



**ISLANDS AND SMALL STATES INSTITUTE,  
UNIVERSITY OF MALTA, MSIDA, MALTA**

**OCCASIONAL PAPERS  
ON ISLANDS AND SMALL STATES**  
ISSN 1024-6282

Occasional Paper Number: 04/2016

---

## **TRADE OPENNESS AND VOLATILITY**

Name of Author/s: Lino Briguglio and Melchoir Vella

---

This is a discussion paper which the author/s submitted for feedback from interested persons. The author/s are free to submit a revised version of this paper for inclusion in other publications. An electronic version of this paper is available at [www.um.edu.mt/islands](http://www.um.edu.mt/islands). More information about the series of occasional paper can be obtained from the Islands and Small States Institute, University of Malta. Tel/Fax: 356-21344879, email: [islands@um.edu.mt](mailto:islands@um.edu.mt).

# TRADE OPENNESS AND VOLATILITY\*

---

**Lino Briguglio and Melchior Vella**  
**University of Malta**

## 1. INTRODUCTION

The objective of this presentation is to test whether trade openness leads to economic volatility, keeping other relevant things constant. This theme has been investigated in various studies, as we shall show in the literature review. However this particular study place the analysis within the vulnerability/ resilience framework, proposed by Briguglio et al. (2009).

One would expect that if a country depends highly on economic conditions in other countries, its economic situation will also be highly exposed to external shocks, possibly leading to GDP growth volatility in the country in question. Likewise, a high dependence on imports is likely to lead to a high degree of exposure to economic conditions in the rest of the world. There are other reasons why trade openness leads to GDP growth volatility - these will be discussed in the section on the literature on this matter.

The hypothesis to be tested in this paper is that GDP growth volatility depends on trade openness, on economic governance and on political governance of a given economy, the latter variable possibly proxying GDP per capita (the stage of development) and social governance<sup>1</sup> in the country concerned. The approach used to test this relationship is the regression method, using panel data.

This proposed relationship is an extension of the arguments put forward by Briguglio et. al (2009) and Briguglio (2016), where factors that lead to economic vulnerability were juxtaposed against factors that lead to economic resilience in order to assess the risk of a country being harmed by external shocks. These two studies were not based on regression analysis, but on observations of variables that lead to economic vulnerability and resilience, which enabled the authors to classify countries, in terms of the so-called vulnerability and resilience (V&R) framework. The present study attempts to statistically test this relationship using the regression method.

The confirmation of the hypothesis of this study may help to explain the so-called “small state paradox” referred to in Briguglio et al. (2009), meaning that highly-open economies can and do generate high GDP per capita in spite of the fact that openness, by itself, tends to generate volatility, which is often considered to be harmful to an economy.

---

\* The paper was presented at the 54th Annual Conference of the Philippine Economic Society held in Manila on 8th November 2016.

<sup>1</sup> The index of political governance used in this study, namely the Rule of Law which forms part of the Worldwide Governance Indicators, is highly correlated to GDP per capita. The education and health indicators, which form part of the Human Development Index, which Briguglio et al. used to measure social governance, are also highly correlated to GDP per capita.

The possibility that GDP growth volatility is influenced by economic, social and political governance, may also help to explain why some highly-open economies do not exhibit a high degree of GDP growth volatility, while economies which are not highly open to trade exhibit a high degree of volatility - the reason being that good economic and political and social may be conducive to the reduction of volatility.

The paper is organised in five sections as follows. Section 2, which follows this introduction, presents a brief literature review on the relationship between trade openness and GDP growth volatility. Section 3 explains the methodology utilised in this study to test the relationship between trade openness and GDP growth volatility, and presents the estimation results. The section also reports on some diagnostic tests relating to the validity of the results. Section 4 will conclude the study and puts forward a number of implications that are derived from the results presented in the previous section.

## **2. LITERATURE REVIEW**

This section is organised in five sub-sections on the following themes: (1) the opposing effects of trade openness (2) openness and economic volatility (3) openness and economic growth (4) the downsides of volatility and (5) equations to estimate the relationship between volatility and trade openness.

### **The opposing effects of trade openness**

Trade openness is often thought to bring real benefits, including improved productivity and enhanced variety of goods at lower cost to consumers. In addition, producers would be able to sell on world markets, thus earning more than if the same products were sold only on the domestic market (Jensen, 2004). In this sense, it may be argued that trade openness is conducive to economic growth, *ceteris paribus*.

However, trade openness is also thought to usher in GDP growth volatility, which is considered to be a downside. Di Giovanni & Levchenko (2009), when investigating the channels through which trade openness affects volatility, distinguished between different economic sectors, and argued that trade openness is likely to lead countries to increase the degree of specialization, implying a higher risk due to having too many eggs in one basket.

