The Threshold Effects of Institutional Quality and Capital flows on Economic Growth - Evidence from Emerging Economies

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1. Introduction:

Many emerging economies across the regions of Latin America and Asia, experienced marked differences in their economic growth rate after liberalising their capital accounts in 1990s. However, the positive effect of capital flows on economic growth varied across both these regions. In recent studies, two important factors have been identified that explain the cross-country differences in economic growth driven by the surge in capital flows. First is the difference in the institutional quality, which is a key determinant in promoting the productive use of international capital flows (Klein 2005; Alfaro, L., Kalemli-Ozcan & Volosovych 2007; Kose, Prasad & Terrones 2009); and second is the composition of capital flows, such as the share of FDI, Portfolio flows and other flows received by a country[1](Carlson 2002; Tong & Wei 2011; Leblebicioğlu & Madariaga 2015). Bringing these two factors together, in this paper we examine the interaction effect of capital flows and institutional quality on three different measures of economic progression: GDP per capita, total factor productivity (TFP) and labour productivity, in a selected sample of countries from Asia and Latina America in the period 1990-2013.

[1] According to Milesi-Ferretti (2011), different capital flows have different features such as risk liquidity, tradability, reversibility, expropriability and tax treatment.

Growth in total factor productivity and labour productivity are the key factors driving GDP per capita growth in all endogenous growth models. Despite being regarded as an important source of financing investment, the positive effect of unfettered international capital flows on economic growth is not always visible. This inconclusive finding can be attributed to the fact that growth effects of capital flows are conditional on the two factors discussed above – level of institutional quality and composition of capital flows. Empirical studies suggest that institutional quality plays an important role in determining the positive effect of capital flows on economic growth (Bekaert, Harvey & Lundblad 2005; Chanda 2005; Alfaro, Laura, Kalemli-Ozcan & Volosovych 2008; Klein & Olivei 2008). While most of these studies have analysed the effect of capital flows and institutional quality separately on economic growth, so far very little empirical research has been done that explores the interaction effect of institutional quality and capital flows on economic growth.

Thus, the main purpose of this paper is to examine the roles of institutional quality in determining the partial effect of capital flows on per capita GDP, total factor productivity and labour productivity, respectively, in 35 economies of Asia and Latin America. We use dynamic panel regression model to estimate the threshold level of institutional quality at which capital flows exert a positive effect on economic growth.

The paper has three key contributions to the literature: First, by studying the interaction effect we will determine the threshold level of institutional quality at which capital flows can exert positive effect on all these three measures of economic growth. Second, capital flows are diverse in nature and have different stabilising properties. Investigating their effect separately on economic growth allows for a systematic comparison between FDI and non-FDI inflows as well as total flows. Third, this study to the best of our knowledge, is the first attempt to test the interaction effect of institutional quality and capital flows on total factor productivity and labour productivity of emerging economies.

The rest of the paper is organised as follows. Section 2 provides a brief overview of the related literature. Section 3 presents data and measurement issues and also the growth anatomy of Asia and Latin America. Section 4 discusses the empirical strategy and baseline results for the full sample and provides some robustness and sensitivity tests. Section 5 presents the results for Asia and Latin America separately. Section 6 concludes this paper.

2. An overview of existing literature

This section will particularly focus on the empirical literature that shows the effect of capital flows on GDP growth and productivity measures are conditional on institutional quality.

The growth effect of capital flows on host country comes from the fact that capital flows improves the composition of country's capital stock thereby enabling firms to invest in projects that lift future income streams[2] (Calvo, Leiderman & Reinhart 1996). The majority of empirical studies, discussing the direct effect of capital flows on economic growth, have yet not reached a common consensus. These mixed results can be attributed to the fact that certain initial conditions are required to be fulfilled by the host countries before garnering the positive effect of capital flows on growth. Kose, Prasad and Taylor (2011) offer a thoughtful assessment of the conditions that are required by the host countries to reap the positive effect of capital flows. The term 'conditions' takes account of factors such as, financial development, the degree of trade openness, macroeconomic policies and the level of institutional quality.

Institutions are understood to effect economic growth by offering incentive for productive behaviour (Rodrik 2000). Although a number of studies have investigated the effect of institutional quality on economic growth, empirical literature investigating the threshold level of institutional quality in determining the partial effect of capital flows is still sparse[3].

[2] Investing in projects, wherein, the prospective returns are higher than the cost of financing.

[3] Klein, MW & Olivei, GP 2008, investigated the effect of capital flows on economic growth with the given level of institutional quality; however, they did not estimate the threshold level.

In recent years, literature on economic growth theory has emphasised the role of TFP growth as the main driver of long run per-capita GDP growth. In the neoclassical model of Solow (1956) and Swan (1957) (1956) technical change is an exogenous phenomenon, whereas according to the new growth models technical progress is an endogenous phenomenon (Grossman & Helpman 1993; Aghion & Howitt 1997; Peretto 1998). R&D-based endogenous growth models argue that total factor productivity (measured as Solow residual) captures this technological progress over time. Moreover, one important theme, common in both sets of models, is that when the economies are in transition, capital deepening is fundamental to economic growth. However, since capital stock is subject to diminishing returns in the long-run, only efficient use of capital stock with technological progress exerts positive effects on output per capita growth and consequently have positive effects on TFP growth.

Since capital flows are considered as the main source of financing investment, for successful capital deepening we would expect a positive effect from capital flows on TFP. In addition, the empirical literature suggests that the positive effect of capital flows on TFP is also conditional, depending on the level of financial openness. Countries that are more financially open generally experience higher TFP growth (Bonfiglioli 2008; Kose, Prasad & Terrones 2009). However, financial openness in the presence of distortion like information asymmetries, stemming from the lack of transparency in institutional quality may lead to misallocation of capital flows (Williamson 2005). Based on this hypothetical argument, the partial effect of capital flows on TFP should also depend upon the institutional quality of the host country. However, this relationship is yet to be examined empirically in the economic growth literature.

Changes in labour productivity depend upon the changes in TFP and capital deepening (Ahmed 2011). According to Sargent and Rodriguez (2000), TFP is a more effective in the long-run, assuming underlying growth process and the quality of capital stock data to be highly reliable, whereas labour productivity is a more useful to measure economic growth in the short-run,

when there is a doubt about the underlying growth process and capital stock data are unreliable. In general, labour productivity depends upon the three main factors; investment in physical capital, new technology and human capital.

Empirical literature on labour productivity has provided strong evidence on the association between investment in human capital and institutional quality. According to Reinikka and Svensson (2005) and Rogers (2008), failures in educational governance can severely grind down the productivity of the education sector, thereby, reducing the incentives for human capital accumulation (Gupta, Davoodi & Tiongson 2000). This institutional failure can have negative effect on the labour productivity and in turn can have implications for growth outcomes (Acemoglu, Johnson & Robinson 2005). Although not many studies in the past investigated the effect of capital flows on labour productivity, very recently Kneer (2013) investigates the effect of financial liberalisation on labour productivity on a very small sample of 13 countries. The study finds that financial liberalisation decreases labour productivity in the industries, which rely strongly on skilled labour.

Capital flows are diverse in nature and have different stabilising properties. Among all the components of capital flows, FDI is considered to be the most stable form of capital flows that brings along with it technological and managerial expertise. Whereas, non-FDI flows have been considered more susceptible to reversal during crises (ref?). Therefore, the effect of capital flows on growth varies, depending upon the composition of capital flows. For deeper understanding of nexus among growth, capital flows and institutional quality it is important to look at the literature discussing the effect of FDI on economic growth.

The effect of FDI on host country's economic growth comes from the fact, that FDI inflows brings along with it technology and managerial expertise. Transfer of technology brought by FDI can also have permanent effect on TFP (Basu, Chakraborty & Reagle 2003). Majority of

empirical studies look at different factors which can distort the positive effect of FDI on growth. Many of these studies find that the growth benefit of FDI depends upon the cross-country differences in the development of financial markets, institutions and reforms (Bailliu 2000; Carkovic & Levine 2002; Hermes & Lensink 2003; Lee & Chang 2009). For example, Herzer (2012), suggests that the growth effect of FDI depends upon the government intervention, business freedom, FDI volatility and dependence on primary export. Dissimilarity in factor endowment between source and host country, can lead to the differential effect of FDI on growth (Ford, Rork & Elmslie 2008).

Corresponding to our findings from the literature on FDI-per capita output growth nexus, when we look at the literature that examines the effect of FDI flows on TFP, there is a strong presumption that FDI should exert positive effect on TFP through various channels including, spillover of technology and managerial expertise[4]. However, empirical evidence suggests that the positive effect of FDI is not exogenous but conditional on host country's absorptive capacity[5].

Despite the numerous empirical studies on the effect of FDI on per capita GDP and TFP, the literature on the FDI- labour productivity nexus is very limited. FDI is considered to be the most important channel for technology diffusion. According to Elmawazini, Manga and Saadi (2008), conditional convergence between countries is mainly due to the diffusion of technology. Although the literature discussing the direct effect of FDI on labour productivity is almost non-existent, we did find some empirical literature arguing the conditional effect of

[4] For an extensive survey of determinants of TFP, see Isaksson, A 2007.

[5] For example, Kalemli-Ozcan, S & Alfaro, L 2009, suggest the well-developed financial markets, Borensztein, E, De Gregorio, J & Lee, J-W 1998 suggest human capital, Balasubramanyam, VN, Salisu, M & Sapsford, D 1996 suggest policy environment and Aykut, D & Sayek, S 2007 emphasise on the sectoral characteristics.

FDI, depending upon certain initial conditions of the host country. Notably, level of economic development (Vahter 2005) and foreign presence in the industry (Liu et al. 2001) and development of human capital (Xu 2000) plays important roles to create positive effects from FDI on labour productivity.

The above literature suggests that in spite of identifying that the growth effect of capital flows is conditional on institutional quality, not many studies have tried to investigate this relationship empirically after controlling for institutional quality. Likewise, there is not much evidence supporting the hypothesis that the impact of FDI on the above-mentioned three measurements of economic growth may vary depending upon the level of institutional quality. To overcome these limitations in the literature, this paper investigates the role of institutional quality in determining the partial effect of capital flows on these measures of economic growth in a selected sample of Asia and Latin American countries. Our findings will help to explain the ambiguities in the literature of the contributions of capital flows and in improving the overall institutional quality to promote growth effects of capital flows.

2. Data sources and measurement issues:

Our data comprises of 28 EMEs of Latin America and Asia over a period of 1990-2013[6]. Following Bosworth and Collins (2003), we have taken first difference of the natural logarithm of all the dependent variables[7]. One of the main advantages of taking first difference in the natural logarithm is that it reduces the skewness and kurtosis of the distribution of the variable and strengthens the assumption of normal distribution (Benoit 2011).

2.1 Dependent Variables

[6] List of countries is provided in the Appendix.

[7] Taking logs helps in explaining the coefficients in terms of elasticity concept.

GDP per capita: GDP per capita is measured as real GDP in 2005 US$ after adjusted for PPP and divided by population (thousands). Data published by *World Development Indicators* (WDI) is used to measure the natural logarithm of real gross domestic production (GDP) per capita growth rate.

Labour Productivity (LP): Following standard literature, the labour productivity is measured as a ratio of real GDP to the persons employed (thousands) (Mankiw, Romer & Weil 1990)[8]. Data for real GDP in constant 2005 US dollar is taken from WDI, whereas data published by, The Conference Board Total Economy Database™ is used to measure persons employed (thousands).

Total Factor Productivity (TFP): the measure of TFP is based upon the standard growth accounting framework propagated by (Bosworth & Collins 2003). The Cobb-Douglas production function, with Hick's neutral technology[9] is written as:

$$Y_t = A_t.(K_t)^{\alpha}(L_t)^{1-\alpha} \quad (1)$$

Where Y_t is an aggregate output at a given time *t*, A_t is TFP, K_t is the capital stock and L_t is the labour force. Following the standard practice in the literature, the parameter α is assumed to be one-third (Barro 1999).TFP is calculated as a Solow-residual [10]from equation (1) to solve for at:

[8] According to OECD (2001) manual, 'total number of hours worked' is the more recommended measure of labour productivity, because it reflects changes in the average work time per employee, changes in multiple job holdings and also the role of self-employed person . However, Due to lack of availability of data for 'number of hours worked' for most of our sample countries, we have employed the previous measure.

