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Productivity Growth, Capital Accumulation, and the Banking Sector

Some Lessons from Malaysia

How did the East Asian miracle turn into one of the worst financial crises of the century? A case study of Malaysia provides some answers.

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I. INTRODUCTION

How did the East Asian miracle turn into one of the worst financial crisis of this century? This paper examines the above question using Malaysia as a case study. Many discussions of the East Asian crisis address proximate and short-run causes of the crisis such as the current account deficit, exchange rate misalignment, and large short-run external debt relative to foreign exchange reserves. These indicators of vulnerability are themselves endogenous outcomes of deeper institutional features and are more a symptom than a cause of the underlying problem. We argue that some of the long-term features of the development strategy, that helped sustain high output growth in the first instance, also contributed to increasing vulnerability of the economy. The banking system played a critical role in transforming and accelerating large savings into capital accumulation. Capital accumulation was the key driver of output growth. But the banking system was not always allocating capital efficiently. We find that the rapid growth in bank lending is associated with falling total factor productivity growth. Policy observers have suggested that bank lending growth of one to two times GDP growth should be expected for most countries during normal times [Caprio and Klingebiel (1997)]. If bank lending is too rapid, as was the case in Malaysia, project selection, risk management, and monitoring capability of banks get compromised. In the face of rapid growth in lending, it is difficult for the managers of individual banks, and the supervisors, to ensure that capital is being allocated to most productive activities. A rapid build-up in bank credit can thus lower the quality of investment projects and thereby reduce productivity growth [see for example, Gavin and Hausmann (1996), Radelet and Sachs (1998)].

This paper is organized as follows. Section II examines the key drivers of growth—capital, educational attainment of the workforce (a proxy for human capital), and total factor productivity growth. We use a growth accounting framework to consistently decompose Malaysia's GDP growth into growth in physical capital stock per worker, human capital per worker, and growth in total factor productivity (TFP)[1]. We find that the key driver of growth in Malaysia has been physical capital accumulation. Its contribution averaged nearly 50% per annum during the period 1971-97. By contrast, the relative contribution of total factor productivity growth averaged only 20% during the same period. TFP growth has fluctuated substantially over time, and it has fallen during the latter half of the 1990s.

[1] There is an extensive literature on productivity growth in the context of the East Asia miracle [see Collins and Bosworth (1996), Kim and Lau (1994), Krugman (1994), Pack (1998), Page (1994), Rodrik (1997), Sarel (1997), World Bank (1993), Young (1994), and see the references in these articles].

Section III reports estimates of TFP growth regressions and results of sensitivity analysis. Section IV takes a closer look at growth in bank lending and its sectoral distribution. Section V concludes.

II. SOURCES OF GROWTH

Output growth can be caused by labor, capital, and productivity growth. We can derive a conventional growth accounting equation from the neoclassical production function[2].

$$Y_t = F(A_t, K_t, L_t) \qquad (1)$$

Where A is the level of technology, and K and L are capital stock and quantity of labor respectively. Differentiating the above equation with respect to time and dividing throughout by Y we obtain:

$$\frac{\hat{Y}}{Y} = (\frac{F_A A}{Y}) * \frac{\hat{A}}{A} + (\frac{F_K K}{Y}) * \frac{\hat{K}}{K} + (\frac{F_L L}{Y}) * \frac{\hat{L}}{L} \qquad (2)$$

The hat over a variable represents its time derivative. If technological change occurs in a Hicks-neutral manner, then $F(A, K, L) = Af(K, L)$ and $(F_A A/Y) = 1$. Assuming that labor and capital are paid their (social) marginal products, i.e. $F_K=r$ (rental price of capital) and $F_L = w$ (wages) and rearranging we obtain the growth equation:

$$\tau = \frac{\hat{A}}{A} = \frac{\hat{Y}}{Y} - \alpha * \frac{\hat{K}}{K} - \beta * \frac{\hat{L}}{L} \qquad (3)$$

where $\alpha = rK/Y$ and $\beta = wL/Y$ are shares of capital and labor in total product. Assuming constant returns to scale, payments to factors (factor income) exhaust total product so that $\beta = 1-\alpha$. The term τ is referred to as the Solow residual or total factor productivity growth.

Ideally, the aggregate capital input is a composite index of different varieties of capital employed with each variety being weighted by its share in the total returns to capital. Similarly, the labor input is ideally a composite index of labor differentiated by age, gender, education, sector and hours of work. In the estimates presented below, however, capital and labor are not differentiated in this manner because detailed data are not available. The absence of such "quality" adjustments generally tends to underestimate the aggregate input use.

As can be seen from equation (3) in order to estimate TFP growth we need data on capital stocks, labor, and α.

[2] The derivation here follows Barro (1998).

Reliable measures of α, the capital share in total income, are hard to come by. Bosworth and Collins (1996) after reviewing the existing literature find that a plausible range for capital share is 0.3 to 0.4. In their computations of TFP they use a fixed value of 0.35 for developing countries, including the East Asian countries. While this is valid only for a limited set of production functions, they report that existing studies find little evidence of major changes in factor shares over time. Sarel (1997) who analyzed TFP growth in East Asian countries found no major change in the value of α for Malaysia which hovered around 0.32 over most of the 1978-96 period. We adopt here a one-third share of capital, as some others have done (for instance Klenow and Rodriguez-Claire 1997). However, we also estimated TFP using the end-range values of 0.3 and 0.4 and find that it did not have any significant impact on the analysis.

A series of capital stock was constructed using the perpetual inventory method, as is common in the literature. The initial capital stock was obtained from Nehru and Dhareshwar (1993)[3]. Investment data are taken from World Bank's World Development Indicators cd-rom. We were unable to obtain disaggregated data on capital stocks in order to conduct quality adjustments. The capital stock was computed with depreciation rates ranging from 0.05 to 0.12. The impact on TFP estimates was however not appreciable.

We obtained data on employment of the labor force over the 1970-97 period from official Malaysian publications and World Bank country reports. Labor force was adjusted for what has been found to be it's most important quality adjustment, namely, educational attainment[4]. A series on the educational attainment of the labor force was constructed[5] by employing the methodology described in Nehru, Swanson, and Dubey (NSD, 1995).

Figure 1 plots the trend of TFP *level*, capital per worker, and output per worker during the period 1974 to 1997, employing an α value of 1/3, d = 0.075, and quality unadjusted factor inputs. The level of output per worker has consistently increased during the last two and a half decades. Most of this came through the increases in the level of capital per worker, especially in the 1990s. The TFP level has been relatively flat and has contributed less to output relative to capital.

