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How Does Financial Openness Affect Economic Growth and its Components?*

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Abstract

This paper aims at uncovering the different channels through which *de facto* financial openness affects economic growth and its components. The results herein indicate that *de facto* measures of financial openness (as proxied by different types of capital inflows) stimulate economic growth. In particular, the results indicate that higher levels of FDI inflows stimulate GDP per worker growth and crowd-in domestic investment for developing and emerging markets. As far as developed economies, I find that higher levels of both FDI and Portfolio-type inflows improve GDP per worker growth, but that only the latter type of capital stimulates capital accumulation with crowding-in effects. The one similarity between developed and developing economies is that FDI positively affects total factor productivity in both cases.

JEL Classification: C23, F21, F36, F41, F43, O4

Keywords: Capital account liberalization, capital flows, dynamic panels, foreign direct investment, total factor productivity.

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1 Introduction

The nexus between international financial openness and economic growth continues to be one of the most hotly debated issues among international economists.[1] That is, do financially more open economies grow faster than closed ones precisely because of their openness to global capital markets? Economic theory suggests that financial openness should foster economic growth; however, empirical work thus far has not found robust evidence for the existence of such a link (Kose et al., 2006). Nevertheless, the extent of financial market liberalization around the world increased almost continuously until very recently, where a driving factor underlying this process was the increased possibility for investors to (internationally) diversify risk. At the same time, many economies have encouraged capital inflows by reducing capital controls through the introduction of market-oriented reforms; for example through the elimination of restrictions on certain types of capital.

1.1 Theoretical Developments

In a perfect neoclassical world there are good reasons for a positive effect on economic growth from the integration of capital markets. For example, as Levine (2001) shows, more financial openness can strengthen the domestic financial system, thereby leading to more domestic investment, to a more efficient allocation of capital, and therefore to higher economic growth. Furthermore, theoretical arguments supporting financial openness revolve around (a) the benefits of international risk sharing for consumption smoothing; and (b) the positive impact of capital inflows on capital accumulation; where these likely contributions to the well-being of an economy can be particularly large for capital inflows with equity-like features like foreign direct investment (FDI). Therefore, it is important to differentiate between *short-term* and *long-term* capital flows; where the latter type of investment brings with it not only resources, but also technology, access to markets, and knowledge. As emphasized by Berthélemy and Démurger (2000), Borensztein et al. (1998), and Grossman and Helpman (1991), FDI can smooth the spillovers of managerial and technological know-how, particularly in the form of new varieties of capital inputs; furthermore, it can improve the skills composition of the labor force as a result of "learning by doing" effects, investment in formal education, and on-the-job training. In addition, the trade literature suggests that although higher levels of competition stimulated by FDI may

[1] The fairly recent exchange between J. Stiglitz and K. Rogoff, through a series of papers and open letters, is perhaps the most clear example of the *hotness* of this debate.

tend to reduce the revenues of local firms, spillover effects can lower costs and encourage domestic investment.[2] Moreover, and perhaps more importantly, FDI is also not as volatile, and therefore not as troublesome as short-term flows that can quickly come in and out of an economy.

However, some prominent economists opposed to the free movement of capital flows have put forth strong arguments against financial openness. This side of the debate argues that financial openness is not necessarily welfare enhancing in the presence of distortions such as trade barriers, weak institutions, and/or macroeconomic imbalances; or if information asymmetries affect the proper working of the international financial markets (Bhagwati, 1998; Rodrik, 1998; Rodrik and Subramanian, 2008; Stiglitz, 2000, 2003). Moreover, financial openness might not only have an ambiguous effect on the level but also on the volatility of growth rates. Therefore, this side of the debate evolves around whether (a) access to world capital markets expands investors' opportunities for portfolio diversification and provides the opportunity to attain better (risk-adjusted) returns, or wether (b) volatility risk, sudden stops, and quick reversals in capital flows, in the context of highly open capital accounts, may represent significant costs. As far as the first point above, there are potentially large benefits as well (as seen from the recipient economy) since as argued by Obstfeld (1994), access to international capital markets gives economies the possibility to borrow in order to smooth consumption in the face of adverse shocks. Furthermore, the potential growth and welfare gains, which results from international risk sharing, can be quite large. As far as the second point, concerns associated with such "reversals" have been heightened by the financial crises of the 1990s and early 21^{st} century, and although skewed fundamentals might have played a role in the abovementioned crises, they have called attention to the intrinsic instability of financial markets and the risks that the "unregulated" cross-border movement of capital can bring for economies without the proper "rules of the game".

1.2 Empirical Developments

Despite a rich body of contributions, the empirical literature is inconclusive *vis-à-vis* the financial openness-growth nexus. As is stated by Prasad et al. (2003) "Theoretical models have identified a number of channels through which international financial integration can promote economic growth in developing countries... However, there is as yet no clear and

[2]It is also argued that FDI can help decrease a firms' financing constraints. For example, Blalock and Gertler (2005) find that FDI can alleviate the unfavorable effects of financial crisis by helping firms maintain uninterrupted access to credit through their parent companies.

robust empirical proof that the effect is quantitatively significant." For example, applied work by Grilli and Milesi-Ferretti (1995), Kraay (1998), Edison et al. (2002), and Fratzscher and Bussiere (2004) has not found a robust long-term effect of financial openness on growth, thereby corroborating the oft-cited study by Rodrik (1998). On the other hand, research by Quinn (1997), Edwards (2001) and Henry (2007) shows that financial openness and economic growth are positively associated. More recent research has shed more light on this issue by looking at thresholds (or third factors) such as a sound institutional framework and macroeconomic stability; however, to-date these results remained mixed at best (Arteta et al., 2001; Edison et al., 2002; Klein, 2005).[3]

The theoretical literature that focuses on FDI identifies a number of channels through which FDI inflows will be beneficial to the target economy; yet, the empirical literature has lagged behind and has had more trouble identifying these advantages in practice. The consensus that is slowly emerging is that FDI is beneficial when compared to other types of capital inflows such as portfolio investment or syndicated bank loans, though there are economists who maintain that even this beneficial effect is limited. Nonetheless, additional research efforts have also been devoted to identifying other features unique to FDI such as its relative permanence and the positive externalities it generates (see Aitken and Harrison (1999) for a micro-level study, and Fernadez-Arias and Montiel (1996); Sarno and Taylor (1999) for macro-level studies).

One reason why empirical research on the financial openness-growth nexus is still inconclusive relates to the fact that different econometric techniques make it difficult to harmonize the results; and although the bulk of research papers take cross-country growth models as the starting point, visible dissimilarities remain *vis-à-vis* the sample of countries, the sampling period, and the estimation techniques employed. For example, contemporaneous research has typically employed a neoclassical growth model where economists regress the growth rate of real GDP per capita on a proxy for financial openness, in addition to a set of control variables which stand-in for fundamental growth drivers.[4] However, the econometric models employed differ in three important respects: (1) with regard to the measures for the degree of financial openness; (2) with regard to the model specification; and (3) with regard to the use of the investment rate versus the capital stock per worker.

Financial openness has at times been measured by the extent to which legal (*de jure*) hurdles impede the free flow of capital (Quinn, 1997; Rodrik, 1998; Chinn and Ito, 2005);

[3] Eichengreen (2002), Edison et al. (2002), Kose et al (2006), Henry (2007), and Obstfeld (2009) have given comprehensive assessments of the literature linking financial openness and growth.

