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## What determines foreign direct investment in Russia?

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### Abstract

This article focuses on the determinants of inward foreign direct investment (FDI) in Russia. The article briefly describes the historical context of foreign investment policymaking in Russia since the beginning of the economic transition to an open market economy after the dissolution of the Soviet Union. When compared to other developing countries, Russia's FDI stocks continue to lag despite a set of proactive measures undertaken by the national government. Following the literature review, the most commonly cited determinants explaining inward FDI in Russia include market size, labour productivity, trade and investment barriers, domestic exchange rate, rule of law and institutional framework.

This article aims to contribute empirically to the study of determinants of inward FDI in Russia.

This article uses the Pseudo-Poisson Maximum Likelihood (PPML) estimation technique, the robustness of the PPML estimation is then verified using a standard autoregressive integrated moving average (ARIMA) model with the Durbin–Watson autocorrelation test.

Our benchmark results suggest the efficiency-seeking motive of FDI over a market seeking and horizontal motive as a main reason for inward FDI in Russia. The ARIMA regression indicates the absence of statistical significance of economic openness and variables of labour productivity. Overall, the market size and tax rate variables have the most positive effects on the inward FDI, while barriers to trade and sanctions have the most negative effects. The results confirm that for transitional economies, integration into the world economy, proactive local development and tax cuts for outside investors remain to be critical when it comes to attracting FDI.

### Keywords

foreign direct investment | economic transition | Russia

### JEL Codes

F23, P33

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## 1 Introduction

Multinational enterprises (MNEs) are an important feature of the global economy. With the integration of international markets over the past three decades, foreign direct investment (FDI) flows grew stronger than both trade and the world economy. According to UNCTAD (2019), the world inward FDI stock amounted to US\$31.5 trillion of which 64.5% was located in economically advanced countries. Among the major factors that attract MNEs in the developed countries are monetary stability, rule of law, transparent gover-

nance, near absence of political risks such as minimal exposure to the erratic regulatory policy changes, government failure and armed conflict (Markusen, 2002).

This article focuses on the determinants of inward FDI in Russia and briefly describes the historical context of foreign investment policymaking in Russia since the beginning of its economic transition to market economy in 1991 after the dissolution of the Soviet Union. In its nearly three decades of economic transition to the market economy, certain features of Russia's economic and political life such as monetary

volatility, corruption and property protection risks are well known and continue to daunt international businesses. In comparison with other developing countries from Central and Eastern Europe (CEE), Russia's FDI stocks continue to lag behind. Furthermore, the country's integration into the world economy can only be observed in a limited number of sectors such as energy, mining, metal production and arms trade. As of 2018 (Central Bank of Russia, 2019), FDI is located in industries such as mining and quarrying (US\$ 125.4 billion), manufacturing (US\$ 100.2 billion), wholesale and retail trade (US\$ 81.3 billion), finance and insurance (US\$ 60.6 billion).

Historically, inward FDI flows were relatively small, given the size and needs of the economy in comparison with similar transitional economies of Poland, the Czech Republic and Hungary. At the turn of millennia (1992–1999), aggregate inward FDI flows to Russia amounted to just about US\$ 11 billion. On a per-capita basis, inward FDI flows to Russia were just at US\$ 71, compared to US\$ 511 in Poland, US\$ 1,493 in Czech Republic, US\$ 1,581 in Hungary, US\$ 1,693 in Mexico and US\$ 1,134 in Brazil (World Bank, 2018). This was due to a wide variety of factors such as the absence of a legal framework on FDI activities, severe macroeconomic volatility, external national debt and political risks due to ongoing civil conflict in Chechnya, newly developed institutional and governance frameworks, corruption and so on. Therefore, the policymakers of Russia were faced with a challenge of improving the reputation of country's investment and increasing the levels of inward FDI; thus, much policy attention was focused on this issue at the time (Broadman & Recanatini, 2001).

During the first decade of the 2000s, aggregate inward FDI flows per capita in Russia increased and were estimated at US\$ 3,227, compared to US\$ 3,945 in Poland, US\$ 8,562 in Czech Republic, US\$ 16,874 in Hungary, US\$ 3,204 in Mexico and US\$ 3,466 in Brazil. During this period, the economy of Russia was experiencing a steady pace of economic growth, thanks to the booming oil and gas price markets, fiscal reform, stable monetary policy, integration in the world economy, various transparency-oriented reforms and others. Overall, Russia has managed to attract 45 times more inward FDI per capita than a decade earlier.

