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# Trade Openness and Output Volatility\*

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## Abstract

*This paper studies the effect of trade openness on output volatility. We find that trade openness generally increased output volatility, although this effect was stronger and more significant during 1950-1975 than during 1975-2000. However, if we split the sample into developed and developing countries, we observe that more openness increased volatility in developing countries, while it helped smooth output in developed countries. We also find that the size of the government may have increased volatility in less developed countries. Part of the positive relation between openness and volatility may be explained by the positive relation between openness and government size. Another important finding of this paper is that once we control for government size and some measures of external risk, such as terms of trade volatility and export concentration index, the effect of openness on the output volatility turns out to be negative.*

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# 1 Introduction

Traditionally there has been a lot of interest in the relationship between trade openness and the growth rate of output (Rodriguez and Rodrik, 1999). Less attention has been devoted to the relation between trade openness and the volatility of output. Theoretically, this relationship is not settled. On the one hand, openness leads to specialization and to more volatility if sector-specific shocks are prevalent. Also, Tornell *et al* (2003) shows that trade liberalization is typically followed by financial liberalization. But more financial liberalization is associated with more financial fragility, in the case of developing countries. Through this channel we could think that more openness (i.e. trade liberalization) implies more fluctuations in the GDP growth. On the other hand, trade openness may also provide a way of cushioning oneself against country-specific shocks, since the world economy as a whole is less prone to shocks than individual countries (Krebs, Krishna and Maloney, 2004). The way output volatility reacts to changes in the level of openness is an important question for a number of reasons. First, if consumption smoothing is an issue, output (and consumption) volatility may be costly in terms of welfare. Second, it has been documented that higher volatility tends to lead to lower growth (Ramey and Ramey, 1995). Third, volatility has disproportionately adverse effects on the poor countries (Easterly, Islam and Stiglitz, 2000).

We use a data set of 111 countries going from 1950 to 2000. Our main findings are the following. The correlation between openness and volatility tends to be positive, although it is not always significant. The correlation has become weaker over time though. Also, developing and developed countries exhibit different patterns. Less developed countries suffer from a stronger effect of openness on volatility, although the effect has become weaker in recent decades. In contrast, for developed countries, the effect goes the other way: more openness smoothens output volatility. Here again the effect becomes weaker over time. The degree of specialization and the volatility of the terms of trade do a good job in explaining why openness increases output volatility. When controlling for the size of the economy, the effect of openness tends to weaken, and even disappears. Larger economies are characterized by lower output volatility. This is not surprising, as it is well known that larger countries are less prone to shocks (Head, 1995). Also richer countries display less volatility in output.

We then try to delve deeper into the role of government spending. According to Rodrik (1998), more open economies have larger governments in an attempt to deal with increased volatility. This so called "compensation theory" claims that governments play a mitigating role on risk. In the case of developed countries, we find evidence supporting that theory. Even after controlling for the degree of openness, government continues to reduce output volatility. However, this is no longer true for developing countries. Under some specifications, larger governments in poorer countries lead to increased volatility.

Another interesting question is how the financial sector affects output volatility. It is often argued that opening the capital account allows risk diversification,

stabilizing, in this way, the economy. On the other hand, opening the capital account makes the country more dependent on credit, which, in turn, could make it more vulnerable. Easterly, Islam and Stiglitz (2000) show that financial depth, measured by private credit to GDP, affects output volatility in a non-monotonic way: initially it tends to decrease volatility but too much private credit ends up increasing output volatility. Also they do not find any evidence for the stabilizing role of capital flows. On the other hand, Svaleryd and Vlachos (2000) found a positive relationship between openness to trade and development of financial markets, measured by proxies like liquid liabilities and credit to private enterprises. So it is interesting to see how much of the effect of openness on output volatility is attributed to the development of financial markets. To investigate that, we introduced in our analysis some financial proxies such as black market premium, foreign debt, credit to private sector and liquid liabilities. Our results show that among these financial proxies only the black market premium plays a role in explaining output volatility. In all but the developed economies sample, the black market premium passed from being insignificant during the period 1950-1975 to being highly significant over 1975-2000. Moreover a higher average level of black market premium seems to increase output volatility while a higher variability in the black market premium helps smoothing the volatility of output.

The paper is organized as follows. In the next section we describe the data and present some simple regressions that give a first insight into how openness affects volatility of output. Section 3 includes some robustness tests of the relationship between openness and volatility and presents the reasons for including each variable into our regressions. This is followed by the presentation of the results and a possible interpretation of them. Section 4 presents the government-volatility relationship. In the last section we summarize the results and make some suggestions for future research.

## 2 A first look at the data

The data in this study comes from the Penn World Tables 6.1, the International Monetary Fund, the World Bank and UNCTAD. We use a sample of 111 countries over the period 1950-2000. A detailed description of the data set is presented in the Appendix 4. We start by running some simple regressions of output volatility on the level of openness for the entire set of countries. Then we will split the sample into developed and developing countries, and also check whether the effect of openness on output volatility changed over time. For that, we consider two different time periods (1950-1975 and 1975-2000).

Following Ramey and Ramey (1995) we take the standard deviation of the growth rate of GDP per capita as our measure of output volatility. This contrasts with Hausmann and Gavin (1996) who define macroeconomic volatility as the standard deviation of the level of GDP per capita. The problem with the

last measure is that an economy which grows at a high but constant rate would nevertheless display high volatility. We prefer a measure which is not sensitive to growth in that way. For openness, we focus on the traditional measure:

$$openness = \frac{imports + exports}{GDP} (\%)$$

To just give an example, take the case of Mauritania and the United States. Mauritania, with an openness level of 87.87 is 6.4 times more open than the United States, with an openness level of 13.66. This big difference in the level of openness corresponds to a difference of 0.100 in the volatility of output (0.025 in the United States and 0.125 in Mauritania). This, in relative terms, means that Mauritania is 5 times more volatile than the United States. Therefore this case seems to sustain the idea that more openness implies more output volatility. Nevertheless this is just an example. The objective of this paper is to dig deeper into the data and investigate if this hypothesis is, in fact, a more general and robust result.

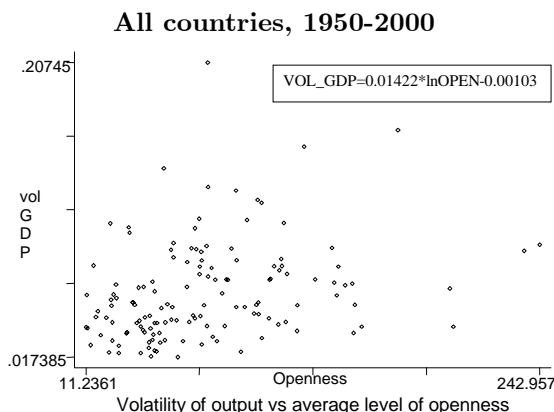


Figure 1.

Figure 1 plots output volatility as a function of openness for the time period 1950-2000, using the entire sample of 111 countries. As one can see from the picture, there is a positive relationship between openness and volatility of output: more open economies exhibit higher output volatility. A simple regression shows that, on average, an increase of 10% in openness increases output volatility by 0.0015. This relation is significant at the 99% level.

When we split our sample into two time periods (1950-1975 and 1975-2000), the positive relationship between openness and output volatility still persists (see Figures 2 and 3) but it weakens over time. While during the period 1950-1975 an average increase of 10% in the level of openness implied an increase of 0.0016 in volatility, during the second period (1975-2000) this impact decreased to 0.0010. As shown by the results in Table 1, we also observe an important decrease in the statistical significance of the openness coefficient in the second period. The coefficient for openness in the first period is significant at the 99% level while in the second period it remains significant only at the 90% level.

