EMPLOYMENT, PRODUCTIVITY AND THE INFORMAL SECTOR IN THE PHILIPPINES, 1974-88: AN INPUT-OUTPUT ANALYSIS

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I. Introduction

One of the major problems now facing Philippine economic policy is the persistence of unemployment and underemployment. Despite steady growth in GNP from 1993 to 1996, unemployment and underemployment rates have remained quite high, higher than even the levels of the 1970s before the country entered into its most severe recession in the mid-1980s. This can simply mean that estimation techniques have improved so that the 1970s data may well be underestimated. Nonetheless, the problem is acute specially since the actual numbers of unemployed and underemployed have been at their historic height simply because of the country's high growth rate of labor force.

Since 1992, the Philippine government has embarked on a more outward-oriented path to industrialization, following the experience of the High-Performing East Asian economies (HPAEs). Tariff and nontariff barriers for many commodities has decreased following the government's commitments to the ASEAN Free Trade Area (AFTA) and the Asia-Pacific Economic Cooperation (APEC) agreements. Substantial investment in infrastructure -- first in energy, then transport and now water -- have been undertaken to improve over-all productivity in the economy. Current discussions now focus not just on maintaing the pace of economic deregulation and liberalization but also on improving employment and labor productivity.

This paper will attempt to pinpoint sectors which have the potential for employment growth. These will also be analyzed for their contribution to output and

export growth. The approach uses the input-output method so that the data are mainly applicable for the period 1974-1988 when the input-output and employment data were complete. Data are therefore nearly a decade outdated which considerably puts a limitation on the applicability of the results. Nonetheless in the absence of more updated figures, the analysis will be useful in identifying broad policy directions for employment promotion.

Also since the Philippines is a developing economy, a substantial portion of economic activity occurs in the informal sector (Myint, 1986; Todaro, 1994). By definition, much of the informal sector cannot be included in official data. However the input-output and employment data are able to include certain of the informal sector establishments, perhaps by accident. The responsiveness of informal sector employment to demand factors and changes in informal employment can thus be estimated to some extent. This would be necessary as the paper would argue that employment growth in the Philippines -- given the high growth rate in the labor force -- would have to consider growth in informal sector employment as necessary component in the foreseeable future.

II. An Overview of the Philippine Economy

The period from 1974-1988 was a major phase in Philippine economic history. A measure of export-orientation began to be undertaken and the share of the manufacturing sector in employment and exports began to dominate that of agriculture. A transition to industrialization seemed to be in place. However it did not seem to have generated substantial growth in employment.

A certain degree of industrialization was begun on an extensive scale not long after political independence in 1945. The underlying philosophy of postwar

Philippine industrialization was largely along import substitution (Baldwin, 1975; Bautista and Power, 1982; Golay, 1961; Valdepeñas, 1970). Industries established during the early 1950s were thus designed to capture the domestic market for manufactured goods away from foreign competitors. Such a program necessarily required a system to protect domestic manufacturers from competition with imports.

The complex foreign exchange control system initiated in 1949 and completely dismantled by 1962 served this purpose effectively at first. The foreign exchange control system was originally intended to ration foreign exchange and stem the outflow of foreign exchange during the first postwar balance of payments crisis in 1949. It was soon found out to be an effective means of controlling importations thus of promoting import-substituting industries as well. With the decontrol of the foreign exchange market beginning in 1960, the task of protection then fell on the tariff and nontariff barriers which were first implemented in 1957. The transition was relatively smooth so that the domestic economy has been effectively officially protected without interruption from the 1950s until the early 1990s (Baldwin, 1975; Medalla, 1990).

The tariff system largely favored the import-substituting manufacturing industries (Valdepeñas, 1970; Baldwin, 1975; Power and Bautista, 1982). This could be readily noted in the steady expansion of the share of manufacturing in total gross value added. Services maintained a relatively steady share. Moreover, the manufacturing sector also experienced the fastest growth rate during the 1950s to early 1960s, deemed as the heyday of import substitution. If ever the agricultural sector (which contributed the bulk of export earnings then) continued to survive, it could well be due to the sector's inherent efficiency and comparative advantage, mainly because of the large pool of rural labor (Bautista and Power, 1982).

This pattern of industrialization moreover was largely capital-intensive and increasingly import-dependent specially for intermediate inputs and capital goods. Thus these industries were largely assembly and packaging operations that relied on imported raw materials and capital equipment which were not imposed any tariff nor nontariff barrier. And they were largely oriented to the domestic market rather than to exports. Their expansion was already retarded by the 1960s because of the slow growth in the domestic market (Bautista and Power, 1982; Valdepeñas, 1970). These long-term structural factors certainly contributed to the persistence to this day of a relatively small domestic market despite -- or perhaps because of -- the high rate of population growth (from 3.01% in 1972 to 2.2% in 1992). Moreover, because industries imported substantial inputs but were not largely export-oriented, they contributed to periodic balance of payments crises which tended to derail economic growth away from a steady and sustained growth path. This also meant that the industrialization process could not significantly contribute to the generation of employment opportunities.

By the 1970s, a measure of export-orientation had begun to be undertaken. Substantial capital inflows by way of external debt fuelled an increase in GNP and GNP per capita from 1973 to 1979 (Please refer to Table 1). Unemployment and underemployment rates were correspondingly quite low then, never more than 5.2% for unemployment in 1976 and 18.9% for underemployment in 1977. But this growth pattern could not be sustained as the economy slowed down in 1980, under pressure from the uncertainties in the Middle East petroleum market. The country then as now was heavily dependent on Middle Eastern petroleum for its energy requirements.

