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Leena Sharma
Department of Economics,
Rajeev Gandhi Tribal
University, Udaipur,
Rajasthan, India

Correspondence:
Leena Sharma
Department of Economics,
Rajeev Gandhi Tribal
University, Udaipur,
Rajasthan, India

International capital flows and GDP growth

Leena Sharma

Abstract
Globalization has several outcomes both favorable and unfavorable. It has widened the scope for economic activity, but at the same time also widened the potential exposure to instability. The same international links that increased welfare and efficiency in recent decades served as a powerful propagation channel for financial and economic shocks during the 2007–09 crises. But the impacts were far and wide. In the early stages of, rapidly falling asset prices put havoc on the balance sheets of international investors; in the later stages, a collapse in world trade punished many export-oriented economies. A different aspect is that gross financial inflows and outflows are substantially larger than the net flows associated with the current account. These are often large even where current account balances are almost negligible. This causes risk in the adjustment to global macroeconomic and financial stability eventually a stage will be reached when deficit nations will find it difficult to continue to spend more than they take in. Also surplus countries will find that their persistent surpluses dent the prospects of future growth. The imbalances will become unsustainable Thus the cherished stability will be in the dis-equilibrium state of the economy. The fluctuations will be severe, unmanageable and will always require state intervention. In this paper six nations Brazil, USA, China, Australia, South Africa and India have been chosen to estimate relationship between capital flows and GDP growth rate. The conclusions can not be generalized because different countries have different facets of capital flows which are statistically significant. Thus the role of FDI should be taken with a pinch of salt.

Keywords: Financial Globalization, Volatility

1. Introduction
Globalization has done many good to emerging nations. It may be harbinger to improved living standards in emerging nations and a carrier of technology. The germane of globalization is the advantage of free trade. However now globalization is not limited to free trade. There is global movement of capital in the financial liberalization regime. The financial globalization takes into consideration the creation of a global money market, a global financial market, a global financial system, depicting deregulation of national financial markets. Globalization implies the amplification in the volume of financial capital flows increases their intensity and ultimately integrates the markets.

2. Review of Literature
Some proven disadvantage of financial liberalization for emerging nations have been that liberalization of capital cause de -capitalization of those branches and elimination of legal restrictions on international financial transactions. Another impact is that liberalization of capital in economies characterized by real wage rigidity leads to an allocation of excessive resources to the intensive capitalized sectors, by replacing labor with capital in manufacturing operations. [Cerna, 2008, 4].Thus the dual economy emerges. The banks which were so far the lurch pin of loans and debts are now have new competitors' mainly insurance companies and pension funds. Thus the scope of direct funding has increased. If the derivative market is added to it the story becomes even more murkier. The sub Prime crisis bears testimony to it. Thus the chances of financial stabilization, once the outflow or inflow of capital is extraordinary, the probability of crisis and the global spread of crisis are even great. While financial innovation has brought about a number of benefits, it could make systemic crises more likely (Hendricks, Kambhu, and Mosser, 2006). Historical evidence suggests that financial markets are intrinsically fragile (Kindleberger, 2005).
Amongst the distortions, the most important relate to **information asymmetry** and to the characteristics of the operating environment, to the widespread use of derivatives and to the cross-border activity of institutional investors. The information may not be equally distributed and there may be hidden premium associated with it. Associated with it are the famous concepts the adverse selection and the moral hazard. The second source of instability is

the **high volume and related speculation**. Millions of dollars move on one information may be right or wrong. Speculative movements represent a harmful source, threatening the stability of financial markets. It is known, in this respect, George Soros' intervention in September 1992, who, speculating on a devaluation of the sterling pound, sold pounds worth of 10 billion dollars, contributing to a substantial fall in the pound and its withdrawal from the European Monetary System

The third issue is **risk management**. Regarding credit risk management, difficulties may occur in the case of limited or non-coherent information about the conduct of credit relations in the host country, thus reducing the effectiveness of measurement instruments and risk management system as a whole. It differs from country to country. Mishkin defines systemic risk as the probability of occurrence of a sudden and unexpected event, which negatively affects the information in the financial markets, making them unable to allocate funds to the most productive investment opportunities (Mishkin 1998).

Much of the academic literature on monetary policy is built on models with perfect financial markets, which essentially assume away any debt catastrophes associated with real estate crashes. But the reality is far away from it. Many analysts have pointed to the apparent trend decline in global long-term real interest rates as justifying a world wide increase in housing prices. This point was emphasized in the IMF's April 2008 World Economic Outlook, which indentified declining real interest rates as a major driver of global house price increases during the 2000s. But even this decline was not uniform Also there is always a risk that over the long run, real interest rates trends will reverse, creating problems in regions where housing purchases are heavily leveraged.