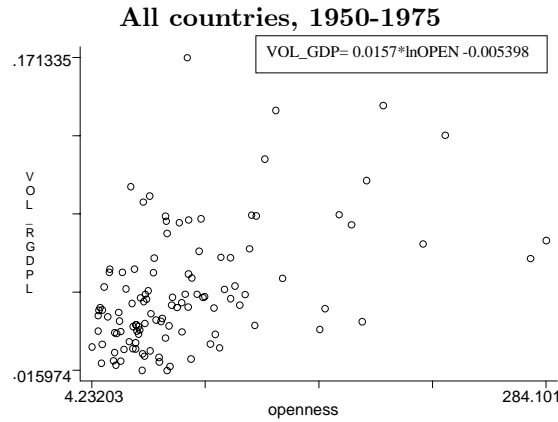


Figure 2.

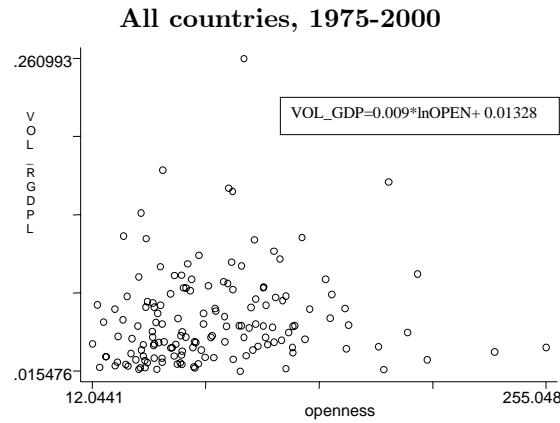


Figure 3.

For the sample of developed<sup>1</sup> countries, the relation between openness and output volatility is significant for the entire period (1950-2000) but not for the two subperiods (1950-1975 and 1975-2000). For the sample of developing countries, the coefficient of openness on output volatility decreases over time and also becomes less significant. *Figure 4* shows the relationship between openness and volatility of output for developed and developing countries subsamples.

As we can see from the graphs, the positive relationship does not disappear if we split the sample. However, if we analyze the data set in more detail we observe that countries like the United States and Belgium, with completely different trade regimes, display similar degrees of volatility. The United States is a relatively closed economy with an openness index of 13.66 compared to Belgium, where the openness level is 90.42. Over the period 1950-2000 they display very similar degrees of volatility: 0.024 in USA versus 0.020 in Belgium.

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<sup>1</sup>We call a *developed country* any country that has the average level of GDP per capita higher than \$6,000.

This gives us an idea that the relationship between openness and volatility is not as trivial as it might be thought. Moreover, in *Table 1* we could observe that in the case of developed countries the relationship is significant only if we consider the entire period of time but it disappears when we split the time period. In the case of less developed economies we have the same effect as in the pooled sample (i.e. with all the countries together). Not only does the coefficient of openness decrease over time, but its significance also decreases from the 99% level before 1975 to only 90% after 1975.

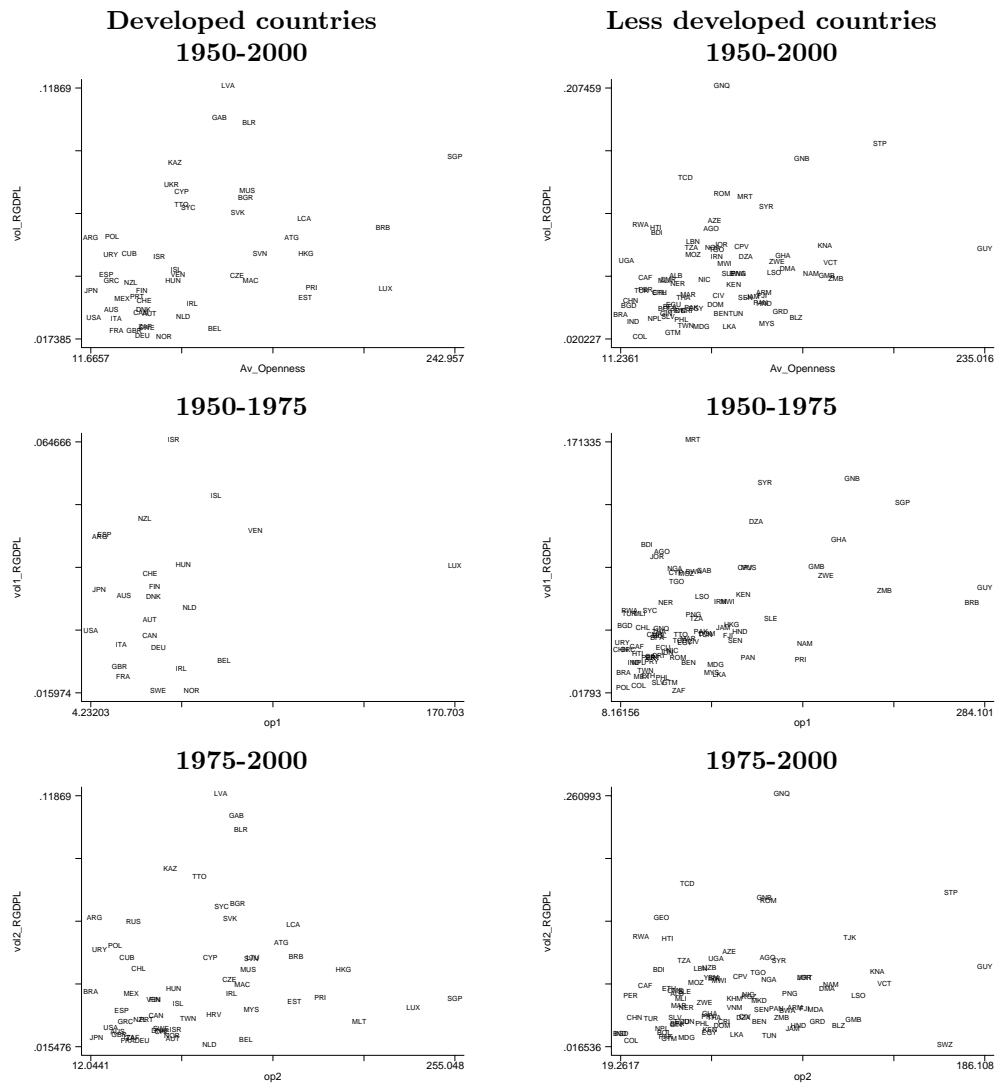


Figure 4.

### 3 Robustness

The results above are nothing more than a first cut at the data. Clearly it is necessary to control for other effects which could have an impact on volatility before jumping to the conclusion that greater openness leads to higher output volatility. The existing literature has identified a number of other sources of output volatility. In this section we start by summing up those other possible explanatory variables. We then analyze whether the positive relation between openness and output volatility is preserved once we include those control variables.

#### 3.1 Control variables

We now give a list of all the control variables we use in our regressions, and explain why they might have an effect on output volatility.

- *Country size and development*

The way one country reacts to any shock depends on some basic characteristics such as the size and the level of development. The most common proxies used to measure these features are the population and the level of GDP per capita. A number of cross-section analyses trying to explain output volatility use GDP per capita and population as control variables and most of the time they turn out to be significant (see for example Easterly, Islam and Stiglitz (2000), Mobarak (2004), Tamirisa (1999), Wolf (2003), Wu and Rapallo (1997)). Regarding the influence of these variables on the output volatility, we expect a country with a higher level of GDP per capita (or larger population) to exhibit lower fluctuations.

- *Government expenditure*

As argued by Rodrik (1996), government plays a risk-reducing role in economies exposed to external risk by providing social insurance. Therefore we would expect a negative influence of government expenditure on output volatility in our analysis.

- *Human capital*

Mobarak (2004) and Wolf (2003) used the average level of human capital as a control variable to explain the observed volatility in output and consumption. Both of them found that a country with a higher level of human capital can better adapt to new situations, therefore its output and consumption are less affected by a shock. We should therefore expect, in our analysis, a country with a higher level of human capital to display less volatility in its GDP per capita.

