The Link Between Foreign Capital Flows and Housing Prices: A panel data estimation

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Abstract

This paper uses a quarterly panel data set, spanning the period from 1990 to 2012, of 45 countries that includes both developed and undeveloped economies to determine the effect of capital flows on housing prices. We distinguish among different types of capital flows—i.e., FDI flows, portfolio equity and debt investment flows, and other flows—to assess the contribution of these categories to housing price dynamics in developed and undeveloped markets. The results show that capital flows positively and significantly affect house prices, with the magnitude of this effect being large for the portfolio investment category. Further, economic growth, the country's exchange rate regime, the level of financial deepness, and the level of trade and capital account openness also determine housing prices.

Keywords: Housing Prices, Foreign Capital Flows, Savings Glut Hypothesis.

JEL Classification: C23, E32, F32, G12

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1 Introduction

From 2000 to 2006, the developed world experienced a major boom in real estate prices. A number of authors attributed this phenomena to the excess savings from developing countries, e.g., China, and the subsequent amount of capital inflows to developed economies, e.g., United States, which led to a decline on interest rates, thus causing real estate prices to rise (Bernanke, 2005, 2008; E. Mendoza and Rios-Rull, 2009).[1] After the *Great Recession* of 2007, this cycle is reversing to developing countries, rising concerns among policy makers in the region. Although the link between capital flows and overall asset price appreciation is documented in the literature (Olaberría, 2011), the empirical evidence on the effect of capital flows on housing markets is still not clearly established. The contribution of this paper is to fill this gap.

This paper uses a quarterly panel data set of 45 countries that includes both developed and undeveloped economies to determine the effect of capital inflows on housing prices. Further, we distinguish among different types of capital inflows—e.g., FDI, Portfolio Investment, among others—to assess the contribution of these categories to housing price dynamics in housing markets. Although we use an unbalanced panel, for most countries the sample period is from early 1990's to 2012, which covers a period of large capital flows between developed and developing countries and, more importantly, two major worldwide economic events: (i) the 2001 recession and (ii) the *Great Recession* of 2007.[2]

To this moment, the literature has centered the attention on the link between capital flows and (general) asset prices. The consensus is that capital inflows are associated with higher asset prices and that the effect varies across country's level of income and capital inflows categories (Jansen, 2003; Kim and Yang, 2008; Olaberría, 2011). For instance, in emerging countries capital inflows are strongly associated with asset price appreciations, with the magnitude of this effect being large for the debt inflow category. However, a number of authors argue that this

[1] Federal Chairman Ben Bernanke was probably the first to use the term "global savings glut" to describe this phenomenon.

[2] The National Bureau of Economic Research dated the 2001 recession from March to November of 2001. The *Great Recession* was dated from December 2007 to June 2009. However, at the time this paper is written, housing markets still ebb and house prices are at record low across all major global economies,
including United States, Europe, Iceland, among others.

relationship does not holds when the sample is restricted to the developed world (Olaberría, 2011; Jack Favilukis and Ludvigson, 2011).[3]

There are alternatives explanations why the relationship between capital inflows and asset prices is not clearly established in developed countries. One set of theories rely on higher household demand to drive both house prices and capital income flows. For instance, a housing price boom might lead to greater household demand and consumption through the increase on housing wealth, which needs to be financed with capital flows from abroad (Laibson and Mollerstrom, 2010). Others attribute the correlation between house prices and capital flows to the desire of households to smooth consumption of different goods (Gete, 2010). Finally, a change in housing policy–e.g., a reduction on credit standards, that boost housing demand and subsequent capital flows–might explain the relationship between house prices and capital flows (Jack Favilukis and Ludvigson, 2011). However, none of these explanations have been satisfactorily addressed empirically.

This paper employs a set of panel regressions estimated with fixed and random effect models to analyze the relationship between capital flows and housing prices. The results show that capital flows positively and significantly affect house prices, with the magnitude of this effect being large for the portfolio investment category. That is, while an increase in foreign direct investment (FDI) flows, as percentage of GDP, raises house prices by 12%, the magnitude of this effect is 13.9% for portfolio investment debt and 16.3% for other investment. Further, the results show that economic growth, the country's exchange rate regime, the level of trade and capital account openness also affect real house prices.

The results are in light with the previous empirical literature. For instance, Olaberría (2011) and Aizenman and Jinjarak (2008) use panel data samples to demonstrate that capital flows and current account deficits increase general asset prices—i.e., stock price indexes. Similar results are found in smaller samples of developed and emerging markets economies (Jinjarak and Sheffrin, 2011; Taguchi, 2011).[4]

[3]United States is one exception in which debt flows seems to affect asset prices (see Olaberría, 2011, p. 22).

[4]Jinjarak and Sheffrin (2011) explores the cases of United States,England, Spain, and Ireland; while Taguchi (2011) focuses on China, Hong Kong, Indonesia, Korea, and Thailand.

This paper departs from the previous literature in two major aspects. First, I collected the largest cross-country panel data on house prices to analyze the direct link between capital flows and housing markets, with emphasis on different categories of capital flows—i.e., FDI, portfolio equity and debt investments, and other capital flows. The analysis is extended to include the effects of current account deficits on housing prices as well. To this moment, the literature has focused on the effect of capital flows and asset price appreciations using a set of stock market indexes to draw conclusions on real estate markets. Given the limited development of capital markets in poor and developing economies, plus all the fluctuations to which financial markets are subject to, this is not the best approach to draw conclusions on the effects of capital flows on housing markets. Second, we estimate a set of panel data regressions, with 45 countries spanning over a 20 year period, to determine a causal relationship, controlling for other important factors omitted in the literature that affects housing prices, such as the country's exchange rate regime, institutional development, the level of trade and capital account openness, among others. The estimation techniques control for individual fixed and random characteristics as well as for the possible endogeneity issues that might arise between capital flows and house prices using the Arellano and Bond (1991)'s GMM estimator.

2 Data Analysis

This section analyzes both housing prices and capital flows using quarterly data for 45 countries for the 2000-2010 period.[5] To simplify the analysis, the countries are divided into groups, according to their location: Latin America and the Caribbean (LAC), Asia, Europe, and North America (NA). Since Australia and South Africa are the only countries in the sample from Africa and Oceania, respectively, both countries are analyzed separately. In addition, the sample is classified according to income levels based on the World Bank's income classification: High, Middle and Lower income economies Tables I-A and II-A at the end of this document lists the countries according to the groups they belong to.

[5]For the estimations, the sample covers quarterly data from early 1990 until 2012Q1 (unbalanced panel). However, for most developing countries the data is fully available starting from the late 1990s thus this section focus the analysis in the last decade. See table **??** for more information on data availability.

Table I shows indicators of average growth rates for House Price Indexes across six country groups or regions for the 2000-2010 time period. For developed economies, the largest increases in house prices were reported in the first half of the decade (2000-2005); for this period, developed economies in the North America region experienced a 5.9% overall increase in house prices; in Europe, developed economies' house prices had a growth rate of 6.7%, while house prices in Australia and South Africa increased by 15.8% and 8.2%, respectively. However, this trend seems to reverse in the second half, as house price growth rates started to decelerate after housing markets collapsed in United States in the year 2007. In developing economies, house price growth rates accelerated in the 2006-2010 period, with significant increases of 6.7% in Latin America and the Caribbean, and 4.1% in Asia.

Table 1: House Price Index Across Regions. Quarterly Average Growth Rate. In percent

	SA	LAC	AS	EU	NA	AU
Max	28.4	9.4	11	8.7	9.4	16.1
Min	-3.8	0.6	-4.9	-7.7	-3.9	-5.4
AG 2000-2010	10.9	5.1	1.9	4.6	4.4	7.1
AG 2001-2005	15.8	3.6	-0.2	6.7	5.9	8.2
AG 2006-2010	5.7	6.7	4.1	2.3	2.7	5.9

*N*ote. **SA**: South Africa. **LAC**: Latin America and the Caribbean. **AS**: Asia. **EU**: Europe. **NA**: North America. **AU**: Australia. **AG**: average growth.
Source: authors' estimations based on various sources.

One hypothesis explaining the increase of house prices in LAC and Asian countries during the 2006-2010 period, could be the fact that large capital flows went from developed economies to developing emerging market economies as a consequence of the global financial crisis. As we mentioned before, a number of authors have documented the existence of a positive relationship between capital flows and asset prices and questioned the extent to which domestic assets are priced locally or globally (Jack Favilukis and Ludvigson, 2011; Karolyi and Stulz, 2002). This question might raise concern to policy makers in developing economies who should be aware of the implications of a reversal in capital flows on the local economy.

Figure A.1, in the appendix, presents the evolution of Net Foreign Direct Investment (FDI)—

i.e., the sum of net direct investment abroad (assets) plus the net direct investment in the reporting economy (liabilities)—for the country groups mentioned above, during the 2000-2010 decade. For the Latin American and Caribbean countries (chart II-A), FDI flows show a modest growth rate during the sample period (5.7%), with a significant quarterly average growth rate of 17.7% during the first half of the decade (2000-2005), followed by a modest 9.6% growth rate in the second half. The downward sloping trend in net investment beginning in the fourth quarter of 2008, which implies more investment flows coming into LAC countries than investment flows going out, suggests a time coincidence between this large entry of FDI flows to Latin America and the Caribbean and the starting of the financial crisis in the United States. Chart I-A shows a similar trend in South Africa. In Asian countries (Chart III-A), the movement of net foreign direct investment flows into the region is strong from the first quarter of 2005 to the second quarter of 2009, quarter in which the United States officially declared themselves to be out of the recession, then FDI flows reversed thereafter. Europe and Australia showed signs of a significant increase in investment abroad, specifically during the second half of the decade.

Figure A.2 shows Net Portfolio Investment Equity flows (net equity)—i.e., net equity portfolio investment assets plus liabilities—for the country groups mentioned above. In the 2000-2010 ten-year period, the quarterly net equity flows increased, on average, 20.6% on a year-over-year basis in LAC countries, that is, LAC countries experienced an net equity outflow during the time period. Similarly, European markets' net equity had an average increase of 20.0% in the last decade. However, In Asian and North American markets net equity flows fell 39.5 and 49.1% respectively, in the 2000-2010 period. This rate of decline is even sharper in South Africa (64.1%).

Table II illustrates that most of the increase in net equity in LAC and European markets occurred between 2000 and 2005, before the 2007's recession, with quarterly growth rates of 117.7% and 106.8%, respectively. After 2006, these regions experienced a reversal in net equity flows with declining rates of 76.6 and 66.9 percent, respectively. In North America, net equities dropped on average 70.8% in the second half of the decade. This contrasts with the evolution of net equity flows in Australia, where it significantly increased (52.1% and 223.5%) in both

halves of the decade.

Table 2: Average Quarterly growth rates of Net Equity in Portfolio Investment, 2000-2010.

Country Groups	2001-2005	2006-2010
South Africa	-114.4	-13.9
Latin American & Caribbean	117.7	-76.6
Asia	-47.2	-31.8
Europe	106.8	-66.9
North America	-27.5	-70.8
Australia[1]	52.1	223.5

*N*ote. [1] 2000-2005 average excludes fourth quarter of 2004. Note: Year-over-Year growth rates in percentage points. Source: authors' estimations based on the International Monetary Fund's Balance of Payments Statistics.

