our principal findings in this paper is that less openness and higher terms of trade risk are related to non-budgetary forms of government such as greater use of price controls, asset expropriation, and contract repudiation. This is hard to reconcile with an insurance motive. It is more consistent with politically motivated government use of trade barriers and other non-budgetary policies to cater to special interests.[6] It is possible that governments simultaneously provide benevolent social insurance and also pursue political objectives to favor special interests with non-budgetary policies. Indeed, Milanovic (2000) finds evidence of this where median voters in wealthy countries redistribute income to poorer households through budgetary transfers while non-budgetary policies favor special interests.

The remainder of the paper is organized as follows. After describing the data in Section 2, in Section 3 we present our empirical analysis. We begin by examining some basic correlations between openness and various measures of government to gain a sense of the plausibility of our priors that non-budgetary aspects of government vary in much different ways that budgetary aspects. We show that in fact, the relationship of openness to government varies depending on the measure of government. We present evidence that less open economies are highly interventionist and their governments "large" as measured by non-budgetary forms of government. Using expenditure measures of government, generally we find a positive association between government and openness. In examining the influence of income, we show that controlling for per capita GDP explains a large proportion of both the positive association of openness to expenditure based measures of government and its negative association with the non-budgetary measures. We find very similar results for another form of government-trade barriers. Trade barriers are negatively related to government expenditure and GDP per capita, but positively related to a range of non-budgetary measures of government. These findings dovetail with our other results: trade barriers are an aspect of government intervention that occur together with other forms of intervention, a less open economy, less government expenditure, and lower GDP per capita.

In Section 4, we examine the relationship between the various measures of the size of government, openness, and the risk of terms of trade shocks. As argued in Rodrik (1998), if larger governments provide social insurance against terms of trade risk, one expects greater government in countries with both greater openness and greater terms of trade risk.

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[5] See Hillman (2003, Chapter 5, Section 1).
[6] See Hillman's (2003, Chapter 6) discussion of this.

We do find some evidence of this effect with government consumption, consistent with Rodrik (1998). However, in our analysis, we find little evidence of this effect with government expenditures. Additionally, aspects of government involvement such as government ownership, government expropriation of assets, government repudiation of contracts, and trade barriers are associated with greater terms of trade risk. While it is possible that some of these government activities could be used to provide insurance against terms of trade risk, it would seem that they have major distortionary effects and serve special interests.

Section 5 concludes the paper. Our findings imply that understanding the relationship between government and openness is complex. One needs to understand the positive relationship between openness and government expenditure and the negative association of openness and other forms of government. A clear conclusion of our paper is that focus on budgetary measures of government misses much of the picture regarding the role of government and its relationship to international trade. Any explanation of the association of government and openness should include non-budgetary aspects of government; otherwise it will be seriously incomplete.

2. The data

Table 1 provides descriptions and summary statistics for the variables used in our analysis. All data is for 1990 and is drawn from a variety of sources.[7] For our central variable of interest, the size of government, we employ two classes of measures for the size of government in our analysis: budgetary and non-budgetary. For the budgetary measures, we use both central government expenditures (GEXP) and consumption (GCONS) expressed as a percent of GDP.[8] The data on government consumption is the primary variable of analysis in Rodrik (1998) and is used more frequently in the literature.[9] It is available for a wide range of countries from the Penn World Tables 5.6 which uses specific government price deflators to express the data in *real* terms.[10] Although expressed in nominal terms, the data on central government expenditures includes transfers and public investment. If larger governments are a means of compensating those sectors harmed by trade, the inclusion of transfers is particularly important as they are likely to be the most efficient means of achieving such compensation.

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[7] In the current paper, we use exclusively cross-sectional analysis. Using a panel data set, Garrett (2001) also casts doubt on the existence of positive link between the size of government and openness demonstrating that changes in openness are not predictive in explaining changes in the size of government.

[8] Government consumption is defined as the sum of compensation of government employees, consumption of government fixed capital, and intermediate goods and services purchased less sales to other sectors and own-account investment.

[9] Rodrik (1998) also employs government expenditure and various sub-categories of both expenditure and consumption. Rodrik (1997b) uses the share of government employment which is also expenditure based in that it is tied to the wage component of government consumption.

[10] In his investigation of Wagner's Law, Ram (1987) provides a thorough discussion of the importance of this issue in cross-section analysis.