[9] An increase in technological progresses raises the level of output without affecting the marginal productivity of capital and labour.

[10] In our analysis since we are looking at the interaction effect of capital flows on TFP, it measures only technological progress in the economy. In his recent work Jones (2015), has provided various measures of TFP including technical efficiency or misallocation of resources. These various measures can be looked in future research.

$$A_t = Y_t / (K_t^{\alpha}.L_t^{(1-\alpha)}) \quad (2)$$

Taking logs and first difference, we get,

$$\Delta \ln A_t = \left[\Delta \ln Y_t - (\alpha \Delta \ln K_t + (1-\alpha)\Delta \ln L_t)\right] \quad (3)$$

Real GDP in constant 2005 US dollar published by WDI has been used to measure Y_t, and the data on the number of persons employed (in thousands) published by, The Conference Board Total Economy Database™, has been used to measure L_t.

Capital Stock: Capital stock (K_t) is calculated from investment series.. Following Bosworth and Collins (2003), 'Perpetual Inventory Method', has been used for calculating capital stock. The equation is written as:

$$K_t = I_t + (1-\delta)K_{t-1} \quad (4)$$

Where, I_t is the gross investment and δ is the rate of depreciation. Data on 'Gross capital formation' published by WDI has been used to measure gross investment. Based on the estimates found in various literature, value of δ is assumed to be 0.08[11].

The initial capital stock is calculated using the following equation suggested by (Bosworth & Collins 2003):

$$K_0 = I_0 / (I_t + \delta) \quad (5)$$

Where, I_t is the steady growth rate of investment from 1990-2013. Subsequent levels of the capital stock are calculated using equation (4).

[11] According to Bosworth and Collin (2003), the value of gross fixed formation is 0.05 and according to Bloom, Griffith and Van Reenen (2002), the economic depreciation rate for buildings is approximately 3.61% and 12.64% for plant and machinery respectively. Since we are accounting for gross capital formation we have taken the average ratio between the depreciation rate of building, plant and machinery.

2.2 Explanatory Variables

Institutional Quality (IQ): Using various methodologies and datasets, literature suggests a positive relationship between IQ and growth in EMEs (Aron 2000; Gwartney, Holcombe & Lawson 2004; Rodrik 2008). For our analysis we use, the Composite Risk Index Data (**CRID**) published by *International Country Risk Guide index (ICRG)* to measure IQ. The ICRG method uses over 40 metrics affecting Political Risk (**PR**), Financial Risk (**FR**), and Economic Risk (**ER**). The composite risk index is the weighted average of political, financial and economic risks. The highest overall rating (theoretically 100) indicates the lowest risk, and the lowest rating (theoretically zero) indicates the highest risk. The political risk rating contributes 50% of the composite rating, while the financial and economic risk ratings each contribute 25%. The following formula, developed by ICRG is used to calculate the aggregate political, financial and economic risk: ***CRID (country X) = 0.5 (PR + FR + ER).***

Capital flows: Data on capital flows comprises of FDI inflows and outflows, portfolio inflows and outflows and other inflows and outflows measured as a percentage of nominal GDP in millions of US Dollars. We have summed up all the data on capital inflows and outflows to measure the effect of total gross capital flows (TGKF) on growth. Similarly, we have summed up all the components of capital inflows to derive total gross capital inflows (TGKI). Finally, data on FDI inflows and outflows is added up together to derive total gross FDI flows (TFDI). Data for capital flows are collected from IMF, *International Financial statistics* (IFS) CD, 2014.

2.3 Control variables

Control variables are added on to the growth regression to further examine the effect from the other variables on growth besides capital flows and institutional quality. To avoid the problems

associated with the biased coefficients due to omitted variables, control variables are added to the model. Data for all the control variables are from WDI.

Domestic credit provided by banks (FD): The natural logarithm of this variable is used as a proxy for analysing the effect of financial development on growth. We measure financial development as the ratio of domestic credit to private sector provided by banks to nominal GDP[12]. According to conventional wisdom, financial development exerts positive effect on growth and increase in capital flows promote growth through its effect on capital accumulation (Bailliu 2000). However, according to the hypothesis drawn by Minsky (2015), financial deepening may eventually divert financial resources from financing real activities over time into speculative and destabilizing financial investment. Cecchetti and Kharroubi (2015), verified this hypothesis and affirmed that in EMEs financial development is good only up to a point, depending on the level of IQ in the host country, after which it becomes a strain on growth. Similarly, using sectoral data in Asia and Latin America, Aizenman, Jinjarak and Park (2015), asserted that credit boom and bust cycles associated with financial development have disproportionate effect on business activities, indicating a non-linear impact of financial development on growth. Since, there is no common consensus in literature about the effect of financial development on economic growth; we cannot assert the expected sign for financial development.

Trade Openness (TO): The natural logarithm of sum of imports and exports as a ratio of real GDP is used to measure trade openness. Differences in IQ serve as a source of comparative advantage in trade. Therefore EMEs with sound IQ experience greater benefits from trade openness (Levchenko 2007). Export led growth is often considered a prime factor of economic

[12] Literature suggests many other variables like ratio of broad money to GDP, stock market capitalisation, ratio of private credit as a proxy for financial development. Since we are using financial development as a control variable, domestic credit to private sector provided by banks to GDP, is preferred. The economic intuition behind this variable is that it measures the direct impact of banking development on the private sector (Levine,1997).

growth in EMES (Aulakh, Rotate & Teegen 2000; Pontines & Rajan 2011). Hence, TO is expected to exert positive effect on growth. Furthermore, the measure is widely used as a control variable in growth literature (Madsen, Ang & Banerjee 2010).

Population growth: The first difference of the natural logarithm of population is included in the growth regression. According to Banerjee (2012), transition to modern economic growth implies that technological progress outpaces the effect of population growth on productivity growth. Therefore, it is expected that this variable has negative effect on growth regressions.

Expenditure on Research and Development: According to Carlaw and Lipsey (2003), expenditure on research and development involves costly allocation of resources. It is also difficult to predict whether a proposed R & D project is good or bad for the economy, (Griliches 1979). Further, positive effect of expenditure on research and development on economic growth is dependent upon the level of institutional quality. According to Coe, Helpman and Hoffmaister (2009), economies where ease of doing business, level of legal system and quality of tertiary education system is relatively high tend to have a positive effect on economic growth from their own R&D and from international R&D spillover. In absence of high institutional quality, the R&D effect will be insignificant on economic growth.

Inflation: According to growth literature, a reasonably low rate of inflation is conducive to sustained economic growth (Fischer 1993). Surge in capital flows creates inflationary pressure in the economy. In presence of poor management they can also cause economy to overheat (Lopez-Mejia 1999). Thus it is expected that inflation will have negative effect on growth.

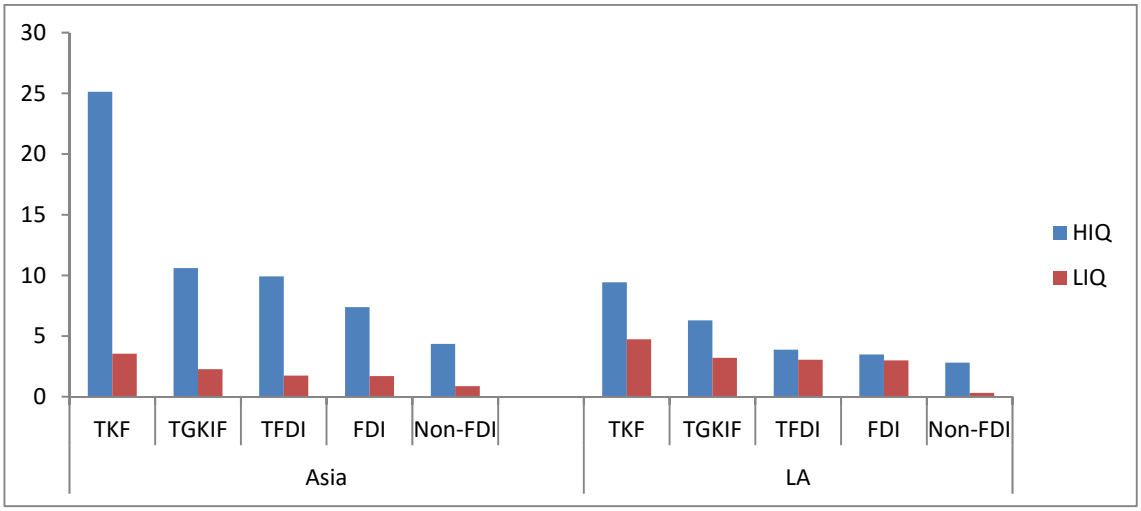
2.4 Growth Anatomy of Emerging Economies of Latin America and Asia:

In this section, we present growth accounting results to explain the nexus among the level of institutional quality, per capita GDP and TFP for all the sample countries. Following Kose,

Prasad and Terrones (2009), we have divided the full sample based upon the regions: Asia and Latin America. Further we present each regional sample into - lower institutional quality group (LIQ) and higher institutional quality group (HIQ). The group of LIQ economies includes those with below median-levels of institutional quality and HIQ economies are those with above the median level of institutional quality. The cross-sectional median of institutional quality is based on the average level of institutional quality for each country over the full sample period.

Figure 1 presents the average amount of capital flows received by Asia and Latin America across the groups of HIQ and LIQ. Among both the regions, total capital flows to Asia surpassed those to Latin America by more than double. On an average in both the regions, economies with HIQ received more capital flows in the form of FDI as compared to the economies with LIQ.

Figure5.1: Capital flows in Asis and Latin America with high and low IQ.



Following equation (3), we employ the standard growth accounting exercise for each region in our sample over the period of 1990-2013. Table 1 presents the contribution of TFP to growth rate in Asia and Latin America. For ease of understanding, we have divided the whole sample into three time periods. In the decade 1990-1999, most of the emerging economies liberalised

their capital account, followed by a surge in capital flows. During this period Asia experienced Asian crisis in 1997 and Latin America experienced Mexican crisis in 1994 and Brazilian crisis in 1999. One of the notable highlights of this period is the contribution of TFP to growth rate. In Asia growth in TFP contributed approximately 2% to the growth in output, which was less than the contribution of physical capital[13]. Whereas, in Latin America contribution of TFP was minuscule and growth rate declined by 0.36%. In the period 2000-2008, pre global financial crisis period, Asia experienced increase in growth, when contributions from all factors are found to be higher than the 1990s. However, contribution from TFP was highest among the three factors. In contrast, Latin America experienced downturn in growth during this period, with lower contributions from physical capital and TFP. Finally, in 2009-2013, post global financial crisis period, both the regions experienced an increase in growth, with higher contributions from TFP. We have also presented the results for the entire period, 1990-2013. It can be concluded from the results that share of TFP was one of the main contributor of growth in Asia, whereas in Latin America share of TFP was much less prominent than the share of labour and capital. It is also evident from table 5.1 that contribution of TFP as compared to other inputs is largest when growth in output is high. Conversely, when growth in output slows down the contribution of TFP also gets smaller than other inputs. This clearly indicates that TFP is the major source of high growth phase.

Table5.1. Growth Accounting for Asia and Latin America, 1990-2013

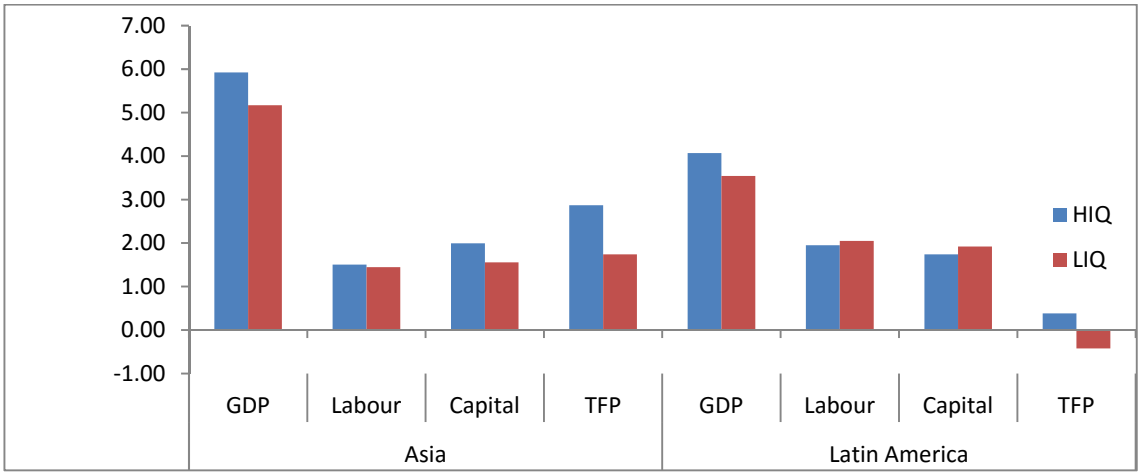
	Asia				Latin America			
Year	Growth in Output	Growth in Labour	Growth in Physical Capital	Growth in TFP	Growth in Output	Growth in Labour	Growth in Physical Capital	Growth in TFP
1990-2013	5.54	1.50	1.82	2.22	4.01	1.98	1.79	0.24
1990-1999	5.42	1.34	2.09	1.99	4.01	2.07	2.30	-0.36

[13] As mentioned by Jones (2014), higher growth in Asia can be attributed to the fact that after the crisis, Asian economies decreased their foreign borrowing and increased their savings, producing a global saving glut.