When looking at other types of investment flows—i.e., money, reserves and other types of capital flows not classified as direct investment and reserve assets— by country groups in figure A.3, it is possible to observe a similar pattern in most developed and developing markets, with the exception of the Latin American and Caribbean region. LAC countries experienced an average quarterly 22.5% drop in other types of investment flows during the decade, a decline that is significant after year 2005. Similarly, both, in North America and Australia, net investment in other types of capital fell 84.7% and 83.2%, respectively. This situation is very different when compared with other parts of the world. In Asian countries, this category of capital flows rose to 133.5%; in Europe, the increase was 95.4%. However, Latin American and Caribbean markets showed a significant 42.7% increase in the latter half of the decade. Asian markets showed an increase of 47.4% in 2006-2010, significantly smaller than the 219.6% increase during the first half of the decade.

In general, figure A.3 shows that, except for the LAC market, all country groups increased their assets in other forms of capital either after the first quarter of 2006 or the first quarter of 2008, while LAC countries show a decreasing trend in between 2005 and 2010. The latter could mean that this form of capital is moving from more developed markets into developing markets, which supports Bernanke's "savings glut" hypothesis.

Lastly, figure A.4 shows the net current account balance by country groups. The average quarterly growth rate of the current account in LAC countries was 45.9% during the 2000-2010 ten-year period, and increased 107.4% between the years 2006 and 2010, which could be attributable to a fall of exportable goods from high income countries. For example, current account decreased at a quarterly average of 35.0% between the years 2000 and 2010 in European countries from the sample; the decline in exports started in early 2005 and the quarterly growth rate reached a period-low of 190% decrease in the fourth quarter of 2008. A similar case can be made for North American countries, where net current account worsened during the second half of the 2000 decade; during this period the average quarterly growth rate was -3.5%. As in Latin American countries, there was an increase in net current account in other parts of the world. Both, South Africa and Australia's net current account, increased at a quarterly average of 13.6% and 15.5% between the years 2006 and 2010, respectively. Likewise, Asian economies experienced an 8.3% increase in net current account during the same period.

3 Empirical Estimations and Results

To examine the impact of capital flows on housing prices, we estimate the following model in a quarterly panel dataset of 45 countries covering the 1990-2012 period subject to data availability:

$$\log(HPI)_{it} = \beta_0 + \beta_1 K_{i,t} + \beta_2 X_{i,t} + \mu_t + \eta_i + \epsilon_{i,t} \tag{1}$$

In equation 1 above HPI_{it} is the real house price index for country i at time t (i.e., quarter or year). $K_{i,t}$ is a matrix of the components of foreign capital flows—i.e, foreign direct investment (FDI), portfolio investment equity ($Equity$), portfolio investment debt ($Debt$), reserve assets (RA), and other capital flows ($Other$)—as percentage of GDP. For some estimations, the matrix K_{it} is substituted for a measure of the current account balance as a share of GDP (CA/GDP). The matrix $X_{i,t}$ contains the following control variables: the real GDP growth rate to account for the accelerator effect ($GDPg$); the Chinn and Ito (2006)'s index for capital account openness ($KAOpen$); the share of domestic banking credit to GDP as a measure of financial deepness

($Credit/GDP$); the World Bank's Worldwide Governance Indicator corruption index as a measure of quality of institutions ($Corrup$); the real exchange rate (RER); the country's industrial production index ($Production_{it}$); and the ratio of imports plus exports to GDP ($Openness$). Also, equation 1 includes a set of dummy variables to account for the World Bank's income classification ($Income_i$=1 if country i is high-income, and zero otherwise); and Reinhart and Rogoff (2004)'s classification of the country's exchange rate arrangements—e.g., fixed, peg, and floating regimes.[6] Finally, μ_t and η_i denote unobserved time- and country-specific effects, respectively; and $\epsilon_{i,t}$ is an error term.[7]

Table 3 shows the estimated model employing quarterly data, from the 1990q1 to 2012q1 period, across different specifications. The first two columns show the estimation from a pooled ordinary least squares (OLS) regression, followed by a random effects (RE) estimation (columns 3 and 4), and a fixed effects (FE) specification (columns 5 and 6). The estimations in columns 2, 4 and 6 include controls for time effects with year dummy variables (not shown in the table). Also, the table reports the coefficient's Driscoll and Kraay (1998) robust standard errors (in brackets), as well as the number of observations, number of groups, and $R-squared$. In general, table 3 shows that an increase in country i capital flows affects positively and significantly real house prices.

To decide about the best fitted model, I first ran a Breusch-Pagan Langrange Multiplier (LM) test and found significant differences across countries, suggesting that it is inadequate to run a simple OLS model. Therefore, the OLS model was discarded in favor of the RE model (see Table B.5 in the appendix).[8] Then, when comparing the FE and RE models, the Hausman test

[6] I employ Reinhart and Rogoff (2004)'s "coarse" classification for exchange rate regimes, which classifies countries from 1 to 5, being 1 the most restrictive exchange rate regime ($Fixed$), or dollarized economy, and 5 the free market exchange rate regime ($Floating$). Ilzetzki and Reinhart (2012) updated this classification to year 2010 and the data is available on-line (see references). For years 2011 and 2012, I assume for each country the same classification reported in year 2010.

[7] As part of the sensibility analysis, I also use other variants of equation 1. For instance, I substitute HPI_{it} for its nominal value—i.e., not deflated by CPI—and introduce a number of control variables such as inflation, money growth (M1), industrial production indexes, and the HarvardâĂŹs emerging market classification ($emerging_i = 1$ if country i is emerging market, and zero otherwise), among others. The estimation with these variables are not reported in the final tables because some of them were not significant and others reduced significantly the number of observations. However, in all cases the main results still hold and they are available upon request.

[8] Under the null hypothesis of "no significant differences across units", I obtained a $\chi^2 = 18,331$, thus I rejected $H0$ at 1% confidence level.

suggested that the FE model perform the best (Table B.6). Also, the F-test indicates that all year dummy variables are significant at the 1% confidence level (Table B.7), thus I chose the estimation with fixed effects that corrects for time effects (column 6).[9]

Table 3 shows that all categories of capital flows significantly increase house prices. That is, an increase in one point of foreign direct investment flows as percentage of GDP (FDI/GDP) raises real house prices by 12%. The magnitude of this effect is even larger for other categories of capital flows such as portfolio investment debt (13.9%) and other investment flows (16.3%). These results are consistent with a number of studies that assess the relationship between asset prices (or stock indexes) and capital flows (Jansen, 2003; Kim and Yang, 2008; Olaberría, 2011).

The estimations also show a number of important factors that affect house price growth. For instance, the real GDP growth rate, the county's real exchange rate, and the level of financial deepness determine house prices. The elasticity between house prices GDP and growth is one. That is, a 1% increase in the country's GDP growth rate raises house prices also by 1%, while a real exchange rate appreciation of 1% increase real house prices about 0.6%. An expansion in the level of credit in the economy, as percentage of GDP, as well as the degree of trade openness ($Openness$) affects positively and significantly house prices, but the magnitude of these effects are small.

The results also suggest that the more flexible is a country's exchange rate arrangement the larger the magnitude of the effects of capital flows on real house prices. For instance, for countries with fixed, or dollarized, exchange rate regimes ($Fixed$) house prices are 10% lower than countries with more flexible regimes. On the other hand, in countries with free market exchange rate regimes ($Flexible$), the effect of capital flows on real house prices are on average 15% larger than their counterparts.

As part of the sensitivity analysis, table 4 shows different estimations of model 1, with fixed

[9]I also performed a battery of test to assess the validity of the FE model for testing hypothesis and tried to correct for some issues presented. For instance, the Pesaran's test of cross sectional dependence shows that the residuals across entities are correlated, and the modified Wald test for heterokedasticity rejected the null of constant variance in the residuals (see tables B.8 and B.9, respectively), therefore the model was estimated with Driscoll and Kraay (1998) robust standard errors. Finally, the LM test for serial correlation showed some evidence of first-order autocorrelation (Table B.10).

and time effects. In general, the signs and significance levels of the estimated coefficient remain very stable across specifications. As the number of control variables increase in the model, the number of groups (countries) in the sample is reduced only from 43 to 37 (observations decline by 468 units). Table 5 substitutes the capital flows category for the ratio of current account to GDP (CA/GDP). The results are consistent with the previous estimations: an increase in the current account deficits (capital inflows) raises significantly house prices.

When assesing the effects of capital flows on house prices, it is important to notice the role of economic growth and credit in this process. First, capital flows by itself have a smaller and less significant impact on house price than when the estimations control for $GDPg$. Since economic growth is strongly positively correlated with real house prices, removing its effects by controlling for $GDPg$ allows the estimations to identify the significant positive effects for the capital flows (and the current account). Second, across all specifications, the magnitude of the coefficients for capital flows decrease when $Credit/GDP$ is controlled for (see tables 4 and 5). This is explained by the important role that credit expansion—or the reduction of credit standards—have on real house prices, as explained in Jack Favilukis and Ludvigson (2011).

3.1 Arellano-Bond GMM estimation

As part of the sensibility analysis, I decided to re-estimate model 1 using annual data, which also allows to consider a number of regressors that might affect housing prices that are not available for some countries in quarterly frequency: e.g., population growth, gross fixed capital formation, among others. However, there is an endogeneity issue that might arise in panel data set estimation with $T < N$. Specifically, the capital flows variables in K_{it} might be endogenous because the causality between capital flows and house prices might run in both directions—i.e., increasing house prices in year t might induce more capital inflows in t or $t + 1$ into the economy, because foreign investors would like to bring their assets to these markets.

To address this issue, I estimate equation 1 using Arellano and Bond (1991) difference GMM estimator, which use as instruments lagged values of both exogenous and endogenous regressors, making the variables in K_{it} pre-determined and uncorrelated with the error term

(see D. Holtz-Eakin and Rosen, 1988).[10]

Table 6 shows the estimation results using annual data for the 1990-2011 period. As before, the first two columns present the pooled OLS estimations, followed by the fixed effects and the Arellano-Bond estimations. All specifications control for time year effects. For comparison columns 1, 3, and 5, show the estimations with the same regressors as in table 3. Columns 2, 4, and 6 include new regressors for which data is available in an annual basis: population growth ($POPg$), gross fixed capital formation (GFK), World Bank's corruption index ($Corrup$), and net foreign assets (NFA).

In general, the results with annual data and controlling for possible endogenous regressors are consistent with the previous estimations. That is, capital flows affect positively and significantly house prices. An increase in economic activity and credit also raise significantly real house prices. Further, the positive and significant coefficient in the GFK variable suggest that investments that increases the stock of capital for a particular country (e.g., roads, highways, electricity and communication infrastructures, etc.) also raise real house prices. Finally, as the level of a country's corruption increases house prices tend to significantly decline. This might be explained because in countries with high degree of corruption, investors and buyers in housing markets might avoid fees and regulations that increase the cost of housing units, therefore, reducing house prices.

[10]Specifically, I use for the estimations the Stata's *xtabond* and *xtabond2* procedures, as explained in Mileva (2007) and Roodman (2006).

