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Do international capital flows smooth or transmit macroeconomic volatility? Time-series evidence from emerging markets

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Abstract

Capital flows—particularly of more volatile types of investment—have the potential to destabilize an emerging economy. On the other hand, economic theory suggests that financial integration provides channels by which macroeconomic volatility might be reduced. This study looks at four emerging economies to test which hypothesis is correct. Generalized impulse-response and variance decomposition analysis shows that the volatility of real consumption shows relatively little response to capital flows, but that FDI reduces output and investment volatility only in a few cases. Non-FDI flows have a stronger but ambiguous influence, reducing real investment volatility for Mexico and South Africa, but increasing it for Brazil and Russia.

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1. Introduction

Before the recent crisis, economists had discussed the so-called "Great Moderation"—the apparent reduction in macroeconomic volatility that has been attributed to improvements in monetary policy, good luck, or a combination of both. This situation, of course, did not last. Instability, both real and financial, has returned to advanced economies as well as to emerging markets. But this instability might be influenced by the drastic changes to capital movements that accompanied the crisis. While investors at first sought the "safe haven" of U.S. assets, even at historically low interest rates, this "flight to quality" eventually reversed itself. Capital flows eventually returned to emerging markets, pushing their currencies upward and sharply reducing their export demand.

The resulting contraction from this sequence of events represents one channel by which external volatility might be transmitted to an emerging market through capital flows. This volatility can be detrimental: As Loayza *et al*. (2007) note, macroeconomic volatility imposes a large welfare cost, particularly on developing countries. While this variability might be increased by an influx of capital, an *outflow* might also lead to a drop in demand if it has a detrimental effect on consumption or government expenditures. Therefore, it is unclear whether an inflow increases or decreases real macroeconomic volatility.

This ambiguity is further highlighted by the fact that access to international financial markets is supposed to lead to the *smoothing* of macroeconomic shocks, particularly in consumption. Following this line of reasoning—which is well-established in the literature discussed below—capital inflows could lead to reduced macroeconomic instability. This idea obviously contradicts some of those mentioned above.

In addition, stable FDI might be expected to behave differently from "hot" portfolio investment flows. Two schools of thought are prevalent in the literature. In the first, Claessens *et al.* (1995) find few differences between flow types; but later papers, most notably by Chuhan *et al.* (1996) and Sarno and Taylor (1999), find that FDI and portfolio flows do exhibit differing variability. It is thus probable that non-FDI might be more likely to increase macroeconomic volatility (while FDI might help stabilize an economy). Since this introduces yet another ambiguous relationship between capital flows and volatility, these effects must be tested empirically.

This study examines the role that these capital flows play on the real macroeconomic volatility of four emerging markets. This is done in a time-series framework. Using quarterly data, the variability of real output, consumption, and investment in these countries are entered into Vector Autoregression (VAR) models along with sets of macroeconomic variables and measures of Foreign Direct Investment (FDI) and non-FDI flows. Impulse-response and variance decomposition analysis shows that each of the three types of volatility responds differently for each country, and that non-FDI investment plays more of a role than does FDI.

1.2 Relationship to the Literature

While the literature on the role of finance on macroeconomic volatility has grown in recent years, many studies have instead focused on the interrelationship between volatility and economic growth. Important analyses include Ramey and Ramey (1995), Edwards (2007), and Imbs (2007). While these tend to find that macroeconomic volatility leads to a reduction in GDP, Fang and Miller (2008) find no relationship between output growth and volatility for the United States. Since government expenditure can be used to smooth out other fluctuations, Furceri (2007) examines the relation between the volatility of government spending and growth for a

panel of 116 countries and finds a robust negative relationship between the two.

Other papers tend to focus on the role of economic openness in determining macroeconomic volatility, often constructing trade and/or financial openness measures rather than evaluate capital flows themselves. Kose *et al.* (2006) note in a review article, however, that the effect of openness has not been conclusively shown. These studies tend to investigate large panels of countries. Razin and Rose (1994), for example, examine 138 countries and find no significant correlation between trade and financial openness and the volatility of output, consumption, and investment. Karras (2006), on the other hand, finds that trade openness has a negative effect on output, consumption, investment, and exchange-rate volatility. In a study of a panel of 25 sub-Saharan African countries from 1971 to 2005, Ahmed and Suardi (2009) find that financial liberalization helps stabilize income and consumption growth.

Sometimes, macroeconomic volatility can be attributed to external spillovers. While Hirata *et al.* (2007) use impulse-response and variance decomposition methods to find that terms of trade shocks explain a large share of macroeconomic volatility in four Middle Eastern and North African countries, Kim (2007) separates openness from external risk in a panel of 175 countries. Here, too, the volatilities of income, private consumption, and investment seem to be influenced more by external risk than by economic openness.

Relatively few studies examine the connections between macroeconomic volatility and capital flows. Alper (2002) does so for Mexico and Turkey, analyzing the cross-correlations between real output volatility and a number of relevant macroeconomic variables at four-quarter leads and lags. Short-term net capital inflows appear to show a countercyclical relationship, and correlations between long-term net capital inflows and volatility are significant only for Mexico. In addition, real consumption and investment volatilities show a highly significant contemporaneous correlation with output variability. Erturk (2005) presents a theoretical analysis of the effects of capital account liberalization on emerging markets. Likewise, Evans and Hnatkovska (2007a, 2007b) examine linkages between financial integration and real volatility. These papers, however, focus much more on theory than empirics.

This study thus performs an important role, examining the linkages between capital flows and three types of macroeconomic volatility. It does so as follows: Section II outlines the data and econometric methodology. Section III presents the empirical results. Section IV concludes.