2000-2008	5.82	1.58	1.55	2.69	3.82	2.07	1.32	0.43
2009-2013	5.32	1.63	1.76	1.93	4.23	1.72	1.64	0.87

To investigate further whether the differences in the contribution of TFP to growth across regions can be attributed to the difference in institutional quality, we divided the regions across the groups of HIQ and LIQ. Figure 2 presents the growth contribution of labour, capital and TFP across regions and also across the groups of HIQ and LIQ. In Asia, growth contribution of TFP was larger than the relevant share of labour and capital in HIQ economies. Whereas, the share of capital as compared to TFP was higher in the economies with LIQ. Conversely, in Latin America labour was the highest contributor of growth in both HIQ and LIQ followed by capital and then TFP. Further, in Latin America, contribution of TFP to growth was negative in economies with LIQ.

Figure 5.2: Growth Accounting in Asia and Latin America for HIQ and LIQ



The growth anatomy of Latin America and Asia suggests that economies with higher institutional quality demonstrate higher contributions from TFP to output growth and subsequently these economies achieve higher aggregate growth. Moreover, Asia demonstrates higher growth in output and TFP as compared to Latin America. Although, in this section we

have established a direct link between aggregate output growth and TFP in a growth accounting framework, in our next section we perform more formal regression analysis to empirically investigate the relationship between capital flows, institutional quality and growth.

3. Empirical Methodology and Results

3.1 Model:

We begin the analysis based on the cross-country growth regression framework developed in Barro (1989) and further extended by King and Levine (1993) to study the threshold effect of capital flows and institutional quality on growth. Since, the cross-country growth regression framework is based on two unrealistic assumptions about the country specific effects and the endogeniety of the explanatory variables, OLS estimator creates not only the issues of measurement errors in the right hand side variables but also gives rise to inconsistent and biased parameters (Siemsen, Roth & Oliveira 2010). To overcome these issues, dynamic panel growth methods for estimating growth regressions have proven to be more efficient. The model adopted here is of the following form:

$$\Delta Y_{i,t} = \alpha_0 + \alpha_1 Y_{i,t-1} + \alpha_2 X_{i,t} + \alpha_3 IQ + \alpha_4 (X_{i,t} * IQ)_{i,t} + \alpha_5 Z_{i,t} + \mu_i + \nu_{i,t} \quad (6)$$

Where $\Delta Y_{i,t}$ is the vector of the logarithm of 3 variables (GDP per capita, labour productivity and total factor productivity). $Y_{i,t-1}$ is the initial level of $Y_{i,t}$ for each country in a given period. $X_{i,t}$ is the vector of 4 variables (Total gross capital flows (TGKF), total gross capital inflows (TGKI), total FDI (TFDI) and FDI inflows (FDI)). IQ is the vector for institutional quality that could enhance (if $\alpha_2 > 0$) or mitigate (if $\alpha_2 < 0$) the effect of $X_{i,t}$ on $Y_{i,t}$. $Z_{i,t}$ is the vector of other determinants of growth (trade openness, inflation, population growth, domestic credit to

private sector provided by banks, and expenditure on R&D). μ_i is country –specific effects and $\nu_{i,t}$ is idiosyncratic error term.

The two parameters of particular interest in the above model are α_2 and α_4, and the main instrument of analysis in this study is the derivative, which captures the interaction effect of the two:

$$\frac{\partial \ln(Y)_{i,t}}{\partial X_{i,t}} = \alpha_2 + \alpha_4 * IQ \qquad (7)$$

Equation (2), for example measures the effect of FDI ($X_{i,t}$) on growth ($Y_{i,t}$) for different values of institutional quality (IQ) of the sample countries over a given period of time, holding other variables constant. Therefore, holding all other variables in the model constant, growth is expected to change by $\{(e^{\alpha_2+\alpha_4*IQ})-1\}*100\% \approx (\alpha_2+\alpha_4*IQ)*100\%$ when α_2 changes by one percent point of $Y_{i,t}$. If both α_2 and α_4 are positive (or negative), then the α_2 has positive (or negative) effect on $Y_{i,t}$. However, if $\alpha_2 < 0$ while $\alpha_4 > 0$, this means α_2 has an adverse effect on $Y_{i,t}$, although this effect is mitigated by the certain level of institutional quality. In this case we can determine a threshold level of the institutional quality above which increased level of α_2 can have positive effect on $Y_{i,t}$. Alternatively, if $\alpha_2 > 0$ while $\alpha_4 < 0$, this means that α_2 has positive effect on the $Y_{i,t}$, however, the marginal effect of α_2 on $Y_{i,t}$ decreases with the increase in institutional quality and becomes negative after a certain threshold level. This implies, that good institutional quality beyond a threshold level mitigates the positive effect of capital flows on growth.

The model in equation (6) also undergoes the problem of autocorrelation. Presence of lagged-dependent variable in the explanatory variables gives rise to autocorrelation; this means the

country specific effects may be correlated with the explanatory variables, which may not be strictly exogenous. To overcome this problem, it is important to incorporate an instrument variable - variable that in principle influences the explanatory variable but not the dependent variable. Unfortunately, finding an appropriate instrument at the country level is difficult. The first-differenced Generalized Method of Moments (GMM) estimation techniques proposed by Arellano and Bover (1995) and further developed by Blundell and Bond (2000) is employed here to overcomes these issues. The model in equation (1) can be written as:

$$Y_{i,t} = \tilde{\alpha} Y_{i,t-1} + X'_{i,t}\beta + \mu_i + \nu_{i,t'} \qquad i = 1,\ldots. \text{N};\ t = 2,\ldots.\text{T} \tag{8}$$

Where $\tilde{\alpha} = \alpha + 1$, with all the standard assumptions, that is μ_i and $\nu_{i,t'}$ are independently distributed, $\text{E}(\mu_i) = \text{E}(\nu_{i,t'}) = \text{E}(\mu_i\ \nu_{i,t'}) = 0\ \ \forall i - 1,....,N; t + 2,....,T$ and the transit errors are uncorrelated, i.e. $E(\mu_i \nu_{i,t}) = 0 \forall i, \& s \neq t$. With this specification and our structure of panel (raised N and short T), Arellano and Bover (1995) and Blundell and Bond (2000) suggest the system GMM, which allows the parameters to be consistently estimated by taking the first difference of the equation to be estimated. The purpose is to eliminate country-specific effects and then use the values in a lagged level with one period at most from the explanatory variable as instruments of these variables at the level of the equation in first difference. Blundell and Bond (2000), further suggest that estimating a system of equation in levels, with lagged differences of the endogenous variables as instruments in a very persistent series makes the instruments good predictors for the endogenous variable. In context of growth regressions, this means assuming that the deviation of initial observation from their steady states must be uncorrelated with the country specific fixed-effects. Because of the finite sample bias which may lead to weak instruments, good performance of the system GMM estimator has made it the preferred estimator in many applied panel data analysis (Bun & Windmeijer 2010).

For the GMM to be a consistent estimator, it needs to exhibit the validity of the assumptions that there is no indication of serial correlation in the error terms and also the validity of instruments. To address these issues, following Arellano and Bond (1991) , Arellano and Bover (1995) and Blundell and Bond (2000), two specification tests are performed. The first is Sargen test of over-identifying restrictions, which tests the overall validity of the instruments by analysing the sample analog of the moment conditions used in the estimation process. The second is autocorrelation test, AR (2), for examining the hypothesis that whether differenced error terms are second-order serially correlated. Failure to reject the null hypothesis of both tests will provide support to our benchmark model. All models are estimated using fixed-effect panel regression and two-step system GMM estimator. The instrumental variables employed in our study are lagged values of indicators and time dummies that capture common productivity progress across countries over time.

3.2 Estimation Results and Discussion

In this section, we discuss the empirical results of the effects of institutional quality (IQ) and capital flows (CF) on growth for the whole sample and then for each region to address the regional differences between Latin America and Asia. The empirical results presented below are in the following order: first, the effects of IQ and CF on per capita GDP growth; second, the effects of IQ and CF on labour productivity growth; and finally, the effects of IQ and CF on TFP growth.

3.2.1 Effects of Institutional quality and capital flows-on GDP per capita growth

We start by running the fixed-effect panel regression model using annual data for the whole sample. Table 5.2 reports the empirical results, analysing the effect of institutional quality on

the relationship between capital flows and GDP per capita growth. The dependent variable is the change in the log of GDP per capita (GDP) and the main explanatory variables are total gross capital flow (TGKF), total gross capital inflow (TGKI), FDI inflow (FDI), Total FDI (TFDI), institutional quality (IQ) and the interaction term. Each capital flow variable is considered in separate specifications to avoid multicollinearity. In all four specifications reported in table 5.2, control variables i.e. domestic credit provided by banks, trade openness, and population growth appear highly significant and shows the correct sign, as expected following the standard literature. Expenditure on R&D is negative though not significant. Inflation is significant at 10% level and only in the specification measuring total gross capital inflows.

Among our main variables of interest, IQ has positive and significant effect in all the specifications. Although the variables reporting TGKF, TGKI, FDI and TFDI, have negative effect on GDP per capita growth, the interaction effect indicates that the effect of these variables on GDP per capita growth becomes positive with the increase in institutional quality. In other words, gross capital flows exert a positive effect on GDP per capita growth, only when IQ is above a certain threshold level[14]. Since equation (6) cannot be estimated consistently with this model due to problem of endogeniety among capital flows, institutional quality and growth; we may be capturing reverse causality.

Table 5.2: Capital flows, Interactions and GDP Growth: Fixed-effect using annual data (Full Sample)

Dependent variable – GDP per capita (GDP) growth in log

	Fixed - Effects			
	1	**2**	**3**	**4**
	TGKF	**TGKI**	**FDI**	**TFDI**
L1. GDPPC	**-0.060**	**-0.072**	**-0.043**	**-0.019**
	(0.060)	**(0.058)**	**(0.060)**	**(0.061)**
Initial GDP (in logs)[15]				

[14] Threshold values in percentile are shown in table 5.2

[15] In Fixed-effect model initial GDP is omitted because of collinearity.

