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Working Paper

Philippine Productivity Performance in the 1990s: An Assessment

PIDS Discussion Paper Series, No. 2000-28

Provided in Cooperation with:

Philippine Institute for Development Studies (PIDS), Philippines

Suggested Citation: Austria, Myrna S. (2000) : Philippine Productivity Performance in the 1990s: An Assessment, PIDS Discussion Paper Series, No. 2000-28, Philippine Institute for Development Studies (PIDS), Makati City

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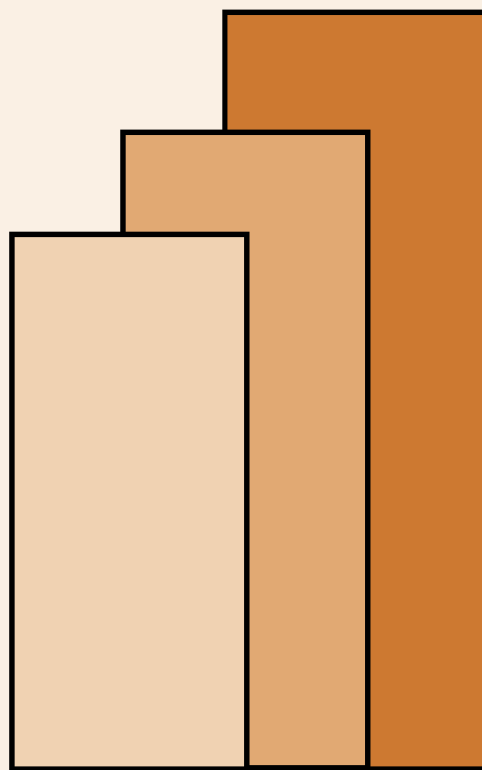
Myrna S. Austria

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July 2000

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Philippine Productivity Performance in the 1990s: An Assessment

Abstract

This paper examines the total factor productivity performance (TFP) of the Philippines in the 1990s in order to provide a picture of the extent of the productivity concern that needs to be addressed in the Medium-Term National Action Agenda for Productivity, 2000-2004. The findings show that while the average TFP growth of the country has improved in the 1990s, it has nonetheless remained negative, a big contrast to the favorable productivity performance of the other ASEAN-Four. Positive productivity performance was, however, registered during the trade liberalization period of 1986-1996. Among the different sectors, only mining, manufacturing and utilities registered positive TFP performance. Key issues and research gaps that need to be addressed were also identified.

Philippine Productivity Performance in the 1990s: An Assessment

*Myrna S. Austria*¹

The low and declining productivity growth of the country has long been a concern for policymakers. This is due to the fact that the country cannot rely on accumulating capital or on its increasing labor force to sustain its growth process in the long run. Because of diminishing returns, the contribution of capital and labor to growth will eventually slow down. Hence, productivity becomes critical for the country's long run sustainable growth.

The purpose of this paper is to present the country's productivity performance in the 1990s in order to provide a picture of the extent of the productivity concern that needs to be addressed in the Medium-Term National Action Agenda for Productivity (MTNAAP), 2000-2004.

Productivity Performance

- *Total factor productivity (entire economy)*

The TFP performance of the country has improved but it has remained negative. The results of Austria (1998) showed a –0.4 percent average growth of TFP for the period 1960-1996, a slight improvement from the –0.6 percent estimate for the period 1950-87 by Austria and Martin (1995). Cororaton and Caparas (1999) also found negative TFP for the entire economy for the period 1980-1996.

Nonetheless, an examination of the TFP performance vis-à-vis the different industrial regimes the country went through showed encouraging results (Austria 1998). While the average TFP growth for the period 1960-1996 was negative, the annual performance shows a higher growth during the trade liberalization period of 1986-1996 (Figure 1). TFP growth during the period was 0.93 percent compared to –2.89 percent during the period 1980-1986.