Between 2013 and today, aggregate inward FDI flows per capita are estimated at US\$ 4,033 in Russia, compared to US\$ 6,675 in Poland, US\$ 14,939 in Czech Republic, US\$ 26,254 in Hungary, US\$ 6,398 in

Mexico and US\$ 6,675 in Brazil. During this period, Russia has experienced serious monetary volatility, severe economic sanctions and oil price market volatility. The economy remained in deep stagnation and averaged an annual rate of just about 1%. As a result, Russia continues to face a policy challenge of improving the country's investment climate; thus, the study of inward FDI determinants presents to be a relevant research problem.

The mainstream economic literature identifies two main reasons for FDI: market-seeking and efficiency-seeking (Markusen, 2013). First, FDI helps to overcome distance and lower costs of foreign markets' access, and FDI is also undertaken to serve local markets, which is often called as horizontal FDI, because it refers to producing the same goods and services in a host country just as in the home country. Second, efficient-seeking FDI is made to acquire production inputs at a lower cost than the cost of the home country; FDI is called vertical FDI as it aims to reduce production costs. It involves international fragmentation of the value chain as MNEs locate various stages of production in different countries, where production factors are relatively inexpensive.

This article primarily aims to contribute empirically to the study of inward FDI determinants in Russia using the national data from 1996 to 2017 following the major events of the economic transition of Russia.

The article is organised as follows. Section 2 provides a literature review, discusses the empirical implications of various theoretical frameworks and briefly discusses the previous research. Section 3 describes an empirical methodology. Section 4 reports and discusses the estimation results. Finally, we include concluding remarks, policy advice and guidelines for further research in Section 5.

## 2 Literature review

Research efforts on the topic of international production were primarily focused on explaining FDI between economically similar countries. The early models of horizontal FDI were proposed by Krugman (1983) and Markusen (1984). Their models were extended inter alia by Horstmann and Markusen (1987), Brainard (1993a), Markusen and Venables (1998, 2000), Helpman, Melitz, and Yeaple (2004), Sinha (2010), Collie (2011) and Cieřlik and Ryan (2012). On the other hand, research was conducted to explain FDI

arising between developed and developing countries as a result of differences between the endowments of physical capital between countries. Helpman (1984) and Helpman and Krugman (1985) proposed the first models of vertical FDI.

On the other hand, FDI is viewed as a channel that creates competition incentives. Markusen and Venables (1998) conclude that the presence of a foreign company in a particular industry can increase competition and general development through 'backward' and 'forward' linkages with other industries. Where backward links act through any inputs required by the FDI-based industry, incentives are created for firms (domestic and foreign) to enter and develop the industry that produces that input. The forward link works if the output of the FDI-based industry is used as an intermediary input in another industry. Fortanier (2007) finds that FDI can motivate other domestic firms in the industry to innovate faster and lead to improved allocation of resources thus resulting in economic growth. In addition, the presence of foreign MNEs may bring previously nonexistent know-how, which can spur the growth of domestic firms in the same industry (Mottaleb & Sonobe, 2011) but also provide better inputs, which were previously unavailable or substandard, to that industry and even others (Lin, 2012).

Empirical studies that attempted to validate the predictions of various theoretical FDI models initially focused on US-based MNEs operate abroad and inward FDI in the United States from similarly developed economies such as Japan, the United Kingdom, Canada and others. For example, Brainard (1993b, 1997) tested horizontal and vertical FDI models to find that most US MNEs were horizontally integrated and not vertically integrated. Subsequently, Carr et al (2001) found that US MNEs were integrated not only horizontally, but also vertically.

Studies of inward FDI determinants in the groups of CEE countries were studied, among others, by Lansbury, Pain, and Smidkova (1996), Brenton, Di Mauro, and Lucke (1999), Benacek, Gronicki, Holland, and Sass (2000), Resmini (2003), Garibaldi, Mora, Sahay, and Zettelmeyer (2001), Bevan and Estrin (2004), Carstensen and Toubal (2004), Cieřlik and Ryan (2004), Baniak, Cukrowski, and Herczyński (2005), Torrisi et al. (2009), Gorbunova, Infante, and Smirnova (2012), Wach and Wojciechowski (2016), Ascani (2016), Stack, Ravishankar, and Pentecost (2017) and Tang (2017). However, recent empirical

studies on FDI determinants in particular post-Soviet countries in the region are scarce.