Table 3: Effect of capital flows on house prices: Results across different specifications. Quarterly data 1990q1 - 2012q1. Dependent Variable: $\log(HPI)$

	Pooled OLS		**Random Effects**		**Fixed Effects**	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI/GDP	0.344^{**}	0.042	0.086	0.121	0.080	0.120^{***}
	[0.154]	[0.129]	[0.089]	[0.079]	[0.075]	[0.041]
$Equity/GDP$	0.200	0.061	0.046	0.103^{*}	0.043	0.103^{**}
	[0.138]	[0.093]	[0.065]	[0.062]	[0.107]	[0.052]
$Debt/GDP$	0.471^{***}	0.311^{***}	0.041	0.144^{*}	0.028	0.139^{***}
	[0.133]	[0.110]	[0.094]	[0.075]	[0.071]	[0.037]
$Other/GDP$	0.511^{***}	0.331^{***}	0.073	0.167^{**}	0.062	0.163^{***}
	[0.094]	[0.077]	[0.086]	[0.072]	[0.066]	[0.036]
RA/GDP	-0.384^{*}	-0.135	-0.061	0.113	-0.060	0.112^{**}
	[0.193]	[0.101]	[0.089]	[0.081]	[0.092]	[0.050]
$GDPg$	0.011	0.016^{***}	0.009^{***}	0.010^{***}	0.009^{**}	0.010^{***}
	[0.011]	[0.006]	[0.003]	[0.004]	[0.004]	[0.003]
$Income^{\dagger}$	-0.187^{**}	0.063	-0.487^{**}	-0.121		
	[0.071]	[0.042]	[0.190]	[0.157]		
$KAOpen$	-0.096^{***}	-0.125^{***}	0.012	-0.041	0.014	-0.039^{***}
	[0.020]	[0.016]	[0.034]	[0.033]	[0.014]	[0.013]
$Credit/GDP$	0.001^{***}	0.000	0.004^{***}	0.001	0.004^{***}	0.001^{***}
	[0.000]	[0.000]	[0.001]	[0.001]	[0.000]	[0.000]
RER	0.008^{***}	0.010^{***}	0.004	0.006^{***}	0.004^{***}	0.006^{***}
	[0.001]	[0.002]	[0.002]	[0.002]	[0.001]	[0.001]
$Openness$	0.000^{***}	0.000^{***}	-0.000^{***}	0.000	-0.000^{***}	0.000^{**}
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Fixed$	-0.007	-0.193^{***}	-0.046	-0.106	-0.049^{***}	-0.104^{***}
	[0.030]	[0.020]	[0.063]	[0.106]	[0.014]	[0.025]
Peg	0.068^{*}	-0.150^{***}	0.059	-0.047	0.051	-0.047
	[0.040]	[0.021]	[0.056]	[0.060]	[0.035]	[0.030]
$Floating$	-0.214^{*}	-0.016	0.113^{***}	0.148^{***}	0.117^{***}	0.149^{***}
	[0.119]	[0.060]	[0.028]	[0.048]	[0.020]	[0.024]
$Constant$	-0.731^{***}	-1.215^{***}	-0.446^{*}	-0.419	-0.925^{***}	0.000
	[0.166]	[0.185]	[0.233]	[0.268]	[0.113]	[0.000]
Time Effects	NO	YES	NO	YES	NO	YES
Observations	2125	2125	2125	2125	2125	2125
Number of countries	37	37			37	37
R-squared	0.253	0.514	0.088^{a}	0.446^{a}	0.353	0.553

Note. Standard errors in brackets. *Significant at 10%; **significant at 5%; ***significant at 1%.
†Dummy variable not included in the Fixed Effects estimations. ^{a}Overall R-squared

Table 4: Effect of capital flows on house prices: Fixed-Effects estimation. Quarterly data 1990q1 - 2012q1. Dependent Variable: $\log(HPI)$

	(1)	(2)	(3)	(4)	(5)
FDI/GDP	0.170^{***}	0.148^{***}	0.135^{***}	0.122^{***}	0.120^{***}
	[0.051]	[0.056]	[0.046]	[0.038]	[0.041]
$Equity/GDP$	0.235^{***}	0.200^{***}	0.171^{***}	0.108^{**}	0.103^{**}
	[0.043]	[0.042]	[0.045]	[0.048]	[0.052]
$Debt/GDP$	0.351^{***}	0.338^{***}	0.231^{***}	0.154^{***}	0.139^{***}
	[0.049]	[0.050]	[0.051]	[0.039]	[0.037]
$Other/GDP$	0.341^{***}	0.318^{***}	0.229^{***}	0.173^{***}	0.163^{***}
	[0.045]	[0.046]	[0.046]	[0.038]	[0.036]
RA/GDP	0.257^{***}	0.278^{***}	0.168^{***}	0.128^{**}	0.112^{**}
	[0.051]	[0.052]	[0.062]	[0.049]	[0.050]
$GDPg$	0.005^{*}	0.007^{**}	0.009^{***}	0.011^{***}	0.010^{***}
	[0.003]	[0.003]	[0.003]	[0.003]	[0.003]
$KAOpen$		-0.044^{***}	-0.036^{***}	-0.048^{***}	-0.039^{***}
		[0.011]	[0.013]	[0.014]	[0.013]
$Credit/GDP$			0.002^{***}	0.001^{***}	0.001^{***}
			[0.000]	[0.000]	[0.000]
RER				0.006^{***}	0.006^{***}
				[0.001]	[0.001]
$Openness$				0.000^{***}	0.000^{**}
				[0.000]	[0.000]
$Fixed$					-0.104^{***}
					[0.025]
Peg					-0.047
					[0.030]
$Floating$					0.149^{***}
					[0.024]
$Constant$	-0.228^{***}	-0.152^{***}	-0.333^{***}	0	0
	[0.010]	[0.019]	[0.037]	[0.000]	[0.000]
Observations	2500	2496	2434	2125	2125
Number of countries	43	43	43	37	37
R-squared	0.421	0.435	0.443	0.546	0.553

Note. All estimations include time year dummy. Driscoll-Kraay standard errors in brackets. * Significant at 10%. ** Significant at 5%. *** Significant at 1%.

Table 5: Effect of current account on house prices: Fixed-Effects estimation. Quarterly data 1990q1 - 2012q1. Dependent Variable: $\log(HPI)$

	(1)	(2)	(3)	(4)	(5)
CA/GDP	-0.739^{***}	-0.719^{***}	-0.558^{***}	-0.418^{***}	-0.380^{***}
	[0.116]	[0.119]	[0.120]	[0.124]	[0.117]
$GDPg$	0.004^{*}	0.006^{**}	0.008^{***}	0.009^{***}	0.009^{***}
	[0.002]	[0.002]	[0.003]	[0.002]	[0.002]
$KAOpen$		-0.058^{***}	-0.052^{***}	-0.051^{***}	-0.045^{***}
		[0.013]	[0.014]	[0.012]	[0.012]
$Credit/GDP$			0.002^{***}	0.001^{***}	0.001^{***}
			[0.000]	[0.000]	[0.000]
RER				0.006^{***}	0.006^{***}
				[0.001]	[0.001]
$Openness$				0.000^{***}	0.000^{***}
				[0.000]	[0.000]
$Fixed$					-0.070^{***}
					[0.018]
Peg					-0.051^{**}
					[0.025]
$Floating$					0.097^{**}
					[0.048]
$Constant$	-0.221^{***}	-0.180^{***}	-0.301^{***}	0	0
	[0.017]	[0.024]	[0.033]	[0.000]	[0.000]
Observations	2705	2697	2635	2313	2313
Number of countries	45	45	45	39	39
R-squared					

Note. All estimations include a time year dummy. Driscoll-Kraay standard errors in brackets. * Significant at 10%. ** Significant at 5%. *** Significant at 1%.

Table 6: Effect of capital flows on house prices: Results across different specifications. Annual data 1990-2011. Dependent Variable: $log(HPI)$

	Pooled OLS		**Fixed Effects**		**Arellano-Bond**	
	(1)	(2)	(3)	(4)	(5)	(6)
FDI/GDP	-0.112	-0.25	0.345^{**}	0.438^{*}	0.036	0.156
	[0.341]	[0.325]	[0.162]	[0.220]	[0.107]	[0.132]
$Equity/GDP$	0.129	0.043	0.251^{*}	0.122	0.421^{**}	0.493^{***}
	[0.152]	[0.154]	[0.125]	[0.157]	[0.169]	[0.177]
$Debt/GDP$	0.595^{***}	0.700^{***}	0.423^{**}	0.262	0.194^{**}	0.250^{**}
	[0.165]	[0.149]	[0.151]	[0.170]	[0.092]	[0.102]
$Other/GDP$	0.759^{***}	0.772^{***}	0.509^{***}	0.348^{*}	0.231^{*}	0.306^{**}
	[0.157]	[0.188]	[0.163]	[0.189]	[0.114]	[0.120]
RA/GDP	-0.763^{**}	-0.591^{*}	0.361^{*}	0.477^{**}	0.172	0.464
	[0.359]	[0.313]	[0.189]	[0.211]	[0.368]	[0.306]
$GDPg$	0.023^{**}	0.011	0.015^{***}	0.010^{***}	0.009^{**}	0.011^{**}
	[0.010]	[0.010]	[0.005]	[0.003]	[0.004]	[0.004]
$Income^{\dagger}$	0.068	0.142^{**}				
	[0.049]	[0.061]				
$KAOpen$	-0.122^{***}	-0.123^{***}	-0.055^{**}	-0.082^{***}	-0.01	-0.008
	[0.022]	[0.019]	[0.020]	[0.020]	[0.030]	[0.022]
$Credit/GDP$	0	0	0.001^{*}	0.001^{***}	0.001^{**}	0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
RER	1.009^{***}	0.844^{***}	0.652^{***}	0.761^{***}		
	[0.265]	[0.283]	[0.123]	[0.126]		
$Openness$	0.000^{***}	0	0.000^{**}	0.000^{*}	0	0
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
$Fixed$	-0.198^{***}	-0.155^{***}	-0.164^{***}	-0.192^{*}	-0.035	-0.07
	[0.046]	[0.047]	[0.052]	[0.105]	[0.072]	[0.168]
Peg	-0.011	0.162^{**}	-0.144^{***}	-0.068	0.181	0.14
	[0.125]	[0.071]	[0.049]	[0.066]	[0.130]	[0.199]
$Floating$	-0.172^{***}	-0.093^{**}	-0.133^{**}	-0.150^{**}	-0.033	-0.144
	[0.051]	[0.041]	[0.051]	[0.069]	[0.069]	[0.285]
$POPg$		0.017		0.056		0.008
		[0.014]		[0.033]		[0.054]
GFK		0.000^{***}		0.000^{***}		0
		[0.000]		[0.000]		[0.000]
$Corrup$		-0.042^{**}		-0.110^{**}		0.03
		[0.015]		[0.048]		[0.055]
NFA/GDP		0.115^{*}		0.187^{***}		0.043
		[0.062]		[0.050]		[0.051]
reer					0.003^{***}	0.003^{**}
					[0.001]	[0.001]
$Constant$	-4.897^{***}	-4.016^{**}	-3.240^{***}	-3.491^{***}		
	[1.274]	[1.377]	[0.556]	[0.586]		
Observations	542	446	542	446	498	405
Number of countries	37	37	37	37	37	37
R-squared	0.530	0.514	0.571	0.605	N.R.	N.R.

Note. All estimations include a time year dummy. Driscoll-Kraay standard errors in brackets. *Significant at 10%; **significant at 5%; ***significant at 1%. N.R. = Not reported.

†Dummy variable not included in the FE and Arellano-Bond estimations.

4 Capital Flows and House Prices: The case of the Dominican Republic

Table 7 below shows the results of the Ordinary Least Squares (OLS) estimation of the gross capital inflows (GKI) effects on house prices for the case of the Dominican Republic. Basically, we take from the panel the part of the data related only to the Dominican Republic and perform a time series estimation. As in the case of the panel data estimation, I look to quantify the effects capital inflows have on real house prices controlling for several macroeconomic and external sector variables such as domestic credit provided by the banking sector, the real growth rate, capital account openness, and the real exchange rate index. The estimations also include the variable remittances, which represents an important source of resources for and remittances households, to account for the effects of these flows on housing prices.