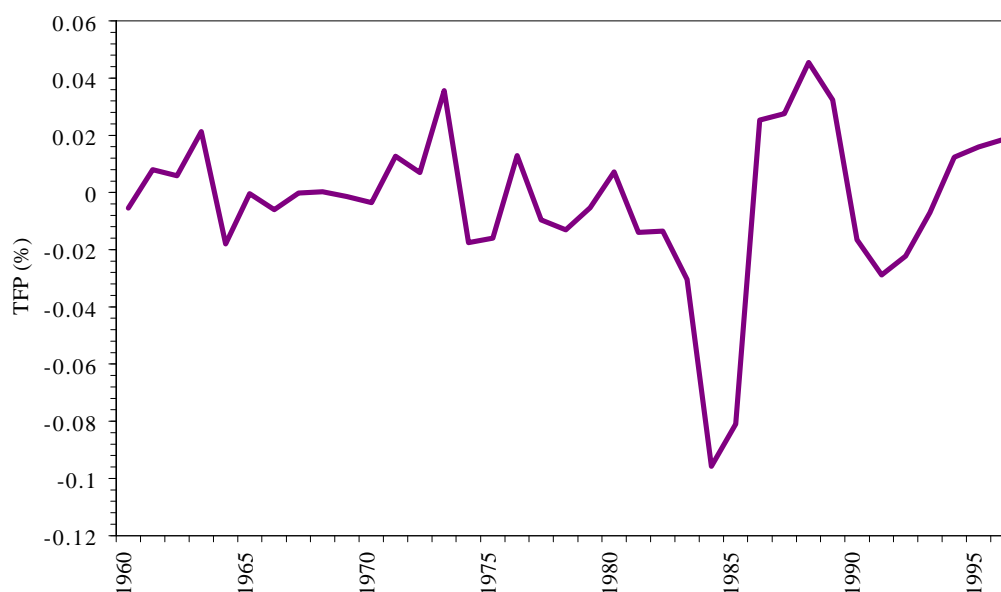
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The poor TFP performance of the economy is a big contrast to the favorable TFP performance of the other ASEAN-Four (Collins and Bosworth, 1997) (Table 1). Malaysia, Indonesia and Thailand registered an increase in their TFP from the period 1973-1984 to the period 1984-1994. While the TFP of the Philippines also improved during the same period, it has nonetheless remained negative.

- *Sectoral total factor productivity*

The only recent estimates of TFP at the sectoral level were those of Cororaton and Caparas (1999). For the period 1980-1996, only mining, manufacturing and utilities registered positive TFP growth rate (Table 2). Utilities registered the highest TFP growth rate at 4.38 percent while finance registered the highest decline at -6.84 percent.

Figure 1. Annual TFP growth rate, Philippines, 1960-1996 (percent).



Source: Austria (1998).

Table 1. Annual growth rate of TFP, ASEAN (percent)

Period	Philippines	Malaysia	Indonesia	Thailand
1960-73	0.7	1.0	1.1	1.4
1973-94	-1.1	0.9	0.7	2.1
1973-84	-1.3	0.4	0.5	1.1
1984-94	-0.9	1.4	0.9	3.3
1960-94	-0.4	0.9	0.8	1.8

Agriculture performed better in the 1990s than in the 1980s registering positive TFP on the average during the period 1991-1996. This is contrary to the common perception of low productivity in the sector. Cororaton and Caparas (1999) argued that technological change in the sector may be disembodied and hence, are captured in the residual which is TFP. During the period 1990-1996, TFP was registered highest at 10.34 percent in 1993.

Mining registered favorable TFP growth in the 1990s although the trend has been declining until a negative growth was posted in 1996. The same trend can be observed for manufacturing, i.e. positive but declining TFP since 1993 and a negative TFP in 1996.

Surprisingly, construction posted negative TFP during the period 1990-1996 despite the construction boom that occurred during the period. Utilities performed well although a decrease was registered in 1996 from 1995. The sub-sectors on transportation, finance and other services all registered negative TFP all throughout the period 1990-1996.

Within the manufacturing sector, the number of industries with negative TFP growth has increased from 3 during the period 1956-1970, to 10 during the period 1981-1992 (Table 3) (Cororaton, et. al. 1995).