[4] Such as the investment to GDP ratio, human capital, plus a convergence effect.

however, it has also been argued that financial openness should be measured quantitatively (*de facto*) by using, for example, the sum of financial assets and liabilities as a proportion of GDP (see Kose et al., 2006). Eichengreen (2001) and Edison et al. (2002) compare and contrast both approaches, and conclude that the choice of indicator is both a question of convenience and accessibility to data. The second main issue in which current research differs relates to the econometric model. Some authors have argued that short-term policy variables like the budget deficit and inflation need to be included (Edison et al., 2002), while other researchers have chosen to mimic Barro and Sala-i-Martin (1995), by employing a more selective set of the determinants of long-run economic growth. In particular, the addition of the investment rate as a percentage of GDP has proved challenging; for example, Edison et al. (2002), Eichengreen and Leblang (2003), Klein and Olivei (1999), and Bekaert et al. (2006) did not include it under the argument of endogeneity, although the motivation has not always been discussed in detail by most economists. Nevertheless, other economists such as Rodrik (1998), Arteta et al. (2001), Edwards (2001), and Klein (2003) control for different investment rates measured at the start of the sampling period; however, as Bosworth and Collins (2003) indicate, using the investment rate severely biases any results.

Notwithstanding the aforementioned caveats, the results herein show that *de facto* financial openness (as proxied by different types of capital flows) stimulate economic growth for developing and emerging markets. In particular, I find that FDI positively affects GDP per worker growth, and that FDI also affects the growth rate of the capital stock per worker positively with (non-robust) evidence of crowding-in effects; this mirrors the Borensztein et al. (1998) results. As far as developed economies, I find that higher levels of both FDI and portfolio-type inflows improve GDP per worker growth, but that only the latter type of capital stimulates capital accumulation with crowding-in effects. The one similarity between developed and developing economies is that FDI positively affects total factor productivity in both cases.

The road map for the paper is as follows: Section 2 describes the data and the econometric methodology. Section 3 explores the stylized facts of the relationship between financial openness and the components of economic growth. Section 4 formally looks at the relationship between *de facto* measures of financial openness as proxied by FDI and portfolio inflows, to gauge the effects of financial openness on GDP per worker growth and on the growth rate of the capital stock for both developed and developing economies. Section 5 discusses absorptive capacity and "relative backwardness" issues, while section 6 looks at the effects of *de facto* financial openness on total factor productivity (TFP). Last but not least, section 7 summarizes and concludes.

2 Data & Econometric Methodology

Situations in which past decisions impact on current behavior are ubiquitous in economics. In this light, panel data sets provide a solution to accommodating the joint occurrence of dynamics and "unobserved" heterogeneity in the task at hand. Therefore, in order to test the hypothesis that financial openness and different types of capital flows have a positive effect on economic growth, I employ a dynamic panel-data methodology; thereby making it possible to control for country-specific effects, the potential endogeneity of the explanatory variables, in addition to autocorrelation and persistence. Nickell (1981) was the first to show that the least square dummy variable (LSDV) estimator is not consistent for a finite number of time periods in panel data models; however, ever since his seminal work, a number of consistent IV and GMM estimators have been proposed as an alternative to LSDV. For example, Anderson and Hsiao (1982) suggest two simple IV estimators that use the second lags of the dependent variable as an instrument for the lagged and differenced dependent variable. Additionally, Arellano and Bond (1991) propose a GMM estimator for a model in first differences, which is more efficient than the Anderson and Hsiao (1982) estimator. As a follow-up, Blundell and Bond (1998) detect that first-differenced IV or GMM estimators may well experience a small sample bias due to frail instruments, especially when the data is exceedingly persistent. As a solution they suggest a system GMM estimator with first-differenced instruments for the levels-equation and instruments in levels for the equation in first-differences

However, a weakness of both the IV and GMM estimators is that their properties hold for a large number of observations, which implies that they can be severely biased and imprecise in macro panel models. On the other hand, Monte Carlo studies by Arellano and Bond (1991), Kiviet (1995), and Judson and Owen (1999) show that IV and GMM estimators have a higher variance when compared to LSDV, although the latter estimator is still inconsistent. An alternative approach, based on a bias-correction of LSDV, has recently regained popularity in the literature. Nickell (1981) derives an expression for the inconsistency in LSDV, while Kiviet (1995) uses "more complicated" techniques to derive the small sample bias of the LSDV estimator. However, the approximation terms evaluated at the unobserved true parameter values are of no direct use for estimation; therefore, to make them operational Kiviet (1995) and Kiviet (1999) suggest replacing the true parameters by the estimates from some consistent estimators. His Monte Carlo evidence shows that the bias-corrected LSDV estimator (LSDVC) tends to outperform the IV-GMM estimators, especially in terms of bias and root mean squared error (Bruno,

2005). In addition, Judson and Owen (1999) give strong support to LSDVC, especially when the number of observations is small. Bun and Kiviet (2003) simplify Kiviet (1999); furthermore, they perform Monte Carlo experiments that show that 90% of the actual bias can be accounted for when they evaluate their first-order approximation term at its true parameter value. However, none of the aforementioned corrections to the LSDV estimator is possible for unbalanced panels; however, this hole in the econometric literature is filled by Bruno (2005). Therefore, I will employ the bias corrected LSDV estimator for unbalanced panels as developed by Bruno (2005), where the correction employed is based on the "system GMM" estimator as developed by Blundell and Bond (1998).

2.1 Construction of Accounts

As we know from the literature, growth accounts bode well with alternative formulations of the relationship between factors of production and output. All that is required is a sufficient level of competition to ensure that the returns to the factors of production are proportionate to their productivity (Bosworth and Collins, 2003). However, as Bosworth and Collins (2003) explain, consistent measures of factor income shares are seldom available for individual economies; thereby forcing economists to use fixed income-share weights. For the construction of the accounts, I assume a Cobb-Douglas production function of the form:

$$Y = AK^{\alpha}(LH)^{1-\alpha} \tag{1}$$

The capital share, α, is assumed equal to one-third for the entire sample.[5] H is a measure of educational attainment stemming from the Barro-Lee dataset.[6] I report the results through a decomposition of the growth in output per worker $(\frac{y}{l})$, by looking into the contributions of growth in capital per worker $(\frac{k}{l})$, increases in education per worker (h), and the contribution of improvements in TFP (a):

$$\frac{y}{l} = \alpha(\frac{k}{l}) + (1-\alpha)h + a \tag{2}$$

I assume (as in the literature) that capital services grow proportionally to the capital stock, which I estimate through the perpetual inventory model,

[5] Gollin (2002) concludes that once self-employment income is account for, capital income shares are stable over time within countries, and similar across countries (see also Bernanke and Gurkaynak, 2001; and Caselli and Feyrer, 2007 for a discussion on the marginal product of capital).

[6] The actual variable used is the secondary school completion rate as a percentage of the labor force over 25 years of age.

$$K_t = K_{t-1}(1-d) + I_t \tag{3}$$

where the depreciation rate, d, equals 0.10. The basic gross fixed capital formation data extending back to 1960 (in constant \$2000) and the measure of labor input both come from the World Bank.

2.1.1 Investment Rate versus the Capital Stock

As noted by Bosworth and Collins (2003), the choice between the investment rate and the growth rate of the capital stock has extremely important implications for empirical analysis. The change in the capital stock is given by

$$\Delta K = I - dK \tag{4}$$

dividing both sides by K and assuming a steady-state value (ϕ) for the inverse of the capital-output ratio allows the rate of change of the capital stock (k) to be measured by the investment rate:

$$k = \phi\left(\frac{I}{Y}\right) - d \tag{5}$$

A production function such as (2) can be re-written to replace k with the steady-state approximation (5), yielding the formulation used in many cross-national studies,

$$\frac{y}{l} = \alpha(\phi\left(\frac{I}{Y}\right) - d) + (1-\alpha)(h+l) + a \tag{6}$$

As Bosworth and Collins (2003) state:

> "The use of the investment rate has an obvious advantage. It avoids the measurement problems introduced by the choice of an initial capital stock and an assumed rate of depreciation. However, the assumption of a constant capital-output ratio seems particularly unreasonable for studying the growth experiences of a highly diverse groups of countries, many of which seem very far from conditions of steady-state. It also seems unreasonable to assume the same capital-output ratio across a sample of countries at very different stages of development."