There are four estimations in table 7 that differ only on the independent variables included in each one of them. The first column shows the results of regressing real house prices on gross capital inflows and remittances both measured as a percentage of GDP; residuals coming out of this specification are non-stationary therefore we reject it. The second column adds macroeconomic control variables to the estimation, but as in the previous case we get poor and unreliable results given the non-stationary behavior of the residuals. The column labeled as (2.1) adds a dummy variable to the previous specification that takes the value 1 only during the 2004Q1-2005Q1 period in order to reflect the steep increase shown by real house prices after the banking crisis exploded; the residuals are stationary as a consequence of adding the dummy variable.[11] Finally, column 3 includes two external sector control variables in the specification. Based on the panel data estimations in section 3, I would have expected variables such as gross capital inflows, remittances, and domestic credit to have a positive effect on real house prices, instead we get small negative effects from these variables. It should be noticed that we only count with few observations (44) for each of our estimations. Also, our gross capital inflows measure only includes FDI flows leaving out portfolio flows, and other assets flows.

[11] All the estimations include this dummy variable but the results were only different and significant in the case of the column (2.1).

Table 7: Effect of capital flows on house prices: The case of Dominican Republic.
OLS estimation. Quarterly data 2000Q1-2011Q4

Variable	(1)	(2)	(2.1)	(3)
$Constant$	5.249***	2.92**	0.817	4.110***
	[0.279]	[1.481]	[1.137]	[0.509]
GKI/GDP	0.006	0.003	0.000	-0.010***
	[0.013]	[0.012]	[0.00]	[0.003]
$Remittances/GDP$	-0.149***	-0.073	-0.098***	-0.027
	[0.029]	[0.049]	[0.025]	[0.021]
$Credit/GDP$		0.043	0.102	-0.018***
		[0.032]	[0.029]	[0.004]
$GDPg$		0.028*	0.036***	0.002
		[0.016]	[0.011]	[0.004]
RER				0.008**
				[0.003]
$KAOpen$				0.285***
				[0.019]
$Dummy$			0.933***	
			[0.277]	
Adjusted R^2	0.31	0.43	0.68	0.95
Observations	44	44	44	44
Residuals I(.)[a]	I(1)	I(1)	I(0)	I(0)

Note: log(real house price index) is the dependent variable. **credit_gdp**: Domestic credit provided by the banking sector (% GDP). **gdp_growth**: Real GDP growth (year-on-year). **gci_ngdp**: Gross capital inflows (% GDP). **rem_ngdp**: Workers' remittances, receipts (%GDP). **reer**: Real exchange rate regime-CPI. **kaopen**: Capital account openness. **dum**: dummy variable takes value 1 on 2004Q1-2005Q1. [a] I(·) refers to the integration order given by the ADF test. ***Statistical significance at the 1%. ** Statistical significance at the 5%. * Statistical significance at the 10% level. Newey-West standard errors in [·].

5 Conclusions

This paper analyze the effect of capital flows on housing prices using a panel data set with quarterly (and annual) data covering the period from 1990-2012. The results are consistent with previos studies that analyze the effect of capital on real stock prices (Jansen, 2003; Kim and Yang, 2008; Olaberría, 2011; Jack Favilukis and Ludvigson, 2011). That is, this paper shows that capital flows affect positively and significantly real house prices and the magnitude of these effects varies across different categories of capital flows, as well as the country's level of income and exchange rate regime.

The results are consistent across a number of econometric specifications, including pooled OLS, random effects, fixed effects, and Arellano and Bond (1991) estimator. The estimations, based on the fixed effects model, shows that an increase in one point of foreign direct investment flows as percentage of GDP raises real house prices by 12%. The magnitude of this effect is even larger for other categories of capital flows such as portfolio investment debt (13.9%) and other investment flows (16.3%). Other factors affecting positively and significantly real house prices growth include, the real GDP growth rate, the real exchange rate, trade openness, and the level of financial deepness. On the other hand, the level of openness in the capital account measured by the Chinn and Ito (2006)'s index, affects negatively real housing prices.

The results also suggest that the more flexible is a country's exchange rate arrangement the larger the magnitude of the effects of capital flows on real house prices. For instances, for countries with fixed, or dollarized, exchange rate regimes (err_1) house prices are 10% lower than countries with more flexible regimes. On the other hand, in countries with free market exchange rate regimes, the effect of capital flows on real house prices are on average 15% larger than their counterparts (err_5).

Although these results show strong evidence for Bernanke (2005, 2008)'s "savings glut" hypothesis, they do not reject the role of the credit channel and the flexibility of housing policy as an important channel that affects real house prices. For instance, the magnitude and significance level of the effects of capital flows on house prices decrease when I control for the

level of credit in the economy (see tables 4 and 5). This is explained by the important role that credit expansion—or the reduction of credit standards—have on real house prices, as explained in Jack Favilukis and Ludvigson (2011).

Finally, the data shows that emerging market economies have been receiving large capital inflows in recent years. This raises a concern for policy makers because of the fear that a sudden stop of capital flows might bring adverse consequences into housing markets and the overall economy. However, to increase the level of capital controls might not be the answer for policy makers to respond. As the results show, the Chinn and Ito (2006)'s $KAOpen$ index, which measures the intensity and the extend of capital controls, indicates that more capital restrictions does note lead to lower real housing prices. This might be explained because a higher level of financial openness cause a higher development in equity market, which also increases financial deepness and the availability of funds that households can access to satisfy their financial requirements. Moreover, it is possible to extend that the private sector will always find ways to avoid regulatory capital controls, therefore nullifying their possible effects in the economy (Edwards, 1999). For those reasons, the more reasonable way to make housing markets reflect prices according to the fundamentals of the economy might be to eliminate policy distortions—e.g., subsidies, credit standard regulations, etc.—that can affect the real value of housing and financial credit conditions.

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A Data Appendix: Figures and Tables

Table A.1: Countries

Countries	Country groups	Income Groups
Australia	Oceania	High Income OECD
Austria	Europe	High Income OECD
Belgium	Europe	High Income OECD
Bulgaria	Europe	Middle-to-Upper Income
Canada	North America	High Income OECD
Colombia	Latin America\Caribbean	Middle-to-Upper Income
Cyprus	Europe	High Income OECD
Czech Republic	Europe	High Income OECD
Denmark	Europe	High Income OECD
Dominican Republic	Latin America\Caribbean	Middle-to-Upper Income
Ecuador	Latin America\Caribbean	Middle-to-Upper Income
Estonia	Europe	High Income OECD
Finland	Europe	High Income OECD
France	Europe	High Income OECD
Germany	Europe	High Income OECD
Greece	Europe	High Income OECD
Hong Kong	Asia	High Income Economy
Hungary	Europe	High Income OECD
Iceland	Europe	High Income OECD
Indonesia	Asia	Lower-to-Middle Income
Ireland	Europe	High Income OECD
Israel	Asia	High Income OECD
Italy	Europe	High Income OECD
Japan	Asia	High Income OECD
Lithuania	Europe	Middle-to-Upper Income
Malaysia	Asia	Middle-to-Upper Income
Malta	Europe	High Income Economy
Mexico	Latin America\Caribbean	Middle-to-Upper Income
Netherlands	Europe	High Income OECD
New Zealand	Europe	High Income OECD
Norway	Europe	High Income OECD
Poland	Europe	High Income OECD
Portugal	Europe	High Income OECD
Russia	Europe	Middle-to-Upper Income
Singapore	Asia	High Income Economy
Slovak Republic	Europe	High Income OECD
Slovenia	Europe	High Income OECD
South Africa	Africa	Middle-to-Upper Income
South Korea	Asia	High Income OECD
Spain	Europe	High Income OECD
Sweeden	Europe	High Income OECD
Switzerland	Europe	High Income OECD
United Kingdom	Europe	High Income OECD
United States	North America	High Income OECD
Uruguay	Latin America\Caribbean	Middle-to-Upper Income

*N*ote. Both High Income and High Income OECD were grouped as "High Income" in Chart I; the rest of the groups were grouped as "Lower-to-Middle Income" for the same chart.

Table A.2: Data description and sources

Series codes	Description	Source
hpi	House price indices	Bloomberg; GPG
din_gdp	Direct investment, net (%GDP)	IMF-IFS
pieqnet_gdp	Portfolio investment equity, net (%GDP)	IMF-IFS
pidebtnet_gdp	Portfolio investment debt, net (%GDP)	IMF-IFS
oinet_gdp	Other investment, net (%GDP)	IMF-IFS
ran_gdp	Reserve assets, net (%GDP)	IMF-IFS
can_gdp	Current account, net (%GDP)	IMF-IFS
infy	Inflation (year-on-year)	IMF-IFS
gdp_growth	Real GDP growth (year-on-year)	IMF-IFS
Ind_production	Industrial production index	IMF-IFS
reer	Real exchange rate regime-CPI	IMF-IFS
openness	(exports+imports)\GDP	IMF-IFS
m1	Currency and demand deposits	IMF-IFS
err_1	De facto peg; pre announced peg or band	Ilzetzki et al. (2008)
err_2	De facto and pre announced crawling peg or band	Ilzetzki et al. (2008)
err_3	Moving band; managed floating	Ilzetzki et al. (2008)
err_4	Freely floating	Ilzetzki et al. (2008)
err_5	Freely falling	Ilzetzki et al. (2008)
err_6	Dual market; parallel market data missing	Ilzetzki et al. (2008)
d_income	Country classification by income dummy	World Bank-WDI
credit_gdp	Domestic credit provided by banking sector (% GDP)	World Bank-WDI
remit	Workers' remittances, receipts (BoP, current US$)	World Bank-WDI
popul	Population, total	World Bank-WDI
f_capital	Gross fixed capital formation (%GDP)	World Bank-WDI
corruption	Corruption index	World Bank-WGI
d_emer	Emerging market dummy	EMGPP
kaopen	Capital account openness	Chinn and Ito (2006)

Notes. GPG: Global Property Guide. IMF-IFS: IMF's International Financial Statistics. WDI: World Development Indicators. WGI: World Governance Indicators. Ilzetzki et al. (2008): For more detail on exchange rate regimes classification see Ilzetzki, Reinhart and Rogoff (2008). EMGPP: Emerging Market Global Players Project (Columbia University).