With the slowdown in the US market in 1981, a major export market for the Philippines, and with the subsequent international debt crisis, the economy declined. With a financial crisis in 1982 and the assassination of Benigno Aquino in 1983, the increrase in insurgency and uncertainty over the future of the Marcos administration, the decline accelerated until the severe recession of 1983-1985. GNP grew by -8.72% in 1984 and -7.06%. Unemployment peaked at 12.5% in 1985 and underemployment to 30.5% in 1984.

The change in government in 1986 brought a measure of recovery. GNP growth reached 7.16% in 1988 but once more declined to a near standstill in 1991 and 1992 because of the economic slowdown in the major export markets, the lack of investor confidence due to the coup attempts and energy shortages then, and a series of severe natural calamities. The economy once again recovered and managed to sustain reasonably high growth rates from 1994 onwards, albeit low by the standards of the HPAEs.

Whether this growth will be sustained remains to be seen, specially with the current currency crisis plaguing the region. What is certain is that the employment situation has not substantially improved. The underemployment rate has never gone below 20% and the unemployment rate has always hovered around 9%. Growth with equity is a truly serious problem in the Philippines.

Thus studies on the informal sector has been spurred to examine its capability to generate jobs (Jurado and Castro, 1979; Quesada, 1988). This sector is formally defined as comprising income, employment and production generated by activities which are officially unrecorded, unregistered and unregulated (Templo and de Leon, 1992). Criminal activities are generally part of this sector in any economy (Quesada,

1988) but for developing economies, this sector covers activities which are far from being criminal but cannot simply be registered nor recorded with the government because of the economic structure.

Table 1
Growth Rates of GNP, Rates of Unemployment and Underemployment
(%)

Year	GNP	GNP per capita	Unemployment	Underemployment
1973	9.76	6.77	4.9	11.8
1974	4.20	1.39	4.0	9.8
1975	4.88	2.51	3.9	11.2
1976	8.17	4.83	5.2	10.1
1977	5.79	3.01	5.1	18.9
1978	5.46	2.67	4.9	15.2
1979	6.38	3.55	a	a
1980	4.63	1.86	7.9	20.7
1981	3.24	0.70	8.8	22.8
1982	2.84	0.33	9.6	25.8
1983	1.44	-1.06	10.4	29.1
1984	-8.72	-10.92	10.4	30.5
1985	-7.06	-9.31	12.5	20.4
1986	4.15	1.68	11.8	23.0
1987	5.10	2.61	11.2	23.1
1988	7.16	4.67	9.5	21.3
1989	5.73	3.31	9.1	21.1
1990	4.53	2.19	8.4	22.4
1991	0.23	-1.99	10.5	22.5
1992	0.62	-1.54	9.8	20
1993	2.12	-1.16	9.3	21.7
1994	5.25	2.75	9.5	21.4
1995	4.96	3.02	9.3	19.8
1996	6.94			

[a] no data available
Unemployment data for 1956-75 and 1980 onward use "past week" reference period while for 1976-78 use "past quarter" reference period. Prior to 1987, underemployed was defined as the number of employed persons wanting additional work. From 1987 onwards, the concept wasredefined to number of employed persons wanting more hours of work. No labor force survey was conducted in 1979. GNP data for 1993 and employment data for 1992-93 are still preliminary.
Source: National Statistics Office.

Among the activities covered are: small business people engaged in trading and service activities, cottage industry (i.e., production within residential premises) and street and flea market vending and hawking; credit and finance; transportation; household help and domestic service; small-scale utilization of fisheries, mining and logging; and foreign exchange trading. The International Labor Organization defines the informal sector as activities where "free entry exists, enterprises are small, often family-owned and rely on indigenous resources, workers have limited formal training and markets are highly competitive and unregulated" (Templo and de Leon, 1992).

In general firms in this sector can be described as having low levels of productivity, employment and fixed assets. Hours of work can be longer than those in the formal sector but most workers in the informal sector perceive their occupation as temporary till a more preferred job is available. Because the sector is precisely unregulated, unregistered and unrecorded, conditions of work and terms of employment can often be more severe than in the formal sector (Templo and de Leon, 1992). However, substantial production is undertaken in sectors which are precisely among the major export items of the Philippines, namely garments, leather and leather products, footwear, furniture and fixtures.

Based on a special Labor Force Survey that is still not officially published (Templo and de Leon, 1992), the informal sector has comprised a substantial majority of the labor force since 1986 (the earliest for which data are available) as shown in Table 2. The majority of the informal sector labor -- consistently above 65% -- are concentrated in the agricultural sector. It would be specially interesting to compare this result with the census data on employment in establishments where agriculture

never comprises a majority in formal sector employment. Moreover from the available data, the actual level of informal sector employment in agriculture has declined from 1986 to 1991 but that in the services sector has increased. This suggests that given the low level of skills required and the ease of entry in either the services sector or the traditional agricultural sector, the unskilled labor can easily be absorbed in either of these.

Moreover a cursory inspection of the data suggests that the level of employment in the informal sector may be related to the level of overall economic activity as measured by standard measures of national income and output. The level of informal sector employment declined after 1986 as the economy initially expanded. But it went up even higher than the 1986 level by 1990 on to 1991 (Templo and de Leon,1992).

