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The Role of Capital Controls in Mediating Global Shocks

Kerli Lille*

Abstract

This paper studies the role of capital controls in the transmission of global commodity price shocks in explaining the variation of domestic business cycles in 89 countries for the period 1995–2013. The results suggest that countries that are relatively open or closed have lower variance in output, consumption and investments explained by global shocks than those countries that have partially liberalised capital markets. On the contrary, relatively closed and open economies have a much higher share of the trade balance to output ratio volatility explained than partially liberalised countries. This pattern is independent of the level of economic development or geographical region. The results show that a partial liberalisation of the capital account might make countries more vulnerable to world shocks, than opening and closing the capital account completely.

JEL Classification: F3; F38; F45; C51

Keywords: World Shocks, Capital Controls, Capital Account Liberalisation

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1. INTRODUCTION

The discussion of imposing capital control has been re-opened since the Great Recession. After a period of strong moves against financial market liberalisation when controls were argued to limit economic progress and efficiency, they are again considered to be a useful policy tool. Capital controls can help stabilise the domestic economy against world shocks, and are seen as a protective measure, especially against large capital inflows generating booms as well as outflows during crises. Therefore, an understanding of the international environment and the effects of different control mechanisms are essential for policymakers to integrate the expected impact that world shocks have on the domestic economy and monetary and fiscal policy decisions.

This paper investigates the role of capital controls in the transmission mechanism process from world commodity price shocks to domestic business cycles. More specifically, I focus on the prices of agricultural commodities, metals and minerals, and fuels, to analyse their effect on macroeconomic variables like output, consumption, investment and the trade balance to output ratio. Commodity markets are a prime example of international trade, and prices reflect developments in the world economy. Dividing sample countries into three capital control categories makes it possible to track differences in financial liberalisation and draw comparisons between countries with more open and closed capital accounts. Furthermore, studying the results in different categories like income groups, commodity and net exporters and importers, allows to determine the possible patterns of capital controls in explaining world shocks in domestic markets.

I set the following hypotheses coming from macroeconomic theory, that opening capital accounts should: increase output volatility, decrease the volatility of consumption through higher consumption smoothing, raise investment volatility and make the trade balance less stable. The share of volatility created by world shocks should increase as countries open up their capital accounts. From a theoretical perspective, a higher degree of capital mobility is expected to enhance specialisation in goods that countries have comparative advantage in. This makes output more volatile, as well as investment, because opening capital accounts provides better investment opportunities, making it possible to diversify country-specific productivity shocks. In closed economies output fluctuations have an immediate effect on consumption, while opening capital accounts offer a country the possibility to smooth its consumption using the capital from international markets (Razin and Rose 1992).

The approach of the paper is close to the analysis of Fernandez, Schmitt-Grohe and Uribe (2016), who study the shares of variances that global shocks generate in domestic business cycles. The novelty of the paper is the combination of strands of literature and investigation of the role capital controls play in mediating the effects of global shocks to domestic business cycles through commodity prices. The literature has not previously considered capital controls in the transmission process of world shocks, neither has it looked at capital account liberalisation from the perspective of global shocks. Therefore, the aim of this paper is to understand the extent to which multiple commodity prices mediate the effects of global shocks to domestic business cycles. This paper uses the capital control indices from the International Monetary Fund's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). The paper divides countries into three categories based on Klein (2012) as follows: Open, Gate and Wall. This makes it possible to investigate the connection between financial liberalisation and the transmission of global shocks.

Several findings emerge from this paper. Firstly, the main conclusion is that capital controls have a role in mediating global shocks to domestic business cycles. The shares of output

variances explained by global shocks in countries with strong capital control are smaller than in countries that have liberalised their capital accounts either partly or fully. However, the relationship is not linear; Gate countries that have partially liberalised their financial markets are the most influenced by international shocks in output. Second, the closed Wall group manages to be protected from the consumption volatility generated by world shocks only to a certain extent. Partly liberalised countries are affected the most, as the share of variance coming from world fluctuations is the largest. Third, contrary to expected results, the share of world shocks explaining trade balance volatility is the highest in the Wall group that should be in theory be more protected from world shocks. Moreover, the absolute volatility of the trade balance is also the highest in the Wall group. The fourth result of this paper is that among both commodity and oil exporting countries, world shocks explain almost twice as much of the variance in business cycles in output and consumption, whereas in Open countries, world shocks explain a higher share of variance in trade balance to output ratio. Lastly, the data show clearly that capital controls are used more in countries that have lower income and are still considered developing countries. This is supported by earlier results in which the literature suggests that countries with lower income levels should liberalise their capital accounts after reaching a certain level of institutional and financial development; therefore, it makes sense that capital controls are less in place among lower income groups.

The identification of the effect relies on the assumption that the extent of capital controls introduced is exogenous to business cycle developments and to the share of world shocks explaining domestic variables. It is possible that only the countries that are not sensitive to world shocks open up their capital accounts completely, and therefore self-select in the Open group. In part, the result that the Wall countries are relatively more volatile than Gate and Open countries could reflect this, but an analysis according to a different level of development and various groups shows the main results are not sensitive to observable differences. Financial market liberalisation was strongly suggested to all countries by the International Monetary Fund, alleviating the concerns that countries self-selected to liberalise. Many papers have also shown that capital controls are exogenously decided and do not depend on the business cycle (IMF 2012).

Earlier literature has found that the world interest rate and terms of trade shocks are the main drivers of business cycles in small open economies. For example, Lubik and Teo (2005) found that the world interest rate and terms of trade shocks constitute together a wide range – from 10% to 90% – of output fluctuation. Whereas Blankenau *et al*. (2001) estimate the share to be much smaller, saying that around one-third of changes in output are explained by the world interest rate. The estimates differ so vastly because of the method; dynamic stochastic general equilibrium (DSGE) methods tend to have larger intervals, whereas vector autoregression (VAR) models give more exact answers. Cross and Nquyen (2016) focused on the effect of global oil price shocks and found that the impacts on China's output are small and temporary.

Similarly, there are different views on capital controls; economists have even used different measures of capital controls to study capital accounts. Some rely on the International Monetary Fund's (IMF) Annual Report in Exchange Arrangements and Exchange Restrictions (AREAER); the others construct their own indicator. Calderon *et al.* (2005) concluded after studying the relationship between international integration and a country's external vulnerability that opening capital accounts promises higher growth and the effect is even stronger when the financial system is stable. Klein and Olivei (1999) also find the positive effect of financial liberalisation only among industrialised countries. There are also researchers that find little evidence in favour of financially open countries having higher growth prospects (Stiglitz 2000, Rodrik 1998, Kraay 1998). They even do not support the

arguments that the institutional background of a country helps to realise more beneficial effects for a country.

The paper is structured as follows: Section 2 gives an overview of the relevant literature. Section 3 introduces the method used for analysing, while section 4 describes the data. Section 5 shows and discusses the results of the analysis, while section 6 concludes and summarizes the paper.

2. LITERATURE REVIEW

This section gives a short summary of the literature to place the paper in the broader context and help understand the results. As the paper discusses the role of capital controls in mediating the effects of global macroeconomic shocks to domestic business cycles, the literature review describes possible transmission channels of world shocks to domestic economies and analyses the role and essence of capital controls. I will first give a general overview of the literature on the importance of the international transmission of shocks and continue with papers that study the role of capital controls and the positive and negative effects of capital account liberalisation on the economy.

2.1. International transmission of shocks

Earlier papers have for years attempted to find out the main drivers of business cycles and the list of drivers continues to grow, and includes, for example, productivity shocks, shocks to terms of trade and to preferences, monetary and fiscal shocks or commodity price shocks. Estimating the contribution of the shocks to domestic business cycles has meant that a lot of researchers believe the main drivers are terms of trade and interest rate shocks, whereas the exact contribution of the shock varies strongly across different studies and even depends on the econometric method used when conducting a survey. The most used econometric methods for analysing the effects of international shocks on domestic business cycles are DSGE, VAR together with its different extensions, for example, structural VAR (SVAR[1]) or factor augmented VAR (FAVAR) or even a combination of VAR and DSGE.

Mendoza (1991) conducted the first survey using a calibrated DSGE model to study Canada's business cycle regularities from 1946 to 1985, where he concluded that exogenous shocks follow fluctuations in productivity or terms of trade. The latter was pointed out as an appealing topic for future research, as this model provides a framework for studying the business cycles arising from terms of trade shocks. Mendoza (1995) himself focused on the relationship between terms of trade and business cycles in seven largest industrialised countries (G7) from 1995 until 1990 and 23 developing countries between 1960 and 1990. The model in this case captures the transmission mechanisms of terms of trade shocks through international capital mobility, overall purchasing power of exports and the cost of imported inputs. Mendoza (1995) concludes that the terms of trade shocks are persistent, weakly procyclical and account for about half of the observed variability of GDP and the real exchange rate.

Kose and Riezman (1999) came to the same conclusion among developing countries. After constructing a DSGE model reflecting the structural characteristics of 20 non-oil exporting African countries from 1970 to 1990, they found that almost 45% of the fluctuations in aggregate GDP is explained by trade shocks, whereas financial shocks only play a minor role and world interest rate fluctuations have no significant impact on economic dynamics. By

[1] SVAR – Structural vector autoregression method by adding economic restrictions to an otherwise statistical modelling method in order to identify the exact sources of macroeconomic fluctuations; the method was proposed by Blanchard and Quah (1989)

contrast, Blankenau *et al.* (2001), using DSGE models based on Canadian dataset from 1960–1996, show that world interest rate shocks have an important role in explaining up to one-third of the changes in GDP.

These papers obtained very different results – both terms of trade and world interest rate shocks can account for varying amounts of the fluctuations in small open economies. This then motivated Lubik and Teo (2005) to use Bayesian methods to estimate DSGE models in 5 countries with different backgrounds – Australia (1978–2004), Canada (1981–2004), New Zealand (1987–2004), Mexico and Chile (both 1996–2004). They found that world interest rate shocks are the main drivers of business cycles in small open economies, the mean levels of the contribution of world interest rate shocks to output fluctuations range from 40% to 75%, whereas terms of trade shocks have a very small contribution, explaining less than 3% of output movements.

Hoffmaister and Roldos (1997) approach this topic using the SVAR method. They found that from 1970 to 1991 the terms of trade shocks explained around 7% of the fluctuations in output among 15 Asian and 17 Latin American countries. In history, the macroeconomic fluctuations in developing countries are similar, especially between Latin America and Sub-Saharan Africa. Therefore, Hoffmaister *et al.* (1998) used the same method in estimating the effect of trade shocks on 23 countries from Sub-Saharan Africa from 1971 to 1993 and found the terms of trade shocks are estimated to explain a slightly higher share, 16% of the fluctuations in output. In analysing the differences with Mendoza's (1991) findings, they explained that the vast differences may come from the fact that Mendoza does not allow for domestic demand shocks and world interest rate shocks, which forces terms of trade shocks to pick up the effect of these shocks, especially world interest rates (Hoffmaister and Roldos 1997).

Changes in the prices of different commodities, like oil or food, can also greatly affect domestic business cycles. Cross and Nguyen (2016) study the effect of global oil price shocks on China's output over the period from 1992 to 2015 and find in their analysis using VAR that the impacts of intertemporal global oil price shocks on China's output are small and temporary. Oil supply together with specific oil demand shocks generally produce negative movements in China's GDP growth, whilst oil demand shocks tend to have positive effects. Rapsomanikis and Mugera (2011) focus on the changes in food prices in developing markets (Ethiopia, India and Malawi), their results point out that short-run adjustments to world price changes are incomplete while volatility spillovers are significant only during periods of extreme world market volatility, but this extreme volatility is due to domestic rather than world market shocks. Gubler and Hertweck (2013) studied using SVAR the business cycles in the U.S and concluded that commodity price shocks play an important role in explaining the fluctuations. The impulse response analysis shows that commodity price shocks generate significant U-shaped responses in output, consumption, and per-capita hours.

During recent decades, the factor augmented VAR (FAVAR) has been used in many studies that concentrate particularly on the effect that monetary policy has on the economy. FAVAR is not limited by restricted sets of variables, making it possible to use a broader set of variables that policy makers and researchers are interested in and makes it possible to trace back the effects of global developments on different macroeconomic variables as it takes into account the additional information that the central banks and private sector have. Moreover, it allows the use of less arbitrary measures like employment level instead of measures of real variables (Bernanke *et al*. 2004).

While SVAR and DSGE tend to be used on developing countries, the FAVAR approach allows for a larger information set making it more suitable to use among developed countries to describe what kind of impact different monetary policy measures have on the overall

economy. As I concentrate in this paper on the role of capital control through commodity price shocks, only a short summary of monetary policies is made. For example Lagana and Mountford (2005) follow Bernanke *et al.* (2005) in also applying the Stock and Watson (2002) two-step principal component approach to monetary policy in a balanced panel containing 105 monthly observations for the UK from 1992 to 2003 covering 10 variables (employment; government finance; consumer and retail confidence; money and loans; interest rates; stock prices etc.). They show that the UK is affected by changes in foreign interest rates and their results show clearly that using the FAVAR method with different possible factors generates models with better predictive qualities and a reasonable explanation of unexpected increases in interest rates and how to get rid of the price puzzle[2] problem. Vasishtha and Maier (2013) conduct a similar study based on a Canadian dataset from 1985 to 2008. Their results indicate that shocks to global interest rates and global inflation do not affect Canada as much as in the UK. Canada is more influenced by the shock to foreign activity or commodity prices, which tend to lower the economic activity and hurt the demand for Canadian exports.