Table A.4: Descriptive statistics[12]

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Austria				
Min	64.7	0.0	-8.3	-12.3	-1.6	1.1	118.7	85.2
Median	89.1	2.1	-0.3	0.9	3.4	2.5	124.5	155.2
Average	92.0	2.2	-0.6	1.6	3.2	2.3	126.3	362.1
Max	123.7	4.1	7.7	22.6	5.9	2.5	140.9	876.0
Obs.	88.0	84.0	88.0	88.0	89.0	89.0	84.0	89.0
σ	17.2	1.0	2.7	5.9	1.5	0.4	6.1	264.2
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
				Australia				
Min	39.6	-0.3	-7.2	-14.7	-5.9	1.1	69.7	40.0
Median	58.9	2.6	0.5	3.5	2.5	1.1	93.8	72.3
Average	75.8	2.7	0.9	3.0	2.2	1.6	101.8	72.7
Max	144.8	6.1	16.2	12.8	5.3	2.5	147.6	106.7
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	35.2	1.4	2.8	4.7	2.0	0.6	26.3	15.2
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Belgium				
Min	40.4	-1.2	-23.4	-31.9	-4.2	1.7	69.1	177.7
Median	71.4	2.2	0.0	0.0	2.1	2.5	117.3	319.8
Average	80.0	2.1	1.1	-0.4	2.9	2.3	119.5	1453.3
Max	137.6	5.6	21.4	28.3	29.2	2.5	149.1	5754.7
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	84.0	89.0
σ	30.8	1.1	6.3	9.0	5.1	0.3	22.5	1872.4
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Bulgaria				
Min	87.6	-0.9	-7.8	-13.5	-7.6	-1.2	15.0	74.5
Median	103.0	8.1	5.2	-0.8	5.5	-0.9	55.6	231.7
Average	109.1	89.4	8.7	-1.3	3.8	0.1	59.7	188.0
Max	330.2	1715.6	33.8	7.0	8.8	2.2	133.1	500.5
Obs.	76.0	80.0	72.0	72.0	36.0	73.0	84.0	89.0
σ	30.3	282.7	8.7	3.1	4.3	1.5	38.8	112.8
I(·)	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)	I(1)	I(0)
				Canada				
Min	59.1	-0.9	-2.9	-2.4	-3.7	2.5	102.5	16.0
Median	69.7	1.9	-0.1	0.3	2.5	2.5	118.8	23.8
Average	87.2	2.1	-0.1	0.2	2.3	2.5	147.3	23.9
Max	158.0	6.4	2.2	3.4	5.9	2.5	219.6	33.3
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	76.0	89.0
σ	30.9	1.2	0.7	1.0	2.2	0.0	41.0	5.5
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	n.a.	I(1)	I(1)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Colombia				
Min	57.7	2.0	-3.6	-5.9	-6.8	-1.9	30.2	21.3
Median	82.4	8.0	2.3	0.0	3.8	-1.2	40.7	26.2
Average	95.4	12.4	2.1	0.2	3.2	-0.8	44.1	22.3
Max	170.3	31.6	5.8	4.0	7.7	1.1	65.9	35.4
Obs.	60.0	84.0	72.0	72.0	65.0	89.0	88.0	89.0
σ	34.2	8.7	1.7	1.8	3.0	0.7	10.3	11.2
I(·)	I(1)	I(1)	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)
				Cyprus				
Min	77.2	-1.0	-25.7	-193.6	-3.0	-1.2	113.5	55.5
Median	107.4	3.1	0.0	0.0	3.6	-0.1	191.2	67.7
Average	104.0	3.2	2.1	-9.0	2.8	0.3	200.5	56.2
Max	118.6	7.8	21.1	165.3	6.6	2.5	330.1	92.0
Obs.	23.0	84.0	68.0	68.0	65.0	89.0	88.0	89.0
σ	12.0	1.5	6.3	49.8	2.1	1.5	62.4	32.4
I(·)	I(1)	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)	I(0)
				Czech Republic				
Min	98.7	-0.4	-4.0	-10.7	-6.2	-0.1	40.6	1697.3
Median	118.5	3.1	3.2	0.1	3.2	2.5	55.6	2758.6
Average	115.6	4.5	3.9	0.5	3.1	1.6	55.2	2641.5
Max	133.2	13.3	26.5	11.9	16.4	2.5	68.3	5024.3
Obs.	28.0	72.0	88.0	88.0	69.0	65.0	76.0	89.0
σ	13.3	3.5	4.5	3.4	3.9	1.1	9.7	1116.4
I(·)	I(1)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Denmark				
Min	35.8	0.9	-10.6	-24.5	-8.0	1.9	52.9	334.0
Median	70.4	2.1	-0.4	0.5	1.8	2.5	148.6	401.0
Average	74.0	2.1	-0.6	-0.8	1.5	2.4	126.4	410.9
Max	127.4	4.2	11.6	19.6	6.7	2.5	221.9	589.3
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	30.3	0.6	3.4	10.3	2.5	0.1	66.2	75.1
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	n.a.	I(1)	I(1)
				Dominican Republic				
Min	30.8	-1.1	-1.6	-7.6	-2.2	-1.9	18.1	19.4
Median	70.0	7.1	3.4	0.0	5.8	-1.2	31.7	29.4
Average	65.8	12.1	3.0	0.5	5.7	-0.2	30.3	27.3
Max	105.4	80.4	13.0	9.0	12.8	2.2	40.6	46.5
Obs.	48.0	84.0	80.0	80.0	76.0	89.0	88.0	89.0
σ	24.6	15.5	2.6	2.4	3.5	1.5	7.9	11.3
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Ecuador				
Min	100.6	1.5	-2.3	-40.2	-7.2	-1.1	15.5	35.9
Median	120.9	22.6	2.2	0.0	3.5	0.2	24.7	49.0
Average	119.3	25.3	2.1	0.7	3.3	0.6	25.3	46.1
Max	132.3	104.8	7.8	124.2	12.0	2.5	42.7	74.4
Obs.	29.0	84.0	80.0	80.0	76.0	89.0	88.0	89.0
σ	9.6	24.5	1.9	15.0	3.5	1.2	7.7	17.4
I(·)	I(0)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Estonia				
Min	89.2	-2.0	-6.0	-46.7	-17.6	1.9	11.2	1081.5
Median	210.0	5.2	5.5	-0.4	6.6	2.5	50.4	1620.5
Average	227.5	15.6	6.0	-0.6	4.7	2.4	57.2	1401.4
Max	355.4	256.2	34.3	16.2	13.1	2.5	105.4	2789.6
Obs.	32.0	76.0	76.0	76.0	73.0	65.0	68.0	89.0
σ	82.2	34.2	6.6	9.6	6.6	0.1	30.0	753.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	n.a.	I(1)	I(0)
				Finland				
Min	44.4	-1.0	-32.6	-21.3	-9.8	1.1	55.0	66.8
Median	68.9	1.6	-0.7	0.4	3.1	2.5	74.0	128.9
Average	77.4	1.8	-1.5	0.0	2.2	2.3	75.4	183.8
Max	127.9	4.9	11.5	26.0	9.3	2.5	100.8	396.3
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	88.0	89.0
σ	27.0	1.3	5.2	9.4	4.2	0.4	15.0	95.8
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
				France				
Min	45.9	-0.4	-25.2	-11.3	-3.9	0.2	99.5	49.6
Median	58.8	1.8	-1.3	0.0	1.8	2.5	103.9	93.8
Average	73.7	1.7	-2.2	0.8	1.6	2.2	109.7	145.3
Max	127.4	3.4	3.2	22.4	5.6	2.5	133.5	293.9
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	84.0	89.0
σ	29.4	0.8	4.0	6.8	1.6	0.7	11.2	79.5
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)
				Germany				
Min	84.8	-0.2	-9.9	-34.3	-6.8	2.5	101.8	66.7
Median	101.1	1.6	-1.3	0.6	1.9	2.5	132.0	114.4
Average	100.1	1.9	-0.9	0.5	2.2	2.5	129.8	115.2
Max	104.2	6.1	25.6	10.8	16.2	2.5	146.5	274.2
Obs.	86.0	80.0	88.0	88.0	88.0	89.0	88.0	89.0
σ	4.4	1.2	3.7	5.9	3.4	0.0	13.3	27.3
I(·)	I(0)	I(1)	I(0)	I(0)	I(0)	n.a.	I(1)	I(0)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Greece				
Min	96.2	0.7	-4.2	-23.5	-8.6	-1.2	76.3	28.5
Median	192.4	3.9	-0.1	4.8	1.8	1.4	94.6	32.4
Average	192.4	6.2	0.0	4.4	0.8	1.3	99.3	28.1
Max	261.4	21.5	3.4	29.5	7.4	2.5	148.5	68.7
Obs.	60.0	84.0	48.0	48.0	46.0	89.0	88.0	89.0
σ	53.6	4.9	1.4	10.5	4.4	1.3	19.1	26.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)	I(0)
				Hong Kong				
Min	56.5	-5.8	-37.6	-89.5	-8.1	2.5	120.2	196.0
Median	97.6	2.3	0.0	0.0	5.2	2.5	142.5	246.8
Average	104.4	3.1	-0.1	-7.5	4.1	2.5	146.5	271.3
Max	177.5	12.0	24.7	47.6	12.0	2.5	211.2	399.9
Obs.	80.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	28.1	4.7	9.7	21.0	4.0	0.0	22.1	64.2
I(·)	I(1)	I(1)	I(0)	I(0)	I(0)	n.a.	I(1)	I(1)
				Hungary				
Min	45.6	2.5	-8.8	-16.5	-8.1	-1.9	49.6	6736.0
Median	172.4	8.9	4.3	0.9	3.3	1.4	73.5	23272.0
Average	149.5	12.5	4.1	1.9	2.2	0.7	73.5	18792.6
Max	200.7	35.8	30.9	18.6	5.6	2.5	105.5	43217.5
Obs.	56.0	84.0	68.0	68.0	65.0	89.0	88.0	89.0
σ	46.5	9.2	5.1	6.7	3.0	1.7	16.3	12437.1
I(·)	I(0)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Iceland				
Min	137.1	0.2	-79.8	-136.2	-8.6	-1.2	49.4	2719.7
Median	294.7	3.9	-0.7	2.2	2.7	1.1	99.0	3579.2
Average	253.0	4.7	-1.9	-0.9	3.0	0.4	123.6	3270.1
Max	354.7	17.1	59.9	116.7	14.1	1.1	313.9	8940.2
Obs.	48.0	84.0	60.0	60.0	56.0	89.0	88.0	89.0
σ	77.8	3.4	21.8	54.2	4.9	1.0	80.2	2770.7
I(·)	I(1)	I(1)	I(0)	I(1)	I(1)	I(1)	I(1)	I(1)
				Indonesia				
Min	124.7	-0.6	-4.3	-15.8	-17.6	1.0	36.5	37.4
Median	133.3	8.2	0.5	1.1	5.1	1.1	48.3	45.0
Average	133.6	11.2	0.4	0.7	3.7	1.6	48.6	43.5
Max	142.8	78.4	4.5	8.6	7.2	2.5	62.1	105.3
Obs.	24.0	84.0	76.0	76.0	57.0	89.0	88.0	89.0
σ	5.8	13.2	1.6	3.2	5.2	0.6	7.8	21.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)	I(0)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
					Ireland			
Min	18.5	-6.1	-39.4	-82.5	-8.3	-0.1	48.8	105.0
Median	58.3	2.6	3.5	-6.1	4.6	2.5	107.1	145.4
Average	58.4	2.5	2.3	-0.9	3.9	2.1	122.4	153.2
Max	119.6	6.6	34.6	250.9	15.2	2.5	233.2	933.6
Obs.	84.0	84.0	60.0	60.0	56.0	89.0	88.0	89.0
σ	33.9	2.3	16.4	46.3	5.1	0.8	61.5	163.3
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)
					Israel			
Min	119.6	-2.5	-22.6	-14.2	-4.7	-1.2	74.0	44.0
Median	187.9	4.1	0.8	-0.1	4.8	1.4	82.3	55.2
Average	194.7	5.8	0.7	0.2	4.4	1.0	83.1	55.5
Max	292.8	21.2	13.2	17.6	11.4	2.5	106.2	71.0
Obs.	72.0	84.0	88.0	88.0	89.0	89.0	80.0	89.0
σ	35.7	5.3	3.5	4.3	3.1	1.4	7.9	8.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(0)	I(0)
					Italy			
Min	47.6	0.1	-6.8	-11.0	-6.9	0.2	87.0	49.1
Median	65.7	2.5	-0.3	1.0	1.3	2.5	98.6	87.3
Average	77.9	2.9	-0.6	1.2	1.1	2.2	107.2	21187.8
Max	115.8	6.6	3.3	12.0	6.3	2.5	157.0	71189.3
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	88.0	89.0
σ	22.7	1.4	1.7	4.7	2.2	0.7	21.0	26867.4
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)
					Japan			
Min	85.0	-2.2	-1.1	-3.7	-9.2	2.2	253.8	293.4
Median	128.2	-0.1	-0.2	-0.1	1.3	2.5	299.3	560.8
Average	124.6	0.3	-0.2	-0.2	1.1	2.4	295.4	561.8
Max	165.4	3.7	0.0	3.0	7.7	2.5	337.8	968.0
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	25.1	1.2	0.2	1.0	2.6	0.1	22.8	157.7
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
					Lithuania			
Min	58.4	-1.7	-5.5	-7.2	-15.8	1.7	11.1	299.9
Median	87.1	3.6	2.7	0.2	5.7	2.5	19.2	382.0
Average	97.9	29.4	2.8	1.3	4.0	2.3	32.2	381.6
Max	144.3	722.9	19.4	21.5	11.6	2.5	70.0	2110.5
Obs.	69.0	75.0	76.0	76.0	73.0	65.0	76.0	89.0
σ	21.1	101.6	3.1	4.7	6.4	0.3	21.2	266.7
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(0)

