

FINANCIAL GLOBALIZATION AND INFLATION IN DEVELOPING COUNTRIES: A REAPPRAISAL

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Abstract

A number of economists have stated, and two recent empirical studies have suggested, that financial globalization should exert a positive effect on macroeconomic outcomes in general and inflation in particular. We re-examine the impact of such openness on inflation by exploiting a recent index of capital controls which improves on previous binary measures. In addition, we include one key variable missing from the previous studies-money growth. We find, as did the previous studies, that in the absence of money growth financial (and trade) openness appear to lower inflation. However, once previous money growth is taken into account, financial (and even a proxy for trade) openness exerts no significant effect at all on inflation.

JEL Codes: O11, F2, E31

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1. Introduction

The traditional case for capital account liberalization is that capital can flow from industrialized nations to developing countries, and the developing countries can then invest at a lower cost and experience faster growth. The IMF accordingly pressed emerging markets to remove their capital controls. However, Kose, Prasad, Rogoff and Wei (2006) admit that there is no robust empirical relationship between capital account openness and growth. Moreover, the tremendous volatility of the last fifteen years, with wrenching balance of payments crises in Mexico, Argentina, Asia, and Russia has led to a large decrease in enthusiasm for financial globalization.

However, while the direct growth effects of an open capital account may be negligible, if they exist at all, Kose, Prasad, Rogoff and Wei (KPRW hereafter) argue that financial globalization may entail more indirect “collateral benefits”. Allowing foreign investment may, the authors claim, improve financial deepening, corporate governance, and lead to better macroeconomic performance in the form of lower budget deficits and inflation. The focus of this paper will be on the impact financial globalization has on inflation. The impact of capital account openness on fiscal policy has been studied (Kim, 2003, Tytell and Wei, 2004). The two studies which examine the impact of financial openness on inflation (Gruben and McLeod (2002), Tytell and Wei (2004)) both find a negative impact.

Two challenges present themselves in studies of capital account openness-measurement problems and endogeneity. Gruben and McLeod acknowledge the potential endogeneity and find a set of instruments for capital account policy and perform two-stage least squares (2SLS). Whether this has addressed the simultaneity problem sufficiently is doubtful, as we will discuss. Tytell and Wei address both problems by employing a measure of openness that reflects not policy, but the level of autonomous

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capital flows, and employing three-stage least squares. Unfortunately, this may not go far enough in lowering the potential simultaneity bias, as their specification (as well as Gruben and McLeod's) omits one vital regressor-the money supply. This is especially important, for while capital flows may or may not exert a disciplinary effect on macroeconomic policy, capital controls are often employed by nations which have a number of other distortionary policies, among them high inflation (and presumably a correspondingly high money growth; see Quinn, Inlan and Toyoda, 2001). As will therefore be discussed, failing to include money growth can lead to an upward bias (in magnitude) in the coefficient on capital account policy.

Using our specification, the results indicate, in a model without the money supply, that financial openness indeed appears to lower inflation (as does trade openness as measured by imports and exports as a fraction of output). However, once the money supply is included, capital account openness has no significant effect on inflation (nor does the size of the trade sector), contradicting Gruben and McLeod and Tytell and Wei as well as speculation by KPRW. These results suggest, whatever merits financial globalization may or may not have, helping achieve price stability is not one of them.

This paper proceeds as follows. The next section describes the previous literature. The third section explains the data and methodology, and the fourth displays the results. The fifth section concludes.

2. Previous Literature

The traditional case for open capital accounts is straightforward. Capital rich countries (in which the return to capital is presumably relatively low) can send funds to developing countries, with relatively less capital (and presumably higher returns). In this way, residents of industrialized countries can gain higher returns, and emerging market nations can obtain a lower cost of capital, thus increasing investment and therefore growth a la Solow and Swan. The model's results were so well-understood, that, as Rodrik and Subramanian (2009) point out, "so clear were the theoretical priors that one could presume...that the evidence in favor of capital-account would cumulate over time.." (p. 1).

As strong as the theory may have seemed, KPRW concede that there is no robust empirical relationship between financial globalization and growth. Rodrik and Subramanian point out that opening the capital account can reduce growth by causing real exchange rate appreciation and lowering the profitability of investment in tradeables. Moreover, the volatility experienced in the last fifteen years of balance of payments crises in emerging markets, usually followed by wrenching recessions, has cast financial globalization in a decidedly less favorable light.