- *Financial markets proxies*

A country's capability to insure against shocks should be strongly related to the extent to which the country has access to international financial



markets. We would expect a more developed financial system to reduce output volatility. Svaleryd and Vlachos (2002), in their empirical study of the relationship between openness and markets for risk, classify proxies for financial development into three categories: the size of financial sector (*ratio of liquid liabilities to GDP*), the financial system's ability to allocate credit (*credit issued to private sector, divided by GDP*) and the *real interest rate*. They found evidence that all these proxies have a positive and strong influence on the level of openness of a country. Lee (1993), using the *black market premium* as a proxy for capital and exchange controls, found that these controls tend to reduce trade. These are the reasons to think that there could be a strong impact of these proxies on output volatility too.

- *Foreign direct investment (FDI)*

FDI generates some links between production processes across countries. At first sight, one may think that this provides a way to alleviate country specific shocks and thus decrease output volatility. However, Barrell and Gottschalk (2004) test this hypothesis for the cases of US and UK and find that the effect of FDI on output volatility is not significant. We also want to test this hypothesis in our cross-section analysis.

- *Total investment*

Investment plays a central role in output growth through the rate of return on capital and the process of capital accumulation. Ramey and Ramey (1995) show that investment has a strong negative effect on the volatility of GDP and we would expect the same relationship in our analysis: a country with a higher level of investment should display less volatility in its output.

- *Inflation*

Financial volatility could be an important factor affecting output volatility of an economy. Many papers find that inflation volatility has an important positive effect on consumption volatility (Wolf (2003), Wu and Rapallo (1997)). Old Phillips curve models imply a permanent trade-off between inflation and output. We would therefore expect to have a positive impact of the volatility of inflation on output volatility.

- *External risk proxies*

Rodrik (1998) shows how the relationship between openness and government size becomes weaker and even disappears when measures of external risk are added. The proxies he used for measuring external risk are *export concentration index* and *terms of trade volatility*. He found empirical confirmation of the fact that the effect of openness on government size is stronger in the economies with a higher export concentration index. Moreover, he found that countries with more concentrated exports have bigger governments. Hence we would expect to obtain that a country with more concentrated exports displays higher volatility. Controlling for the

volatility of terms of trade, Rodrik found that the openness coefficient turns out to be insignificant. This highlights the fact that the volatility of the terms of trade is the channel through which openness affects the size of the government. In the light of these findings, we expect to obtain a positive influence of the terms of trade volatility on output volatility and the openness effect to disappear.

- *Geographical dummies*

The relationship between openness and volatility could be affected by a common factor that affects both variables. Geographical dummies are standard candidates (see for example Mobarak (2004), Razin and Rose (1992), Rodrik (1998), Svaleryd and Vlachos (2002)).

### 3.2 Empirical results for the pooled sample

We start by looking at the entire sample of countries. *Table 2* reports the results for the time period 1950-2000, whereas *Tables 3* and *4* look at the subperiods 1950-1975 and 1975-2000. The number of control variables for the second subperiod is greater, because of better data availability. Openness tends to have a positive and significant effect on output volatility. This effect was both greater and more significant in the period 1950-1975 than in the period 1975-2000. If during the period 1950-1975 a 10% increase in the level of openness would mean a 0.0015 increase in the volatility of output, over the period 1975-2000 this impact decreases to only 0.0001. Moreover, if we pay attention to the adjusted  $R^2$  as a measure of how the equations fit the reality, we can observe a decrease over time in all the equations.

From the same tables we can observe that the control variables are always significant and tend to have the expected sign: GDP per capita, human capital, the level of investment and FDI inflows decrease volatility, whereas inflation increases volatility. We also observe that regional dummies do not seem to have any effect on the volatility of output.

As reported in *Table 4*, once we control for the export concentration index, openness ceases to have a positive effect on volatility. We could only check for this effect during the period 1975-2000, because earlier data was insufficient. The result from this table seems to suggest that openness increases volatility because openness leads to greater specialization, making the economy more vulnerable to external (sectoral) shocks. This specification is also the one with the highest adjusted  $R^2$  among all the regressions for the second period of time.

Our preliminary results suggest that it is crucial to control for the size of the economy. This is not surprising: we would expect bigger countries to be more diversified, and therefore less prone to external risk. Moreover, when controlling for the size of the economy, it makes sense to make a distinction between a greater size due to a larger population, or a greater size due to a higher GDP per capita. We now redo our previous exercise, but in each regression we control for population size and GDP per capita. These results are reported in *Tables 5*,

6 and 7. In nearly all regressions both GDP per capita and population have a negative and significant effect on volatility. There is also a marked improvement in the adjusted  $R^2$ , suggesting that these two variables have high explanatory power. The effect of openness on volatility becomes smaller – even negative – and less significant. Whereas for the time period 1950-1975 openness continues to be statistically significant, this is no longer true for the period 1975-2000. During the period 1975-2000 we observe a negative effect of openness on volatility but this effect does not result to be significant at the 90% level. The main results are therefore confirmed: openness tends to increase volatility, but much less — or even not at all — in recent decades. As far as the other explanatory variables are concerned, they tend to lose significance, once we include GDP per capita and population. Only inflation continues to increase volatility and FDI inflow continues to smooth output over 1950-1975. These effects disappear over time, though. During the second period, 1975-2000, only volatility in the terms of trade results to have a significant positive influence on output volatility. As before, this suggests that openness may increase output volatility because of a higher exposure to external shocks. Introducing geographical dummy variables does not improve results.

Another interesting question is to see whether the degree of trade openness is proxying for the degree of openness of financial markets. As for the proxies for financial development (see *Tables 8, 9 and 10*), only the black market premium, foreign debt and liquid liabilities increase the explicative power of the regressions in the second period of time. From these control variables only black market premium is significant per se. We observe that a higher average level of black market premium increases output volatility while more variability in the level of black market premium smooths the volatility of GDP. An interesting issue here is that the effect of black market premium on output volatility becomes stronger over time while the opposite happens with the openness effect. This fact could suggest that maybe trade openness is simply picking up financial openness.

### 3.3 Empirical results for the developed countries

We present the results for this group of countries in *Tables 11-14*. The most unexpected result appears in *Table 11* which suggests a strong negative effect of openness on volatility in developed countries during the period 1950-1975. While in the pooled sample more openness meant more volatility, in the case of developed economies a higher level of openness seems to help reducing the volatility in GDP. Moreover this relationship is robust to the introduction of all the control variables. This negative effect is still apparent during the period 1975-2000 but it loses significance (*Table 12*). Therefore more openness helps smooth output volatility. The interpretation we can give to this somehow unexpected finding is that openness offers more possibilities for hedging against country specific shocks.

During the period 1950-1975 inflation proved to have a strong effect in raising volatility of output while over the next period its role was replaced by the volatility in terms of trade and export concentration index, which explain more than half of the volatility displayed by GDP. Another aspect presented in *Tables 11-18* is the effect of GDP per capita, which becomes highly significant only in the second period, and population, which increases its significance during 1975-2000. The regional dummies' lack of effect on volatility is still present in the case of developed economies.

*Tables 13* and *14* present the effect of financial development proxies on volatility in output in the case of developed countries. As in the pooled sample, none of these variables affects volatility in the first period but this "zero-influence" is still present during the second period in the case of rich countries. The only effect they have is to decrease the significance of the openness coefficient. Taking a look at the  $R^2$ -s we observe that controlling for financial proxies in the case of rich economies does not help improve the explanatory power of the regressions.

