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Estimates of Total Factor Productivity in the Philippines

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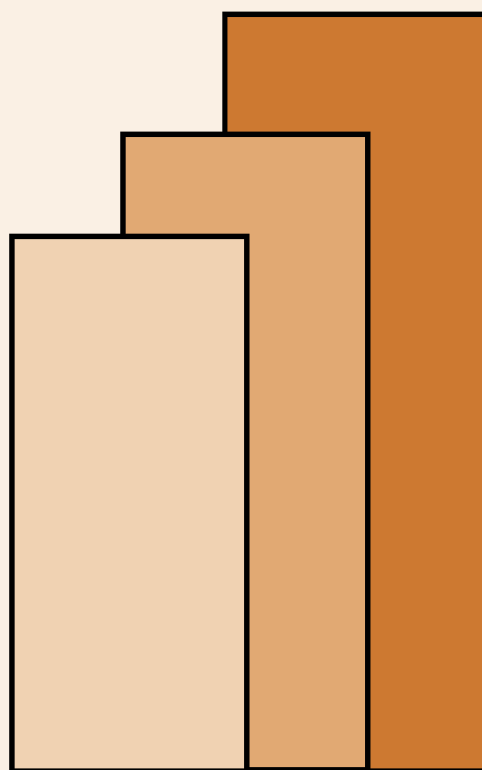
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Estimates of Total Factor Productivity in the Philippines

Abstract

The paper presents an updated TFP estimates in the Philippines. The present estimates were derived using a modified set of methodologies, thus may not be comparable with those derived in the previous estimates (Cororaton and Caparas, 1999). Modifications were introduced in the method for computing sectoral employment, sectoral investment and sectoral capital stock.

Based on the revised TFP estimates, one can observe favorable as well as unfavorable trends. Sectoral estimates showed improving TFP in the 1990s, although a number of the sectoral TFP levels are still negative. However, for the economy as a whole, 1990 saw a slight decline in TFP. This could indicate that there may seem to be some unfavorable resource allocation effects. Looking at the factor intensity results, the growth during the period could generally be described as capital accumulation type of growth. This is particularly true for non-tradable sectors, specially the service-related sectors. The labor-capital ratios and the sources of growth analysis indicate a movement of capital towards these sectors, relative to the rest of the sectors. One factor which may have contributed to this type of resource movement is the prolonged real appreciation of the currency in face of an aggressive trade reform programs in the first half of the 1990s. This kind of an economic environment may not be conducive to production activities, both for domestic consumption and exports. In a period when capital inflow is massive, which actually transpired during the first half of the 1990s, non-tradable, service sectors could become an attractive destination of capital.

Estimates of Total Factor Productivity in the Philippines

Caesar B. Cororaton and Janet Cuenca¹

Introduction

We came out with preliminary estimates of total factor productivity (TFP) in 1999 (Cororaton and Caparas, 1999). In the present paper, we attempted to update the estimates from 1996 to 1998. Also, after a series of discussion with various groups, we introduced substantial improvement in the methodology. In particular, we applied changes to the methodology for computing the sectoral employment, sectoral investment, and sectoral capital stock series. Thus, with these changes, the results of the previous TFP estimates may not be comparable with the present ones. Thus, the two sets of estimates have to be considered in the light of these changes in the methodology.

Total Factor Productivity

Total factor productivity (TFP) in its simplest definition is the ratio between real product and real factor inputs. It is a neoclassical concept of productivity measure that takes into account all factor inputs that go into the production of a certain product². Although the origin of the concept of TFP dates back to the early 1950s in the paper of Tinberger, a German economist, the concept became popularized in the paper of Solow in 1957 in which he investigated the TFP of the US economy. Solow found out that a major part of growth of the US economy was attributed to the growth in TFP.

Productivity is a technical concept measuring efficiency. When only one single input is considered, for example labor input, the notion of productivity is

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² In contrast to the classical Ricardian labor theory of value which states that labor is the only factor input in production.

simple both in interpretation and in measurement. One simply needs to get the ratio between output and labor input to obtain labor efficiency estimate. However, complication arises when there are more than one factor of production, labor and capital for example. In particular, the problem is how to weight the contribution of each of the factors.

The standard form of productivity ratio is

$$(1) \quad A = \frac{Q}{L^{\alpha} K^{\beta}}$$

Equation (1) can be written as

$$(2) \quad A = \frac{Q}{\alpha L + \beta K}$$

where (1) is an arithmetic index and (2) is geometric. A is a measure of productivity index, Q is output, L and K represents labor and capital, and α and β are the weights. The problem of weighing is solved using an aggregate production function which can be written as

$$(3) \quad Q_t = F [K_t, L_t, t]$$

This expresses output as a function of stock of capital, employment, and time³. If time can be separated from L and K, then

$$(4) \quad Q_t = A_t F [K_t, L_t,] \quad \text{and}$$

$$(5) \quad A_t = \frac{Q_t}{F [K_t, L_t]}$$

A_t measures how output will change as time elapses with the input bundle held constant (Felipe 1997). Therefore, productivity is an index of factors

³ The time variable is a proxy for productivity and technical progress.

of production other than labor and capital. These factors are not explicitly accounted for but considerably contributing to output. Some of these factors may be research and development, managerial competence and diffusion of technology.

There are two general ways of estimating TFP. One is through the use of discrete data for national accounting or the growth accounting approach. Another is through the use of econometric estimation of an aggregate production function. The growth accounting approach of estimating TFP was first adopted by Stigler and popularized by Kendrick (1961) and Denison (1962). It uses factor shares in national income as weights in combining the individual factor inputs forming an index of TFP. The weights are further utilized in defining that part of output growth which cannot be defined by the factor inputs. One advantage in this approach is that it provides more room in decomposing the contribution of factor inputs and technological change to output growth.

A general neo-classical production function is given by

$$(6) \quad Y = F(K, L, t)$$

where Y is output, K is capital, L is labor and t is time. Differentiate (6) with respect to time and rearrange terms, the following equation is arrived at

$$(7) \quad \frac{dY/dt}{Y} = \frac{(\delta F/\delta K)K}{Y} \cdot \frac{dK/dT}{K} + \frac{(\delta F/\delta L)L}{Y} \cdot \frac{dL/dt}{L} + \frac{(\delta F/\delta t)}{Y}$$

where $(\delta F/\delta t)/Y$ is the proportional rate of shift of the production function. This represents technological change, or TFP. The $(\delta F/\delta L)L/Y$ and $(\delta F/\delta K)K/Y$ are the factor shares of labor and capital respectively. Simplifying the equation using Y , K , and L , for growth, and S_k and S_l for the share of capital and labor to income, equation 7 becomes

$$(8) \quad Y = S_k K + S_l L + \text{TFP}$$

which can also be written as

$$(9) \quad TFP = Y - S_K K - S_L L$$

Equation 9 can now be used to calculate the sources of economic growth. Similarly, the contribution of labor, capital and technological change can be identified.

Neoclassical economics assumes perfect competition and profit maximization, which in turn would imply infinite price elasticity of demand and factor shares equal to factor elasticities. An alternative form of (9) is

$$(10) \quad TFP = Y - \alpha K - (1-\alpha)L$$

This is the Solow residual⁴. Growth accounting implicitly assumes a well-behaved neoclassical production function that facilitates the decomposition of sources of growth. It becomes important to bear in mind that TFP using this approach is treated as a residual. It proxies as a "catch all" variable and embodies that part of output growth which cannot be explained by increases in factor inputs. It can also be considered as an index of "ignorance" (Chen 1997).

Equation 10 can be further modified with the use of discrete data using the Tornqvist index. It can be shown that

$$(11) \quad \theta_{t,t-1} = \ln \frac{Q_t}{Q_{t-1}} - \Phi_L \ln \frac{L_t}{L_{t-1}} - \Phi_K \ln \frac{K_t}{K_{t-1}}$$

where

$$\Phi_L = \frac{\omega_L L + \omega_{L-1}}{2} \quad \Phi_K = \frac{\omega_K + \omega_{K-1}}{2}$$

⁴ Recall the Y, K, and L are growth rates.

These last two terms denote the share of factor inputs in total factor payments.

In this paper the growth accounting approach is applied. In particular, a translog form is used. This can be written as,

$$(12) \quad TFP_i = [\ln Q_i(t) - \ln Q_i(t-1)] - v_{iL} * [\ln L_i(t) - \ln L_i(t-1)] - v_{iK} * [\ln K_i(t) - \ln K_i(t-1)]$$

where

$$v_{iL} = \frac{1}{2} * (v_{iL}(t) - v_{iL}(t-1))$$

$$v_{iK} = \frac{1}{2} * (v_{iK}(t) - v_{iK}(t-1))$$

\ln is the natural logarithm operator, Q_i value added of sector i , v_{iL} , v_{iK} average factor shares, L_i employment, and K_i is capital service. This approach can generate annual estimates of TFP.