However, KPRW, while conceding the lack of clear evidence of direct growth benefits for capital account liberalization, argue that such openness may entail indirect, collateral benefits. For instance, foreign investors may demand better practice and regulation, thus improving corporate governance. Financial globalization may lead to better financial market development, or improved institutions. Finally, liberalizing the capital account and exposing the economy to capital flows may enhance macroeconomic discipline, and lead to smaller fiscal deficits and lower inflation.

Inflation is still a major macroeconomics issue in emerging markets (see Hossain,

2005 and Bildirici and Cosar, 2006 for country-specific investigations). Three previous papers have investigated whether financial globalization enhances macroeconomic outcomes in emerging markets. Kim (2003) investigates the impact of capital account liberalization on fiscal deficits. Gruben and McLeod (2002) find financial globalization lowers inflation. Tytell and Wei (2004) examine whether such liberalization affects both fiscal deficits and inflation. As Tytell and Wei state, “if international capital flows become more important for national economic development, and if they respond negatively to bad monetary and fiscal policies, governments may be induced to conduct better macroeconomic policies” (p. 2). The authors go on to cite Fischer (1998), Obstfeld (1998) and Stiglitz (2000) as sharing similar sentiments. Rodrik (2001), on the other hand, casts doubt on any disciplinary effect from capital flows policy, noting that capital flows are dominated by mood swings rather than fundamentals.

In terms of methods and results, Kim, Tytell and Wei, and Gruben and McLeod all differ. Kim finds, using several indices based on the IMF’s *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), that capital account liberalization has a negative, significant effect on the budget deficit. Gruben and McLeod use the AREAER, as well as the Quinn-Toyoda index, and find that financial openness has a negative impact on inflation. Tytell and Wei use a somewhat different methodology than most studies of capital account openness. Most, though not all rely on some index of capital account policy, again often based on the IMF’s AREAER. There are measurement problems with this index, as will be discussed. So Tytell and Wei proxy financial openness with a quantity measure of capital flows. In particular, the authors distinguish policy-driven from *autonomous* capital flows. The latter are defined as changes in flows due to changes in returns or the business cycle in industrialized countries. These flows are exogenous to developing countries. The authors examine how autonomous flows (instrumented with the weighted average of capital flows to neighboring countries) affect macroeconomic outcomes. With this method, the authors find, contrary to Kim (2003), that financial openness has no effect on fiscal outcomes, but does have a negative effect on inflation. Of course the use of a quantity measure to gauge openness is questionable.

A central problem is that, while Gruben and McLeod (and Tytell and Wei) acknowledge that capital flows are endogenous, and employ two (three)-stage least squares, it is not clear that their methods actually address the simultaneity problem. In particular, when examining inflation, and finding a negative impact of openness, both studies fail to include one very important variable—the money supply. Since the link between money and inflation is one of the most widely accepted in economics, we will include the money supply in our study.

3. Data and Methodology

A complete description of the data is in the appendix (data available from the author upon request). Studies on the effect of capital account openness struggle with two difficult statistical problems: measurement and endogeneity. Regarding measurement, it has not been easy to obtain an accurate measure of policy regarding the capital account. Some researchers thus turn to the quantity of flows as a metric, as did Tytell and Wei. The quantity of flows is of course an outcomes-based measure. It can be problematic,

since, while perhaps a good indicator at a point in time, Edison and Warnock (2003) point out that changes in flows are likely due to factors besides openness such as changes in returns and asset prices.

A few other studies employ price-based measures of openness, such as deviations from uncovered interest parity. Chinn and Ito (2009) note that changes in interest parity conditions can reflect changes in macroeconomic conditions, even if there is no change in capital account regulations.

Most papers thus employ some index of capital account policy, the oldest being the AREAER. However, this particular measure is only binary until 1996, and doesn't capture the extent and intensity of controls. Fortunately, Chinn and Ito (2009) have developed a new, much finer index of controls, which captures both their intensity and breadth. This metric is on a scale from closed to open, with lower values indicating greater capital controls. We will employ it.