Table 2
Employment in the Informal Sector, 1986-1991
(in thousands)

Sector	1986	1987	1988	1989	1990	1991
Total Employment	18,855	20,050	20,205	21,908	22,211	22,915
Total Informal Employment	11,320	11,001	11,075	11,149	11,387	11,708
Share of Informal in Total (%)	60.00	54.87	54.81	50.89	51.27	51.09
Agriculture	7,837	7,494	7,457	7,275	7,499	7,667
Mining and quarrying	53	30	52	56	49	52
Manufacturing	626	459	625	657	589	617
Construction	49	68	79	97	106	113
Utilities	3	8	0	8	0	8
Services	2,752	2,386	2,862	3,056	3,144	3,251

Source: Templo, Ofelia and de Leon, Teresita, 1992, "The Urban Informal Sector in the Philippines: Recent Developments and Future Policy Directions". Paper presented at the Seminar on Employment Policies for the Urban Sector in East and Southeast Asia, Bangkok, 12-16 October.

The National Statistical Coordination Board (NSCB) has attempted to estimate the contribution of the informal sector to total GDP (Templo and de Leon, 1992). From this methodology, the informal sector accounted for about 40 percent of total GDP during the period 1980-90. (Please refer to Table 3) In general, the formal sector economic growth is inversely related to that of the informal sector with the share of the latter increasing during the negative GDP growth years of 1983-85 and 1990. This suggests that indeed the informal sector absorbs the unemployment and underemployment of the formal sector.

Table 3
Contribution of the Informal Sector
(%)

	Average 1980-85	Average 1986-90	Average 1980-90
Growth Rates			
Gross domestic product	19.38	12.79	16.45
Formal	14.44	13.26	13.91
Informal	27.47	12.30	20.73
Shares			
Gross domestic product	100	100	100
Formal	63	57	60
Informal	37	43	40

Source: Templo and de Leon, *op. cit.*, following p. 7.

By industrial origin, agriculture, fishery and forestry contributed the biggest share (about 41%) of total informal sector output in 1980 but this has declined to 30% by 1990. The services sector increased its share from 31% in 1980 to 47% in 1990. The share of manufacturing even declined from 27% in 1980 to 23% (Please refer to Table 4). This decline may to some extent be explained by the steady expansion of the formal sector manufacturing which requires level of skills higher than what the informal sector labor may possess and levels of technology and efficiency that can successfully compete with those of the informal sector.

The Philippines has decided on an outward-oriented industrialization path and has substantially reduced tariff barriers on many imported items. To attain sustained growth it has attracted foreign investment and promoted exports. But it still needs to generate substantial employment growth. Because of the high rate of underemployment and the high population growth rate, employment growth in the foreseeable future has to come from both formal and informal sector employment.

The input-output analysis can provide insight into employment growth per sector and sources of employment growth. Since the data on employment and on input-output transactions among establishments include a few that are informal, according to the National Statistics Office, one can then gain some insight also into emplyment patterns in the informal sector.

Table 4
Share of the Informal Sector in GDP by Industrial Origin, 1980-90
(%)

Sector/Industry	1980	1985	1990
Agriculture, Fishery and Forestry	40.68	31.78	30.27
Industry	27.95	23.01	22.68
Construction	3.35	1.29	1.65
Manufacturing	24.60	20.61	20.54
Mining and Quarrying	0.00	1.11	0.49
Services	31.37	45.21	47.06
Transport, Communication and Storage	5.22	6.57	4.77
Trade	7.21	18.16	21.47
Ownership of Dwellings and Real Estate	12.76	11.37	11.08
Finance	0.26	0.29	0.13
Private Services	5.92	8.82	9.60

Source: Templo and de Leon, *op. cit.*, following p. 8.

III. The Accounting Framework

The accounting framework of the formal input-output model is as follows:

Let X, 39-order vector of Total Output (TO) by sector or industry i

Y, 39-order vector of total final demand by sector

= C + I + G + E (consumption, investment, government expenditure and exports)

A, 39-order matrix of technical coefficients from the competitive transactions tables

L, 39-order vector of employment by industry i

L_{inf}, 39-order vector of employment of informal labor by industry i

$$\Sigma L_i$$

l, 39-order vector of labor coefficients where $l_j = L_j / x_j$

l_{inf}, 39-order vector of coefficients of informal labor

F, 39 by 4 matrix of final demand = [C, I, G, E].

λ, 39-order matrix of employment multipliers per sector

λ_{inf}, 39-order matrix of informal employment multipliers per sector.

Unless otherwise stated, the variables are in constant pesos. Therefore, the employment multipliers are:

(1) $\lambda = l(I-A)^{-1}$

(2) $\lambda_{inf} = l_{inf}(I-A)^{-1}$

A measure of labor productivity is

(3) $LP_i = 1/\lambda_i$

An increase in LP is an indicator of improvement in labor productivity.

To measure sources of employment growth,

(4) $N = l(I-A)^{-1}F = \lambda (I-A)^{-1}[C + I + G + E]$

To measure sources of growth in the informal sector employment,

(5) $N = l_{inf}(I-A)^{-1}F = \lambda_{inf}(I-A)^{-1}[C + I + G + E]$

The data requirements of the empirical analysis are the input-output tables for 1974. 1979, 1983 and 1988 prepared by the National Statistics Office (NSO) for the Philippine economy. The employment and capital stock vectors were constructed from the data available in the NSO Annual Survey of Establishments (ASE) and the Census of Establishments (CE). The informal labor coefficients are obtained from the data on unpaid workers, working owners and family workers

Please see Appendix A for more details on the data and data sources.