Malaysia faced two major economic crisis during the last two decades. During both crises, a downturn in the TFP growth is evident prior to the crisis. TFP growth fell in the early 1980s prior to the first crisis in 1984-85 (Figure 2). This was followed by a sharp recovery and impressive performance during the period 1987-90, as the Government liberalized the manufacturing sector, resulting in increased inflow of foreign direct investments, import of capital goods, and technical change. TFP growth slowed down in the latter part of the 1990s.

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[3] Available on the Economic Growth Research web site of the World Bank.
http://www.worldbank.org/html/prdmg/grthweb/growth_t.htm

[4] One could also include human capital as a separate factor of production in order to capture the impacts of education. Adjusting the labor input assumes that the benefits of education are embodied in workers.

[5] Constructed by Koji Miyamoto (June, 1999).

Although the variations in TFP growth could reflect the pro-cyclical nature of the measured variable, there were other factors and policies that were also in play that might have influenced the changes in productivity growth, as we attempt to show below.

The growth rates of physical capital per worker, human capital per worker (proxied by educational attainment per worker, and TFP and their relative contributions to total output growth at three-year intervals, excluding crisis years[6], during the period 1971-97 period are shown in Figures 3 and 4. We choose the three year intervals for ease of presentation, and it does not alter the substantive conclusions. Consistent with earlier findings, we find that growth in the physical capital accumulation is the key contributor to output growth. Averaged over the entire period its contribution was 47%. The contribution human capital averaged 33%, while that of TFP growth averaged 20%.

Between 1987-1991, the five years following the last recession, TFP was the chief contributor to growth averaging 60 per cent. The contribution of capital per worker in this period was under 10 per cent. In more recent years (1993-97), however, the contribution of TFP has fallen to under 10 percent. In this period capital accumulation became the main driver of growth with an average share of nearly 60 per cent. Thus compared with the late 1980s the character of growth in recent years has changed from being productivity driven to input driven. The contribution of education per worker was roughly 30 percent in both periods.

We also compare the Malaysian experience with other countries in the region. For this purpose the results of two studies (Sarel, 1997 and Bosworth and Collins, 1996) that provide comparative factor productivity estimates for East Asian countries are reported in Table 1. Since these studies use different methodologies, and time periods, their estimates are not comparable and neither are the estimates presented here comparable with these studies. It is the relative ranking of the countries within each study that is important. In Sarel's study Malaysia's performance is better than Indonesia and Philippines, comparable with Thailand, and a little lower than Singapore. In Bosworth and Collins' work, while Malaysia still does better than Philippines and Indonesia, its performance falls short of the other countries.

Role of Labor Productivity: Declining TFP growth can be associated with lower TFP within sectors and/or a slower process of reallocating resources from less to more efficient sectors in the economy. Because data on capital stock and investment by sector are not available, TFP growth within each sector cannot be measured. Labor productivity unadjusted for educational attainment (Y_i/L_i) by sector i, can, however, be computed from available data. This information can be utilized to decompose economywide labor productivity change into labor productivity change in each sector and the productivity gains achieved through the reallocation of labor to more productive sectors.

$$\frac{Y_t}{L_t} = y_t = \sum_i s_{it} y_{it} \qquad (5)$$

[6] Years in which output per worker was negative, namely, 1975, 1985, and 1986.

where $s_{it} = \frac{L_{it}}{L_t}$ is the ratio of labor employed in sector i to total labor employed in the economy. Taking the differential of (5) we obtain:

$$dy_t = \sum_i s_{it} dy_{it} + \sum_i y_{it} ds_{it} \qquad (6)$$

Figure 5 shows the relative contributions of sectoral labor productivity growth and labor reallocation between sectors to economy-wide labor productivity growth. It can be seen that labor productivity growth within sectors has been the dominant contributor. The impact of labor reallocation which was negative till 1987-88 has been positive since then. Given that Malaysia has accumulated capital quite rapidly relative to labor, the increase in sectoral labor productivity and its large contribution should not be surprising.

IV. EXPLANING TFP GROWTH

In theory, a large number of policies and factors can contribute to output, capital and TFP growth. There is an extensive cross-country empirical literature that has identified macroeconomic, trade and financial sector policies as being significant factors in explaining output growth [Fischer (1993), King and Levine (1993), Summers and De Long (1993)]. Given the cross-country nature of these studies over relatively long time intervals they tend to capture long-run relationships between the chosen variables. In contrast with the earlier literature we employ time-series data for an individual country rather than cross-country data. In what follows, we would not interpret our results as capturing long-run relationships, rather what we capture are shorter run dynamics in the specific Malaysian setting. We discuss below some of the key policies that influenced TFP growth, at least in the short-run. The longer run relationship between these variables may or may not be similar.

Three structural features of Malaysia stand out. First, its openness. The ratio of exports and imports to GDP for Malaysia at 190% in 1997, is high compared to Korea (77%) and Thailand (93%), Mexico (33%) and Chile (49%). Second, capital inflows. FDI inflows into Malaysia averaged nearly 5% of GDP during 1994-97, while it was less than 2% for Korea and Thailand. Third, Malaysia's financial sector loan leverage and loan growth is amongst the highest in the world. Financial sector loan leverage, defined as the ratio of banking sector loans to the private sector to nominal GDP was nearly 162% at end-1997. This is high in comparison to financial sector loan leverage in Korea (74%), Thailand (145%), Mexico (25%), Chile (60%) and UK (125%). Growth in this ratio averaged 20% during 1992-96. This is comparable to the loan growth in other East Asian countries such as Korea (17%), Thailand (23%), and the Latin American countries such as Chile (23%) during the same period. Mexico's loan growth is low at 8% because of the crisis in 1994-95. How did the banking sector and trade policies, and institutions influence Malaysia's growth process? What were the channels through which these

policies impacted the growth process? Was it largely through capital accumulation or through productivity growth?

Boom in Bank lending: Figure 6 shows the positive association between capital stock growth and growth in the loan/GDP ratio. Figure 7 shows that the *flow* of real bank loans is positively associated with the change in physical capital stock (real investment) over the period 1971-97. These findings are not surprising. Malaysia has had a well developed banking sector and the availability of credit has made rapid rates of investment possible. However, as shown in Figure 8, rapid growth in bank lending relative to GDP appears to be negatively correlated with TFP growth rate. During the period 1971-97, lending by the commercial banks and finance companies grew at nearly 21% per annum over. Nominal GDP growth, on the other hand, averaged 12.5% per annum during this period. Growth in bank lending in excess of GDP growth averaged nearly 8% per annum.

Several factors help explain the boom in bank lending. Guarantee provided by the Government is one such factor. An example of this is Malaysia's privatization program of its infrastructure projects in the 1990s. The guarantees by the government to these projects and the implicit assumption by the banking sector that the government will not let these projects fail, in part, contributed to the growth in bank lending. The Government wanted to maximize the growth objective, and rapid growth in bank lending helped sustain high growth rates in capital accumulation.