Lombardi *et al.* (2012) studied more specifically the relationship between non-energy commodity prices (metals and food) and different macroeconomic variables. After estimating FAVAR they found that exchange rates and economic activity affect individual non-energy commodity prices, but they cannot find an effect from interest rates. Additionally, the individual commodity prices are affected by common trends that the food and metals factors successfully captured.

2.2. Capital Controls

The previous sub-chapter gave an overview of the literature on international shocks transmission mechanisms, showing that the results vary greatly. Next the focus turns to the main subject of this paper, to find out the role of capital controls.

The Organization for Economic Co-Operation and Development (OECD) defines capital controls in its Code of Liberalization of Capital Movements (2009) as "rules, taxes or fees associated with financial transaction that discriminate between domestic residents and those outside the country". They are divided into two sets of measures: administrative or market-based measures. The latter includes taxes on cross-border capital transactions and unremunerated reserve requirements and differential bank reserve requirements for resident and non-resident accounts. In contrast, administrative controls consist of outright prohibitions and limits on foreign borrowing or lending and requires primary government approval for international capital transactions (Klein 2012).

Historically, the attitude towards capital controls has been shaped by different events in the global economy and capital markets that forced countries to impose capital controls. Capital controls were introduced with Bretton Woods after World War II in 1944 to build up a stable financial system. Then capital controls were destabilizing and countries could not have free capital mobility and trade in goods at the same time (Ghosh ad Quereshi 2016). Already in the late 1970s and 1980s, after the economy had stabilised, countries started to eliminate capital controls. For example, in the 1990s, capital controls towards emerging countries were seen as undesirable, as they distort the international allocation of capital. Already at the turn

[2] Price puzzle – the initial positive response of prices to contractionary monetary policy shock. The term first used by Eichenbaum (1992) in a commentary on "Macroeconomic and reality" by Sims (1980), a study on the effects of monetary policy several countries. Often referred to as "puzzling" because macroeconomic models are having troubles to explain it theoretically or, even when capable of explaining it in principle, they do not produce a positive price response empirically.

of the century, several financial and exchange-rate crises caused economists and policy makers to blame free capital mobility as the reason for real exchange rate overvaluation or over-borrowing. As a result, some countries that had liberalised their capital accounts started to re-introduce capital controls. That kind of behaviour increased after the onset of the Great Recession, when both advanced economies (Ireland, Iceland) and emerging markets (Brazil, Turkey and Peru) imposed capital controls. Governments saw capital accounts closing as a protective measure against inflow-fuelled exchange rate appreciating and potentially destabilizing asset price booms (Klein 2012).

All this led many economists to rethink the pains and gains of financial liberalisation, but the topic remained controversial and still divides economists and policy makers in two – in favour and against capital account liberalisation, as empirical analysis has yet failed to yield conclusive results. Magud *et al.* (2011) draw out that the situation is made worse by the fact that the capital controls literature does not have common grounds or a unified theoretical framework that helps to analyse the macroeconomic consequences of financial liberalisation nor compare the different results of different empirical studies.

There are a large number of different indicators and indices that measure the capital account openness of a country. The first measures of financial integrations were mainly compiled on the basis of AREAER, which is a report published by the IMF gathering the rules and regulations for governing current and capital transactions as well as the proceedings arising from them between residents and non-residents (Quinn *et al.* 2011). Epstein and Schor (1992) developed the first indicators of capital controls by converting AREAER into a binary variable. Johnston and Tamirisa (1998) included different asset categories and the type of investor to the analysis, allowing them to construct a Financial Openness Index (FOI). This is a cumulative total of binary scores under 13 categories distinguishing between capital inflows and outflows, but fails to distinguish the resident country. Miniane (2004) altered the capital control index in order to track world trends towards greater capital account openness. He points out that capital controls should control capital movement and explain how economic shocks influence local markets, while taking into account the channels through which they come. In other words, Miniane divided capital flows between inflows and outflows to understand where they come from. Chinn and Ito (2008) covered 181 countries from 1970 to 2005 and created an index to measure the extent and intensity of openness in capital account transactions to quantify capital controls (KAOPEN). They assigned four dummy variables from AREAER that indicate, whether there are multiple exchange rates present, restrictions on current or capital account transactions and if the requirement of the surrender of export proceeds is imposed. This makes KAOPEN a standardised indicator over four AREAER table variables, where higher scores indicate greater openness.

Magud *et al.* (2011) focused on the comparability of different studies on capital controls, and after standardising the results of more than 30 empirical studies, they constructed two indices of capital controls: Capital Control Effectiveness Index (CCE), and Weighted Capital Control Effectiveness Index (WCCE). In order to assign values to the results of the papers, they asked the following questions about what capital controls are expected to achieve:

- Are capital controls able to reduce the volume of capital flows?
- Do they alter the composition of capital flows toward longer maturity flows?
- Do they reduce real exchange rate pressures?
- Are capital controls able to allow for a more independent monetary policy?

If the answer to the question was positive, then the corresponding value was 1 and in case of negative value was –1. If the paper did not address the issue, then the corresponding value

was 0. After summarizing the indices, Magud *et al.* (2011) found that capital controls on inflows make monetary policy more independent and reduce real exchange rate pressures.

The core focus in this paper is on the role of capital controls in the process where commodity prices transfer global shocks to domestic business cycles. Therefore, it is relevant to give an overview of the effects of financial liberalisation and macroeconomic performance.

Calderon *et al.* (2005) studies the relationship between international integration and the external vulnerability of a country and concluded that financial openness does not harm the economic growth of a country. Based on 76 countries covering the period from 1970 to 2000, they find that there is no evidence that either trade or financial openness causes a decline in economic growth. On the contrary, there is a positive effect between opening the capital account and higher growth, which increases with the development level of the country. Similarly, they found no evidence that a higher degree of financial openness also increases growth volatility, but their study supported the fact that if the country's financial system is stable, then financial openness can even decrease the growth volatility.

Additionally, Klein and Olivei (1999) find that capital account liberalisation promotes growth among industrialised countries, but they cannot find evidence of a positive effect among developing countries. They analyse 20 OECD and 18 non-OECD countries over the period of 1986 to 1995 using two steps: first they focus on the effect of capital account liberalisation on financial development and then they consider the effect of financial development on overall growth. These findings suggest that capital account liberalisation can only be beneficial if there is a strong institutional background and sound macroeconomic policies. Similarly, Prasad *et al.* (2013) were not able to conclude that there are strong empirical connections between financial globalisation, macroeconomic volatility and growth, but they did stress that forming solid institutional grounds for financial liberalisation can help put a country into a better position to benefit from financial globalisation. Moreover, Bekaert *et al.* (2005) stressed that countries with a better legal system, good institutions, favourable conditions for foreign investment, and investor protection generate larger growth effects. Beck and Poelhekke (2017) have concentrated on their work on windfalls gains and the role financial sector plays in intermediating those. As a result they find out that the financial system plays a minor role in intermediating the resource boom, but the effect is stronger if the financial institutions are stronger, which shows that strong institutions are essential in turning windfall natural resource income into productive investment.

On the contrary, there are a lot of economists who somehow follow Stiglitz (2000), who has stated that there is no compelling case for capital market liberalisation, as there is no compelling case against market liberalisation. Meaning they do not support the view that financial openness also enhances a country's growth, but at the same time they have failed to provide evidence stating that financial openness has a negative effect on a country's economy. Kraay (1998) finds that there is little evidence suggesting that financially open countries have higher volatility of capital flows. Rodrik (1998) studies the possible relationship investments and capital controls and concludes that there is not enough evidence to support capital account liberalisation in countries with stronger public institutions.

In summary, the studies concerning capital controls carry different results because there is no common ground on how to approach this issue and different researchers use different measurements of capital controls. Still, none of the papers find a negative relationship between financial liberalisation and economic growth, but rather a positive or no relationship at all.

3. METHOD

In the empirical part of the paper, I estimate the shares of variances transferred to domestic business cycles through commodity prices. I use the same approach, data and code as Fernandez, Schmitt-Grohe and Uribe (2016)[3]. In order to analyse the role of capital controls, I add capital controls to the dataset, which makes the sample smaller, and then divide it into different subsets to study the relationships more thoroughly.

As the focus of the paper is on the role of capital controls, then the method has been adjusted to have applicable results under the hypothesis raised in this work. Table 1 gathers the capital control indices compiled by Schindler in 2009, which are based on the annual report AREAER published by the IMF. This table distinguishes capital controls using three factors.

Table 1. Asset and Transaction Categories for Capital Control Measures

Assets that Each Include Four Transaction Categories		
mm	Money market (Bonds with maturity of 1 year or less)	
bo	Bonds (Bonds with maturity more than 1 year)	
eq	Equities	
ci	Collective investments	
de	Derivatives	
	Categories	
	Inflow Controls	
	_plbn	Purchase Locally by Non-Residents
	_siar	Sale or Issue Abroad by residents
	Outflow Controls	
	_pabr	Purchase Abroad by Residents
	_siln	Sale or Issue Locally by Non-Residents
Assets that Include Only Inflow (i) or Outflow (o) Categories		
gsi and gso	Guarantees, Sureties and Financial Backup Facilities	
fci and fco	Financial Credits	
cci and cco	Commercial Credits	
Real Estate		
Re	Real Estate	
	Categories	
	Outflow	
	_pabr	Real Estate Purchase Abroad by Residents
	_slbn	Sale Locally By Non-Residents
	Inflow	
	_plbn	Real Estate Purchase Locally By Non-Residents
Direct Investments		
dii	Direct Investment Controls on Inflows	
dio	Direct Investment Controls on Outflows	
ldi	Direct Investment Controls on Liquidation	

Source: Fernandez *et al. (2015)*

In order to study the role of capital controls in mediating the effects of global shocks to domestic business cycles, I follow the approach of Fernandez *et al.* (2016) by estimating a structural VAR with two blocs, foreign and domestic. As this assumes that the world commodity prices are exogenous for every country, then the foreign bloc is the same for every

[3] Data together with Matlab necessary codes for replication are available at: http://www.columbia.edu/~mu2166/fsu/

country and consists of commodity price indices for agriculture, metals and minerals, and fuels.

Formally, the price vector is denoted by:

$$p_t = \begin{bmatrix} p_t^a \\ p_t^f \\ p_t^m \end{bmatrix}, \quad (1)$$

where p_t^a, p_t^f and p_t^m are the cyclical components of the natural logarithms for prices of agricultural, fuel and metal, and mineral commodities. The trend from prices is removed using the Hodrick-Prescott (HP) filter with a smoothing parameter of 100.

Moreover, it is assumed that the price vector follows a first-order autoregressive model (Fernandez *et al.* 2016):

$$p_t = Ap_{t-1} + \mu_t, \quad (2)$$

where A is the matrix of coefficients and μ_t denotes a vector of world shocks affecting commodity prices. This is an independent and identically distributed mean-zero random vector with a variance-covariance matrix Σ_μ. I am interested in finding out what fraction of business cycle fluctuations in different countries results from world shocks, and is mediated through the three previous commodity prices. For that reason, the joint contribution of μ_t is the main focus and the three individual shocks do not need to be identified.

The domestic bloc on the other hand is described separately for every country and consists of real GDP, real consumption, real investments, terms of trade, trade balance to output ratio as well as the abovementioned commodity prices. The formula is as follows (Fernandez *et al.* 2016):

$$Y_t^i = B^i p_{t-1} + C^i Y_{t-1}^i + D^i p_t + \epsilon_t^i, \quad (3)$$

where ϵ_t^i is an innovation with mean-zero and variance-covariance matrix Σ_i. As with foreign bloc, the country-specific domestic bloc (2) is estimated using ordinary least squares (OLS) and all variables are detrended before using the HP filter with a smoothing parameter equal to 100.

Combining foreign (1) and domestic blocs (2), it is possible to estimate the joint behaviour of commodity prices p_t and Y_t in the following autoregressive model (Fernandez *et al.* 2016):

$$\begin{bmatrix} p_t \\ Y_t \end{bmatrix} = F \begin{bmatrix} p_{t-1} \\ Y_{t-1} \end{bmatrix} + G \begin{bmatrix} \mu_t \\ \epsilon_t \end{bmatrix}, \quad (4)$$

where

$$F = \begin{bmatrix} A & \theta \\ DA + B & C \end{bmatrix}, \quad G = \begin{bmatrix} I & \theta \\ D & I \end{bmatrix}, \quad \text{and} \quad E = \begin{bmatrix} \mu_t \mu_t' & \mu_t \epsilon_t' \\ \mu_t \epsilon_t' & \epsilon_t \epsilon_t' \end{bmatrix} = \Sigma \equiv \begin{bmatrix} \Sigma_\mu & \theta \\ \theta & \Sigma_r \end{bmatrix}$$

Estimates *B*, *C*, *D* and Σ_i are country-specific, which gives the possibility to obtain an estimate of the contribution of world shocks (μ_t) to movements in domestic macroeconomic indicators (Y_t) in different countries after conducting the variance decomposition. It is important to draw out that world shocks can only affect small open economies through changes in world prices, for example, commodity prices or the world interest rate.