### 3.4 Empirical results for the developing countries

The results for the sample of developing countries are reported in *Tables 15* to *18*. There, like in the case of the entire sample, the highest level of significance for openness is reached in the first subperiod of time. Moreover, we see that the effect of openness does not disappear once we control for the population size and GDP per capita (see *Table 1* and *Tables 15, 16*). Like in the case of the total sample the combination openness, GDP, population and inflation explains almost half of the variability in the GDP growth over the period 1950-1975. If we take a look at *Table 16* we observe that during the period 1975-2000 the European location seems to be the only one that affects output volatility in poor countries. Also comparing *Tables 15* and *16* we observe that, in terms of the explanatory power, inflation's role in the first period is replaced by that of the volatility in terms of trade in the second period. In terms of financial market accessibility (*Tables 17* and *18*), in the first subperiod we do not see any influence of the financial proxies on volatility. In the second subperiod, we see the same influence of the black market premium for the pooled sample. The openness effect on output volatility is replaced by the black market premium effect.

## 4 Government, Openness and Volatility

There is an important literature analyzing the relationship between openness and government size. Rodrik (1998) suggests that more open economies have greater exposure to the shocks in the world market. In an attempt to better hedge against these shocks, more open economies have larger government

spending. This is called the "compensation theory" and it received empirical support in Rodrik's paper for a broad sample of countries. However, in a recent study of OECD countries, Molana, Motagna and Violato (2004) claim that this theory only holds for a limited number of countries.

The question we address in this section is slightly different: when controlling for openness, does government spending continue to have a mitigating effect on volatility? *Table 19* shows the results of the regression of output volatility on openness and government spending, distinguishing between different time periods and splitting up the sample into rich and poor countries. For the entire sample of countries, openness increases output volatility, and government size decreases output volatility. This seems to reinforce the view of Rodrik (1998): for a given level of openness, bigger governments reduce output volatility. However, splitting the sample into developed and less developed countries we see that the government size effect disappears in the case of less developed economies. *Table 20* presents the results of the same exercise when we controlled for the level of GDP per capita and population. Once we do that, the mitigating effect of government spending on output volatility still appears only in the richer countries, over the period 1975-2000. In fact, for the entire sample of countries and for the poorer countries, government spending now increases output volatility, although the effect is not significant.

We then continue our analysis by adding more control variables. In the light of the "compensation theory", the government size interacts with proxies for the external risk, represented in our analysis by volatility of terms of trade and export concentration index. We check this theory using the same kind of analysis Rodrik (1998) presented in his paper. One of the proxies for external risk we use here is the export concentration index. Countries with a more diversified set of exports are supposed to be less exposed to external risk. The second proxy used in Rodrik's paper is volatility of terms of trade which is considered a measure of the terms of trade risk. The last measure, called the interaction term, is generated by multiplying openness with these proxies. The results are reported in *Tables 21-23*. As one could observe comparing these three tables, the results in the case of low income countries are completely different from the pooled sample or rich countries. If in the last two samples we found evidence of the compensation theory discussed by Rodrik, in the case of developing economies only the government effect on volatility of output is strongly significant. As in Rodrik's paper, in the case of pooled sample and developed economies, the coefficients for interaction terms are significant, confirming that the effect of openness is stronger in countries with more concentrated exports or more volatility in terms of trade. But in the case of poor countries, none of the interaction terms result to be significant. Another big difference between the pooled sample or rich countries sample and poor countries sample is the effect of openness. While the openness coefficient becomes negative and significant in the first two samples, it completely disappears in the case of poor economies. For the case of rich economies, this result could be interpreted as an evidence of the mitigating role played by government: more open economies are more exposed to external risk, but at the same time more openness means bigger

government which, in turn, can compensate for the negative effects of shocks. In conclusion, more openness means less volatility of output. In the poor countries not only can we not say the same, but the role played by the government is completely different: more government expenditure increases output volatility and this effect remains strongly significant and positive irrespective of the proxies for external shocks we add.

## 5 Conclusions

This paper has explored the relationship between trade openness and output volatility. We have found that this relationship is a complex one. In developing countries more openness is associated with higher volatility. In contrast, in developed countries openness smoothens output volatility. However, for both samples the relationship has become weaker in recent decades.

An interesting feature we found in the case of developing countries is that the decreasing effect over time of openness on trade is associated with an increasing effect of the black market premium (as a proxy for financial development) on output volatility. This fact could suggest that maybe trade openness is partly picking up financial openness.

This paper also contributes to the empirical literature on testing the so called "compensation theory", which states that more open countries have bigger governments in an attempt to compensate for the exposure to external risk. We found that this theory holds for developed but not for developing countries.

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## 7 Appendix 1: Data Description

In this appendix we will describe in detail the variables we use and the sources we took them.

- volatility=standard deviation of the growth rate of real GDP per capita in constant prices: Laspeyres index (Penn World Tables 6.1) (1950-2000)
- OPEN=average level of openness ((imports+exports) as percentage of GDP) (1950-2000) (Penn World Tables 6.1)
- openness=log(OPEN)



- total GDP=log of the average level of GDP Laspeyres index (1950-2000) (Penn World Tables 6.1)
- GDP per capita=log of the average level of GDP per capita Laspeyres index (1950-2000) (Penn World Tables 6.1)
- population=log of the average level of population (1950-2000) (Penn World Tables 6.1)
- human capital=average level of human capital (Barro & Lee data 1960-2000: average years of school)
- FDI inflow=log of the average FDI (foreign direct investment) inflow (1970-2000) (IMF-IFS: International Monetary Fund-International Financial Statistics)
- investment=log of the average investment (1950-2000) (Penn World Tables 6.1)
- government=log of the average level of government expenditure (1950-2000) (Penn World Tables 6.1)
- export index=export concentration index (averaged 1980-2000) (UNCTAD Handbook of Statistics)

This is a modified version of the Herfindahl-Hirschman index:

$$H_i = \frac{\sqrt{\sum_{j=1}^{239} \left(\frac{E_{ij}}{E_i}\right)^2} - \sqrt{\frac{1}{239}}}{1 - \sqrt{\frac{1}{239}}}$$

where  $H_i$ =concentration index for country  $i$ ,  $E_{ij}$ =value of export of product  $j$  and country  $i$ ,  $E_i = \sum_{j=1}^{239} E_{ij}$

- terms of trade=standard deviation of the terms of trade (1980-2000) (UNCTAD Handbook of Statistics)
- inflation=standard deviation of inflation (1950-2000) (consumption price index: Penn World Tables 6.1)
- black market premium av=black market premium average level (exchange rate in the black market, divided by the official rate) (average 1960-1999) ("Global Development Network Growth Database", Easterly & Sewadeh, World Bank)
- black market premium vol=black market premium volatility (standard deviation over the period 1960-1999) ("Global Development Network Growth Database", Easterly & Sewadeh, World Bank)

- interest rate= standard deviation of the national interest rate (IMF-IFS) (1950-2000)
- liquid liabilities=average liquid liabilities % GDP (IMF-IFS) (1950-2000)
- credit to private sector=average credit to private sector % GDP (IMF \_IFS) (1950-2000)
- foreign debt=average foreign debt % GDP (IMF \_IFS) (1950-2000)

## 8 Appendix 2: Tables

Sample	All countries			Rich countries			Poor countries		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Openness	0.0142 (3.19)	0.0157 (5.12)	0.0093 (1.58)	0.0093 (2.27)	0.0018 (0.61)	0.0033 (0.82)	0.0168 (2.49)	0.0172 (4.51)	0.0191 (1.81)
N-obs	111	111	111	40	25	44	71	86	67
Adj- $R^2$	0.07	0.19	0.01	0.10	-0.02	-0.00	0.07	0.18	0.03

**Table 1: Openness and Volatility**

N= nr of observations, t-statistics in parenthesis

(1) all the interval:1950-2000 (2)1st subperiod: 1950-1975, (3) 2nd subperiod: 1975-2000