Excessive growth in bank lending also arose because of the relatively underdeveloped nature of capital markets in Malaysia. During the period 1995-97, the banking sector accounted for 58% of net funds raised, compared to 15% from the equity market and 11% from the domestic debt market. This over-dependence on the banking contributed to inefficient intermediation of capital (e.g., poor risk management, loan maturity mismatches). The high risk nature of banking (versus fund management, for example) arises from its high gearing and from its massive asset liability mismatches and in particular from the tendency of the banking industry to borrow short and lend long. The implicit government guarantee of deposits may have led to a high gearing of the banking industry to more risky lending and to over investment and hence to boom and bust cycles of the property and share markets.

Finally, some of the institutional and regulatory characteristics of the Malaysian banking sector also help explain the rapid growth in bank lending. For example, in 1994, the Central Bank classified banks into two tiers, Tier One and Tier Two, and doubled the minimum paid-up capital requirements for Tier 1 banks, and allowed them to offer a wider range of financial products. The large minimum paid-up capital requirements led to shareholders of several banking institutions to borrow short-term to enhance their capital base. Instead, capitalization should have taken place through non-debt sources such as internal funds or alternatively, long-term bonds rather than borrowings. Banking institutions which borrowed heavily to fund their capitalization plans had to lend excessively in order to generate sufficient returns to service their debt obligations. This may have contributed towards their deteriorating portfolio quality.

Growth in Foreign Direct Investments and imported capital goods: Figure 9 shows the trend on imported capital goods to GDP and FDI to GDP. FDI increased from around 1-2 percent of GDP in the mid-1980s to nearly 9 percent by 1992. During this period, Malaysia had substantially liberalized its manufacturing sector and capital was absorbed without experiencing declines in TFP growth levels. Figure 10 shows a positive correlation between growth in the FDI to GDP ratio and TFP growth over the period 1971-1997. It confirms earlier findings that countries that are more open to the rest of the world have greater ability to access and absorb technological advances generated in leading nations. These technological advances are often embodied in capital goods imports. Thus, it is not surprising to find a positive correlation between growth in imported capital good to GDP and TFP growth as well.

TFP Growth Equations: Table 2 reports the results of the regression equations. The dependent variable is TFP growth rate, and the right hand side variables are: (a) growth in bank lending to GDP, (b) growth in FDI to GDP, and (c) budget balance to GDP. A better budget balance is expected to be positively associated with TFP growth. A better fiscal balance could signal that the Government is not out of control on macroeconomic policy, and thereby, contribute to TFP growth (Fischer 1993). A budget surplus by crowding in the private sector, may also help improve the TFP growth. All variables were found to be stationary according to the ADF test.

We also include dummy variables which allow us to distinguish four sub periods of Malaysia's recent economic history. The first dummy represents the years 1974 and 1975 which capture the impact of the first oil-shock. The second dummy represents the period before the first oil shock and the period between 1976 and 1984. A third dummy variable is included for the financial crisis of the mid-1980s, covering the years 1985 and 1986. The overall intercept thus covers the 10-year period since 1987 when Malaysia's economy experienced robust growth. Since, these dummy variables cover different phases of growth they also allow us to control for the level of capacity utilization in the economy. This is important since capacity utilization can affect TFP growth independent of the policy environment. During an upswing, increased demand can lead to higher capacity utilization and measured TFP growth.

In column (1) in table 2, the coefficient on growth in bank lending to GDP is negative and significant. A one percentage point increase in the growth of bank lending relative to GDP is associated with a reduction in TFP growth by 0.16 percentage points, after controlling for the effect of the other variables. The coefficient on FDI to GDP ratio is positive and significant. A one percentage point increase in the growth rate of FDI to GDP is associated with 0.04 percentage point increase in TFP growth. The coefficient on budget balance to GDP has the right sign and it is also significant. A one percentage point improvement in the level of budget balance to GDP is associated with 0.30 percentage point increase in TFP growth.

We tried other policy measures on trade policy in the TFP growth equation. Column (3) replaces FDI with imported capital goods. The coefficient on growth in imported capital goods to GDP is positive and significant. A one percentage point increase in the growth rate in the ratio of imported capital goods to GDP is associated with 0.09 percentage point increase in the TFP growth rate. It should be noted that the coefficient on imported capital goods is larger than the

coefficient on FDI, suggesting that technological change is taking place through channels which are broader than FDI. Column (5) uses a traditional measure of openness—growth in exports plus imports to GDP. This variable is significant and it has a positive correlation with TFP growth. However, we can not say with certainty whether an increase in openness is causing the TFP growth to pick up or it is the other way round. We did not find changes in average tariff rate (measured by import revenue to the Government as a ratio of total value of imports) to be significant.

It could be argued that an increase in the growth of bank lending to GDP is endogenous and thus the results reported here may not be robust. We tried to use an instrument to control for the endogeneity of the bank lending variable. Since bank lending is generally based on physical collateral and capital intensity of projects, we used a one year lagged growth in capital-output ratio to instrument for the growth in bank lending to GDP. Table 3 reports the instrumental variable estimate of the TFP growth regression. The coefficient on bank lending to GDP remains significant and negative. The coefficient on FDI, MKG, and budget balance have the right signs and they are also significant.

Sensitivity tests: We carried out sensitivity tests on the TFP growth regression. First, we added another financial policy variable used in the literature—financial depth (M2/GDP). This variable was not significant, and it did not change the sign or significance on the bank lending variable. Second, volatility in inflation can make it difficult to pick good borrowers as it adds to screening and monitoring costs and thus can affect TFP growth. Inflation, however, was not significant. Stability tests based on recursive residuals were performed on all models, and we found coefficients to be stable over the period.

V. WHERE DID THE BANK LENDING GO?

Commercial bank lending, which accounts for nearly 70% of the total bank lending, grew at an average annual rate of nearly 19% in nominal terms over the period 1974-1997 (inflation has not been a problem in Malaysia with CPI inflation rate averaging 3-4% during this period). If we were to include the finance companies and merchant banks, the growth rate in lending would increase to 20%.

Table 4 shows the sectoral allocation of commercial bank lending for three periods, 1974-92, 1993-97, and the entire period. The first two periods correspond to the broad trends in TFP growth. During the period 1993-97, and just prior to the regional crisis, the TFP growth rate was on a downward trend (see Figure 2). The sectoral allocation of bank lending is shown for (a) building, construction and real estate, (b) infrastructure consisting of electricity, transport, storage and communications, (c) purchase of stocks and securities, and (d) manufacturing. Bank lending to building, construction and real estate increased from 21% during the period 1974-1992 to nearly 27% per annum during the period 1993-97. There was an even greater increase in lending to the infrastructure sector from 7% to 44% during the same period. Lending for the purchase of securities increased from 15% to 37% during this period. In contrast, bank lending to the manufacturing sector increased modestly from 19% to 21% during the same period. The

broad property sector, including housing, and purchase of securities account for nearly 45% of the outstanding stock of commercial bank lending. These are the sectors which are vulnerable to changes in asset prices and have a high concentration of non-performing loans and therefore less productive.