Table 2. TFP estimates using growth accounting methods

	Economy	Agriculture	Mining	Manufacturing	Construction	Utilities	Transportation	Trade	Finance	Other Services
1980										
1981	-1.90	-17.96	3.91	-0.34	-8.62	4.47	-3.72	-9.78	-7.00	1.16
1982	-2.11	-14.18	0.47	0.32	-7.65	9.74	-2.40	-11.44	-9.79	-2.12
1983	-3.03	0.31	-54.54	-8.78	-59.31	-24.17	-0.05	-4.91	-44.72	14.45
1984	-2.36	21.60	-3.02	-2.65	-25.34	7.60	-6.31	-12.48	-6.57	-11.06
1985	0.30	8.25	35.27	0.08	-2.18	3.07	4.73	9.08	4.37	0.29
1986	2.93	14.26	9.28	5.30	11.13	3.30	4.36	-4.00	-2.31	-2.63
1987	3.66	-11.24	-9.12	3.96	6.54	-3.58	0.73	0.74	-2.81	0.51
1988	2.89	-11.39	8.59	5.52	6.63	16.63	-0.40	-7.80	-2.25	-11.60
1989	1.84	-11.52	-2.17	1.86	4.05	8.03	3.77	-11.95	-4.20	5.11
1990	-0.04	-33.15	-0.30	1.31	-40.96	5.30	3.21	-4.08	2.63	0.39
1991	-0.83	4.67	-2.11	-0.10	-12.04	5.29	-0.42	-13.14	-35.83	-7.17
1992	-1.01	-7.95	16.29	1.77	3.43	6.77	-1.50	-6.85	-4.44	-8.70
1993	-0.27	10.34	4.80	3.57	-3.90	2.39	-2.65	-28.13	-7.01	-7.73
1994	-0.40	-2.41	2.95	2.30	-2.19	3.53	-9.12	-5.46	-4.68	-4.88
1995	-0.69	5.20	2.00	1.29	1.51	7.76	-2.59	-6.81	-6.70	-2.60
1996	-0.84	4.30	-4.04	-0.38	-2.98	6.17	-2.71	10.28	-3.74	-2.85
1980-96		-1.31	1.56	1.01	-5.88	4.38	-0.68	-5.53	-6.84	-1.81

Source: Cororaton and Caparas (1999).

Table 3. Total factor productivity growth, using Stochastic Frontier Approach

Industry Description	1956-70	1971-80	1981-92	1956-92
Food manufacturing	1.42	0.43	2.41	1.49
Sugar milling		1.45	-0.15	0.38*
Beverages	2.30	2.76	-0.47	1.56
Tobacco products	3.08	-0.24	-3.51	0.25
Textiles	4.08	0.63	0.56	1.77
Wearing Apparel		-9.47	-0.68	-4.56*
Leather products	3.29	0.75	-4.74	0.09
Footwear	0.42	0.24	3.61	1.34
Wood products	5.18	-0.10	0.88	2.38
Furnitures and fixtures	1.76	9.51	2.58	4.23
Paper and paper products	2.70	0.58	1.65	1.81
Printing and publishing	5.91	2.57	1.16	3.43
Industrial chemicals	-0.28	5.17	-0.22	1.39
Other chemicals		-1.24	2.30	0.94*
Rubber products	1.18	-0.48	1.48	0.76
Plastic products		-7.25	-1.75	-3.95*
Non-metallic mineral products	-5.08	2.50	2.06	-0.01
Glass products		-4.78	-3.24	-4.12*
Iron and steel basic industries	1.80	-0.87	-1.52	0.43
Fabricated metal products	3.61	3.63	2.59	3.24
Machinery	5.92	3.08	0.15	3.40
Electrical machinery	4.21	4.52	2.90	3.78
Transport equipment	-0.34	-1.63	-3.29	-1.79
No of industries with declining TFP growth	3	9	10	5
Maximum	5.92	9.51	3.61	4.23
Minimum	-5.08	-9.47	-4.74	-4.56

Note: * - 1972-1992

Source: Cororaton and Associates (1995).

- *Partial productivity (labor and capital)*

Between 1990 and 1998, real labor productivity worsened in all sectors, except for utilities and other services (Table 4). The mining and quarrying sector posted the highest decline from P128 thousand in 1990 to P83 thousand in 1998. Labor productivity in the manufacturing sector registered a negative growth during the period 1990-1995. However, the sector bounced back in 1998 although the growth is less than 1 percent.

Table 4. Labor productivity, major sectors, 1990, 1995 & 1998

Industry	Constant 1990 prices (P '000)			Growth rate (%)	
	1990	1995	1998	1990-95	1995-98
Manufacturing	119.64	105.50	106.06	(2.48)	0.17
Agriculture	23.64	23.44	20.34	(0.17)	(4.62)
Mining and Quarrying	128.81	98.92	83.10	(5.14)	(5.64)
Construction	67.07	51.61	49.32	(5.11)	(1.50)
Utilities	251.50	263.14	270.43	0.91	0.91
Transportation	48.53	37.93	37.33	(4.81)	(0.53)
Trade	48.99	43.79	41.40	(2.22)	(1.85)
Finance	97.77	92.12	95.74	(1.18)	1.29
Other Services	38.45	44.26	49.43	2.85	3.76
Economy	48.50	46.76	47.23	(0.73)	0.33

Source: Philippine Statistical Yearbook, 1990 & 1999.