2. Methodology

2.1. Choice of Volatility Measure and Time-Series Procedure

This study uses quarterly time-series data, primarily from the International Financial Statistics of the International Monetary fund, to examine the relationships between net capital flows and real macroeconomic volatility in Brazil, Mexico, Russia, and South Africa. The first step in this process is to construct a time-varying volatility measure for each variable of interest. While the literature has a number of methods to construct such a measure, none has been conclusively shown to be preferred to the others.[1] The volatility measure for each variable x is thus created, using percentage changes in each variable, according to the following formula:

$$VOL_{t+m} = \left(\frac{1}{m} \sum_{i=1}^{m} \left(\ln x_{t+i-1} - \ln x_{t+i-2} \right)^2 \right)^{0.5} \quad (1)$$

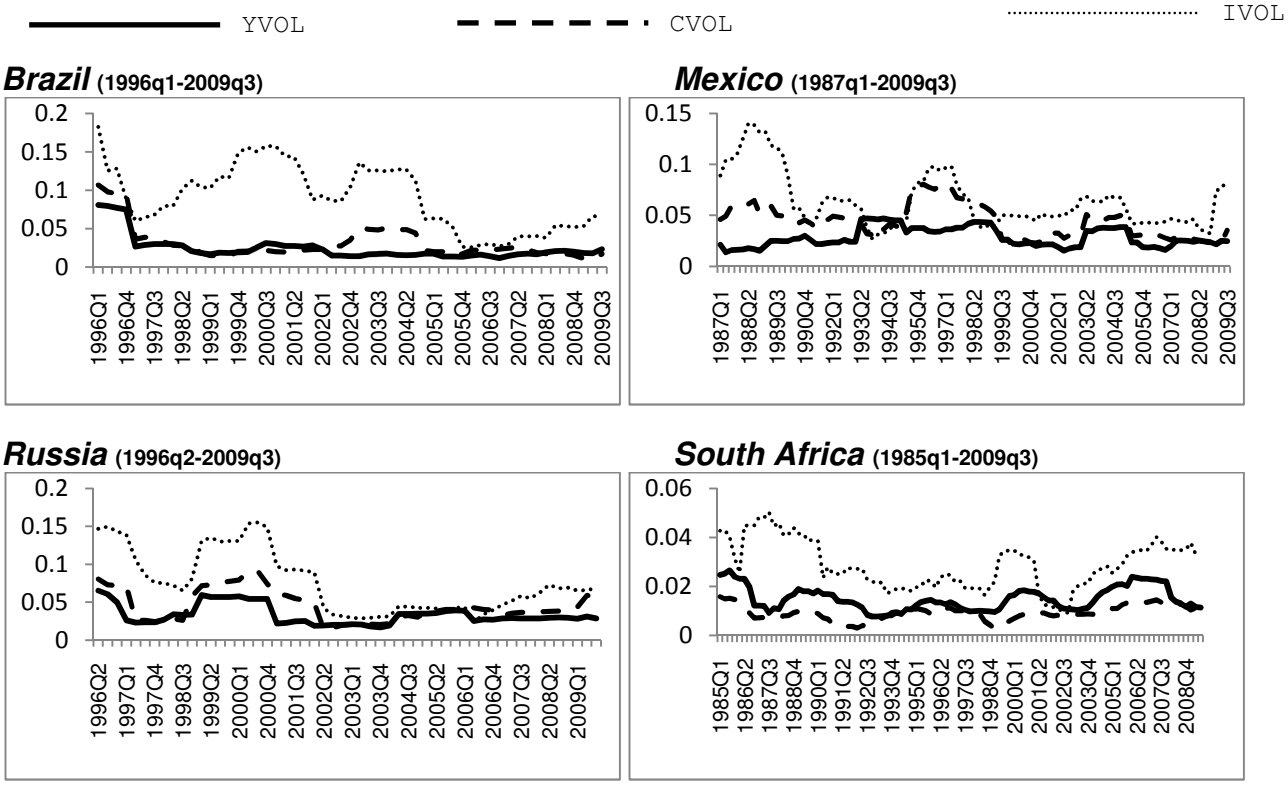
This is similar to that used by Fang and Miller (2008), but with m equal to 8. Volatility is constructed for each of real output, consumption, and investment, as well as Government

[1] While GARCH is often used in analyses of volatility, they require higher-frequency data than are used here.

expenditure and the real effective exchange rate for each of the four countries.

Figure 1 shows macroeconomic volatility for each of the four countries. Investment is clearly shown to be more volatile than output or consumption. Yet, while it is often assumed that consumption is less volatile that output due to consumption smoothing (and the Permanent Income Hypothesis), this is only the case for South Africa. Russia sees a large increase in investment volatility corresponding to the 1998 crisis. All four countries register an increase in variability, particularly in investment, beginning in the second half of the 2000s. Output volatility is fairly low in Brazil; perhaps there is some evidence for the "Great Moderation" in certain emerging markets.

Figure 1. Real Macroeconomic Volatility.



These variables, as well as the others in each VAR, are then tested for stationarity using the Phillips-Perron test. This is a standard test that has one advantage over the better-known Augmented Dickey-Fuller test: It uses Newey-West (1987) heteroskedasticity and autocorrelation-consistent (HAC) lags, so it does not require an arbitrarily selected lag structure to control for autocorrelation. Once the order of integration is established, the variables are entered into a vector for each country. If they are integrated of order 1, first-differences are used; otherwise they are entered as levels.