### 8.1 The entire sample (all countries)

<i>Time Period</i>	<b>1950-2000</b>									
<b>Openness</b>	0.0142 (3.19)	0.0129 (3.25)	-0.0025 (-0.53)	0.0054 (0.96)	0.0138 (3.43)	0.0109 (3.35)	0.0138 (3.37)	0.0072 (2.09)	0.0103 (2.41)	
<b>GDP per capita</b>		-0.0137 (-5.27)								
<b>Total GDP</b>			-0.0095 (-5.88)							
<b>Population</b>				-0.0053 (-2.46)						
<b>Investment</b>					-0.009 (-5.00)					
<b>Human Capital</b>						-0.0032 (-4.08)				
<b>Inflation</b>							0.1467 (4.51)			
<b>FDI Inflow</b>								-0.0050 (-5.28)		
<b>Europe</b>									-0.0085 (-0.57)	
<b>Africa</b>									0.0263 (1.84)	
<b>Asia</b>									0.0053 (0.35)	
<b>North America</b>									-0.0011 (-0.08)	
<b>South America</b>									0.0055 (0.35)	
<b>N-obs</b>	111	111	111	111	111	92	111	91	111	
<b>Adj-<math>R^2</math></b>	0.07	0.26	0.29	0.12	0.24	0.25	0.22	0.28	0.23	

**Table 2: All countries, 1950-2000**

<i>Time period</i>	<b>1950-1975</b>								
<b>Openness</b>	0.0157 (5.12)	0.0134 (4.56)	0.0071 (1.96)	0.0123 (3.34)	0.0147 (5.07)	0.0136 (4.99)	0.0162 (6.17)	0.0129 (4.41)	0.0121 (4.15)
<b>GDP per capita</b>		-0.0112 (-4.09)							
<b>Total GDP</b>			-0.0065 (-4.01)						
<b>Population</b>				-0.003 (-1.63)					
<b>Investment</b>					-0.00652 (-3.92)				
<b>Human Capital</b>						-0.0032 (-3.55)			
<b>Inflation</b>							0.0162 (6.43)		
<b>FDI Inflow</b>								-0.0039 (-3.86)	
<b>Europe</b>									-0.0134 (-1.03)
<b>Africa</b>									0.0186 (1.47)
<b>Asia</b>									0.0095 (0.72)
<b>North America</b>									-0.0111 (-0.83)
<b>South America</b>									-0.0003 (-0.03)
<b>N-obs.</b>	111	111	111	111	111	92	111	91	111
<b>Adj-<math>R^2</math></b>	0.19	0.29	0.28	0.20	0.28	0.35	0.41	0.29	0.35

Table 3: All countries, 1950-1975

<i>Time period</i>	<b>1975-2000</b>										
<b>Openness</b>	0.0093 (1.58)	0.0117 (2.22)	-0.0101 (-1.71)	-0.0058 (-0.78)	0.0121 (2.26)	0.0066 (1.53)	0.0083 (1.46)	0.0017 (0.41)	0.0016 (0.38)	0.0132 (2.15)	0.008 (1.40)
<b>GDP per capita</b>		-0.0161 (-5.53)									
<b>Total GDP</b>			-0.0114 (-6.43)								
<b>Population</b>				-0.0082 (-3.15)							
<b>Investment</b>					-0.0108 (-5.09)						
<b>Human Capital</b>						-0.0031 (-3.45)					
<b>Inflation</b>							0.1065 (3.08)				
<b>FDI Inflow</b>								-0.0054 (-4.88)			
<b>Export Index</b>									0.0681 (5.80)		
<b>Terms of Trade</b>										0.0005 (3.32)	
<b>Europe</b>											-0.008 (-0.43)
<b>Africa</b>											0.0294 (1.64)
<b>Asia</b>											0.0005 (0.03)
<b>North America</b>											0.0048 (0.25)
<b>South America</b>											0.0114 (0.57)
<b>N-obs</b>	111	111	111	111	111	92	111	91	107	97	111
<b>Adj-<math>R^2</math></b>	0.01	0.22	0.28	0.09	0.20	0.12	0.08	0.20	0.25	0.12	0.14

Table 4: All countries, 1975-2000

<i>Time Period</i>	<b>1950-2000</b>					
<b>Openness</b>	0.00158 (0.32)	0.00019 (0.04)	0.0052 (1.30)	0.0028 (0.60)	0.0042 (0.90)	-0.0003 (-0.07)
<b>GDP per capita</b>	-0.0149 (-5.98)	-0.0229 (-2.66)	-0.0097 (-2.28)	-0.0127 (-5.15)	-0.0111 (-2.22)	-0.0107 (-2.90)
<b>Population</b>	-0.0068 (-3.60)	-0.0073 (-3.72)	-0.0034 (-2.20)	-0.006 (-3.28)	-0.0034 (-1.29)	-0.0072 (-3.39)
<b>Investment</b>		0.0056 (0.97)				
<b>Human Capital</b>			-0.0004 (-0.30)			
<b>Inflation</b>				0.099 (3.31)		
<b>FDI Inflow</b>					-0.0008 (-0.36)	
<b>Europe</b>						0.0023 (0.17)
<b>Africa</b>						0.0158 (1.09)
<b>Asia</b>						0.0125 (0.84)
<b>North America</b>						-0.0013 (-0.09)
<b>South America</b>						0.0038 (0.26)
<b>N-obs</b>	111	111	92	111	91	111
<b>Adj-<math>R^2</math></b>	0.33	0.33	0.30	0.39	0.31	0.33

Table 5: All countries, 1950-2000, controlling for GDP per capita and population

<i>Time period</i>	<b>1950-1975</b>					
<b>Openness</b>	0.0079 (2.26)	0.0077 (2.05)	0.0103 (3.15)	0.0111 (3.49)	0.0118 (3.20)	0.0069 (2.01)
<b>GDP per capita</b>	-0.0126 (-4.63)	-0.0137 (-2.08)	-0.0022 (-0.48)	-0.0092 (-3.73)	-0.0036 (-0.93)	-0.0046 (-1.27)
<b>Population</b>	-0.0045 (-2.63)	-0.0046 (-2.56)	-0.0029 (-1.81)	-0.0027 (-1.73)	-0.0006 (-0.31)	-0.0048 (-2.68)
<b>Investment</b>		0.0007 (0.20)				
<b>Human Capital</b>			-0.0027 (-1.81)			
<b>Inflation</b>				0.1368 (5.46)		
<b>FDI Inflow</b>					-0.0031 (-2.21)	
<b>Europe</b>						-0.0085 (-0.66)
<b>Africa</b>						0.0153 (1.15)
<b>Asia</b>						0.0144 (1.04)
<b>North America</b>						-0.0107 (-0.81)
<b>South America</b>						0.00043 (0.03)
<b>N-obs.</b>	111	111	92	111	91	111
<b>Adj-<math>R^2</math></b>	0.33	0.32	0.36	0.47	0.29	0.38

Table 6 All countries, 1950-1975, controlling for GDP per capita and population

<i>Time period</i>	<b>1975-2000</b>							
<b>Openness</b>	-0.0035 (-0.55)	-0.0066 (-1.00)	-0.0019 (-0.38)	-0.0034 (-0.54)	-0.0045 (-0.85)	-0.0007 (-0.14)	-0.0085 (-1.31)	-0.0043 (-0.58)
<b>GDP per capita</b>	-0.0161 (-5.86)	-0.0361 (-3.22)	-0.0181 (-3.91)	-0.0148 (-5.24)	-0.0154 (-4.05)	-0.0102 (-3.57)	-0.0129 (-4.56)	-0.0152 (-3.57)
<b>Population</b>	-0.0083 (-3.64)	-0.0095 (-4.05)	-0.0049 (-2.72)	-0.0078 (-3.46)	-0.0064 (-2.84)	-0.0042 (-2.19)	-0.0111 (-4.97)	-0.0085 (-3.15)
<b>Investment</b>		0.0148 (1.84)						
<b>Human Capital</b>			0.0025 (1.55)					
<b>Inflation</b>				0.0519 (1.66)				
<b>FDI Inflow</b>					0.0007 (0.44)			
<b>Export Index</b>						0.0288 (1.91)		
<b>Terms of Trade</b>							0.0005 (3.72)	
<b>Europe</b>								0.0080 (0.46)
<b>Africa</b>								0.0102 (0.58)
<b>Asia</b>								0.0093 (0.51)
<b>North America</b>								0.0042 (0.24)
<b>South America</b>								0.0072 (0.39)
<b>N-obs</b>	111	111	92	111	91	107	97	111
<b>Adj-<math>R^2</math></b>	0.30	0.32	0.28	0.31	0.32	0.33	0.41	0.27