Did the regulatory authorities try to slow down credit growth? The Central Bank did introduce financial restraint in March 1997 in the form of ceilings on risky asset holdings, but these measures may have come too late. The Bank issued guidelines on lending to the broad property sector and for the purchase of shares and unit trust funds. Under these guidelines, loans to the broad property sector were subject to the limit of 20% of a banking institution's total loan outstanding, while loans for the purchase of stocks and shares were subject to a 15% of a banking institution's total loans outstanding. These guidelines were not very successful in slowing down the credit growth. Exemptions were given to several types of loans including construction of residential houses, development of infrastructure projects, public utilities and amenities, and for the purchase and construction of industrial buildings. How one should design a "negative" directed lending is another policy issue? This would need to be examined in the broader context of, for example, the design and role of deposit insurance scheme, greater disclosure of information, and the potential role for applying different statutory reserve requirements on individual banks depending on their risk profile and growth characteristics.

VII CONCLUSION

Malaysia has maintained an exceptional growth record over the last quarter century. There is broad agreement that this was largely driven by the growth in physical capital stock. Although the TFP levels have been respectable, its relative contribution to growth has been modest. Moreover, there are signs emerging that the TFP growth may have slowed down in the late 1990s. Sustaining high output growth rates in the future will require placing increased emphasis on productivity improvements.

One lesson that we can draw from the Malaysian experience is that policies that encourage inflow of FDI and improve access to imported capital goods contribute to productivity growth. However, there are other policies that may have slowed down improvements in productivity growth. We find that rapid growth in bank lending relative to GDP is one such factor. While Malaysia managed to mobilize savings (both domestic and foreign) and the rapid growth in bank lending contributed to capital accumulation, it did not help raise productivity growth. Financial restraints, introduced in the form of negative directed lending, speed limits, and ceilings on lending to risky sectors, were not effective. More detailed industry level studies are needed on how financial systems influence TFP growth.

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Table 1: Comparative Growth Decompositions for East Asia

	Sarel (1978-96)				Bosworth and Collins (1974-94)			
	Output Growth per Person	**Growth due to Capital per person**	**Growth due to effective Labor per person**	**Growth due to TFP**	**Output Growth per Worker**	**Growth due to Capital per Worker**	**Growth due to Educ. per Worker**	**Growth due to TFP**
Indonesia	4.74	8.97 (62)	0.93 (13)	1.16 (25)	4.0	2.8 (70)	0.5 (13)	0.7 (18)
Korea					5.8	3.4 (59)	0.7 (12)	1.6 (28)
Malaysia	4.54	6.86 (47)	0.58 (9)	2.0 (44)	3.7	2.3 (62)	0.5 (14)	0.9 (24)
Philippines	0.19	1.8	0.62	-0.78	0.5	1.1	0.5	-1.1
Singapore	5.09	6.45 (42)	1.06 14)	2.23 (44)	5.1	2.7 (53)	0.4 (8)	2.0 (39)
Thailand	5.24	7.32 (41)	1.51 (21)	2.03 (39)	5.2	2.3 (44)	0.6 (12)	2.1 (40)

Figures in parentheses are the contributions to output growth.

Effective labor per person corrects for age related productivity differences of the workforce but not for education.

Table 2: Total Factor Productivity Growth Regressions (OLS)

Dependent Variable: TFPG
Method: Least
Squares
Sample(adjusted): 1971 1997
Included observations: 27 after adjusting
endpoints

	(1)	(2)	(3)	(4)	(5)	(6)
Variable	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
C	0.021	4.394	0.014	2.535	0.012	1.955
D1 (1974-75)	-0.055	-4.486	-0.055	-4.482	-0.057	-4.245
D2 (1971-73, 76-84)	0.027	2.974	0.027	2.963	0.018	1.806
D3 (1985-86)	-0.013	-0.940	-0.008	-0.537	-0.026	-1.774
LOANG	-0.161	-4.071	-0.146	-3.614	-0.112	-2.381
FDIG	0.039	4.531				
MKG			0.089	4.438		
OPENG					0.166	3.650
LOGBB	0.295	3.719	0.270	3.388	0.174	1.958
R-squared	0.851		0.847		0.818	
Adjusted R-squared	0.806		0.802		0.764	
S.E. of regression	0.014		0.014		0.016	
Sum squared resid	0.004		0.004		0.005	
Log likelihood	80.380		80.101		77.740	
Durbin-Watson stat	2.082		1.932		1.856	
Mean dependent var	0.000		0.000		0.000	
S.D. dependent var	0.032		0.032		0.032	
Akaike info criterion	-5.436		-5.415		-5.240	
Schwarz criterion	-5.100		-5.079		-4.904	
F-statistic	18.975		18.518		15.012	
Prob(F-statistic)	0.000		0.000		0.000	

TFPG:	Total Factor Productivity Growth
LOANG:	Growth in (loans/GDP) ratio.
FDIG:	Growth in (FDI/GDP) ratio
MKG:	Growth in (Imported capital goods/GDP) ratio
BB:	Budget balance/GDP
OPENG:	Growth in (exports+imports)/GDP

Table 3: Total Factor Productivity Growth Regressions (Instrumental Variable)

Dependent Variable: TFPG
Method: Instrumental Variable
Sample(adjusted): 1971 1997
Included observations: 27

Variable	Coefficient	t-Statistic	Coefficient	t-Statistic
C	0.032	3.531	0.027	2.491
D1 (1974-75)	-0.045	-2.283	-0.045	-2.175
D2 (1971-73, 76-84)	0.041	2.604	0.041	2.501
D3 (1985-86)	0.016	0.625	0.020	0.750
LOANG*	-0.381	-3.303	-0.380	-2.984
FDIG	0.035	2.519		
MKG			0.069	2.037
LOGBB	0.340	2.646	0.316	2.390
R-squared	0.618		0.591	
Adjusted R-squared	0.503		0.468	
S.E. of regression	0.023		0.024	
F-statistic	8.160		7.572	
Prob(F-statistic)	0.000		0.000	
Mean dependent var	0.000		0.000	
S.D. dependent var	0.032		0.032	
Sum squared resid	0.010		0.011	
Durbin-Watson stat	2.336		2.110	

* Lagged capital-output ratio is used as an instrument.