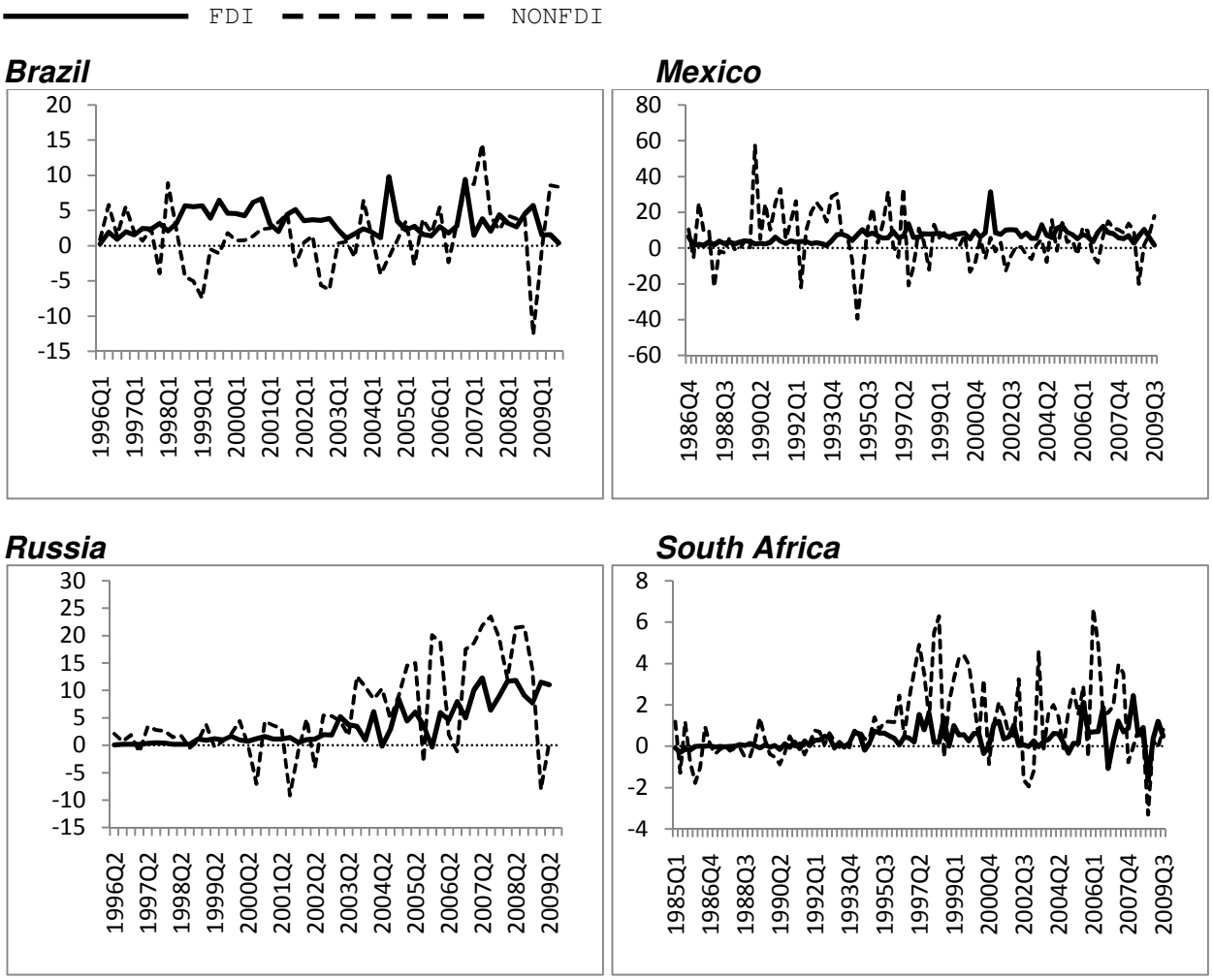
Next, the Generalized VAR methodology of Pesaran and Shin (1998) is applied. This approach is invariant to the ordering of the variables in the VAR. Impulse-Response functions (IRFs) and Forecast Error Variance Decompositions (FEVDs) are obtained for a VAR(2) for each country; these will allow us to determine the effects different types of capital flow on different types of volatility on each country.

2.2. Choice of Variables and VAR Methodology

In a VAR, variables can be endogenous. Since the Generalized VAR methodology is insensitive to the ordering of the variables, all terms are entered into a single vector. It is possible that output, consumption, and investment volatility might influence each other, but only certain relationships are the subject of this study. Based on the literature, a total of nine variables are entered into the VAR. They are defined as follows:

YVOL = volatility of real GDP (nominal deflated by GDP deflator)
CVOL = volatility of real consumption (nominal, deflated by Consumer Price Index)
IVOL = volatility of real gross fixed capital formation (nominal deflated by PPI)
GVOL = volatility of real Government expenditure (nominal, deflated by GDP deflator)
REERVOL = volatility of the real effective exchange rate
REALR = real interest rate (nominal money-market rate minus inflation rate)
YGROWTH = percentage change in real GDP (over four quarters previous)
FDI = net foreign direct investment (inflows minus outflows), as a share of GDP
NONFDI = net portfolio plus net Other investment, as a share of GDP.

Figure 2. Net Capital Flows (Share of GDP).



GDP, consumption, Government expenditure, and investment are each de-seasonalized

using the Census-X12 procedure before the volatility terms are created. Deseasonalized nominal GDP is also used for the capital flow shares. The estimation period (given for each country in Figure 1) is generally restricted by more limited capital-flow datasets; the volatility measures are constructed using data that begin eight quarters before the estimation period.

The other "explanatory" variables are carefully chosen based on previous literature. One main variable is the volatility of government expenditure. Studies such as Furceri (2007), and Fatás and Mihov (2003), note that since the government can act to reduce fluctuations of the business cycle, the volatilities could be related. Most likely, the relationship should be negative if government intervention is countercyclical. Secondly, the volatility of the real effective exchange rate represents a "terms of trade shock" by which external volatility might spill over to the domestic economy. Hirata *et al.* (2007) and Kim (2007) both show this to be an important determinant of domestic macroeconomic variability.

In addition, economic growth is included—the relationship between growth and volatility constitutes a main strand of the literature. Inflation, which represents a type of domestic financial volatility that could spill over to the real economy, is also included as part of the real interest rate. This real interest rate is expected to be an important determinant of capital flows, although the *effects* of shocks to capital flows, rather than the *causes*, are the focus of this study.

These flows are included separately as FDI and non-FDI flows. Figure 2 shows net FDI and non-FDI inflows into each country. FDI does indeed appear to be more stable than the relatively volatile non-FDI inflows. These two types of investment are thus expected to have differing effects on real volatility in the four emerging markets in this study. The empirical results do indeed show such differences.

3. Results

Table I provides the results of the Phillips-Perron stationarity tests. It is clear that while capital flows are generally stationary, macroeconomic volatility is not. No variable is I(2) or higher. In order to avoid the inclusion of nonstationary variables in the VAR (and because stationarity tests are often criticized for having low power), all variables will be considered to be stationary unless they are shown to be stationary at 1 percent. If necessary, variables are first-differenced to make them stationary; the exact combination of level and differenced variables varies by country.

Table I. Phillips-Perron Stationarity Test Results.

Country	*Brazil*		*Mexico*		*Russia*		*South Africa*	
Variable	level	1st diff.	level	1st diff.	level	1st diff.	level	1st diff.
YVOL	-3.883	-7.060	**-2.763**	-8.823	**-2.494**	-6.209	**-2.656**	-6.057
CVOL	-4.399	-6.930	**-2.620**	-9.830	**-3.099**	-6.431	**-2.680**	-7.625
GVOL	-3.773	-7.497	**-1.774**	-8.852	**-2.005**	-7.221	**-1.638**	-6.355
IVOL	**-2.143**	-5.434	**-2.630**	-7.996	**-1.919**	-5.341	**-2.280**	-9.639
REERVOL	**-2.373**	-6.701	**-2.822**	-9.299	**-1.957**	-6.026	**-1.936**	-7.178
YGROWTH	**-2.642**	-4.624	-3.793	-9.411	**-2.547**	-4.541	**-2.248**	-7.137
REALR	**-1.948**	-5.562	-4.229	-7.340	-3.314	-4.569	**-2.354**	-7.823
FDI	-5.807	-19.076	-6.859	-34.488	**-1.669**	-20.430	-8.463	-88.817
NONFDI	-5.159	-18.790	-8.673	-27.312	-3.821	-18.207	-6.645	-33.569
1% CV	-3.574		-3.508		-3.576		-3.513	
5% CV	-2.927		-2.890		-2.928		-2.892	
10% CV	-2.598		-2.580		-2.599		-2.581	

Bold = considered to be non-stationary; first differences used in the VAR analysis.