In the original, Fernandez *et al.* (2016) use two ways to estimate the domestic bloc because there is heterogeneity in their sample and the country-specific regressions do not display the

same number of degrees of freedom. In my work, the sample is balanced, which means that there is no need for two estimation methods and I use only sequential estimation that includes only one domestic indicator at the time and then estimates the domestic bloc four times per country, once for each estimator.

As in Fernandez *et al.* (2016), I try to reduce the potential problem in estimating the combined SVAR equation system, which comes from the small-sample upward bias in the estimation of the contribution of world shock to the variance of domestic macroeconomic indicators. Statistically, the reason behind this is that variance is a positive statistic; therefore, any correlation between commodity prices and macroeconomic indicators results in some participation of world shocks in the variance of the macroeconomic indicators. This would cause problems even if the commodity prices and macroeconomic indicators were independent random variables, because the spurious correlation is still present and there will be a positive share of world shocks in the variance of the macroeconomic variable, which would cause an upward bias making the share of world shocks transferred through commodity prices overly large.

Usually, the OLS estimates of SVAR coefficients are biased in a short sample, which can cause in turn a bias in the estimated contribution world shocks make to the domestic business cycles. The more commodity prices enter the price vector, the higher the bias and *vice versa*, the bias decreases together with the sample size (Fernandez *et al.* 2016).

In order to correct the small-sample bias, I perform a Monte Carlo experiment using random sampling. The correction is done for every 89 country as follows: the estimates of F, G and Σ, denoted by $\hat{F}$, $\hat{G}$ and $\widehat{\Sigma}$ respectively are used to generate artificial time series for Y_t and p_t over 250 years. The estimate of the share of the variance of Y_t explained by μ_t is denoted by $\hat{\sigma}$. Additionally, T^p denotes the same size of the commodity prices and T^y the sample size of Y_t. As I use a balanced sample, then both T^p and T^y are set equal to 18. Next, the last T^p observations of the artificial time series are used to re-estimate A and Σ_t in the foreign bloc and the last T^y observations to re-estimate B, C, D and Σ_ϵ in the domestic bloc. This process results in an estimate of the matrices F, G and Σ from the simulated data, which is used to obtain the share of the variance of Y_t explained by μ_t shocks, denoted by σ. After repeating the process 1,000 times and computing the average estimate of σ, denoted by $\bar{\sigma}$, it is possible to define the small-sample bias as $\bar{\sigma} - \hat{\sigma}$ and the correct estimate of the share of the variance of Y_t explained by μ_t is $\widehat{2\sigma} - \bar{\sigma}$. (Fernandez *et al.* 2016)

This paper treats capital controls as exogenous, but identification of the effects of capital liberalisation might be distorted in case they are correlated with policies that try to enhance the economy. Still, previous multiple studies have found that capital controls are likely to be exogenous to the economic conditions of the economy.

Potential endogeneity of capital controls has been an issue for several studies that look at the capital account liberalisation effects on long-run growth. Demirgüc-Kunt and Detragiache (1998) tested the likelihood of whether banking crises are more likely to occur in liberalised financial markets well before 1980, when their data on 53 countries started. They used a multivariate logit method, where the financial liberalisation variable was based on observed policy changes. The paper finds that financial liberalisation increases the probability of a banking crisis, but less in a weaker institutional environment. Honig (2008) similarly studied the overall effect of financial liberalisation on economic growth and followed the logic of the previously mentioned Demirgüç-Kunt and Detragiache (2002) when choosing an instrument for the instrumental variable method. He uses the average level of capital account openness for all countries in a certain region as an instrument in one particular country within that

region. The explanation behind that is that a decision to open capital accounts in one region influences other policy makers in the region and the likelihood of capital account liberalisation increases with the number of countries that have already adopted the policy. This logic is supported by Kose and Prasald (2012), who interpret capital account liberalisation as a signal of a country's commitment to good economic policies, which indicates a stable environment for foreign investors. Therefore capital inflows from liberalisation should help transfer foreign technological skills, encourage competition and financial development, thereby promoting growth.

Several papers use the instrumental variable technique, but it is difficult to find appropriate instruments that do not correlate with explanatory variables, but correlate with capital controls. Arleta *et al.* (2001) use a wide range of variables that fulfilled the requirement of not being correlated with capital controls; for example, distance to the equator, the fraction of population speaking English, or an island nation dummy. In order to show exogeneity while using more relevant instruments correlating with capital controls, researchers have used different indicators based on financial openness or more specific instruments. For example, Bekaert *et al.* (2006) used price-earnings ratios of the industries that every country has specialised in as an instrument, which in their results exogenously predicts growth. They studied the effect that an open capital account can have on consumption growth variability, finding that liberalisation can be the reason for lower consumption growth volatility.

Kraay (1998) studied the reasons for lacking enough empirical evidence in support of free capital movement using lags of financial openness measures as instruments for current financial openness. He found little evidence in support of higher volatility among financially open economies. Grilli and Milesi-Feretti (1995) support this result and find no evidence of a significant effect of the share of years over a period during which the capital account was open on growth of income per capita. Moreover, Gochoco-Bautista *et al.* (2010) analysed the effectiveness of capital controls in Asia and used the real interest rate differential and the second lag of capital flows as instruments. In both cases they found that none of the capital control variables are statistically significant, which means that endogeneity was not present. Gruben (2001) used mainly country size variables; for example, total GDP in 1980 US dollars, total square miles of land, and oil exporters. The first test, Hausman-type test, raised the possibility of endogeneity, even though the capital controls were exogenous. As an alternative, Gruben (2001) used the Sargan instrument validity tests that provide a better indication of how capital account liberalisation affects the economy. This test showed that capital controls are not determined within the system, meaning they are exogenous.

4. DATA

To study the role that capital controls play in world shocks transmission mechanisms, I use the same dataset on commodity prices as Fernandez *et al.* (2016) and combine it with the capital control indices from the IMF's AREAER database, which covers 100 countries over the period from 1995 to 2013 and divides capital controls into: inflows and outflows, domestic and foreign, sales and purchases – making it possible to track changes at a more granular lever. This dataset has been used before by Klein *et al.* (2003); Schindler (2009) as well as Fernandez *et al.* (2015).

Because of the restrictions of the availability of data on capital controls, the final dataset consists of 89 countries instead of the initial 139, the period starts in 1995 instead of 1960 and lasts until 2013 instead of 2015.

The capital control indices take a value in the range from 0 to 1, where 0 represents no restriction and 1 indicates absolute control over capital flows. In order to answer the research question in this paper, I divide the sample countries in three capital control groups based on the index value as in Klein (2012):

1. Open countries: 0 – 0.10;
2. Gate countries: 0.11 – 0.69;
3. Wall countries: 0.70 – 1.

Table A1 in the appendices provides an overview of capital controls on inflows and outflows for the sample countries in these three groups, as well as in income, geographical and trade groups. The dataset includes ten countries that have no restriction on capital flows – Denmark, Guatemala, Hong Kong, Ireland, the Netherlands, Norway, Panama, Zambia, the United Kingdom and Uruguay. On the other hand, three countries – Algeria, Sri Lanka and Tunisia – have fully restricted capital movements. Almost half of the countries (43) belong to the Gate capital control group; 32 countries are considered to be Open and only 14 countries are in the Wall category. This last closed category consists only of countries that are in the upper-middle (5), lower-middle (7) or low income (2) group. In contrast, high income countries are equally divided between the Open and Gate categories (21 in each). In addition, among the Open category, five countries are in the upper-middle and six in the lower-middle income group. There are no low income countries. In the Gate category, all the income groups are represented, besides the aforementioned high income countries, this category consists of 12 upper-middle; 7 lower-middle and 3 low income countries.

Table 2 below shows the descriptive statistics of capital controls. The overall mean value of capital control is 0.37, and it can be seen that the average value of the capital outflow index is higher than the inflows (0.40 vs. 0.35), so countries restrict on average more capital outflow. The standard deviation in overall capital outflow is largest in the Gate and smallest in the Wall category, while in Wall countries the standard deviation is the largest for capital inflows. The correlation between inflows and outflows is on average 0.34 and this increases with the strength of the restriction on capital movements.

Table 2. Descriptive Statistics of Capital Controls in Capital Control Groups

	All Countries	**Open**	**Gate**	**Wall**
Controls on overall capital flows				
Mean	0.37	0.04	0.45	0.88
Standard deviation	0.08	0.04	0.16	0.10
Controls on capital inflows				
Mean	0.35	0.04	0.42	0.80
Standard deviation	0.07	0.07	0.17	0.20
Controls on capital outflows				
Mean	0.40	0.04	0.49	0.97
Standard deviation	0.08	0.07	0.20	0.03
Correlations between controls on inflows and outflows	0.34	0.20	0.37	0.45

The data on world commodity prices and five country-specific macroeconomic indicators comes from the World Bank and initially covers 138 countries from 1960 to 2015 as in Fernandez *et al.* (2016). The sources for the five macroeconomic variables – real output, real consumption, real investment, the trade balance to output ratio and terms of trade – are the

World Bank's World Development Indicators (WDI) database and the IMF's World Economic Outlook (WEO) database. GDP, consumption and investment are in local currency units and terms of trade are the ratio of trade-weighted export and import unit-value indices. The source for commodity prices is the World Bank's Commodities Price Data (The Pink Sheet), where I focus on three aggregate commodity price indices – fuel, agriculture, and metals and minerals. The fuel index is a weighted average of spot prices for coal, crude oil and natural gas. The agricultural index is a weighted average of the prices of different beverages (tea, cocoa, coffee), food (fats and oils, grains, and other foods), and agricultural raw materials (timber and other raw materials). The price index for metals and minerals is based on the spot prices of aluminium, copper, iron ore, lead, nickel, steel, tin, and zinc. All the other goods are interpreted as composite, whose price is proxied by the US consumer price index and this composite good is used as *numeraire*. Similarly, these three commodity price indices are proxied by the monthly US consumer price index and in order to obtain annual time series, a simple average over the twelve months of the year is taken.

Figure 1 shows the movement level and cyclical effects of the prices of fuels, metals and agricultural commodities giving the picture of the volatility of these prices over more than 50 years. The agricultural and fuel prices increased considerably in the 1970s, but in the 1980s and 1990s all three prices declined. Already in the 2000s, all three prices started do increase until 2008, when the recession began.

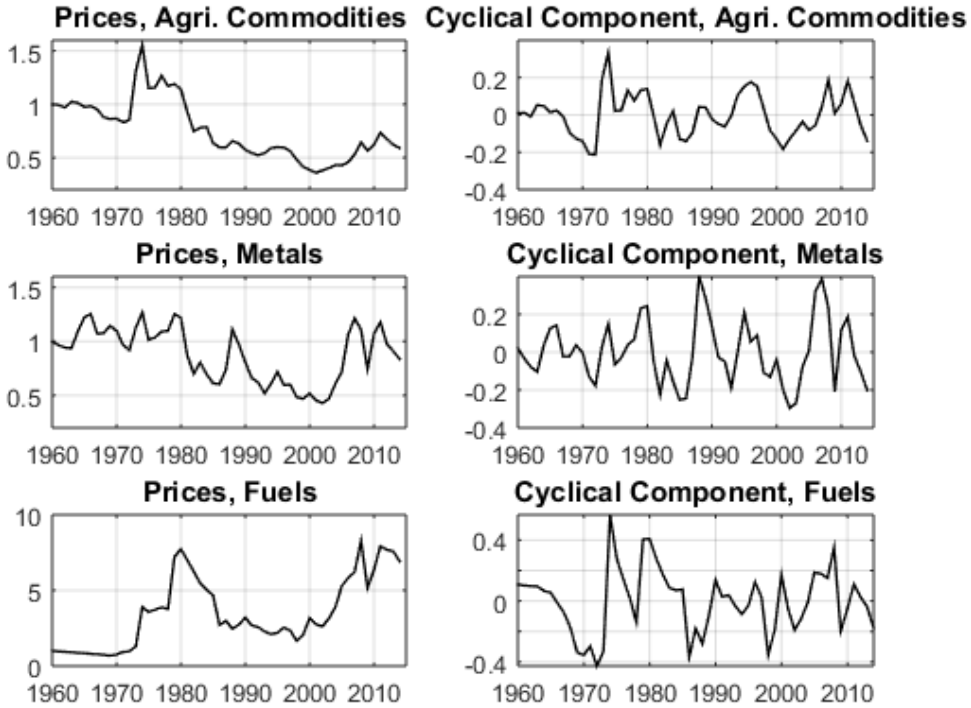

Figure 1. Level and Cyclical Components of Commodity Prices (Fernandez *et al.* 2016)

On the right side of the figure is the cyclical component of the commodity prices captured using the HP filter with a smoothing parameter of 100. On the figure above, it can already be seen that the cyclical components show positive co movement, and this is supported by positive correlations ranging from 33 to 62.1 (Table 3).