Table 1
Variable descriptions and statistics

Variable	Definition	Mean	(S.D.)	N	Source
GEXP	Government expenditure as a percent of GDP.	24.12	(11.8)	96	(1)
GCONS	Government consumption as a percent of GDP.	18.63	(7.9)	96	(2)
GOWN	Government ownership rating.	6.37	(2.9)	96	(3)
PRICE	Extent of price controls rating.	6.79	(2.8)	89	(3)
EXPROP	Risk of expropriation of property rating.	3.78	(2.8)	89	(3)
REPUD	Risk of contract repudiation rating.	4.21	(2.7)	89	(3)
OPEN	Sum of imports and exports as a percent of GDP.	67.48	(46.2)	96	(2)
OECD	Dummy for OECD countries.	0.25	(–)	96	
ASIAE	Dummy for East Asian countries.	0.08	(–)	96	(4)
LAAM	Dummy for Latin American countries.	0.23	(–)	96	(4)
SSA	Dummy for Sub-Saharan African countries.	0.25	(–)	96	(4)
SOC	Dummy for Socialist countries.	0.08	(–)	92	(5)
DEPEND	Ratio of dependents to working age population.	0.71	(0.19)	92	(6)
URBAN	Percent of population living in urban areas.	54.73	(22.5)	92	(6)
PCI	Per Capita GDP.	6526.1	(6220.8)	96	(2)
TRDTX	Total trade taxes as a percent of imports plus exports.	4.71	(4.2)	85	(3)
BMER	Ratio of a currency's official exchange rate relative to its black market exchange rate.	44.15	(241.0)	85	(3)
RESTRICT	Rating of restrictions on foreign capital transactions.	6.75	(3.5)	85	(3)
NATOPEN	Measure of natural openness.	89.59	(34.0)	74	(7)
TOTRISK	Standard deviation of the log changes in country's terms of trade 1971–1990.	0.129	(0.07)	74	(8)

All variables are for 1990.
Sources: (1) World Bank Web Site and CIA Factbook. (2) Penn World Table. (3) Gwartney et al. (2000). Table A.1 provides description for ratings variables. (4) Barro and Lee (1994). (5) Sachs and Warner (1995). (6) World Bank, *World Tables*, various years. (7) The predicted value of openness from the openness regression with the value of the trade barrier variables set to zero. (8) Terms of Trade data from (6) and *Handbook of International Trade and Development Statistics*, UNCTAD, various years.

Data on the non-budgetary aspects of government is more difficult. Conceptually, the tax and expenditure equivalents of the non-budgetary government programs and interventions could be calculated and added to the budgetary programs to obtain a measure of the overall size of government. However, finding the tax and expenditure equivalents of these programs is problematic as detailed knowledge of each program and demand and supply elasticities in multiple markets would be required. Additionally, for data which is available, coverage is in general quite limited and not available for the broad sample of countries we wish to examine.

Our approach here is to utilize existing data on the importance of various types of non-budgetary government intervention taken from Gwartney et al. (2000). This data has the advantage of being quite recent and it is available for a wide range of countries. However, several of measures are categorical ratings which rank the extent of government involvement and we note where appropriate any resulting difficulties in interpretation. Using the 1990 data, we focus on four of the non-budgetary items: the importance of government ownership of enterprises in the economy (GOWN), the extent of price

Table 1(a)
Non-budgetary measures of government, 1990[a]

Description	Rating
Government ownership (GOWN)	
There are very few State Operated Enterprises (SOEs) and government investment is generally less that 15% of total investment.	0
There are very few SOEs other than those involved in industries such as power generation, where economies of scale may reduce the effectiveness of competition. Government investment is generally between 15% and 20% of total investment.	2
There are very few SOEs other than those involved in industries such as power generation, where economies of scale may reduce the effectiveness of competition. Government investment is generally between 20% and 25% of total investment.	3
SOEs are often present in power generation, transportation, communications, but private enterprises dominate other sectors of the economy. Government investment is generally between 25% and 30% of total investment.	4
There are a substantial number of SOEs in many sectors of the economy, including the manufacturing sector. Most of the large enterprises of the economy are operated by the government. Government investment is generally between 30% and 40% of total investment.	6
Numerous SOEs of all sizes are present and they operate in many sectors of the economy, including manufacturing and retail sales. Government investment is generally between 40% and 50% of total investment.	8
The economy is dominated by SOEs. Government investment is generally greater than 50% of total investment.	10
Extent of price controls (PRICE)	
No price controls or marketing boards are present.	0
Except in industries where economies of scale may reduce the effectiveness of competition, prices are generally determined by market forces.	2
Price controls are often applied in energy markets; marketing boards often influence prices of agricultural products; controls are also present in a few other areas, but most prices are determined by market forces.	4
Price controls are levied on energy, agriculture, and many staple products that are widely purchased by households; but most other prices are set by market forces.	6
Price controls apply to a significant number of products in both agricultural and manufacturing industries.	8
There is widespread use of price controls throughout the economy.	10

Description	Range
Risk of expropriation (EXPROP)	
Higher ranking indicates greater risk of expropriation.	1–10
Risk of contract repudiation (REPUD)	
Higher ranking indicates greater risk of contract repudiation.	1–10

Description	Rating
Rating of restrictions on foreign capital transactions (RESTRICT)	
Foreigners are free to undertake domestic direct and financial investments and nationals are free to undertake direct and financial investments abroad.	0
With the exception of a few industries and/or minor administrative procedures, foreigners are free to undertake direct and financial domestic investments and nationals are free to undertake direct and financial investments abroad.	2