One VAR is then constructed for each country using these variables. For each VAR, generalized impulse-response functions and forecast error variance decompositions are obtained. Because IRFs take up a lot of space graphically, only the responses of the three classifications of real volatility (output, consumption, and investment) are shown. The depictions of these responses are further limited to shocks to government expenditure volatility, REER volatility, and FDI and non-FDI inflows. This will allow for a concise analysis of the main question at hand: Whether capital inflows smooth or exacerbate real macroeconomic volatility, or whether internal or external volatility spillovers are responsible instead.

Figure 3 shows the Generalized IRFs for each country's main macroeconomic variability measures. Overall, while external shocks do indeed play a role in domestic volatility, capital flows have a larger influence than does government expenditure. In addition, investment volatility is most susceptible to these flow shocks; consumption volatility feels the least impact.

Examining Figure 3 (below), we see that *GVOL* seems to reduce overall macroeconomic volatility only in two cases: Russian output and Mexican investment—indicating the absence of much countercyclical fiscal policy. On the other hand, there is some evidence that there might be a positive relationship between *GVOL* and output and consumption volatility in Brazil. This effect is weak and dies out immediately, however, but perhaps only here have fiscal shocks been transmitted to the overall economy.

More interesting is the impact of external shocks. *REERVOL* spills over to *IVOL* in all countries (including Brazil, at 10 percent), and is particularly strong for Mexico. This indicates that part of investment's generally higher level of volatility is due to international factors. This may also be related to the fact that both countries are major oil exporters. In addition, in Mexico, *YVOL* is increased after an external shock. In three of the four countries, *CVOL* is unaffected by these external shocks. (It is reduced in South Africa). Perhaps this is evidence of some level of consumption-smoothing that reduces the impact of foreign shocks.

Responses to shocks to capital flows serve as the main emphasis of this study. Here, we see that the two types of capital flow do indeed have different effects, and each type of volatility shows a different response from country to country. FDI reduces *YVOL* in Brazil, as well as *IVOL* in South Africa. While stable investment seems to reduce macroeconomic volatility somewhat, "hot money" has a more prominent effect. These effects often differ in sign.

Within Latin America, non-FDI flows are shown to increase *IVOL* in Brazil, but reduce *IVOL* and *YVOL* in Mexico.[2] In other words, an outflow can increase instability in Mexico, while inflows can be said to be creating discernible instability on the Brazilian economy. Outside of Latin America, output volatility is also affected. In South Africa, net FDI inflows lead to a decrease in investment volatility, as well as a small increase (at 2 quarters) in output volatility. Non-FDI flows also cause a (delayed and temporary) increase in Russian *IVOL*. Russia, the emerging market with the shortest experience with world integration, generally shows a weaker response than the others.

The FEVDs provided in Table II (below) corroborate many of the IRFs. It is important to note that Generalized FEVDs do not necessarily sum to one—they must be looked at in terms of *relative* size rather than as percentages. They are presented at 1, 4, 8, 12, and 24 quarters, and are generally relatively consistent over time. *GVOL* is shown to have a rather large impact on Brazil's *YVOL* and *CVOL*—but its contribution to investment volatility is much lower. For the other countries, government expenditure volatility has a small effect on every other macro volatility term except Russian output and investment, and Mexican investment. *REERVOL* also

[2] The t-statistic for Mexico's IRF for *IVOL* is 1.70 at a one-quarter horizon.

plays a large role where expected: It is relatively large for *IVOL* in Brazil, Mexico, and Russia, as well as for *YVOL* in Mexico and Russia. In addition, external volatility appears to make a large contribution to the forecast error of Russian consumption volatility.

The capital-flow FEVDs are relatively small compared to *GVOL* and *REERVOL*, but are still rather large in comparisons across macro volatility types. FDI has larger value for *IVOL* and *YVOL* in Brazil than is the case for consumption volatility, reflecting the significant IRF for those two variables. For South Africa, the contribution of *NONFDI* to *IVOL* is similar to that of *GVOL*, *REERVOL*, or *FDI*. While these results are subject to a great deal of interpretation, they do appear to provide support for the impulse-response functions.

4. Conclusion

For many emerging markets, macroeconomic fluctuations can be highly destabilizing—with adverse welfare effects as a consequence. While a number of studies have examined the role of financial openness on real macroeconomic volatility, often concluding that integration helps to stabilize economies, few studies have focused on capital flows themselves. This study looks at FDI and non-FDI flows separately, investigating whether shocks to these flows lead to the transmission or the reduction of output, consumption, and investment volatility. Impulse-response functions show that both effects are possible.

Capital flows are shown to affect volatility as much as or more than fiscal or terms-of-trade volatility spillovers. Although output and consumption are affected in a few cases, capital flows have more of an impact on the volatility of real investment. A distinction can also be drawn between FDI and non-FDI flows. While more stable FDI reduces some types of volatility, non-FDI inflows sharply decrease investment volatility in Mexico and South Africa. This, of course, can be interpreted as a "hot money" outflow leading to instability in these countries. At the same time, Brazil and Russia behave in the exact opposite fashion. Thus, we can conclude that international financial integration does indeed have ambiguous effects on emerging markets—ones that differ by variable, by country, and by type of investment.

Understanding the stabilizing or destabilizing effect of both types of capital flow is important in understanding their effects on a country's welfare. Since countries cannot be assumed to respond the same to every shock, further individual analyses will have to be performed. It is only then that specific vulnerabilities can be addressed, and appropriate policies regarding capital movements crafted on a case-by-case basis.

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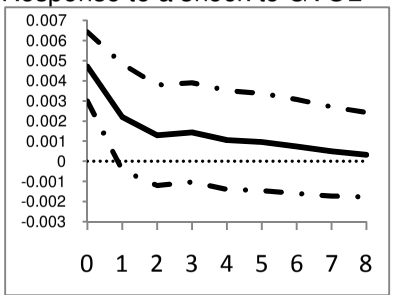
Figure 3. Generalized Impulse-Response Functions to a One Standard-Deviation Shock, with ±2 Standard-Error Bands.