The second issue is endogeneity. Previous studies such as Gruben and McLeod (2002), Kim (2003) and Tytell and Wei (2004) acknowledge that capital controls and macroeconomic outcomes could be endogenous. This endogeneity could take the form of reverse causality, in which good macroeconomic outcomes might induce a government to liberalize the capital account, or both macroeconomic outcomes and capital account policy could be driven by a third force. Eichengreen (2001) discusses the effect of third forces in such studies and the biased results they create in some detail. The difficulty is that countries which choose to employ capital controls likely have a number of other distortions and macroeconomic imbalances (some of which may be hard to observe). Therefore the estimated coefficient on capital account policy picks up the effects of these often omitted distortions and imbalances.

Similarly, Quinn, Inclan and Toydoda (2001) develop the notion of a "policy cluster". They find that countries with capital controls also often have high inflation, weak central banks and trade restrictions. Presumably other problems also characterize such economies, and some are hard to measure directly. Thus if only one indicator of the cluster is included in an empirical model, results could reflect the impact of omitted variables. A key point is that the estimated effect of capital account policy is likely biased *upwards* in magnitude, in the absence of some way to address endogeneity. Again, Quinn, et al. have found that high inflation (and presumably money growth) and capital controls tend to be a part of the same policy cluster. Thus including a measure of capital account policy, but excluding money supply growth from the group of regressors means the financial openness variable will pick up the effects of omitted money, and thus have a higher (in magnitude) estimated coefficient than it would in a correctly specified model.

The standard way to address endogeneity is to find some instruments, and use IV, two-stage least squares (Gruben and McLeod) or three-stage least squares (Tytell and Wei). The problem, of course, is finding good instruments. Gruben and McLeod use country size variables-1980 GDP, area in square miles, and a dummy for oil exporters-as instruments. However, they find, using a Hausman test, no difference between their OLS and 2SLS estimates, which may well indicate that their instruments are not sufficient.

Tytell and Wei employ the weighted average of capital flows to neighboring countries as an instrument for openness, but, as mentioned, using the quantity of flows is

not a measure of policy, as flows can change for reasons unrelated to openness.

We will employ an alternative approach. First, we acknowledge, given the arguments of Eichengreen and Quinn, et al., that in studying the effect of capital account policy, endogeneity is a problem, and the simultaneity bias is upward in magnitude. The deck is thus stacked in favor of finding a significant effect. Second, in response, we will employ fixed effects estimation, as did Tytell and Wei, which should counter the effect of time-invariant third forces. We will also follow Tytell and Wei and include time dummies. Next, we will lag our regressors, (which Tytell and Wei did not do), which should help counter bias arising from reverse causality. Finally, there is one third force, which has certainly been shown to affect inflation in other studies, but was omitted from the Tytell and Wei and Gruben and McLeod papers, which we will include. That is the money supply. We will observe results both before and after inclusion of the money supply to see how endogeneity may have affected the results.

The baseline variables, aside from the money supply, included in the study are the same as Tytell and Wei, although the particular metrics used for the variables are obviously different (we include a much different measure of openness, for example). We use the Ghosh, Gulde and Wolf (2003) data set for most of the variables, as it is extremely comprehensive. The data is annual, and runs from 1971 through 1999. It covers 75 developing countries, which are listed in the appendix. These nations in our sample include all 40 developing countries included in Tytell and Wei's paper, plus an additional 35 nations. The dependent variable will be inflation, specifically from the consumer price index, scaled as $\pi / (1 + \pi)$, where π is the inflation rate. By scaling the inflation rate in this way, the impact of outliers, such as hyperinflation episodes is minimized.

Our first regressor will be the fiscal balance. Large fiscal deficits have often been monetized, and thus may affect inflation. Another potential determinant of inflation is the independence of the central bank (Cukierman, 1992). We thus include the central bank governor turnover rate, which, as explained in Ghosh, et al. (p. 76) is an inverse measure of central bank independence.

There is a large literature on the impact of exchange rate regimes on inflation. As with the capital account, there have been measurement problems. The difficulty is that the officially announced, de jure regime may differ substantially from actual exchange rate policy. Accordingly, several authors, such as Levy-Yeyati and Sturzenegger (2003) and Reinhart and Rogoff (2004) have developed de facto measures of actual exchange rate behavior. Ghosh, et al. develop their own de facto measure of currency regimes. It is a three-way variable, with fixed, intermediate and floating regimes, and we will employ the measure as a regressor.