Among the manufacturing industries, petroleum refineries registered the highest real labor productivity of P4.8 million in 1990 and P9.8 million in 1995 (Table 5). Labor productivity was also high among the capital-intensive industries like cement, metal basic industries, other chemical products and tobacco manufacturing. Out of the 31 manufacturing industries, 12 registered negative growth rate in labor productivity during the period 1990-1995. Industries with more than 10 percent growth rate in labor productivity include petroleum refineries, miscellaneous products of coal and petroleum, glass and glass products, cement and machinery, except electrical. Surprisingly, the manufacture of electrical machinery apparatus which includes electronics, the country's number one export product, suffered a

Table 5. Labor and capital productivity, manufacturing sector, 1990-1995 (at constant 1990 prices)

Industry	Labor Productivity (P'000)		Capital Productivity (P million)		Growth rate (%)	
	1990	1995	1990	1995	Labor Productivity	Capital productivity
311 Food Mfr	137.49	184.01	8.37	4.75	6.00	(10.72)
312 Food Mfr	189.14	148.40	9.43	5.74	(4.74)	(9.46)
313 Beverage Mfr	579.02	782.75	3.82	2.70	6.22	(6.69)
314 Tobacco Mfr	784.51	1,053.67	37.94	19.90	6.08	(12.10)
321 Mfr of Textiles	94.51	133.04	5.86	3.02	7.08	(12.40)
322 Mfr of Wearing Apparels exc. Footwear	61.20	68.28	25.31	16.25	2.21	(8.48)
323 Mfr of Leather and Leather Products	67.15	51.69	20.17	20.81	(5.10)	0.63
324 Mfr of Footwear exc Rubber	24.73	36.71	15.39	17.31	8.22	2.39
331 Mfr of Wood & Wood & Cork Products	74.39	63.14	8.97	7.95	(3.23)	(2.37)
332 Mfr & Repair of Furnitures & Fixtures exc of Metal	44.06	53.66	17.11	6.52	4.02	(17.55)
341 Mfr of Paper & Paper Products	283.44	255.82	9.14	1.34	(2.03)	(31.86)
342 Printing,Publishing & Allied Industries	95.24	110.59	20.30	6.22	3.03	(21.07)
351 Mfr of Industrial Chemicals	573.08	495.19	7.61	4.71	(2.88)	(9.14)
352 Mfr of Other Chemical Products	581.83	696.17	10.78	5.39	3.65	(12.94)
353 Petroleum Refineries	4,771.79	9,829.66	7.27	6.92	15.55	(1.00)
354 Mfr of Misc Products of Coal & Petroleum	139.51	455.34	11.07	14.55	26.69	5.61
355 Mfr of Rubber Products	127.47	155.16	6.64	2.15	4.01	(20.16)
356 Mfr of Plastic Products	132.39	179.94	6.24	1.78	6.33	(22.18)
361 Mfr of Pottery, China & Earthenware	102.77	84.89	5.29	5.83	(3.75)	1.96
362 Mfr of Glass & Glass Products	245.27	449.49	2.70	2.10	12.88	(4.90)
363 Mfr of Cement	455.96	860.62	6.12	0.89	13.55	(32.04)
369 Mfr of Non-Metallic Mineral Products	114.25	108.41	3.33	2.00	(1.04)	(9.69)
371 Iron & Steel Basic Industries	297.79	383.61	3.43	3.72	5.20	1.66
372 Non Ferrous Metal Basic Industries	942.13	945.92	21.64	7.46	0.08	(19.17)
381 Mfr of Fabricated Metal Products	80.59	73.64	14.00	4.30	(1.79)	(21.02)
382 Mfr of Machinery exc Electrical	77.57	143.64	5.33	2.66	13.11	(12.96)
383 Mfr of Elctrical Machinery Apparatus	247.05	215.11	4.40	2.03	(2.73)	(14.30)
384 Mfr of Transport Equipment	268.59	348.44	4.04	5.34	5.34	5.75
385 Mfr of Prof. & Scientific Eqpt	96.19	90.64	9.20	2.33	(1.18)	(24.03)
386 Mfr & Repair of Furnitures & Fixtures	76.27	65.80	24.11	7.12	(2.91)	(21.65)
390 Other Mfg Industries	81.29	79.99	14.38	5.47	(0.32)	(17.58)

Source: Annual Survey of Establishments, NSO.

decline in labor productivity from P247 thousand in 1990 to P215 thousand in 1995 or an average real growth rate of –2.73 percent per year during the period.