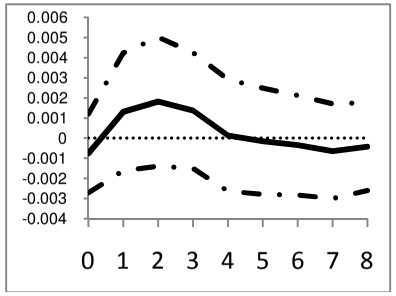
Brazil

YVOL

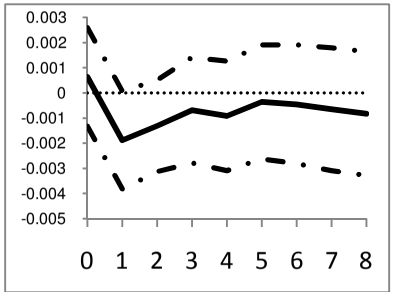
Response to a shock to GVOL



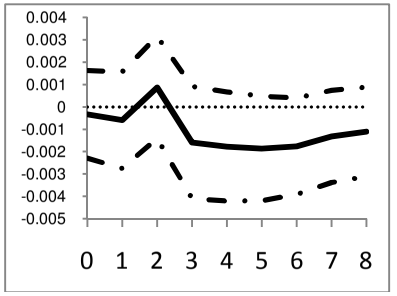
REERVOL



FDI

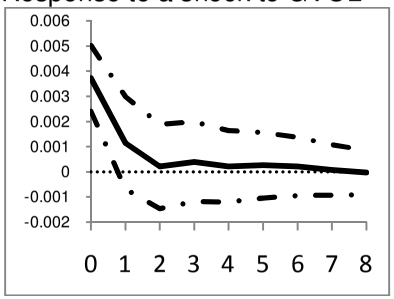


NONFDI

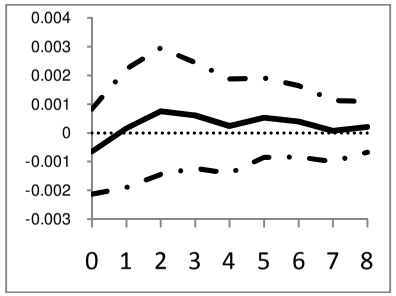


CVOL

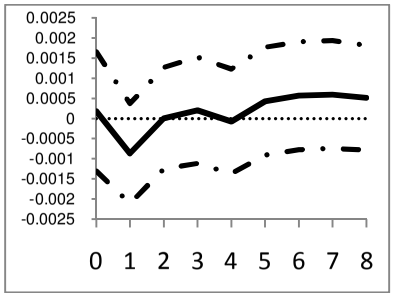
Response to a shock to GVOL



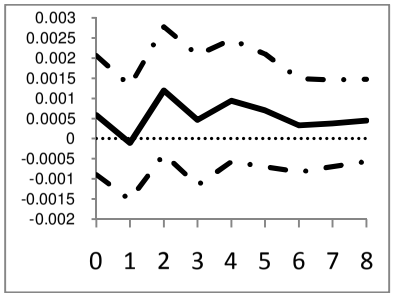
REERVOL



FDI

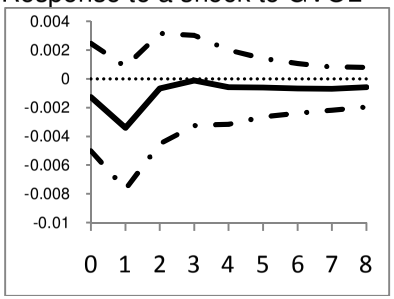


NONFDI

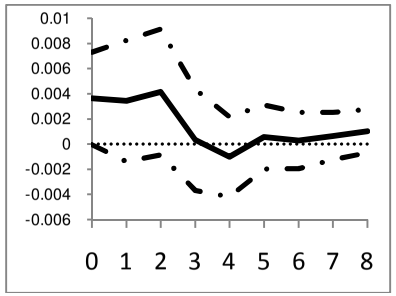


VOLI

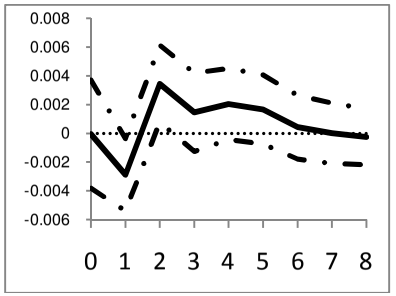
Response to a shock to GVOL



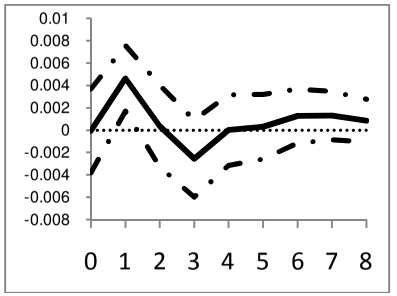
REERVOL



FDI



NONFDI



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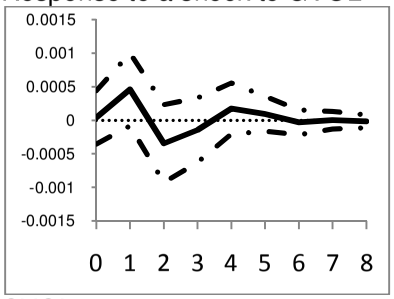
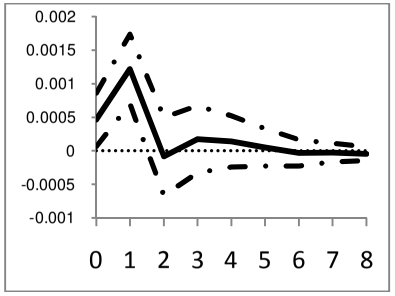
Mexico