TFPG:	Total Factor Productivity Growth
LOANG:	Growth in (loans/GDP) ratio.
FDIG:	Growth in (FDI/GDP) ratio
MKG:	Growth in (Imported capital goods/GDP) ratio
BB:	Budget balance/GDP

Table 4: Growth of Commercial Bank Lending by Sector, 1974-97

	Building, Construction, and Real Estate	Infrastructure	Share Purchase	Manufacturing
1974-92	21.1	10.0*	15.0	19.3
1993-97	26.8	43.8	37.0	21.3
1974-97	21.3	18.7*		19.1

* 1980-92 and 1980-97.

Figure 1: Trends in TFP level, Capital and Output per Worker (1970-97)

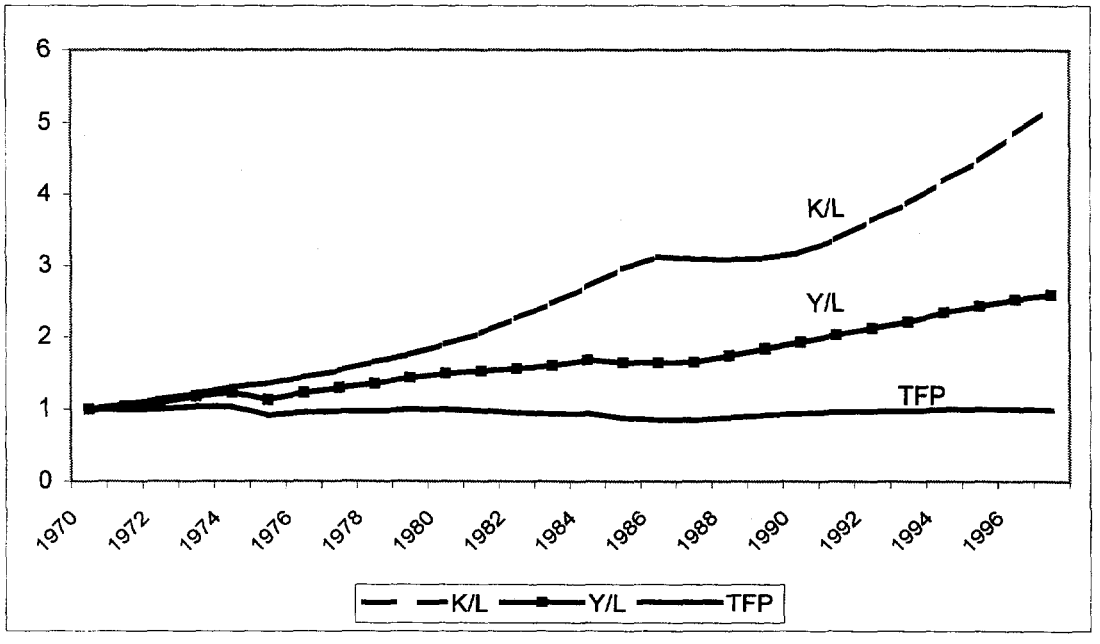


Figure 2: TFP growth (1971-97)

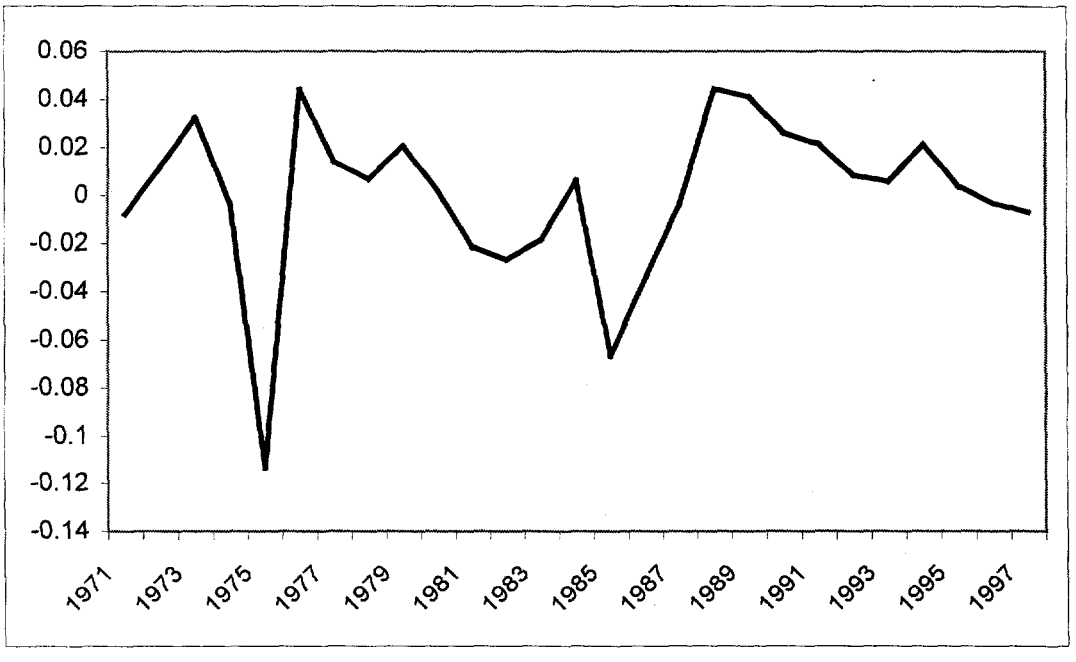


Figure 3: Growth in Capital per worker, Human Capital per worker, and TFP

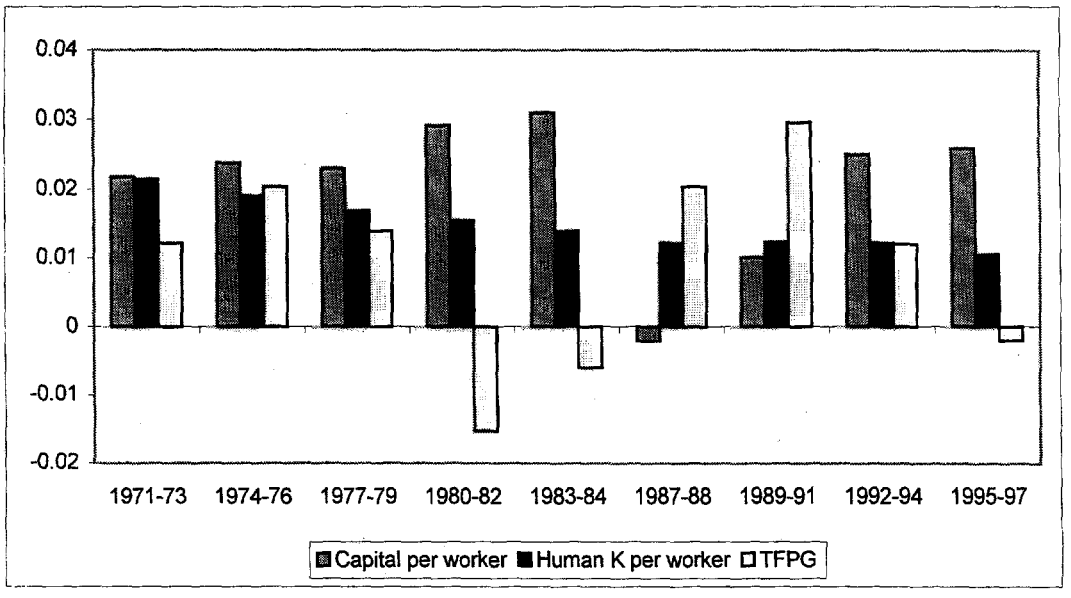


Figure 4: Contribution of Capital per worker, Human Capital per worker, and TFPG to growth in Output per worker