Table 3. Descriptive Statistics on World Commodity Prices

Statistic	p^a	p^m	p^f	r
Standard deviation	11.2	14.7	27.4	2.2
Serial correlation	62.3	50.2	50.2	32.2
Correlation with Agri.	100.0	57.9	46.7	-1.5
Correlation with Metals	62.1	100.0	33.0	16.2
Correlation with Fuels	44.4	36.5	100.0	26.9
Correlation with Interest Rates	-4.0	18.0	-31.7	100.0
Relative Std. Dev to Output	3.1	44.9	5.7	3.7

Note: the abbreviations stand for different prices as follows: p^a - agriculture; p^m - metals and minerals; p^f - fuels and r - real interest rate.

The standard deviation of these prices is between 11.2 and 27, and the price of fuel is as expected the most volatile. Comparing this volatility with the volatility of an average country, then these values are more than three times more volatile and when it comes to fuels, then even more than 5.73 times more volatile. The right side of Table A2 in the appendices gives the full overview of the standard deviation of the commodity prices in all countries. This basic overview of the data and descriptive statistics provides an overall understanding of the data and allows to start answering the main questions.

5. RESULTS

This subsection presents the results on the role of capital controls in mediating world shocks to business cycles using a performing variance decomposition of the SVAR system (Equation 3) consisting of the foreign and domestic bloc. Firstly, the results are analysed in three capital control groups for all countries, then the countries within these groups are divided into groups according to income, trade and geographical location. In order to give a more detailed understanding and intuition regarding the results, the shares are presented together with the absolute volatility of the same variables. This makes it also possible to study the effects of capital account liberalisation in absolute terms.

As this paper follows Fernandez *et al.* (2016), then in the appendices Table A3 presents the results of the replication with a shorter period and smaller number of countries using sequential estimation. It gathers the overall results of variance decomposition country by country and shows cross-country median shares of the variances of output, consumption, investment and the trade balance to output ratio explained using world shocks mediated by commodity prices[4]. The corrected estimate of the sequential estimation shows that world shocks explain 35.5% of variance in output; 24.8% of variance in consumption; 25.4% of variance in investment, and 18.6% of variance in the trade balance to output ratio. The estimated contribution of world shocks varies strongly across the 89 countries because the median absolute value of the corrected value is 18.6%, which means that the share of variance of output can range in an interval of almost 20 percentage points. Comparing these results with those of the original (Fernandez *et al.*, 2016), then the estimates are slightly larger, as the number of countries has decreased – in the replicated article they had 138 countries. Also the time span in this article is not equalised across the countries, the longest sample period is

[4] Corrected estimate is achieved after removing the small sample bias through Monte Carlo method

55 years (1960–2014) and the shortest 25 years. Moreover, table A4 presents more precise results country by country and both corrected and noncorrected versions.

The left panel of Table 4 presents the shares of variances in output, consumption, investment and trade balance to output ratio in domestic business cycles that are explained by world shocks. It can be seen from looking at the whole sample group that on average the world shocks are estimated to explain 35.5% of business cycle fluctuations in domestic output, about 25% of the variances in consumption and investments and 18.6% in the trade balance to output ratio.

Table 4. Share of Variance Explained by World Shocks Mediating through Commodity Prices in Capital Control Groups and the Absolute Volatilities of Macroeconomic Variables

Capital Control Group	Group Size	Share of Variance Explained by World Shocks (%)				Median Absolute Deviation (%)				Absolute volatility (%)			
		Y	C	I	TBY	Y	C	I	TBY	Y	C	I	TBY
Baseline	89	35.5	24.8	25.4	18.6	34.4	3.8	8.1	9.9	6.11	4.26	11.0	8.54
Open	32	34.4	19.2	27.8	19.6	13.9	12.0	**19.6**	11.0	4.97	3.41	9.18	6.96
Gate	43	**38.5**	**27.6**	**32.2**	12.9	**20.7**	**19.7**	11.5	**11.5**	6.32	4.32	11.9	9.03
Wall	14	23.6	20.9	20.3	**24.9**	18.4	9.5	6.6	8.8	**8.08**	**6.01**	**12.9**	**10.6**

Note: Abbreviations: Y – output; C – consumption; I – Investment and TBY – trade balance to output ratio.

Table 4[5] shows that global shocks explain the largest share of variance in domestic business cycles in the Gate capital control group, whereas the smallest share of variance is explained in the Wall country group. This means that if a country imposes capital controls with the intention of protecting themselves from larger fluctuations in output coming from international economy, then this measure works. Global shocks only explain 23.6% of the variance in output in domestic business cycles among Wall countries. The fact that global shocks explain less variation in closed countries aligns with the findings of Ostry *et al.* (2010), who concluded while analysing capital inflows to emerging markets, that countries who had capital controls in place before the global crises of 2007 and 2008 suffered smaller output declines.

Similarly, the world shocks explain the most in consumption among Gate countries – 27.6% of the variance – and the least in the Open group (19.2%) – 20.9% of the variance – even though comparing with the Wall countries, the difference is not great. Studying the absolute volatilities that world shocks can cause in consumption in the Wall (6.01*0.209 = 1.3%) and Gate (4.32*0.276 = 1.2%) countries, then the differences are not that big great because of the high volatility in Wall countries. Investment is most affected by world shocks in Gate countries, where the value is considerably higher than on average – 32.9%; in Open countries it is 27.8%, being about two percentage points higher than in the baseline group, whereas in the Wall countries world shocks explain only 20.9% of the variance in investment in domestic business cycles.

On the contrary, global shocks influence more trade in Wall countries, where world shocks cause 2.6% of absolute volatility in trade balance to output ratio, whereas in Open countries

[5] Bold values in table 4 and all the following tables in this chapter show the largest shares of values among output, consumption, investment and trade.

the world shocks cause 1.4% of the absolute volatility. This is interesting in light of the results by Tamirisa (1999), who concluded that capital controls reduce exports only to transition and developing countries, but the effect on developed and industrialised countries is minimalised. Here this could mean that the data includes a number of developed countries that have imposed capital control, as the global shocks are able to explain the changes in trade in closed countries.

The middle panel of Table 4 gives the median absolute deviation (MAD), helping to estimate how widely spread the values are without being statistically affected by outliers. The baseline value of output – 34.4% shows that the output level of the countries included varies across countries, whereas the MAD for consumption is only 3.8% in the baseline group. In the capital control groups, the Gate countries have the highest MAD, output values deviate 20.7% and consumption 19.7% and trade 11.5%. The MAD values for trade across the capital control groups deviate the least. In the investment group, the Open group has the highest deviation measured by MAD. One possible reason for MAD being the highest in the Gate group is that it includes countries with capital controls ranging from 0.11 to 0.69, where countries with extreme values could have very different development levels.

Table 4 right panel presents absolute volatilities of the same four indicators in the three capital control groups. As expected, investment is on average the most volatile component, followed by trade, output and consumption. The right side of the table shows that the volatility decreases when countries have less capital controls – the Wall countries have the highest and the Open group the lowest volatilities. These result align with the theory, where capital controls are expected to raise the volatility of output, investment and trade balance to output ration and decrease the volatility of consumption (Obstfeld and Rogoff 1996). Taking into account the absolute volatility of output in these country groups, the differences in the absolute variance that the world shocks generate are small, but nevertheless the Gate countries remain the strongest affected by the world shocks, generating 2.4% of absolute volatility compared to 1.9% in the Wall and 1.7% in the Gate countries.

Table 5 provides a view of the distribution of capital control groups in three income groups (lower and low are aggregated together). Higher income also indicates the development level of a country – lower income countries are still emerging while the higher income group already includes industrialised countries. Therefore, it is possible to detect possible connections between capital controls and the effects of global shocks in different income groups.

The table shows how there are countries in the high income groups that are Open or Gate, whereas the majority of the Wall countries belong to lower income groups. The same was found by Grilli and Milesi-Feretti (1995), which capital controls are used more in countries with lower incomes, as they are seen as a protective measure. They also add a large government and a central bank with limited independence to their list.

The share of variance explained by world shocks in output does not vary across income groups, being roughly between 35 and 39%; therefore, the main results are not due to the fact that rich economies are open and poor are mainly closed. This shows that the hypothesis that capital account openness makes output more volatile due to specialisation does not hold here. Whereas on income levels, the wealthier the country, the greater the share of variance explained by the world shocks in consumption and the smaller the share in trade balance to output ratio. Meaning the poorer the country, the more their trade balance to output ratio is influenced by shocks in the global economy. Investments do not have such concrete directions: it can be said that the share of variance explained by world shocks decreases with

the income level of a country, but the poorest countries almost have an extremely much higher share of variance explained by global shocks – 39.5%. This exceeds the overall average value by 14.1 percentage points and the high income group by 8.2 percentage points.

Table 5. Share of Variance Explained by World Shocks in Income Groups

Specification		Group Size	Share of Variance Explained by World Shocks (%)			
			Y	C	I	TBY
Baseline		89	35.5	24.8	25.4	18.6
High Income		42	34.7	26.5	31.3	17.2
	Open	21	**35.6**	24.8	30.0	**20.6**
	Gate	21	26.9	**27.2**	**36.4**	12.9
	Wall	-	-	-	-	-
Upper-Middle Income		22	39.3	23.2	23.9	23.0
	Open	5	23.5	19.4	**46.8**	18.2
	Gate	12	**44.1**	**27.4**	29.1	**31.4**
	Wall	5	26.0	17.0	20.0	22.9
Lower-Middle Income		20	38.2	19.8	20.2	24.9
Low Income		5	36.4	19.7	39.5	24.6
	Open	6	16.9	9.2	6.2	23.9
	Gate	10	**56.6**	**33.4**	**24.3**	11.0
	Wall	9	21.2	23.8	20.6	**26.8**

Note: Abbreviations: Y – output; C – consumption; I – Investment and TBY – trade balance to output ratio.

Table 5 shows that none of the countries with high income are completely closed in terms of capital controls, and there are differences between Open and Gate countries in mediating the effects of global shocks to domestic business cycles. In the Open countries, world shocks influence output and trade more: world shocks explain 35.6% and 20.6% of the variance in output and balance to output ratio respectively, and these shares are about 8 percentage points higher than in Gate countries. Whereas among Gate countries, the shares of variances explained by world shocks are 27.2% of consumption and 36.4% of investments. The difference with Open countries is less than three and more than six percentage points respectively.

Looking at the upper-middle income group, the first thing to point out is that in output, consumption and the trade balance to output ratio, the share of variance explained by global shocks is considerably higher than in other capital control groups, especially in Gate countries global shocks explain 44.1% in output, which is around 20 percentage points higher than in other capital control groups. Similarly, consumption and the trade balance to output ratio are around ten percentage points higher in the Gate group than in the Open or Wall. Only the share of variance explained by global shocks in investments is higher in Open countries – 46.8%, which besides exceeding the values of other groups, is almost two times as high as in the baseline value.

Klein (2003) studied the experiences of different countries with capital account opening and he found that it has a U-shaped relationship with income per capita, which means that middle income countries benefit significantly more from capital account openness than poor or rich countries. Here, the upper-middle income group is on average across income groups the most dependent on global shocks. This can mean that during the good times, these countries can enjoy a good economic climate, whereas if something happens in the global economy, then they are the first ones to be influenced.

The shares in capital control groups vary more among lower income countries – for example, in the Gate countries the share of variance in output is as high as 56.6%; in consumption it is 33.4% and in investments 24.3%. All these values are more than three times higher than in open countries. In the low income group, the trade balance to output ratio is almost equally influenced by world shocks in Wall and Open countries, where the share of variance is close to 25%.

The right-hand panel of Table A5.1 shows the absolute volatility in income groups, and the tendency that poorer countries with capital controls are more volatile than countries in higher income groups and allow for capital movement. The standard deviation of output in the low income group and the Wall countries is 8.6%, whereas the overall average on the baseline level is 3.7%. Looking at absolute volatilities, then the Gate countries in the high income group are more influenced by world shocks than open countries, as world shocks generate respectively 1.4% and 1.2% of absolute volatility in output. In the upper-middle income group, world shocks generate 3.1% of absolute volatility in output among Gate countries, whereas in the low income group among Gate countries, world shocks generate 3.6% of absolute volatility in output. The left-hand panel shows the MADs in income groups. Interestingly, within capital control groups, the deviation of output is smaller than in the baseline group. In consumption, Gate countries have a larger deviation in all three income groups, whereas the Open and Wall countries are only slightly higher than the overall baseline value. Trade balance to output ratio deviates the most among Gate countries in the upper-middle income group, but stays around 10% as in the baseline.