A very rough estimate of capital productivity shows that only 6 of the 31 manufacturing industries registered an increase during the period 1990-1995. This includes leather and leather products; footwear, except rubber; miscellaneous products of coal and petroleum; pottery, china and earthenware; iron and steel basic industries; and transport equipment.

Industries that registered an increase in both labor and capital productivity during the period 1990-1995 include footwear, except rubber; miscellaneous products of coal and petroleum; iron and steel basic industries; and transport equipment.

- *Factors affecting TFP²*

Austria (1998) analyzed the factors that explain the TFP performance of the country giving emphasis on the role of trade and investment liberalization policies. The common argument stems from competitive pressure arising from the increase in imports and foreign companies that accompanies liberalization. To be able to cope with exposure to foreign competition and survive, domestic industries are forced to improve on their productivity through the development of new production techniques or making efficient use of factors of production. This is in contrast to a protectionist regime where the absence of foreign competition results to inefficient production of domestic industries. Likewise, the expansion of markets across international borders permits industries to achieve economies of scale and hence, lower average costs, leading to higher productivity. Liberalization also forces industries to refrain from rent-seeking activities which, under protectionist policies lower productivity as resources shift away from productive activities.

Trade liberalization also offers a wider choice of high quality imported intermediate inputs at lower prices resulting in improved productivity. On the other hand, the entry of foreign companies brings in technology and management know

² This section was lifted from Austria (1998).

how which contributes to increasing productivity. FDI also increases the productive capacities of domestic industries if foreign companies are complementary to local companies.

The results of the study show a significant positive impact of exports to TFP growth. Contrary to what is expected however, imports have a significant but a negative effect on TFP. Two possible explanations were raised by the study. First, an examination of the components of the country's merchandise imports show that machinery, electrical machinery and transport equipment accounted for only a small portion of the country's total imports. These are the types of imports which embody with them new techniques of production necessary for increasing productivity. These imports accounted for a combined share of 14 percent, 26 percent and 37 percent of total imports in 1985, 1990 and 1996, respectively. This implies that it is the type of imports and not the increase in imports per se that matter for imports to have a favorable impact on TFP growth. Second, while new production techniques are embodied in the imports of machineries and equipment, it is also equally important that there are corresponding manpower skills who can operate these machines and that capital utilization is maximized. Otherwise, they will just remain idle or inefficiently used. Considering that there are more capital costs to be paid by not operating the machines longer, productivity declines.

Tariff rate, on the other hand, has a negative, though rather weak, impact on TFP. It could be that the more relevant variable is the effective protection rate. Unfortunately, time series estimation of EPR are unavailable. Other studies have shown, however, that when protection is reduced at a moderate rate, the rise in productivity is highest; when protection is reduced at an excessively fast rate or when it is not reduced at all, the rise in productivity is low.

Foreign direct investments have a positive but insignificant effect. While it is argued that it takes sometime before FDI brings about productivity increases, the result of including a one-year lagged FDI as one of the determinants of TFP yields a positive though rather weak effect. However, the effect of including both total FDI and FDI in manufacturing as determinants shows a significant positive effect of total FDI to TFP growth but a significant negative effect of FDI in manufacturing. A possible

explanation for the negative effect of FDI in manufacturing is that FDI may have led to oligopolies and that technologies transferred are labor-intensive. Also, it is possible that to the extent that multinational companies are oriented towards global rather than local profits, there may be less room for adaptation of technology to the local environment.

Finally, inflation rate indicating the degree of macroeconomic instability has a significant negative effect on TFP.

Similar findings were found by Cororaton and Abdula (1999) for their analysis of factors affecting the TFP of the manufacturing sector. In addition to the variables above, they also found R&D expenditures as a percentage of GDP to have a positive effect on TFP.