Table 1(a) (*continued*)

Description	Rating
Rating of restrictions on foreign capital transactions (RESTRICT)	
Both domestic investments by foreigners and investments by nationals abroad are authorized, but there are regulatory restrictions that retard the mobility of capital.	5
Either (but not both) (a) foreigners are prohibited from undertaking domestic investments or (b) nationals are prohibited from undertaking investments abroad with the approval of governmental authorities.	8
Regulations substantially reduce the freedom of both foreigners to undertake domestic investments and of nationals to undertake investments abroad. Generally, neither is allowed with the approval of government officials.	10

[a] Source: Gwartney et al. (2000). Our rankings are ten minus the Gwartney and Lawson rankings to make larger values correspond to greater government activity.

controls (PRICE), the risk of expropriation by the government (EXPROP), and the risk of contract repudiation by the government (REPUD).[11] Each is an ordinal rating of the extent of government activities scaled so that higher values indicate greater government involvement. The construction of these ratings is described in Table 1(a).

Finally, we use the standard measure for openness (OPEN), the sum of imports and exports as a fraction of GDP. Table 1 also lists the various controls used in the more detailed analysis. Our basic data set consists of 96 countries included in the Gwartney et al. (2000) data for which the majority of the non-budgetary measures were available. A smaller sample size is used for some analyses depending on missing observations for the other variables analyzed.

3. Empirical analysis

3.1. Basic correlations

We begin with an examination of the simple correlations between openness and the various measures of the size of government: government expenditure, government consumption, and the extent of government ownership. Table 2(a) provides the relationships among the OECD countries. Among these countries, government expenditure has a strong, positive, and statistically significant correlation with openness, consistent with long standing empirical observations. However, while a positive correlation exists among all the measures of government, government consumption, and government ownership are negatively related to openness, although the statistical significance is weak.

Table 2(b) shows the correlations for the entire sample of countries for which data on these four variables are available. Again, government expenditure is positively related to openness, although the magnitude and significance are smaller than for the OECD sample. Government consumption and government ownership continue to be negatively correlated

[11] Only the net transfers from state-owned enterprises will appear as a portion of government expenditures.

Table 2
Correlations: government and openness[a]

	GEXP	GCONS	GOWN
(a) OECD countries (N= 24)			
GCONS	.2794 (.1862)	1.000	–
GOWN	.3710 (.0743)	.2271 (.2859)	1.000
OPEN	.4057 (.0492)	−.1612 (.4518)	−.2178 (.3066)
(b) Entire sample of countries (N= 96)			
GCONS	−.0863 (.4029)	1.000	–
GOWN	−.1270 (.2175)	.4710 (.0000)	1.000
OPEN	.1632 (.1118)	−.1339 (.1933)	−.1695 (.0987)

[a] Levels of significance of correlations in parentheses.

with openness and the relationship is statistically stronger than for the smaller sample. Unlike the OECD sample, government expenditure is negatively related to both government consumption and government ownership, although levels of significance are low.

Table 3 presents the correlation matrix with all the non-budgetary measures of government with a slightly reduced sample size due to missing values. The findings are quite striking. All of the non-budgetary measures of government–government ownership, price controls, risk of expropriation, and risk of contract repudiation–are positively correlated with strong statistical significance. All have a negative correlation with government expenditure and generally are highly significant. While government expenditure is positively related to openness, each of the non-budgetary measures of government is negatively related to openness with levels of significance ranging from 2.1% to 18.7%.

While caution must be used in interpreting correlations with the categorical variables, these results indicate that there is no simple and obvious association between openness and all aspects of government involvement in an economy. In fact, some of the different measures of government are negatively correlated with one another. This even holds for the two budgetary measures of government for the larger sample; government expenditure and government consumption. Government consumption and government expenditure are not good proxies for one another and evidently capture different aspects of government activity. Consistent with our earlier suspicions, there apparently are many countries around

Table 3
Correlations, other measures of government, and openness (N=89)[a]

	GEXP	GCONS	GOWN	PRICE	EXPROP	REPUD
GCONS	−.0189 (.8603)	1.000	–	–	–	–
GOWN	−.1097 (.3061)	.4725 (.0000)	1.000	–	–	–
PRICE	−.2263 (.0329)	.3653 (.0004)	.5045 (.0000)	1.000	–	–
EXPROP	−.5527 (.0000)	.4299 (.0000)	.3928 (.0001)	.5094 (.0000)	1.000	–
REPUD	−.4694 (.0000)	.4873 (.0000)	.5105 (.0000)	.5982 (.0000)	.8724 (.0000)	1.000
OPEN	.1626 (.1279)	−.1217 (.2560)	−.1897 (.0750)	−.1410 (.1875)	−.2160 (.0421)	−.2434 (.0215)

[a] Level of significance of correlations in parentheses.

the world with governments that are very "large" based on non-budgetary measures of government, are small based on spending, and tend to be less open.