Data

The TFP estimation in the paper is done both at the national and sectoral level. The strategy adopted was to start at the national level, utilising information from the national income accounts (NIA). From the national level, data for the sectoral level analysis were constructed using appropriate distribution shares. In particular, this pertains to the construction of sectoral investments and capital stock because there are available data on these variables.

This strategy was adopted because NIA is updated regularly. Thus, with regular updates of the NIA, regular TFP updates can also be done. Furthermore, this strategy has the advantage of reducing the possibility of accumulated error at the national level TFP estimates as compared to a method of adding up sectoral estimates to come up with national estimates. Data errors which may be committed at the sectoral level may add up when computing for the national estimates. This may result in higher accumulated error at the national level.

Because of data constraints the TFP estimation covers only the period 1980 to 1998. A longer series would have been preferable because it could generate long-term movement of TFP estimates, but this would not be possible because one major set of information used in the estimation of TFP, the factor payment shares at the sectoral level, is available only starting 1980. A detailed, step-by-step procedure was used to construct the database presented in Appendix A.

Gross value added. Gross value added (GVA) is used as output in the sectoral estimation, while gross domestic product (GDP) is used in the national TFP estimation. Since updates for both GDP and sectoral GVA come out regularly, it is possible to do regular updates for the TFP indicators at both levels. Factor payments to labor and capital (wage compensation, and mixed income and operating surplus, respectively) at sectoral level are also available regularly on an annual basis. Thus, with GVA, the effects coming from the raw materials are not accounted in the TFP estimates.

Both GDP and sectoral GVA are expressed in real prices using their respective implicit price indexes, which are also available from the NIA. The price indexes are in 1985 prices.

Labor. One major difference between the previous TFP estimates and the present ones is the labor data used. Although in both estimates employment data were used, the methods of constructing the sectoral employment were different. In the present estimates, national and sectoral employment data were taken directly from the employment data series of the Department of Labor and Employment (DOLE). This served as the labor input in the TFP estimation. However, in the previous estimates, although the same national employment data series was used, the sectoral employment was based on the distribution shares derived from the Annual Survey of Establishments (ASE) of the National Statistics Office (NSO) for establishments with 10 or more employees. The main motivation behind this was to make the sectoral employment data consistent with the estimation of sectoral investment which was derived using ASE distribution shares.

However, when the previous TFP were analysed in various discussion groups, what came out was a suggestion to utilize directly the employment data from DOLE.

Capital Stock. Usually, one of the major problems encountered in TFP estimation is the unavailability of capital stock series. The problem is amplified if one goes down to the sectoral level because not only sectoral capital stock data series are unavailable, sectoral investments data are not available as well. Appendix A shows a detailed procedure used to construct capital stock series at the national and sectoral level. In essence, the procedure starts with the gross domestic capital formation GDCF (investment at the national level) which is available from the NIA. This GDCF series is then distributed into sectoral investment using a set of derived sectoral investment shares computed using the sectoral gross additions to fixed assets (GAFA) from the Annual Survey of Establishment (ASE) of the National Statistics Office (NSO). The capital stock series were derived using the perpetual inventory method⁵.

Capacity Utilisation. Capital services are the ones needed in the analysis, instead of the level of capital stock. To arrive at this set of information, the derived capital stock series were adjusted by capacity utilisation. In the study capacity utilisation index was derived using the peak-to-peak method on both real GDP and real sectoral GVA. A detailed analysis appears in Appendix A.

Estimates and Analysis

For purposes of analysis, the whole period was divided into two sub-periods, 1980-1989 and 1990-1998. However, computations for finer sub-period breakdown are also available in the attached tables, but they are not discussed here.⁶

⁵ The task of computing for the sectoral investment would have been a lot easier and the result would have been more accurate if sectoral investment were available. However, there is an ongoing effort in the National Statistical Coordination Board (NSCB) to construct a time series for sectoral investment. The derived investment series in this paper can be checked against these numbers when they come out officially. If there are significant deviations, then the estimates of this paper can be revised accordingly.

Figure 1 shows the movement of the annual TFP. The first half of the 1980s generally saw negative TFP. This is largely attributed to the mid-1980 political and economic crises. Strong recovery though was observed in the second half of the 1980s. TFP estimates show generally poor performance in 1990s. A host of factors may be behind such performance which may include the political crisis, the energy crisis, and the series of natural calamities in the early 1990s. Although economic recovery was observed starting 1993, TFP performance did not show any improvement. This may be due to the economic adjustment process of the structural reforms implemented during the period. In 1996, TFP took even a further dip. In 1997 and 1998 TFP remained negative, but slightly lower than in 1996. The negative TFP may be due to the ripple effects from the Asian regional crisis.

Figure 2 shows the sub-period breakdown of the sectoral estimates for TFP. The results indicate a number of interesting points:

- a. Generally, the non-tradable sectors are the ones behind the poor overall TFP performance of the economy. They are the ones with relatively huge negative TFP especially during the 1980s.
- b. Except for the utilities sector, all sectors showed an improvement in the TFP from the 1980s to the 1990s. Agriculture and mining showed positive TFP. The manufacturing sector showed a much lower negative TFP for the 1990s relative to the 1980s. This pattern holds true for construction, transportation and communications, trade, finance and dwellings, and other services.
- c. The utilities sector showed positive TFP for both sub-periods. However, the TFP for the 1990s is much lower than the 1980s.
- d. However, the national economy estimates showed a slight deterioration in TFP in the 1990s relative to the 1980s which is not generally reflected in the sectoral results, except for the utilities sector. Since the computations of the national TFP estimates were done separately from the computations of the sectoral TFP estimates, the difference could capture the resource allocation effects of movements of factors across sectors through

⁶ The five different sub-period breakdowns are included in the attached tables.

time. Since the effect on the overall economy is negative, i.e., a slight decline from the 1980s to the 1990s, the resource allocation effects may be negative.

Figure 3 shows the sectoral factor intensity ratios; the labor-capital ratios of the sectors. Generally, the results indicate a movement of capital to non-tradable sectors during the 1990s. There is a sharp decline in the ratios from the 1980s to the 1990s (meaning capital growth was much faster than labor growth) for construction, trade, and other services. There was also a decline in the ratio for agriculture, but not as much as the decline in the sectors mentioned. Similarly, manufacturing, transportation and communications, finance and dwellings also saw marginal decline in the labor-capital ratios during the period. On the whole, however, there was a slight increase in the labor-capital ratio for the economy level, which could be attributed to the marginal increase in the ratio for mining and utilities, which are both very capital intensive sectors.

Table 2c shows the results of the sources of growth computations. For the entire period considered in the analysis, growth was generally due to capital accumulation. Except for the manufacturing sector, the contributions of capital growth are all positive.

Although the contribution of TFP was negative for the whole economy, there was actually an improvement during the 1990s. From a negative contribution during the 1980s, it flipped to a slightly positive contribution during the 1990s. The pattern for agriculture is similar: from negative TFP contribution in the 1980s to positive contribution in the 1990s. For mining, manufacturing, and utilities the contribution of TFP growth was positive during the two decades. However, there was a significant slowdown during the 1990s relative to the 1980s. Generally, for non-tradables, particularly the service-related sectors, capital accumulation type of growth was evident. The contribution of TFP was negative.

Based on the TFP computations, there are favorable as well as unfavorable trends observed. Sectoral estimates showed improving TFP in

the 1990s, although a number of the sectoral TFP levels are still negative. However, for the economy as a whole, 1990 saw a slight decline in TFP. This could indicate that there may seem to be some unfavorable resource allocation effects. Looking at the factor intensity results, the growth during the period could generally be described as capital accumulation type of growth. This is particularly true for non-tradable sectors, specially the service-related sectors. The labor-capital ratios and the sources of growth analysis indicate a movement of capital towards these sectors, relative to the rest of the sectors. One factor which may have contributed to this type of resource movement is the prolonged real appreciation of the currency in face of an aggressive trade reform programs in the first half of the 1990s. This kind of an economic environment may not be conducive to production activities, both for domestic consumption and exports. In a period when capital inflow is massive, which actually transpired during the first half of the 1990s, non-tradable, service sectors could become an attractive destination of capital.

Previous studies on TFP in the Philippines showed similar negative contribution of productivity to growth. Productivity has to improve because a capital accumulation type of growth may not be sustainable in the long run. A substantial amount of effort needs to be exerted to reverse this trend. One area which is of key importance is research and development (R&D). In a comprehensive study on R&D done in PIDS (see Cororaton 1999)⁷, it was observed that, not only there was an underinvestment in R&D in the Philippines, there was also an inefficient allocation of very limited R&D resources to various sectors. On relative terms, sectors which contribute much to the economic pie get small R&D resources. Furthermore, there is a severe shortage of R&D personnel and a very inefficient institutional setup in the S&T sector. Inefficiency is quite evident in the very weak linkage between government-funded R&D institutes with the private sector. Unless the R&D and S&T sector is re-organized, TFP as a major source of economic growth

⁷ Cororaton, C.B., 1999. "Study on Public and Private Expenditure on Research and Development: An Integrative Report". PIDS Discussion paper 99-15.

may be not realized even in the medium term. One should note that R&D is a major determinant of TFP⁸.