3. Methodology

The following methodology has been used in this paper.

3.1 Research Question

There is a research question, whether capital flows of different types and magnitude influence the Growth rate of a country? The question cannot be resolved within a narrow orbit of capital flows only. But these influence the growth rate. Take the case of growth rate of advanced and emerging nations after 2007. It has a linkage with the capital flows. Thus the role of various facets of capital flows is to be evaluated in determining growth rate.

3.2 Establishing the relationship

To understand the relationship between the two first the GDP for the year 1980 to 2012 was used to find summary statistics and correlation between the countries. The six countries selected for this study are emerging nations China Brazil, India, South Africa and two advanced economies Australia and USA. The sampling method is purposive. Russia was intended to be selected but finally dropped due to non availability of data for the entire period. Thus the All the data are in current US dollars for all the countries. Then regression was run between Growth rate and different measurements of capital flow.

To ascertain time lag and issues relating to unit root lagged values of one and two year data were considered. The usual criterion, R-squared, F, Akaike, Schwarz, Hannan-Quinn and Durbin-Watson were used to finally select the model. The software used for factor analysis was SPSS and for other GRETL was used

3.3. Data

The data used for this study are from IMF 13/183 Capital Flows database – version 1 published in August 2013 containing different files. In all 38 datasets are available. But not all data are available for all the countries or in most cases there was negligible or no entry. Thus by factor analysis considering the eigenvalue above one, finally seven measures were considered. (see Table 3)

4. Empirical Results

The following empirical results are reported. Regarding GDP of six countries.

Table 1: Summary Statistics, of GDP (Current US dollars) using the observations 1980 – 2012

Variable	Mean	Median	Skewness	Ex. kurtosis
USA	8812.60	8100.20	0.274305	-1.24605
China	1738.60	856.100	1.78063	2.15344
BRAZIL	755.309	552.400	1.40443	1.05802
Australia	513.345	379.700	1.42675	1.05346
India	602.448	399.800	1.45963	0.901725
S_Africa	163.355	133.000	1.16433	0.267879

Table 2. Correlation coefficients, using the observations 1980 – 2012
5% critical value (two-tailed) = 0.3440 for n = 33

USA	China	BRAZIL	Australia	India	S_Africa
1.0000	0.8500	0.8684	0.9016	0.8922	0.9075
	1.0000	0.9623	0.9845	0.9876	0.9519
		1.0000	0.9740	0.9694	0.9617
			1.0000	0.9917	0.9854
				1.0000	0.9756
					1.0000

Table 3: Capital flow variables finally considered

icapfl_gdp	Total Gross Inflows (percent of GDP)
ncapflp_gdp	Total Net Private Inflows (percent of GDP)
ndrvtv_gdp	Net Derivative Inflows (percent of GDP)
nfdi_gdp	Net FDI Inflows (percent of GDP)
nothf_gdp	Net Other Inflows (percent of GDP)
nothfg_gdp	Net Other Inflows to Official Sector (percent of GDP)
oothfg_gdp	Gross Other Outflows to Official Sector (percent of GDP)

The following tables and graphs represent the finally selected models for this study on the criterion mentioned above. The first four tables give the magnitude of gross and net inflow of Advanced Economies (AE) and Emerging Markets (EM)

Model 1: OLS, using observations 1980-2011 (T = 32)
Dependent variable: Gross_Inflows_AE

0	*Coefficient*	*Std. Error*	*t-ratio*	*p-value*	
Const	2.24751	1.71747	1.3086	0.20060	
Time	0.326323	0.0908344	3.5925	0.00115	***
Mean dependent var	7.631834		S.D. dependent var		5.581502
Sum squared resid	675.2529		S.E. of regression		4.744305
R-squared	0.300798		Adjusted R-squared		0.277491
F(1, 30)	12.90606		P-value(F)		0.001154

Log-likelihood	-94.19566		Akaike criterion	192.3913
Schwarz criterion	195.3228		Hannan-Quinn	193.3630
Rho	0.300913		Durbin-Watson	1.383095

Model 2: OLS, using observations 1980-2011 (T = 32)
Dependent variable: Net_Inflows_AE

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	-0.116139	0.233232	-0.4980	0.62215	
Time	0.0616271	0.0123353	4.9960	0.00002	***
Mean dependent var	0.900709		S.D. dependent var		0.857856
Sum squared resid	12.45273		S.E. of regression		0.644276
R-squared	0.454149		Adjusted R-squared		0.435954
F(1, 30)	24.96002		P-value(F)		0.000024
Log-likelihood	-30.30530		Akaike criterion		64.61060
Schwarz criterion	67.54207		Hannan-Quinn		65.58230
Rho	0.135840		Durbin-Watson		1.689323