When it comes to the definition of financial openness, it has long been recognized that it is complicated to measure its extent (see Eichengreen, 2001; Edison et al., 2004); and although there have been many attempts at describing the extent and intensity of capital controls, the consensus is that any such measures fail to fully capture the complexity of real-world capital controls for a number of reasons. First, conventional measures of quantifying capital controls (or financial openness) fail to account for the intensity of capital controls, where the most prominent example of such measures include dummy variables stemming from the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER). Second, as Chinn-Ito (2007) state, "IMF-based variables are too aggregated to illustrate the complexity of actual capital controls". Thirdly, it is extremely difficult to discriminate between *de jure* and *de facto* capital controls. In other words, capital control policies are regularly implemented without explicit policy goals to control the volume and/or type of capital flows. On the other hand, the private sector often circumvents capital account restrictions, thereby eliminating any effect of the capital controls (Edwards, 1999).

This simple discussion suggests that a distinction between *de jure* and *de facto* financial openness is crucial to any analysis. After all, what matters for analyzing the relationship between financial openness and economic growth is not how integrated economies are "on paper", but how integrated they are in practice. Accordingly, I will proxy *de facto* financial openness through the amount of FDI and Portfolio inflows (this data stems from the International Financial Statistics of the IMF). Other research has had the tendency to use net capital inflows or the current account balance as proxies for *de facto* financial openness (see Prasad et al., 2007; Gourinchas and Jeanne, 2009). However, this assumes that all capital is created equal and that they will all have similar effects on an economy. Needless to say, this is an extreme assumption, since it is well known that long-term capital inflows like FDI are more stable and more persistent (see Sarno and Taylor, 1999), while short-term capital inflows are more prone to sudden stops and quick reversals. It is this latter type of capital that can be more destabilizing to an economy by increasing downside risk (see Garita and Zhou, 2009).

I also consider several additional control variables, including *trade openness*, the *U.S real interest rate* as a driver of capital flows (defined as the US T-bill rate minus CPI inflation - both from IFS), the *black market premium* as an index of macroeconomic distortions, an index of *political rights* from the Freedom House that ranges from 1 (the highest degree of freedom) to 7 (the lowest degree of freedom). Moreover, in order to estimate the relationship between financial openness, the different types of capital flows, and economic

growth, five-year periods are employed, which is typical in the literature, since five years is thought to be long enough to eliminate business-cycle effects, but short enough to capture important changes that occur over time for a particular economy (see Henry, 2007). Moreover, I decompose the sample into 25 developed economies and 186 developing and emerging economies (see Appendix A).

3 Stylized Facts

Before turning to the regression analysis, I begin by looking into the stylized facts of the relationship between *de facto* financial openness and economic growth for the entire sample ($1970 - 2005$). Moreover, I also consider how this relationship might have changed over time by decomposing the full sample into two sub-periods: $1970 - 1985$ and $1985 - 2005$. By now it is well recognized in the economics profession that a structural break occurred in the mid-1980's in many respects; but specially in terms of *financial openness*, since many economies around the world began to undertake capital account liberalization programs around this period. As far as the descriptive part of this section, the sample is further decomposed into those economies with a below(above)-average level of *de facto* openness as proxied by the amount of FDI inflows.

Figures 1 and 2 display the cross-sectional mean of labor productivity and the average contributions of the three components separately for the less and more financially open developing economies (in terms of FDI inflows) for the periods before and after 1985. As far as less financially open developing economies, the contribution of TFP remained relatively similar during both periods, while output growth was mostly influenced by the accumulation of physical capital. Turning to the more financially open developing economies we see that, in the period after 1985, these economies have enjoyed an almost doubling in the contribution of TFP to economic growth, surpassing the contribution of capital accumulation. Figures 3 and 4 perform the same exercise for developed economies. These figures show that there was virtually no change in the contribution of any of the three components for the less financially open developed economies in terms of FDI. However, for the more financially open developed economies, we can notice a dramatic increase in TFP after 1985. The main conclusion of this crude disaggregation of the sample, is that on average more financially open developed and developing economies, in terms of allowing more FDI inflows, have enjoyed faster productivity growth over the "most recent" period of globalization, and this suggests that there is a positive relationship between *de facto* financial openness and economic growth, especially TFP growth.

Figure 1: Growth Accounting for Less *de facto* Financially Open Developing Economies

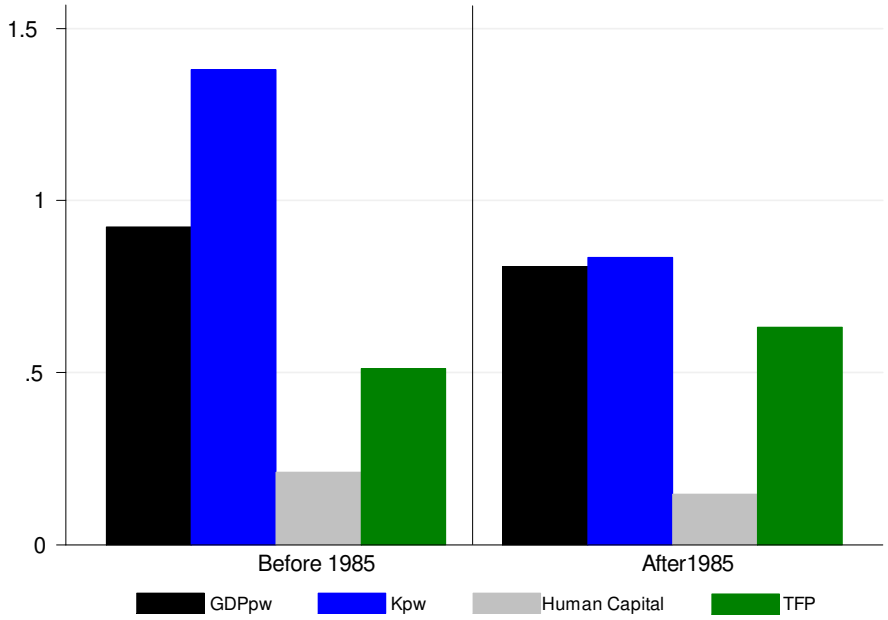


Figure 2: Growth Accounting for More *de facto* Financially Open Developing Economies

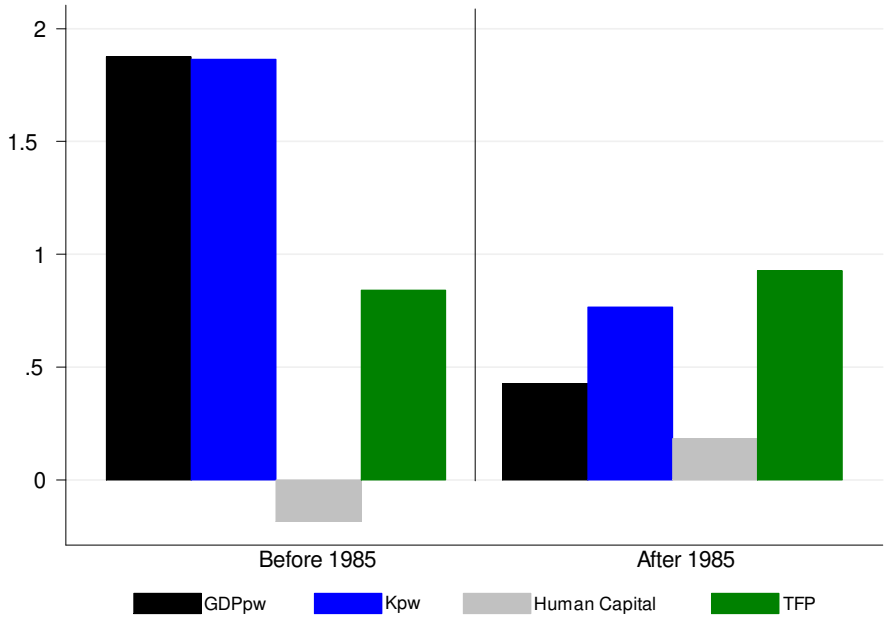


Figure 3: Growth Accounting for Less *de facto* Financially Open Developed Economies