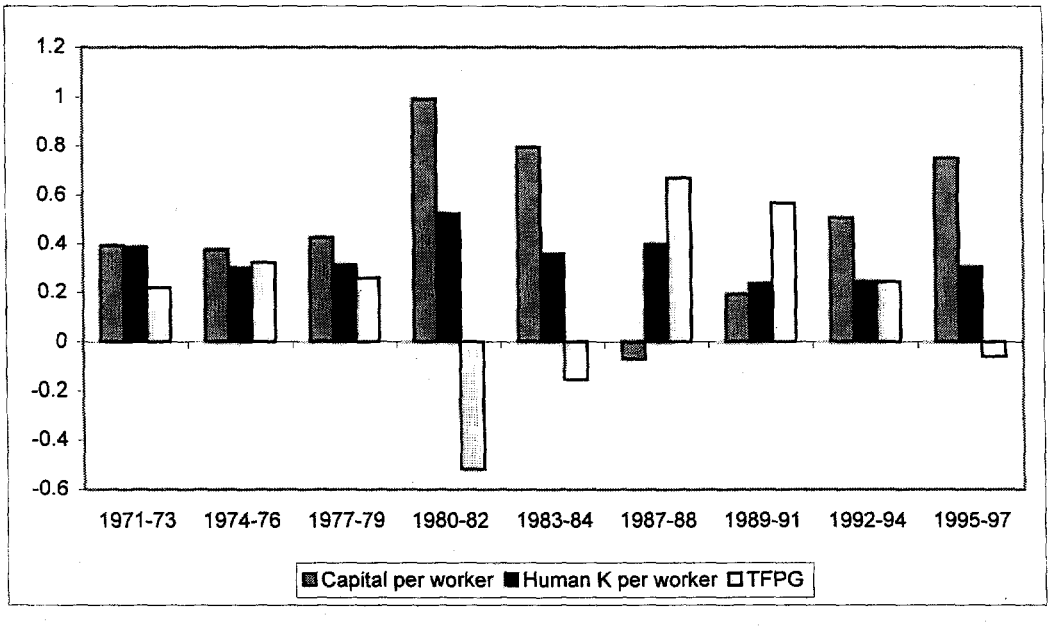


Figure 5: Contributions of Labor Reallocation and Sectoral Labor Productivity Increase to Economy-wide Labor Productivity Growth