Table 7: All countries, 1975-2000, controlling for GDP per capita and population



<i>Time Period</i>	<b>1950-2000</b>				
<b>Openness</b>	-0.0005 (-0.11)	0.00306 (0.40)	-0.0025 (-0.38)	0.0030 (0.67)	0.0033 (0.67)
<b>GDP per capita</b>	-0.0120 (-5.09)	-0.01222 (-3.70)	-0.0138 (-4.80)	-0.0122 (-5.42)	-0.0140 (-5.30)
<b>Population</b>	-0.0068 (-3.33)	-0.0057 (-2.11)	-0.0062 (-2.82)	-0.0055 (-3.11)	-0.007 (-3.12)
<b>Black Market Premium Av.</b>	0.00015 (3.46)				
<b>Black Market Premium Vol.</b>	-0.00003 (-3.24)				
<b>St. dev of Interest Rate</b>		0.00005 (0.40)			
<b>Foreign Debt</b>			4.47E - 16 (0.95)		
<b>Credit to Private Sector</b>				7.97E - 16 (0.76)	
<b>Liquid Liabilities</b>					0.000 (1.00)
<b>N-obs</b>	92	43	36	93	73
<b>Adj-<math>R^2</math></b>	0.37	0.33	0.44	0.34	0.36

Table 8: Financial proxies: all countries, 1950-2000, controlling for GDP per capita and population

<i>Time Period</i>	<b>1950-1975</b>				
<b>Openness</b>	0.0065 (1.56)	0.0019 (0.39)	-0.0074 (-1.30)	0.00891 (2.25)	0.0111 (2.38)
<b>GDP per capita</b>	-0.0113 (-3.66)	-0.0097 (-2.91)	-0.0173 (-4.29)	-0.0101 (-3.25)	-0.0094 (-2.56)
<b>Population</b>	-0.0047 (-2.12)	-0.0034 (-1.45)	-0.0091 (-3.53)	-0.0046 (-2.35)	-0.0049 (-1.85)
<b>Black Market Premium Av.</b>	-0.0000 (-0.50)				
<b>Black Market Premium Vol.</b>	8.84E - 06 (0.40)				
<b>St. dev of Interest Rate</b>		-0.0060 (-1.50)			
<b>Foreign Debt</b>			2.77E - 11 (0.94)		
<b>Credit to Private Sector</b>				2.04E - 14 (0.46)	
<b>Liquid Liabilities</b>					0.000 (1.08)
<b>N-obs</b>	92	43	36	93	73
<b>Adj-R<sup>2</sup></b>	0.25	0.32	0.40	0.28	0.25

Table 9: Financial proxies: all countries, 1950-1975, controlling for GDP per capita and population

<i>Time Period</i>	<b>1975-2000</b>				
<b>Openness</b>	-0.0034 (-0.56)	0.0068 (0.59)	0.0034 (0.48)	-0.0057 (-1.04)	-0.0065 (-1.12)
<b>GDP per capita</b>	-0.0120 (-4.73)	-0.0128 (-3.55)	-0.0127 (-5.17)	-0.0134 (-5.90)	-0.0160 (-6.20)
<b>Population</b>	-0.006 (-2.71)	-0.0064 (-1.83)	-0.0038 (-1.81)	-0.0071 (-3.53)	-0.0090 (-3.67)
<b>Black Market Premium Av.</b>	0.0001 (3.12)				
<b>Black Market Premium Vol.</b>	-0.00003 (-2.93)				
<b>St. dev of Interest Rate</b>		0.0001 (0.77)			
<b>Foreign Debt</b>			2.23E - 16 (0.61)		
<b>Credit to Private Sector</b>				1.72E - 16 (0.29)	
<b>Liquid Liabilities</b>					0.00002 (1.14)
<b>N-obs</b>	92	43	36	93	73
<b>Adj-<math>R^2</math></b>	0.32	0.30	0.44	0.33	0.40

Table 10: Financial proxies: all countries, 1975-2000, controlling for GDP per capita and population

## 8.2 Developed countries

<i>Time period</i>	<b>1950-1975</b>					
<b>Openness</b>	-0.0094 (-2.10)	-0.0094 (-2.06)	-0.0106 (-2.12)	-0.0036 (-0.89)	-0.0227 (-3.19)	-0.0064 (-1.54)
<b>GDP per capita</b>	-0.0108 (-1.34)	-0.0159 (-1.18)	-0.0065 (-0.59)	0.0000 (0.01)	-0.0079 (-0.91)	-0.0045 (-0.52)
<b>Population</b>	-0.0071 (-3.12)	-0.0069 (-2.89)	-0.0075 (-2.97)	-0.0037 (-1.68)	-0.0130 (-3.89)	-0.0065 (-3.14)
<b>Investment</b>		0.0050 (0.48)				
<b>Human Capital</b>			-0.0014 (-0.81)			
<b>Inflation</b>				0.1299 (3.25)		
<b>FDI Inflow</b>					0.0027 (1.46)	
<b>Europe</b>						-0.0079 (-1.04)
<b>Asia</b>						0.0110 (1.03)
<b>North America</b>						-0.0031 (-0.31)
<b>South America</b>						0.0095 (0.94)
<b>N-obs.</b>	25	25	23	25	21	25
<b>Adj-<math>R^2</math></b>	0.26	0.23	0.22	0.49	0.44	0.44

Table 11: Developed countries, 1950-1975, controlling for GDP per capita and population

<i>Time period</i>	<b>1975-2000</b>							
<b>Openness</b>	-0.0053 (-1.29)	-0.0041 (-0.97)	-0.0052 (-1.43)	-0.0014 (-0.31)	-0.0049 (-1.31)	-0.0038 (-0.98)	-0.006 (-1.30)	-0.0060 (-1.19)
<b>GDP per capita</b>	-0.0227 (-4.50)	-0.0065 (-0.47)	-0.0236 (-3.76)	-0.0201 (-3.91)	-0.0188 (-3.81)	-0.0154 (-2.81)	-0.0100 (-1.42)	-0.0151 (-2.32)
<b>Population</b>	-0.0064 (-3.91)	-0.0056 (-3.24)	-0.0054 (-3.97)	-0.0049 (-2.77)	-0.0055 (-3.57)	-0.0035 (-2.00)	-0.0081 (-4.31)	-0.0063 (-3.41)
<b>Investment</b>		-0.0121 (-1.25)						
<b>Human Capital</b>			0.0011 (0.86)					
<b>Inflation</b>				0.0868 (1.74)				
<b>FDI Inflow</b>					0.0000 (0.06)			
<b>Export Index</b>						0.0487 (2.91)		
<b>Terms of Trade</b>							0.00033 (2.69)	
<b>Europe</b>								0.0053 (0.50)
<b>Africa</b>								0.0201 (1.49)
<b>Asia</b>								0.0094 (0.74)
<b>North America</b>								0.0193 (1.59)
<b>South America</b>								0.0149 (1.14)
<b>N-obs</b>	44	44	40	44	37	43	34	44
<b>Adj-<math>R^2</math></b>	0.47	0.48	0.50	0.49	0.47	0.56	0.57	0.49

Table 12: Developed countries, 1975-2000, controlling for GDP per capita and population