### **Openness and economic volatility**

Many authors associate openness with volatility, including Loayza & Raddatz (2007), Karras & Song (1996), Easterly & al. (2001), Di Giovanni & Levchenko (2006) and Krishna & Levchenko (2009). It will be shown later on in this literature review that GDP volatility is thought to likely harm growth.

Therefore, trade openness is often considered as good for GDP growth, but it also generates volatility which is thought to be bad for the economy. In the literature, one finds various papers that refer to these two opposing effects of openness. Easterly & Kraay (2000) refer to these tendencies when discussing small economies, which are often highly open to trade. These

authors argue that the positive and negative effects of openness may offset each other in the case of small states.

Some authors consider that export concentration exacerbates the effect on trade openness on volatility. This view is echoed by Haddad et al. (2010) who argue that export diversification (the obverse of concentration), both across products and markets, reduces growth volatility. The authors first discussed the mechanisms by which trade openness affects growth volatility, with one of the variables considered being export diversification indicators. They found evidence that export diversification reduces the effect of trade openness on growth volatility.

Various authors, while admitting that trade openness leads to GDP growth volatility, also acknowledge the importance of domestic factors in attenuating or exacerbating volatility, including governance, institutional frameworks and domestic economic policy. For example, Easterly et al. (2001) contend that output volatility, while being affected by external shocks, is also influenced by the manner in which the economy reacts to such shocks.

Acemoglu et al. (2003), Fatás & Mihov (2013), Gavin & Hausmann (1996), and Malik & Temple (2009) refer to the effect of the domestic institutional quality on volatility, including the possibility that openness leads to a higher risk of policy mismanagement if political institutions are weak, which, according to (Ahmed 2003) could intensify the negative effects of external shocks. On this matter see also Chang et al. (2009).

Some studies argue that the extent of volatility caused by trade openness depends on the stage of development. Abubaker (2015) found that trade openness increases output volatility, but countries with a higher level of development are affected to a lower extent in this regard. In the same vein, Jensen (2004) contends that GDP per capita has a significantly effect on income volatility. This may explain why particularly poor economies, like Least Developed Countries (LDCs), are also characterized by high income volatility, even though they do not tend to be characterized by particularly high levels of openness.

Some studies distinguish between different types of trade openness, arguing that some forms of openness are highly destabilising. Jackman (2014) investigated the relationship between tourism specialization and output volatility in a sample of 34 small island developing states (SIDS). The conclusion is that there appears to be a positive relationship between tourism and output volatility, and that the impact of tourism on economic volatility depends greatly on the level of volatility in tourism .

Dabla-Norris & Srivasal (2013) examine the impact of financial depth on macroeconomic volatility and find that financial depth could lead to a dampening of output volatility, but only up to a point. They find that at very high levels, such as those observed in many advanced economies, financial depth amplifies volatility. On this matter see also Tornell et al. (2003).

Jensen (2004) argues that this effect is increased if exports are concentrated in commodities, including oil, that are characterized by high price volatility. A similar view is also expressed in Koren & Tenreyro (2007), who argue that volatility is particularly intense when exports consist mainly or to a high degree of commodities, a characteristic of many developing countries.

A number of studies do not confirm the positive effects of openness to trade and volatility. A case in point is Cavallo (2007) who presents empirical evidence that suggests that, after appropriately accounting for the likely endogeneity of trade, the net effect of trade openness on output volatility is stabilizing. This view is echoed in Cavallo & Frankel (2008).

In the same vein, Bowdler & Malik (2005) argue that trade openness can reduce volatility through limiting recourse by shifting consumption and production towards goods for which the terms of trade are relatively stable. Hegerty (2014), likewise concludes that trade openness appears to be correlated with a reduction in output volatility for LDCs. Bejan (2005) argues that once one controls for government size and some measures of external risk, such as export concentration index, the effect of openness on the output volatility turns out to be negative.

Studies that associate openness with a lower degree of volatility also base their arguments on the possibility that international trade permits a country to better integrate into the world economy, further permitting the possibility of policy reforms that lead to stability.

### **Openness and economic growth**

Although, most studies conclude that trade openness generates GDP growth volatility, which is a downside, openness is generally found to be positively related to GDP growth. Studies that associate openness with growth often base their arguments on the possibility that international trade stimulates competitiveness, leading to increased productivity and innovation, improves resource allocation and lowers prices for consumers. Such an argument is proposed by Winters (2004); Easterly & Kraay (2000). Some studies show that the positive effect of trade openness on economic growth, is particularly possible with a conducive institutional framework (Dollar and Kraay, 2003)

Many studies show that the quality of institutions is an important consideration in assessing the effects of trade openness. Calderon & Fuentes (2006), for example, argue that countries with strong institutions receive the largest benefit of trade openness. Yanikkaya (2003), goes as far as to show that openness may actually not be good for growth. The author shows through his estimation that trade barriers are positively and significantly associated with growth, especially for developing countries.