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Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Mexico				
Min	81.3	3.1	-0.1	-2.8	-9.7	-0.8	31.8	7.1
Median	101.2	6.5	0.6	0.4	3.6	1.1	37.4	13.4
Average	100.2	11.3	0.6	0.3	2.9	0.8	38.8	12.4
Max	116.8	48.7	2.1	2.7	8.4	1.1	49.6	16.5
Obs.	28.0	84.0	88.0	88.0	88.0	89.0	88.0	89.0
σ	10.6	10.3	0.3	0.9	3.7	0.6	5.1	2.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
				Malasya				
Min	93.4	-2.3	-9.9	-26.6	-11.2	-1.2	72.7	469.0
Median	116.7	3.0	0.0	0.0	6.8	-0.1	129.8	675.7
Average	118.7	2.9	0.0	0.0	6.1	0.5	127.2	676.5
Max	157.8	8.4	5.4	17.6	13.1	2.5	163.4	973.9
Obs.	52.0	84.0	84.0	84.0	88.0	89.0	88.0	89.0
σ	17.2	1.6	2.3	6.3	4.7	1.0	22.6	222.6
I(·)	I(1)	I(0)	I(1)	I(0)	I(0)	I(1)	I(1)	I(1)
				Malta				
Min	93.1	-0.4	-43.0	-127.5	-6.6	-1.2	82.3	124.7
Median	166.4	2.8	4.2	-7.9	2.7	-1.2	128.4	175.2
Average	150.6	2.7	7.4	-14.7	2.6	0.1	123.8	162.0
Max	181.9	5.1	63.5	182.5	11.8	2.5	159.2	344.1
Obs.	48.0	84.0	80.0	80.0	60.0	89.0	88.0	89.0
σ	29.2	1.3	15.8	39.7	3.5	1.6	21.7	62.3
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Netherlands				
Min	28.7	0.3	-57.7	-69.5	-4.5	2.5	102.8	111.5
Median	77.9	2.2	-2.4	-1.3	2.4	2.5	147.8	218.7
Average	71.8	2.2	-3.1	-0.6	2.1	2.5	151.8	232.4
Max	112.7	4.4	54.9	44.9	5.4	2.5	224.1	807.6
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	84.0	89.0
σ	30.5	0.8	10.9	13.5	1.9	0.0	40.0	97.1
I(·)	I(1)	I(1)	I(0)	I(0)	I(0)	n.a.	I(1)	I(0)
				Norway				
Min	39.4	-1.4	-13.5	-37.4	-4.4	-0.1	56.9	309.1
Median	76.9	2.2	-0.5	-3.1	2.3	2.5	68.2	389.9
Average	80.9	2.1	-1.4	-5.9	2.6	1.9	70.4	395.9
Max	148.6	4.7	9.3	22.1	9.3	2.5	87.0	575.7
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	68.0	89.0
σ	33.7	1.0	4.3	12.0	2.5	0.9	9.9	67.9
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				New Zeland				
Min	37.1	-0.5	-5.1	-19.0	-2.4	2.5	79.2	95.6
Median	57.2	2.2	1.6	0.7	2.7	2.5	110.5	115.8
Average	72.0	2.3	2.5	0.9	2.6	2.5	113.0	121.0
Max	124.3	5.3	22.0	14.1	8.0	2.5	154.8	196.1
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	84.0	89.0
σ	30.6	1.2	4.0	5.6	2.3	0.0	23.6	24.8
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	n.a.	I(1)	I(1)
				Poland				
Min	91.1	0.3	-0.5	-3.4	-0.3	-1.9	18.8	123.9
Median	100.7	5.5	1.8	0.0	4.4	-0.1	37.1	234.5
Average	104.2	15.2	2.0	1.3	4.4	-0.7	40.2	184.3
Max	117.8	95.8	11.1	9.4	11.8	0.1	66.2	343.2
Obs.	48.0	84.0	68.0	68.0	65.0	89.0	88.0	89.0
σ	9.5	19.5	2.2	3.0	2.3	0.8	11.8	113.1
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Portugal				
Min	45.7	-1.5	-6.4	-15.7	-4.0	-0.1	63.9	0.0
Median	90.9	3.1	0.2	1.1	2.1	2.5	132.5	51.3
Average	83.8	3.7	0.1	0.6	1.9	2.0	124.9	1140.4
Max	106.9	12.6	8.0	13.2	10.8	2.5	209.1	6870.9
Obs.	88.0	84.0	68.0	68.0	87.0	89.0	88.0	89.0
σ	17.4	2.6	2.1	5.7	2.6	0.9	45.5	2370.6
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
				Russia				
Min	100.0	5.9	-4.0	-12.3	-11.2	-1.9	22.1	37.1
Median	349.4	14.7	0.3	-0.1	5.0	-0.1	26.9	46.5
Average	349.6	94.0	0.2	0.3	3.9	-0.3	29.2	39.2
Max	585.3	952.9	4.7	27.7	13.2	0.4	44.9	65.8
Obs.	44.0	76.0	72.0	72.0	63.0	65.0	76.0	89.0
σ	171.8	206.2	1.2	4.2	5.7	0.7	6.2	20.1
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(0)
				South Africa				
Min	41.8	0.4	-2.1	-6.4	-3.3	-1.9	77.5	30.2
Median	107.6	7.0	0.0	0.3	3.0	-1.2	153.3	83.2
Average	174.7	7.4	0.2	0.3	2.6	-1.1	152.6	80.6
Max	402.1	16.1	9.3	3.0	6.4	-0.1	195.3	184.6
Obs.	88.0	84.0	88.0	88.0	88.0	89.0	84.0	89.0
σ	130.5	3.7	1.1	1.3	2.4	0.4	30.4	38.6
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
					Sweden			
Min	45.1	-1.4	-16.0	-57.9	-6.8	1.1	48.6	249.1
Median	70.5	1.7	-1.5	-1.2	3.1	2.5	119.4	514.7
Average	80.1	2.0	-0.9	-1.5	2.3	2.2	118.5	497.8
Max	143.7	10.8	60.2	21.6	8.1	2.5	144.1	730.6
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	32.3	2.2	8.1	9.8	2.9	0.5	20.1	123.2
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)
					Singapore			
Min	99.5	-1.5	-5.8	-17.5	-8.3	1.4	56.1	655.0
Median	136.5	1.6	4.1	-5.8	7.5	2.5	71.2	0.0
Average	142.9	1.8	4.9	-5.7	6.9	2.4	72.8	320.8
Max	206.2	7.5	19.8	5.4	19.8	2.5	97.2	948.2
Obs.	75.0	84.0	36.0	36.0	84.0	89.0	88.0	89.0
σ	29.6	1.8	5.4	5.6	4.7	0.3	12.8	396.0
I(·)	I(1)	I(1)	I(0)	I(1)	I(0)	I(1)	I(1)	I(1)
					South Korea			
Min	70.9	0.6	-3.0	-5.1	-8.1	-1.2	50.2	43.6
Median	85.1	3.9	-0.3	1.3	5.3	-0.1	77.0	59.7
Average	92.3	4.1	-0.4	1.3	5.4	-0.2	76.4	62.9
Max	129.3	11.0	1.9	9.5	15.5	0.7	109.4	99.5
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	17.5	2.0	1.0	2.7	4.1	0.5	21.0	16.2
I(·)	I(1)	I(0)	I(1)	I(0)	I(0)	I(1)	I(1)	I(1)
					Slovak Republic			
Min	140.2	0.4	-5.7	-15.5	-9.5	-1.2	42.9	205.5
Median	214.1	6.0	1.6	0.3	4.0	0.6	54.0	3381.9
Average	204.9	6.3	3.4	0.7	3.3	0.1	54.3	3126.5
Max	261.7	15.8	49.8	14.5	8.2	1.4	70.8	6969.2
Obs.	28.0	72.0	76.0	76.0	77.0	65.0	64.0	89.0
σ	35.9	3.8	6.7	4.4	3.5	1.2	7.4	2145.9
I(·)	I(0)	I(1)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
					Spain			
Min	30.3	-1.1	-21.0	-18.8	-4.4	-0.1	96.3	49.3
Median	48.8	3.4	0.1	1.4	3.0	2.5	117.5	89.6
Average	65.2	3.3	-0.9	2.3	2.5	1.9	140.7	1739.4
Max	118.2	6.6	3.6	32.2	8.4	2.5	233.9	6554.3
Obs.	86.0	84.0	88.0	88.0	88.0	89.0	88.0	89.0
σ	31.5	1.5	3.6	8.3	2.4	0.9	48.4	2165.1
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	I(0)	I(1)	I(1)

Continued on next page

Table A.4 – continued

	hpi	inf	din_ngdp	pin_ngdp	gdp_growth	kaopen	credit_gdp	openness
				Slovenia				
Min	62.1	-0.2	-5.0	-13.7	-9.5	-1.2	22.7	80.2
Median	88.7	6.6	0.6	-0.3	4.0	1.7	43.6	93.0
Average	91.7	8.1	0.8	0.8	3.3	1.2	53.6	76.8
Max	123.7	56.6	11.9	31.0	8.2	2.5	97.4	125.5
Obs.	89.0	76.0	68.0	68.0	77.0	65.0	84.0	89.0
σ	17.4	8.3	2.3	7.2	3.5	1.0	24.0	44.2
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	I(1)	I(1)	I(1)
				Switzerland				
Min	86.7	-1.0	-32.8	-45.3	-3.5	2.5	167.4	107.9
Median	99.4	1.0	0.0	0.0	1.4	2.5	176.0	145.7
Average	100.1	1.4	-3.8	-4.9	1.5	2.5	177.3	144.6
Max	122.5	6.3	15.3	20.7	6.7	2.5	193.1	188.1
Obs.	86.0	84.0	88.0	88.0	88.0	65.0	88.0	89.0
σ	9.7	1.5	7.5	10.8	1.8	0.0	7.3	23.2
I(·)	I(1)	I(0)	I(0)	I(1)	I(0)	n.a.	I(1)	I(1)
				United Kingdom				
Min	34.7	0.6	-40.7	-21.0	-6.9	2.5	111.6	54.8
Median	59.7	2.1	-0.9	0.2	2.8	2.5	133.0	65.1
Average	69.3	2.5	-1.4	1.7	2.0	2.5	149.3	64.4
Max	121.5	8.4	19.4	47.0	5.2	2.5	229.2	76.7
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	89.0
σ	32.1	1.6	7.2	11.6	2.3	0.0	38.8	9.0
I(·)	I(1)	I(0)	I(0)	I(0)	I(1)	na.a	I(1)	I(1)
				Uruguay				
Min	100.0	3.5	0.0	-8.5	0.3	0.4	24.5	32.7
Median	136.1	8.7	4.8	0.1	6.3	2.5	33.8	0.0
Average	156.2	23.0	4.6	1.8	5.8	1.9	42.1	13.4
Max	275.2	125.6	8.3	19.6	11.1	2.5	98.9	57.3
Obs.	56.0	84.0	28.0	28.0	24.0	89.0	84.0	89.0
σ	43.7	26.5	2.5	6.9	2.6	0.7	17.3	20.0
I(·)	I(1)	I(0)	I(1)	I(0)	I(0)	I(1)	I(1)	I(0)
				United States				
Min	47.5	-1.6	-0.8	-0.5	-5.0	2.5	151.0	7.6
Median	68.8	2.7	-0.1	0.6	2.8	2.5	202.5	9.3
Average	74.1	2.6	-0.1	0.6	2.4	2.5	200.5	9.6
Max	109.4	5.3	1.0	2.3	5.4	2.5	244.4	12.9
Obs.	86.0	84.0	88.0	88.0	89.0	89.0	88.0	88.0
σ	21.5	1.1	0.3	0.6	2.0	0.0	28.9	1.4
I(·)	I(1)	I(0)	I(0)	I(0)	I(0)	n.a.	I(1)	I(1)

[12] **hpi**: house price index; **inf**: inflation; **din_ngdp**: net direct investment (%GDP); **pin_ngdp**: net portfolio investment (%GDP); **gdp_growth**: real GDP growth (year-on-year); **kaopen**: capital account openness; **credit_gdp**: domestic credit provided by banking sector (%GDP); **openness**: $\frac{imports+exports}{GDP}$. σ stands for the standard deviation; I(·) refers to the order of integration.