IV. Analysis of Results

Table 5 shows the computed employment multipliers for the 39 sectors from 1974 to 1988 based on equation (1). By 1988, the sectors with the highest impact on job generation were sugarcane production (4), machinery except electrical (27), non-metallic mining and quarrying (10), leather and leather products except footwear (20), garments (15), furniture and fixtures (17), private services (39), trade (36) and transportation services (33). The last three are service sectors that generally require unskilled or semiskilled labor and entry is easy. The others are also labor-intensive activities where the skills required are very high either, even for non-electrical machinery. With the exception of mining and quarrying and nonelectrical machinery and the service sectors, these sectors with high employment multiplier are also among the major export sectors of the Philippines since 1980.

The sectors with the lowest employment multiplier happen to be agricultural: other crops (5), tobacco products (13), forestry and logging (8), fisheries (7), livestock and poultry (6), coconut and copra (3), palay or unhusked rice (1), and corn (2). Agriculture has been the slowest-growing production sector of the Philippines and has not attracted substantial investment in the last 30 years. Any production activity in this

sector is largely being undertaken by the informal sector. The lack of investment thus resulted in low rates of employment and productivity, thus the persistent problem of unemployment and underemployment.

Table 5
Employment Multipliers

	Sector	1974	1979	1983	1988
1	palay	0.0028	0.0041	0.0017	0.0003
2	corn	0.0025	0.0023	0.0011	0.0003
3	coconut and copra	0.0023	0.0028	0.0021	0.0004
4	sugarcane	0.0173	0.0299	0.0232	0.0081
5	other crops	0.0073	0.0075	0.0015	0.0012
6	livestock and poultry	0.0060	0.0064	0.0040	0.0006
7	fisheries	0.0056	0.0071	0.0035	0.0008
8	forestry and logging	0.0082	0.0109	0.0070	0.0008
9	metallic mining	0.0184	0.0124	0.0093	0.0017
10	non-metallic mining and quarrying	0.0269	0.0112	0.0064	0.0073
11	food manufacturing	0.0154	0.0077	0.0054	0.0012
12	beverages	0.0280	0.0149	0.0077	0.0018
13	tobacco products	0.0174	0.0119	0.0061	0.0012
14	textile manufactures	0.0514	0.0244	0.0113	0.0033
15	wearing apparel and made-up textile goods	0.1030	0.0366	0.0175	0.0059
16	lumber and plywood and veneer plants	0.0440	0.0213	0.0107	0.0027
17	furniture and fixtures	0.0526	0.0502	0.0310	0.0056
18	paper and paper products	0.0163	0.0154	0.0097	0.0017
19	printing, publishing, and allied industries	0.0336	0.0291	0.0144	0.0033
20	leather and leather products except footwear	0.0420	0.0235	0.0127	0.0073
21	rubber products	0.0311	0.0277	0.0092	0.0031
22	chemical products	0.0225	0.0124	0.0067	0.0018
23	petroleum refineries & other petroleum products	0.0190	0.0087	0.0048	0.0023
24	nonmetallic mineral products	0.0332	0.0216	0.0089	0.0030
25	basic metals	0.0221	0.0135	0.0084	0.0012
26	metal prods. except mach. and trans. equipt.	0.0365	0.0199	0.0098	0.0026
27	machinery except electrical	0.0481	0.0185	0.0069	0.0075
28	electrical machinery apparatus and appliances	0.0360	0.0245	0.0103	0.0020
29	transport equipment	0.0238	0.0164	0.0113	0.0022
30	miscellaneous manufactures and scrap	0.0298	0.0228	0.0078	0.0033
31	construction	0.0255	0.0129	0.0073	0.0015
32	electricity, gas and water services	0.0210	0.0148	0.0069	0.0017
33	transportation services	0.0365	0.0235	0.0062	0.0039
34	storage and warehousing	0.0157	0.0108	0.0043	0.0025
35	communication	0.0143	0.0130	0.0071	0.0018
36	trade	0.0487	0.0258	0.0106	0.0039
37	financial institutions	0.0161	0.0122	0.0080	0.0028
38	real estate	0.0058	0.0033	0.0018	0.0011
39	private services	0.0342	0.0375	0.0127	0.0048

It would not be too easy to identify the key growth sectors for the period under study given because it covered both the high growth era of 1974 to 1979 and the recession years of 1984 and 1985. As can be seen in the Table 6, even from 1974 to 1979, a number of sectors already registered negative compounded annual growth rates, namely forestry and logging (sector 8), paper and paper products (18), and petroleum refineries (23). The declines however are not substantial, ranging from -4.07% for forestry and logging to a mere -0.36% for petroleum refineries. The fastest growing sectors, those with compounded annual growth rates of above fifteen percent, were coconut and copra (3), nonmetallic mining and quarrying (10), garments (15), lumber, plywood and veneer (16), rubber products (21), chemical products (22), basic metals (25), non-electrical machinery (27), electrical machinery (28), transport equipment (29), construction (31), and storage and warehousing (34). Note that the five industries with the highest productivity improvements are among these fastest growing industries. But interestingly enough, coconut and copra (3), nonmetallic mining and quarrying (10), non-electrical machinery (27) and storage and warehousing (34) are among the ten lowest in productivity gains.