Some authors, however, refer to the downside of trade openness in the short run, due to adjustment costs of trade openness, possibly leading to poverty and inequality (Goldberg & Pavcnik, 2004).

### **The downsides of volatility**

The arguments derived from the literature so far generally point out that while openness may be good for growth, (with a few dissenting voices), it also has negative effects by generating volatility. This leads to the question as to why volatility is undesirable.

There are various reasons for this, including that fluctuations can generate a welfare loss (Loayza

et al., 2007) through the negative effect of uncertainty (economic, political, and policy-related). This matter is also discussed in Montalbano (2011).

In addition, volatility ushers in a higher risk of policy failure and weak economic governance (Fatás & Mihov, 2005, Gavin & Hausmann, 1996, and Rodrik, 1999), including fiscal and monetary policies that intensify rather than calm the trade cycle.

Some authors argue that volatility tends to lead to lower growth (Ramey and Ramey, 1995), particularly on poor countries (Easterly et al., 2000). Hnatkovska & Loayza (2005) for example, estimate that a one standard-deviation increase in macroeconomic volatility results in an average loss of 1.3 percentage points in annual per capita GDP growth.

On the other side of the coin, Kose et al. (2004) found that trade openness appears to attenuate the negative growth-volatility relationship. Specifically, they find that the estimated coefficients on interactions between volatility and trade integration are significantly positive, suggesting that countries that are more open to trade appear to be able to tolerate higher volatility without hurting their long-term growth.

García-Herrero & Vilarrubia (2006) building upon the general consensus that followed the study by Ramey and Ramey (1995), namely that that the volatility of per capita GDP growth reduces growth, showed empirically that a moderate degree of volatility can be growth-enhancing, while very high volatility is clearly detrimental. These results point to the existence of a “Laffer curve” between volatility and growth.

Meschi and Vivarelli (2007) find that that of trade of developing countries with high income countries are destabilising as they worsen income distribution in these countries, both through imports and exports. This would seem to suggest that technological differentials between trading partners are important factors in explaining the affects of volatility that result from economic openness.

### **Equations used to estimate the relationship between volatility and trade openness.**

In the literature, the procedure used to estimate the relationship between openness and volatility is generally the regression method, often utilising panel data. GDP growth volatility is measured generally measured by the standard deviation of GDP growth,<sup>2</sup> and openness is generally measured as the average of exports and imports, as a ratio of GDP (e.g. Hadded & et. al., 2010).

The control variables utilised in the regression equations varied, as indicated in the preceding slides of this literature review, and included variables standing for policy and institutional frameworks, stage of development, export concentration, terms of trade, financial liberalisation, and geographical dummy variables.

---

<sup>2</sup> Various other methods of measuring volatility have been proposed (see Cariolle, 2012).

### 3. ESTIMATION RESULTS

To test the hypothesis that trade openness generates GDP growth volatility, we specified the following equation, using annual data for 172 countries spanning the years from 2010 to 2014

$$VLT_{i,t} = \alpha + \beta OPN_{i,t} + \chi EGV_{i,t} + \delta PGV_{i,t} + \varepsilon_{i,t} \quad (1)$$

where:

VLT is GDP growth volatility;

OPN refers to trade openness;

EGV refers to economic governance; and

PGV refers to political governance, possibly also capturing the stage of development.

The subscripts indicate that all variables refer to country  $i$  in year  $t$ . Further,  $\varepsilon_{i,t}$  is assumed to be normally distributed with mean 0 and constant variance.

The basic assumption underpinning Equation (1) is that GDP volatility is influenced by trade openness as well as by economic and political governance.

A priori, one expects that trade openness (OPN) has a positive effect on growth volatility. On the other hand good economic governance (EGV) and good political governance (PGV) have a negative effect on volatility, in that good governance could attenuate the effect of trade openness. Conversely, bad governance would exacerbate the affect of trade openness on volatility.

The estimation of Equation (1) was carried out using panel data, assuming fixed effects, following the application of the Hausman test for panel data estimation. This test decisively favours the use of “Fixed Effects” estimator over “Random Effects”.

The data covered a period of five years (2010 to 2014).

**Volatility (VLT)** is measured by the standard deviation of GDP growth rates, with a rolling window size of previous 10 years;

**Trade openness (OPN)** is measured as the average of imports and exports of goods and services as a ratio of GDP [(Exports + Imports)/2] /GDP). The data was sourced from the UNCTAD statistics.<sup>3</sup>

**Economic governance (EGV)** is measured by the average of two indices, namely (i) debt as a ratio of GDP and (ii) current account imbalances as a ratio of GDP. The data was sourced from the IMF World Economic Outlook database.<sup>4</sup> Following Briguglio et al. (2009) and Briguglio (2016), these indicators were chosen because they were thought to be policy induced and thus are closely related to economic governance. These two variables are intended to capture domestic

<sup>3</sup> Source: <http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx>

<sup>4</sup> Source: <http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/index.aspx>

balance (debt) and external balance (current account).