Model 3: OLS, using observations 1980-2011 (T = 32)
Dependent variable: Gross_inflows_to_EM

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	0.753374	0.831421	0.9061	0.37209	
Time	0.234779	0.0439727	5.3392	<0.00001	***
Mean dependent var	4.627233		S.D. dependent var		3.155214
Sum squared resid	158.2457		S.E. of regression		2.296706
R-squared	0.487242		Adjusted R-squared		0.470150
F(1, 30)	28.50712		P-value(F)		8.94e-06
Log-likelihood	-70.98064		Akaike criterion		145.9613
Schwarz criterion	148.8928		Hannan-Quinn		146.9330
Rho	0.539879		Durbin-Watson		0.870513

Model 4: OLS, using observations 1980-2011 (T = 32)
Dependent variable: Net_Inflows_to_EM

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
Const	1.56323	0.504892	3.0962	0.00423	***
Time	0.0509459	0.026703	1.9079	0.06602	*
Mean dependent var	2.403835		S.D. dependent var		1.452880
Sum squared resid	58.35618		S.E. of regression		1.394706
R-squared	0.108204		Adjusted R-squared		0.078477
F(1, 30)	3.639969		P-value(F)		0.066020
Log-likelihood	-55.01930		Akaike criterion		114.0386
Schwarz criterion	116.9701		Hannan-Quinn		115.0103
Rho	0.594694		Durbin-Watson		0.766832

Conclusion: There is very poor fit of data in case of Net inflow to Emerging markets and Gross inflow to Advance Economies. The other two are also below 0.5. Though all are statistically significant. While there is not much difference in net inflow, the gross inflow is different in case of Advanced economies and emerging nations. Thus generalization on the basis of aggregation is not possible.

Model 5: OLS, using observations 1982-2011 (T = 30)
Dependent variable: Brazil GDP_GROWTH

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
nfdi_gdp	-9.55135	2.38271	-4.0086	0.00046	***
icapfl_gdp_1	9.86691	1.78812	5.5180	<0.00001	***
ncapflp_gdp_1	-5.28074	1.54232	-3.4239	0.00206	***
nothf_gdp_1	-7.06165	1.62992	-4.3325	0.00020	***
Mean dependent var	10.94334		S.D. dependent var		19.17710
Sum squared resid	6086.679		S.E. of regression		15.30043
R-squared	0.573098		Adjusted R-squared		0.523840
F(4, 26)	8.725960		P-value(F)		0.000132
Log-likelihood	-122.2581		Akaike criterion		252.5161
Schwarz criterion	258.1209		Hannan-Quinn		254.3091
rho	-0.142127		Durbin-Watson		2.241263

Model 6: OLS, using observations 1983-2011 (T = 29)
Dependent variable: GDP_Growth USA

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	4.36182	0.761938	5.7246	0.00001	***
icapfl_gdp	0.362517	0.105558	3.4343	0.00249	***
icapfl_gdp_1	-0.742639	0.141659	-5.2424	0.00003	***
nothf_gdp_1	1.17861	0.405733	2.9049	0.00847	***
nothf_gdp_2	0.689005	0.354585	1.9431	0.06553	*
nfdi_gdp	1.6623	0.435803	3.8143	0.00101	***
oothfg_gdp_1	-1.66949	0.317998	-5.2500	0.00003	***
oothfg_gdp_2	-1.00511	0.316632	-3.1744	0.00457	***
Mean dependent var	5.463645		S.D. dependent var	2.366549	
Sum squared resid	45.34902		S.E. of regression	1.469516	
R-squared	0.710813		Adjusted R-squared	0.614417	
F(7, 21)	7.373906		P-value(F)	0.000161	
Log-likelihood	-47.63206		Akaike criterion	111.2641	
Schwarz criterion	122.2025		Hannan-Quinn	114.6899	
rho	0.105861		Durbin-Watson	1.777614	

Model 7: OLS, using observations 1982-2010 (T = 29)
Dependent variable: China GDP_Growth