Domestic credit provided by banks (Log)	**-0.041*** (0.008)**	**-0.041*** (0.007)**	**-0.042*** (0.008)**	**-0.042*** (0.008)**
Trade openness (Log)	**0.041*** (0.009)**	**0.039*** (0.009)**	**0.045*** (0.010)**	**0.044*** (0.010)**
Population Growth (Log)	**-0.014*** (0.004)**	**-0.013*** (0.004)**	**-0.012*** (0.004)**	**-0.013*** (0.004)**
Expenditure on R&D (Log)	**-0.025 (0.010)**	**-0.024 (0.010)**	**-0.026 (0.010)**	**-0.026 (0.010**
Inflation	**0.001 (0.000)**	**0.001* (0.000)**	**0.001 (0.000)**	**0.001 (0.000)**
Institutional Quality (IQ)	**0.002*** (0.001)**	**0.002*** (0.001)**	**0.002*** (0.001)**	**0.002*** (0.001)**
Total Gross Capital Flows (TGKF)	**-0.561 (0.004)**			
Interaction 1(TGKF*IQ)	**0.009*** (0.006)**			
Total Gross Capital Inflows (TGKI)		**-0.5643*** (0.008)**		
Interaction 2(TGKI*IQ)		**0.009*** (0.004)**		
Gross FDI Inflows (FDI)			**-0.410* (0.305)**	
Interaction 3(FDI*IQ)			**0.006 (0.401)**	
Total FDI flows (TFDI)				**-0.140* (0.104)**
Interaction 4 (TFDI*IQ)				**0.002 (0.042)**
R squared	**0.521**	**0.548**	**0.514**	**0.352**
Countries	**28**	**28**	**28**	**28**
Observations	**280**	**280**	**280**	**280**
Approx. Threshold level of IQ (percentile)	**30**	**30**	**52**	**63**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

It has been widely accepted in the growth literature that there reverse causality exist between good institutional quality and economic growth (Hall & Jones 1999; Acemoglu, Johnson & Robinson 2001; Easterly & Levine 2003). Rodrik, Subramanian and Trebbi (2004) concluded, as compared to other determinants of growth, quality of institutions is the only positive and significant determinant of income levels, claiming that "Institutions Rule"[16]. Conversely, slowdown in economic activities can also cause deterioration in institutional quality. Similarly, level of economic growth can also alter the capital flows to and from a country. According to

[16] Among all the other factors, the quality of institutions has the greatest direct positive effect on GDP.

Prasad, Rajan and Subramanian (2007), economies with high income attract more capital flows, conversely surge in capital flows improves economic growth.

Similarly, the problem of reverse causality also exists in estimating capital flows – labour productivity relationship and capital flows – total factor productivity relationship. According to Jin (2012) economies that concentrate in producing labour-intensive goods, can dissuade capital flows. Correspondingly, According to Prasad, Rajan and Subramanian (2007), de jure capital account openness have positive effect in total factor productivity growth. Conversely, Gourinchas and Jeanne (2006), finds that among the developing countries, net capital flows[17] have negative correlation with the productivity growth. Equally, Prasad, Rajan and Subramanian (2007), find that net private capital flows, especially FDI from developing to industrial countries increases with the productivity growth.

Problem of reverse causation in variables of interest can be solved by using appropriate instrumental variable. However, due to lack of proper instruments for both capital flows and institutional quality that varies across countries and over time, we use lag of the explanatory variables as instruments to control for endogeniety. Since this is a weak form of instrumenting, two-stage least squares (2SLS) would also lead to biased estimation same as OLS (Mileva 2007).

As noted earlier, system GMM, which is admittedly a mechanical approach to deal with endogeniety, is considered as an econometrically sound estimator and has been used widely in variety of context[18]. However, when we performed the regressions using annual data on system GMM estimator, Hansen test generated implausibly good *p*-values of 1.000[19]. According to Andersen and Sørensen (1996) and Bowsher (2002), getting perfect *p*-values of 1.000 indicates

[17] Net capital flows have been measured as the negative of current account balances.
[18] Bond, Hoeffler and Temple (2001), have emphasized on the numerous advantages of this method in empirical growth studies.
[19] Due to poor Hansen test, we are not reporting the results of GMM estimator using annual data. However, these results are available if needed.

that our Hansen test is weak and does not approve the validity of our instruments. Justification for such weak results have been provided by (Roodman 2006). According to him, in a finite sample, the number of elements in the estimated variance matrix of the moments is quadratic in the instrument count and it is *quartic* in *T*. Further, Roodman (2006) states, that a large collection of instruments can overfit endogenous variables and overstate the distance of Feasible Efficient GMM from the asymptotic perfection. Since our panel consists of 28 countries over 24 years, our instrument count becomes very large and we may lack adequate information to estimate such a large matrix accurately. To overcome this problem, Roodman (2009) suggests to choose a sample with large N and small T. Following Roodman, we averaged our data to non-overlapping 4-year period to reduce T and remove the sample bias. In doing so, we also mitigate the effect of short-run fluctuations in the business cycle[20].

Along with fixed-effects, we now use system GMM to estimate equation (6). Table 5.3 show the results from a series of dynamic panel estimations of growth, including the interaction term with institutional quality. To be consistent with Table 5.2, first we present the fixed effects panel results in the first panel of Table 5.3 with a 4-year non overlapping data. Subsequently, the GMM estimation results are present in panel 2 of Table 5.3. As before, the coefficients on the interaction effect of TGKF and TGKI are positive and significant. The coefficients on the interaction effect of FDI and TFDI are positive, but not significant.

Table 5.3: Capital flows, Interactions and GDP Growth: Dynamic Panel Regression using 4yr Average (Full Sample)
Dependent variable – GDP per capita (GDP) growth in log

	Fixed - Effects				System GMM			
	1	2	3	4	1	2	3	4
	TGKF	TGKI	FDI	TFDI	TGKF	TGKI	FDI	TFDI
L1. GDPPC	-0.049 (0.056)	-0.072 (0.056)	-0.072 (0.056)	-0.041 (0.057)	0.069 (0.045)	0.025 (0.044)	0.086 (0.052)	0.091* (0.054)
Initial GDP (in logs)[21]					-0.012*** (0.003)	-0.012*** (0.003)	-0.012*** (0.004)	-0.012*** (0.003)

[20] Commonly, literature suggests non-overlapping 5, 7 and 10 years average to capture business cycle fluctuations. Since our data comprises only 24 years, 4-year average entails 6 non-overlapping periods for all the sample countries

[21] In Fixed-effect model initial GDP is omitted because of collinearity.

Domestic credit provided by banks (Log)	**-0.033 (0.008)**	**-0.033*** (0.008)**	**-0.038*** (0.008)**	**-0.037*** (0.009)**	**-0.003 (0.005)**	**-0.007 (0.006)**	**-0.010 (0.007)**	**-0.004 (0.006)**
Trade openness (Log)	**0.012** (0.012)**	**0.012** (0.005)**	**0.014*** (0.005)**	**0.012 (0.005)**	**0.004 (0.004)**	**0.006 (0.004)**	**0.008* (0.004)**	**0.006 (0.004)**
Population Growth (Log)	**-0.011 (0.012)**	**-0.009 (0.012)**	**-0.017 (0.012)**	**-0.016 (0.013)**	**-0.014* (0.008)**	**-0.016* (0.008)**	**-0.012 (0.010)**	**-0.011 (0.009)**
Expenditure on R&D (Log)	**-0.007 (0.007)**	**-0.008 (0.007)**	**-0.010 (0.007)**	**-0.009 (0.007)**	**0.005 (0.004)**	**0.005 (0.004)**	**0.003 (0.004)**	**0.004 (0.004)**
Inflation	**0.000 (0.000)**	**0.000 (0.000)**	**0.000 ((0.000)**	**0.000 (0.000)**	**0.000 (0.000)**	**0.000 (0.000)**	**0.000 (0.001)**	**0.000 (0.006)**
Institutional Quality (IQ)	**0.002*** (0.001)**	**0.002*** (0.001)**	**0.002*** (0.001)**	**0.002*** (0.001)**	**0.001* (0.001)**	**0.001* (0.001)**	**0.001* (0.001)**	**0.001 (0.001)**
Total Gross Capital Flows (TGKF)	**-0.258*** (0.056)**				**-0.320*** (1.151)**			
Interaction 1(TGKF*IQ)	**0.002** (0.011)**				**0.005*** (0.014)**			
Total Gross Capital Inflows (TGKI)		**-0.584*** (1.560)**				**-0.554*** (1.139)**		
Interaction 2(TGKI*IQ)		**0.006*** (0.019)**				**0.009*** (0.026)**		
Gross FDI Inflows (FDI)			**-0.938* (0.403)**				**-0.906** (0.488)**	
Interaction 3(FDI*IQ)			**0.005 (0.069)**				**0.105** (0.063)**	
Total FDI flows (TFDI)				**-0.721* (0.482)**				**-0.624** (0.361)**
Interaction 4 (TFDI*IQ)				**0.073 (0.045)**				**0.009** (0.004)**
R squared	**0.364**	**0.392**	**0.373**	**0.352**				
Countries	**28**	**28**	**28**	**28**	**28**	**28**	**28**	**28**
Observations	**109**	**109**	**109**	**109**	**109**	**109**	**109**	**109**
AR(2) test					**0.571**	**0.582**	**0.420**	**0.399**
Hansen test of over identification					**0.321**	**0.456**	**0.416**	**0.312**
Approx. Threshold level of IQ (percentile)					**34**	**27**	**24**	**38**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

The results in the second panel of Table 5.3 are derived by using Bundell-Bond system GMM estimator. In all the four specifications reported in panel 2 of Table 5.3, control variables i.e. GDP at the initial level appeared significant at 1%, whereas, population growth appeared negatively significant at 10% only in specification measuring TGKF and TGKI and trade openness was significant at 10% only in the specification measuring FDI.

Now we turn our analysis to our main variables of interest. IQ has significantly positive effect on GDP in all the four specifications. In column (1) of panel 2, effect of TGKF is significantly negative and its interaction term has significantly positive effect on GDP. The partial effect of TGKF on GDP is given by $\alpha_2 + \alpha_4 * IQ$. Based on the results presented in column (1), the partial effect of TGKF on GDP increases with the institutional quality and the threshold level of institutional quality to turn negative effect into positive is 34th percentile in our sample. Similarly, in columns (2), (3) and (4), TGKI, FDI and TFDI has significantly negative effect and their interaction terms have significantly positive effect on GDP. Partial effect of TGKI on GDP becomes positive at the threshold level of 27th percentile in our sample, whereas, the partial effect of FDI on GDP becomes positive at the threshold level of 24th percentile and for TFDI the threshold level is 38th percentile.

According to results discussed above, our main finding suggests that the partial effect of capital flows on GDP per capita depends upon the level of institutional quality. In other words, economies with higher institutional quality will experience higher GDP per capita growth from capital account–openness. This is consistent with our earlier findings from growth accounting exercise. One of the interesting finding is that the threshold level of institutional quality matters for both inflows as well as outflows. Also, it is lower for both total gross inflows and FDI inflows as compared to total gross flows and total FDI flows.

3.2.2 Effects of Institutional quality and capital flow on Labour productivity growth.

Following the methodology adopted for estimating capital flows –growth relationship, this section outlines the results analysing the effect of institutional quality on the relationship between capital flows and labour productivity. Table 5.4 reports the results of equation (1) using fixed-effect panel regression model for the whole sample. In all the specifications IQ has significantly positive effect on labour productivity. This implies that an increase in 1% of IQ improves labour productivity by 2.1% in the specification of TGKF, 1.8% in TGKI, 1.2% in FDI and 1.9% in total FDI. Conversely, expenditure on R&D has negative effect on the labour productivity. Although this result is striking, it can be partially attributed to the fact that EMEs, has large productivity gaps between different sectors of the economy. When the share of employment in industrial sector shrinks due to structural change, then the dispatched labour ends up in activities with lower productivity (Mallick 2015). In column (1) (2), (3) and (4) TGKF, TGKI, FDI and TFDI have significantly positive effect on labour productivity. This result is at par with the finding of (McMillan & Rodrik 2011). According to this study, globalisation exposes domestic firms to foreign competition, leaving them with no choice but to either become more productive or shut down. However, their interaction terms have negative effect. This finding implies that the positive effect of total capital flows and total inflows on labour productivity reduces at a very high level of institutional quality. This finding can be mainly due to the adoption of strict employment protection legislation by the EMEs with strong IQ. According to Scarpetta and et al. (2002); Bassanini and Ernst (2002) and Brandt (2005) when IQ is very strong, it implies strict regulatory setting, wherein hiring and firing cost of labour becomes very high. If the wages does not offset these high cost then adjustment to new technology and incentive to innovate is sub-optimal, thereby weakening labour productivity performance. They further state that if the technology gap is significant between foreign and domestic firms, adoption of existing technology is discouraged to reduce

competitive pressures and to restrict entry of new high-tech firms. This in turn also creates negative impact on labour productivity.

However, as noted in the previous section, there is an issue of reverse causality between capital flows and labour productivity relationship. To address the issue of endogeniety, along with fixed-effects, we now use system GMM to estimate equation (1) by averaging data to 4 year non-overlapping periods.