The debt ratio and the current account ratio observations were rescaled so that their values range from -0.5 to +0.5, so as to permit averaging these variables, which are individually measured in different scales and also to set threshold values between good and bad governance as will be explained below.

**Political governance** (PGV) was measured by the Rule of Law indicator of the so-called Kaufman Index, which ranges between -2.5 and +2.5, with higher values indicating improving governance.<sup>5</sup> This variable may also capture the stage of development, because this index is highly correlated to GDP per capita. Had we used the two variables separately we risked the chance of multicollinearity, given the high correlation between these two variables.

Using the available data for 172 countries<sup>6</sup>, the following estimation results were obtained:

$$\text{VLT} = 12.15 + 0.06 \text{ OPN} - 9.18 \text{ EGV} - 11.92 \text{ PGV}$$

*t statistics*    (3.91)                      (2.65)                      (-3.53)                      (-2.88)

R-squared = 0.83                      Number of observations = 860

The estimated parameters are in line with a priori expectations. The numbers in parentheses are the t-statistics and indicate that the estimates of the coefficient on the explanatory variables are statistically different from zero at the 95% level.

The results confirm that, keeping governance constant, trade openness does intensify GDP growth volatility. Nevertheless, this does not automatically imply that more open economies face a higher degree of growth volatility. Indeed, the regression results verify that well-managed economies could mitigate the effects of openness. In addition, the stage of development, measured by GDP per capita, could also be associated with a dampening of volatility, given that GDP per capita is closely correlated to political governance.

### **Categorising countries in terms of volatility**

Using the results of the estimated equation, one can assess what the effect on volatility would have been, had the openness factor been adjusted by a governance factor. Thus we have two possibilities, namely:

Equation (a): Volatility affected by openness, keeping the governance factor is constant:

$$\text{VLT} = 12.15 + 0.06 \text{ OPN}$$

Equation (b): Volatility affected by openness, with openness adjusted for the governance factor:

$$\text{VLT} = 12.15 + 0.06 \text{ OPN} - 9.18 \text{ EGV} - 11.92 \text{ PGV}$$

---

<sup>5</sup> Sourced from: <http://info.worldbank.org/governance/wgi/index.aspx#home> .

<sup>6</sup> The IMF database, from which the volatility data was sourced, contained 187 politically independent states. Sixteen countries were omitted due to missing data. These are Chad, Eritrea, Kosovo, Marshall Islands, Mongolia, Montenegro, Palau, Syria, Timor-Leste, Tonga, Turkmenistan, Cyprus, Kiribati, Liberia, Trinidad and Tobago.



As already explained, the rule of law indicator takes a value of between -2.5 and +2.5. In this study negative values of the Rule of Law indicator are considered as bad political governance, with higher negative values representing higher levels of bad governance, while positive values are considered as indicators of good governance, with higher positive values representing high levels of good governance. Thus the term for the Political Governance Index (PGV) will represent an intensification effect on volatility when it takes a negative value, and an attenuation effect on volatility when it takes a positive value, given that its estimated coefficient is negative.

The components of the Economic Governance Index (EGV), namely Debt/GDOP and Current Account/GDP, were rescaled to take a value of between -0.5 and +0.5 so as to permit averaging them and also to establish a cut-off value between good economic governance and bad economic governance.<sup>7</sup> The procedure used for this purpose is explained in Appendix 1.

The Debt/GDP component was considered as representing good economic if its value is 60% or lower, with lower values being taken as representing improving economic governance. Conversely, ratios higher than 60% were considered as associated with bad economic governance, with higher ratios being associated with deteriorating economic governance.<sup>8</sup> Thus 60% was set to equal zero, while values equal to or higher than 60% were rescaled to take values of between 0 and -0.5 and values equal to or lower than 60% were rescaled to take values of between 0 and 0.5.

The Current Account /GDP component was considered as being associated with good economic if its value was 0 or higher, with higher values representing improving economic governance.<sup>9</sup> Conversely, negative values of the ratio were associated with bad economic governance with higher negative ratios being associated with deteriorating economic governance. Thus positive and negative values of the ratio were rescaled to take a value of between +0.5 and -0.5.

In this way, the two components of EGV could be averaged. As was the case with PGV, the term for EGV will represent an intensification effect on volatility when it takes a negative value,

---

<sup>7</sup> The procedure used for rescaling the ratios is the following:

The usual Min-Max formula for rescaling variable X is expressed as:  $XRS_i = (X_i - X_{min}) / (X_{max} - X_{min})$ ,

Where:  $XRS_i$  is an array of rescaled values of observed values  $X_i$ ,  $X_{min}$  is the minimum value in the array of observations; and  $X_{max}$  is the maximum value in the same array. This formula rescales all the observed values within a range of 0 ( $XRS_{min}$ ) and 1 ( $XRS_{max}$ ).