YVOL

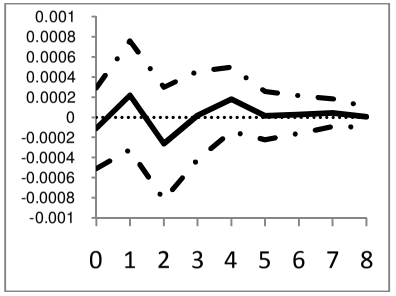
Response to a shock to GVOL



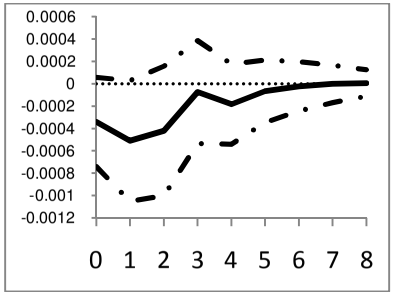
REERVOL



FDI

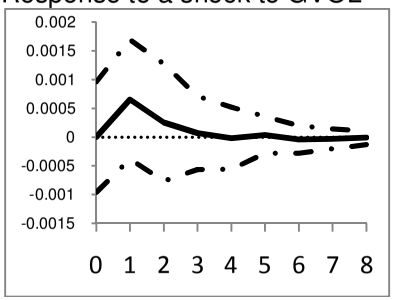


NONFDI

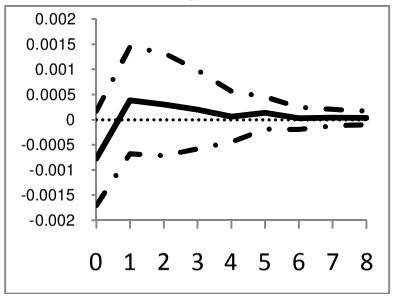


CVOL

Response to a shock to GVOL



REERVOL



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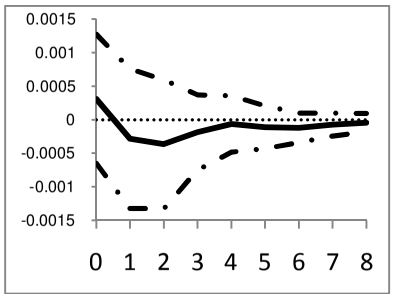

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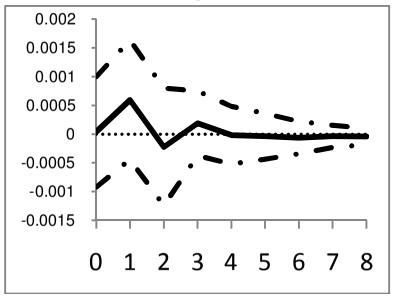
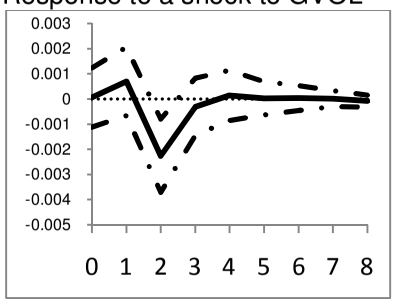
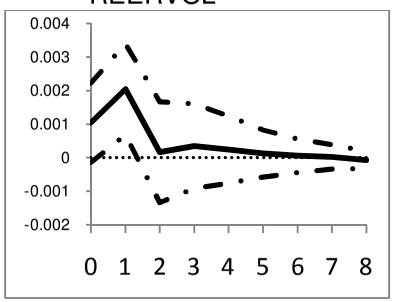


IVOL

Response to a shock to GVOL



REERVOL



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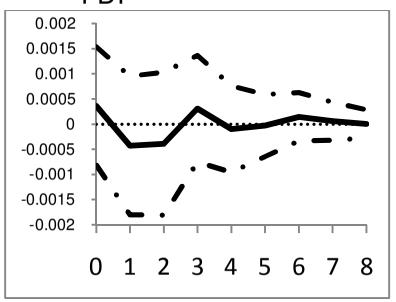
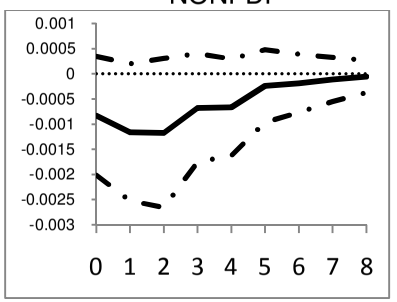


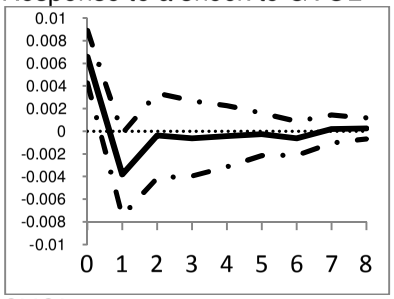
NONFDI



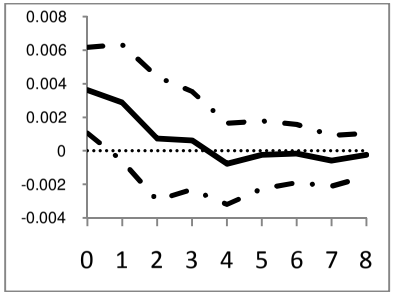
Russia

YVOL

Response to a shock to GVOL



REERVOL



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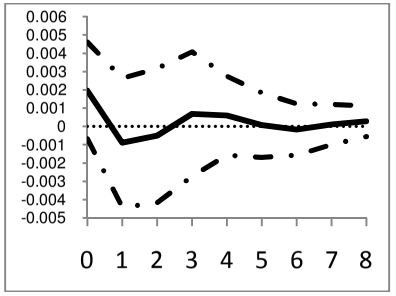
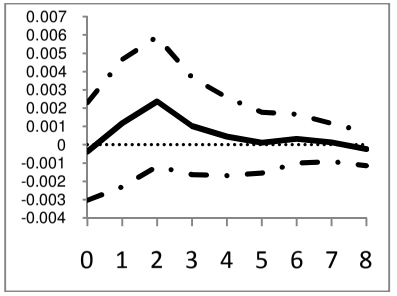
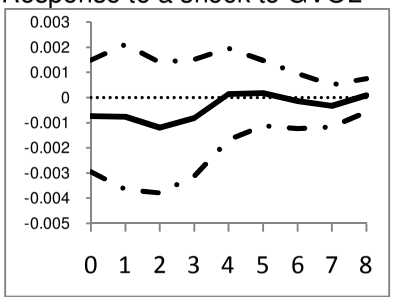


NONFDI

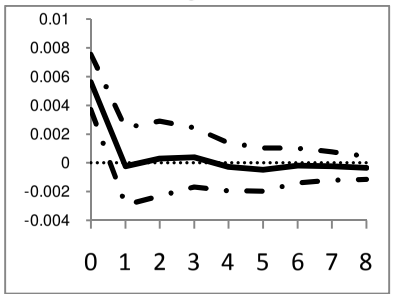


CVOL

Response to a shock to GVOL



REERVOL



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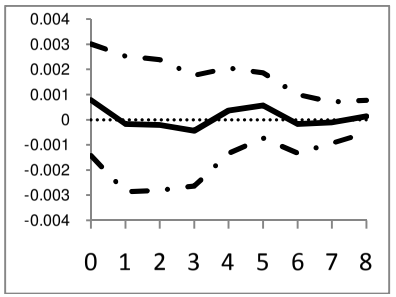
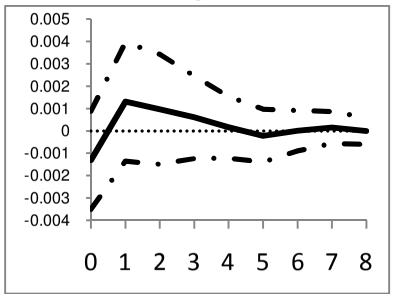
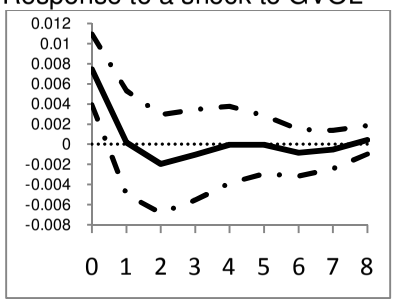