⁸ See footnote 4.

Appendix A: Data Base

The sectoral breakdown includes: (1) agriculture, (2) mining, (3) manufacturing, (4) construction, (5) utilities, (6) transportation, (7) trade, (8) finance and dwellings, and (9) services. The estimation at the national level utilized data from the NIA and employment from the labor statistics. On the other hand, the sectoral estimation used data from the NSO, in particular from the ASE to generate distribution shares to break down total investment data from the NIA. The values of the following variables were sourced from the NIA:

1. Total Gross Domestic Products (GDP), sectoral GDP, their respectively implicit price deflators (IPI), 1985=100.
2. Compensation, total and sectoral
3. Mixed income, total and sectoral
4. Net operating surplus, total and sectoral
5. Depreciation, total and sectoral

The data series covers the period from 1980 to 1998. For purposes of TFP estimation, mixed income and net operating surplus were lumped to form the payment to capital input. Since only labor and capital were considered as factor inputs in the analysis, depreciation was deducted from GDP to satisfy the accounting identity that the sum of payment to labor and capital equals output (value added), i.e., $Q = w \cdot L + r \cdot K$, where Q is output (value added), L employment, w wage, K capital, and r rate of profit.

Both total value added and sectoral value added were deflated by their respectively 1985 implicit price deflators to convert into 1985 prices (Table A1). The sectoral breakdown of value added into compensation and surplus is shown in Table A2.

Gross Domestic Capital Formation, hereafter referred to as total investments, was sourced from the NIA. One of the main problems encountered in the paper was how to break down total investment into

Total investment was sourced from the NIA. To break it down to the sectoral level, data from ASE were utilized. In particular, information on the Gross Addition to Fixed Assets (GAFA) of the ASE was used. Another major deviation of the previous TFP estimates from the present estimates is in the calculation of the sectoral distribution of investment using the GAFA data. In the previous estimates, because of the observed wide variability of sample sizes in the ASE through time, a normalization using the number of establishments was applied. However, staff of the NSO commented that this normalization is not necessary anymore because data in the ASE are already national estimates. Thus, upon their suggestion the normalization was dropped in the present estimates.

Another problem encountered was that ASE for the agriculture sector covers the period from 1988 to 1997 only. Thus, there was the problem of extending the series backwards to earlier years. The methodology applied was through a regression analysis where the derived GAFA share for agriculture was regressed against the real growth of the agriculture sector for the period covering 1988 and 1994. This regression analysis was based on the fact that the movement of the GAFA share for agriculture follows generally the movement of real growth of agriculture during the period, especially the turning points (Figure A1).

Using the results from this regression the share of GAFA of the agriculture sector for the earlier years were derived as predicted values.⁹

⁹ The regression results are: (share of agri. GAFA) = 0.1.389 + 1.535* (real growth of agri)
(t=0.623) (t=1.560)
& R² = 0.288.

However, in other years when there is no information available, either a simple or a four-year moving average method was applied to fill up the data gap. Simple average was applied to 1983 and 1985, while four-year moving average was applied to 1980 and 1998. These computed investment shares were applied to the total investment (in 1985 prices) to derive the sectoral investment data which is shown in Table A4.

In the estimation of the capital stock series rate of depreciation is needed. Again, there is no readily available information on this variable. However, there is information in the ASE which can be utilized to derive the rate of depreciation, both at the national and sectoral level. These variables are the sectoral book value of fixed assets and the depreciation expenses. In ASE information on these variables are reported as end-of-year values. Thus, to account for this the following average sectoral depreciation rates formula (i.e. average for the entire period) was devised:

$$d_i = 1/T \{ \sum (Dep_i^t / NOE_i^t) / ((BV_i^{[t-1]} - LD_i^{[t-1]}) / NOE_i^{[t-1]}) \}$$

where i is sector, t year, depreciation rate, T number of years in the period, Dep depreciation expense available in the ASE, NOE number of establishments, BV total book value of fixed assets, and LD land value. The depreciation rate for the entire economy was derived as the weighted of these computed sectoral depreciation rates, where the weights are the sectoral value of the difference between the book value of fixed assets and land value for the period 1988 and 1997. The results are shown in Table A5.

Ideally, it is capital services that go into the TFP estimation instead of capital stock. However, there is no available information on capital services. Thus, in empirical work the derived capital stock series is usually adjusted by an estimated capacity utilization.

Sectoral capacity utilization rate was derived using the peak-to-peak method. The steps involved were:

1. Regress the sectoral value added in constant real prices against a trend variable.
2. Based on the results of the regression, compute for the trend.
3. Divide the sectoral value added by the computed trend value of the variable to get the cyclical/irregular component of the series.
4. Connect the peak points of item #3 and develop a straight line out of these peak points. Points along this straight line are considered 100 percent capacity utilisation.
5. Derive the results of item #3 with the results of item #4 to get the annual capacity utilisation rate.

The results of the computation are shown in Table A6.

In the estimation of capital stock a two-step procedure was applied: the estimation of initial capital stock, and the estimation of the capital stock series. Initial capital stock was estimated using the methodology adopted by Martin and Warr (1990) and Austria and Martin (1995). In this method the logarithm of the derived investment series was regressed against a time trend to obtain its average growth and a trend value of investment at the beginning of the sample, 1980, I_0 . Making the conventional assumption that capital stock was in a steady state at time t_0 , initial capital stock at the level, K_{0i} can be computed using the following formula

$$K_{0i} = I_{0i} / (g_i + d_i)$$

where g_i is the period average sectoral investment growth and d_i period average depreciate rate. This formula was used to derive both sectoral and economy-wide initial capital stock.

In computing for the capital stock series the traditional method perpetual inventory method was applied

$$K_{ti} = K_{t-1,i} * (1 - d_i) + I_{ti}$$

where K_t is capital stock in year t , K_{t-1} capital stock in previous year, d_i average depreciation rate, and I_t investment in year t . For the 1980, the initial capital stock is K_{0i} . The results are shown in Table A7.

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Table 1. TFP Estimates Using Translog Index Method

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981	-0.02777	-0.24808	0.08607	-0.07593	-0.30538	-0.01906	-0.21303	-0.35571	-0.29522	-0.06042
1982	-0.01849	-0.00270	0.04773	-0.08575	-0.23614	0.09341	-0.19087	-0.25948	-0.23063	-0.02758
1983	-0.03964	0.01857	-0.20346	-0.09737	-0.42065	-0.05250	-0.15898	-0.20290	-0.13338	-0.06049
1984	-0.01146	0.08009	-0.01099	-0.09444	-0.14775	0.07669	-0.10670	-0.01857	-0.07924	-0.03196
1985	0.01382	0.00100	0.16591	0.04638	-0.23519	0.01278	0.07997	-0.02186	0.01700	-0.03852
1986	0.03366	-0.06467	0.05233	0.01138	-0.01674	0.13016	-0.03585	-0.07258	-0.06858	-0.02376
1987	0.03748	-0.04105	-0.02572	-0.00553	0.09314	-0.06799	-0.07444	-0.19680	-0.08217	-0.06794
1988	0.02916	-0.04790	0.02748	-0.04020	-0.14689	0.13134	-0.07209	-0.21941	-0.22088	-0.00642
1989	0.00755	-0.17771	-0.02001	-0.06393	-0.29356	0.06852	-0.01993	-0.14440	-0.04454	-0.05665
1990	-0.00013	0.03052	0.11764	-0.02551	0.00405	0.05892	-0.03048	-0.11908	-0.35955	-0.01597
1991	-0.00996	-0.04519	0.01322	-0.01430	-0.15605	0.00238	-0.03395	-0.06324	-0.07974	-0.07044
1992	-0.00653	0.04706	0.04205	-0.00412	-0.01349	0.04919	-0.04432	-0.21025	-0.04959	-0.04726
1993	-0.00986	0.04973	0.08674	0.00051	-0.01370	-0.03247	-0.11148	-0.04541	-0.05794	-0.00931
1994	-0.00919	0.03442	0.09958	-0.03007	0.01507	0.00986	-0.05073	-0.06897	-0.04860	-0.03445
1995	-0.00458	0.04991	0.04801	-0.02535	-0.03095	0.05206	-0.09355	-0.03863	-0.01727	-0.03285
1996	-0.02019	0.07876	-0.08821	0.03154	-0.15069	0.03438	-0.15504	-0.06852	-0.11143	0.00132
1997	-0.01620	0.08403	0.03479	-0.00301	-0.00473	-0.03814	-0.09658	-0.01720	-0.01087	-0.01982
1998	-0.01226	0.05305	0.10992	-0.00054	-0.07372	0.01016	-0.05176	-0.02314	-0.01173	-0.02814