<i>Time Period</i>	<b>1950-1975</b>				
<b>Openness</b>	-0.0087 (-1.37)	-0.0069 (-0.80)	-0.0137 (-1.76)	-0.0106 (-2.03)	-0.0068 (-1.48)
<b>GDP per capita</b>	-0.0074 (-0.72)	-0.0179 (-0.94)	-0.0223 (-1.41)	-0.0096 (-0.93)	-0.0183 (-1.93)
<b>Population</b>	-0.0066 (-0.87)	-0.0064 (-1.57)	-0.0094 (-2.35)	-0.0073 (-2.74)	-0.0078 (-3.78)
<b>Black Market Premium Av.</b>	0.00002 (0.39)				
<b>Black Market Premium Vol.</b>	0.00008 (0.56)				
<b>St. dev of Interest Rate</b>		0.0127 (1.08)			
<b>Foreign Debt</b>			9.77E - 10 (0.03)		
<b>Credit to Private Sector</b>				1.61E - 16 (0.01)	
<b>Liquid Liabilities</b>					3.42E - 06 (0.64)
<b>N-obs</b>	22	10	12	22	17
<b>Adj-<math>R^2</math></b>	0.09	-0.05	0.42	0.20	0.47

Table 13: Financial proxies: Developed countries, 1950-1975, controlling for GDP per capita and population

<i>Time Period</i>	<b>1975-2000</b>				
<b>Openness</b>	-0.0048 (-0.90)	0.0142 (0.62)	-0.0005 (-0.09)	-0.0059 (-1.18)	-0.0055 (-0.95)
<b>GDP per capita</b>	-0.0200 (-3.03)	-0.0364 (-2.31)	-0.0163 (-3.04)	-0.0237 (-3.88)	-0.0243 (-3.23)
<b>Population</b>	-0.0067 (-2.70)	-0.0034 (-0.61)	-0.0025 (-1.44)	-0.0067 (-3.62)	-0.0078 (-2.96)
<b>Black Market Premium Av.</b>	0.0003 (0.56)				
<b>Black Market Premium Vol.</b>	-0.0002 (-0.47)				
<b>St. dev of Interest Rate</b>		-0.0019 (-1.52)			
<b>Foreign Debt</b>			5.25E - 11 (0.24)		
<b>Credit to Private Sector</b>				1.03E - 15 (0.23)	
<b>Liquid Liabilities</b>					0.00001 (1.38)
<b>N-obs</b>	34	13	15	37	26
<b>Adj-R<sup>2</sup></b>	0.36	0.44	0.43	0.48	0.38

Table 14: Financial proxies: Developed countries, 1975-2000, controlling for GDP per capita and population

### 8.3 Less developed countries

<i>Time period</i>	<b>1950-1975</b>					
<b>Openness</b>	0.0119 (2.87)	0.0119 (2.66)	0.0140 (3.73)	0.0148 (4.00)	0.0149 (3.51)	-0.0069 (-0.55)
<b>GDP per capita</b>	-0.0122 (-2.73)	-0.0123 (-1.51)	-0.0007 (-0.12)	-0.0103 (-2.63)	-0.0002 (-0.04)	-0.0154 (-1.80)
<b>Population</b>	-0.0050 (-2.45)	-0.0050 (-2.31)	-0.0029 (-1.49)	-0.0035 (-1.95)	-0.0008 (-0.34)	-0.0149 (-3.42)
<b>Investment</b>		0.0001 (0.02)				
<b>Human Capital</b>			-0.0037 (-1.81)			
<b>Inflation</b>				0.1394 (4.95)		
<b>FDI Inflow</b>					-0.0029 (-1.74)	
<b>Europe</b>						0.0144 (0.66)
<b>Africa</b>						0.0189 (1.01)
<b>Asia</b>						0.0232 (1.17)
<b>North America</b>						-0.0082 (-0.43)
<b>South America</b>						0.0079 (0.39)
<b>N-obs.</b>	86	86	69	86	70	86
<b>Adj-<math>R^2</math></b>	0.26	0.25	0.31	0.42	0.21	0.32

Table 15: Less developed countries, 1950-1975, controlling for GDP per capita and population



<i>Time period</i>	<b>1975-2000</b>							
<b>Openness</b>	0.0036 (0.29)	-0.003 (-0.23)	0.0006 (0.06)	0.00102 (0.08)	-0.00203 (-0.18)	0.0084 (0.84)	-0.0092 (-0.81)	-0.0069 (-0.55)
<b>GDP per capita</b>	-0.0159 (-2.17)	-0.0408 (-2.47)	-0.0166 (-1.95)	-0.0148 (-2.01)	-0.0188 (-2.07)	-0.0123 (-2.02)	-0.0181 (-2.73)	-0.0154 (-1.80)
<b>Population</b>	-0.0091 (-2.44)	-0.0109 (-2.85)	-0.0045 (-1.37)	-0.0091 (-2.44)	-0.0075 (-1.46)	-0.0036 (-1.21)	-0.0130 (-3.83)	-0.0150 (-3.42)
<b>Investment</b>		0.0182 (1.67)						
<b>Human Capital</b>			0.0045 (1.55)					
<b>Inflation</b>				0.0423 (1.00)				
<b>FDI Inflow</b>					0.00189 (0.42)			
<b>Export Index</b>						0.0155 (0.71)		
<b>Terms of Trade</b>							0.0007 (3.15)	
<b>Europe</b>								0.1385 (3.09)
<b>Africa</b>								0.0153 (0.56)
<b>Asia</b>								0.0298 (1.00)
<b>North America</b>								-0.0007 (-0.03)
<b>South America</b>								0.0057 (0.19)
<b>N-obs</b>	67	67	52	67	54	64	63	67
<b>Adj-<math>R^2</math></b>	0.16	0.18	0.06	0.16	0.11	0.13	0.33	0.26

Table 16: Less developed countries, 1975-2000, controlling for GDP per capita and population

<i>Time Period</i>	<b>1950-1975</b>				
<b>Openness</b>	0.0103 (2.03)	0.0040 (0.66)	-0.0015 (-0.18)	0.0133 (2.84)	0.0140 (2.51)
<b>GDP per capita</b>	-0.009 (-1.85)	-0.0094 (-1.49)	-0.0224 (-2.26)	-0.0087 (-1.70)	-0.0094 (-1.39)
<b>Population</b>	-0.005 (-1.80)	-0.0036 (-1.15)	-0.0106 (-2.84)	-0.00505 (-2.10)	-0.0057 (-1.52)
<b>Black Market Premium Av.</b>	-0.00003 (-0.39)				
<b>Black Market Premium Vol.</b>	0.00001 (0.34)				
<b>St dev of Interest Rate</b>		-0.0063 (-1.32)			
<b>Foreign Debt</b>			4.86E - 11 (1.30)		
<b>Credit to Private Sector</b>				4.93E - 11 (1.22)	
<b>Liquid Liabilities</b>					0.00061 (0.53)
<b>N-obs</b>	70	33	24	71	56
<b>Adj-R<sup>2</sup></b>	0.16	0.19	0.22	0.20	0.16

Table 17: Financial proxies: Less developed countries, 1950-1975, controlling for GDP per capita and population

<i>Time Period</i>	<b>1975-2000</b>				
<b>Openness</b>	0.0103 (0.03)	0.0046 (0.33)	0.0116 (1.00)	-0.0024 (-0.24)	-0.0046 (-0.46)
<b>GDP per capita</b>	-0.0142 (-2.28)	-0.0183 (-2.20)	-0.0164 (-2.12)	-0.0155 (-2.65)	-0.0202 (-3.26)
<b>Population</b>	-0.0057 (-1.65)	-0.0074 (-1.60)	-0.0050 (-1.55)	-0.0066 (-1.91)	-0.0097 (-2.43)
<b>Black Market Premium Av.</b>	0.0001 (2.45)				
<b>Black Market Premium Vol.</b>	-0.00003 (-2.32)				
<b>St. dev of Interest Rate</b>		0.00013 (0.91)			
<b>Foreign Debt</b>			4.70E - 16 (0.94)		
<b>Credit to Private Sector</b>				2.75E - 16 (0.37)	
<b>Liquid Liabilities</b>					0.00003 (0.40)
<b>N-obs</b>	58	30	21	56	47
<b>Adj-<math>R^2</math></b>	0.14	0.17	0.23	0.12	0.24