NONFDI

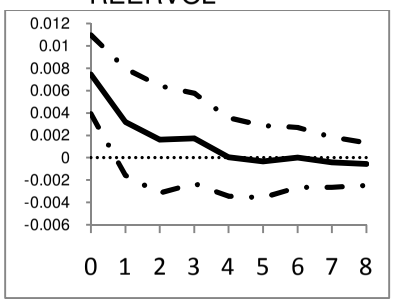


IVOL

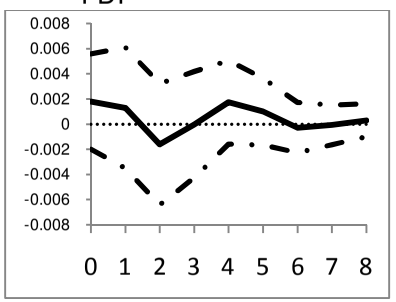
Response to a shock to GVOL



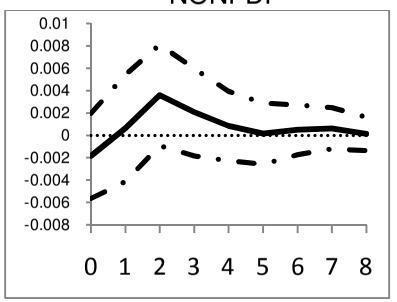
REERVOL



FDI



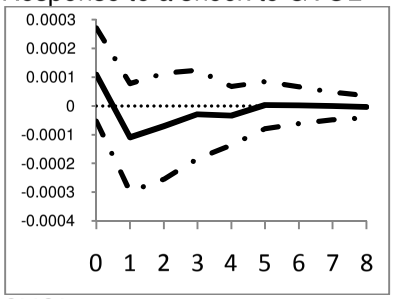
NONFDI



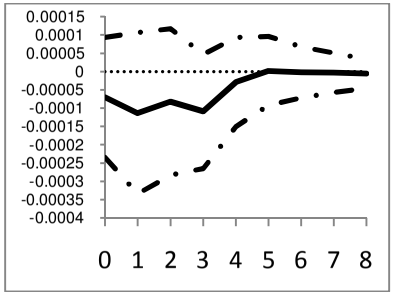
South Africa

YVOL

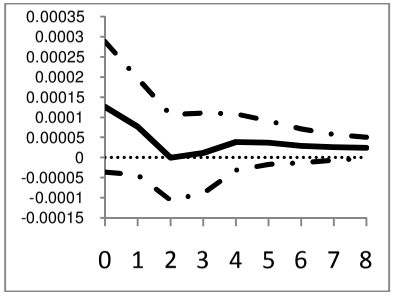
Response to a shock to GVOL



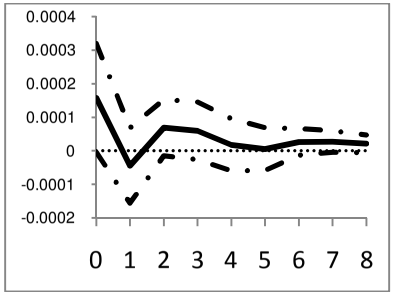
REERVOL



FDI

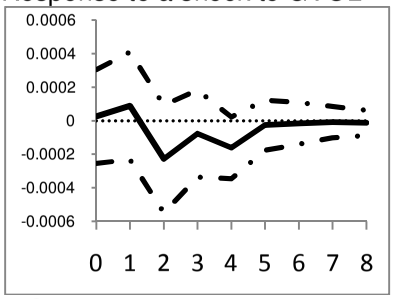


NONFDI

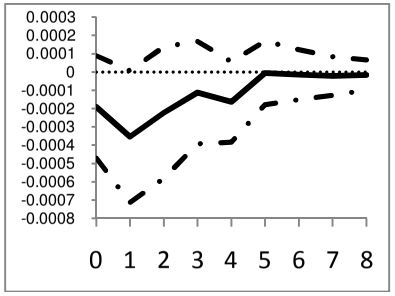


CVOL

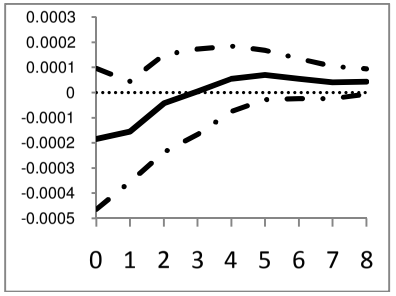
Response to a shock to GVOL



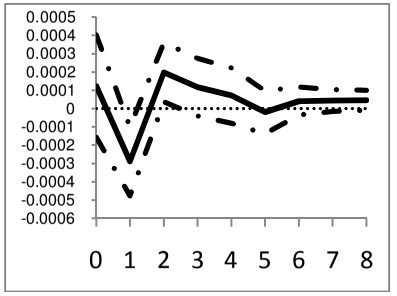
REERVOL



FDI

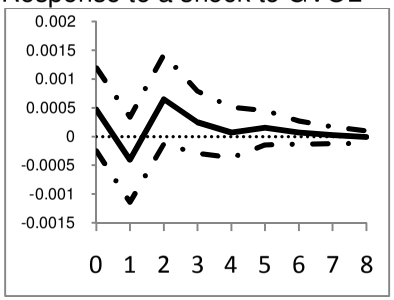


NONFDI

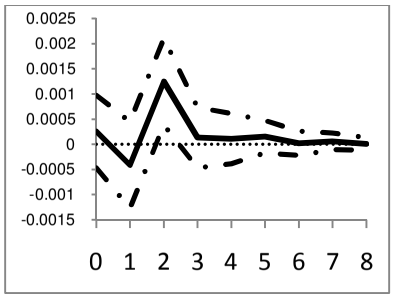


IVOL

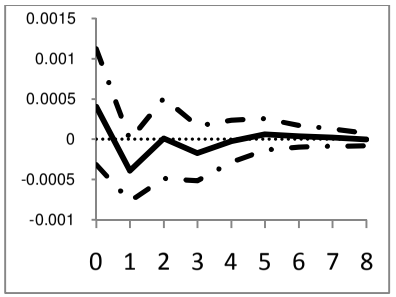
Response to a shock to GVOL



REERVOL



FDI



NONFDI

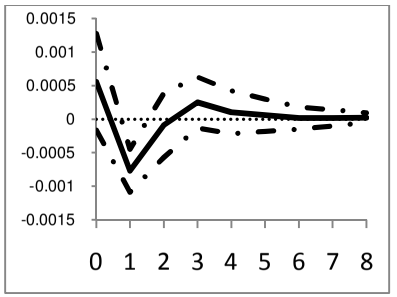


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Table II. Generalized Forecast Error Decompositions.