Source: Authors' estimates

Table 2a. Growth of Production Variables

Average TFP										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1989	0.00270	-0.05361	0.01326	-0.04504	-0.18991	0.04148	-0.08799	-0.16575	-0.12641	-0.04153
1990-1998	-0.00988	0.04248	0.05153	-0.00787	-0.04714	0.01626	-0.07421	-0.07271	-0.08297	-0.02855
1981-1998	-0.00359	-0.00556	0.03239	-0.02646	-0.11852	0.02887	-0.08110	-0.11923	-0.10469	-0.03504
Average Growth*										
GVA	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1989	0.01616	0.01282	0.01711	0.00996	-0.03851	0.03756	0.03651	0.02660	0.02107	0.04204
1990-1998	0.02640	0.00866	-0.00409	0.02355	0.03785	0.04933	0.03722	0.03459	0.03620	0.03320
1981-1998	0.02128	0.01074	0.00651	0.01676	-0.00033	0.04345	0.03687	0.03059	0.02863	0.03762
Average Growth*										
Labor	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1989	0.02953	0.01470	0.04505	0.02605	0.04993	0.05198	0.04300	0.06409	0.02354	0.04042
1990-1998	0.02690	0.01102	-0.03739	0.01770	0.06051	0.04944	0.06057	0.03739	0.05820	0.03798
1981-1998	0.02822	0.01286	0.00383	0.02188	0.05522	0.05071	0.05178	0.05074	0.04087	0.03920
Average Growth*										
Capital	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1989	0.00843	0.07897	-0.02801	0.06405	0.24285	-0.02607	0.15307	0.21015	0.17211	0.17562
1990-1998	0.04005	-0.04408	-0.07360	0.03414	0.11645	0.02555	0.13180	0.11949	0.12919	0.10816
1981-1998	0.02424	0.01744	-0.05080	0.04910	0.17965	-0.00026	0.14243	0.16482	0.15065	0.14189

* defined as $[\ln ()t] - [\ln ()t-1]$

Table 2b. Input Productivity and Factor Intensity

Labor/GVA ('000/P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1989	0.03367	0.06893	0.01501	0.01284	0.02093	0.00643	0.02931	0.02931	0.00694	0.05299
1990-1998	0.03445	0.06699	0.01478	0.01361	0.03123	0.00712	0.03523	0.03218	0.00731	0.05239
1981-1998	0.03404	0.06801	0.01490	0.01320	0.02581	0.00675	0.03212	0.03067	0.00711	0.05271
Capital/GVA (both in P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1989	2.03642	0.26963	25.83888	1.79683	0.16663	47.42305	2.27637	0.15013	0.45249	0.21729
1990-1998	1.90791	0.31011	12.21622	2.17506	0.47833	27.49886	4.71445	0.46317	1.31336	0.56077
1981-1998	1.97554	0.28880	19.38604	1.97599	0.31428	37.98528	3.43125	0.29841	0.86027	0.37999
Labor/Capital ('000 / P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1989	0.01656	0.26145	0.00064	0.00735	0.18450	0.00014	0.01433	0.23438	0.01831	0.27390
1990-1998	0.01806	0.22147	0.00124	0.00626	0.06551	0.00026	0.00782	0.07190	0.00559	0.09609
1981-1998	0.01727	0.24251	0.00092	0.00683	0.12813	0.00020	0.01125	0.15742	0.01229	0.18968

Table 2c. Sources of Growth

[illegible]

Table 3a. Growth of Production Variables

Average TFP	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	-0.02864	-0.07740	-0.02322	-0.08635	-0.32072	0.00728	-0.18763	-0.27270	-0.21975	-0.04950
1984-1985	0.00118	0.04054	0.07746	-0.02403	-0.19147	0.04474	-0.01336	-0.02022	-0.03112	-0.03524
1986-1990	0.02154	-0.06016	0.03034	-0.02476	-0.07200	0.06419	-0.04656	-0.15046	-0.15514	-0.03415
1991-1992	-0.00825	0.00093	0.02764	-0.00921	-0.08477	0.02579	-0.03913	-0.13674	-0.06467	-0.05885
1993-1996	-0.01096	0.05320	0.03653	-0.00584	-0.04507	0.01596	-0.10270	-0.05538	-0.05881	-0.01883
1997-1998	-0.01423	0.06854	0.07236	-0.00178	-0.03923	-0.01399	-0.07417	-0.02017	-0.01130	-0.02398
1981-1998	-0.00359	-0.00556	0.03239	-0.02646	-0.11852	0.02887	-0.08110	-0.11923	-0.10469	-0.03504
Average Growth* GVA	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.02513	0.00227	-0.02375	0.01362	0.02582	0.04778	0.04592	0.04366	0.02592	0.08257
1984-1985	-0.07002	-0.01204	0.13488	-0.08994	-0.43276	0.05017	-0.01358	-0.04532	-0.09944	-0.03154
1986-1990	0.04955	0.02762	-0.01188	0.05364	0.10505	0.01547	0.04848	0.05147	0.07228	0.05018
1991-1992	-0.00198	0.00919	0.01521	-0.01068	-0.07186	0.03841	0.00186	0.01040	-0.00669	0.01005
1993-1996	0.03988	0.03826	-0.06282	0.04037	0.08425	0.06334	0.04037	0.04251	0.04810	0.03830
1997-1998	0.02219	-0.04947	0.09947	0.01616	0.03176	0.06541	0.07271	0.03108	0.04808	0.03415
1981-1998	0.02128	0.01074	0.00651	0.01676	-0.00033	0.04345	0.03687	0.03059	0.02863	0.03762
Average Growth* Labor	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.03932	0.03489	0.03660	0.00452	0.04310	0.07321	0.04928	0.07369	0.02106	0.05027
1984-1985	0.02197	0.00552	0.01575	0.01407	0.01744	0.02740	0.02541	0.08756	0.03108	0.02712
1986-1990	0.02064	0.00025	0.01493	0.03794	0.06296	0.02267	0.03579	0.04302	0.02325	0.03387
1991-1992	0.03953	0.04770	0.02798	0.04432	0.05101	0.04002	0.06275	0.01361	0.03983	0.02788
1993-1996	0.03436	0.02055	-0.06576	0.01658	0.08699	0.06496	0.07573	0.05073	0.08104	0.03482
1997-1998	0.01314	-0.03155	0.03005	0.00370	0.03250	0.09257	0.06303	0.03593	0.04513	0.06809
1981-1998	0.02822	0.01286	0.00383	0.02188	0.05522	0.05071	0.05178	0.05074	0.04087	0.03920
Average Growth* Capital	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.05945	0.09031	-0.03205	0.12990	0.55879	0.03238	0.30388	0.35293	0.29760	0.31811
1984-1985	-0.10249	-0.06817	0.07924	-0.08654	-0.45617	0.00119	-0.00402	-0.03997	-0.08791	-0.03452
1986-1990	0.03110	0.10975	-0.07719	0.08809	0.31886	-0.08162	0.11049	0.22275	0.26082	0.17913
1991-1992	-0.00628	-0.00115	-0.05585	-0.01020	-0.04249	-0.00118	0.03395	0.17090	0.06069	0.15104
1993-1996	0.05710	-0.02322	-0.13130	0.05152	0.18174	0.03924	0.16968	0.10619	0.11141	0.09926
1997-1998	0.04582	-0.13709	0.02302	0.02047	0.11668	0.07466	0.18058	0.05378	0.06179	0.03698
1981-1998	0.02424	0.01744	-0.05080	0.04910	0.17965	-0.00026	0.14243	0.16482	0.15065	0.14189

* defined as $[\ln ()t] - [\ln ()t-1]$

Table 3b. Input Productivity and factor Intensity

Labor/GVA ('000/P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	0.03043	0.06655	0.01296	0.01148	0.01168	0.00620	0.02777	0.02473	0.00648	0.05150
1984-1985	0.03594	0.07223	0.01634	0.01361	0.02470	0.00624	0.03098	0.03126	0.00783	0.05356
1986-1990	0.03514	0.06856	0.01624	0.01367	0.02772	0.00673	0.02987	0.03262	0.00680	0.05356
1991-1992	0.03495	0.06799	0.01608	0.01420	0.03247	0.00705	0.03204	0.03168	0.00696	0.05267
1993-1996	0.03499	0.06782	0.01395	0.01373	0.03176	0.00729	0.03718	0.03229	0.00746	0.05145
1997-1998	0.03381	0.06576	0.01474	0.01299	0.03181	0.00707	0.03751	0.03280	0.00790	0.05474
1980-1998	0.03404	0.06801	0.01490	0.01320	0.02581	0.00675	0.03212	0.03067	0.00711	0.05271