It can be shown that if the range of values is to be rescaled to other pre-set minimum and maximum values, which may be different from 0 and 1, the following formula can be used:  $YRS_i = [XRS_i (Y_{max} - Y_{min})] + Y_{min}$

Where:  $YRS_i$  is the rescaled variable taking a value of between a pre-set  $Y_{max}$  (e.g. 0.5) and a pre-set  $Y_{min}$  (e.g. -0.5).

<sup>8</sup> A debt-to-GDP ratio of 60% is considered as a prudential limit for the EU member states, and a higher ratio is considered to be fiscally unsustainable. However there is considerable debate on this threshold value of the Debt/GDP ratio (see Chowdhury & Islam, 2014).

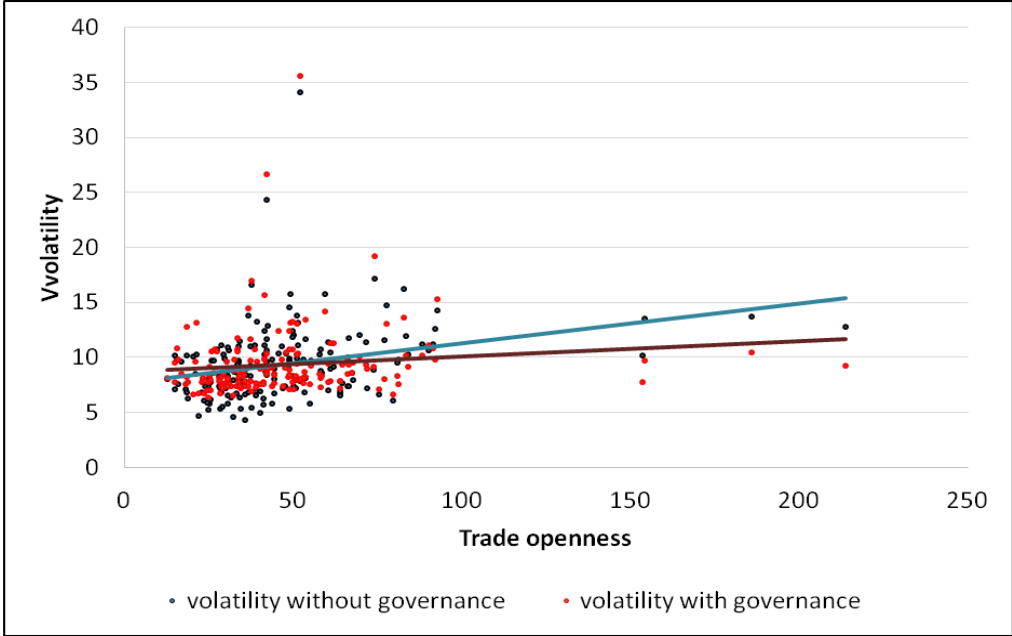
<sup>9</sup> Although a current account surplus is not generally considered as being a major problem, it is questionable whether such a surplus is a sign of good governance, as such a situation may signify that a country could improve its standard of living, by, for example, stimulating demand and encouraging imports. In addition, a current account surplus may push up the exchange rate of a floating domestic currency. On the other hand, a current account deficit may be an indication that a country is living beyond its means, and therefore not sustainably. In addition, a deficit reflects relatively lower national savings in relation to investment. On this issue see Ghosh and Ramakrishnan (2006).

and an attenuation effect on volatility when it takes a positive value, given that its estimated coefficient is negative.

It should be noted that these arbitrary cut-off points do not affect the sign of the coefficients and the statistical significance of the regression results once the relative distance between different observations of a variable remain the same. The regression result implying that improved governance will have a negative effect on volatility will remain. These cut-off points are however useful to decide when governance has a negative, neutral or positive effect on volatility.

Using the values just described, we constructed two scatter diagrams based on equation (a) and equation (b) as shown in the following figure.

**Figure 1: The effect of governance on volatility**



The figure shows that most countries with high openness scores registered lower volatility as a result of the inclusion of the governance effect. This would seem to suggest that many highly trade-open countries, have attenuated the effect of openness on volatility. These include most small island developing states. On the other hand, the governance factor has exacerbated volatility in the case of many countries with a low degree of trade openness.

It should be emphasised that the point of intersection depends on the cut off values between good and bad governance that were assumed in rescaling the variables representing economic governance (EGV) and political governance (PGV). Irrespective of these cut-off values, however, our results indicate that good governance is likely to attenuate the effect of trade openness on volatility.

#### **4. CONCLUSIONS AND IMPLICATIONS**

This study has tested the relationship between trade openness and GDP growth volatility, using a sample of 172 countries, and keeping other relevant variables constant.