After analysing the role of capital controls in the overall level and across income groups, it can be said that there is an inverse U-shaped relationship between capital account openness and country acceptance of global shocks through commodity prices. Global shocks explain a larger share of variance among Gate countries with some exceptions in the trade balance to output ratio. Several researchers have found that countries with a better legal system, good institutions and favourable conditions for foreign investment, and investor protection, generate larger growth effects from financial liberalisation (Bekaert *et al.* (2005) and Prasad *et al.* (2013)). Therefore, one possible explanation for Gate countries being the most effected by international markets is that they are attractive enough for capital inflows, but at the same time their legal and institutional development is still fragile when hit by changes in the global markets. Whereas Open countries have a strong institutional background and Wall countries are not that dependent on international markets.

Next, I consider the role of capital controls through different trade groups, as trade is highly dependent on global markets and assumed to have a substantial influence on capital flows. Moreover, looking at Table 6 can help confirm or refute my hypothesis that the relationship between capital account openness and the share of variance is explained by global shocks.

Looking at the pattern in Table 6 on the next page shows that global shocks explain the largest share in output, consumption and investment among commodity and oil exporters in Gate countries. In some cases the largest share explained in output or consumption is among Wall or Open countries, but the difference compared to Gate countries is small – only 1 or 2 percentage points. The trade balance to output ratio is the most influenced by global shocks in the Open capital control group if I consider only exporters, and in the Wall group considering commodity and oil importers.

Furthermore, net commodity and oil importers have similar shares explained by world shocks and in turn exporters resemble each other. For example, among the Gate countries, the share

of variance in consumption explained by global shocks in domestic business cycles is as high as 47.4% for net commodity exporters and 55.3% for oil exporters. The share of variance in output for exporters in the Gate countries is also higher than 50%, while in the Wall countries it is only 2.9%. While GDP and consumption are more influenced by global shocks than the average baseline value, in investments in all three capital control groups, the world shocks explain around 20–25% of the variance in net commodity and oil exporters, and for oil exporters in the Open group, global shocks only explain 6.1% of the variance in domestic business cycles.

The importers among commodity and oil traders are more stable, and it is hard to draw out extreme values. The share of variance in output explained by world shocks for both commodity and oil importers is around 35% and for consumption around 20–25%. The values differ more if investments and the trade balance to output ratio are considered. In both, commodity and oil importers, the Open and Gate countries' investments are more affected by world shocks than in the Wall countries. There the share of variance explained by global shocks among importers is around 20%, while the share of variance in investment explained by world shocks is more than 30% among Open and Gate countries' commodity and oil importers. The Wall countries trade balance to output ratio is affected the most by global shocks – the share of variance in both import groups is a little bit less than 25%, while in Gate countries it is slightly higher than 10%.

Table 6. Share of Variance Explained by World Shocks in Trade Divisions

Specification		Group Size	Share of Variance Explained by World Shocks (%)			
			Y	C	I	TBY
Baseline		89	35.5	24.8	25.4	18.6
Net Commodity						
Exporters		31	25.6	27.1	22.4	28.5
	Open	9	13.7	16.3	17.6	**30.3**
	Gate	18	**44.0**	**47.4**	**26.7**	30.3
	Wall	4	16.5	26.2	23.6	25.7
Importers		56	36.0	23.2	28.7	15.7
	Open	23	35.6	**24.8**	30.4	17.4
	Gate	24	35.5	23.2	**30.7**	11.9
	Wall	9	**37.9**	20.8	18.9	**22.9**
Oil Trade						
Exporters		21	26.0	32.2	21.1	32.2
	Open	5	13.7	18.7	6.1	**35.3**
	Gate	13	**54.2**	**55.3**	**21.2**	32.6
	Wall	3	2.9	21.0	17.4	22.9
Importers		66	35.6	23.8	28.7	16.7
	Open	27	**35.6**	19.4	30.0	18.2
	Gate	29	34.6	**26.6**	**33.9**	12.8
	Wall	10	29.5	22.3	22.7	**24.9**
Excluding Large Commodity Exporters		50	33.7	23.8	20.9	15.9
	Open	13	25.5	19.0	12.5	23.2
	Gate	26	**39.4**	**27.4**	**25.1**	11.8
	Wall	11	21.2	20.8	20.0	**26.8**

Note: Abbreviations: Y – output; C – consumption; I – Investment and TBY – trade balance to output ratio.

As the results vary in export countries, then the 30 biggest exporters of every commodity are excluded. In the remaining 50 countries, global shocks explain the largest amount of variance in output, consumption and investment in the Gate countries – 39.4%; 27.4% and 25.1% of the variance respectively. In the Wall countries, domestic business cycles are influenced by world shocks the most – 26.8% of the variance is explained there. Excluding large commodity exporters lowers the share of variances when comparing commodity and oil exporters, and this is consistent with the possibility that export countries are more influenced by global shocks as exporting comes with higher risks as countries need to sell their goods and services on foreign markets, whereas importing is just meeting the demand that the country itself cannot satisfy.

The panel on the right in Table A5.2 shows the absolute volatilities in trade groups. Considering exporters and importers separately, then among commodity exporters in the Gate countries, world shocks actually generate 2.8% of absolute volatility in the trade balance to output ratio, while in the Wall countries the world shocks generate only 2.3% of the absolute volatility. Similarly, the world shocks influence Gate countries the most among oil exporters, where they generate 3.2% of the absolute volatility, whereas in the Open countries they generate 2.6% of absolute volatility. In contrast to absolute volatility, it is impossible to draw out a pattern in the trade groups, where the shares of variances deviate most when looking at the MAD. The MAD value is smaller than the baseline group across capital control groups in different trade divisions in output and exceeds the baseline value among other macroeconomic variables.

Looking at countries in different geographical regions confirms that development level matters when analysing the role of capital controls in the transmission of shocks, as countries with similar development levels are usually gathered in the same region. Table 7 on the next page shows countries and capital control categories in five geographical groups: East Asia, South Asia and Pacific; Europe, Central Asia and North America; Latin America and the Caribbean; Middle East and North Africa; and finally Sub-Saharan Africa.

First looking at the groups that consist of more developed countries with higher income, even the distribution of capital control groups is the same, and among Europe, Central Asia and North America, all the countries belong to Open or Gate countries. The share of variances in this regional group also resemble the results from the previous high-income group. Similarly, the tendency that Gate countries are more affected by world shocks still exists and the share of variance explained in the trade balance to output ratio is higher among countries with an open capital control policy.

The share of variances explained by global shocks in East and South Asia and the Pacific also quantitatively resemble the countries with higher income, even though the Gate countries are not influenced by world shocks the most, but the Wall countries are in output, consumption and the trade balance to output ratio, whereas the share of variance in investment is highest in the Open capital control group, but the differences with the Gate and Wall groups are only a couple of percentage points.

By contrast, even though none of the countries in the Latin America and Caribbean region belong to the Wall capital control group, the shares of variances resemble countries with lower income more. The share of variance in output explained by world shocks in the Gate countries is almost 50%, in consumption it is around 30% and in investment and the trade balance to output ratio around 20%. These are the same as in the lower income group.

Table 7. Share of Variance Explained by World Shocks in Geographical Regions

Specification		Group Size	Share of Variance Explained by World Shocks (%)			
			Y	**C**	**I**	**TBY**
Baseline		89	35.5	24.8	25.4	18.6
East Asia, South Asia & Pacific		16	35.3	19.9	30.9	18.1
	Open	4	37.8	21.6	**31.4**	16.2
	Gate	6	29.8	11.5	29.5	18.8
	Wall	6	**42.6**	**26.9**	28.8	**22.9**
Europe, Central Asia & North America		28	38.9	27.4	28.0	12.3
	Open	15	36.6	21.6	30.4	**22.8**
	Gate	13	**40.3**	**27.2**	**36.4**	11.7
	Wall	-	-	-	-	-
Latin America & Caribbean		17	25.5	26.8	21.1	17.4
	Open	8	24.5	14.2	16.5	16.7
	Gate	9	**49.0**	**27.7**	**21.1**	**18.8**
	Wall	-	-	-	-	-
Middle East & North Africa		14	38.9	27.4	28.0	12.3
	Open	3	13.7	18.7	6.1	**35.3**
	Gate	8	**29.5**	**30.1**	**44.0**	20.3
	Wall	3	1.1	10.2	17.4	27.7
Sub-Saharan Africa		14	39.1	29.0	26.1	26.7
	Open	2	47.3	11.7	**60.1**	26.7
	Gate	7	**54.0**	**34.4**	27.4	15.7
	Wall	5	21.2	14.8	20.0	**35.2**

Note: Abbreviations: Y – output; C – consumption; I – Investment and TBY – trade balance to output ratio.

In the case of the Middle East and North Africa or Sub-Saharan Africa it is hard to draw any parallels with specific income groups, as the shares of variance deviate largely within one group. One of the possible reasons for this is that three capital control groups are not distributed equally inside a group; for example, the Open and Wall capital control groups in the Middle East and North Africa region consist of three countries, while in Sub-Saharan Africa there are only two countries in the Open group. The world shocks in these three Wall countries in the Middle East and North Africa region have basically no effect on the output share of variance in the domestic business cycle. This shows that if being protected from world shocks has been the intention, then capital controls have been effective.

In the Middle East and North Africa, world shocks do not influence very much of the domestic markets, because the share of variance in output in the Gate countries is only 29.5%, being around five percentage points less than the baseline value. The other variables, such as consumption, investment and the trade balance to output ratio, are considerably higher than the baseline value. World shocks explain 44% of the variance in investment in the Gate countries and world shocks in the Wall countries explain 35.3% of the variance in the trade balance to output ratio.

In Sub-Saharan Africa, 35% of the variance in the trade balance to output ratio is explained by global shocks. Overall in Sub-Saharan Africa, the largest shares of variances exceed the baseline values even more than two times. For example, the share of variance explained by world shocks in investment in the Open group is as high as 60.1% or in output among the Gate countries 54%. On the other hand, the shares of variances in consumption among the

Open and Wall countries are as little as 10%, which is 15 percentage points less than the baseline value.

Table A5.3 shows the MADS and absolute volatilities in regional groups. Even though global shocks in the East Asia, South Asia and Pacific group explain almost the same amount of variance in investment among three capital control groups, looking at absolute volatilities the result is different. In the Gate countries, world shocks generate 3.7% of absolute volatility in investment, while in the Open countries world shocks generate only 2.3% of absolute volatility. Looking at MAD, it can similarly be said in the trade groups that it is hard to detect one pattern there and the regions deviate differently, even though the Wall countries deviate less across all groups.

All in all, looking the role of capital controls in different groups has shown, the relationship between capital controls and the shares of variances explained by the global shocks has an inverse U-shape. The Gate countries are the most influenced by global shocks in output, consumption and investments, while global shocks explain more of the variance in the trade balance to output ratio among the Wall countries.

6. CONCLUSION

This paper analyses the role of capital control on transferring global shocks through commodity prices on domestic business cycles. More specifically, the paper studies the effect that global shocks have on the shares of variances in output, consumption, investment and trade balance to output ratio from 1995 to 2013 in 89 developed and developing countries.

The main result is that capital controls have a role in mediating international shocks to domestic business cycles in macroeconomic indicators like output, consumption and investment. Capital account openness and a country's acceptance of global shocks through commodity prices has an inverse U-shaped relationship, meaning that the global shocks explain the largest share of variance in domestic business cycles in countries that belong to the partially open countries, and less in the open and closed countries. Comparing the shares of variances that global shocks explain in domestic business cycles shows that they are lowest in output, consumption and investment among the relatively closed countries. The only variable that is explained more by global shocks among the closed countries is the trade balance to output ratio.

There are substantial differences in trade groups between commodity and oil importers and exporters, where export is more influenced on domestic markets by global shocks. After excluding the biggest exporters, the shares of variances explained by world shocks are lower, indicating that the possible reason for exporters being more dependent on fluctuations on international markets is that selling abroad has a higher risk than in the domestic market, making exports more sensitive.