Table 4 presents two lists of countries which illustrate this clearly. The list of countries in the left column contains those with above average non-budgetary forms of government. In particular, they have a government ownership rating of 8 or 10, a price control rating of 8 or 10, and have above median risk of expropriation. The list on the right are countries that have below average non-budgetary forms of government; they have a government ownership rating of 4 or less, a price control rating of 4 or less, and have below median risk of expropriation. These data and a look at the countries on the list leaves little doubt that government plays a highly interventionist role in the countries in the left column. In addition, our perception is that government corruption is much more pervasive for these countries than those in the right column.

It is evident that many countries have pervasive government involvement in non-budgetary forms yet have very little government expenditure. In fact, government expenditure for this group averages more than 10% less than that for the group in the right column and the difference is significant at better than the 1% level. Additionally, their economies on average are less open than the group on the right, lending credence to the

Table 4

Government expenditure for countries with above and below average non-budgetary measures of government

Above average non-budget[a]		Below average non-budget[b]	
Country	GEXP	Country	GEXP
Uganda	5.7	Japan	16.1
Sierra Leone	5.8	Chile	19.9
Nigeria	7.4	Switzerland	21.7
China	8.2	Singapore	21.8
C.A.R.	9.3	United States	23.5
Ghana	12.3	Australia	24.0
Madagascar	12.6	Canada	25.9
Zambia	14.5	Germany	30.5
Iran	19.9	Finland	30.9
Burundi	21.5	Iceland	32.0
Syria	21.6	United Kingdom	36.1
Algeria	23.4	Ireland	37.2
Kenya	26.2	New Zealand	38.7
Morocco	28.8	Denmark	38.8
Zimbabwe	29.3	Sweden	43.2
Jordan	29.7	Netherlands	51.5
Egypt	30.1		
Nicaragua	34.6		
Congo, Rep. of	36.6		
Mean GEXP	19.9	Mean GEXP	30.7
Mean OPEN	56.4	Mean OPEN	79.0
Mean GCONS	23.7	Mean GCONS	13.7

[a] Countries with a government ownership rating (GOWN) of 8 or 10, a price control rating (PRICE) of 8 or 10, and an above median risk of expropriation (EXPROP).

[b] Countries with a government ownership rating (GOWN) of 4 or less, a price control rating (PRICE) of 4 or less, and a below median risk of expropriation(EXPROP).

argument that government and openness go together.[12] However, this is illusory; the role of government is very large in these countries. Government expenditure simply does not capture the importance of government in many countries. Note, however, that mean government consumption is lower for the countries with less non-budgetary government and this difference exceeds the 1% level of significance. However, as indicated above, openness is higher than for this group, suggesting a negative association of government and openness.

3.2. The influence of income

A look at the countries listed in Table 4 suggests that it is low-income countries that have governments that are "large" based on non-budgetary measures, have relatively small government expenditure, and also have relatively closed economies. Thus, the influence of income may underlie the positive relationship between openness and government expenditure and the negative association between openness and non-budgetary aspects of government.[13] GDP per capita is certainly not exogenous to government involvement in the economy and openness. However, poor and rich countries have different institutions and it is worthwhile to examine inter-relationships with a country's income.

Table 5 shows that there are strong correlations with GDP per capita and the other variables of interest. Government expenditure and openness both exhibit a strong, positive association with GDP per capita. However, government consumption and all of the non-budgetary measures are negatively related to GDP per capita with all correlations attaining a high level of significance. It seems clear that poorer countries have different forms of government intervention than do richer countries. While poorer countries are less open and have greater government in non-budgetary forms, richer countries are more open and have greater government expenditure.[14] However, it is certainly not clear which group would be said to have "bigger" government.

Tables 6 and 7 present some regression analyses to examine the relationship between government and openness in order to control for other factors which may confound the relationship, including GDP per capita. Table 6(a) shows the results for government expenditure. The first three columns are linear specifications. Column (1) is a univariate regression, indicating a positive and significant effect of openness on government expenditure. Controlling for GDP per capita, column (2) illustrates a positive and significant effect of per capita GDP on government expenditure that reduces the effect of openness to insignificance. This suggests that all of the relationship of spending to openness is due to both being positively related to GDP per capita. Column (3) adds a number of control variables used in Rodrik's (1998) basic equation: dummy variables

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[12] However, this difference does not attain statistical significance.

[13] Iversen (2001) argues and provides evidence that the correlation of government expenditure and openness is spurious. He shows that deindustrialization, defined as resource allocation moving from agriculture and manufacturing to services, is associated with greater government spending and accounts for the correlation of openness and government expenditure.

[14] One reason why less developed countries rely on non-budgetary forms of government may be that the costs of tax collection are higher in these countries or that administrative capacities are insufficient.