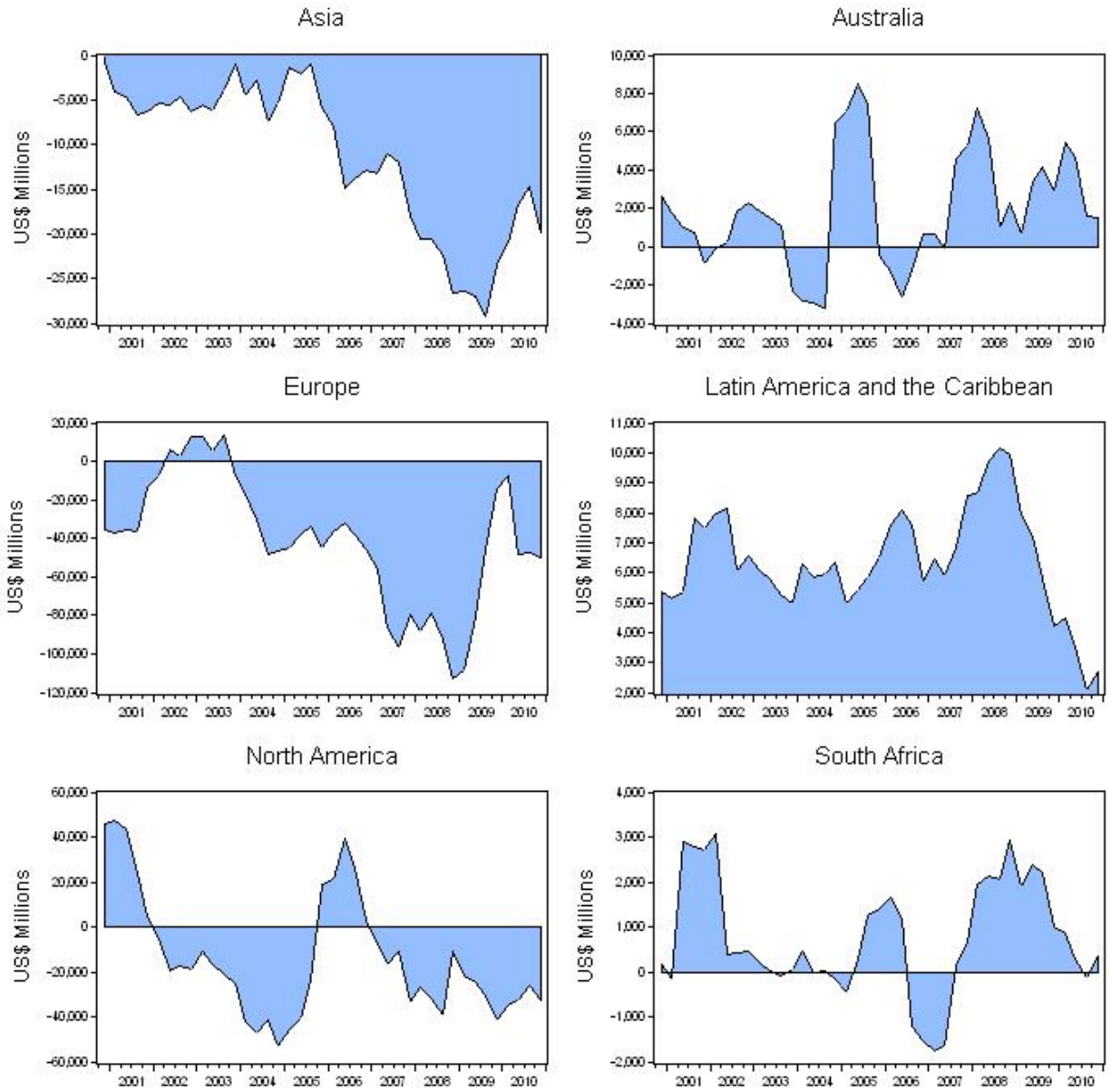

Figure A.1: Net Foreign Direct Investment by Country Groups. Source: author's estimations based on the International Monetary Fund's International Financial Statistics.

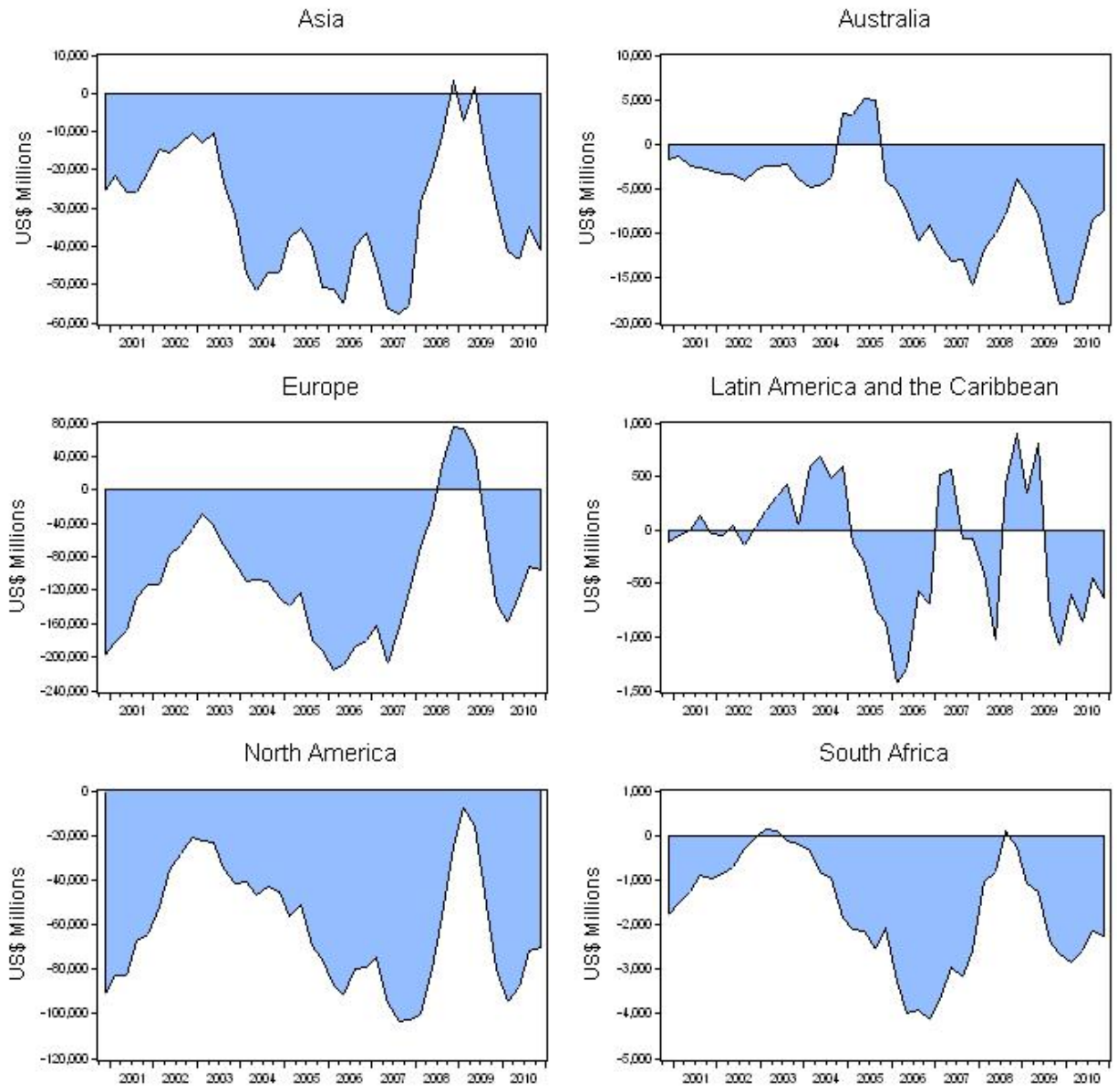

Figure A.2: Net Portfolio Investment Equity by Country Groups. Source: author's estimations based on the International Monetary Fund's International Financial Statistics.