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APPENDICES

Table A1. Sample Countries in Capital Control Groups (1995-2011)

Sample Countries (1995-2011)			Trade Groups		Capital Controls		
Country	**Income Group**	**Geographic Group**	**Net Commodity Trade**	**Oil Trade**	**Overall**	**Inflows**	**Outflows**
OPEN - 32 countries					**0,05**	**0,05**	**0,04**
Austria	High	Europe & Central Asia	Import	Import	0,10	0,00	0,20
Belgium	High	Europe & Central Asia	Import	Import	0,07	0,00	0,13
Canada	High	North America	Export	Export	0,09	0,17	0,00
Costa Rica	Upper-Middle	Latin America & Caribbean	Import	Import	0,02	0,04	0,00
Denmark	High	Europe & Central Asia	Import	Import	0,00	0,00	0,00
Egypt, Arab Rep.	Lower-Middle	Middle East & North Africa	Export	Export	0,08	0,02	0,13
El Salvador	Lower-Middle	Latin America & Caribbean	Import	Import	0,08	0,11	0,06
Finland	High	Europe & Central Asia	Import	Import	0,03	0,07	0,00
France	High	Europe & Central Asia	Import	Import	0,12	0,06	0,18
Greece	High	Europe & Central Asia	Import	Import	0,04	0,01	0,06
Guatemala	Lower-Middle	Latin America & Caribbean	Import	Import	0,00	0,00	0,00
Hong Kong SAR	High	East Asia & Pacific	Import	Import	0,00	0,00	0,00
Ireland	High	Europe & Central Asia	Import	Import	0,00	0,00	0,00
Italy	High	Europe & Central Asia	Import	Import	0,04	0,00	0,09
Japan	High	East Asia & Pacific	Import	Import	0,08	0,01	0,00
Mauritius	Upper-Middle	Sub-Saharan Africa	Import	Import	0,10	0,20	0,00
Netherlands	High	Europe & Central Asia	Export	Import	0,00	0,00	0,00
New Zealand	High	East Asia & Pacific	Export	Import	0,09	0,17	0,00

Table A1 *(continuation)*

Nicaragua	Lower-Middle	Latin America & Caribbean	Import	Import	0,01	0,03	0,00
Norway	High	Europe & Central Asia	Export	Export	0,00	0,00	0,00
Oman	High	Middle East & North Africa	Export	Export	0,10	0,20	0,00
Panama	Upper-Middle	Latin America & Caribbean	Import	Import	0,00	0,00	0,00
Paraguay	Upper-Middle	Latin America & Caribbean	Import	Import	0,04	0,02	0,05
Peru	Upper-Middle	Latin America & Caribbean	Export	Import	0,01	0,01	0,00
Singapore	High	East Asia & Pacific	Import	Import	0,09	0,00	0,18
Spain	High	Europe & Central Asia	Import	Import	0,04	0,04	0,04
Sweden	High	Europe & Central Asia	Import	Import	0,03	0,05	0,00
Zambia	Lower-Middle	Sub-Saharan Africa	Export	Import	0,00	0,00	0,00
United Kingdom	High	Europe & Central Asia	Import	Import	0,00	0,00	0,00
United States	High	North America	Import	Import	0,09	0,00	0,18
Uruguay	High	Latin America & Caribbean	Import	Import	0,00	0,00	0,00
Yemen	Lower-Middle	Middle East & North Africa	Export	Exporter	0,08	0,16	0,00
GATE - 43 countries					**0,45**	**0,43**	**0,49**
Argentina	High	Latin America & Caribbean	Import	Import	0,54	0,48	0,68
Australia	High	East Asia & Pacific	Export	Export	0,30	0,28	0,32
Bahrain	High	Middle East & North Africa	Export	Import	0,31	0,41	0,21
Bangladesh	Lower-Middle	South Asia	Import	Import	0,68	0,66	0,70
Bolivia	Lower-Middle	Latin America & Caribbean	Export	Export	0,32	0,39	0,26
Brazil	Upper-Middle	Latin America & Caribbean	Import	Import	0,64	0,62	0,67
Bulgaria	Upper-Middle	Europe & Central Asia	Import	Import	0,18	0,14	0,22
Burkina Faso	Low	Sub-Saharan Africa	Export	Import	0,68	0,39	0,97
Chile	High	Latin America & Caribbean	Export	Import	0,44	0,45	0,44

Table A1 *(continuation)*

Colombia	Upper-Middle	Latin America & Caribbean	Export	Export	0,69	0,62	0,76
Czech Republic	High	Europe & Central Asia	Import	Import	0,30	0,10	0,50
Cyprus	High	Europe & Central Asia	Import	Import	0,50	0,41	0,58
Dominican Republic	Upper-Middle	Latin America & Caribbean	Import	Import	0,30	0,34	0,27
Ecuador	Upper-Middle	Latin America & Caribbean	Export	Export	0,30	0,23	0,37
Ethiopia	Low	Sub-Saharan Africa	Import	Import	0,68	0,65	0,71
Germany	High	Europe & Central Asia	Import	Import	0,31	0,26	0,35
Ghana	Lower-Middle	Sub-Saharan Africa	Import	Import	0,69	0,80	0,58
Hungary	High	Europe & Central Asia	Import	Import	0,31	0,22	0,41
Iceland	High	Europe & Central Asia	Export	Import	0,32	0,31	0,33
Indonesia	Lower-Middle	East Asia & Pacific	Export	Export	0,49	0,67	0,31
Iran, Islamic Rep.	Upper-Middle	Middle East & North Africa	Export	Export	0,69	0,68	0,70
Israel	High	Middle East & North Africa	Import	Import	0,30	0,28	0,33
Kenya	Lower-Middle	Sub-Saharan Africa	Import	Import	0,38	0,43	0,33
Korea, Rep.	High	East Asia & Pacific	Import	Import	0,37	0,37	0,36
Kuwait	High	Middle East & North Africa	Export	Export	0,35	0,38	0,32
Lebanon	Upper-Middle	Middle East & North Africa	Import	Import	0,50	0,50	0,50
Malta	High	Middle East & North Africa	Import	Import	0,44	0,41	0,48
Mexico	Upper-Middle	Latin America & Caribbean	Export	Export	0,60	0,45	0,75
Myanmar	Lower-Middle	East Asia & Pacific	No info	No info	0,69	0,60	0,77
Nigeria	Lower-Middle	Sub-Saharan Africa	Export	Export	0,35	0,38	0,33
Poland	High	Europe & Central Asia	Import	Import	0,37	0,33	0,42
Portugal	High	Europe & Central Asia	Import	Import	0,35	0,33	0,37
Romania	Upper-Middle	Europe & Central Asia	Import	Import	0,40	0,30	0,50
Russian Federation	High	Europe & Central Asia	Export	Export	0,69	0,69	0,69

Table A1 *(continuation)*

Saudi Arabia	High	Middle East & North Africa	Export	Export	0,55	0,63	0,47
Slovenia	High	Europe & Central Asia	Import	Import	0,42	0,44	0,40
South Africa	Upper-Middle	Sub-Saharan Africa	Export	Import	0,64	0,44	0,84
Switzerland	High	Europe & Central Asia	Import	Import	0,30	0,30	0,30
Thailand	Upper-Middle	East Asia & Pacific	Import	Import	0,69	0,60	0,78
Turkey	Upper-Middle	Europe & Central Asia	Import	Import	0,35	0,20	0,50
Uganda	Low	Sub-Saharan Africa	Import	Import	0,40	0,20	0,59
United Arab Emirates	High	Middle East & North Africa	Export	Export	0,31	0,37	0,24
Venezuela, RB	High	Latin America & Caribbean	Export	Export	0,37	0,48	0,27
WALL - 14 countries					**0,88**	**0,80**	**0,97**
Algeria	Upper-Middle	Middle East & North Africa	Export	Export	1,00	1,00	0,99
Angola	Upper-Middle	Sub-Saharan Africa	No info	No info	0,96	1,00	0,92
China	Upper-Middle	East Asia & Pacific	Import	Import	0,98	1,00	0,96
Cote d'Ivoire	Lower-Middle	Sub-Saharan Africa	Export	Import	0,84	0,70	0,97
India	Lower-Middle	South Asia	Import	Import	0,92	0,90	0,94
Malaysia	Upper-Middle	East Asia & Pacific	Export	Export	0,84	0,69	0,99
Morocco	Lower-Middle	Middle East & North Africa	Import	Import	0,79	0,64	0,97
Pakistan	Lower-Middle	South Asia	Import	Import	0,73	0,50	0,96
Philippines	Lower-Middle	East Asia & Pacific	Import	Import	0,76	0,53	1,00
Sri Lanka	Lower-Middle	South Asia	Import	Import	1,00	1,00	1,00
Swaziland	Lower-Middle	Sub-Saharan Africa	Import	Import	0,78	0,66	0,89
Tanzania	Low	Sub-Saharan Africa	Import	Import	0,95	0,95	0,95
Togo	Low	Sub-Saharan Africa	Export	Import	0,80	0,60	1,00
Tunisia	Upper-Middle	Middle East & North Africa	Import	Export	1,00	1,00	1,00
				Mean	**0,38**	**0,35**	**0,40**
				Standard Deviation	**0,32**	**0,33**	**0,33**

Table A2. Standard Deviation of Sample Countries Macroeconomic Variables and Commodity Prices

Country	Capital Control Group	Income Group	Std of Macroeconomic Variables (GDP)	(C)	(I)	(TBY)	Std. Dev (p)/ Std. Dev (GDP) p^A	p^M	p^F	r
Baseline			**0.061**	**0.043**	**0.111**	**0.085**	**0.11**	**0.15**	**0.27**	**0.02**
Argentina	Gate	High	0.06	0.06	0.13	0.09	4.10	5.95	7.58	0.48
Australia	Gate	High	0.04	0.02	0.08	0.05	1.30	1.89	2.41	0.15
Bahrain	Gate	High	0.06	0.04	0.13	0.07	1.78	2.58	3.28	0.21
Bangladesh	Gate	Lower-Middle	0.07	0.06	0.14	0.10	7.79	11.29	14.39	0.92
Bolivia	Gate	Lower-Middle	0.05	0.03	0.12	0.10	7.81	11.33	14.44	0.92
Brazil	Gate	Upper-Middle	0.03	0.03	0.10	0.07	5.09	7.39	9.42	0.60
Bulgaria	Gate	Upper-Middle	0.08	0.06	0.16	0.09	14.59	21.16	26.97	1.72
Burkina Faso	Gate	Low	0.11	0.07	0.17	0.15	7.86	11.40	14.53	0.93
Chile	Gate	High	0.07	0.05	0.12	0.08	4.01	5.81	7.41	0.47
Colombia	Gate	Upper-Middle	0.05	0.02	0.10	0.08	3.51	5.09	6.49	0.41
Cyprus	Gate	High	0.04	0.02	0.08	0.05	1.79	2.59	3.30	0.21
Czech Republic	Gate	High	0.04	0.03	0.11	0.07	4.47	6.48	8.26	0.53
Dominican Republic	Gate	Upper-Middle	0.05	0.03	0.10	0.08	5.40	7.83	9.99	0.64
Ecuador	Gate	Upper-Middle	0.05	0.03	0.10	0.08	2.12	3.08	3.93	0.25
Ethiopia	Gate	Low	0.08	0.05	0.17	0.14	3.53	5.12	6.53	0.42
Germany	Gate	High	0.02	0.02	0.05	0.04	4.40	6.39	8.14	0.52
Ghana	Gate	Lower-Middle	0.07	0.03	0.16	0.14	3.56	5.17	6.59	0.42
Hungary	Gate	High	0.04	0.03	0.07	0.06	2.70	3.91	4.99	0.32
Iceland	Gate	High	0.06	0.03	0.11	0.06	4.33	6.28	8.00	0.51
Indonesia	Gate	Lower-Middle	0.07	0.05	0.13	0.10	2.94	4.26	5.43	0.35
Iran. Islamic Rep.	Gate	Upper-Middle	0.09	0.07	0.16	0.12	5.99	8.69	11.08	0.71
Israel	Gate	High	0.04	0.02	0.08	0.06	3.63	5.26	6.71	0.43
Kenya	Gate	Lower-Middle	0.08	0.06	0.15	0.11	3.73	5.42	6.90	0.44
Korea. Rep.	Gate	High	0.05	0.03	0.09	0.06	3.96	5.75	7.32	0.47

Table A2 *(continuation)*

Country	Capital Control Group	Income Group	GDP	C	I	TBY	p^A	p^M	p^F	r
Kuwait	Gate	High	0.06	0.04	0.14	0.12	2.76	4.00	5.10	0.33
Lebanon	Gate	Upper-Middle	0.10	0.08	0.18	0.15	2.20	3.20	4.07	0.26
Malta	Gate	High	0.04	0.02	0.07	0.05	3.27	4.74	6.04	0.39
Mexico	Gate	Upper-Middle	0.08	0.06	0.10	0.08	7.76	11.25	14.34	0.92
Myanmar	Gate	Lower-Middle	0.08	0.05	0.18	0.16	6.11	8.86	11.30	0.72
Nigeria	Gate	Lower-Middle	0.10	0.07	0.14	0.12	3.67	5.33	6.79	0.43
Poland	Gate	High	0.05	0.03	0.09	0.06	2.99	4.33	5.52	0.35
Portugal	Gate	High	0.05	0.03	0.10	0.07	4.61	6.69	8.52	0.54
Romania	Gate	Upper-Middle	0.07	0.05	0.12	0.09	3.32	4.81	6.13	0.39
Russian Federation	Gate	High	0.07	0.05	0.15	0.11	3.13	4.54	5.78	0.37
Saudi Arabia	Gate	High	0.06	0.05	0.14	0.11	3.21	4.66	5.94	0.38
Slovenia	Gate	High	0.04	0.03	0.07	0.05	6.05	8.78	11.19	0.71
South Africa	Gate	Upper-Middle	0.05	0.04	0.08	0.06	2.72	3.94	5.02	0.32
Switzerland	Gate	High	0.03	0.02	0.05	0.04	1.46	2.12	2.70	0.17
Togo	Gate	Low	0.11	0.07	0.17	0.16	3.28	4.76	6.07	0.39
Uganda	Gate	Low	0.09	0.07	0.16	0.14	4.41	6.40	8.15	0.52
United Arab Emirates	Gate	High	0.08	0.06	0.12	0.09	6.67	9.67	12.33	0.79
United Kingdom	Gate	High	0.03	0.03	0.07	0.06	5.54	8.04	10.24	0.65
Yemen. Rep.	Gate	Lower-Middle	0.08	0.05	0.14	0.11	4.71	6.82	8.70	0.56
Austria	Open	High	0.03	0.01	0.06	0.04	4.02	5.83	7.43	0.47
Belgium	Open	High	0.02	0.02	0.06	0.05	0.76	1.11	1.41	0.09
Canada	Open	High	0.03	0.02	0.07	0.05	1.07	1.55	1.97	0.13
Costa Rica	Open	Upper-Middle	0.06	0.05	0.10	0.08	3.49	5.06	6.45	0.41
Denmark	Open	High	0.03	0.02	0.06	0.04	4.52	6.56	8.36	0.53
Egypt. Arab Rep.	Open	Lower-Middle	0.07	0.05	0.12	0.08	5.32	7.72	9.83	0.63
El Salvador	Open	Lower-Middle	0.09	0.05	0.15	0.11	3.29	4.77	6.08	0.39
Finland	Open	High	0.03	0.03	0.07	0.05	4.57	6.63	8.45	0.54