In 1983, as a reflection of the deceleration of the economy, fourteen of the 39 production sectors experienced negative compounded annual growth rates. Of these eight experienced negative rates higher than two percent namely, sugarcane (4), forestry and logging (8), metallic mining (9), beverages (12), tobacco products (13), paper and paper products (18), chemical products (22), and transport equipment (29). Noteworthy was the fact that four of the twelve high growth sectors in 1974-79 registered negative growth rates, namely coconut and copra (3), basic metals (25),

chemical products (22) and transport equipment (29), the last two among the eight with highest negative rates.

Table 6
Sectoral Output Growth
(cagr, %)

		1974-79	1979-83	1983-88	1974-88
1	palay/unhusked rice	10.32	-0.78	1.26	3.80
2	corn	7.96	-1.05	7.70	5.21
3	coconut and copra	15.27	-0.84	9.45	8.39
4	sugarcane	0.51	-5.97	-12.04	-5.97
5	other crops	9.21	7.45	-0.99	4.96
6	livestock and poultry	12.80	10.85	-0.33	7.39
7	fisheries	6.32	4.66	-1.68	2.93
8	forestry and logging	-4.07	-11.75	-0.83	-5.21
9	metallic mining	6.34	-3.05	2.63	2.26
10	non-metallic mining and quarrying	22.78	10.67	-3.22	9.48
11	food manufacturing	12.39	0.20	-1.23	3.86
12	beverages	9.80	-2.78	9.90	6.08
13	tobacco products	9.06	-2.21	-4.12	0.96
14	textile manufactures	10.83	-1.41	-6.87	0.73
15	wearing apparel and made-up textile goods	19.36	1.92	-1.89	6.38
16	lumber and plywood and veneer products	18.31	3.45	-5.21	5.19
17	furniture and fixtures	1.13	-1.65	21.40	7.09
18	paper and paper products	-1.73	-13.60	5.69	-2.79
19	printing, publishing, and allied industries	1.39	7.50	3.05	3.70
20	leather and leather products except footwear	11.41	4.42	-8.82	1.81
21	rubber products	21.03	24.47	-17.53	6.39
22	chemical products	16.30	-3.82	-0.38	4.23
23	petroleum refineries & other petroleum prodts.	-0.36	0.86	-1.56	-0.44
24	nonmetallic mineral products	4.56	5.49	-3.74	1.77
25	basic metals	16.76	-0.17	0.75	5.92
26	metal prods. except mach. and trans. equipt.	13.83	3.90	-7.26	3.08
27	machinery except electrical	27.53	23.10	-35.85	-1.22
28	electrical machinery apparatus and appliances	26.05	13.41	7.12	15.40
29	transport equipment	16.77	-10.72	-12.84	-2.58
30	miscellaneous manufactures and scrap	4.52	7.55	-2.51	2.79
31	construction	23.66	0.15	-4.52	6.16
32	electricity, gas and water services	10.46	14.25	-0.84	7.31
33	transportation services	5.68	8.44	1.28	4.86
34	storage and warehousing	24.81	13.88	52.99	30.76
35	communication	1.27	26.71	3.87	8.95
36	trade	5.83	4.70	-3.54	2.07
37	financial institutions	5.38	5.23	-4.03	1.88
38	real estate	4.27	0.90	-17.52	-5.00
39	private services	5.73	7.48	4.17	5.66

In 1988, an even more telling indicator of the severity of the recession of 1984-85 and the weakness of the subsequent recovery was the fact that 25 of the 39 production sectors registered negative growth rates, and only nine of these sectors experienced negative growth rates of less than -2%. The most severe contraction occurred in sugarcane (4), textile manufacture (14), lumber, plywood and veneer (16), leather and leather products (20), rubber products (21), metal products (26), non-electrical machinery (27), transport equipment (29) and real estate (38).

Over the entire period from 1974 to 1988, seven sectors registered negative compounded annual growth rates in output, namely sugarcane (4), forestry and logging (8), paper and paper products (18), petroleum refineries (23), non-electrical machinery (27), transport equipment (29) and real estate (38). The sectors with the highest growth rates were coconut and copra (3), nonmetallic mining and quarrying (10), electrical machinery (28), storage and warehousing (34), and communication (35).

In terms of labor productivity, based on equation (3), nearly all sectors experienced substantial increases from 1974 to 1988 (please refer to Table 7). One would note that there has been a steady and uniform decrease in employment multipliers for all sectors during this time period. The biggest improvements occurred in basic metals (25), electrical machinery apparatus and equipment (28), wearing apparel and made-up textile goods or garments (15), construction (31), and lumber, plywood and veneer products (16). The least productivity gains were in leather and leather products except footwear (20), financial insitutions (37), real estate (38), nonmetallic mining and quarrying (10), and sugarcane farming (4). The productivity

improvement was steady and quite rapid over time. The average increase in productivity was 57.28% in 1974-79, 106.61% in 1979-83, and 206.42% in 1983-88..