Capital/GVA (both in P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	1.93871	0.24551	32.20923	1.40196	0.05568	54.85999	1.58242	0.08661	0.27459	0.14853
1984-1985	2.27957	0.24925	28.17022	2.08775	0.18550	45.93190	2.51189	0.14207	0.47732	0.21451
1986-1990	1.98022	0.31534	17.88763	2.05728	0.29516	39.17552	2.91580	0.23610	0.69985	0.30588
1991-1992	1.90590	0.36869	14.32841	2.20825	0.49387	30.12567	3.45309	0.39128	1.20026	0.48502
1993-1996	1.91339	0.30157	11.67981	2.21686	0.46761	27.21132	4.85830	0.49929	1.39278	0.61539
1997-1998	1.92746	0.24317	9.17165	2.09505	0.52177	22.72117	6.46095	0.53951	1.41057	0.61782
1980-1998	1.97554	0.28880	19.38604	1.97599	0.31428	37.98528	3.43125	0.29841	0.86027	0.37999

Labor/Capital ('000 / P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	0.01571	0.27494	0.00040	0.00836	0.28047	0.00011	0.01912	0.31659	0.02608	0.36687
1984-1985	0.01576	0.28978	0.00058	0.00652	0.13363	0.00014	0.01234	0.21989	0.01642	0.24960
1986-1990	0.01777	0.22257	0.00091	0.00665	0.10377	0.00018	0.01028	0.14788	0.01040	0.18129
1991-1992	0.01834	0.18463	0.00113	0.00643	0.06575	0.00023	0.00928	0.08232	0.00582	0.10918
1993-1996	0.01829	0.22636	0.00119	0.00620	0.06814	0.00027	0.00774	0.06479	0.00536	0.08377
1997-1998	0.01755	0.27042	0.00161	0.00620	0.06121	0.00031	0.00581	0.06081	0.00560	0.08860
1980-1998	0.01727	0.24251	0.00092	0.00683	0.12813	0.00020	0.01125	0.15742	0.01229	0.18968

Table 3c. Sources of Growth

[illegible]

Table 4a. Growth of Production Variables

Average TFP	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	-0.02864	-0.07740	-0.02322	-0.08635	-0.32072	0.00728	-0.18763	-0.27270	-0.21975	-0.04950
1984-1985	0.00118	0.04054	0.07746	-0.02403	-0.19147	0.04474	-0.01336	-0.02022	-0.03112	-0.03524
1986-1990	0.02154	-0.06016	0.03034	-0.02476	-0.07200	0.06419	-0.04656	-0.15046	-0.15514	-0.03415
1991-1993	-0.00878	0.01720	0.04734	-0.00597	-0.06108	0.00637	-0.06325	-0.10630	-0.06243	-0.04234
1994-1998	-0.01249	0.06004	0.04082	-0.00549	-0.04901	0.01366	-0.08953	-0.04329	-0.03998	-0.02279
1997-1998	-0.01423	0.06854	0.07236	-0.00178	-0.03923	-0.01399	-0.07417	-0.02017	-0.01130	-0.02398
1981-1998	-0.00359	-0.00556	0.03239	-0.02646	-0.11852	0.02887	-0.08110	-0.11923	-0.10469	-0.03504
Average Growth* GVA	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.02513	0.00227	-0.02375	0.01362	0.02582	0.04778	0.04592	0.04366	0.02592	0.08257
1984-1985	-0.07002	-0.01204	0.13488	-0.08994	-0.43276	0.05017	-0.01358	-0.04532	-0.09944	-0.03154
1986-1990	0.04955	0.02762	-0.01188	0.05364	0.10505	0.01547	0.04848	0.05147	0.07228	0.05018
1991-1993	0.00585	0.01388	0.01236	-0.00492	-0.02977	0.01968	-0.00139	0.01505	-0.00081	0.02378
1994-1998	0.03648	0.00617	-0.01180	0.03744	0.06922	0.08039	0.06295	0.04156	0.05552	0.03405
1997-1998	0.02219	-0.04947	0.09947	0.01616	0.03176	0.06541	0.07271	0.03108	0.04808	0.03415
1981-1998	0.02128	0.01074	0.00651	0.01676	-0.00033	0.04345	0.03687	0.03059	0.02863	0.03762
Average Growth* Labor	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.03932	0.03489	0.03660	0.00452	0.04310	0.07321	0.04928	0.07369	0.02106	0.05027
1984-1985	0.02197	0.00552	0.01575	0.01407	0.01744	0.02740	0.02541	0.08756	0.03108	0.02712
1986-1990	0.02064	0.00025	0.01493	0.03794	0.06296	0.02267	0.03579	0.04302	0.02325	0.03387
1991-1993	0.03588	0.04440	-0.00973	0.02071	0.04874	0.06472	0.06509	0.02038	0.06814	0.02126
1994-1998	0.02703	-0.00373	-0.02356	0.02004	0.07375	0.06617	0.07185	0.04817	0.05793	0.05349
1997-1998	0.01314	-0.03155	0.03005	0.00370	0.03250	0.09257	0.06303	0.03593	0.04513	0.06809
1981-1998	0.02822	0.01286	0.00383	0.02188	0.05522	0.05071	0.05178	0.05074	0.04087	0.03920
Average Growth* Capital	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1983	0.05945	0.09031	-0.03205	0.12990	0.55879	0.03238	0.30388	0.35293	0.29760	0.31811
1984-1985	-0.10249	-0.06817	0.07924	-0.08654	-0.45617	0.00119	-0.00402	-0.03997	-0.08791	-0.03452
1986-1990	0.03110	0.10975	-0.07719	0.08809	0.31886	-0.08162	0.11049	0.22275	0.26082	0.17913
1991-1993	0.00661	-0.01459	-0.06205	-0.00284	0.00582	-0.01104	0.06132	0.13932	0.06037	0.15370
1994-1998	0.05753	-0.06511	-0.08094	0.04703	0.17158	0.06741	0.18477	0.09124	0.10190	0.06239
1997-1998	0.04582	-0.13709	0.02302	0.02047	0.11668	0.07466	0.18058	0.05378	0.06179	0.03698
1981-1998	0.02424	0.01744	-0.05080	0.04910	0.17965	-0.00026	0.14243	0.16482	0.15065	0.14189

* defined as $[\ln ()t] - [\ln ()t-1]$

Table 4b. Input Productivity and Factor Intensity

Labor/GVA ('000/P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	0.03043	0.06655	0.01296	0.01148	0.01168	0.00620	0.02777	0.02473	0.00648	0.05150
1984-1985	0.03594	0.07223	0.01634	0.01361	0.02470	0.00624	0.03098	0.03126	0.00783	0.05356
1986-1990	0.03514	0.06856	0.01624	0.01367	0.02772	0.00673	0.02987	0.03262	0.00680	0.05356
1991-1993	0.03519	0.06876	0.01558	0.01419	0.03237	0.00725	0.03328	0.03179	0.00718	0.05197
1994-1998	0.03438	0.06650	0.01414	0.01335	0.03170	0.00713	0.03759	0.03256	0.00761	0.05294
1997-1998	0.03381	0.06576	0.01474	0.01299	0.03181	0.00707	0.03751	0.03280	0.00790	0.05474
1981-1998	0.03404	0.06801	0.01490	0.01320	0.02581	0.00675	0.03212	0.03067	0.00711	0.05271

Capital/GVA (both in P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	1.93871	0.24551	32.20923	1.40196	0.05568	54.85999	1.58242	0.08661	0.27459	0.14853
1984-1985	2.27957	0.24925	28.17022	2.08775	0.18550	45.93190	2.51189	0.14207	0.47732	0.21451
1986-1990	1.98022	0.31534	17.88763	2.05728	0.29516	39.17552	2.91580	0.23610	0.69985	0.30588
1991-1993	1.91557	0.35702	13.53547	2.22399	0.49125	30.40900	3.71353	0.41597	1.24467	0.51203
1994-1998	1.91471	0.27178	10.62259	2.16041	0.48560	24.66239	5.62413	0.52216	1.41176	0.62623
1997-1998	1.92746	0.24317	9.17165	2.09505	0.52177	22.72117	6.46095	0.53951	1.41057	0.61782
1981-1998	1.97554	0.28880	19.38604	1.97599	0.31428	37.98528	3.43125	0.29841	0.86027	0.37999