Table A2 *(continuation)*

France	Open	High	0.02	0.02	0.07	0.04	2.10	3.04	3.88	0.25
Greece	Open	High	0.06	0.03	0.09	0.07	6.07	8.80	11.22	0.72
Guatemala	Open	Lower-Middle	0.06	0.03	0.13	0.10	4.43	6.43	8.19	0.52
Hong Kong SAR	Open	High	0.04	0.04	0.07	0.05	2.21	3.21	4.09	0.26
Ireland	Open	High	0.04	0.02	0.06	0.04	2.38	3.45	4.40	0.28
Italy	Open	High	0.02	0.02	0.05	0.04	5.50	7.98	10.17	0.65
Japan	Open	High	0.03	0.02	0.06	0.05	4.03	5.85	7.45	0.48
Mauritius	Open	Upper-Middle	0.06	0.05	0.11	0.08	5.93	8.61	10.97	0.70
Netherlands	Open	High	0.03	0.02	0.06	0.04	2.38	3.46	4.41	0.28
New Zealand	Open	High	0.04	0.02	0.06	0.04	2.64	3.83	4.88	0.31
Nicaragua	Open	Lower-Middle	0.08	0.05	0.16	0.12	2.38	3.46	4.41	0.28
Norway	Open	High	0.02	0.02	0.06	0.05	3.17	4.60	5.86	0.37
Oman	Open	High	0.06	0.04	0.11	0.08	2.97	4.30	5.48	0.35
Panama	Open	Upper-Middle	0.06	0.04	0.09	0.06	3.89	5.64	7.19	0.46
Paraguay	Open	Upper-Middle	0.07	0.04	0.13	0.11	1.80	2.61	3.32	0.21
Peru	Open	Upper-Middle	0.08	0.04	0.13	0.12	1.45	2.10	2.68	0.17
Singapore	Open	High	0.06	0.03	0.10	0.07	2.07	3.00	3.82	0.24
Spain	Open	High	0.04	0.03	0.08	0.06	3.19	4.63	5.90	0.38
Sweden	Open	High	0.02	0.02	0.06	0.04	2.53	3.67	4.68	0.30
Tanzania	Open	Low	0.08	0.06	0.16	0.13	5.37	7.78	9.92	0.63
United States	Open	High	0.02	0.02	0.06	0.04	3.99	5.79	7.38	0.47
Uruguay	Open	High	0.03	0.05	0.09	0.08	3.69	5.35	6.82	0.44
Venezuela. RB	Open	High	0.09	0.06	0.12	0.09	3.08	4.47	5.69	0.36
Zambia	Open	Lower-Middle	0.10	0.08	0.13	0.12	5.25	7.62	9.71	0.62
Algeria	Wall	Upper-Middle	0.06	0.05	0.12	0.08	5.23	7.59	9.67	0.62
Angola	Wall	Upper-Middle	0.08	0.07	0.13	0.10	5.35	7.77	9.90	0.63
China	Wall	Upper-Middle	0.07	0.03	0.10	0.09	2.71	3.93	5.00	0.32
Cote d'Ivoire	Wall	Lower-Middle	0.09	0.04	0.15	0.12	2.23	3.23	4.12	0.26
India	Wall	Lower-Middle	0.08	0.05	0.10	0.09	5.62	8.16	10.39	0.66

Table A2 *(continuation)*

Malaysia	Wall	Upper-Middle	0.09	0.06	0.10	0.08	2.88	4.18	5.32	0.34
Morocco	Wall	Lower-Middle	0.07	0.05	0.11	0.09	3.75	5.44	6.93	0.44
Pakistan	Wall	Lower-Middle	0.07	0.05	0.14	0.10	1.61	2.33	2.97	0.19
Philippines	Wall	Lower-Middle	0.06	0.04	0.12	0.09	5.08	7.36	9.38	0.60
Sri Lanka	Wall	Lower-Middle	0.09	0.08	0.17	0.13	5.83	8.46	10.78	0.69
Swaziland	Wall	Lower-Middle	0.11	0.08	0.19	0.17	2.22	3.22	4.10	0.26
Thailand	Wall	Upper-Middle	0.09	0.07	0.15	0.14	1.84	2.67	3.40	0.22
Tunisia	Wall	Upper-Middle	0.08	0.08	0.12	0.10	3.86	5.60	7.13	0.46
Turkey	Wall	Upper-Middle	0.08	0.07	0.11	0.11	3.40	4.94	6.29	0.40
Relative Standard Deviation (Std. Dev(p)/Mean(StdDev(GDP)))							3.10	4.49	5.73	0.37
Median							3.63	5.26	6.71	0.43

Table A3. Share of Variances Explained by World Shocks and Mediated by Commodity Prices in two different datasets

	Fernandez *et al.* (2016) 130 countries in 1960-2015 (%)				This paper 89 countries in 1995-2013 (%)			
Sequential Estimation	*y*	*c*	*i*	*tby*	*y*	*c*	*i*	*tby*
Noncorrected estimate	43.9	33.9	33.8	29.3	44.7	35.9	36.9	31.1
Small-Sample Bias	9.8	12.6	12.2	13.3	10.2	13.0	12.1	13.0
Corrected estimate	34.1	21.3	21.6	16.0	35.5	24.8	25.4	18.6
MAD of Corrected estimate	19.7	15.9	15.4	14.5	18.6	13.9	16.6	15.3

Source: Fernandez *et al.* (2016) and author's calculations using the replication files.

Table A4. Share of Variances Explained by World Shocks and Mediated by Commodity Prices in Different Countries Using Sequential Estimation

Country	**Corrected estimates**				**Uncorrected estimates**			
	Y (%)	**C (%)**	**I (%)**	**TB/Y (%)**	**Y (%)**	**C (%)**	**I (%)**	**TB/Y (%)**
Algeria	1.1	21.0	17.4	28.5	20.2	35.6	31.4	39.7
Angola	39.7	14.8	20.0	35.8	48.9	28.6	32.7	46.6
Argentina	63.1	66.8	54.3	45.4	68.8	71.8	61.6	54.9
Australia	23.1	1.1	19.5	33.9	33.0	13.6	29.1	42.1
Austria	35.6	3.5	25.6	25.8	43.4	16.5	34.6	34.6
Bahrain	13.7	26.2	44.6	28.5	33.7	43.3	54.9	42.4
Bangladesh	12.1	0.5	4.8	2.6	27.7	16.1	20.8	15.1
Belgium	63.7	33.8	54.7	36.1	68.6	43.1	60.5	44.9
Bolivia	54.2	10.9	21.1	2.0	60.9	26.1	33.7	19.0
Brazil	24.3	14.2	17.1	48.5	36.1	29.4	30.5	56.1
Bulgaria	59.2	61.3	15.7	63.3	65.6	67.0	32.0	69.1
Burkina Faso	25.6	32.5	2.6	12.8	36.9	41.7	18.4	26.1
Canada	24.8	21.6	38.5	42.5	35.5	32.8	46.2	49.4
Chile	20.1	26.7	41.6	18.8	30.6	36.8	48.1	29.9
China	62.0	17.0	57.4	17.6	67.1	32.5	63.3	31.9
Colombia	62.5	56.9	70.6	69.5	67.2	63.1	74.9	73.0
Costa Rica	23.5	26.8	7.5	1.5	32.7	34.6	18.3	13.3
Cote d'Ivoire	11.8	31.4	24.9	3.8	28.4	42.1	36.9	12.2
Cyprus	40.3	22.2	36.4	9.5	49.1	33.4	46.3	24.4
Czech Republic	45.3	7.0	22.7	15.7	56.9	18.8	39.9	34.3
Denmark	21.6	1.4	19.0	2.4	31.6	13.7	30.4	16.8
Dominican Republic	4.1	27.7	15.2	11.8	20.0	38.1	28.3	23.0
Ecuador	65.4	40.0	5.6	3.3	68.1	45.4	16.7	15.4
Egypt. Arab Rep.	15.6	18.7	31.3	30.5	29.0	31.8	41.4	40.0
El Salvador	18.2	1.2	7.5	11.9	32.4	19.2	12.3	26.3
Ethiopia	2.2	34.4	27.4	4.1	18.9	44.2	38.3	12.6

Table 4A *(continuation)*

Finland	40.7	35.9	30.4	0.1	47.9	43.5	40.4	15.5
France	65.6	62.4	74.2	27.3	68.8	66.0	76.4	36.9
Germany	34.6	5.2	38.7	12.9	44.8	22.6	48.7	26.8
Ghana	38.5	2.1	2.9	15.7	45.8	10.8	9.3	26.8
Greece	36.6	31.5	12.2	26.9	44.7	40.1	24.7	36.4
Guatemala	25.5	9.3	4.8	8.5	34.8	23.2	16.7	4.2
Hong Kong SAR	41.6	18.4	6.3	13.9	48.9	30.1	20.0	25.6
Hungary	0.2	29.8	13.4	5.1	16.4	38.9	4.9	18.6
Iceland	37.5	27.2	18.0	7.0	44.8	35.9	29.2	20.0
India	37.9	30.9	35.2	22.9	46.2	40.8	44.2	34.2
Indonesia	66.0	55.3	65.1	61.3	70.7	61.0	69.7	66.4
Iran. Islamic Rep.	39.0	54.8	8.0	0.4	49.4	61.2	25.2	16.6
Ireland	30.0	21.5	12.5	22.8	39.0	32.1	25.1	32.1
Israel	4.7	7.9	14.4	12.1	18.8	6.8	3.6	23.2
Italy	61.9	31.9	42.1	0.8	66.3	41.4	49.2	14.6
Japan	34.1	24.8	56.5	20.6	41.9	34.7	60.3	31.1
Kenya	65.7	60.0	33.9	33.1	70.1	65.1	44.1	43.2
Korea. Rep.	7.8	3.9	1.7	3.7	20.9	11.3	14.1	18.3
Kuwait	6.6	16.1	32.2	2.0	21.7	27.0	42.8	16.9
Lebanon	42.1	22.6	44.4	0.0	54.3	38.3	55.1	21.3
Malaysia	26.0	44.8	22.4	22.9	35.1	50.6	32.6	32.2
Malta	32.5	34.1	43.6	51.9	45.3	44.8	53.1	59.6
Mauritius	20.9	19.4	56.4	23.2	33.9	31.7	62.2	34.7
Mexico	49.0	27.1	21.2	0.1	56.8	38.7	34.0	18.9
Morocco	0.6	8.4	20.6	27.7	12.9	5.9	32.4	37.8
Myanmar	61.5	49.1	57.6	2.3	67.7	58.3	64.0	18.4
Netherlands	45.1	16.3	17.6	6.4	51.5	28.6	28.4	10.0
New Zealand	5.5	16.5	0.0	18.6	20.0	29.5	15.9	29.5
Nicaragua	9.2	9.1	0.1	17.4	22.9	22.3	16.5	30.2
Nigeria	76.4	59.8	19.8	32.6	79.4	65.2	33.5	43.0
Norway	5.8	3.6	4.4	5.7	20.1	17.7	11.5	10.3
Oman	0.0	32.2	6.1	57.7	0.0	46.0	19.7	66.3
Pakistan	47.3	29.9	18.9	26.8	55.5	41.5	32.4	39.2
Panama	57.6	19.0	46.8	16.0	64.3	32.3	54.7	29.2
Paraguay	59.4	44.7	62.0	26.5	64.5	52.4	66.4	36.6
Peru	12.2	2.3	25.4	18.2	22.5	13.8	32.9	27.0
Philippines	18.2	20.8	7.7	6.9	32.2	33.2	23.5	10.3
Poland	26.9	27.6	41.6	1.4	41.8	41.5	52.6	18.2
Portugal	50.1	36.9	15.5	9.7	55.7	45.0	27.5	6.6
Romania	2.9	23.8	37.0	51.4	22.9	39.2	49.9	59.8
Russian Federation	76.5	56.7	80.8	70.7	79.6	63.7	83.4	76.0
Saudi Arabia	26.4	60.1	71.7	32.2	38.8	65.6	75.3	43.5
Singapore	48.8	25.3	72.2	10.6	55.9	37.6	75.5	24.2