Table 7
Growth in Labor Productivity

	Sector	1974-79	1979-83	1983-88	1974-88
1	palay	-7.20	19.46	38.98	16.69
2	corn	1.08	17.16	33.32	17.72
3	coconut and copra	-3.81	6.54	42.59	14.51
4	sugarcane	-10.42	5.24	23.39	5.55
5	other crops	-0.46	38.74	4.46	13.98
6	livestock and poultry	-1.43	9.90	47.30	18.16
7	fisheries	-4.42	14.97	35.94	15.41
8	forestry and logging	-5.54	9.20	54.52	18.12
9	metallic mining	8.20	5.99	40.78	18.66
10	non-metallic mining and quarrying	19.16	11.90	-2.70	9.75
11	food manufacturing	15.03	7.29	35.11	20.04
12	beverages	13.45	14.11	34.09	21.77
13	tobacco products	7.89	14.31	39.43	21.36
14	textile manufactures	16.07	16.61	27.69	21.58
15	wearing apparel and made-up textile goods	23.01	15.84	24.37	22.67
16	lumber and plywood and veneer plants	15.68	14.62	31.41	21.93
17	furniture and fixtures	0.97	10.10	40.76	17.34
18	paper and paper products	1.11	9.68	41.10	17.34
19	printing, publishing, and allied industries	2.95	15.13	34.16	18.01
20	leather and leather products except footwear	12.36	13.13	11.69	13.33
21	rubber products	2.38	24.56	24.06	17.80
22	chemical products	12.77	13.03	29.79	19.70
23	petroleum refineries & other petroleum products	17.03	12.72	15.75	16.32
24	nonmetallic mineral products	9.00	19.34	24.51	18.79
25	basic metals	10.34	9.95	47.69	23.16
26	metal prods. except mach. and trans. equipt.	12.92	15.13	30.86	20.89
27	machinery except electrical	21.11	21.70	-1.66	14.17
28	electrical machinery apparatus and appliances	8.04	18.84	39.16	23.03
29	transport equipment	7.75	7.82	38.81	18.61
30	miscellaneous manufactures and scrap	5.47	23.90	18.56	16.92
31	construction	14.64	12.14	36.45	22.23
32	electricity, gas and water services	7.23	16.45	32.09	19.57
33	transportation services	9.21	30.43	10.00	17.39
34	storage and warehousing	7.78	20.40	11.17	13.99
35	communication	1.87	12.90	30.89	15.73
36	trade	13.53	19.53	21.87	19.68
37	financial institutions	5.61	8.94	23.31	13.31
38	real estate	12.06	13.00	10.33	12.68
39	private services	-1.85	24.17	21.45	15.03

This contrasts with Puerto Rico where the rate of productivity improvement from 1948 to 1963 was 37.27% (Wolff, 1975). Thus steady and rapid labor productivity and uneven growth resulted in the high rates of unemployment

To follow on Wolff's prescription for Puerto Rico (1975), employment can be promoted in an open economy by promoting exports in sectors with highest employment multipliers. And for the Philippines the ones with the highest emplyment multipliers for any of the three subperiods happen to be the main new export sectors, namely garments (15), leather and leather products except footwear (20), and furniture and fixtures (17), and one traditional export sector, sugarcane production (4). Of these, only garments (15) had a very signifiacant decrease in employment multiplier, or an increase in labor productivity.

But given the high rates of labor productivity improvement, increased employment would be promoted if the rates of investment and export growth were even faster. Thus it comes as no surprise, when one would consider the economic performance of the Philippines during the period under study, that in fact the growth rates in output were far lower than the rates of productivity improvement. Textiles (14) expanded by a mere 0.85%, garments (15) 6.46%, lumber, plywood and veneer (16) by 5.52%, and furniture and fixtures (17) by 6.96%. Indeed the sectors with the fastest growth rates in output as noted above were those that did not have high labor productivity, namely nonmetallic mining and quarrying (10), rubber products (21), non-electrical machinery (27), storage and warehousing (34) and communication (35). Moreover of the four sectors with the highest labor productivity, only garments (15) in 1983-88 and furniture and fixtures (17) in 1974-79 registered productivity improvement below the overall average. In all other sectors for all the other time

periods, the rate of productivity improvement in labor was quite higher than the overall average.

On the whole these data again suggest that the modern sector of the economy has been utilizing substantial labor-saving technology. Not only have employment multipliers drastically declined, their magnitudes in themselves are far lower than those obtained for Puerto Rico during the phase of rapid industrialization (Wolff, 1977). For the Philippines that has yet to enter an unassailably sustainable phase of industrialization, low employment multipliers with rapid increases in labor productivity may not be able to generate sufficient employment to absorb the informal sector labor unless the rate of investment and export growth increases rapidly enough to generate more jobs and improve productivity.

Table 8 shows the proportion of unpaid labor, working owners and family labor in the total employment of each sector. This indicates the extent of informal sector labor in the input-output transactions. For the entire economy, this proportion has been steadily declining from 1974 to 1988. The sectoral variations are quite fascinating though. Six sectors consistently registered proportions higher than ten percent during the period under study, namely food manufacturing (11), garments (15), furniture and fixtures (17), metal products (26), trade (36), and private services (39). The last two would be understandable given the low level of skills that these activities require. Indeed the previous section noted an increase in the share of services in informal sector employment from 1980 to 1990 (Templo and de Leon, 1992). Garments and furniture and fixtures as already noted have among the highest employment multiplers and are among the major exporting sectors of the economy. The trend for garments seems to be a steady decline whilst that for furniture and

fixtures is unclear given the sharp increase from 1979 to 1983 followed by a decline in 1988 which is still higher than in 1979. Food manufacturing (11) involves a wage good whose production requires relatively low level of skills, low level of investment and labor-intensive technology. The ratio of unpaid labor to total employment declined steadily from 1974 to 1983 before jumping again in 1988 to a level close to that of 1974.