Key Issues

- *Low productivity growth of the economy* – The growth experience of the developed economies has shown that productivity growth has been a substantial source of growth of these economies. On the other hand, the experience of the newly industrializing economies (NIEs) and other developing economies has shown that the growth of factor inputs has contributed more to the growth of these economies than TFP. This finding, especially about the NIEs, has ignited debate in the literature in recent years (See studies of Young (1992) and Kim and Lau (1994)). In particular, it puts to question the sustainability of growth of these economies. The argument goes that because of diminishing returns, countries whose growth relies on factor accumulation will not be able to sustain their economic growth.

Likewise, the increasing competition in international trade requires higher productivity for economies to be able to compete in an increasingly borderless world. In other words, higher productivity is the key to international competitiveness.

Considering the above arguments, the low productivity performance of the economy continues to be a concern that requires priority action in the agenda of the government.

- *Failure in developing, acquiring and adapting new technology* – The study by Cororaton, et al. (1995) decomposed TFP growth in the manufacturing sector into technical progress and technical efficiency. The former refers to the shifts in the production frontier over time resulting from developing, acquiring or adapting new technology while the latter refers to movement towards the frontier. Their findings show that there has not been a shift in the frontier in the manufacturing sector. This implies that there has been a big gap or failure in the approach to acquiring and adapting new or foreign technology.

Considering that the country has been relying mostly on FDI for new technology, there is a need to review the practices of multinational companies in technology transfer or even examine the kind of technology they bring. For example, the manufacture of semiconductor products which comprise about 58 percent of the country's total exports involves only assembly and testing, part of the global production chain in semiconductor which do not require any sophisticated manufacturing technologies. Hence, technology transfer is minimal. The failure to adapt new technology may help explain the results of Austria (1998) presented earlier that FDI does not have a significant effect on productivity.

- *Non-availability of data on capital stock* – A major problem in the estimation of total factor productivity for the entire economy and for the different sectors is the non-availability of data on capital stock. Researchers on productivity resort to building their database and, differences in the methodology and assumptions made, particularly in the sectors, affects the quality of TFP estimates. Since TFP is an important indicator for the analysis of the long-term growth prospect of the country, the quality of its estimate become critical. The data on capital stock should therefore be included in the country's statistical system.

- *Productivity target setting* – Productivity has always been taken as a variable to measure past performance. However, there is a need to set productivity targets, both at the micro and macro levels, so that individual as well as national productivity programs can be properly monitored and assessed.

Research Gaps

- *Need to update estimates of TFP*, both for the entire economy and sectoral – The recent estimates of TFP covers only up to 1996.
- A recent study by the APEC Economic Committee (1999) on productivity trends and patterns of specialization in APEC shows that economies with negative TFP growth are those specializing in the products which have decreasing market shares. It might be worthwhile investigating this issue for the country's major export products. For example, the study by Austria (1999) shows that 44 percent of the country's exports on semiconductor/IT products are accounted for by products that are deteriorating in world trade relative to other products. The study however did not investigate the relationship between the TFP of this industry and the country's patterns of specialization towards semiconductor.
- The study by Cororaton and Caparas (1999) on the TFP of the different sectors did not include an analysis of the factors affecting the sectors' productivity performance. This is one area of research that needs to be done to be able to design appropriate policies to improve the productivity performance of the sectors.

REFERENCES

- Annual Survey of Establishments (various years), National Statistics Office.
- Asia-Pacific Economic Cooperation, 1999. *Cost and Productivity Trends and Patterns of Specialization in APEC*. Singapore.
- Austria, Myrna S., 1998. Productivity Growth in the Philippines After the Industrial Reform. PIDS Discussion Paper Series No. 98-26. Makati City.
- Cororaton, C and Associates, 1995. "Total Factor Productivity of the Philippine Manufacturing Industries", *Journal of Philippine Development*, 22(2):303-390.
- _____ and Caparas, T., 1999. Total Factor Productivity: Estimates for the Philippine Economy. PIDS Discussion Paper Series No. 99-06. Makati City.
- _____ and Zingapan, S., 1999. Recent TFP Policy Agenda for the Philippines. PIDS Discussion Paper Series No.99-07. Makati City.
- _____ and Abdula, R. 1999. Productivity of Philippine Manufacturing. PIDS Discussion Paper Series No. 99-21. Makati City.
- Philippine Statistical Yearbook (various years), National Statistical Coordination Board.