Labor/Capital ('000 / P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1983	0.01571	0.27494	0.00040	0.00836	0.28047	0.00011	0.01912	0.31659	0.02608	0.36687
1984-1985	0.01576	0.28978	0.00058	0.00652	0.13363	0.00014	0.01234	0.21989	0.01642	0.24960
1986-1990	0.01777	0.22257	0.00091	0.00665	0.10377	0.00018	0.01028	0.14788	0.01040	0.18129
1991-1993	0.01837	0.19331	0.00116	0.00638	0.06590	0.00024	0.00900	0.07781	0.00578	0.10256
1994-1998	0.01796	0.24712	0.00135	0.00618	0.06576	0.00029	0.00683	0.06240	0.00539	0.08460
1997-1998	0.01755	0.27042	0.00161	0.00620	0.06121	0.00031	0.00581	0.06081	0.00560	0.08860
1981-1998	0.01727	0.24251	0.00092	0.00683	0.12813	0.00020	0.01125	0.15742	0.01229	0.18968

Table 4c. Sources of Growth

[illegible]

Table 5a. Growth of Production Variables

Average TFP										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1985	-0.01671	-0.03022	0.01705	-0.06142	-0.26902	0.02226	-0.11792	-0.17171	-0.14430	-0.04380
1986-1992	0.01303	-0.04271	0.02957	-0.02032	-0.07565	0.05322	-0.04444	-0.14654	-0.12929	-0.04121
1993-1998	-0.01205	0.05832	0.04847	-0.00449	-0.04312	0.00598	-0.09319	-0.04364	-0.04297	-0.02054
1981-1998	-0.00359	-0.00556	0.03239	-0.02646	-0.11852	0.02887	-0.08110	-0.11923	-0.10469	-0.03504
Average Growth*										
GVA	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1985	-0.01293	-0.00346	0.03970	-0.02780	-0.15761	0.04874	0.02212	0.00807	-0.02423	0.03693
1986-1992	0.03482	0.02235	-0.00414	0.03526	0.05450	0.02203	0.03516	0.03974	0.04972	0.03872
1993-1998	0.03398	0.00902	-0.00872	0.03230	0.06676	0.06403	0.05115	0.03870	0.04809	0.03692
1981-1998	0.02128	0.01074	0.00651	0.01676	-0.00033	0.04345	0.03687	0.03059	0.02863	0.03762
Average Growth*										
Labor	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1985	0.03238	0.02314	0.02826	0.00834	0.03284	0.05489	0.03973	0.07923	0.02507	0.04101
1986-1992	0.02604	0.01380	0.01866	0.03976	0.05955	0.02762	0.04349	0.03462	0.02799	0.03216
1993-1998	0.02729	0.00319	-0.03382	0.01229	0.06883	0.07416	0.07150	0.04580	0.06907	0.04591
1981-1998	0.02822	0.01286	0.00383	0.02188	0.05522	0.05071	0.05178	0.05074	0.04087	0.03920
Average Growth*										
Capital	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1981-1985	-0.00532	0.02692	0.01247	0.04333	0.15281	0.01990	0.18072	0.19577	0.14340	0.17706
1986-1992	0.02042	0.07806	-0.07109	0.06001	0.21561	-0.05863	0.08862	0.20794	0.20364	0.17110
1993-1998	0.05334	-0.06118	-0.07986	0.04117	0.16005	0.05105	0.17331	0.08872	0.09487	0.07850
1981-1998	0.02424	0.01744	-0.05080	0.04910	0.17965	-0.00026	0.14243	0.16482	0.15065	0.14189

* defined as $[\ln ()t] - [\ln ()t-1]$

Table 5b. Input Productivity and Factor Intensity

Labor/GVA ('000/P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1985	0.03227	0.06844	0.01409	0.01219	0.01602	0.00621	0.02884	0.02691	0.00693	0.05218
1986-1992	0.03509	0.06840	0.01619	0.01382	0.02908	0.00682	0.03049	0.03236	0.00685	0.05330
1993-1998	0.03460	0.06713	0.01421	0.01349	0.03178	0.00722	0.03729	0.03246	0.00761	0.05254
1981-1998	0.03404	0.06801	0.01490	0.01320	0.02581	0.00675	0.03212	0.03067	0.00711	0.05271
Capital/GVA (both in P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1985	2.05233	0.24676	30.86289	1.63056	0.09895	51.88396	1.89224	0.10510	0.34217	0.17053
1986-1992	1.95898	0.33058	16.87071	2.10041	0.35193	36.58985	3.06931	0.28043	0.84283	0.35706
1993-1998	1.91808	0.28210	10.84376	2.17626	0.48567	25.71460	5.39251	0.51270	1.39871	0.61620
1981-1998	1.97554	0.28880	19.38604	1.97599	0.31428	37.98528	3.43125	0.29841	0.86027	0.37999
Labor/Capital ('000 / P million 1985 prices)										
	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980-1985	0.01573	0.27989	0.00046	0.00774	0.23153	0.00012	0.01686	0.28435	0.02286	0.32778
1986-1992	0.01793	0.21173	0.00097	0.00659	0.09291	0.00019	0.01000	0.12915	0.00909	0.16069
1993-1998	0.01804	0.24105	0.00133	0.00620	0.06583	0.00028	0.00710	0.06346	0.00544	0.08538
1981-1998	0.01727	0.24251	0.00092	0.00683	0.12813	0.00020	0.01125	0.15742	0.01229	0.18968

Table 5c. Sources of Growth

[illegible]

Figure 1. Economy - Total Factor Productivity

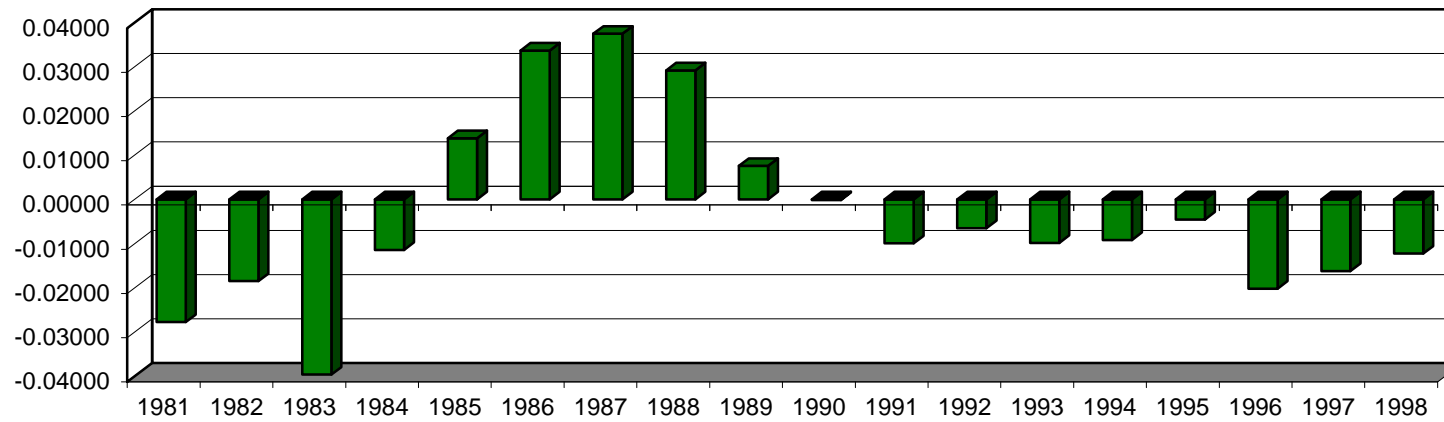
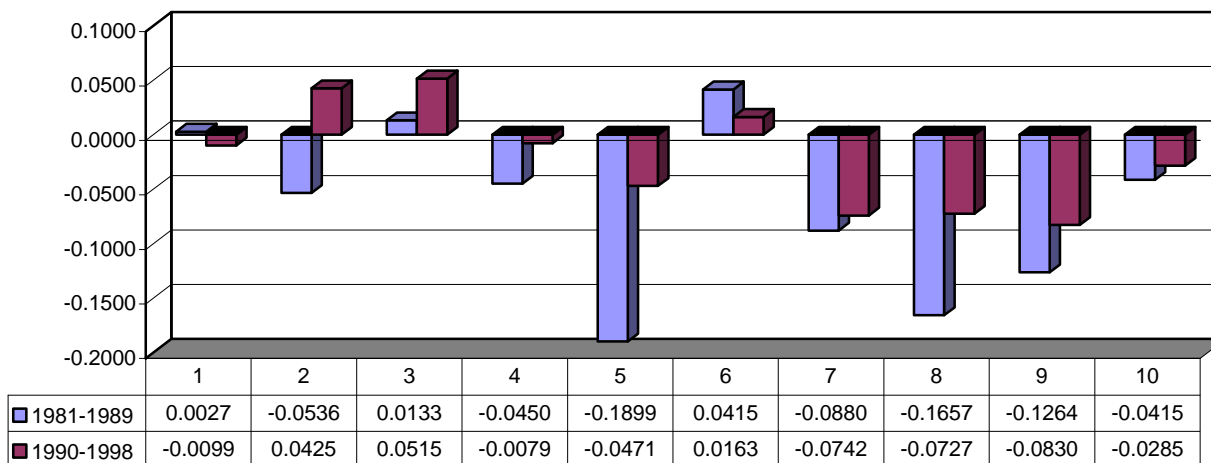