Table 5.4: Capital flows, Interactions and LP growth: Fixed-effect using annual data (Full Sample)

Dependent variable – Labour Productivity (LP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. LP	0.059 (0.065)	0.054 (0.065)	0.058 (0.066)	0.064 (0.066)
Initial LP (in logs)[22]				
Domestic credit provided by banks (Log)	-0.005 (0.004)	-0.008 (0.003)	-0.007 (0.002)	-0.006 (0.006)
Trade openness (Log)	0.006 (0.007)	0.010 (0.008)	0.009 (0.006)	0.012 (0.010)
Population Growth (Log)	0.003 (0.003)	0.004 (0.002)	0.008 (0.006)	0.010 (0.001)
Expenditure on R&D (Log)	-0.011 (0.008)	-0.024 (0.016)	-0.015 (0.007)	-0.010 (0.005)
Inflation	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.000)
Institutional Quality (IQ)	0.021*** (0.001)	0.018*** (0.010)	0.012*** (0.008)	0.0019** (0.005)
Total Gross Capital Flows (TGKF)	1.097** (0.764)			
Interaction 1(TGKF*IQ)	-0.013** (0.006)			
Total Gross Capital Inflows (TGKI)		0.175** (0.133)		
Interaction 2(TGKI*IQ)		-0.002** (0.001)		
Gross FDI Inflows (FDI)			0.177 (0.180)	
Interaction 3(FDI*IQ)			-0.001 (0.035)	
Total FDI flows (TFDI)				0.161 (0.147)
Interaction 4 (TFDI*IQ)				-0.002 (0.022)
R squared	0.276	0.277	0.255	0.235
Countries	28	28	28	28
Observations	274	273	274	274
Approx. Threshold level of IQ (percentile)	96	95	98	92

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[22] In Fixed-effect model initial LP is omitted because of collinearity.

Table 5.5: Capital flows, Interactions and LP Growth: Panel Regression (Full Sample)

Dependent variable – Labour productivity (LP) growth in log

	Fixed - Effects				System GMM			
	TGKF	TGKI	FDI	TFDI	TGKF	TGKI	FDI	TFDI
L1. LP	0.002 (0.003)	0.016 (0.010)	0.010 (0.008)	0.009 (0.006)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
Initial GDP (in logs)[23]					-0.026*** (0.003)	-0.014*** (0.002)	-0.013*** (0.001)	-0.020*** (0.008)
Domestic credit provided by banks (Log)	-0.010 (0.009)	-0.011 (0.009)	-0.012 (0.009)	-0.013 (0.009)	0.001 (0.002)	0.010 (0.009)	0.006 (0.006)	0.008 (0.006)
Trade openness (Log)	0.008 (0.005)	0.009* (0.005)	0.011** (0.005)	0.011** (0.005)	0.003 (0.003)	0.004 (0.003)	0.009** (0.004)	0.007* (0.004)
Population Growth (Log)	0.025* (0.013)	0.025* (0.013)	0.030** (0.014)	0.030** (0.014)	-0.007 (0.010)	-0.009 (0.012)	-0.005 (0.0)	-0.003 (0.012)
Expenditure on R&D (Log)	-0.004 (0.008)	-0.004 (0.008)	-0.005 (0.008)	-0.005 (0.008)	0.006 (0.004)	0.006 (0.004)	0.002 (0.005)	0.004 (0.004)
Inflation	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.000)	0.001 (0.000)	0.000 (0.001)
Institutional Quality (IQ)	0.024** (0.001)	0.022** (0.001)	0.018** (0.001)	0.021** (0.001)	0.036 (0.020)	0.021 (0.019)	0.018 (0.013)	0.022 (0.017)
Total Gross Capital Flows (TGKF)	0.249** (1.047)				0.422*** (0.273)			
Interaction 1(TGKF*IQ)	-0.002** (0.013)				-0.004*** (0.000)			
Total Gross Capital Inflows (TGKI)		0.200** (0.002)				0.646*** (1.191)		
Interaction 2(TGKI*IQ)		-0.004** (0.021)				-0.074*** (0.014)		
Gross FDI Inflows (FDI)			-0.101 (0.006)				0.113 (0.372)	
Interaction 3(FDI*IQ)			0.002 (0.077)				-0.013 (0.064)	
Total FDI flows (TFDI)				0.120 (0.004)				0.653 (0.508)
Interaction 4 (TFDI*IQ)				-0.020 (0.050)				-0.007 (0.042)
R squared	0.217	0.210	0.197	0.193				
Countries	28	28	28	28	28	28	28	28
Observations	106	105	105	105	106	105	106	106
AR(2) test					0.167	0.183	0.132	0.133
Hansen test of over identification					0.514	0.431	0.542	0.232
Approx. Threshold level of IQ (percentile)					97	97	95	95

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies

[23] In Fixed-effect model initial LP is omitted because of collinearity.

In table 5.5 we report the results from a series of dynamic panel estimations of labour productivity, including the interaction term with institutional quality. The first panel presents results from the fixed-effects panel regressions. The coefficient on the interaction term in all the specifications is negative, although they are significant only for TGKF and TGKI, implying that the positive effect of total gross capital flows and total gross capital inflows reduces at a very high level of institutional quality. These findings are robust and similar to the OLS fixed effect estimation results presented above.

The results presented in the second panel of table 5.5 shows that interaction term in all the specifications are significantly negative even when we control for endogeniety using a version of the Bundell-Bond system GMM estimator. The coefficient estimates of interaction effect implies that the institutional quality after crossing the threshold level of 95 percentile reduces the positive effect of capital flows on labour productivity in EMEs. According to Brandt (2005), overly strict regulations that practice complicated license and permit system can discourage new firms in entering the market. Therefore, economies with

These results are different than that of GDP per capita growth. To have any positive effect of capital flows on labour productivity growth, institutional quality has to be below a threshold level of 95 percentile, otherwise the diminishing returns sets in. Conversely, in case of GDP per capita growth, institutional quality needs to be above a certain threshold level to experience positive effect of capital flows.

3.2.3 Effects of Institutional quality and capital flow on total factor productivity growth.

Similar to the methodology adopted for estimating capital flows –growth and labour productivity relationship, this section outlines the results of regressions analysing the effect of institutional quality on the relationship between capital flows and total factor productivity. Table 5.6 reports the results of equation (1) using fixed-effect panel regression model for the

whole sample. In column (2) and (3) effect of TGKI and FDI on TFP is significantly positive, though their interaction terms are negative. Conversely, in column (1) and (4) the effect of TGKF and TFDI on TFP is positive, though their interaction effect is negative and also insignificant. Similar to the labour productivity growth regression results, these results indicate that the positive effect of total gross capital inflows on total factor productivity decreases when the institutional quality has reached a very high level.

Along with fixed-effects, we now use system GMM to estimate equation (1) by averaging data to 4 year non-overlapping period.

Table 5.6: Capital flows, Interactions and TFP growth: Fixed-effect using annual data (Full Sample)

Dependent variable – Total Factor productivity (TFP) growth in log

	Fixed - Effects			
	1	**2**	**2**	**4**
	TGKF	**TGKI**	**FDI**	**TFDI**
L1. TFP	**0.041**	**0.037**	**0.034**	**0.044**
	(0.062)	**(0.062)**	**(0.064)**	**(0.064)**

Initial TFP (in logs)[24]				
Domestic credit provided by banks (Log)	**-0.004** **(0.012)**	**-0.014** **(0.009)**	**-0.024** **(0.021)**	**-0.018** **(0.014)**
Trade openness (Log)	**0.029**** **(0.009)**	**0.036***** **(0.006)**	**0.024*** **(0.018)**	**0.019*** **(0.010)**
Population Growth (Log)	**0.046**** **(0.012)**	**0.036**** **(0.016)**	**0.052**** **(0.029)**	**0.043**** **(0.019)**
Expenditure on R&D (Log)	**-0.008** **(0.025)**	**-0.014** **(0.016)**	**-0.010** **(0.013)**	**-0.015** **(0.016)**
Inflation	**0.000** **(0.000)**	**0.000** **(0.000)**	**0.000** **(0.000)**	**0.001** **(0.000)**
Institutional Quality (IQ)	**0.001***** **(0.000)**	**0.001***** **(0.000)**	**0.001**** **(0.000)**	**0.001**** **(0.000)**
Total Gross Capital Flows (TGKF)	**-0.566** **(0.494)**			
Interaction 1(TGKF*IQ)	**0.007** **(0.004)**			
Total Gross Capital Inflows (TGKI)		**0.079**** **(0.051)**		
Interaction 2(TGKI*IQ)		**-0.001** **(0.000)**		
Gross FDI Inflows (FDI)			**0.239**** **(0.113)**	
Interaction 3(FDI*IQ)			**-0.003** **(0.002)**	
Total FDI flows (TFDI)				**-0.166** **(0.102)**
Interaction 4 (TFDI*IQ)				**0.002** **(0.020)**
R squared	**0.256**	**0.264**	**0.235**	**0.235**
Countries	**28**	**28**	**28**	**28**
Observations	**274**	**273**	**274**	**274**
Approx. Threshold level of IQ (percentile)		**91**	**95**	

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies

[24] In Fixed-effect model initial TFP is omitted because of collinearity.

Table 5.7: Capital flows, Interactions and TFP Growth: Panel Regression (Full Sample)

Dependent variable – Total factor productivity (TFP) growth in log

	Fixed - Effects				System GMM			
	1	2	3	4	1	2	3	4
	TGKF	TGKI	FDI	TFDI	TGKF	TGKI	FDI	TFDI
L1.TFP	-0.214*** (0.081)	-0.213*** (0.081)	-0.217*** (0.081)	-0.216*** (0.082)	-0.204*** (0.019)	-0.256*** (0.017)	-0.149*** (0.021)	-0.160*** (0.021)
Initial TFP (in logs)[25]					-0.094 (0.071)	-0.129 (0.87)	-0.072 (0.058)	-0.083 (0.063)
Domestic credit provided by banks (Log)	0.053 (0.253)	0.043 (0.252)	0.043 (0.255)	0.048 (0.256)	0.050 (0.064)	-0.008 (0.047)	0.027 (0.050)	0.014 (0.055)
Trade openness (Log)	-0.073 (0.144)	-0.057 (0.143)	-0.077 (0.142)	-0.081 (0.145)	-0.001 (0.055)	-0.025 (0.049)	0.046 (0.050)	0.053 (0.054)
Population Growth (Log)	0.258 (0.371)	0.288 (0.370)	0.248 (0.368)	0.251 (0.371)	0.341 (0.348)	0.240 (0.277)	0.300 (0.319)	0.319 (0.329)
Expenditure on R&D (Log)	0.075 (0.217)	0.074 (0.216)	-0.084 (0.217)	-0.078 (0.219)	0.174 (0.122)	0.198 (0.132)	0.144 (0.104)	0.139 (0.091)
Inflation	0.001 (0.011)	0.001 (0.011)	0.001 (0.011)	0.001 (0.012)	0.014 (0.009)	0.007 (0.008)	0.014 (0.009)	0.016 (0.010)
Institutional Quality (IQ)	0.008* (0.017)	0.019* (0.009)	0.010* (0.019)	0.016* (0.019)	0.002* (0.005)	0.012* (0.012)	0.010* (0.007)	0.011* (0.002)
Total Gross Capital Flows (TGKF)	-0.1.68 (0.802)				-0.838 (0.799)			
Interaction 1(TGKF*IQ)	0.002 (0.344)				0.012 (0.166)			
Total Gross Capital Inflows (TGKI)		0.371 (0.048)				0.900* (0.033)		
Interaction 2(TGKI*IQ)		-0.031 (0.576)				-0.010* (0.410)		
Gross FDI Inflows (FDI)			0. 599 (0.171)				0.503* (0.098)	
Interaction 3(FDI*IQ)			-0.050 (0.103)				- 0.006* (0.237)	
Total FDI flows (TFDI)				0.371 (0.112)				0.311 (0.082)
Interaction 4 (TFDI*IQ)				-0.032 (0.352)				-0.003 (0.007)
R squared	0.441	0.343	0.347	0.440				
Countries	28	28	28	28	28	28	28	28
Observations	106	105	106	106	106	105	106	106
AR(2) test					0.303	0.268	0.315	0.281
Hansen test of over identification					0.213	0.416	0.512	0.234
Approx. Threshold level of IQ (percentile)						92	95	

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[25] In Fixed-effect model initial TFP is omitted because of collinearity.