The regression equation was kept as simple as possible, reflecting the possibility that GDP growth volatility is influenced by trade openness, economic governance and political governance, the latter variable also proxying the stage of development.

The panel data analysis, convincingly shows that openness does lead to economic growth volatility, but good governance could attenuate and even reverse this effect.

The main implication of these results is that countries that are highly dependent on international trade, including most small states, would be exposed to GDP growth volatility, which has various downsides, as explained in the literature review.

However, it does not necessary follow that highly trade-open economies - small states in particular - are the ones that experience the highest degree of GDP growth volatility, if these countries adopt appropriate policies to attenuate the effect of openness on volatility. In other words it is possibly that highly-open economies do not exhibit a high degree of GDP growth volatility, while economies which are not highly trade-open may exhibit a high degree of volatility - the reason being that good economic and political governance may be conducive to the reduction of such volatility.

The major implication that can be derived from this study is that highly trade-open countries, in particular small states, are those countries which mostly need to adopt good economic, social and political governance, if they are to counteract growth volatility, with all its downsides.

This is in line with the vulnerability/resilience framework, proposed in Briguglio et al. (2009) and Briguglio (2016), where factors that lead to economic vulnerability were juxtaposed against factors that lead to economic resilience in order to assess the risk of a country being harmed by external shocks. This framework was used to show that small economically vulnerable states, can, and do, adopt policies that enable them to withstand the downsides of economic vulnerability.

#### **REFERENCES**

- Abubaker, R. (2015). The asymmetric impact of trade openness on output volatility, *Empirical Economics* Volume 49 (3): 881–887. <http://link.springer.com/article/10.1007/s00181-014-0899-2>
- Acemoglu, D., S. Johnson, J. Robinson, & Y. Thaicharoen (2003). 'Institutional Causes, Macroeconomic Symptoms: Volatility, Crises and Growth', *Journal of Monetary Economics*, 5(1): 49-123  
[http://dev.wcfia.harvard.edu/sites/default/files/903\\_\\_jr\\_JMEpublishedversion.pdf](http://dev.wcfia.harvard.edu/sites/default/files/903__jr_JMEpublishedversion.pdf)

- Ahmed, Shaghil (2003). “Sources of Economic Fluctuations in Latin America and Implications for Choice of Exchange Rate Regimes”. *Journal of Development Economics* 72(1) (October): 181–202 . <http://www.federalreserve.gov/PubS/ifdp/1999/656/ifdp656.pdf>
- Bejan Maria (2006). Trade Openness and Output Volatility Maria Bejan ITAM (Instituto Tecnológico Autónomo de México) . [https://mpra.ub.uni-muenchen.de/2759/1/MPRA\\_paper\\_2759.pdf](https://mpra.ub.uni-muenchen.de/2759/1/MPRA_paper_2759.pdf)
- Bowdler, C. and Malik, A. (2005), Openness and inflation volatility: Panel data evidence. <https://www.nuffield.ox.ac.uk/economics/papers/2005/w14/maydraft2.pdf>.
- Briguglio (2016). Exposure to external shocks and economic resilience of countries: evidence from global indicators. *Journal of Economic Studies*, Vol. 43(6) <http://www.emeraldinsight.com/doi/pdfplus/10.1108/JES-12-2014-0203>
- Briguglio, L., Cordina, G., Farrugia, N. and Vella, S. (2009). 'Economic Vulnerability and Resilience: Concepts and Measurements', *Oxford Development Studies*, Vol. 37(3): 229-247. <http://www.tandfonline.com/doi/abs/10.1080/13600810903089893> .
- Calderon, C. & Fuentes, R. (2006) Complementarities between Institutions and Openness in Economic Development: Evidence for a Panel of Countries. *Cuadernos de Economía*, Vol. 43:49-80, 2006 [http://www.scielo.cl/scielo.php?pid=S0717-68212006000100002&script=sci\\_arttext&tlng=en](http://www.scielo.cl/scielo.php?pid=S0717-68212006000100002&script=sci_arttext&tlng=en) .
- Cariolle, J.(2012). Measuring macroeconomic volatility: applications to export revenue data, 1970-2005. FERDI working paper n°I14. ClermontFerrand, France: FERDI. Available at: [http://www.ferdi.fr/sites/www.ferdi.fr/files/idi/I14\\_eng.pdf](http://www.ferdi.fr/sites/www.ferdi.fr/files/idi/I14_eng.pdf) .
- Cavallo (2007). Output Volatility and Openness to Trade: A Reassessment1 Eduardo A. Cavallo Inter-American Development Bank August 2007 . <http://www.iadb.org/res/publications/pubfiles/pubWP-604.pdf>
- Cavallo, E.A., & Frankel., J.A. (2008). Does openness to trade make countries more vulnerable to sudden stops, or less? using gravity to establish causality. *Journal of International Money and Finance*, 27(8), 1430-1452. <https://core.ac.uk/download/pdf/6441476.pdf>
- Calderón, C. & Schmidt-Hebbel, K. (2008). Openness and growth volatility. Central Bank of Chile, Working Papers N° 483. file:///C:/Users/User/Downloads/Dialnet-OpennessAndGrowthVolatility-2870626.pdf
- Chang, R., Kaltani, L., & Loayza, N. V. (2009). Openness can be good for growth: The role of policy complementarities. *Journal of Development Economics*, 90(1), 33-49. <http://dx.doi.org/10.1016/j.jdeveco.2008.06.011>
- Chowdhury, A. & Islam, I. (2014). *Is there an optimal debt-to-GDP ratio?* VOX CEPR's Policy Portal. Available at: <http://voxeu.org/debates/commentaries/there-optimal-debt-gdp-ratio>.
- Dabla-Norris, E. and Srivisal, N. (2013). Revisiting the Link Between Finance and Macroeconomic Volatility <https://www.imf.org/external/pubs/ft/wp/2013/wp1329.pdf>
- di Giovanni, J.& Levchenko, A. (2009). “Trade Openness and Volatility”. *Review of Economics and Statistics*. Vol. 91(3) (August): 558–585. [http://www.alevchenko.com/JAvol\\_19Nov07.pdf](http://www.alevchenko.com/JAvol_19Nov07.pdf)
- Dollar, D., & Kraay, A. (2003). Institutions, trade, and growth. *Journal of Monetary Economics*, Vol.50(1): 133-162. [file:///C:/Users/User/Downloads/Institutions,Trade\\_and\\_Growth\[1\]%20\(1\).pdf](file:///C:/Users/User/Downloads/Institutions,Trade_and_Growth[1]%20(1).pdf)
- Easterly, W. and Kraay, A. (2000). small States, Small Problems? Income, Growth, and Volatility in Small States. *World Development* Vol. 28 (11): 2013-2027.