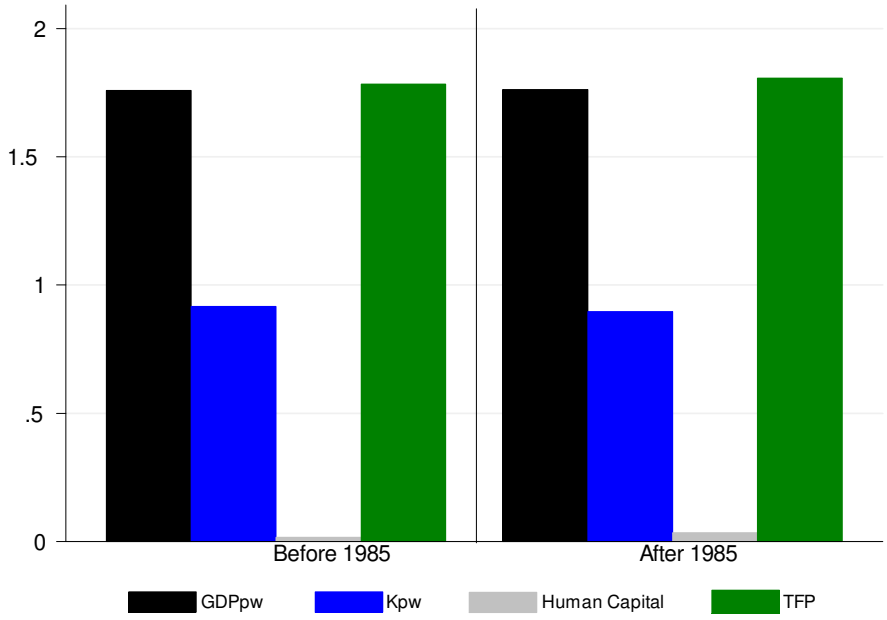
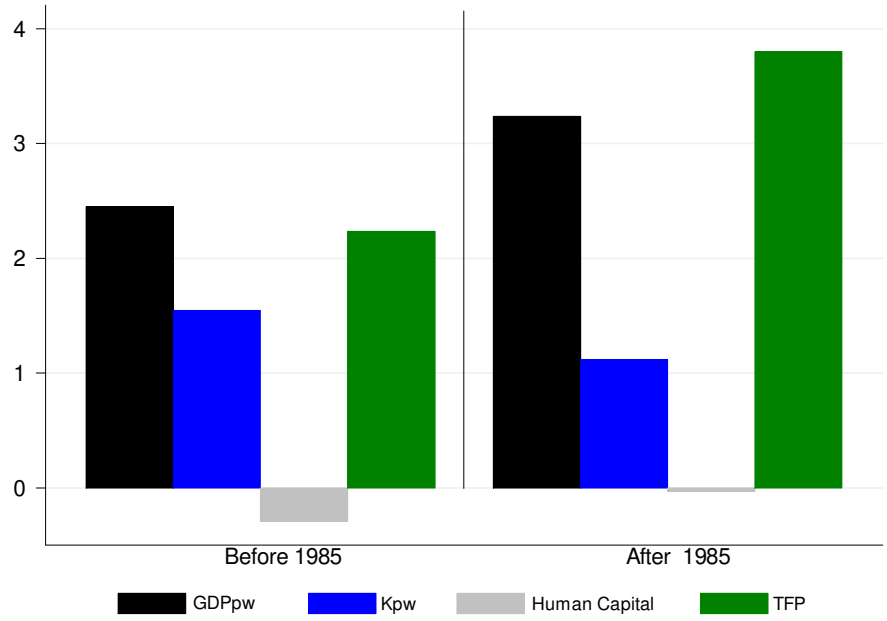


Figure 4: Growth Accounting for More *de facto* Financially Open Developed Economies



4 *De Facto* Financial Openness[7]

The research avenue of analysis into the outcome of financial openness *vis-à-vis* economic growth, which I pursue in this section, is based on the view that capital flows are not all created equal. For example, Stiglitz (2000) has argued that economies (especially developing economies) should pursue long-term capital flows, while "regulating" short-term inflows. That is, capital flows that are characterized by "equity-like" features are not only believed to be more stable and less prone to reversals (see Wei, 2006), but are also believed to carry with them many indirect benefits of financial globalization, such as transfers of managerial and technological expertise, but also the reduction of financing constraints (see Blalock and Gertler, 2005).

While we must realize that it is difficult to state unequivocally that private capital flows drive growth (since it could be that domestic growth drives capital flows), the evidence does seem to point to the idea that private capital flows can, at the very least, reinforce the growth process. Although economic theory and empirical investigations have much to say about where international capital flows may gravitate, both theory and evidence are less precise about the impact of such flows on a "local" economy. For example, once in a country, private capital flows may increase domestic consumption, investment, and/or TFP, or they may principally increase a country's foreign exchange reserves. However, if flows are driven merely by incentives to evade taxes or jump other legal barriers, money may flow out of a country as quickly as it flows in.

The results in Table 1 show that the "standard" growth drivers have the expected effect (time dummies will always be included in all regressions in order to isolate purely cross-country effects; however, these results will not be reported). Moreover, Table 1 confirms that FDI inflows are indeed beneficial to the growth prospects of developing and emerging markets.[8] Most of the burgeoning literature analyzing portfolio flows into emerging markets suggests that portfolio equity flows should have a positive and significant impact on economic growth; however, the results in specification 1.2 do not confirm this positive association. Specification 1.3 introduces the (ln)black market premium, where the

[7] I also tried all the regressions in sections 4 and 6 with what Kose et al. (2006) call "financial integration", which is simply the sum of financial assets and liabilities divided by GDP stemming from Lane and Milesi-Ferretti (2007). However, this variable never entered significantly.

[8] I also performed two additional regressions; one on what I call the *BRICplus* economies only; which are: *Brazil, Russia, India, China, Hong-Kong, Israel, Mexico, Singapore, and South Korea.* The results for this regression still indicate that FDI inflows contribute positively and significantly to GDP per worker growth. The other regression was performed on all other developing economies (excluding the *BRICplus* economies), and the results continue to show the aforementioned positive relationship.

results confirm the expected negative effect of the black market premium on the growth rate of an economy.[9] Figure 5, which is based on specification 1.4 shows that FDI inflows do stimulate growth in GDP per worker, but only when the initial level of human capital is below 35% (section 5 will elaborate further on this issue).[10]

Table 1: De Facto Financial Openness and Growth in GDPpw for Developing Economies

Dependent variable: $\Delta ln\text{GDP}_w$

	1.1	1.2	1.3	1.4
$\Delta ln\text{GDPw}_{t-1}$	0.101	0.093	0.019	0.057
	(0.071)	(0.059)	(0.065)	(0.058)
Initial GDPpc	-2.436 ***	-2.374 **	-3.019 **	-1.807 *
	(0.756)	(1.061)	(1.494)	(1.009)
Human Capital	0.109 **	0.093 *	0.154 **	0.167 ***
	(0.051)	(0.051)	(0.069)	(0.061)
(G/Y)	-0.024	-0.024	-0.048	-0.021
	(0.044)	(0.037)	(0.078)	(0.036)
FDI Inflows	0.341 ***	0.325 ***	0.434 ***	0.813 **
	(0.099)	(0.098)	(0.132)	(0.229)
Portfolio Inflows		-0.065	0.159	0.052
		(0.125)	(0.243)	(0.132)
LnBMP			-0.405 *	
			(0.213)	
FDI Inflows*HC				-0.021 ***
				(0.008)
observations	286	281	216	281