Table 5
Correlations With PCI[a]

Variable	GEXP	OPEN	GCONS	GOWN	PRICE	EXPROP	REPUD
Correlation coefficient	.5325 (.0000)	.2114 (.0386)	−.4931 (.0000)	−.5386 (.0000)	−.6183 (.0000)	−.8418 (.0000)	−.8529 (.0000)

[a] $N=89$ for PRICE, EXPROP, and REPUD. For all other variables, $N=96$. Levels of significance of correlations are in parentheses.

indicating OECD, Sub-Saharan Africa, East Asia, Latin America, and a socialist government, along with the degree of urbanization and the dependency ratio. Definitions and summary statistics for these variables are in Table 1. The inclusion of these dummies reduces the GDP per capita variable to insignificance and increases the openness coefficient about back to its magnitude and significance in column (1). However, the regional dummies are closely correlated with income, so it is not entirely clear how to interpret these findings.

The last three columns of panel (a) use a double-logarithmic specification common in the literature. Here, the statistical significance of the openness variable is stronger than with the linear specification although the results are otherwise similar to the linear specification. Inclusion of GDP per capita reduces its magnitude and significance, while including the control variables reverses this to some extent. While there is a clear, positive

Table 6
Determinants of the size of government, budgetary measures

(a) Government expenditure

	GEXP			LOG(GEXP)		
	(1)	(2)	(3)	(4)	(5)	(6)
OPEN	.0531 (1.95)	.0233 (0.97)	.0530 (2.15)	–	–	–
PCI	–	.00097 (5.60)	−.00020 (0.48)	–	–	–
Log(OPEN)	–	–	–	.3211 (2.96)	.2065 (2.17)	.2660 (2.69)
Log(PCI)	–	–	–	–	.2661 (5.72)	.2880 (1.99)
Controls[a]	no	no	yes	no	no	yes
R^2	.041	.294	.479	.089	.334	.389
N	92	92	92	92	92	92

(b) Government consumption

	GCONS			LOG(GCONS)		
	(1)	(2)	(3)	(4)	(5)	(6)
OPEN	−.0218 (1.23)	−.0037 (0.23)	.0120 (0.71)	–	–	–
PCI	–	−.00059 (5.15)	−.00028 (0.97)	–	–	–
Log(OPEN)	–	–	–	.0233 (0.27)	.1246 (1.79)	.1642 (2.28)
Log(PCI)	–	–	–	–	−.2353 (6.94)	−.1968 (2.35)
Controls[a]	no	no	yes	no	no	yes
R^2	.016	.242	.421	.001	.352	.463
N	92	92	92	92	92	92

[a] Control variables include dummy variables for OECD, Sub-Saharan Africa, East Asia, Latin America, and socialist government, along with the degree of urbanization and the dependency ratio.

Table 7
Determinants of the size of government, non-budgetary measures[a]

	GOWN		PRICE		EXPROP	
	(1)	(2)	(3)	(4)	(5)	(6)
(a) OLS estimation						
OPEN	−.0137 (2.08)	−.0063 (1.09)	−.0106 (1.64)	−.0031 (0.58)	−.0145 (2.21)	−.0024 (0.66)
PCI	–	−.00024 (5.86)	–	−.00027 (7.01)	–	−.00038 (14.84)
R^2	.046	.312	.030	.386	.052	.729
N	92	92	88	88	91	91
(b) Ordered logit estimation						
OPEN	−.0098 (2.33)	−.0059 (1.406)	−.0074 (1.87)	−.0046 (1.09)	−.0075 (1.84)	.0031 (0.65)
PCI	–	−.00017 (5.02)	–	−.00023 (5.84)	–	−.00064 (7.18)
R^2	.016	.101	.077	.133	.009	.288
N	92	92	88	88	91	91

association of spending and openness, their partial correlation is unclear and the findings are somewhat sensitive to the econometric specification.

Table 6(b) presents a similar set of regressions for government consumption as the dependent variable. The sensitivity of the findings with respect to the specification is even greater here. The linear specifications are in columns (1) through (3). The univariate regression of column (1) shows a negative but insignificant effect of openness on government consumption. In column (2), GDP per capita has a negative and significant effect, but openness remains negative and insignificant. Adding the control variables does little, although the openness coefficient becomes positive, but is still insignificant. With the double-log specification, the univariate regression in column (4) shows a positive and insignificant effect of openness. In column (5), GDP per capita has a negative and significant coefficient and openness is positive and marginally significant. Adding the control variables in column (6) increases the magnitude and significance of the openness coefficient. This last regression duplicates the central result of Rodrik (1998). However, we find in general that the results are very sensitive to the specification.[15]

Table 7 shows similar regressions for three of the non-budgetary measures of government: government ownership, price controls, and risk of expropriation. Panel (a) presents OLS estimates. The findings for all three variables are similar. Openness has a negative effect on non-budgetary government, although statistical significance is low in the price control regression. When GDP per capita is added to the equations, it has a strong negative effect and reduces the openness coefficient to insignificance. Inclusion of the control variables does not have much influence so the results are not reported.