Table 18: Financial proxies: Less developed countries, 1975-2000, controlling for GDP per capita and population

## 8.4 Government, Openness and Volatility

Sample	All countries			Rich countries			Poor countries		
Time Period	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Openness	0.0143 (3.39)	0.0146 (4.85)	0.0129 (2.27)	0.0094 (2.52)	0.00209 (0.70)	0.0047 (1.23)	0.0173 (2.53)	0.0172 (4.51)	0.0218 (1.96)
Government	-0.0106 (-3.54)	-0.007 (-2.75)	-0.0136 (-3.78)	-0.0166 (-2.99)	-0.005 (-1.02)	-0.0153 (-2.54)	-0.0031 (-0.59)	-0.0027 (-0.73)	-0.0055 (-0.78)
N-obs	111	111	111	40	25	44	71	86	67
Adj- $R^2$	0.16	0.23	0.12	0.25	-0.02	0.10	0.06	0.18	0.03

Table 19: Government, openness and volatility

Sample	All countries			Rich countries			Poor countries		
<i>Time Period</i>	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Openness	0.00182 (0.37)	0.00803 (2.27)	-0.0038 (-0.59)	-0.0020 (-0.47)	-0.0092 (-1.99)	-0.0065 (-1.62)	0.00456 (0.60)	0.0120 (2.88)	-0.0006 (-0.05)
GDP per capita	-0.0197 (-3.83)	-0.0151 (-3.18)	-0.0231 (-3.84)	-0.0144 (-1.82)	-0.0089 (-0.94)	-0.0162 (-2.78)	-0.0298 (-3.10)	-0.0151 (-2.44)	-0.0323 (-2.58)
Population	-0.0063 (-3.28)	-0.0044 (-2.53)	-0.0077 (-3.33)	-0.0065 (-3.47)	-0.007 (-2.99)	-0.0072 (-4.47)	-0.0062 (-2.22)	-0.0047 (-2.29)	-0.0082 (-2.22)
Government	0.0059 (1.05)	0.0028 (0.66)	0.0091 (1.30)	-0.0128 (-2.22)	-0.0020 (-0.41)	-0.0111 (-2.05)	0.0152 (1.87)	0.0036 (0.69)	0.0183 (1.61)
N-obs	111	111	111	40	25	44	71	86	67
Adj- $R^2$	0.33	0.32	0.31	0.51	0.23	0.51	0.23	0.26	0.18

Table 20: Government, openness and volatility, controlling for GDP per capita and population

<i>Time Period</i>	<b>1975-2000</b>					
<b>Openness (OPEN)</b>	-0.0049 (-1.06)	-0.0136 (-2.25)	-0.0058 (-1.17)	-0.0163 (-2.38)	-0.0053 (-1.12)	-0.0197 (-2.87)
<b>GDP per capita</b>	-0.0186 (-4.31)	-0.0177 (-4.16)	-0.0157 (-3.27)	-0.0158 (-3.35)	-0.0178 (-3.85)	-0.0183 (-4.09)
<b>Population</b>	-0.0074 (-4.47)	-0.0078 (-4.79)	-0.0048 (-2.69)	-0.0051 (-2.88)	-0.007 (-3.78)	-0.0081 (-4.31)
<b>Government</b>	0.0096 (1.95)	0.0085 (1.75)	0.0092 (1.76)	0.0074 (1.44)	0.0096 (1.94)	0.0074 (1.52)
<b>Terms of Trade (TOT)</b>	0.0004 (4.19)	-0.0004 (-0.18)			0.0004 (3.14)	0.0001 (0.44)
<b>Export Concentration Index (EXP)</b>			0.0375 (2.66)	-0.0056 (-0.23)	0.0078 (0.48)	-0.0397 (-1.60)
<b>TOT*OPEN</b>		7.79E - 06 (2.18)				5.66E - 06 (1.33)
<b>EXP*OPEN</b>				0.0005 (2.18)		0.0005 (1.77)
<b>N-obs</b>	94	94	94	94	94	94
<b>Adj-<math>R^2</math></b>	0.47	0.49	0.41	0.44	0.47	0.50

Table 21: All countries: Government, openness and proxies for risk

<i>Time Period</i>	<b>1975-2000</b>					
<b>Openness (OPEN)</b>	-0.0063 (-1.31)	-0.0133 (-2.65)	-0.0066 (-1.40)	-0.0155 (-2.67)	-0.0065 (-1.40)	-0.0172 (-2.97)
<b>GDP per capita</b>	-0.0094 (-1.27)	-0.0065 (-0.96)	-0.0096 (-1.34)	-0.0111 (-1.65)	-0.0073 (-1.01)	-0.0077 (-1.14)
<b>Population</b>	-0.0083 (-4.19)	-0.0079 (-4.45)	-0.0051 (-2.34)	-0.0046 (-2.27)	-0.0061 (-2.66)	-0.0065 (-2.89)
<b>Government</b>	-0.0020 (-0.28)	-0.0042 (-0.64)	-0.0075 (-1.19)	-0.0051 (-0.85)	-0.0033 (-0.48)	-0.0013 (-0.21)
<b>Terms of Trade (TOT)</b>	0.0003 (2.22)	-0.0009 (-0.45)			0.0002 (1.28)	0.0001 (0.33)
<b>Export Concentration Index (EXP)</b>			0.0484 (2.50)	-0.0152 (-0.47)	0.036 (1.68)	-0.0324 (-0.97)
<b>TOT*OPEN</b>		7.86E - 06 (2.72)				3.85E - 06 (0.98)
<b>EXP*OPEN</b>				0.0008 (2.34)		0.0006 (1.71)
<b>N-obs</b>	34	34	34	34	34	34
<b>Adj-<math>R^2</math></b>	0.56	0.64	0.57	0.63	0.58	0.65

Table 22: Developed countries: Government, openness and proxies for risk

<i>Time Period</i>	<b>1975-2000</b>					
<b>Openness (OPEN)</b>	-0.0060 (-0.76)	-0.0226 (-1.60)	-0.0070 (-0.82)	-0.0179 (-1.29)	-0.0062 (-0.74)	-0.0294 (-1.91)
<b>GDP per capita</b>	-0.0334 (-4.17)	-0.0332 (-4.18)	-0.0334 (-3.96)	-0.0323 (-3.81)	-0.0333 (-4.09)	-0.0323 (-3.96)
<b>Population</b>	-0.0071 (-2.95)	-0.0086 (-3.30)	-0.0043 (-1.76)	-0.0048 (-1.92)	-0.007 (-2.61)	-0.0093 (-3.05)
<b>Government</b>	0.0183 (2.55)	0.0190 (2.67)	0.0208 (2.79)	0.0193 (2.54)	0.0183 (2.51)	0.0165 (2.19)
<b>Terms of Trade (TOT)</b>	0.0004 (2.99)	-0.0003 (-0.58)			0.0004 (2.17)	0.00002 (0.03)
<b>Export Concentration Index (EXP)</b>			0.0352 (1.94)	0.0078 (0.24)	0.0014 (0.06)	-0.0424 (-1.08)
<b>TOT*OPEN</b>		0.00001 (1.42)				8.10E - 06 (0.79)
<b>EXP*OPEN</b>				0.0004 (1.00)		0.0005 (1.05)
<b>N-obs</b>	60	60	60	60	60	60
<b>Adj-<math>R^2</math></b>	0.40	0.41	0.34	0.34	0.38	0.40

Table 23: Less developed countries: Government, openness and proxies for risk