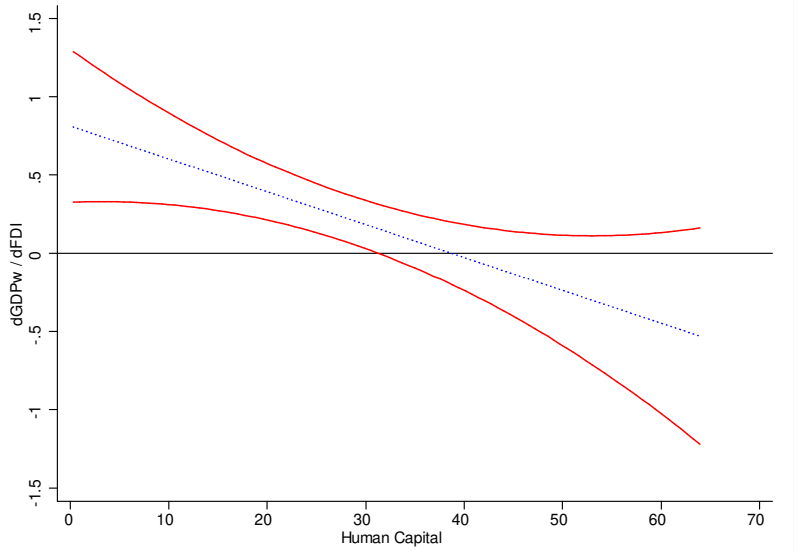
Notes: bootstrapped standard errors in parenthesis

*, **, *** are 10%, 5%, 1% significance levels respectively

[9] While note reported here, I also interacted the *LnBMP* with *FDI inflows*, but this interaction was not significant. Moreover, the *Political Rights* index from the Freedom House was never significant.

[10] The total effect is calculated as $\beta_1 + \beta_2 HC$, where β_1 denotes the coefficient of FDI and β_2 the interaction coefficient. For the moment $dHC \;/\; dFDI = 0$.

Figure 5: Effect of FDI inflows on ΔlnGDPw for Developing Economies (with 95% C.I)



As far as developed economies, Table 2 shows that both FDI and portfolio investment have a positive and significant effect on economic growth. These results are in line with Reisen and Soto (2001) and Durham (2004) who find that both capital flows can have growth-promoting effects. As far as the total effect of FDI inflows, Figure 6 (based on specification 2.3) shows that FDI inflows have a positive effect on economic growth; however, this effect is not significantly positive for economies with a human capital level exceeding 55% (i.e. Austria, Germany, New Zealand, Norway, Sweden, Switzerland and the US).

The results for portfolio inflows can best be discerned by looking at Figure 7, which is based on specification 2.4. The figure indicates that economies with a human capital level below 43%, are the ones that benefit the most from portfolio inflows *vis-à-vis* the growth rate of GDP per worker. For example, the marginal effect is significantly positive for Greece (1970-1990), Portugal (1970-2005) and Spain (1970-1990); moreover, even though the United States has a human capital level of almost 46% (in the period 2001-2005), I cannot reject the possibility that there is no effect (or even a negative effect) of portfolio flows on the growth rate of GDP per worker. Another notable result in Table 2, is the negative effect of government spending on GDP per worker growth, which simply points in the direction of fiscal discipline as a growth driver.

Figure 6: Effect of FDI inflows on ΔlnGDPw for Developed Economies (with 95% C.I)

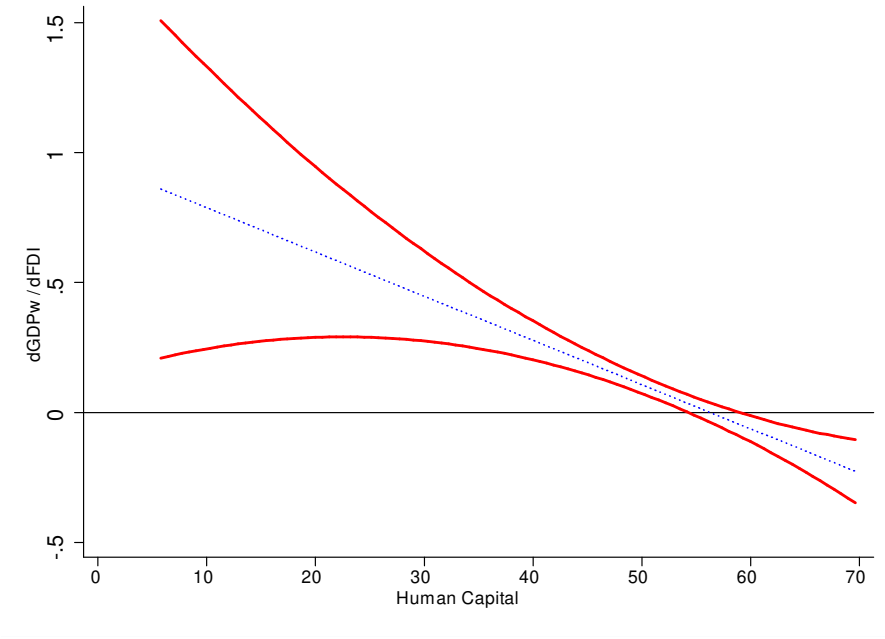


Figure 7: Effect of Port. inflows on ΔlnGDPw for Developed Economies (with 95% C.I)

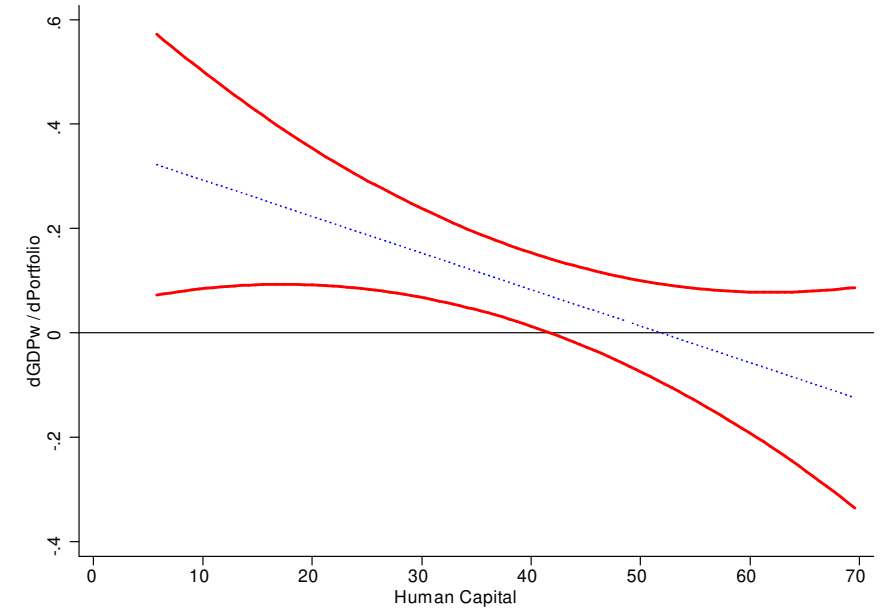


Table 2: De Facto Financial Openness and Growth in GDPpw for Developed Economies

Dependent variable: $\Delta ln\text{GDP}_w$

	2.1	2.2	2.3	2.4
$\Delta ln\text{GDPw}_{t-1}$	-0.079	-0.089	-0.068	-0.078
	(0.089)	(0.093)	(0.091)	(0.092)
Initial GDPpc	-1.707	-1.746 *	-2.207 **	-2.132 **
	(1.070)	(1.048)	(1.090)	(1.068)
Human Capital	0.015	0.013	0.054 **	0.024
	(0.017)	(0.020)	(0.023)	(0.021)
(G/Y)	-0.266 ***	-0.281 ***	-0.326 ***	-0.347 ***
	(0.092)	(0.083)	(0.087)	(0.087)
FDI Inflows	0.185 ***		0.957 ***	
	(0.068)		(0.336)	
Portfolio Inflows		0.038 **		0.363 ***
		(0.019)		(0.130)
FDI Inflows*HC			-0.017 **	
			(0.007)	
Portfolio_Inflows*HC				-0.007 **
				(0.002)
observations	126	127	126	126