Recall that these non-budgetary measures of government are categorical and the categories are ordinal, not cardinal. Thus, use of regression analysis is not entirely appropriate. Table 7(b) reports the findings with use of ordered logit which imposes an order on the dependent variable while the cardinal values are irrelevant. The findings are

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[15] Alesina and Wacziarg (1998), in a paper emphasizing how country size influences government and openness, also find sensitivity of Rodrik's result with respect to the specification.

Table 8
Correlations of trade barriers with openness and various measures of government[a]

	OPEN	PCI	GEXP	GOWN	PRICE	EXPROP	REPUD
TRDTX	−.2408	−.6202	−.3587	.4008	.4498	.5296	.5972
	(.0264)	(.0000)	(.0000)	(.0001)	(.0000)	(.0000)	(.0000)
BMER	−.0917	−.1076	−.0969	.1355	.1003	.2491	.1480
	(.4038)	(.3271)	(.3778)	(.2161)	(.3611)	(.0215)	(.1766)
RESTRICT	−.2750	−.7500	−.3541	.5787	.6120	.5877	.6801
	(.0108)	(.0000)	(.0009)	(.0000)	(.0000)	(.0000)	(.0000)

[a] Levels of significance of correlations are in parentheses.

similar to the OLS results in panel (a). Openness is negatively related to the non-budgetary measures of government. Once GDP per capita is included, its partial correlation becomes nil. However, the influence of per capita income is strongly negative.

It is clear that openness is negatively related to non-budgetary forms of government and that virtually all of this association is due to GDP per capita. For the budgetary measures of government, openness is positively related to government expenditure and negatively related to government consumption. Parts of these associations are due to GDP per capita. Any remaining partial correlation is highly tenuous.

3.3. Relationship with trade barriers

A clear pattern which emerges from the above analysis is that relatively wealthy countries tend to have higher government expenditure, less government in other forms, and they are more open while low-income countries tend to be the reverse. One obvious reason why high spending/high GDP countries are more open is that they may have lower trade barriers. To investitate this link, we use several variables indicative of a country's trade barriers that are available from the Gwartney et al. (2000) data set. We select those that cover most of the countries in our data: total trade taxes (TRDTX), the black market exchange rate (BMER), and restrictions on capital market transactions with foreigners (RESTRICT). The descriptions and summary statistics are reported in Tables 1 and 1(a). The total trade taxes variable is a direct proxy for tariff barriers while the other variables pertain to the general openness of the economy.[16] The black market exchange rate variable is used to capture the idea that countries with overvalued currencies generally must take steps to interfere with international trade and close the economy. Similarly, interference with capital market transactions with foreigners is indicative of an economy less open to international trade.[17]

Table 8 presents correlations of these variables with openness, GDP per capita, government expenditure, and the non-budgetary measures of government. Each has a

[16] This proxy has shortcomings in that it is possible for the trade taxes variable to be perversely correlated with actual tariff barriers. If tariffs were set so high to nearly choke off trade, few trade taxes would be collected and the variable would suggest low tariff barriers.

[17] As an example, consider that during the East Asian crisis, the majority of affected economies chose to remain open and defend their currencies to some degree–an expenditure based measure. Indonesia chose capital restrictions–resulting in a closed economy with relatively little expenditure.

negative correlation with openness, although the black market exchange rate correlation levels of significance are low. Each is negatively associated with GDP per capita and government expenditure. Each has a positive relationship to the non-budgetary measures of government. With the exception of those involving the black market exchange rate, these correlations are highly significant. The incidence of trade barriers is very similar to that of non-budgetary forms of government. They occur in poorer economies with lower government expenditures.

4. Terms of trade shocks, risk, and insurance

Rodrik (1998) argues that "big" government provides insurance to open economies against terms of trade shocks.[18] The evidence provided in support is that government tends to be larger where a country's economy is open *and* it faces higher variability in its terms of trade. Cassing et al. (1986) show that in a specific factors model, agents want ex ante insurance against terms of trade risk under certain conditions. However, Feeney and Hillman (2004) show that income diversification through asset markets reduces the demand for protection. This implies that there is less demand for ex ante social insurance in countries with more developed asset markets that allow for greater income diversification. Thus, there are conditions under which government provision of social insurance against terms of trade risk is welfare enhancing. We do not engage in a detailed empirical analysis of the demand for social insurance, however. Instead, we extend previous empirical work by examining the correlates of openness and terms of trade variability with other, non-budgetary forms of government.

Before turning to our empirical analysis, one other issue arises. Obviously, trade barriers that a country has in place reduce the value of openness. The ideal measure of openness is "natural openness;" the value of openness if the economy had no trade barriers. We estimate natural openness in the following way. Openness is regressed on our three measures of trade barriers and several variables to account for natural openness. These variables are the country's area, the country's population, and the other control variables used for the regressions in Tables 6 and 7. Our measure of natural openness (NATOPEN) is the predicted value of openness from this regression with the value of the trade barrier variables set to zero.[19] Note that it is particularly important to control for country size to develop this measure. Large countries, such as the U.S., look less open based on the volume of trade relative to income despite having low trade barriers, but this is because of the size of the economy and within-country trade. The measure of terms of trade risk (TOTRISK) is the standard deviation of the log changes in the country's terms of trade for the previous 20 years. Summary statistics for both variables are presented in Table 1.