In table 5.7 we report the results from a series of dynamic panel estimations of total factor productivity, including the interaction term with institutional quality. Focusing directly on the system GMM estimates in second panel of table 5.7, the basic results for TGKF and TFDI are quite similar to the results presented in column (1)and(4) of the first panel reporting fixed-effect. Interaction effect of IQ variable with TGKF and TFDI indicates that better institutions reduces the negative effect of total gross capital flows and total FDI flows on the TFP growth. However, these results are not significant. An interesting result is that the TGKI and FDI flows have positively significant effect on the TFP, but surprisingly the interaction term with IQ has significantly negative effect. This result implies that the partial effect of TGKI and FDI on TFP reduces with the improvement in IQ. The threshold level of IQ for TGKI and FDI is 82.63 and 83.88 which is 92 and 95 percentile of IQ. These results are quite similar to the effect of capital flows on labour productivity. The implications of these result are that, after the economy has attained a very high level of institutional quality, total gross capital inflows and even FDI effects TFP growth adversely. These results are at par with the findings of (Kose, Prasad & Terrones 2009)[26].

As a robustness check all the estimated models are tested for the validity of instruments using the Hansen test of over-identifying restrictions. This test checks the validity of all the instruments by analysing the sample analog of the moment conditions used in the estimation process. The null hypothesis of this test is that the instruments are not correlated with the residuals. The p-values of the test that are reported in all the tables fail to reject the null hypothesis, thereby validating the instruments used in all the models. We also performed the Arellano-Bond test for the first order and the second order serial correlations in all the models. The null hypothesis of this is that the error term is not serially correlated. The results of AR(2) tests that are reported in all the tables fail to reject null hypothesis.

[26] They have studies the effect of various measures of financial openness on TFP.

In the next section we further test the robustness and sensitivity of our results by splitting the full sample into regions, i.e. Asia and Latin America. However, after dividing the full sample into regions, the dynamics of our panel estimation changes to large *T (years)* and small *N (countries)*. According to Roodman (2006), if *T* is large, then the dynamic panel bias becomes insignificant and a fixed effect estimator proves to be a more reliable estimator. Also if we average our data to non-overlapping 4-year period to reduce *T* our sample size becomes too small to run GMM. According to Baum, Schaffer and Stillman (2003), if sample size is small, then the Wald tests under GMM estimator tends to over-reject the null. Thus running fixed effect dynamic panel regression is sufficient to test for sensitivity of our results across regions. Recently, Baum and Schaffer (2015), suggested an instrumental variables regression model following Lewbel's method that serves to identify structural parameters in regression models with endogenous or mismeasured regressors. We follow this alternative method as a robustness check for our fixed effect results[27].

4. Regionalism (Asia and Latin America)

4.1 Effects of Institutional quality and capital flow on GDP per capita.

In this section we estimate equation (1) by using fixed-effect dynamic panel regression model for a sample of 13 emerging Asian countries and 15 Latin American countries. Table 5.8 reports the regression analysis of the effect of IQ on capital flows – GDP per capita growth relationship for Asia and table 5.9 reports for Latin America. In all the specifications for Asia and Latin America, as expected inflation has significantly negative effect on the GDP per capita growth whereas; IQ and trade openness has significantly positive effect on GDP per capita growth. In both the regions, domestic credit provided by bank has negative effect on GDP per capita growth.

[27] Results of Lewbel's method is reported in Appendix. We have run this alternative method for full sample, Asia and Latin America.

Among our main variables of interest for Asia and Latin America, TGKF, TGKI, FDI and TFDI have negative effect on growth initially. However, their interactions terms indicate that the effect becomes positive once the institutional quality reaches a certain threshold level. As noted earlier, this result implies that the partial effect of capital flows on GDP per capita increases with the increase in IQ. The threshold level of IQ for each specification in Asia ranges between 26 to38 percentiles and for Latin America the threshold level for each specification ranges between 38-48 percentiles respectively[28]. This result confirms our previous finding that the partial effect of capital flows on GDP increases with the increase in IQ. However, an important thing to note here is that the threshold level of IQ for Asia is smaller than that for Latin America. Again this is consistent with our growth accounting results in section 2.1 where we find GDP per capita growth is much higher in Asian countries with stronger institutions as compared to Latin American countries. Thus LA countries needs to satisfy a higher level of IQ threshold level, to have any effect on output growth.

[28] In Latin America the effect of TFDI and their interaction term though had negative and positive effect on GDP, their results were not significant.

Table 5.8: Capital flows, Interactions and GDP Growth: Fixed-effect using annual data (Asia)

Dependent variable – GDP per capita (GDP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. GDPPC	-0.054 (0.086)	-0.060 (0.085)	-0.064 (0.088)	-0.042 (0.090)
Initial GDP (in logs)[29]				
Domestic credit provided by banks (Log)	-0.023 (0.015)	-0.025 (0.015)	-0.024 (0.014)	-0.026 (0.015)
Trade openness (Log)	0.023** (0.012)	0.026** (0.012)	0.023* (0.014)	0.021* (0.012)
Population Growth (Log)	-0.002 (0.016)	-0.000 (0.015)	-0.001 (0.012)	-0.003 (0.016)
Expenditure on R&D (Log)	-0.028 (0.018)	-0.027 (0.011)	-0.025 (0.015)	-0.026 (0.012)
Inflation	-0.002** (0.001)	-0.002** (0.001)	-0.001** (0.001)	-0.002** (0.001)
Institutional Quality (IQ)	0.002* (0.000)	0.003* (0.001)	0.002* (0.001)	0.002* (0.001)
Total Gross Capital Flows (TGKF)	-0.129** (0.106)			
Interaction 1(TGKF*IQ)	0.003** (0.001)			
Total Gross Capital Inflows (TGKI)		-0.153** (0.109)		
Interaction 2(TGKI*IQ)		0.002** (0.001)		
Gross FDI Inflows (FDI)			-0.140** (0.062)	
Interaction 3(FDI*IQ)			0.002* (0.001)	
Total FDI flows (TFDI)				-0.126* (0.011)
Interaction 4 (TFDI*IQ)				-0.10* (0.041)
Approx. Threshold level of IQ (percentile)	38	26	26	33
R squared	0.589	0.594	0.596	0.581
Countries	13	13	13	13
Observations	141	141	141	141

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[29] In Fixed-effect model initial GDP is omitted because of collinearity.

Table 5.9: Capital flows, Interactions and GDP Growth: Fixed-effect using annual data (LA)

Dependent variable – GDP per capita (GDP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. GDPPC	-0.113 (0.090)	-0.163 (0.087)	-0.110 (0.091)	-0.111 (0.095)
Initial GDP (in logs)[30]				
Domestic credit provided by banks (Log)	-0.039*** (0.009)	-0.040*** (0.007)	-0.037*** (0.005)	-0.038*** (0.009)
Trade openness (Log)	0.054** (0.022)	0.060*** (0.021)	0.063*** (0.023)	0.062** (0.024)
Population Growth (Log)	0.002 (0.019)	0.001 (0.023)	0.030 (0.029)	0.030 (0.023)
Expenditure on R&D (Log)	0.036 (0.042)	0.028 (0.038)	0.025 (0.040)	0.026 (0.039)
Inflation	0.001* (0.000)	0.001* (0.000)	0.001* (0.000)	0.001* (0.000)
Institutional Quality (IQ)	0.003** (0.001)	0.002** (0.001)	0.003** (0.002)	0.004** (0.001)
Total Gross Capital Flows (TGKF)	-0.256* (0.161)			
Interaction 1(TGKF*IQ)	0.004* (0.003)			
0.004/Total Gross Capital Inflows (TGKI)		-0.189*** (0.056)		
Interaction 2(TGKI*IQ)		0.003*** (0.000)		
Gross FDI Inflows (FDI)			-0.442* (0.329)	
Interaction 3(FDI*IQ)			0.007* (0.003)	
Total FDI flows (TFDI)				-0.606 (0.601)
Interaction 4 (TFDI*IQ)				0.009 (0.024)
Approx. Threshold level of IQ (percentile)	38	34	34	48
R squared	0.665	0.700	0.663	0.670
Countries	15	15	15	15
Observations	141	141	141	141

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[30] In Fixed-effect model initial GDP is omitted because of collinearity.

4.2 Effects of institutional quality and capital flow on labour productivity growth.

Table 5.10 and 5.11 reports the regression analysis of the effect of IQ on capital flows – labour productivity relationship for Asia and Latin America. Among the main variables of interest in Asia, TGKF, TGKI, FDI have significantly positive effect on labour productivity. However, their interaction terms have negative effect. As noted earlier, this implies that the partial effect of capital flows on labour productivity reduces once the IQ has reached a very high level. In Asia, the threshold level of IQ wherein the positive effect of capital flows on labour productivity starts to decline is approximately 90thth percentile. Whereas, in Latin America TGKF has significantly positive effect, indicating that 1% increase in TGKF increase labour productivity by 9.3%, however there interaction term is not significant. Nevertheless, TGKI and FDI have significantly positive effect; and their interaction terms are negative. The threshold level of IQ wherein the positive effect of capital flows on labour productivity starts to decline is 81-88 percentile.

Table 5.10: Capital flows, Interactions and LP growth: Fixed-effect using annual data (Asia)

Dependent variable – Labour Productivity (LP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. LP	0.136 (0.089)	0.133 (0.086)	0.146 (0.091)	0.154 (0.090)
Initial LP (in logs)[31]				
Domestic credit provided by banks (Log)	-0.017 (0.013)	-0.014 (0.010)	-0.018 (0.011)	-0.019 (0.010)
Trade openness (Log)	0.021** (0.011)	0.026** (0.007)	0.018** (0.006)	0.020** (0.009)
Population Growth (Log)	-0.006 (0.014)	-0.006 (0.010)	-0.007 (0.013)	-0.007 (0.008)
Expenditure on R&D (Log)	-0.032 (0.021)	-0.032 (0.025)	-0.030 (0.029)	-0.031 (0.024)
Inflation	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)
Institutional Quality (IQ)	0.002** (0.001)	0.002** (0.001)	0.017**) (0.001)	0.019*** (0.001)
Total Gross Capital Flows (TGKF)	0.082* (0.045)			
Interaction 1(TGKF*IQ)	-0.001* (0.001)			
Total Gross Capital Inflows (TGKI)		0.166** (0.030)		
Interaction 2(TGKI*IQ)		-0.002** (0.001)		
Gross FDI Inflows (FDI)			0.235* (0.195)	
Interaction 3(FDI*IQ)			-0.003* (0.001)	
Total FDI flows (TFDI)				0.156 (0.182)
Interaction 4 (TFDI*IQ)				-0.002 (0.005)
Approx. Threshold level of IQ (percentile)	94	94	91	90
R squared	0.542	0.522	0.544	0.543
Countries	13	13	13	13
Observations	133	133	133	133

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[31] In Fixed-effect model initial LP is omitted because of collinearity.

Table 5.11: Capital flows, Interactions and LP growth: Fixed-effect using annual data (LA)

Dependent variable – Labour Productivity (LP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. LP	0.001 (0.003)	0.002 (0.002)	0.008 (0.001)	0.005 (0.005)
Initial LP (in logs)[32]				
Domestic credit provided by banks (Log)	-0.003 (0.014)	-0.002 (0.010)	-0.001 (0.015)	-0.002 (0.009)
Trade openness (Log)	0.049* (0.033)	0.047** (0.029)	0.048** (0.027)	0.051* (0.030)
Population Growth (Log)	0.055* (0.032)	0.062* (0.030)	0.068** (0.028)	0.068** (0.026)
Expenditure on R&D (Log)	0.039 (0.062)	0.018 (0.059)	0.033 (0.055)	0.023 (0.056)
Inflation	0.001 (0.001)	0.001 (0.001)	0.002 (0.001)	0.001 (0.001)
Institutional Quality (IQ)	0.001 (0.001)	0.001 (0.001)	0.002 (0.002)	0.002 (0.002)
Total Gross Capital Flows (TGKF)	0.075* (0.033)			
Interaction 1(TGKF*IQ)	-0.002 (0.011)			
Total Gross Capital Inflows (TGKI)		0.298** (0.166)		
Interaction 2(TGKI*IQ)		-0.004** (0.002)		
Gross FDI Inflows (FDI)			0.231** (0.109)	
Interaction 3(FDI*IQ)			-0.003* (0.001)	
0.251Total FDI flows (TFDI)				0.928 (0.949)
Interaction 4 (TFDI*IQ)				-0.012 (0.035)
Approx. Threshold level of IQ (percentile)	85	81	88	88
R squared	0.414	0.407	0.409	0.411
Countries	15	15	15	15
Observations	143	143	143	143

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[32] In Fixed-effect model initial LP is omitted because of collinearity.