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	7.269	2.79102	2.6044	0.01502	**
ncapflp_gdp_1	2.13569	0.97315	2.1946	0.03732	**
nothfg_gdp	-3.99748	1.95548	-2.0442	0.05118	*
Mean dependent var	11.55085		S.D. dependent var	11.06148	
Sum squared resid	2504.294		S.E. of regression	9.814225	
R-squared	0.269028		Adjusted R-squared	0.212800	
F(2, 26)	4.784544		P-value(F)	0.017010	
Log-likelihood	-105.7970		Akaike criterion	217.5940	
Schwarz criterion	221.6958		Hannan-Quinn	218.8786	
rho	-0.152158		Durbin-Watson	2.195118	

Model 8: OLS, using observations 1982-2011 (T = 30)
Dependent variable: SA_Growth_Rate

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	8.22408	2.61158	3.1491	0.00434	***
icapfl_gdp_1	-4.24818	0.919566	-4.6198	0.00011	***
ncapflp_gdp	3.05493	0.996068	3.0670	0.00529	***
ncapflp_gdp_1	4.46282	1.6876	2.6445	0.01420	**
nothf_gdp_1	-6.26138	1.44717	-4.3266	0.00023	***
oothfg_gdp	-3.92992	1.53757	-2.5559	0.01734	**
Mean dependent var	6.397343		S.D. dependent var	14.95177	
Sum squared resid	2414.125		S.E. of regression	10.02938	
R-squared	0.627629		Adjusted R-squared	0.550051	
F(5, 24)	8.090357		P-value(F)	0.000137	
Log-likelihood	-108.3866		Akaike criterion	228.7732	
Schwarz criterion	237.1803		Hannan-Quinn	231.4627	
rho	-0.024517		Durbin-Watson	2.048128	

Model 9: OLS, using observations 1982-2010 (T = 29)
Dependent variable: Australia_GDP_Growth

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	-24.9879	6.32446	-3.9510	0.00064	***
icapfl_gdp	1.05428	0.542837	1.9422	0.06446	*
icapfl_gdp_1	2.88722	0.64529	4.4743	0.00017	***
ncapflp_gdp	2.56971	0.92078	2.7908	0.01039	**
nothf_gdp_1	-4.31229	1.1673	-3.6942	0.00120	***
oothfg_gdp_1	10.5182	2.54398	4.1345	0.00040	***
Mean dependent var	7.269888		S.D. dependent var	11.05111	
Sum squared resid	1322.743		S.E. of regression	7.583572	
R-squared	0.613183		Adjusted R-squared	0.529092	
F(5, 23)	7.291930		P-value(F)	0.000320	
Log-likelihood	-96.54164		Akaike criterion	205.0833	
Schwarz criterion	213.2871		Hannan-Quinn	207.6526	
rho	-0.001623		Durbin-Watson	1.875115	

Model 10: OLS, using observations 1992-2010 (T = 19)
Dependent variable: INDIA_GDP_GROWTH

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	2.27298	3.93668	0.5774	0.57645	
icapfl_gdp_1	-3.91853	1.78694	-2.1929	0.05308	*
ncapflp_gdp	8.59985	1.23093	6.9864	0.00004	***
ncapflp_gdp_1	5.21403	2.31855	2.2488	0.04827	**
nfdi_gdp	-5.89418	1.74716	-3.3736	0.00708	***
nfdi_gdp_1	-4.32119	1.81899	-2.3756	0.03890	**
nothf_gdp	-8.35479	4.39815	-1.8996	0.08668	*
nothfg_gdp_1	10.121	4.92807	2.0537	0.06709	*
oothfg_gdp	12.4967	5.49513	2.2741	0.04624	**
Mean dependent var	10.41608		S.D. dependent var	8.746427	
Sum squared resid	168.0676		S.E. of regression	4.099605	
R-squared	0.877947		Adjusted R-squared	0.780304	
F(8, 10)	8.991413		P-value(F)	0.001101	
Log-likelihood	-47.66914		Akaike criterion	113.3383	
Schwarz criterion	121.8382		Hannan-Quinn	114.7768	
rho	-0.251187		Durbin-Watson	2.493308	

5. Conclusion and Limitations

From the above data and empirical results the following conclusions may be drawn

- The arrival of capital flow has effect not only in the current year but in the coming years two. Thus the lagged values of one and two years are significant in many cases,
- While constant has been added in each model but the exception is Brazil where the model without constant gives far better results.
- Different countries have different variables which explain the growth rate. Thus generalization is not possible. Thus the rhetoric of FDI should be taken with a pinch of salt. Various facets of FDI are different for different countries.

This study has one serious limitation. The GDP growth depends on many factors and simply to estimate it with capital flows is not possible unless it is very small country totally dependent on foreign investment. Even more difficult is to link financial stability with GDP growth rate as proxy.
However with these caveats and riders one can study country specific features at the cost of humble generalization.

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