Surprisingly this ratio is very low for the agricultural sector with the highest reaching 1.59% for palay (1) in 1988. This seems striking when one recalls that the majority of the infomal labor happen to be in this sector (Templo, 1992). This may suggest that formal sector establishments for census purposes are easier to identify in the agricultural sector than in manufacturing. Indeed the proportions for agriculture are on the same range as those of recognizably capital-intensive production sectors, such as rubber products (21), chemical products (22), petroleum refineries (23), and electrical machinery (28). Perhaps the CE and ASE cover largely the commercial farms and plantations.

In terms of the growth in sectoral employment (Table 9), one would note that the rate of growth of employment in establishments in fact declined from 1979 to 1983 and that from 1983 to 1988 is less than for the labor force. From 1979 to 1983, only eleven sectors registered an increase in employment, none of which was higher than ten percent. This is in contrast to the increase in the labor force by sixteen percent during this time period. Moreover this was before the severe recession of 1984-85. But by 1988, the majority of the sectors -- 24 out of 39 -- registered positive growth rates in total employment, the highest being corn (2), other crops (5), nonmetallic mining

and quarrying (10), furniture and fixtures (17), chemical products (22), miscellaneous manufacture (30), storage and warehousing (34) and private services (39).

Table 8
Ratio of Unpaid Employment to Total Employment
(%)

	Sector	1974	1979	1983	1988
1	palay/unhusked rice	2.21	1.13	3.54	1.59
2	corn	0.94	5.81	6.33	0.18
3	coconut and copra	3.12	1.27	3.36	0.94
4	sugarcane	2.75	1.26	1.73	0.21
5	other crops	0.36	0.44	2.94	0.10
6	livestock and poultry	2.79	3.12	2.16	0.61
7	fisheries	5.57	7.23	5.88	0.88
8	forestry and logging	0.20	0.04	0.05	0.21
9	metallic mining	1.33	0.03	0.00	0.24
10	non-metallic mining and quarrying	5.09	6.23	5.47	0.56
11	food manufacturing	23.56	17.97	16.45	21.85
12	beverages	3.26	1.39	5.14	5.05
13	tobacco products	0.06	0.08	0.05	0.09
14	textile manufactures	8.45	4.93	4.38	2.71
15	wearing apparel and made-up textile goods	34.98	24.62	23.01	12.66
16	lumber and plywood and veneer products	7.98	4.19	4.27	6.76
17	furniture and fixtures	17.94	11.32	21.57	13.20
18	paper and paper products	1.66	0.65	0.94	2.43
19	printing, publishing, and allied industries	8.75	5.46	10.20	9.51
20	leather and leather products except footwear	13.46	8.70	7.68	8.00
21	rubber products	3.64	3.48	3.97	1.95
22	chemical products	0.59	0.34	0.49	0.73
23	petroleum refineries & other petroleum prodts.	1.26	0.19	0.00	0.20
24	nonmetallic mineral products	9.08	7.98	9.86	13.01
25	basic metals	0.41	0.70	0.30	1.27
26	metal prods. except mach. and trans. equipt.	14.38	15.87	19.91	24.41
27	machinery except electrical	4.28	4.59	7.51	8.11
28	electrical machinery apparatus and appliances	0.55	0.23	0.31	0.22
29	transport equipment	3.09	1.87	2.35	3.40
30	miscellaneous manufactures and scrap	17.16	10.18	16.04	8.84
31	construction	0.50	0.53	0.54	1.51
32	electricity, gas and water services	0.64	0.03	0.09	0.14
33	transportation services	27.59	19.81	4.08	2.36
34	storage and warehousing	12.86	5.91	9.84	4.33
35	communication	0.26	0.07	0.11	0.19
36	trade	60.94	44.97	48.76	38.10
37	financial institutions	1.14	0.49	0.64	1.95

38	real estate	4.84	4.70	1.99	5.47
39	private services	17.35	19.97	28.60	22.49

Table 9
Growth in Total Employment
(cagr, %)

	Sector	1974-79	1979-83	1983-88	1974-88
1	palay	36.13	-12.65	-30.91	-5.87
2	corn	-18.35	-15.51	47.63	1.88
3	coconut and copra	24.66	-6.54	-16.62	-0.55
4	sugarcane	20.57	0.65	-11.47	2.55
5	other crops	16.63	-25.63	24.87	5.09
6	livestock and poultry	31.52	2.92	-7.82	8.01
7	fisheries	22.36	-3.03	-15.23	0.43
8	forestry and logging	25.00	2.31	-27.44	-2.80
9	metallic mining	3.42	-1.33	-2.56	-0.11
10	non-metallic mining and quarrying	4.18	0.67	38.84	14.31
11	food manufacturing	4.74	-3.23	7.26	3.27
12	beverages	3.26	-3.14	1.54	0.78
13	tobacco products	-1.75	-0.91	-4.37	-2.46
14	textile manufactures	10.94	-10.15	0.46	0.82
15	wearing apparel, made-up textile goods	6.37	-2.86	5.46	3.33
16	lumber and plywood and veneer products	6.43	-2.27	0.02	1.59
17	furniture and fixtures	12.85	-3.18	12.03	7.74
18	paper and paper products	12.12	-8.85	3.30	2.63
19	printing, publishing, allied industries	7.13	-3.26	7.23	4.09
20	leather, leather products exc. footwear	5.94	2.12	7.04	5.22
21	rubber products	32.30	-2.14	-6.51	7.22
22	chemical products	6.69	-2.67	11.10	5.44
23	petroleum refineries, other petroleum prodts.	3.40	3.07	0.12	2.12
24	nonmetallic mineral products	10.23	-5.29	0.54	2.14
25	basic metals	17.29	-1.32	-2.35	4.57
26	metal prods. exc. mach., trans. equipt.	5.53	-6.95	4.57	1.47
27	machinery except electrical	4.88	-4.04	4.54	2.13
28	electrical machinery apparatus, appliances	17.27	1.86	0.76	6.70
29	transport equipment	9.26	-8.88	-8.52	-2.64
30	miscellaneous manufactures and scrap	13.47	-13.81	21.77	7.57
31	construction	8.52	5.70	-9.92	0.78
32	electricity, gas and water services	16.70	2.92	4.47	8.22
33	transportation services	14.63	-20.65	0.16	-1.66
34	storage and warehousing	14.09	-7.91	92.10	29.26
35	communication	17.12	8.09	0.19	8.26
36	trade	2.95	-7.32	-1.89	-1.80
37	financial institutions	6.17	8.79	-0.91	4.31
38	real estate	15.54	-6.34	-5.61	1.24
39	private services	20.95	-10.01	10.79	7.72