Research of inward FDI determinants in Russia began in the late 1990s with the availability of open statistical data. The earliest empirical work on regional-level inward FDI determinants was done by Brock (1998), who identified the market size and local crime rates as important factors that influence foreign investor decisions. Broadman and Recanatini (2001) analysed the determinants of inward FDI in the Russian regions using a generalised least squares estimation for panel data and an ordinary least squares estimation for cross-sectional data. They concluded that market size, infrastructure and policy frameworks explain most of the observed variations in inward FDI across the regions of Russia. Iwasaki and Suganuma (2005) applied a Cobb–Douglas production function framework and proposed resource endowments, infrastructure development and degree of industrialisation as key explanatory factors of FDI stock variation between the regions of Russia. Further studies on the location determinants of MNEs were done by Linden and Ledyaeva (2006), Ledyaeva (2009) and Karhunen et al (2014). The authors concluded that foreign investors from less corrupt and more democratic countries are more likely to invest in less corrupt and more democratic parts of Russia and vice versa. In a more recent study, Kuzmina, Volchkova, and Zueva (2014) focused on the relationship between quality of local governance and inward FDI in the regions of Russia and proposed a hypothesis that worker strikes during 1895–1914 had a significant impact on the quality of local governance intuitions. Lastly, Gonchar et al. (2014) employed the KC framework to the firm-level data and concluded that the spatial pattern of affiliate production in Russia cannot be satisfactorily described within the framework of the dominance of pure vertical or horizontal motives, and further evidence was found for the knowledge-capital framework, suggesting some vertical activities among almost one-fifth of foreign-owned plants. Mariev, Drapkin, and Chukavina (2016) applied Pseudo-Poisson Maximum Likelihood (PPML) method with instrumental variables to the bilateral FDI data between 112 investor and 44 recipient countries for the period 2001–2011 and concluded that the economy of Russia performs well in attracting FDI because the actual inward FDI values exceed the predicted inward FDI.

In conclusion, the previous empirical literature has primarily focused on the regional level of FDI determinants, local governance quality and firm-level



data. This article contributes to the existing literature by examining the dependency of inward FDI in Russia to several macro-economic variables from 1996 to 2017.

### 3 Research methodology

Following the literature review, most commonly cited determinants explaining inward FDI in Russia include market size, labour productivity, trade and investment barriers, domestic currency valuation against US\$, rule of law and quality of the institutional framework.

The dependent variable in this model is inward FDI in Russia from 1995 to 2017, expressed in constant 2010 US\$ billion dollars. FDI data are sourced from the World Bank database. In addition, the model specifies independent variables specific to the economy of Russia: market size, price of Brent Crude, exchange rate, openness to trade and investment, corporate tax rate, economic sanctions and labour productivity. Where possible, a 1-year lag for independent variables with respect to the dependent term was used to avoid the potential simultaneity problem.

Market size is measured by the annual GDP of Russia, expressed in constant 2010 US\$ dollars and lagged 1 year. The lag represents the delay between the decision to invest and the actual flow of inward FDI in Russia. The GDP data for Russia are sourced from the World Bank database. Market size plays one of the central roles in the FDI literature, and this variable is expected to be positive and statistically significant in the model.

Profits from oil and gas exports are estimated at 40% of Russia's annual federal budget income (Ros-siyskaya Gazeta, 2018). Thus, the model includes the price of Brent crude oil (BRE), which acts as a proxy variable and represents the degree of fiscal stability, suggesting that this variable should have a positive sign and statistical significance in the model. On the other hand, due to the dubious nature of this variable, higher energy prices may also imply an increased dependence on the oil and gas sector in Russia due to their international trade. Such dependence creates allocation dichotomy in the economy as production factors (primarily capital) move across sectors of the economy and possibly cause deindustrialisation in other sectors, thus discouraging any FDI in the economy (the so-called Dutch disease). In sum, the nature of this variable will depend on its sign in the

model. Brent crude price data are sourced from the United States Energy Information Administration (2018).