An implication of Romer (1993) is that greater trade openness should have a negative effect on inflation. We thus include exports and imports as a fraction of GDP. As noted, this is a quantity measure, and does not measure actual trade policy (which is notoriously difficult, see Rodriguez and Rodrik, 2001). But trade as a fraction of output is included in Tytell and Wei's specification, so we include it in ours.

The last variable in our baseline specification is Chinn and Ito's measure of capital account openness. This is a policy measure, and is much more detailed than

previous, crude measures such as the IMF's AREAER. Since it is measured on a scale from closed to open, if financial openness does lower inflation, we should observe a negative, significant coefficient.

The above variables constitute (qualitatively) the same set of regressors that Tytell and Wei employed. Kim (2003) also added the current account balance in a study of the capital account and fiscal policy. Since current account balances can affect inflation, we will also run a specification that includes this variable.

Finally, since money affects inflation, and its omission can greatly bias the results, we include broad money growth, scaled as $m/(1 + m)$, in another specification, and see if its inclusion affects the other estimated coefficients.

4. Results

Results from the initial specification, using only the same qualitative variables as Tytell and Wei, are displayed in Table 1. As noted, both capital account openness and trade "openness" are negative and statistically significant at the ten percent level. The budget balance has by far the largest impact. The lack of significance for the exchange rate may seem to contradict some earlier studies. However, more recent papers suggest a much reduced role for the exchange rate in controlling inflation. Bleaney and Francisco (2005) find only the "hardest" pegs have any effect on inflation, and Miles (2008) finds no significant effect at all on inflation from the exchange rate regime. When yearly dummies are added, the results are not palpably changed.

Table 1. Results Without Money

Variable	Coefficient	P-Value	Coefficient	P-Value
Budget Balance	-7.293	0.008	-7.57	0.007
CB Turnover	0.2904	0.807	0.0961	0.968
Peg	-0.608	0.265	-0.3508	0.581
Intermediate	-0.5483	0.557	-0.401	0.675
Trade	-0.383	0.057	-0.405	0.047
Capital Account	-0.537	0.061	-0.54	0.08
Country Dummies	Yes		Yes	
Year Dummies	No			
R ²	0.0893		0.1068	

Sample size N=1283. The dependent variable is scaled inflation, or $\pi / (1 + \pi)$, where π is the inflation rate. The data is annual from 1971 through 1999. All regressors are lagged one period.

Table 2. Results With Money

Variable	Coefficient	P-Value	Coefficient	P-Value
Budget Balance	-6.28	0.022	-6.7	0.016
CB Turnover	-0.172	0.885	-0.019	0.987
Peg	0.0473	0.932	0.643	0.324
Intermediate	-0.788	0.396	-0.775	0.414
Trade	-0.2207	0.377	-0.229	0.367
Capital Account	-0.1265	0.664	-0.202	0.516
Money Growth	16.92	0.000	17.77	0.000
Country Dummies	Yes		Yes	
Year Dummies	No		Yes	
R ²	0.1496		0.1692	

Sample size N=1235. The dependent variable is scaled inflation, or $\pi / (1 + \pi)$, where π is the inflation rate. The data is annual from 1971 through 1999. All regressors are lagged one period.

Thus the results from Table 1 are qualitatively the same those found by Tytell and Wei, as well as Gruben and McLeod. But in Table 2, we add what was clearly an important (*the* most important judging by its magnitude and significance) omitted variable-money supply growth. Money growth has by far the largest impact of any regressor, and its inclusion renders both forms of openness completely insignificant. The budget balance is still significant, but has a slightly lower impact. These results suggest that contrary to Tytell and Wei, as well as Gruben and McLeod and KPRW, capital account openness has no significant impact on inflation.

In Tables 3 and 4, we add the current account balance to the specification. As noted, the results are qualitatively unchanged. Opening the capital account, once the money supply is controlled for, yields no effect on inflation (nor does having a large trade sector).