Notes:bootstrapped standard errors in parenthesis

*, **, *** are 10%, 5%, 1% significance levels respectively

4.1 Capital Inflows and the Capital Stock

The following section measures the effect of *de facto* financial openness on the growth rate of the capital stock per worker. In particular, I distinguish between FDI inflows and portfolio inflows, where theory predicts that these type of capital flows can simulate economic growth by augmenting capital accumulation and/or by improving total factor productivity (this section focuses on the first channel; see section 6 for the TFP channel). The growth impact of FDI flows has attracted renewed interest in the wake of the "recent" financial crisis, where developed and developing economies alike are looking for "new" engines of growth. However, while the theoretical literature has pointed out that FDI may boost growth, the empirical literature shows considerable disagreement *vis-à-vis* the relevance of these impacts. On the one hand, firm-level data often find no significant productivity effects of FDI (see for example Fernadez-Arias and Montiel, 1996). On the other hand, macro-level studies tend to conclude that FDI boosts growth via higher productivity and/or physical investment (see World Bank, 2001), while other papers argue that this requires the target economy to satisfy certain thresholds (see Borensztein et al., 1998). More recent studies

are even less successful in establishing a connection between FDI and economic growth (see Blonigen and Wang, 2004; Carkovic and Levine, 2005). Despite these ambiguities, private capital flows (with equity-like features) are generally found to have a significant impact on domestic investment, with the relationship being strongest for FDI and international bank lending, and weaker for portfolio flows (Bosworth and Collins, 1999).

Table 3: De Facto Financial Openness and Capital Stock per worker for Developing Economies

Dependent variable: $\Delta Ln\text{Kstock}_w$

	3.1	3.2	3.3	3.4	3.5
$\Delta Ln\text{Kstock}_{w,t-1}$	0.542 ***	0.542 ***	0.503 ***	0.482 ***	0.486 ***
	(0.080)	(0.080)	(0.111)	(0.098)	(0.098)
$Ln\text{GDPpc}_{ini}$	0.023	0.023	0.302	0.190	0.239
	(1.145)	(1.145)	(1.260)	(1.418)	(1.457)
Human Capital	-0.003	-0.003	0.007	0.025	0.039
	(0.059)	(0.059)	(0.082)	(0.074)	(0.088)
lnBMP	-0.497 ***	-0.497 ***	-0.676 ***	-0.519 ***	-0.502 **
	(0.246)	(0.246)	(0.283)	(0.219)	(0.226)
FDI Inflows	0.532 ***	0.532 ***	0.701 ***	0.741 ***	0.832 ***
	(0.157)	(0.157)	(0.230)	(0.199)	(0.352)
US Real Int. Rate		-0.387 ***	-0.411 ***	-0.465 ***	-0.471 ***
		(0.131)	(0.112)	(0.141)	(0.141)
Portfolio Inflows			-0.051	-0.105	-0.109
			(0.210)	(0.282)	(0.294)
G/Y				0.189 *	0.198 **
				(0.103)	(0.101)
Political Rights				-0.093	-0.094
				(0.271)	(0.270)
FDI Inflows * HC					-0.005
					(0.022)
observations	206	206	165	164	164

Notes: bootstrapped standard errors in parenthesis

*, **, *** are 10%, 5%, 1% significant levels respectively

Table 3 shows that, for developing economies, an increase in FDI inflows of 10% leads to an increase in the growth rate of the capital stock per worker of 5.3% (in specification 3.1) to 8.3% (in specification 3.5). However, while these results show a positive correlation and crowding-in effects[11] (for specifications 3.1 and 3.2) between FDI inflows and capital accumulation, they also indicate that FDI might be crowding out domestic investment in developing economies (see specifications $3.3 - 3.5$). Moreover, portfolio inflows do not have a significant effect on capital accumulation (3.3). Adding the share of government expenditures (G/Y) and an index of political rights does not change the estimates in (3.4). The last column (specification 3.5) introduces an interaction between FDI inflows and human capital; however, the interaction term is not significant, while the total effect of FDI inflows on the growth rate of the capital stock increases to 0.83.[12] I also use the (ln)black market premium as an indicator of economic instability, since it can be interpreted as both a measure of expectations of depreciation of the "local" currency, and as a rudimentary index of distortions; therefore, it should be negatively correlated with the growth rate of the capital stock. As expected, the growth rate in the capital stock per worker falls with this premium. The usage of the real interest rate in the USA follows Calvo et al. (1996) who argue that the U.S. interest rate is a strong determinant of capital flows, especially to developing economies. More recently, Rodrik and Subramanian (2008) have argued that domestic investment should be quite sensitive to the availability of resource inflows; however, only when an economy is "saving-constrained" (I must mention that from the results we cannot say anything as to whether an economy is "saving-constrained" or "investment-constrained"). The results in Table 3 also shows that tighter monetary policy in the U.S. leads to a lower growth rate of the capital stock per worker for developing economies.

As far as developed economies, the results in Table 4 are markedly different in comparison to developing economies. However, one major difference in the regression specifications is that the black market premium is not used since it is almost non-existent for developed economies; therefore, I use the *political rights index* from the Freedom House as a basic control variable. In all specifications the political rights index enters with a negative sign as expected (remember that this index ranges from 1 = Highest degree of freedom to 7 = lowest degree of freedom), indicating that more political freedoms are associated with

[11] $H_0 : \beta > 1;\ H_1 : \beta \leq 1;\ t = \frac{(\beta-1)}{s_\beta}; t < -1.645 \rightarrow H_0$ is not rejected. These results corroborate Borensztein et al. (1998) who also found a (non-robust) crowding-in effect for developing economies.

[12] Following footnote 8, the results of this decomposition show that for *BRICplus* economies, FDI inflows have a positive and significant effect on the growth rate of the capital stock. For all other economies, FDI inflows continue to stimulate positively the growth rate of the capital stock, with crowding-in effects.

higher growth rates of the capital stock per worker. Moreover, the G/Y-ratio has a negative effect on capital accumulation showing that fiscal discipline is beneficial for the growth rate of the capital stock per worker. Interestingly, FDI inflows do not have a significant effect on capital accumulation. However, portfolio inflows are positively and significantly correlated with the growth rate of the capital stock, also indicating that portfolio inflows to developed economies have a crowding-in effect for domestic investment.