4.3 Effects of institutional quality and capital flow on total factor productivity growth.

Table 5.12 and 5.13 reports the regression analysis of the effect of IQ on capital flows – total factor productivity relationship for Asia and Latin America. In Asia, IQ has significantly positive effect only in the specifications discussing TGKI and FDI. Conversely, in Latin America in all the specifications, IQ has significantly positive effect on TFP.

Among the variables of interest, in Asia, TGKI, FDI has significantly positive and their interaction term has negative effect on TFP. The threshold level of IQ wherein the partial effect of capital flows on TFP reduces is approximately 97^{th} percentile. Conversely, in Latin America, TGKF, TGKI, FDI negative effect on TFP and their interaction terms have significantly positive effect. This result implies that the partial effect of capital flows on TFP increases with the increase in IQ and the threshold level ranges from 36 to 52 percentiles.

In summary, while comparing the results across regions, the nature of effects coming from different types of capital flows and their interaction terms on GDP per capita and labour productivity are not different in these two regions, except the fact that the threshold level of IQ required to gain positive effects of capital flows on GDP is lower in Asia as compared to Latin America. However, the results are very contrasting between the two regions when it comes to TFP growth. For Asia – IQ is already stronger, so positive effect of FDI on growth is working and interaction effect came out negative, implying if rules are too stringent, then increase in capital flows may cause productivity to decrease. But in LA, institutions are weak on the first place, so initially effect of FDI on growth is negative! But once IQ reaches a threshold level, FDI has positive effect on productivity! From the growth accounting results in section 2.4 we find that Asia has higher TFP growth than LA in this period. Our results from this section confirms our findings from the growth accounting section. Institutional quality is playing a greater role in LA, because they start with a lower level of institutional

quality on the first place. Thus TFP growth is higher in Asia as compared to Latin American countries.

Table 5.12: Capital flows, Interactions and TFP growth: Fixed-effect using annual data (Asia)

Dependent variable – Total Factor productivity (TFP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. TFP	0.082 (0.091)	0.078 (0.091)	0.092 (0.094)	0.105 (0.093)
Initial TFP (in logs)[33]				
Domestic credit provided by banks (Log)	-0.023* (0.011)	-0.020* (0.006)	-0.025* (0.010)	-0.026* (0.007)
Trade openness (Log)	0.013** (0.003)	0.020** (0.008)	0.015* (0.009)	0.017* (0.010)
Population Growth (Log)	-0.001 (0.013)	-0.001 (0.004)	-0.002 (0.009)	-0.002** (0.010)
Expenditure on R&D (Log)	-0.022** (0.010)	-0.021* (0.013)	-0.020* (0.005)	-0.020* (0.010)
Inflation	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)	-0.001** (0.001)
Institutional Quality (IQ)	0.001 (0.001)	0.001* (0.001)	0.001* (0.001)	0.001 (0.001)
Total Gross Capital Flows (TGKF)	-0.080 (0.109)			
Interaction 1(TGKF*IQ)	0.001 (0.001)			
Total Gross Capital Inflows (TGKI)		0.082** (0.044)		
Interaction 2(TGKI*IQ)		-0.001* (0.002)		
Gross FDI Inflows (FDI)			0.242* (0.165)	
Interaction 3(FDI*IQ)			-0.003* (0.001)	
Total FDI flows (TFDI)				0.159 (0.175)
Interaction 4 (TFDI*IQ)				-0.002 (0.004)
Approx. Threshold level of IQ (percentile)	91	94	92	91
R squared	0.557	0.558	0.557	0.556
Countries	13	13	13	13
Observations	133	133	133	133

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[33] In Fixed-effect model initial TFP is omitted because of collinearity.

Table 5.13: Capital flows, Interactions and TFP growth: Fixed-effect using annual data (LA)

Dependent variable – Total Factor productivity (TFP) growth in log

	Fixed - Effects			
	1	2	3	4
	TGKF	TGKI	FDI	TFDI
L1. TFP	-0.197 (0.129)	-0.195 (0.126)	-0.205 (0.130)	-0.203 (0.131)
Initial TFP (in logs)[34]				
Domestic credit provided by banks (Log)	0.052 (0.544)	-0.001 (0.535)	0.039 (0.538)	0.061 (0.547)
Trade openness (Log)	0.053 (0.091)	0.057 (0.066)	0.028 (0.022)	0.096 (0.082)
Population Growth (Log)	0.092 (0.084)	0.114 (0.087)	0.060 (0.066)	0.122 (0.089)
Expenditure on R&D (Log)	0.072 (0.053)	0.056 (0.068)	0.054 (0.080)	0.098 (0.065)
Inflation	-0.008 (0.022)	-0.013 (0.027)	-0.006 (0.026)	0.002 (0.030)
Institutional Quality (IQ)	0.020** (0.059)	0.051** (0.057)	0.005* (0.080)	0.006* (0.078)
Total Gross Capital Flows (TGKF)	-0.198* (0.103)			
Interaction 1(TGKF*IQ)	0.003* (0.002)			
Total Gross Capital Inflows (TGKI)		-0.390* (0.204)		
Interaction 2(TGKI*IQ)		0.006* (0.004)		
Gross FDI Inflows (FDI)			-0.256** (0.114)	
Interaction 3(FDI*IQ)			0.004* (0.002)	
Total FDI flows (TFDI)				-0.330 (0.387)
Interaction 4 (TFDI*IQ)				0.005 (0.006)
Approx. Threshold level of IQ (percentile)	40	40	36	43
R squared	0.258	0.293	0.251	0.216
Countries	15	15	15	15
Observations	133	132	133	133

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All regressions include time dummies.

[34] In Fixed-effect model initial TFP is omitted because of collinearity.

5. Conclusion

There are a large number of empirical studies that examine the growth effect of capital flows in EMEs. However, the results of these studies fail to confirm how the effect of capital flows on economic growth gets distorted with different level of institutional quality. This study examines the dynamic relationship between capital flows and institutional quality on three different measures of economic growth: GDP per capita, labour productivity and total factor productivity. The interaction effect of institutional quality and capital flows is tested in selected samples from Asian and Latin American countries from 1990-2013. This study for the first time in literature takes into account the role of institutional quality in determining the effects of capital flows on economic growth in emerging economies. It also determines the different threshold levels at which the partial effect of capital flows on economic growth become significant.

The main finding is that the partial effect of capital flows on growth depends upon the level of institutional quality. Results from the growth anatomy of Latin America and Asia also suggests that economies with higher institutional quality have experienced higher output growth from TFP. These results coincide with the regression results. Capital flows exert positive effect on GDP per capita growth once the host countries have reached a threshold level of institutional quality. This result also holds true for both the regions. Although the threshold level of institutional quality is lower for Asia as compared to Latin America.

Our results on the interaction effect on labour productivity are different than that of GDP per capita. In both the regions capital flows exert positive effect on labour productivity. However, the positive effect starts to decline once the institutional quality has reached a threshold level of 90^{th} percentile. This can be due to strict labour market regulation policies that discourage entry of new firms, thereby causing decline in labour productivity. The results also hold true

for both regions – Asia and Latin America. This implies for all emerging economies, the relationship between capital flows and labour productivity is very robust and institutional quality has an effect only at the margin.

Finally, our results discussing the interaction effect on total factor productivity asserts that among all different components of capital flows, FDI turns out most important for TFP growth in Asia. Further, positive effect of capital flows on total factor productivity declines once the threshold level of institutional quality reaches around 97th percentile. Whereas, in Latin America, institutional quality has to be above a certain level of threshold to experience positive effect of capital flows on total factor productivity. This shows the stark difference between Latin American and Asian countries. These results were also evident from the growth accounting exercise. Institutional quality played greater role in Latin America, because they start with lower level of institutional quality on the first place.

Our findings from this paper has some serious policy implications. Overall, the findings of this paper support the fact that policies considered to attract more capital flows are not satisfactory in generating spillover for economic growth. Improving the level of institutional quality should be the priority for policymakers in EMEs to exploit capital flows efficiently. Further, it is important for the Latin American countries to improve their institutional quality to achieve higher growth – which draws attention on long-run policies like advancement of technological progress human capital etc. Finally, results from this paper indicates that policy makers must be careful to determine, how capital flows affect different measures of economic development. Our results indicate the effect of capital flows on growth is not same across three measures: GDP per capita, LP and TFP. The results also vary across regions! Unless, policies are directed in the same way, it may cause serious damage in the long run.

Appendix:

Table A1: Capital flows, Interactions and GDP Growth: Lewbel'S method using annual data (Full Sample)

Dependent variable – GDP per capita (GDP) growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. GDPPC	1.002**	0.821**	0.963**	0.860**
	(0.473)	(0.405)	(0.424)	(0.388)
Initial GDP (in logs)				
Domestic credit provided by banks (Log)	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)
Trade openness (Log)	0.000	0.000	0.000	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)
Population Growth (Log)	-0.046**	-0.047**	-0.054	-0.052**
	(0.021)	(0.022)	(0.041)	(0.022)
Expenditure on R&D (Log)	0.276***	0.270***	0.265***	0.255***
	(0.046)	(0.046)	(0.043)	(0.045)
Inflation	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Institutional Quality (IQ)	-0.001	0.001	0.000	0.002
	(0.004)	(0.003)	(0.004)	(0.003)
Total Gross Capital Flows (TGKF)	-0.003			
	(0.002)			
Interaction 1(TGKF*IQ)	0.000			
	(0.000)			
Total Gross Capital Inflows (TGKI)		-0.004		
		(0.004)		
Interaction 2(TGKI*IQ)		0.000		
		(0.000)		
Gross FDI Inflows (FDI)			-0.002	
			(0.011)	
Interaction 3(FDI*IQ)			0.000	
			(0.000)	
Total FDI flows (TFDI)				0.003
				(0.017)

Interaction 4 (TFDI*IQ)				-0.000 (0.000)
Countries	**28**	**28**	**28**	**28**
Observations	**280**	**280**	**280**	**280**
Hansen J- statistics	**3.807**	**4.802**	**5.579**	**6.196**
P-value of Hansen J- statistics	**0.801**	**0.684**	**0.589**	**0.517**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A2: Capital flows, Interactions and LP Growth: Lewbel'S method using annual data (Full Sample)

Dependent variable – Labour productivity growth in log

	1	**2**	**3**	**4**
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	0.539** (0.268)	0.484* (0.274)	0.571** (0.235)	0.495** (0.238)
Initial LP (in logs)	-0.009 (0.007)	0.009 (0.007)	0.008 (0.007)	0.009 (0.008)
Domestic credit provided by banks (Log)	0.001** (0.000)	0.000 (0.000)	0.001** (0.000)	0.001* (0.000)
Trade openness (Log)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)
Population Growth (Log)	-0.019 (0.018)	-0.018 (0.016)	-0.021 (0.019)	-0.018 (0.015)
Expenditure on R&D (Log)	0.171*** (0.045)	0.169*** (0.046)	0.148*** (0.039)	0.132*** (0.037)
Inflation	0.000* (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Quality (IQ)	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)
Total Gross Capital Flows (TGKF)	0.023** (0.010)			
Interaction 1(TGKF*IQ)	-0.005** (0.002)			
Total Gross Capital Inflows (TGKI)		0.046** (0.022)		
Interaction 2(TGKI*IQ)		0.000 (0.000)		
Gross FDI Inflows (FDI)			-0.005 (0.007)	
Interaction 3(FDI*IQ)			0.000 (0.000)	

Total FDI flows (TFDI)				-0.006 (0.010)
Interaction 4 (TFDI*IQ)				0.000 (0.000)
Countries	**28**	**28**	**28**	**28**
Observations	**274**	**274**	**274**	**274**
Hansen J- statistics	**5.251**	**7.537**	**8.872**	**6.007**
P-value of Hansen J- statistics	**0.730**	**0.375**	**0.262**	**0.229**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A3: Capital flows, Interactions and TFP Growth: Lewbel'S method using annual data (Full Sample)