Table 9 presents some correlations to gain a sense of the plausibility of the insurance hypothesis. It shows correlations between various measures of government and terms of

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[18] Cameron (1978) and Bates et al. (1991) also suggest that governments intervene to provide insurance against terms of trade risk.

[19] Our measures of trade barriers are imperfect, so this procedure relies on our trade barrier variables being good proxies for the general level of barriers for the country.

Table 9
Correlations: measures of government with terms of trade risk and openness ($n=74$)

	EXPEND	CONS	GOWN	PRICE	EXPROP	REPUD	TRDTX	RESTRICT
TOTRISK	−.4239	.0594	.2925	.2488	.4923	.4170	.2353	.3272
	(.0002)	(.6149)	(.0115)	(.0326)	(.0000)	(.0002)	(.0436)	(.0044)
OPEN	.1829	−.0520	−.1707	−.1741	−.1581	−.1962	−.1893	−.2403
	(.1189)	(.6598)	(.1460)	(.1379)	(.1785)	(.0938)	(.1062)	(.0391)
NATOPEN	.0868	.1109	−.0306	.1554	.0793	.0189	.0400	.0966
	(.4624)	(.3469)	(.7960)	(.1862)	(.5016)	(.8732)	(.7351)	(.4127)
TOTRISK × OPEN	−.1412	.1311	.1408	.0702	.2466	.2052	.0599	.0996
	(.2302)	(.2654)	(.2315)	(.5522)	(.0342)	(.0704)	(.6122)	(.3984)
TOTRISK × NATOPEN	−.3541	.1554	.2779	.3079	.5145	.4310	.2997	.3740
	(.0020)	(.1861)	(.0165)	(.0076)	(.0000)	(.0001)	(.0095)	(.0010)

trade risk, openness, and natural openness. Moreover, because the insurance role of government is predicted to be greater when both terms of trade risk and openness are high, we correlate government with the product of terms of trade risk and openness and of terms of trade risk and natural openness.[20]

The terms of trade risk itself has a negative and significant relationship to government expenditure, a small, positive but insignificant correlation with government consumption, and strong, positive, and highly significant correlations with all the non-budgetary measures of government. Also, it is positively correlated with the two measures of trade barriers listed in the table. The correlations with openness are exactly the opposite. Openness is positively correlated with government expenditure, negative related to government consumption, and negatively associated with all the non-budgetary measures of government, although levels of significance are not as high. Naturally, the trade barrier variables are negatively correlated with openness.

The correlations of natural openness are lower in magnitude and significance and tend have opposite signs of the correlations with openness, e.g., government consumption, most non-budgetary measures of government, and trade barriers are all positively related to natural openness.

The last two rows of Table 9 show correlations with the overall measures of risk the country faces due to terms of trade shocks. This is the variability in the terms of trade times the exposure to trade. The latter is measured by openness and by natural openness. The pattern of correlations is similar for either measure of risk, but the magnitudes and levels of significance are higher for correlations with terms of trade risk times natural openness.

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[20] We also experimented with treating the European Union as a single country. GDP weighted averages of government, trade barriers, and other variables are created, but actual trade data with non-EU countries is utilized. This produces a data point similar to the U.S.; an observation with a large area, a large population, and a small amount of external trade. The last point occurs because much of the EU's trade is among EU countries. The findings are quite similar to those shown in Table 9, but some correlations are slightly lower in magnitude. This results because the EU provides an observation with high budgetary government, low non-budgetary government, and a low amount of trade in place of the individual EU countries with a large amount of trade. Overall conclusions that we draw do not change.

Government expenditure is negatively related to risk. Government consumption, the non-budgetary measures of government, and trade barriers are all positively related to risk. Regression analysis shows that the statistical significance of many of these correlations is somewhat sensitive to the functional form of the regression and other covariates in the equation. In general, however, the pattern observed in the correlations tends to emerge.

The negative association of government expenditure to risk is contrary to the idea that government is insuring against exposure to trade shocks.[21] If insurance is occurring, it is through other means. Government consumption is positively associated with risk, consistent with the insurance hypothesis and the evidence presented in Rodrik (1998).[22] We also find that risk is positively related to trade barriers. This can also be an optimal intervention; Newberry and Stiglitz (1984) show that in the absence of insurance markets it can be optimal to provide insurance by partially closing the economy with trade barriers. Thus, it is possible that this can be provision of insurance, although distortions will result.

However, risk also is associated with price controls, risk of expropriation, risk of contract repudiation, and government ownership. Government ownership and its associated employment can be like providing income transfers for social insurance to workers who otherwise would be unemployed. On the other hand, it may be an aspect of government intervention to protect an interest group.