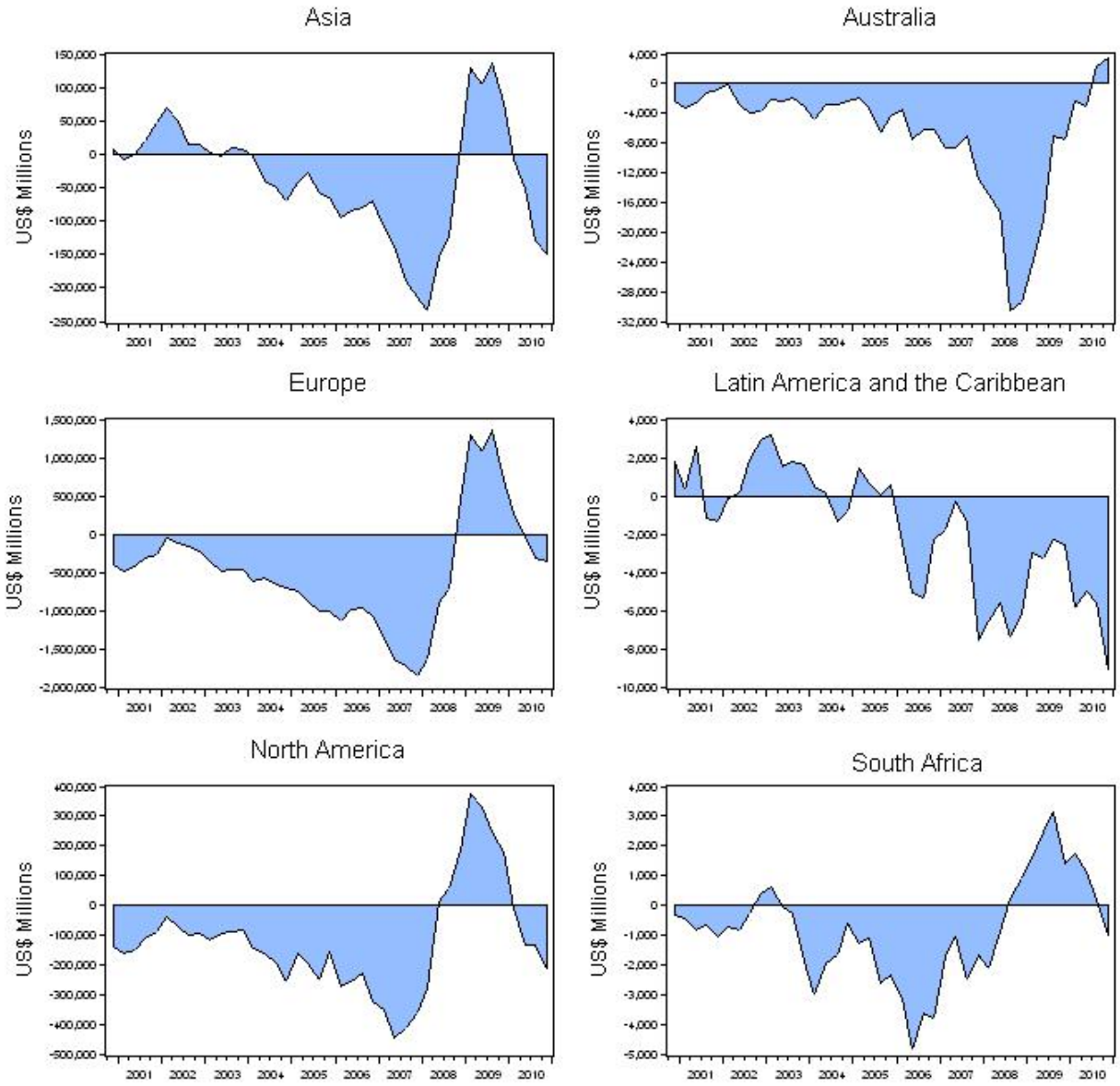

Figure A.3: Other Investments Flows by Country Groups. Source: author's estimations based on the International Monetary Fund's International Financial Statistics.

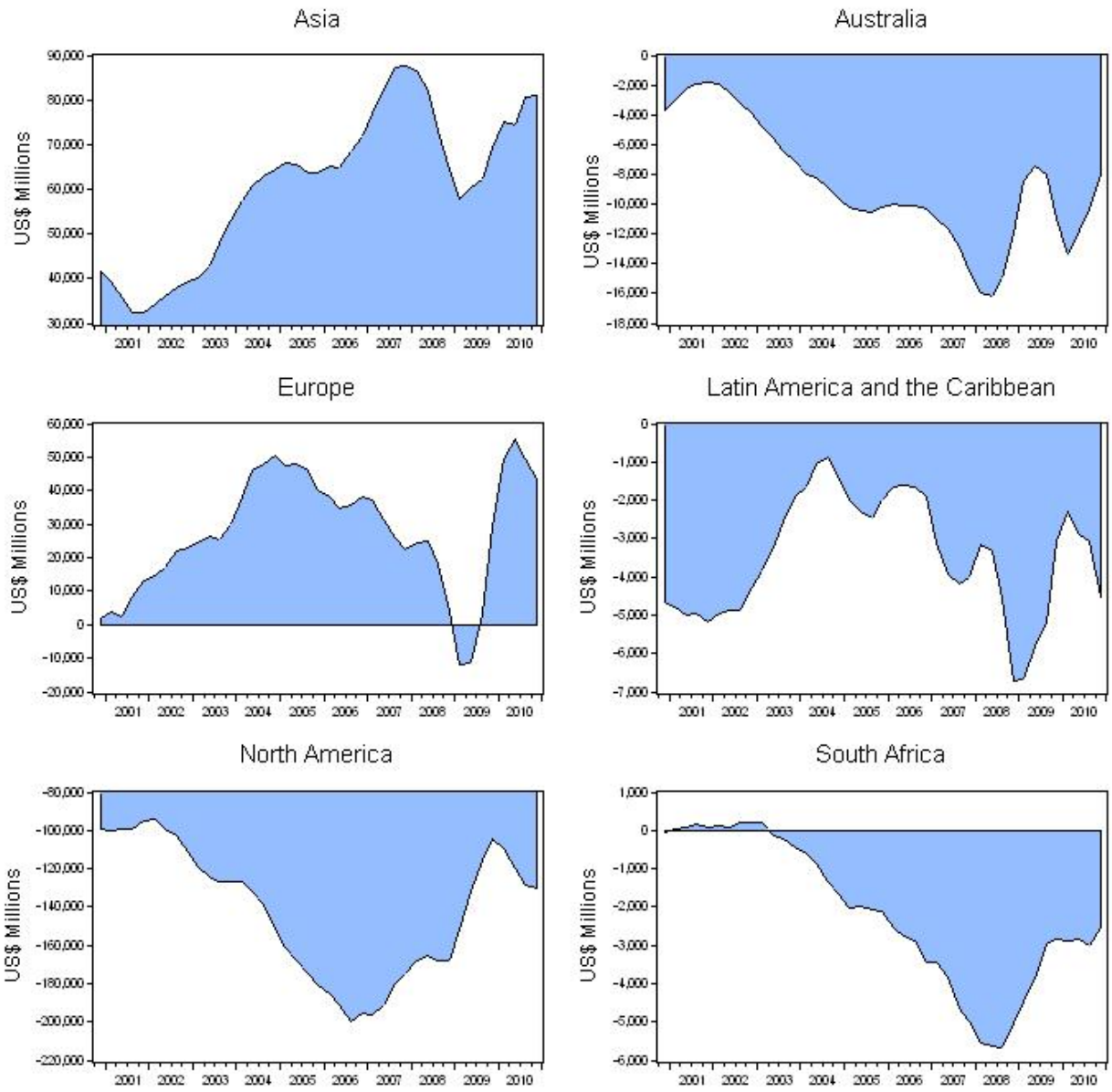

Figure A.4: Net Current Account by Country Groups. Source: author's estimations based on the International Monetary Fund's International Financial Statistics.

B Model Tests

Table A.3: Data Availability: selected countries and variables

Country group	Country	hpi	din	pien	pilen	oian	oiln	can
LAC[1]	Colombia	1997q1:2010q4	1994q1:2010q4	1996q1:2010q4	1996q1:2010q4	1996q1:2010q4	1996q1:2010q4	1996q1:2010q4
	Dominican Rep.	2000q1:2010q4	1997q1:2010q4	N.A.	N.A.	N.A.	N.A.	1997q1:2010q4
	Ecuador	2005q1:2010q4	1993q1:2010q4	2000q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4
	Mexico	2005q1:2010q4		1990q1:2010q5	1990q1:2010q6	1990q1:2010q7	1990q1:2010q8	1990q1:2010q9
	Uruguay	1997q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4
Asia	Hong Kong	1992q1:2010q4	1998q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4
	Indonesia	2006q1:2010q4			1993q1:2010q4			
	Israel	1994q1:2010q4						
	Malaysia	1999q1:2010q4	1999q1:2010q4	2002q1:2010q4	2002q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4
	Singapore	1993q3:2010q4	1995q1:2010q4	N.A.	N.A.	1995q1:2010q4	1995q1:2010q4	1995q1:2010q4
Europe	Austria	1990q2:2010q4						
	Belgium		2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4
	Bulgaria	1993q2:2010q4	1991q1:2010q4	1992q1:2010q4	1992q1:2010q4	1991q1:2010q4	1991q1:2010q4	1991q1:2010q4
	Cyprus	2006q1:2010q4	2001q1:2010q4	2001q1:2010q4	2001q1:2010q4	2001q1:2010q4	2001q1:2010q4	2001q1:2010q4
	Czech Rep.	2004q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4
	Denmark			1990q1:1993q4;	1990q1:1993q4;			
				1994q1:2010q4	1994q1:2010q4			
	Estonia	2002q1:2010q4	1992q1:2010q4	1992q1:2010q4	1992q1:2010q4	1992q1:2010q4	1992q1:2010q4	1992q1:2010q4
	Greece	1997q1:2010q4	1990q1:1997q4;	1990q1:1997q4;	1990q1:1997q4;	1990q1:1997q4;	1990q1:1997q4;	1990q1:1997q4;
			1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4
	Hungary	1998q1:2010q4						
	Iceland	2000q1:2010q4						
	Lithuania	1995q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4	1993q1:2010q4
	Malta	2000q1:2010q4	1995q1:2010q4	1995q1:2010q4	1995q1:2010q4	1995q1:2010q4	1995q1:2010q4	1995q1:2010q4
	Norway		1990q1:1991q4;	1990q1:1991q4;	1990q1:1991q4;	1990q1:1991q4;		1990q1:1991q4;
			1994q1:2010q4	1994q1:2010q4	1994q1:2010q4	1994q1:2010q4		1994q1:2010q4
	New Zealand			1990q1:1991q4;	1990q1:1991q4;			
				1998q2:2010q4	2000q2:2010q4			
	Poland	2000q1:2010q4	1990q1:1995q2;	1990q1:1995q2;	1990q1:1995q2;	1990q1:1995q2;	1990q1:1995q2;	1990q1:1995q2;
			2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4	2000q1:2010q4
	Russia	2001q1:2010q4	1994q1:2010q4	1994q1:2010q4	1994q1:2010q4	1994q1:2010q4	1994q1:2010q4	1994q1:2010q4
	Slovak Rep.	2005q1:2010q4	1993q1:2000q4;	1993q1:2000q4;	1993q1:2000q4;	1993q1:2000q4;	1993q1:2000q4;	1993q1:2000q4;
			2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4	2002q1:2010q4
	Slovenia		1992q1:2010q4	1992q1:1993q4;	1992q1:1993q4;	1992q1:2010q4	1992q1:2010q4	1992q1:2010q4
				1999q1:2010q4	1997q1:2010q4			
	Switzerland		1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4	1999q1:2010q4

Note: Empty cells indicate data is available for the entire period. The data of countries excluded from this list is available for the entire period and for all variables. **N.A.**: data not available for the whole sample period. [1] **LAC**: Latin America and Caribbean.

Table B.5: Breusch-Pagan Lagrange multiplier test for random effects

H_0	var(u)=0 (variance across entities is zero)
$\bar{\chi}^2$ (1)	18331.83
p_{value}	0.0000*

* Reject H_0. Random effects model chosen over ordinary least squares (OLS).

Table B.6: Hausman test

H_0	Difference in coefficients not systematic[1]
χ^2(12)	43.56
p_{value}	0.0000*

[1] Difference between random effects and fixed effects coefficients not systematic. * Reject H_0. Fixed effects model chosen over random effects model.

Table B.7: Fixed effects model's year dummies F-Test

H_0	all year dummies =0
F(21, 36)	6.38
p_{value}	0.0000*

* Reject H_0. All year dummies required in the fixed effects model.

Table B.8: Pesaran's test of cross-sectional independence

H_0	residuals are not correlated across entities (cross-sectional independence)
p_{value}	0.0000*

* Reject H_0. There is cross-sectional dependence.

Table B.9: Modified Wald tests for groupwise heteroscedasticity in fixed effects model

H_0	$\sigma(i)^2$=σ^2 $\forall$ i (groupwise homoscedasticity)
χ^2(37)	14632.73
p_{value}	0.0000*

* Reject H_0. There is evidence of heteroscedasticity.

Table B.10: Wooldridge test for autocorrelation in panel data

H_0	no first-order autocorrelation
F(1, 36)	146.864
p_{value}	0.0000*

* Reject H_0. There is evidence of first-order autocorrelation.