- [https://williameasterly.files.wordpress.com/2010/08/25\\_easterly\\_kraay\\_smallstatesmallproblems\\_prp.pdf](https://williameasterly.files.wordpress.com/2010/08/25_easterly_kraay_smallstatesmallproblems_prp.pdf)
- Easterly, W., Islam, R. & Stiglitz, J.E. (2001). "Shaken and Stirred: Explaining growth volatility." <http://www.rrojasdatabank.info/wbdevecon00-12.pdf>
- Fatas, A. & Mihov, I. (2013). Policy Volatility, Institutions and Economic Growth. *Review of Economics and Statistics* Vol. 45(2): 362-376  
<http://faculty.insead.edu/fatas/volgrowth.pdf>
- García-Herrero, A. & Vilarrubia, J. (2006). The Laffer curve of macroeconomic volatility and growth: can it be explained by the different nature of crises? Paper prepared by A. García-Herrero and J. Vilarrubia presented at the XI Meeting of the Network of America Central Bank Researchers hosted by Banco Central de la República Argentina, in Buenos Aires, November 22-24, 2006.  
[http://www.bis.org/repofficepubl/arpresearch\\_fs\\_200706.02.pdf](http://www.bis.org/repofficepubl/arpresearch_fs_200706.02.pdf)
- Gavin, M. and Hausmann, R. (1996). Macroeconomic Volatility and Economic Development in The Political Dimension of Economic Growth, Part of the series International Economic Association Series: 97-116. [http://link.springer.com/chapter/10.1007/978-1-349-26284-7\\_5](http://link.springer.com/chapter/10.1007/978-1-349-26284-7_5)
- Goldberg, P.J. & Pavcnik, N. (2004). Trade, inequality, and poverty: what do we know? Evidence from recent trade liberalization episodes in developing countries. NBER Working Paper 10593 "Growth Volatility". In Boris Pleskovic & Nicholas H. Stern (editors), Annual World Bank Conference on Development Economics, volume 2000, pp. 191–211. Washington, DC: The World Bank.  
<https://core.ac.uk/download/pdf/6880972.pdf>
- Ghosh, A. & Ramakrishnan, U. (2006). "Current Account Deficits: Is There a Problem?" *Finance & Development*. Vol.43 (4). Available at:  
<http://www.imf.org/external/pubs/ft/fandd/2006/12/basics.htm>
- Haddad, M., Lim, J.J. & Saborawski, C. (2010). Trade Openness Reduces Growth Volatility When Countries are Well Diversified World Bank Policy Research Working Paper No. 5222 . [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1565983](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1565983)
- Hegerty, S. W. (2014) Openness and Macroeconomic Volatility: Do Development Factors Drive Such Ambiguous Results? <http://www.omicsgroup.org/journals/openness-and-macroeconomic-volatility-do-development-factors-drive-such-ambiguous-results-2168-9458-3-136.php?aid=36386>
- Hnatkovska, V. and Loayza, N. (2005). "Volatility and growth". In Managing economic volatility and crises, Aizenmann, J. and Pinto, B.(eds). Cambridge: Cambridge University Press.  
<http://documents.worldbank.org/curated/en/154121468765320854/pdf/WPS3184.pdf>
- Jackman, M. (2014). Output volatility and tourism specialization in small island developing states. *Tourism Economics*, 20(3), 527-544.  
<http://teu.sagepub.com/content/20/3/527.abstract>
- Jensen, M. (2004) Income volatility in small and developing economies: export concentration matters. WTO. [https://www.wto.org/english/res\\_e/booksp\\_e/discussion\\_papers3\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/discussion_papers3_e.pdf)
- Karras, G. & Song, F. (1996). Sources of business-cycle volatility: An exploratory study on a sample of OECD countries. *Journal of Macroeconomics*. Volume 18(4): 621-637  
<http://www.sciencedirect.com/science/article/pii/S0164070496800553>