Variable/	*Country*																	
Horizon	*Brazil*									*Russia*								
YVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.834	0.329	0.208	0.318	0.014	0.025	0.005	0.054	0.002	0.677	0.187	0.382	0.427	0.157	0.013	0.035	0.034	0.011
4	0.675	0.222	0.149	0.273	0.039	0.022	0.004	0.053	0.029	0.557	0.191	0.318	0.351	0.137	0.013	0.029	0.034	0.050
8	0.585	0.177	0.119	0.236	0.034	0.041	0.010	0.048	0.037	0.553	0.189	0.315	0.346	0.136	0.013	0.030	0.034	0.050
12	0.559	0.164	0.111	0.224	0.034	0.047	0.012	0.049	0.037	0.552	0.189	0.315	0.345	0.136	0.013	0.030	0.034	0.050
24	0.545	0.158	0.108	0.218	0.034	0.051	0.013	0.050	0.036	0.552	0.189	0.315	0.345	0.136	0.013	0.030	0.034	0.050
CVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.405	0.868	0.043	0.395	0.002	0.014	0.045	0.000	0.007	0.050	0.818	0.218	0.015	0.413	0.265	0.047	0.008	0.045
4	0.297	0.712	0.046	0.296	0.029	0.034	0.048	0.003	0.018	0.081	0.730	0.215	0.037	0.367	0.241	0.051	0.012	0.055
8	0.276	0.665	0.052	0.276	0.038	0.049	0.058	0.014	0.018	0.085	0.710	0.215	0.038	0.362	0.234	0.050	0.015	0.054
12	0.274	0.660	0.053	0.274	0.038	0.050	0.059	0.015	0.018	0.085	0.709	0.214	0.038	0.361	0.234	0.050	0.015	0.054
24	0.274	0.658	0.053	0.273	0.038	0.051	0.059	0.015	0.018	0.085	0.709	0.214	0.038	0.361	0.234	0.050	0.015	0.054
IVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.073	0.090	0.839	0.081	0.104	0.038	0.029	0.090	0.008	0.523	0.242	0.762	0.222	0.263	0.067	0.114	0.019	0.015
4	0.064	0.079	0.657	0.068	0.149	0.063	0.053	0.107	0.057	0.418	0.248	0.598	0.185	0.218	0.072	0.097	0.032	0.066
8	0.068	0.077	0.640	0.073	0.145	0.065	0.054	0.108	0.063	0.407	0.240	0.582	0.181	0.211	0.070	0.096	0.034	0.065
12	0.068	0.077	0.635	0.074	0.144	0.065	0.054	0.107	0.063	0.406	0.239	0.579	0.180	0.210	0.070	0.095	0.034	0.065
24	0.069	0.076	0.633	0.073	0.144	0.065	0.054	0.106	0.063	0.405	0.239	0.579	0.180	0.210	0.070	0.095	0.034	0.065
	Mexico									*South Africa*								
YVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.624	0.137	0.129	0.035	0.278	0.106	0.030	0.010	0.062	0.915	0.031	0.113	0.017	0.006	0.087	0.036	0.035	0.020
4	0.519	0.122	0.112	0.052	0.238	0.112	0.083	0.022	0.081	0.858	0.047	0.121	0.024	0.022	0.119	0.045	0.034	0.026
8	0.516	0.121	0.111	0.053	0.237	0.113	0.083	0.022	0.081	0.852	0.047	0.121	0.024	0.022	0.124	0.046	0.034	0.026
12	0.516	0.121	0.111	0.053	0.237	0.113	0.083	0.022	0.081	0.852	0.047	0.121	0.024	0.022	0.124	0.046	0.034	0.026
24	0.516	0.121	0.111	0.053	0.237	0.113	0.083	0.022	0.081	0.852	0.047	0.121	0.024	0.022	0.124	0.046	0.034	0.026
CVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.012	0.938	0.203	0.020	0.034	0.019	0.003	0.008	0.016	0.057	0.862	0.134	0.009	0.036	0.130	0.168	0.047	0.029
4	0.015	0.911	0.200	0.022	0.039	0.020	0.004	0.016	0.019	0.117	0.732	0.130	0.033	0.058	0.130	0.146	0.044	0.040
8	0.015	0.904	0.200	0.022	0.040	0.022	0.006	0.017	0.020	0.126	0.717	0.130	0.033	0.058	0.136	0.149	0.043	0.040
12	0.015	0.904	0.200	0.022	0.040	0.023	0.006	0.017	0.020	0.126	0.717	0.130	0.033	0.058	0.136	0.149	0.043	0.040
24	0.015	0.904	0.200	0.022	0.040	0.023	0.006	0.017	0.020	0.126	0.717	0.130	0.033	0.058	0.136	0.149	0.043	0.040
IVOL	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**	**YVOL**	**CVOL**	**IVOL**	**GVOL**	**REERVOL**	**YGROWTH**	**REALR**	**FDI**	**NONFDI**
1	0.187	0.207	0.837	0.013	0.137	0.088	0.021	0.008	0.053	0.156	0.106	0.935	0.008	0.008	0.036	0.033	0.012	0.035
4	0.177	0.167	0.646	0.114	0.109	0.100	0.036	0.011	0.086	0.153	0.087	0.763	0.035	0.080	0.056	0.038	0.012	0.035
8	0.176	0.166	0.643	0.114	0.109	0.101	0.036	0.012	0.088	0.155	0.086	0.748	0.036	0.080	0.063	0.038	0.013	0.037
12	0.176	0.166	0.643	0.114	0.109	0.101	0.037	0.012	0.088	0.155	0.086	0.748	0.036	0.080	0.063	0.038	0.013	0.037
24	0.176	0.166	0.643	0.114	0.109	0.101	0.037	0.012	0.088	0.155	0.086	0.748	0.036	0.080	0.063	0.039	0.013	0.037

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