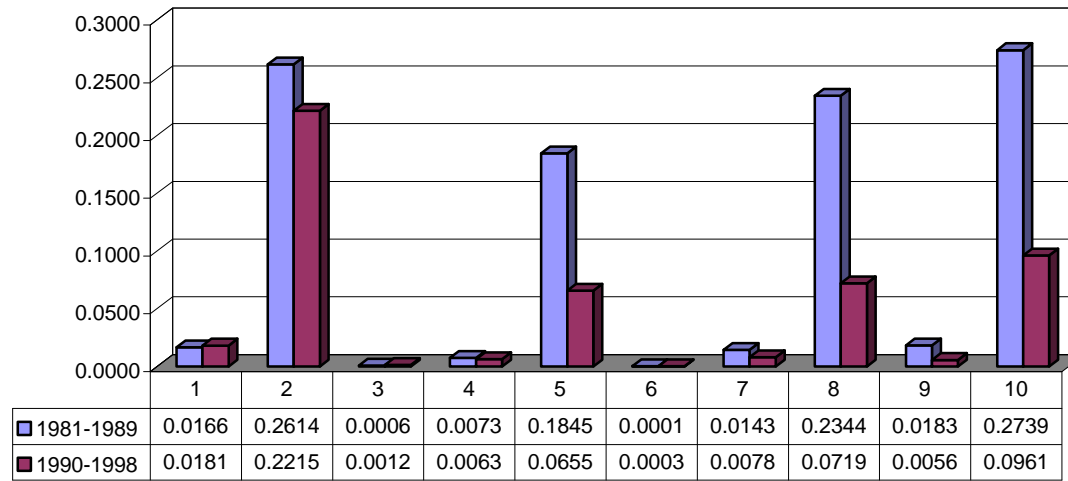
Figure 2. Sectoral Total Factor Productivity



where

- 1 Economy
- 2 Agriculture
- 3 Mining
- 4 Manufacturing
- 5 Construction
- 6 Utilities
- 7 Transportation & Communications
- 8 Trade
- 9 Finance & Dwellings
- 10 Other Services

Figure 3. Sectoral Labor/Capital Ratio ('000/P Million 1985 Prices)



where

- 1 Economy
- 2 Agriculture
- 3 Mining
- 4 Manufacturing
- 5 Construction
- 6 Utilities
- 7 Transportation & Communications
- 8 Trade
- 9 Finance & Dwellings
- 10 Other Services

Table A1. Gross Value Added, Million 1985 prices

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980	559,109	134,703	7,762	154,580	49,066	9,121	25,469	75,143	52,041	50,706
1981	579,241	139,970	8,108	158,562	53,895	9,308	27,142	75,633	48,904	56,663
1982	601,518	140,725	7,993	161,445	55,806	11,574	28,040	82,285	52,059	60,578
1983	602,886	135,623	7,228	161,027	53,018	10,527	29,230	85,659	56,249	64,959
1984	562,423	134,717	6,927	146,409	42,312	12,924	28,956	79,201	49,512	61,419
1985	524,104	132,395	9,466	134,517	22,312	11,638	28,447	78,237	46,104	60,988
1986	541,338	137,139	10,252	137,040	21,479	12,953	29,173	82,162	48,492	62,611
1987	568,044	141,752	9,351	143,459	27,740	9,968	30,791	85,292	52,938	65,915
1988	608,964	146,256	9,572	160,274	28,909	12,058	33,247	88,736	57,340	71,153
1989	646,640	151,175	9,054	169,082	34,693	12,790	35,377	95,467	62,910	74,023
1990	671,438	152,000	8,920	175,895	37,727	12,574	36,251	101,199	66,174	78,381
1991	664,797	154,288	8,660	172,686	31,376	13,384	36,857	101,633	65,240	79,325
1992	668,783	154,820	9,196	172,178	32,677	13,578	36,386	103,327	65,295	79,972
1993	683,320	158,463	9,257	173,316	34,504	13,339	36,100	105,874	66,013	84,177
1994	711,536	163,522	8,610	182,033	38,850	14,659	37,268	110,071	68,104	85,894
1995	745,413	165,357	8,544	194,033	41,378	15,988	39,441	116,182	73,474	88,642
1996	784,436	180,426	7,152	202,348	45,772	17,493	42,762	122,476	79,147	93,213
1997	825,161	175,058	8,263	210,356	53,290	18,789	46,278	127,233	85,019	96,762
1998	820,033	163,430	8,727	208,997	48,774	19,938	49,455	130,331	87,135	99,802

Source of basic data: NSCB

Table A2. Distribution of Value Added into Compensation and Surplus

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Economy																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.280	0.282	0.282	0.270	0.245	0.249	0.258	0.263	0.254	0.288	0.279	0.272	0.268	0.272	0.273	0.280	0.281	0.295	0.294
Surplus	0.720	0.718	0.718	0.730	0.755	0.751	0.742	0.737	0.746	0.712	0.721	0.728	0.732	0.728	0.727	0.720	0.719	0.705	0.706
Agriculture																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.204	0.197	0.207	0.217	0.212	0.198	0.200	0.205	0.204	0.194	0.193	0.193	0.192	0.186	0.190	0.189	0.189	0.175	0.184
Surplus	0.796	0.803	0.793	0.783	0.788	0.802	0.800	0.795	0.796	0.806	0.807	0.807	0.808	0.814	0.810	0.811	0.811	0.825	0.816
Mining																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.185	0.191	0.197	0.382	0.409	0.333	0.352	0.352	0.515	0.518	0.516	0.516	0.525	0.525	0.525	0.525	0.455	0.413	0.352
Surplus	0.815	0.809	0.803	0.618	0.591	0.667	0.648	0.648	0.485	0.482	0.484	0.484	0.475	0.475	0.475	0.475	0.545	0.587	0.648
Manufacturing																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.235	0.240	0.241	0.236	0.194	0.212	0.230	0.236	0.164	0.204	0.170	0.164	0.148	0.153	0.151	0.154	0.148	0.153	0.135
Surplus	0.765	0.760	0.759	0.764	0.806	0.788	0.770	0.764	0.836	0.796	0.830	0.836	0.852	0.847	0.849	0.846	0.852	0.847	0.865
Construction																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.427	0.422	0.388	0.406	0.406	0.554	0.487	0.409	0.437	0.711	0.588	0.597	0.589	0.589	0.532	0.532	0.551	0.535	0.535
Surplus	0.573	0.578	0.612	0.594	0.594	0.446	0.513	0.591	0.563	0.289	0.412	0.403	0.411	0.411	0.468	0.468	0.449	0.465	0.465
Utilities																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.297	0.279	0.259	0.217	0.158	0.188	0.219	0.338	0.307	0.316	0.333	0.316	0.308	0.319	0.295	0.314	0.304	0.273	0.251
Surplus	0.703	0.721	0.741	0.783	0.842	0.812	0.781	0.662	0.693	0.684	0.667	0.684	0.692	0.681	0.705	0.686	0.696	0.727	0.749
Transportation																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.298	0.285	0.266	0.180	0.144	0.145	0.173	0.197	0.220	0.278	0.258	0.228	0.263	0.275	0.265	0.293	0.287	0.287	0.286
Surplus	0.702	0.715	0.734	0.820	0.856	0.855	0.827	0.803	0.780	0.722	0.742	0.772	0.737	0.725	0.735	0.707	0.713	0.713	0.714
Trade																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.135	0.122	0.143	0.122	0.113	0.118	0.108	0.108	0.103	0.133	0.153	0.151	0.151	0.151	0.151	0.151	0.142	0.142	0.142
Surplus	0.865	0.878	0.857	0.878	0.887	0.882	0.892	0.892	0.897	0.867	0.847	0.849	0.849	0.849	0.849	0.849	0.858	0.858	0.858
Finance																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.181	0.199	0.187	0.175	0.160	0.145	0.147	0.139	0.139	0.137	0.143	0.134	0.137	0.145	0.145	0.147	0.146	0.150	0.143
Surplus	0.819	0.801	0.813	0.825	0.840	0.855	0.853	0.861	0.861	0.863	0.857	0.866	0.863	0.855	0.855	0.853	0.854	0.850	0.857
Services																			
Value-Added	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Compensation	0.737	0.708	0.687	0.613	0.619	0.628	0.642	0.637	0.659	0.665	0.675	0.669	0.656	0.648	0.658	0.666	0.671	0.686	0.679
Surplus	0.263	0.292	0.313	0.387	0.381	0.372	0.358	0.363	0.341	0.335	0.325	0.331	0.344	0.352	0.342	0.334	0.329	0.314	0.321