Table 4: De Facto Financial Openness and the Capital Stock per worker for Developed Economies

Dependent variable: $\Delta Ln\text{Kstock}_w$

	4.1	4.2	4.3	4.4
$\Delta Ln\text{Kstock}_{w,t-1}$	0.567 ***	0.597 ***	0.594 ***	0.595 ***
	(0.066)	(0.110)	(0.112)	(0.112)
$Ln\text{GDPpc}_{ini}$	0.539	0.026	-0.040	-0.193
	(0.753)	(0.890)	(0.906)	(0.920)
Human Capital	0.013	0.019	0.032	0.024
	(0.017)	(0.019)	(0.023)	(0.018)
G/Y	-0.161 **	-0.174 **	-0.197 **	-0.190 **
	(0.080)	(0.086)	(0.085)	(0.081)
US Real Int. Rate	-0.037	-0.020	-0.026	-0.016
	(0.061)	(0.063)	(0.064)	(0.063)
FDI Inflows	-0.014	-0.006	0.261	0.007
	(0.079)	(0.082)	(0.003)	(0.083)
Portfolio Inflows	0.101 ***	0.100 ***	0.096 ***	0.236 **
	(0.027)	(0.034)	(0.035)	(0.112)
Political Rights		-0.329 **	-0.301 *	-0.305 *
		(0.167)	(0.172)	(0.173)
FDI*HC			-0.005	
			(0.006)	
Portfolio*HC				-0.003
				(0.003)
observations	120	111	111	111

Notes: bootstrapped standard errors in parenthesis
*, **, *** are 10%, 5%, 1% significant levels respectively

5 Absorptive Capacity & "Relative Backwardness"

International economists have long argued that along with international trade, the most important medium for international technology transfer is FDI. Furthermore, it is well known that multinational corporations (MNCs) are responsible for the bulk of the world's private R&D efforts, and in turn produce, own, and control the lion's share of the world's advanced technology. As argued by Blomstrom and Kokko (2003), when MNCs set up a foreign affiliate, the affiliate receives some of the "technology" that comprises the parent's firm-specific advantage and therefore allows the affiliate "to compete successfully with local firms that (might) have better-quality knowledge of local markets, consumer preferences, and business practices". This argument indicates that there might be a geographical diffusion of technology, but not necessarily a formal transfer of knowledge beyond the boundary of the MNC, since the establishment of a foreign affiliate is basically a decision to internalize the use of "core technology". However, MNC technology can still pour out to the surrounding economy, which improves human capital in the host economy, and can lead to productivity increases in domestic firms.

In many cases, forward and/or backward linkages play a major role, since MNCs provide training and technical assistance to their business networks, including workers and managers. In this manner, longer-term capital flows with equity-like features, like FDI, can be a particularly valuable source of "new technology" since as argued in the introduction, this type of capital flow not only introduce new ideas, but also strengthens the human capital base needed to adapt these ideas to the local market. However, as emphasized by Blomstrom and Kokko (2003), productivity and technology spillovers are not certain outcomes of FDI. Instead, they argue that FDI and human capital interact in a complex manner, where FDI inflows have the capability to create knowledge spillovers on the local workforce. At the same time, the host economies' level of "human capital determines how much FDI it can attract and whether local firms are able to absorb the potential benefits. Therefore, it is likely that the relationship is non-linear and that multiple equilibria are possible" (Blomstrom and Kokko, 2003). For example, economies with "high" levels of human capital can attract large levels of "technology intensive" FDI, which contributes to the further development of local labor skills. At the same time, economies with weaker levels of human capital can experience relatively smaller inflows of FDI; however, those foreign firms that do decide to enter the market are likely to be "simple technology" users that none-the-less can have a major impact local learning and skill development.

Kose et al. (2006) stress that financial openness only leads to "better outcomes" when

certain initial conditions are met. In contrast, the estimation results herein (as illustrated in Figures 5-7) point to negative interaction effects with human capital, implying that countries that operate before a certain human capital threshold seem to benefit the most from *de facto* financial globalization. This "relative backwardness" between economies was first emphasized by Findlay (1978), who highlighted its importance for the speed of adoption of new technologies and spillover benefits from MNCs. Findlay's model suggests that the greater the technological distance between the *less advanced* host country and the *advanced* home country, the greater the available opportunities to exploit in the host country and therefore, the more rapidly new technologies are adopted. In other words, the potential for positive spillovers is higher the larger the absorptive capacity gap between host and home countries, which is precisely the results found in this paper. In the next section, I probe deeper into this effect by looking at how different types of *de facto* financial openness affect *total factor productivity (TFP).*

6 Financial Openness and TFP

The approach that I follow in this last section ties in well with the literature identified by Kose et al. (2006), who emphasize the importance of TFP growth as the main driver of long-term growth. However, at the end of the day, if *de facto* financial openness is to have permanent effects on growth, it must push up the production possibility frontier. The literature has argued that "total" foreign direct investment may bring new technology and management techniques that increase the efficiency of "acquired" firms and generate economy-wide spillovers. For example, Mishkin (2006) has argued that developing countries can import greater efficiency by allowing foreign investors to take controlling stakes in domestic financial firms, and thereby bring in state-of-the-art financial intermediation practices. Recently, Henry (2007) has even stated that "these stories are plausible but empirically unsubstantiated". Surprisingly, research on whether financial openness raises TFP is scarce. Recent exceptions are Edwards (2001) who concludes that the evidence is not robust; and Bonfiglioli (2007), who shows that financial integration has a positive direct effect on productivity, albeit with the use of a dummy variable to proxy for financial integration. In addition, the empirical literature on the spillover effects of FDI also gives mixed results. For example, some studies argue that foreign ownership has a positive effect on productivity for domestic firms and industries (see Barrell and Pain, 1997); while other studies find little or no evidence of spillover effects stemming from FDI (see Aitken and Harrison, 1999).

The results of the TFP-regressions for both developing and developed economies in Table 5 tend to support Mishkin's story. First, FDI inflows do contribute to TFP growth for both types of economies (see specification 5.1 and 6.1). Second, portfolio inflows do not have a significant effect for developing economies (specification 5.2), while portfolio inflows do have a positive effect on TFP growth for developed economies (see specification 6.2).[13] Third, threshold effects in terms of human capital do not improve the explanation of TFP growth.[14]

Table 5: De facto Financial Openness and TFP for Developing and Developed Economies
Dependent variable: TFP growth

	Developing & Emerging Markets			*Developed Economies*		
	5.1	5.2	5.3	6.1	6.2	6.3
TFP growth$_{t-1}$	0.152 *	0.132 *	0.130	-0.157*	-0.170*	-0.142
	(0.085)	(0.074)	(0.085)	(0.083)	(0.095)	(0.088)
Initial GDPpc	-2.481***	-2.337***	-2.222***	-2.110**	-2.108**	-2.709***
	(0.895)	(0.881)	(0.919)	(0.994)	(0.970)	(1.022)
Human Capital	0.078	0.068	0.108 **	0.025	0.022	0.055 **
	(0.052)	(0.053)	(0.053)	(0.016)	(0.018)	(0.022)
US Real Int. Rate	-0.235**	-0.229*	-0.248**	-0.122**	-0.136**	-0.123**
	(0.112)	(0.121)	(0.111)	(0.054)	(0.064)	(0.056)
(G/Y)	-0.056	-0.052	-0.041	-0.284***	-0.300***	-0.350***
	(0.065)	(0.061)	(0.060)	(0.086)	(0.076)	(0.087)
FDI Inflows	0.212 **	0.236 *	0.423 **	0.173 ***		0.647 *
	(0.111)	(0.134)	(0.214)	(0.063)		(0.362)
Portfolio Inflows		-0.098			0.035 *	0.177
		(0.116)			(0.018)	(0.160)
FDI*HC			-0.009			-0.010
			(0.008)			(0.008)
Portfolio*HC						-0.004
						(0.003)
observations	209	204	209	126	127	126

Notes: bootstrapped standard errors in parenthesis;
*, **, *** are 10%, 5%, 1% significant levels respectively

[13] In Table 5 I only report the individual effect of portfolio inflows for developed economies. When I include both FDI and portfolio inflows, then both coefficients become non-significant.

[14] For the *BRICplus* economies, FDI inflows continue to have positive effects on TFP growth (but only at the 10% significance). For all other economies the results are the same, and positively significant at standard levels.