The real exchange rate is measured as weighted averages of bilateral exchange between the Russian ruble and the US\$ dollar, adjusted by relative consumer prices, measured as an index (2010 = 100). A higher variance of real exchange rate decreased any inward FDI as it produced economic uncertainty, while lower values should encourage horizontal inward FDI. The data on the real exchange rate are sourced from Bank for International Settlements (2018).

Openness to trade and investment (OPN) is defined as the value of trade (export plus import in constant 2010 US\$ dollars) as a share of the market size measured in percentage points. As reported in the existing literature, much of FDI is export-oriented and may also require the import of complementary intermediate and capital goods. In either case, the volume of trade is enhanced, thus 'openness to trade and investment' is expected to be positive and significant for FDI in Russia.

To approximate the introduction of economic sanctions (SAN) by the European Union, the United States, Canada, Australia and New Zealand, the model includes a dummy variable, where 0 is the absence of sanctions and 1 is the effect of sanctions. It is assumed that the introduction of economic sanctions strongly discouraged any inward FDI in Russia; thus, the variable will have negative sign and significance in the model.

Tax rate (TAX) is defined as the annual corporate income tax rate (past and current) as reported by the Tax code of Russia (2018). The historical values of the tax rate under review were collected from previous editions of the Tax code. Although tax compliance, tax base and changes in accounting during the economic transition may limit the explanatory value of this variable, *ceteris paribus*, higher tax rates discourage inward FDI because of their impact on firm profitability thus the TAX variable should have a negative correlation relationship with the inward FDI. Indeed, it is supported by the correlation parameter between TAX and FDI, which is estimated at  $-0.57$ . In sum, the tax rate variable should have a positive sign and statistical significance in the model.

Lastly, we include labour productivity (LAB) as it is associated with higher values of human capital development thus signalling the presence of skilled labour force as well as acts as a facilitator in the

process of new technology adoption and diffusion. Labour productivity is measured as GDP per hour and expressed in constant 2010 US\$ dollars. Higher values of labour productivity are often related with the vertical model of inward FDI rather than the horizontal model. The data on national labour productivity are sourced from OECD database (2018).

While earlier years of data are available for certain independent variables such as GDP, Brent crude oil, openness to trade and investment and corporate tax. Data on the real exchange rate and labour productivity are not available; thus, the dataset includes only years where all data for independent variables are available, begging from 1995. The detailed scope of a time frame is available in Table A1 of Appendix, while the detailed description of independent variables is available in Table A2 of Appendix. Furthermore, summary statistics of independent variables are reported in Table A3 of Appendix. Finally, the calculated pairwise correlations between the independent variables used in the study are reported in Table A4 of the Appendix. The pairwise correlations show that the explanatory variables are not strongly correlated with each other.

Although the panel methodology could improve reasoning, the time series method is more appropriate because this article aimed to access the attractiveness of Russia alone to foreign investors.

A general specification of inward FDI determinants can be specified in the following function:

$$FDI_t = f(GDP_t, BRE_t, RER_t, OPN_t, SAN_t, TAX_t, LAB_t) \quad (1)$$

where  $FDI_t$  is the overall volume of inward FDI,  $GDP_t$  is the value of real GDP for Russia,  $BRE_t$  is the market price of Brent oil,  $RER_t$  is the real exchange rate of the Russian ruble against the US dollar,  $OPN_t$  is an index of economic openness to trade investment,  $SAN_t$  is a dummy variable of economic sanctions introduced in 2014,  $TAX_t$  is the corporate income tax rate and  $LAB_t$  is a national level of labour productivity.

Equation (1) can be estimated in a log-linear form as follows:

$$FDI_t = \beta_0 + \beta_1 \ln GDP_{t-1} + \beta_2 \ln BRE_{t-1} + \beta_3 \ln RER_{t-1} + \beta_4 OPN_t + \beta_5 SAN_t + \beta_6 TAX_t + \beta_7 \ln LAB_{t-1} + \varepsilon_t \quad (2)$$

We propose the following hypotheses for the estimation:

**Hypothesis 1:** Higher real exchange rate encourages inward FDI (horizontal motive).

**Hypothesis 2:** High economic openness is positively associated with FDI (horizontal and vertical motives).

**Hypothesis 3:** Stagnating labour productivity in Russia discourages inward FDI.

**Hypothesis 4:** Economic sanctions discourage any inward FDI.

**Hypothesis 5:** Lower corporate tax is positively associated with inward FDI (horizontal and vertical motives).

**Hypothesis 6:** Market size is positively associated with inward FDI (horizontal motive).

For the estimation technique, this article uses the PPML approach introduced by Silva and Tenreyro (2006) as this technique can produce unbiased and consistent estimates, robust to different patterns of heteroscedasticity and avoids under-prediction of large FDI volumes by generating estimates of inward FDI rather than the log of inward FDI. All that is needed for the PPML estimator to be consistent is the correct specification of the condition mean:  $E[OFDI_{ijt} | X] = \exp(X_{ijt} b)$ . Data do not have to follow the Poisson distribution and more importantly, and dependent variable FDI does not have to be an integer (Gourieroux, Monfort, & Trognon, 1984). The computational package in Stata takes care of the mean specification and is used to compute the PPML estimation results. In addition, PPML behaves well even in the presence of overdispersion in the dependent variable and a large proportion of zeros in the sample (Silva & Tenreyro, 2006). Therefore, PPML will be employed in our study. The robustness of the PPML estimation is then verified using a standard ARIMA regression with the Durbin–Watson autocorrelation test. The variables

## 4 Empirical results

This section presents and discusses the estimation results. The benchmark estimation results obtained from the specification (1) discussed in the previous section are shown in column (1) of Table 1. Key variables of the model, namely GDP, BRE and SAN, are all

**Tab. 1:** Estimation results from 1996 to 2017.

Explanatory variable: $FDI_t$	(1)	(2)
GDP	16.33*** (2.352)	14.71*** (4.404)
BRE	-1.08** (0.355)	-1.24** (0.540)
RER	1.70** (0.556)	1.84* (1.145)
LAB	-0.141*** (0.037)	-1.110 (0.072)
OPN	-5.55** (2.295)	-6.91 (5.599)
SAN	-1.10*** (0.250)	-1.26*** (0.372)
TAX	8.48*** (2.140)	6.20* (3.672)
Const	-103.97*** (14.856)	-94.01*** (28.781)
Wald $\chi^2$ (7)		84.79
Prob > $\chi^2$		0.000
Durbin-Watson d-statistic		1.72***
$R^2$	0.88	0.89

Note: Robust standard errors in parentheses.

Source: The author.

\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

displaying expected signs and significant at 5% and 1% levels. To start with, the market size has the strongest positive effect, which is conventional to the already existing theory. It suggests that for FDI to occur in the host economy, it has to be economically significant as well as relatively open to the world markets. On the other hand, the negative sign of the BRE variable suggests that when the energy sector of Russia is 'booming' due to the increased world prices, there is a resource movement effect that discourages any FDI in the economy. Furthermore, the model observes a strong negative effect of external economic sanctions on the inward FDI, which confirms that the introduction of economic sanctions in 2014 has achieved a persisting negative effect on the inward FDI. Second, economic openness has a negative sign, suggesting a weak horizontal motive for inward FDI, while positive signs of the exchange rate and decreased corporate income tax rate favour the vertical model of MNE in which the cost-reducing motive determines FDI over

the pure horizontal model. Lastly, the negative sign of labour productivity variable can be explained by the overall stagnation of national productivity levels for the past 12 or so years and indicating that MNEs are, to a lesser extent, interested in the quality of human capital, compared to similar CEE countries.

The robustness of benchmark results is studied in a subsequent column (2) of Table 1. In particular, column (2) reports the estimation results obtained with a standard time series ARIMA regression. However, this time the dependent variable  $FDI_t$  is normalised using a logarithmic function. The obtained results are then verified using a Durbin-Watson autocorrelation, which confirms that the residuals from the ARIMA regression are not autocorrelated. To begin with, variables of market size, oil prices and economic sanctions display the exact same signs and significance levels as the benchmark estimation in column (1). In addition, economic openness and labour productivity variables, while having similar signs and magnitudes, are not significant in the model, and this result suggests, that, overall, the horizontal mode of inward FDI is not important in Russia. Lastly, the positive signs of exchange rate and decreased corporate income tax rate are in line with the benchmark results from column (1), confirming the cost reduction motive of MNEs investing in the economy of Russia.