- Koren, M. & Tenreyro S. Volatility and Development . The Quarterly Journal of Economics, Vol. 122 (1): 243-287. <http://personal.lse.ac.uk/tenreyro/volatilitydev.pdf>
- Kose, M.A., E. Prasad & M. Terrones (2004). "How Do Trade and Financial Integration Affect the Relationship Between Growth and Volatility?" Washington, DC, United States: International Monetary Fund. Mimeographed document.  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.468.3552&rep=rep1&type=pdf>
- Krishna, P & Levchenko, A (2009). Comparative Advantage, Complexity and Volatility. NBER Working Paper No. 14965. <http://www.alevchenko.com/w14965.pdf>
- Loayza, N. V. , Ranciere, N. and Serven, L. And Ventura, j. () Macroeconomic Volatility and Welfare in Developing Countries: An Introduction. The World Bank Economic Review, VOL. 21(3): 343–357. <http://romainranciere.com/research/WBER.pdf>
- Loayza, N.V. & Raddatz, C. (2007) The Structural Determinants of External Vulnerability The Structural Determinants of External Vulnerability . The World Bank Economic Review, VoL. 21 (3): 359 –387 .  
<http://documents.worldbank.org/curated/en/641521468336280437/pdf/775550JRN02007Ouctural0Determinants.pdf>
- Malik, A. & and Temple, J. (2009). The geography of output volatility Journal of Development Economics, 2009, vol. 90, issue 2, pages 163-178.  
<http://www.sciencedirect.com/science/article/pii/S0304387808001053>
- Meschi, E. & Vivarelli, M. (2007) Trade openness and income inequality in developing countries. Working Paper. Coventry: University of Warwick. Centre for the Study of Globalisation and Regionalisation. Working papers (University of Warwick. Centre for the Study of Globalisation and Regionalisation) (No.232).  
<http://www2.warwick.ac.uk/fac/soc/pais/research/researchcentres/csgr/papers/workingpapers/2007/wp23207.pdf>
- Montalbano, P.L. (2011); Trade Openness and Developing Countries' Vulnerability: Concepts, Misconceptions, and Directions for Research. World Development, Vol. 39 (9): 1489–1502.  
<http://www.sciencedirect.com/ejournals.um.edu/mt/science/article/pii/S0305750X11000283>
- Ramey, G., Ramey, V., 1995. "Cross-Country Evidence on the Link Between Volatility and Growth," The American Economic Review, Vo. 85, No. 5, pp. 1138–1151
- Rodrik, D. (1999). Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses. Journal of Economic Growth, Vol. 4 (4): 385–412.  
<http://link.springer.com/article/10.1023/A:1009863208706> .
- Tornell, A., Westermann, F., Martinez, L.: "Liberalization, Growth and Financial Crises: Lessons from Mexico and the Developing World", Brookings Papers on Economic Activity No. 2 (2003). <https://muse.jhu.edu/article/51245/summary>
- Winters, L. A. (2004). Trade liberalisation and economic performance: An overview The Economic Journal, vol. 114: pp. F4–F21.  
<http://onlinelibrary.wiley.com/doi/10.1111/j.0013-0133.2004.00185.x/abstract>
- Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. Journal of Development economics, 72(1), 57-89.  
[https://www.researchgate.net/profile/Halit\\_Yanikkaya/publication/222566984\\_Trade\\_openness\\_and\\_economic\\_growth\\_a\\_cross-country\\_empirical\\_investigation/links/00b495395771495af0000000.pdf](https://www.researchgate.net/profile/Halit_Yanikkaya/publication/222566984_Trade_openness_and_economic_growth_a_cross-country_empirical_investigation/links/00b495395771495af0000000.pdf)