7 Conclusions

In order to understand the total effect of financial openness on economic growth, it is important to know the channels and the directionality through which such policies affect an economy. Furthermore, it is important to take into account the possibility that financial openness affects countries differently (this is especially true for developed versus developing economies). In this light, this paper has probed deeper into the aforementioned relationship by studying separately the impact of *de facto* financial openness on economic growth and its components. By studying the direct and indirect channels of *de facto* financial openness, I find that FDI inflows positively affect GDP per worker growth and that these inflows also affect capital accumulation positively with (non-robust) evidence of crowding-in effects, mirroring the Borensztein et al. (1998) results. When it comes to developed economies, the results show that FDI and portfolio inflows both play a significant and positive role in stimulating the growth rate of GDP per worker. As far as the growth rate of the capital stock per worker, the results for advanced economies show that only portfolio inflows matter for capital accumulation with crowding-in effects on domestic investment. The one similarity between developed and developing economies relates to the TFP regression results, which show that there is a significant and positive correlation between FDI inflows and TFP for both types of economies. The paper also finds evidence in favor of the importance of "relative backwardness" for the speed of adoption of new technologies and spillover benefits. This suggests that the greater the technological distance between the "less advanced" host economy and the "advanced" home country, the greater the available opportunities to exploit in the host country, and therefore, the more rapidly "new technologies" are adopted. From a policy perspective, while the literature suggests that transitional risks are associated with financial openness, this paper shows that resisting *de facto* financial openness (especially in terms of FDI inflows) over an extended period may prove counterproductive. One possible strategy is to try to mitigate the down-side risks associated with an open capital account (see Garita and Zhou, 2009). In this light, sound domestic policies and institutions, a regulatory framework promoting a strong and efficient financial sector, and effective systems and procedures for monitoring capital flows greatly improve the chances of ensuring that capital inflows foster sustainable growth. Therefore, counter-intuitive as it may seem (especially given the severe economic downturn that is gripping the world economy), *more* and *not less* financial openness is the way forward; however, only if it is initially done by attracting long-term investment flows, while keeping a close watch on short-term capital flows.

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Appendix A - List of Countries

Developed Economies				
AUSTRALIA	FINLAND	IRELAND	MONACO	SPAIN
AUSTRIA	FRANCE	ITALY	NETHERLANDS	SWEDEN
BELGIUM	GERMANY	JAPAN	NEW ZEALAND	SWITZERLAND
CANADA	GREECE	LIECHTENSTEIN	NORWAY	UK
DENMARK	ICELAND	LUXEMBOURG	PORTUGAL	USA
Developing (Emerging) Economies				
AFGHANISTAN	BELIZE	CENTRAL A. REP.	DOMINICAN REP.	GUATEMALA
ALBANIA	BENIN	CHAD	ECUADOR	GUINEA
ALGERIA	BERMUDA	CHILE	EGYPT	GUINEA BISSAU
ANDORRA	BHUTAN	CHINA	EL SALVADOR	GUYANA
ANGOLA	BOLIVIA	COLOMBIA	EQUATORIAL GUINEA	GREENLAND
ANTIGUA AND BAR.	BOSNIA-HERZ.	COMOROS	ERITREA	HAITI
ARGENTINA	BOTSWANA	CONGO	ESTONIA	HONDURAS
ARMENIA	BRAZIL	COSTA RICA	ETHIOPIA	HONG KONG
AZERBAIJAN	BRUNEI	COTE D'IVOIRE	FIJI	HUNGARY
AMERICAN SAMOA	BULGARIA	CROATIA	FAEROE ISLANDS	INDIA
ARUBA	BURKINA FASO	CUBA	GABON	INDONESIA
BAHAMAS	BURUNDI	CYPRUS	GAMBIA	IRAN
BAHRAIN	CAMBODIA	CZECH REP.	GEORGIA	IRAQ
BANGLADESH	CAMEROON	CHANNEL ISL.	GHANA	ISRAEL
BARBADOS	CAPE VERDE	CONGO D. R. (ZAIRE)	GRENADA	ISLE OF MAN
BELARUS	CAYMAN ISLANDS	DJIBOUTI	GUAM	JAMAICA

Developing (Emerging) Economies (continued)				
JORDAN	MALTA	OMAN	SLOVAK REPUBLIC	TUNISIA
KAZAKHSTAN	MARSHALL ISL.	PAKISTAN	SLOVENIA	TURKEY
KENYA	MARTINIQUE	PALAU	SOLOMON ISLANDS	TURKMENISTAN
KIRIBATI	MAURITANIA	PANAMA	SOMALIA	TUVALU
KOREA NORTH	MAURITIUS	PAPUA N. G.	SOUTH AFRICA	UGANDA
KOREA SOUTH	MEXICO	PARAGUAY	SRI LANKA	UKRAINE
KUWAIT	MICRONESIA	PERU	ST KITTS AND NEVIS	UNITED ARAB E.
KYRGYZ REP.	MOLDOVA	PHILIPPINES	ST LUCIA	URUGUAY
LAOS	MONGOLIA	POLAND	ST VINCENT AND THE G.	UZBEKISTAN
LATVIA	MOROCCO	PUERTO RICO	SUDAN	VANUATU
LEBANON	MOZAMBIQUE	QATAR	SURINAME	VENEZUELA
LESOTHO	MYANMAR	ROMANIA	SWAZILAND	VIETNAM
LIBERIA	MAYOTTE	RUSSIA	SYRIA	VIRGIN ISLANDS(US)
LIBYA	NAMIBIA	RWANDA	SERBIA AND MONT.	WEST BANK
LITHUANIA	NAURU	SAMOA	TAIWAN	YEMEN
MACAO	NEPAL	SAN MARINO	TAJIKISTAN	YUGOSLAVIA
MACEDONIA	NETHERLANDS A.	SAO TOME AND P.	TANZANIA	ZAMBIA
MADAGASCAR	NICARAGUA	SAUDI ARABIA	THAILAND	ZIMBABWE
MALAWI	NIGER	SENEGAL	TIMOR EAST	
MALAYSIA	NIGERIA	SEYCHELLES	TOGO	
MALDIVES	NEW CALEDONIA	SIERRA LEONE	TONGA	
MALI	N. MARIANA ISL.	SINGAPORE	TRINIDAD AND T.	

Appendix B - Descriptive Statistics

Table 6: Descriptive Statistics for 186 Developing Economies

Variable	Mean	Std. Dev.	Min.	Max.	N
growth GDP_w	0.94	4.72	-36.97	37.17	932
growth $Kstock_w$	2.11	5.53	-10.72	53.42	593
TFP	0.47	3.56	-17.34	15.93	521
Initial GDPpc	8.16	1.09	5.23	11.11	975
Human Capital	15.91	12.15	0.30	63.90	580
G/Y	23.59	11.05	2.48	89.22	1026
Financial Openness	-0.23	1.38	-1.77	2.60	888
Trade Openness	81.31	50.74	2.21	410.33	1017
US Real Int. Rate	1.29	1.99	-1.1	4.58	1302
FDI Inflows	4.47	61.29	-5.55	1660.54	735
Portfolio Inflows	0.21	4.15	-94.07	20.83	589
LnBMP	2.55	1.91	-1.10	12.92	584
Political Rights	4.21	2.11	1	7	1056

Table 7: Descriptive Statistics for 25 Developed Economies

Variable	Mean	Std. Dev.	Min.	Max.	N
growth GDP_w	1.99	1.49	-1.71	7.46	161
growth $Kstock_w$	2.01	1.35	-0.71	9.45	161
TFP	1.39	1.30	-1.67	6.07	161
Initial GDPpc	9.51	0.74	6.97	10.78	161
Human Capital	38.28	13.24	5.80	69.60	154
G/Y	17.03	4.16	6.83	26.50	161
Financial Openness	1.33	1.35	-1.77	2.60	161
Trade Openness	62.84	45.20	10.76	279.58	161
US Real Int. Rate	1.29	1.99	-1.1	4.58	175
FDI Inflows	1.83	2.49	-0.01	15.30	147
Portfolio Inflows	4.39	32.40	-0.04	380.27	137