## 5 Conclusion

To sum up, this study empirically investigated various determinants for inward FDI in Russia during nearly three decades of transition to an open market economy. Our benchmark results, obtained using a PPML estimation technique, suggest the efficiency-seeking motive of FDI over a market-seeking, horizontal one as the main reason for inward FDI in Russia. These results are further supported by a standard ARIMA regression, which indicates the absence of statistical significance of economic openness and labour productivity variables. Overall, the market size and tax rate variables have the most positive effects on the inward FDI, while barriers to trade and sanctions have the most negative effects. These empirical results are in line with the existing discourse on the economy of Russia and further confirm that for transitional economies, integration into the world economy, proactive local development and tax cuts for outside investors remain to be critical when it comes to attracting FDI. Lastly, the negative sign of Brent crude suggests



Russia's strong dependence on natural resource trade, which creates a resource dichotomy in the economy as production factors such as capital move across sectors of the economy and causes deindustrialisation in others thus discouraging the FDI, while a positive sign of exchange rate is conventional to the theory and points to the cost reduction motive of FDI as weaker domestic currency significantly cheapens local operation costs.

Empirical findings have several empirical policy implications. While economic sanctions are confined to the domain of foreign policy. Policymakers in Russia have to focus on domestic issues, which can be categorised into two broad groups: market access and competition. First of all, the improvement of market access and capital movement mechanisms as the country continues to be ranked as one of the least accessible countries to foreign investors. Our results indicate that there is a potential for a pure vertically integrated model of MNEs in Russia, and such firms can create demand for quality labour and intermediate inputs that may, in turn, translate into rising wages and stimulate further economic development in the country. In addition, due to the geographical nature of the country, there are country-wide scaling issues for MNEs because of steep differences between regions in terms of infrastructure quality and capacity (basic utilities, electricity). Thus, capacity building and infrastructure investment to promote regional development must be carried out outside major cities. On the other hand, some of the FDI-recipient industries in Russia, such as mining and quarrying, are strongly oligopolistic and could use policies that promote and encourage competition rather than collusion as domestic firms can improve their productivity benefitting from a wide range of positive spillovers resulting from various interactions with vertically integrated MNEs.

Finally, we suggest possible future extensions of this research. The proposed framework can be possibly enriched by including various control effects for factors such as type of political regime, level of corruption, civil rights and rule of law. Such an extension may provide deeper insights into the nature of FDI motives in Russia as this study primarily focuses on the quantitative side of economic-driven motives. Lastly, the scale of research can be expanded to other post-Soviet countries to analyse detailed FDI determinants in the region.

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## Appendix

**Table A1:** Sample of years used in the estimation.

<b>Sample</b>	1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017
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Source: The author.

**Table A2:** Description of variables.

FDI	Inward FDI measured in constant 2010 US\$ dollars, log	World Bank database
GDP	Russia's GDP measured in constant 2010 US\$ 2,010 dollars, log	
BRE	BRENT crude oil price in dollars per barrel, log	United States Energy Information Administration
RER	Real effective exchange rates as weighted averages of bilateral exchange with US\$ dollar adjusted by relative consumer prices, measured as index, 2010 = 100, log	Bank for International Settlements
OPN	Own elaboration based on values of GDP, Import and Export, measured in percentage points, log	World Bank database
SAN	Own elaboration, dummy variable to account for the effect of Western sanctions on the economy of Russia, measured as 0 or 1	Own elaboration
TAX	Corporate income tax rate, measured in percentage points	Tax code of Russia
LAB	Labour productivity, GDP per hour, measured in constant 2010 US\$ dollars, log	OECD database

Source: The author.

**Table A3:** Summary statistics of variables.

Variables	Mean	Std. Dev.	Minimum	Maximum
GDP	1,303.91	324.86	813.02	1,706.43
BRE	54.06	33.48	12.76	111.57
RER	81.56	16.57	48.09	106.67
OPN	45%	0.06	37%	59%
SAN	0.14	0.34	0	1
TAX	26%	0.06	20%	35%
LAB	86.01	16.64	63.26	107.63

Source: The author.

**Table A4:** Correlations between variables.

Variables	GDP	BRENT	RER	OPN	SAN	TAX	LAB
GDP	1						
BRENT	0.85	1					
RER	0.75	0.87	1				
OPN	0.92	0.78	0.76	1			
SAN	0.52	0.12	0.08	0.53	1		
TAX	-0.89	-0.71	-0.63	-0.82	-0.40	1	
LAB	0.73	0.87	0.79	0.94	0.50	-0.88	1

Source: The author.