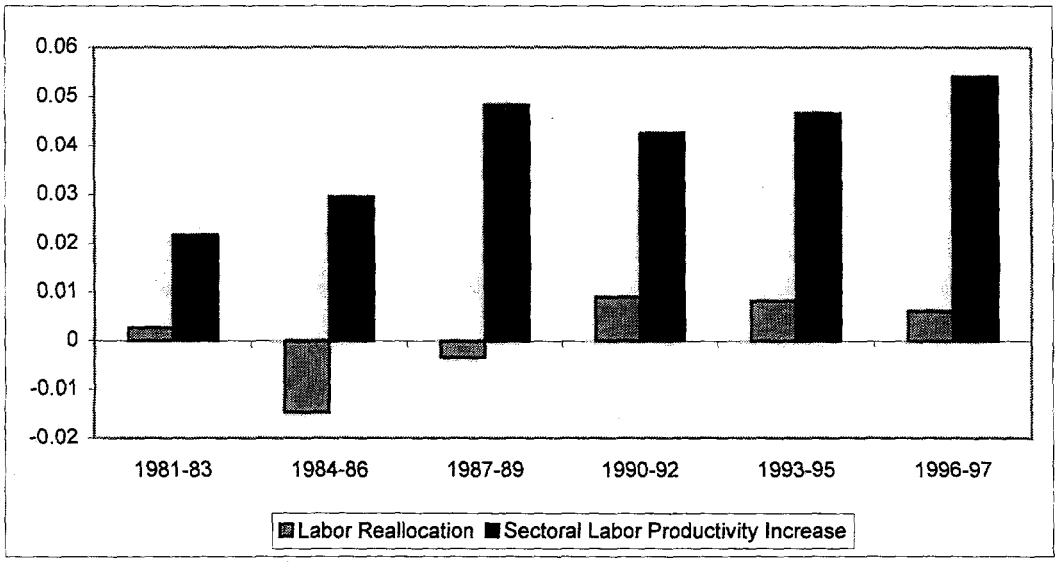


Figure 6: Growth in Capital Stock vs Growth in Loan/GDP

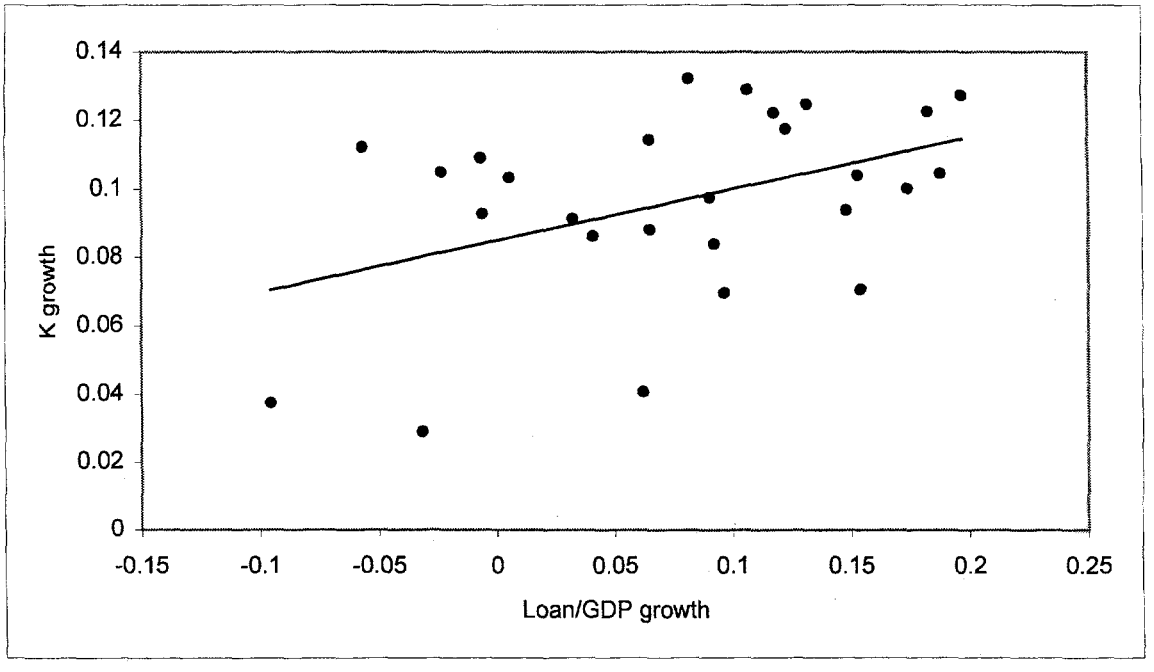


Figure 7: Trends in Real Loan Flows and Real Investment

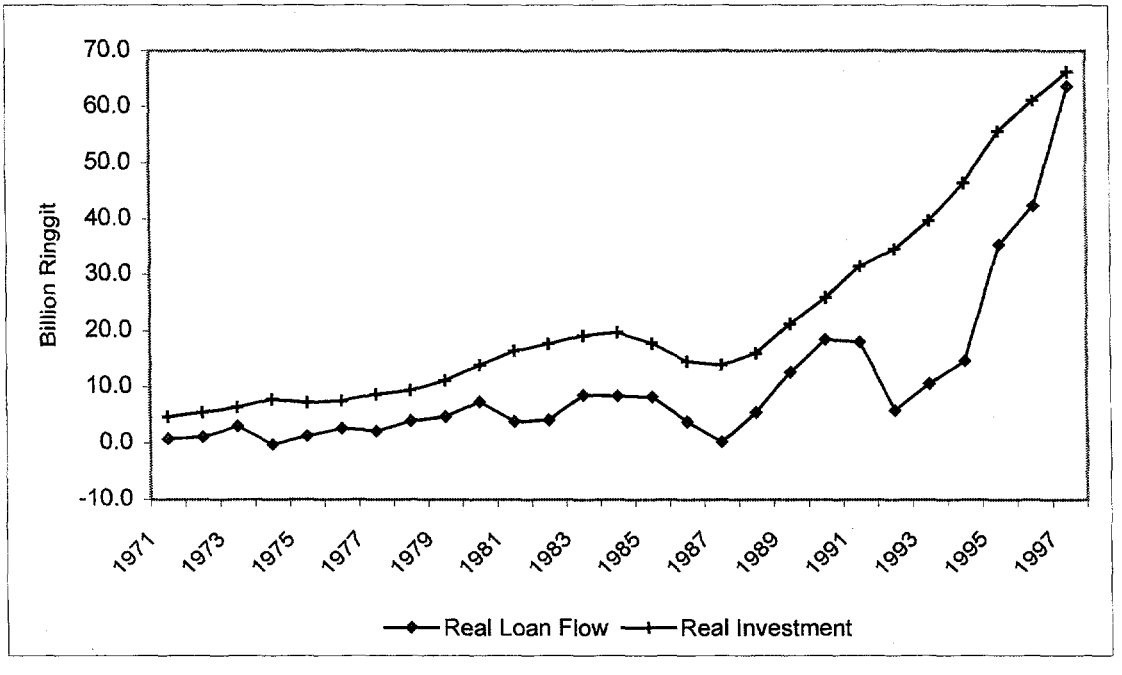


Figure 8: TFPG vs Growth in Loan/GDP

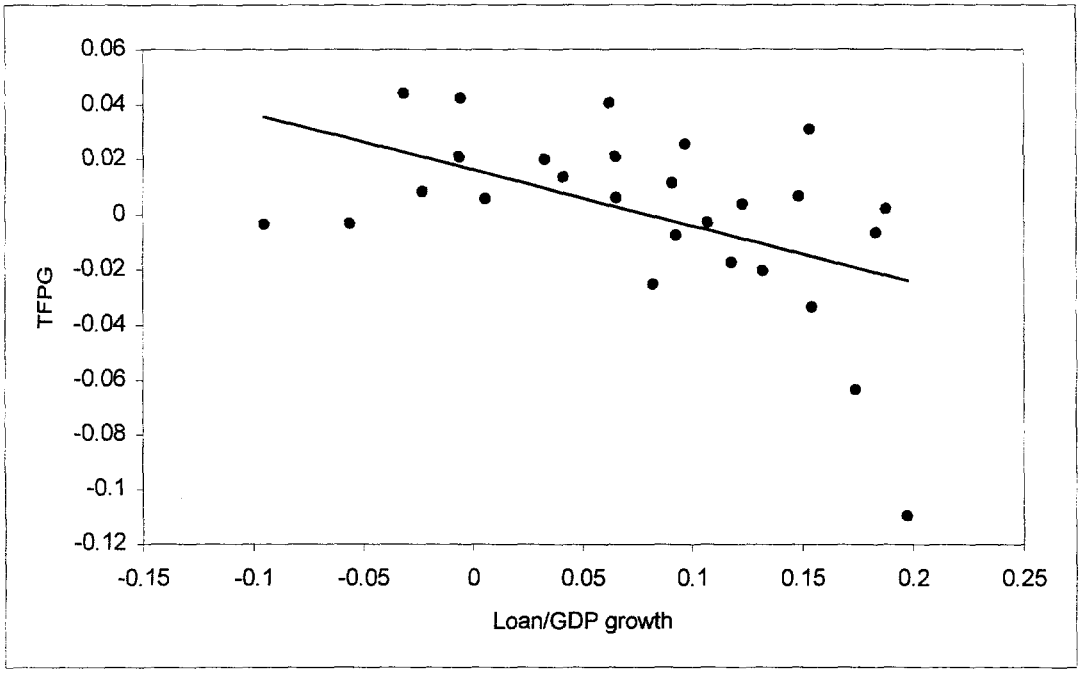