It is difficult to argue that the positive association of risk with price controls, risk of expropriation, and risk of contract repudiation are utilized by government to provide insurance. These aspects of government are often associated with greater corruption. Also, these aspects of government, along with trade barriers, are shown to reduce productivity (Hall and Jones, 1999), are associated with lower income per capita (Gwartney et al., 1998), and are often used in the literature as indicators of bad government (La Porta et al., 1999; Wei, 2000).

In sum, as a country's exposure to international trade risk is higher, its government activity is different. Its government expenditure is lower, its government consumption is higher, it has higher trade barriers, it has more government ownership and price controls, and is more likely to expropriate property and repudiate contracts. There is not much evidence of government insurance in these circumstances and much evidence of value-reducing distortions. However, as noted above, governments may act simultaneously to provide insurance and to protect special interests.

As a final illustration of the nature of government in countries with high terms of trade risk, Table 10 lists countries in the highest quartile of exposure to trade risk as measured by terms of trade risk times natural openness. The values of several variables for these countries are reported. The last two rows report the means for this subsample of countries and for the remaining countries. There is considerable overlap of this list with the list of countries with the most non-budgetary forms of government in Table 4. Eight of the countries on that list also are listed in Table 10 and the government characteristics of all countries on the lists are similar. They tend to have less government expenditure, are

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[21] Also, we find similar results with government transfers and subsidies, though with a smaller sample.
[22] However, our results apparently are more sensitive than Rodrik's.

Table 10
Countries in the highest quartile of exposure to international trade risk[a]

	TOTRISK	OPEN	NATOPEN	GEXP	GOWN	EXPROP	TRDTAX	RESTRICT
Cameroon	.163	43.3	100.2	21.3	6	5.4	5.4	10
Congo, Rep. of	.230	88.3	117.4	36.6	10	8.1	8.2	10
Cote d'Ivoire	.147	63.9	107.6	24.9	10	4.1	10.9	10
Dominican Rep.	.270	59.2	99.3	11.6	6	6.8	8.2	8
Ecuador	.307	60.1	78.1	14.5	6	5.4	4.0	8
Ghana	.184	39.4	102.7	12.3	8	5.4	11.6	10
Indonesia	.201	52.6	96.9	18.4	6	3.4	2.5	10
Iran	.339	33.3	88.1	19.9	8	8.8	7.3	10
Madagascar	.166	42.7	91.4	12.6	10	8.1	14.0	10
Mauritius	.154	142.1	162.8	23.0	4	4.1	7.6	8
Nigeria	.319	64.6	77.5	7.4	10	6.8	4.0	10
Philippines	.114	61.5	131.8	20.1	2	8.1	6.6	8
Sri Lanka	.160	67.4	102.4	28.9	6	6.8	8.8	10
Syria	.150	55.1	120.8	21.6	10	8.1	2.9	10
Togo	.169	93.5	123.4	12.9	10	4.1	9.2	10
Trinidad and Tobago	.174	73.8	138.2	13.7	6	2.7	2.7	10
Uganda	.237	24.9	94.0	5.7	8	8.1	10.8	10
Venezuela	.336	59.6	75.0	23.7	10	4.1	2.2	5
Zambia	.193	70.1	105.1	14.5	10	5.4	4.8	8
Mean	.211	62.9	105.9	18.1	7.7	5.9	6.9	9.2
Mean, rest of sample	.098	64.5	89.9	26.8	5.6	3.1	4.2	5.8

[a] The sample consists of countries for which TOTRISK × NATOPEN exceeds 15.

highly interventionist on other measures of government, have lower GDP per capita, and as noted above, our impression is that government corruption is more pervasive.

5. Conclusion

Our examination of the data gives us a different perspective and conclusion than Rodrik (1998), who states, "The scope of government has been larger, not smaller, in economies taking greater advantage of world markets." In contrast, we find that, in many respects, the scope of government is much larger in less open economies. Less open economies tend to have less government expenditure, but have a great deal more government in other forms. The lower government expenditure gives a misleading view; the role of government is large in these countries. Moreover, the nature of the non-budgetary forms of government seems to indicate an arbitrary control by the state that the budgetary forms do not. Thus, governments with high values of the non-budgetary measures are large, but also different from governments with high levels of expenditure.

Further empirical analysis leads us to question that the provision of insurance is the sole explanation for the correlation of openness and government expenditure. Government expenditure is not higher for countries with greater exposure to trade shocks. Government consumption is higher for these countries, but so are trade barriers, government ownership, use of price controls, and the chances of expropriation and of repudiation of contracts. Although governments may be providing social insurance in some respects, it is difficult

to argue that this set of government activities provides value-increasing insurance for the citizens of those countries.

The inter-relationships uncovered by Rodrik (1998), various authors in the literature, and in this paper are still not completely understood. It is clear, however, that focus on budgetary measures of government misses much of the picture regarding the role of government and its relationship to international trade. This is particular true since non-budgetary measures of government tend to be inversely correlated with budgetary measures. Any explanation of the association of government and openness should include non-budgetary aspects of government; otherwise it will be seriously incomplete.

Acknowledgement

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