Source of basic data: NSCB

Table A3. Employment, '000

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980	16,795	8,674	112	1,832	594	57	728	1,730	322	2,746
1981	17,632	9,049	86	1,794	589	64	730	1,984	336	3,000
1982	17,991	9,307	76	1,814	610	57	749	2,013	352	3,013
1983	18,898	9,631	125	1,857	676	71	844	2,158	343	3,193
1984	19,238	9,553	132	1,906	763	78	890	2,349	383	3,184
1985	19,747	9,738	129	1,910	700	75	888	2,571	365	3,371
1986	20,488	10,197	140	1,918	669	62	862	2,777	355	3,508
1987	20,770	10,013	156	1,998	735	80	914	2,832	390	3,652
1988	21,205	9,969	160	2,183	830	85	1,015	2,871	390	3,702
1989	21,908	9,901	168	2,316	931	91	1,072	3,080	398	3,951
1990	21,894	9,750	139	2,309	959	84	1,062	3,188	410	3,993
1991	22,914	10,290	140	2,374	1,018	99	1,142	3,218	465	4,168
1992	23,695	10,726	147	2,523	1,062	91	1,204	3,276	444	4,222
1993	24,382	11,139	135	2,457	1,110	102	1,291	3,389	503	4,256
1994	25,032	11,286	111	2,539	1,187	112	1,393	3,520	490	4,394
1995	25,676	11,147	107	2,617	1,302	114	1,477	3,767	535	4,610
1996	27,186	11,645	113	2,696	1,504	118	1,630	4,013	614	4,853
1997	27,715	11,314	130	2,732	1,637	132	1,742	4,138	688	5,202
1998	27,910	10,933	120	2,716	1,605	142	1,849	4,312	672	5,561

Source of basic data: Labor Force Survey

Table A4. Investment, Million 1985 prices

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980	150,717	5,761	14,668	47,180	1,147	58,061	15,046	2,116	4,398	2,340
1981	169,002	12,812	14,568	44,280	1,059	72,575	14,093	2,368	4,648	2,599
1982	177,635	4,274	14,257	50,813	1,216	77,824	17,259	2,955	5,896	3,141
1983	192,637	2,850	31,499	59,328	2,814	65,491	17,917	3,285	5,853	3,599
1984	137,461	760	10,996	58,089	615	42,761	17,194	1,441	3,897	1,709
1985	94,168	3,593	5,849	12,703	233	62,466	3,491	1,612	2,496	1,725
1986	95,083	6,730	2,435	31,144	751	29,898	13,860	2,498	5,369	2,397
1987	101,627	6,851	4,246	36,891	339	18,563	18,285	4,990	6,082	5,380
1988	118,252	7,635	7,048	52,377	1,661	4,203	20,014	6,960	13,205	5,148
1989	143,804	16,668	3,425	63,589	8,187	15,130	16,537	6,846	7,794	5,628
1990	165,364	4,740	5,034	56,240	2,662	32,529	20,358	7,604	28,957	7,240
1991	141,903	9,119	3,308	46,670	1,923	33,060	18,755	6,500	13,715	8,853
1992	150,974	2,991	1,917	41,972	2,013	42,231	21,162	14,428	14,583	9,678
1993	169,144	2,969	1,092	46,991	2,357	47,568	35,252	8,279	14,454	10,181
1994	183,397	4,173	1,735	61,312	2,178	47,542	28,839	10,502	17,162	9,954
1995	184,667	3,172	1,962	63,541	2,262	34,951	45,462	9,342	13,715	10,261
1996	206,854	1,586	3,363	35,431	7,412	42,002	72,667	12,204	25,348	6,840
1997	230,662	783	2,477	52,986	4,498	68,073	70,706	9,473	14,745	6,922
1998	204,279	1,923	2,562	50,735	4,602	46,810	61,557	10,258	17,754	8,078

Source of basic data: NSCB, NSO and authors' estimates

Table A5. Average Depreciation

Economy	0.1011
Agriculture	0.1821
Mining	0.1133
Manufacturing	0.1000
Construction	0.1998
Utilities	0.0780
Transportation & Communication	0.0866
Trade	0.1411
Finance & Dwellings	0.1280
Other Services	0.1071

Source of basic data: NSO and authors' estimates

Table A6. Capacity Utilization

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980	0.980	0.981	0.701	0.996	0.874	0.845	0.984	0.985	1.000	0.884
1981	0.988	1.000	0.742	1.000	0.963	0.821	1.000	0.952	0.903	0.945
1982	1.000	0.987	0.740	0.997	1.000	0.975	0.987	0.997	0.925	0.970
1983	0.977	0.934	0.678	0.974	0.953	0.849	0.985	1.000	0.964	1.000
1984	0.890	0.911	0.658	0.868	0.763	1.000	0.935	0.892	0.820	0.911
1985	0.810	0.879	0.911	0.783	0.403	0.865	0.882	0.852	0.738	0.873
1986	0.817	0.895	1.000	0.782	0.390	0.927	0.870	0.866	0.752	0.866
1987	0.839	0.909	0.925	0.804	0.505	0.688	0.884	0.871	0.797	0.882
1988	0.879	0.922	0.960	0.882	0.528	0.804	0.920	0.879	0.838	0.923
1989	0.914	0.937	0.921	0.914	0.635	0.825	0.945	0.919	0.894	0.931
1990	0.930	0.926	0.921	0.935	0.693	0.785	0.936	0.947	0.916	0.958
1991	0.902	0.925	0.907	0.902	0.578	0.810	0.920	0.925	0.880	0.942
1992	0.889	0.913	0.978	0.885	0.604	0.798	0.879	0.916	0.859	0.925
1993	0.891	0.920	1.000	0.876	0.639	0.762	0.845	0.915	0.848	0.949
1994	0.911	0.935	0.945	0.906	0.722	0.814	0.846	0.928	0.855	0.944
1995	0.936	0.931	0.953	0.951	0.772	0.865	0.869	0.956	0.902	0.951
1996	0.968	1.000	0.811	0.976	0.856	0.922	0.915	0.985	0.951	0.977
1997	1.000	0.956	0.953	1.000	1.000	0.966	0.962	1.000	1.000	0.991
1998	0.977	0.879	0.984	0.979	0.918	1.000	1.000	0.999	0.999	1.000

Source: Authors' estimates

Table A7. Derived Capital Stock (perpetual inventory method), million 1985 prices

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation & Communications	Trade	Finance & Dwellings	Other Services
1980	1,036,654	26,165	262,547	179,785	1,140	524,150	25,465	3,717	8,250	5,435
1981	1,100,851	36,332	250,571	205,889	2,084	543,734	36,984	5,709	12,064	7,484
1982	1,167,190	36,933	239,495	235,886	3,089	566,586	50,504	8,087	16,740	9,868
1983	1,241,824	36,049	246,782	271,365	5,591	574,795	63,315	10,555	20,901	12,470
1984	1,253,736	33,165	232,828	302,019	5,641	559,444	74,107	10,928	22,686	12,918
1985	1,221,152	33,405	215,138	284,188	5,303	565,350	70,106	11,435	22,888	13,338
1986	1,192,776	36,758	195,822	286,601	5,518	538,092	76,878	12,777	25,943	14,387
1987	1,173,814	39,893	180,271	294,516	5,299	502,254	87,391	16,475	29,402	18,312
1988	1,173,393	43,494	169,094	317,118	6,425	455,679	98,570	21,770	39,635	21,609
1989	1,198,567	55,765	155,423	348,647	13,962	424,739	105,142	26,415	43,422	25,052
1990	1,242,756	54,867	144,743	369,639	15,212	414,327	114,870	31,349	67,989	29,759
1991	1,259,016	58,439	133,418	378,939	15,597	405,499	122,011	34,680	74,831	35,603
1992	1,282,704	55,521	121,846	382,600	16,033	406,734	130,838	45,601	81,848	41,682
1993	1,322,166	52,877	110,619	390,911	16,769	413,181	152,862	49,270	88,028	47,649
1994	1,371,892	51,703	101,171	412,701	17,252	418,951	166,247	54,791	96,290	52,786
1995	1,417,861	49,648	92,904	434,518	17,770	411,546	194,901	58,593	100,270	57,710
1996	1,481,369	46,215	86,875	426,020	23,386	411,940	247,864	64,874	115,481	58,715
1997	1,562,265	42,326	80,569	435,935	25,519	438,366	293,511	67,787	118,550	59,701
1998	1,608,599	39,969	74,985	442,597	27,541	440,857	325,395	71,192	124,319	61,743

Source: Authors' estimates

Figure A1. Share of Agri GAFA vs Real Agri Growth