Dependent variable – Total factor productivity growth in log

	1	**2**	**3**	**4**
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. TFP	-0.049 (0.170)	-0.098 (0.167)	-0.066 (0.159)	-0.079 (0.159)
Initial TFP (in logs)	-0.589** (0.230)	-0.593*** (0.218)	-0.474** (0.235)	-0.538** (0.235)
Domestic credit provided by banks (Log)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Trade openness (Log)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000** (0.000)
Population Growth (Log)	0.007 (0.005)	0.007 (0.005)	0.008 (0.005)	0.006 (0.005)
Expenditure on R&D (Log)	0.124*** (0.031)	0.129*** (0.031)	0.104*** (0.025)	0.108*** (0.025)
Inflation	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000* (0.000)
Institutional Quality (IQ)	0.003* (0.002)	0.003* (0.001)	0.005*** (0.002)	0.004** (0.002)
Total Gross Capital Flows (TGKF)	-0.002** (0.001)			
Interaction 1(TGKF*IQ)	0.000* (0.000)			
Total Gross Capital Inflows (TGKI)		-0.002 (0.002)		
Interaction 2(TGKI*IQ)		0.000 (0.000)		
Gross FDI Inflows (FDI)			-0.004 (0.005)	
Interaction 3(FDI*IQ)			0.000 (0.000)	
Total FDI flows (TFDI)				-0.002 (0.007)

Interaction 4 (TFDI*IQ)				0.000 (0.000)
Countries	**28**	**28**	**28**	**28**
Observations	**274**	**274**	**274**	**274**
Hansen J- statistics	**5.618**	**4.702**	**8.223**	**6.795**
P-value of Hansen J- statistics	**0.689**	**0.788**	**0.412**	**0.558**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A4: Capital flows, Interactions and GDP Growth: Lewbel'S method using annual data (Asia)

Dependent variable – GDP per-capita growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. TFP	-0.049 (0.170)	-0.098 (0.167)	-0.066 (0.159)	-0.079 (0.159)
Initial TFP (in logs)	-0.589** (0.230)	-0.593*** (0.218)	-0.474** (0.235)	-0.538** (0.235)
Domestic credit provided by banks (Log)	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Trade openness (Log)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000** (0.000)
Population Growth (Log)	0.007 (0.005)	0.007 (0.005)	0.008 (0.005)	0.006 (0.005)
Expenditure on R&D (Log)	0.124*** (0.031)	0.129*** (0.031)	0.104*** (0.025)	0.108*** (0.025)
Inflation	0.000** (0.000)	0.000** (0.000)	0.000** (0.000)	0.000* (0.000)
Institutional Quality (IQ)	0.003* (0.002)	0.003* (0.001)	0.005*** (0.002)	0.004** (0.002)
Total Gross Capital Flows (TGKF)	-0.002** (0.001)			
Interaction 1(TGKF*IQ)	0.000* (0.000)			
Total Gross Capital Inflows (TGKI)		-0.002 (0.002)		
Interaction 2(TGKI*IQ)		0.000 (0.000)		
Gross FDI Inflows (FDI)			-0.004 (0.005)	
Interaction 3(FDI*IQ)			0.000 (0.000)	
Total FDI flows (TFDI)				-0.002 (0.007)
Interaction 4 (TFDI*IQ)				0.000 (0.000)
Countries	**28**	**28**	**28**	**28**
Observations	**274**	**274**	**274**	**274**
Hansen J- statistics	**5.618**	**4.702**	**8.223**	**6.795**
P-value of Hansen J- statistics	**0.689**	**0.788**	**0.412**	**0.558**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A5: Capital flows, Interactions and LP Growth: Lewbel'S method using annual data (Asia)

Dependent variable – Labour productivity growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	1.104*	0.729	0.986*	0.842*
	(0.594)	(0.556)	(0.508)	(0.431)
Initial LP (in logs)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit provided by banks (Log)	-0.001	-0.000	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)
Trade openness (Log)	0.002**	0.002**	0.018**	0.002**
	(0.000)	(0.000)	(0.001)	(0.000)
Population Growth (Log)	-0.012	-0.013	-0.010	-0.009
	(0.009)	(0.009)	(0.009)	(0.009)
Expenditure on R&D (Log)	-0.173	-0.165	-0.152	-0.162
	(0.146)	(0.145)	(0.139)	(0.139)
Inflation	-0.001	-0.002	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Institutional Quality (IQ)	0.005**	0.006**	0.004**	0.006*
	(0.002)	(0.002)	(0.004)	(0.003)
Total Gross Capital Flows (TGKF)	0.002**			
	(0.000)			
Interaction 1(TGKF*IQ)	0.001			
	(0.000)			
Total Gross Capital Inflows (TGKI)		0.003**		
		(0.003)		
Interaction 2(TGKI*IQ)		-0.001*		
		(0.000)		
Gross FDI Inflows (FDI)			0.012**	
			(0.005)	
Interaction 3(FDI*IQ)			-0.000	
			(0.000)	
Total FDI flows (TFDI)				0.032**
				(0.014)
Interaction 4 (TFDI*IQ)				-0.000**
				(0.000)
Countries	**13**	**13**	**13**	**13**
Observations	**133**	**133**	**133**	**133**
Hansen J- statistics	**7.530**	**7.337**	**7.704**	**8.285**
P-value of Hansen J- statistics	**0.375**	**0.390**	**0.359**	**0.302**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A6: Capital flows, Interactions and TFP Growth: Lewbel'S method using annual data (Asia)

Dependent variable – Total factor productivity growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	1.104*	0.729	0.986*	0.842*
	(0.594)	(0.556)	(0.508)	(0.431)
Initial LP (in logs)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit provided by banks (Log)	-0.001	-0.000	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)
Trade openness (Log)	0.002**	0.002**	0.018**	0.002**
	(0.000)	(0.000)	(0.001)	(0.000)
Population Growth (Log)	-0.012	-0.013	-0.010	-0.009
	(0.009)	(0.009)	(0.009)	(0.009)
Expenditure on R&D (Log)	-0.173	-0.165	-0.152	-0.162
	(0.146)	(0.145)	(0.139)	(0.139)
Inflation	-0.001	-0.002	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Institutional Quality (IQ)	0.005**	0.006**	0.004**	0.006*
	(0.002)	(0.002)	(0.004)	(0.003)
Total Gross Capital Flows (TGKF)	0.002**			
	(0.000)			
Interaction 1(TGKF*IQ)	0.001			
	(0.000)			
Total Gross Capital Inflows (TGKI)		0.003**		
		(0.003)		
Interaction 2(TGKI*IQ)		-0.001*		
		(0.000)		
Gross FDI Inflows (FDI)			0.012**	
			(0.005)	
Interaction 3(FDI*IQ)			-0.000	
			(0.000)	
Total FDI flows (TFDI)				0.032**
				(0.014)
Interaction 4 (TFDI*IQ)				-0.000**
				(0.000)
Countries	**13**	**13**	**13**	**13**
Observations	**133**	**133**	**133**	**133**
Hansen J- statistics	**7.530**	**7.337**	**7.704**	**8.285**
P-value of Hansen J- statistics	**0.375**	**0.390**	**0.359**	**0.302**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A7: Capital flows, Interactions and GDP Growth: Lewbel'S method using annual data (LA)

Dependent variable – GDP per-capita growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	1.104*	0.729	0.986*	0.842*
	(0.594)	(0.556)	(0.508)	(0.431)
Initial LP (in logs)	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Domestic credit provided by banks (Log)	-0.001	-0.000	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.000)
Trade openness (Log)	0.002**	0.002**	0.018**	0.002**
	(0.000)	(0.000)	(0.001)	(0.000)
Population Growth (Log)	-0.012	-0.013	-0.010	-0.009
	(0.009)	(0.009)	(0.009)	(0.009)
Expenditure on R&D (Log)	-0.173	-0.165	-0.152	-0.162
	(0.146)	(0.145)	(0.139)	(0.139)
Inflation	-0.001	-0.002	-0.001	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)
Institutional Quality (IQ)	0.005**	0.006**	0.004**	0.006*
	(0.002)	(0.002)	(0.004)	(0.003)
Total Gross Capital Flows (TGKF)	0.002**			
	(0.000)			
Interaction 1(TGKF*IQ)	0.001			
	(0.000)			
Total Gross Capital Inflows (TGKI)		0.003**		
		(0.003)		
Interaction 2(TGKI*IQ)		-0.001*		
		(0.000)		
Gross FDI Inflows (FDI)			0.012**	
			(0.005)	
Interaction 3(FDI*IQ)			-0.000	
			(0.000)	
Total FDI flows (TFDI)				0.032**
				(0.014)
Interaction 4 (TFDI*IQ)				-0.000**
				(0.000)
Countries	**13**	**13**	**13**	**13**
Observations	**133**	**133**	**133**	**133**
Hansen J- statistics	**7.530**	**7.337**	**7.704**	**8.285**
P-value of Hansen J- statistics	**0.375**	**0.390**	**0.359**	**0.302**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A8: Capital flows, Interactions and LP Growth: Lewbel'S method using annual data (LA)

Dependent variable – Labour productivity growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	0.141 (0.312)	0.272 (0.306)	0.170 (0.303)	0.113 (0.323)
Initial LP (in logs)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Domestic credit provided by banks (Log)	-0.001 (0.000)	-0.001 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Trade openness (Log)	0.002** (0.000)	0.002** (0.000)	0.002** (0.000)	0.002** (0.000)
Population Growth (Log)	0.034 (0.025)	0.046 (0.034)	0.041 (0.034)	0.042 (0.035)
Expenditure on R&D (Log)	0.010 (0.072)	0.009 (0.070)	0.022 (0.066)	0.006 (0.067)
Inflation	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Quality (IQ)	0.003** (0.001)	0.003*** (0.001)	0.003 (0.002)	0.003 (0.002)
Total Gross Capital Flows (TGKF)	0.005* (0.003)			
Interaction 1(TGKF*IQ)	-0.000 (0.000)			
Total Gross Capital Inflows (TGKI)		0.008** (0.004)		
Interaction 2(TGKI*IQ)		-0.004** (0.002)		
Gross FDI Inflows (FDI)			-0.015* (0.010)	
Interaction 3(FDI*IQ)			-0.002* (0.001)	
Total FDI flows (TFDI)				0.015 (0.030)
Interaction 4 (TFDI*IQ)				-0.000 (0.000)
Countries	**15**	**15**	**15**	**15**
Observations	**141**	**141**	**141**	**141**
Hansen J- statistics	**6.754**	**5.833**	**6.238**	**4.737**
P-value of Hansen J- statistics	**0.455**	**0.559**	**0.512**	**0.692**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

Table A9: Capital flows, Interactions and TFP Growth: Lewbel'S method using annual data (LA)

Dependent variable – Total factor productivity growth in log

	1	2	3	4
	TGKF	**TGKI**	**TFDI**	**FDI**
L1. LP	0.141 (0.312)	0.272 (0.306)	0.170 (0.303)	0.113 (0.323)
Initial LP (in logs)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Domestic credit provided by banks (Log)	-0.001 (0.000)	-0.001 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Trade openness (Log)	0.002** (0.000)	0.002** (0.000)	0.002** (0.000)	0.002** (0.000)
Population Growth (Log)	0.034 (0.025)	0.046 (0.034)	0.041 (0.034)	0.042 (0.035)
Expenditure on R&D (Log)	0.010 (0.072)	0.009 (0.070)	0.022 (0.066)	0.006 (0.067)
Inflation	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Institutional Quality (IQ)	0.003** (0.001)	0.003*** (0.001)	0.003 (0.002)	0.003 (0.002)
Total Gross Capital Flows (TGKF)	0.005* (0.003)			
Interaction 1(TGKF*IQ)	-0.000 (0.000)			
Total Gross Capital Inflows (TGKI)		0.008** (0.004)		
Interaction 2(TGKI*IQ)		-0.004** (0.002)		
Gross FDI Inflows (FDI)			-0.015* (0.010)	
Interaction 3(FDI*IQ)			-0.002* (0.001)	
Total FDI flows (TFDI)				0.015 (0.030)
Interaction 4 (TFDI*IQ)				-0.000 (0.000)
Countries	**15**	**15**	**15**	**15**
Observations	**141**	**141**	**141**	**141**
Hansen J- statistics	**6.754**	**5.833**	**6.238**	**4.737**
P-value of Hansen J- statistics	**0.455**	**0.559**	**0.512**	**0.692**

Note: The symbols*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively. All the variables are centred to remove country-fixed effects.

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