Figure 9: Trends in FDI/GDP and Imported Capital Goods/GDP

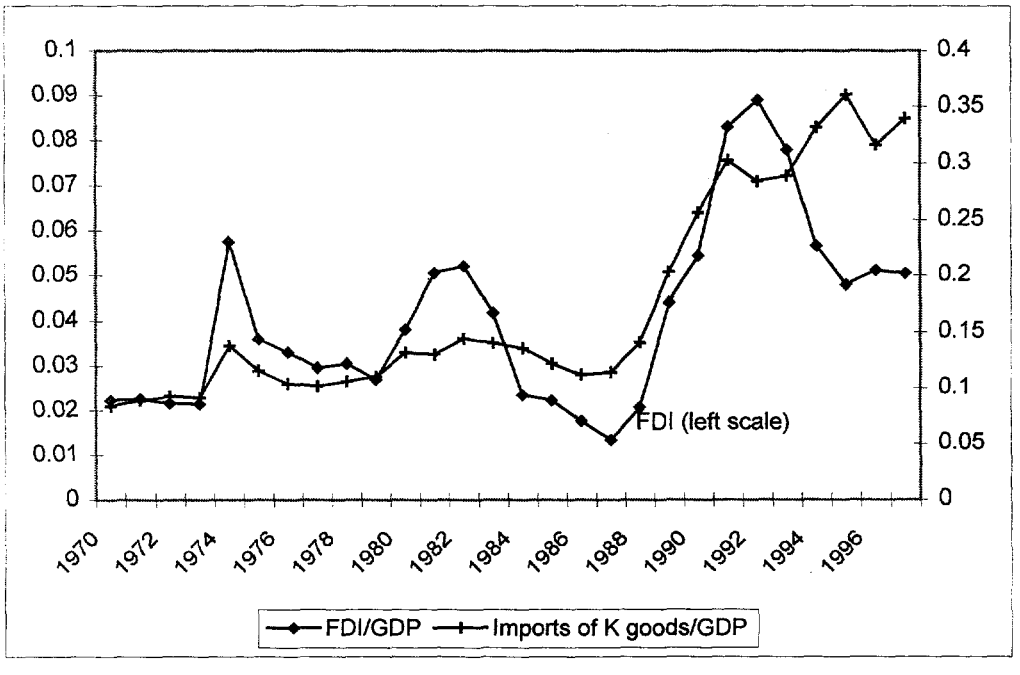


Figure 10: TFPG vs Growth in FDI/GDP

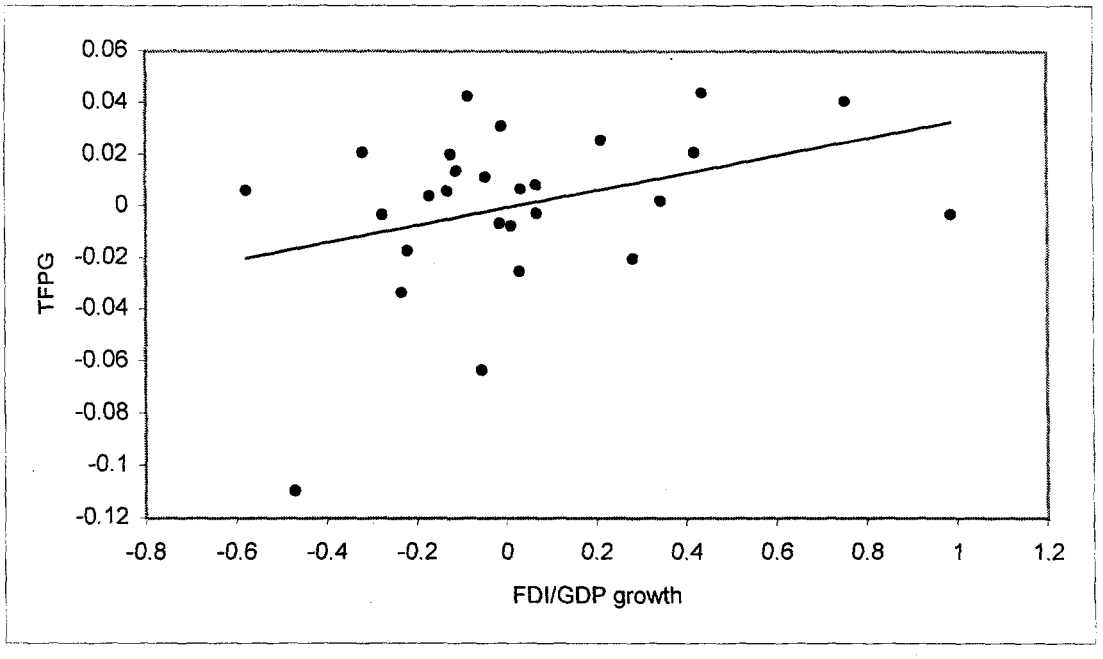
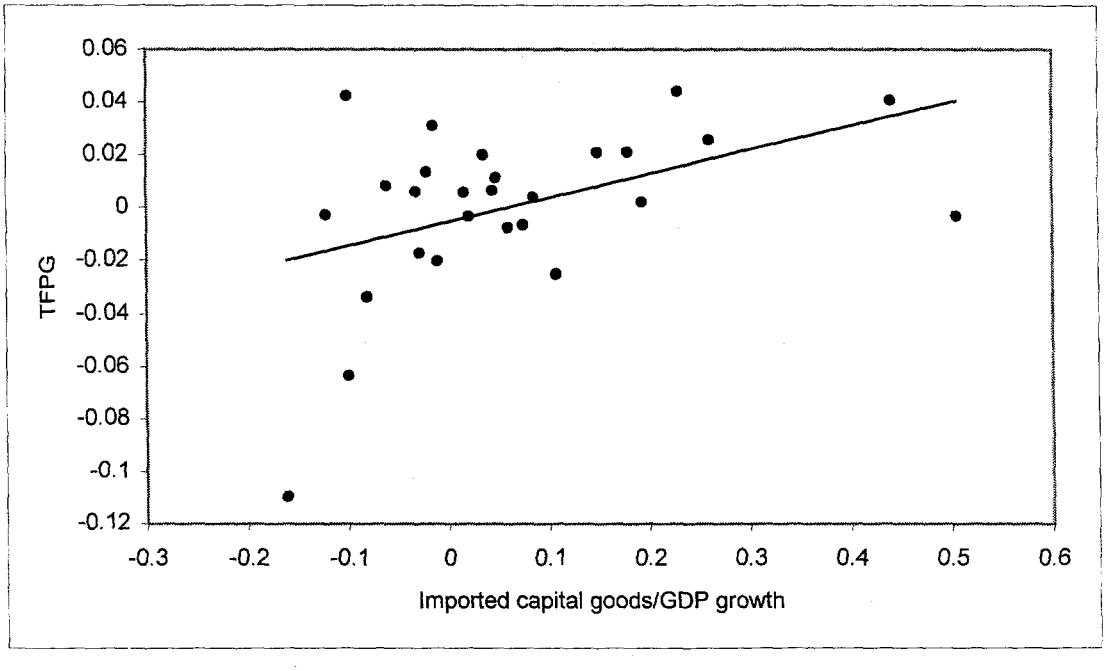


Figure 11: TFPG vs Growth in Imported Capital Goods/GDP



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