Table 4A *(continuation)*

Slovenia	12.3	0.3	9.8	11.7	11.4	17.1	12.2	26.6
South Africa	54.0	66.5	72.4	69.6	60.3	71.0	76.1	73.2
Spain	60.6	57.0	45.8	39.0	64.1	61.4	52.9	46.7
Sri Lanka	50.0	23.8	73.0	30.0	56.5	35.0	76.5	40.7
Swaziland	55.8	65.0	17.6	35.2	61.4	70.5	32.2	45.8
Sweden	22.9	7.5	41.8	2.8	34.6	8.1	48.3	17.1
Switzerland	59.4	68.2	61.1	2.6	63.7	71.3	65.2	10.2
Tanzania	73.6	4.0	63.7	30.3	76.3	17.5	67.5	41.2
Thailand	9.9	0.7	9.4	8.6	23.1	15.7	21.8	20.3
Togo	36.4	19.1	39.5	38.3	46.6	33.6	47.8	47.3
Tunisia	21.2	12.5	40.3	40.5	34.9	7.1	50.7	49.2
Turkey	2.9	10.2	11.6	10.6	18.2	8.2	25.2	23.9
Uganda	46.0	19.7	57.8	24.6	55.7	33.9	64.0	36.7
United Arab Emirates	59.0	26.6	38.8	9.2	64.6	37.5	47.0	23.7
United Kingdom	60.4	65.6	52.0	44.2	64.8	68.9	57.5	50.6
United States	35.5	46.0	24.6	62.1	43.9	52.2	34.9	65.7
Uruguay	43.2	14.7	42.2	4.2	48.7	23.7	47.5	8.3
Venezuela. RB	34.8	55.9	30.0	34.1	43.6	61.5	39.8	43.7
Yemen. Rep.	15.7	61.1	12.4	61.3	11.8	68.8	32.1	69.4
Zambia	13.7	10.2	1.9	35.3	28.0	24.9	15.1	44.8
Median	35.5	24.8	25.4	18.6	44.7	35.9	36.9	31.1
MAD	34.4	3.8	8.1	9.9	24.4	0.3	5.6	8.6

Table A5.1. Median Absolute Deviation and Absolute Volatilities in Income Groups

Specification		**Group Size**	**Median Absolute Deviation (%)**				**Absolute volatility (%)**			
			Y	**C**	**I**	**TBY**	**Y**	**C**	**I**	**TBY**
Baseline		89	34.4	3.8	8.1	9.9	3.71	3.27	12.20	8.21
High Income		42	13.1	10.5	14.5	13.0	3.55	3.13	11.70	5.57
	Open	21	10.8	9.0	15.8	**14.8**	3.37	2.51	7.00	5.06
	Gate	21	**14.6**	**20.2**	**17.9**	10.3	**5.27**	**3.56**	**9.99**	**7.06**
	Wall	-	-	-	-		-	-	-	-
Upper-Middle Income		22	18.3	6.2	15.6	12.8	4.42	3.89	12.81	9.90
	Open	5	11.3	7.3	**15.2**	5.0	6.63	4.52	11.41	9.18
	Gate	12	12.5	**10.5**	14.6	**29.6**	6.93	5.10	**12.36**	**9.67**
	Wall	5	**23.0**	4.0	2.6	5.7	**7.66**	**5.93**	11.46	8.97
Lower-Middle Income		20	22.6	11.4	13.7	9.1	3.70	3.26	12.27	8.35
Low Income		5	10.2	6.7	15.2	8.8	3.71	3.26	12.49	8.44
	Open	6	5.5	3.1	5.2	**9.0**	8.20	5.01	13.76	10.89
	Gate	10	13.7	**22.2**	**17.0**	8.5	8.18	5.42	**15.31**	**12.53**
	Wall	9	**16.7**	7.6	11.2	8.4	**8.59**	**5.98**	14.67	11.96

Table A5.2. Median Absolute Deviation and Absolute Volatilities in Trade Groups

Specification		Group Size	Median Absolute Deviation (%)				Absolute Volatility (%)			
			Y	C	I	TBY	Y	C	I	TBY
Baseline		89	34.4	3.8	8.1	9.9	3.71	3.27	12.20	8.21
Net Commodity										
Exporters		31	19.0	16.2	16.3	15.7	7.25	4.75	11.91	9.34
	Open	9	8.1	6.1	13.7	12.1	5.85	3.73	9.74	7.71
	Gate	18	**19.7**	**16.5**	**18.3**	**27.7**	7.10	4.66	12.32	9.33
	Wall	4	7.1	9.5	3.8	8.8	**8.80**	**5.86**	**13.67**	**10.97**
Importers		56	14.8	11.9	15.5	11.1	6.06	4.40	11.17	8.68
	Open	23	12.8	11.1	**18.3**	**9.5**	4.37	3.12	8.65	6.44
	Gate	24	**23.3**	**12.5**	14.4	8.8	5.81	4.22	11.29	8.59
	Wall	9	19.7	10.1	9.5	7.1	**8.01**	**5.86**	**13.57**	**10.99**
Oil Traders										
Exporters		21	23.0	22.0	13.1	25.6	6.75	4.64	11.64	9.01
	Open	5	7.9	8.5	4.1	7.3	5.38	3.41	9.91	7.38
	Gate	13	**15.2**	5.9	**13.2**	**29.3**	7.03	4.67	**12.33**	**9.66**
	Wall	3	1.9	**10.8**	5.0	5.7	**7.84**	**6.55**	11.51	8.88
Importers		66	15.0	10.2	15.1	10.4	3.37	2.98	11.74	8.03
	Open	27	7.9	8.5	4.1	7.3	4.67	3.27	8.78	6.69
	Gate	29	15.2	5.9	**13.2**	**29.3**	6.06	4.29	11.46	8.57
	Wall	10	**18.7**	**8.8**	12.9	8.8	**8.38**	**5.65**	**14.23**	**11.62**
Excluding Large Commodity Exporters		50	31.1	23.8	20.9	15.9	6.95	4.77	12.51	9.71
	Open	13	9.9	**15.0**	**16.8**	3.9	6.76	4.51	11.60	9.05
	Gate	26	**20.9**	8.6	14.5	8.8	6.37	4.26	12.23	9.24
	Wall	11	18.3	10.1	8.4	**9.0**	**8.53**	**6.29**	**14.24**	**11.60**

Table A5.3. Median Absolute Deviation and Absolute Volatilities in Geographic Regions

Specification		Group Size	Median Average Deviation (%)				Absolute Volatility (%)			
			Y	C	I	TBY	Y	C	I	TBY
Baseline		**89**	**34.4**	**3.8**	**8.1**	**9.9**	**3.71**	**3.27**	**12.20**	**8.21**
East Asia, South Asia & Pacific		16	13.5	4.9	25.5	7.4	6.48	4.54	11.24	8.72
	Open	4	7.3	3.5	**28.2**	3.3	4.18	2.90	7.32	5.28
	Gate	6	**19.8**	**10.7**	26.2	**16.3**	6.78	4.84	**12.76**	**10.07**
	Wall	6	12.0	5.0	15.5	4.6	**7.71**	**5.32**	12.33	9.68
Europe, Central Asia and North America		28	14.0	14.8	13.7	10.7	0.04	4.00	2.79	8.09
	Open	15	11.8	**14.1**	11.7	**17.1**	2.97	2.14	6.53	4.63
	Gate	13	**13.4**	9.7	**20.7**	6.6	**5.19**	**3.55**	**9.89**	**7.05**
	Wall	-	-	-	-	-	-	-	-	-
Latin America & Caribbean		17	16.3	17.5	13.7	14.1	6.39	4.18	11.69	9.16
	Open	8	11.3	12.2	**12.6**	6.5	**6.76**	**4.37**	**12.34**	**9.97**
	Gate	9	**16.3**	**13.5**	8.7	**18.7**	6.06	4.01	11.11	8.44
	Wall	-	-	-	-	-	-	-	-	-
Middle East & North Africa		14	12.7	11.6	17.8	16.1	6.92	5.08	12.41	9.37
	Open	3	2.0	8.5	4.1	4.8	**7.27**	4.48	12.22	9.17
	Gate	8	**14.2**	**18.1**	**9.9**	**19.1**	6.69	4.93	**12.77**	**9.54**
	Wall	3	0.5	1.9	3.3	0.9	7.21	**6.09**	11.63	9.14
Sub-Saharan Africa		14	19.0	20.7	13.4	12.4	8.79	6.13	14.89	12.31
	Open	2	**26.3**	7.7	3.7	3.6	7.97	6.58	12.05	9.90
	Gate	7	15.4	**25.4**	**11.4**	**11.6**	8.48	5.62	14.84	12.20
	Wall	5	11.3	14.1	4.9	5.2	**9.55**	**6.67**	**16.09**	**13.41**

KOKKUVÕTE

Kapitalikontrollide roll maailma majandussõkkide ülekandumisel

Käesoleva artikli teemaks on uurida, mis rolli mängivad kapitalikontrollid maailma majandussõkkide ülekandumisel kohalikele äritsüklitele. Kui 2000ndate aastate majanduskriisi järel peeti kapitalikontrolle eelkõige kaitsvaks meetmeks suurte kapitali sissevoolude vastu, siis rohkem on hakatud välja tooma, et kapitalkkontrollid võivad pärssida nii majandusarengut kui ka majanduse efektiivust.

Kapitalikontrollide mõju globaalsete majandussõkkide ülekandumist on artiklis uuritud läbi põllumajandustoodete, metallide ja mineraalide ning naftahindade muutuse mõju makromajanduslikele näitajatele nagu toodang, tarbimine, investeeringud ja kaubandusbilanss. Selleks on kombineeritud mitmed andmebaasid 89 riigi kohta aastatel 1995–2013. Kapitalikontrolle puudutavad andmed tulevad Rahvusvahelise Valuutafondi aastaaruandest vahetamise korralduse ja piirangute kohta *(Annual Report on Exchange Arrangements and Exchange Restrictions* – AREAER), kus on võetud keskmised üle erinevate tehingute, näiteks omakapitali, väärtpaberi, kinnisvara, rahaturgude või aktsiate. Vastavalt keskmise näitaja ehk kapitallikontrolli indeksi suurusele jagatakse riigid kolme gruppi: Avatud (0–0,10), Värava (0,11–0,69) või Müüri (0,70–1) riigid. Kaupade hinnad pärinevad Maailmapanga toodete hindu kajastavast kuisest raportist *"The Pink Sheet"* ja riikide makromajanduslikud näitajad maailma arengunäitajate andmebaasist (*World Development Indicators* – WDI). Analüüs viiakse läbi kasutades struktuurset vektor-autoregressiivset ehk SVAR mudelit *(structural vestor autoregressive*), mis on jaotatud kaheks blokiks välismaiseks ja koduseks, kus välismaine kirjeldab üldist toodete hindade käitumist ja on riikidel ühine, kuid kodumaine on riigi erinev, kuna koosneb iga riigi majandusnäitajatest. Sellise uurimisteema puhul võib probleemiks kujuneda endogeensus, sest riigid võivad kapitalikontrolle kasutada just majanduse võimaliku ülekuumenemise eel või vastupidiselt lõdvendada kapitalikontrolle, kui majandus on stabiliseerunud. Kuna mitmed varasemad artiklid on näidanud, et kapitalikontrollid on eksogeensed, siis käesolevas artiklis eeldatakse ka kapitalikontrollide eksogeensust.

Analüüsi tulemustest selgus, et vastupidiselt eeldatud hüpoteesidele, et kapitalikontrollidel on lineaarne mõju muutes toodangut ja investeeringuid volatiilsemaks, kuid tarbimist vähem volatiilsemaks ja kaubandusbilansi ebastabiilseks, on mõju hoopis mittelineaarne, tagurpidi U kujuga, mõjutades kõige rohkem just keskmiselt avatud, n-ö värava riike. Võrreldes variatsiooni osakaale, mida maailma majandussõkid seletavad kohalikes äritsüklites, saab öelda, et kõige väiksemad on globaalsete šokkide osakaal toodangu, tarbimise ja investeeringu lõikes suletud riikides. Ainult kaubanduses on suletud riikides globaalsetel majandussõkkidel suurem osakaal kohalikes äritsüklites. Huvitava tulemusena saab välja tuua, et variatsiooni osakaaludes on suured erinevused nii üleüldiste toodete kui ka nafta importijate ja eksportijate vahel. See tulemus võis tuleneda sellest, et valimis olid esindatud ka suured eksportijad, sest nende välja arvamisel muutusid variatsiooni osakaalud väiksemaks, sarnanedes üleüldisele lähtetulemustele, kus olid kaasatud kõik 89 riiki.

Teema edasiseks uurimiseks tuleks uurida lähemalt riikide kapitalikontrollide indekseid ning analüüsida näiteks, kas riikides, kus kapitalikontrollid on kehtestatud vastavalt kapitali sisse- või väljavooludele on globaalsetel maailma majandussõkkidel teistsugune

mõju kohalikele äritsüklitele, või uurida veel väiksemalt varade lõikes või tehingu läbiviijate asukohta silmas pidades.