Table 3. Results Without Money

Variable	Coefficient	P-Value	Coefficient	P-Value
Budget Balance	-11.15	0.001	-11.88	0.001
CB Turnover	0.138	0.907	-0.054	0.964
Peg	-0.575	0.292	-0.344	0.588
Intermediate	-0.606	0.516	-0.454	0.634
Trade	-0.377	0.06	-0.409	0.045
Capital Account	-0.517	0.071	-0.524	0.088
Current Account Balance	4.475	0.069	4.91	0.051
Country Dummies	Yes		Yes	
Year Dummies	No		Yes	
R ²	0.0918		0.1096	

Sample size N=1283. The dependent variable is scaled inflation, or $\pi / (1 + \pi)$, where π is the inflation rate. The data is annual from 1971 through 1999. All regressors are lagged one period.

Table 4. Results With Money

Variable	Coefficient	P-Value	Coefficient	P-Value
Budget Balance	-8.92	0.012	-9.63	0.008
CB Turnover	-0.269	0.822	-0.118	0.924
Peg	0.0572	0.918	0.638	0.327
Intermediate	-0.826	0.374	-0.808	0.395
Trade	-0.218	0.383	-0.235	0.356
Capital Account	-0.114	0.693	-0.192	0.536
Current Account Balance	2.97	0.246	3.24	0.214
Money Growth	16.72	0.000	17.54	0.000
Country Dummies	Yes		Yes	
Year Dummies	No		Yes	
R ²	0.1506		0.1703	

Sample size N=1235. The dependent variable is scaled inflation, or $\pi / (1 + \pi)$, where π is the inflation rate. The data is annual from 1971 through 1999. All regressors are lagged one period.

5. Conclusion

It is important to reiterate, given the discussion in Eichengreen (2001), and Quinn, et al. (2001), that, in regressing inflation on policies such as capital account openness, the endogeneity likely biases the estimated coefficient upward in magnitude (indeed, as was the case in our initial models, financial openness had a significant effect). We make no claim that lagging the regressors and adding the money supply have perfectly dealt with the simultaneity problem. However, given that the deck is likely stacked, statistically, in favor of finding a significant effect, the fact that the significance of financial globalization is eliminated once the money supply is controlled for strongly suggests that, whatever other collateral benefits capital account openness may or may not entail, low inflation is not one of them.

Our results do not necessarily suggest that emerging market nations should resist financial globalization. At the same time, given the enthusiasm with which capital account openness is still promoted by some (Mishkin, 2006), and the dangers, not just of crises but also of harm to long run growth due to real exchange rate appreciation (Rodrik and Subramanian, 2009), any alleged benefits of financial globalization should not be exaggerated.

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Appendix: Countries in Sample and Data Definitions

Algeria, Argentina, Bahrain, Bolivia, Botswana, Brazil, Chile, Colombia, Congo (Democratic Republic), Costa Rica, Cyprus, Czech Republic, Dominican Republic, Ecuador, Egypt, Estonia, Ethiopia, Gambia, Ghana, Greece, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Jamaica, Jordan, Kazakhstan, Kenya, Korea, Kuwait, Lebanon, Lithuania, Malawi, Malaysia, Malta, Mexico, Morocco, Nigeria, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Senegal, Singapore, Slovak Republic, Slovenia, South Africa, Spain, Sri Lanka, Suriname, Syria, Tanzania, Trinidad and Tobago, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Zambia, Zimbabwe.

Inflation: Scaled consumer price index inflation ($\pi / (1 + \pi)$) from the Ghosh, Gulde and Wolf (2003) dataset.

Budget balance: The Fiscal balance as a percent of GDP from the Ghosh, Gulde and Wolf (2003) dataset.

CB Turnover: Central bank governor turnover rate, per five years, from the Ghosh, Gulde and Wolf (2003) dataset.

Peg and Intermediate: Dummies from the de facto index of exchange rate regimes from the Ghosh, Gulde and Wolf (2003) dataset. The omitted category is floating exchange rate regimes.

Trade: The sum of imports and exports expressed as a fraction of GDP from the Ghosh, Gulde and Wolf (2003) dataset.

Capital Account: Chinn and Ito's (2009) measure of capital account openness, measured on a scale from closed to open. The index is available at www.ssc.wiscconsin/~mchinn/research.html.

Money Growth: Scaled ($m / (1 + m)$) growth in the broad money supply, from the Ghosh, Gulde and Wolf (2003) dataset.