For the entire period, seven sectors registered negative compounded annual growth rates, namely palay (1), coconut and copra (3), forestry and logging (8), tobacco products (13), transport equipment (29), transportation services (33), and trade (36). The highest growth rate was registered by nonmetallic mining (10) at fourteen percent. The rate of employment growth is not very high compared to the overall increase in the labor force. It might also be worthwhile to recall that employment in establishments from 1979 to 1983 actually declined and that there has been a substantial degree of emigration of labor to overseas markets. One can argue that the informal sector was expanding during this time period when the economy was undergoing a slowdown leadin the the recession of 1983-85.

Another telling indicator is the rate of growth of the stock of capital (Please refer to Table 10). For both the 1979-83 and 1983-88 periods, 25 production sectors out of 39 registered negative growth rates. And for the entire period, seventeen sectors registered negative growth rates. This is specially confirmed by Table 11 which shows the growth in the capital-labor ratios per sector. Indeed only fourteen sectors registered positive growth in the capital-labor ratio from 1974 to 1988, the highest growth rate being a mere eleven percent per annum in fisheries (7) which became a major exporting sector by 1980. Even the other major exporting sectors such as textiles (14), garments (15) and furniture and fixtures (17) recorded negative growth in the capital-labor ratios.

Table 10
Growth Rate of Capital Stock
(1972 prices, cagr, %)

	Sector	1974-79	1979-83	1983-88	1974-88
1	palay	35.11	-15.88	-31.29	-7.31
2	corn	-9.77	-16.02	58.44	8.09
3	coconut and copra	40.88	-3.10	-17.58	4.54
4	sugarcane	25.61	-4.59	-20.52	-1.39
5	other crops	0.95	7.63	7.28	5.07
6	livestock and poultry	16.64	28.14	-14.40	7.28
7	fisheries	24.97	-2.53	10.83	11.52
8	forestry and logging	0.63	-2.09	-24.15	-9.74
9	metallic mining	-10.13	28.96	-11.93	-1.08
1	non-metallic mining and quarrying	-3.46	18.02	54.01	20.81
1	food manufacturing	13.00	-3.88	-6.95	0.66
1	beverages	15.44	15.97	-3.64	8.37
1	tobacco products	2.33	23.59	-29.05	-5.24
1	textile manufactures	5.67	-4.77	-9.97	-3.12
1	wearing apparel, made-up textile goods	26.38	-26.98	-0.99	-0.97
1	lumber, plywood, veneer products	3.88	-2.46	-14.35	-4.77
1	furniture and fixtures	19.47	-8.96	2.87	4.79
1	paper and paper products	-8.54	-3.94	-17.05	-10.43
1	printing, publishing, and allied	15.37	-5.96	-0.66	3.16
2	leather, leather products exc. footwear	4.44	-3.90	4.10	1.87
2	rubber products	35.48	-10.38	-5.68	5.78
2	chemical products	11.83	3.10	14.01	10.02
2	petroleum refineries, other petroleum	-16.11	-13.78	23.16	-3.03
2	nonmetallic mineral products	-5.34	-3.91	-6.11	-5.21
2	basic metals	22.20	25.64	13.41	19.93
2	metal prods. exc. mach. and trans.	9.25	-5.28	-6.91	-0.95
2	machinery except electrical	9.74	-13.64	-4.41	-2.45
2	electrical machinery apparatus,	22.84	0.40	9.97	11.46
2	transport equipment	10.17	2.90	-23.34	-5.08
3	miscellaneous manufactures and scrap	10.09	-14.41	-3.55	-2.28
3	construction	13.53	7.27	-19.69	-1.29
3	electricity, gas and water services	13.00	8.03	6.39	9.18
3	transportation services	22.71	-10.74	-83.22	-44.95
3	storage and warehousing	61.65	-19.49	48.85	28.62
3	communication	29.06	0.10	-3.68	8.11
3	trade	24.43	-22.76	6.01	2.54
3	financial institutions	13.16	16.28	-9.92	5.12
3	real estate	43.39	-28.46	-7.60	0.48
3	private services	43.80	-21.75	3.56	7.48

Table 11
Growth in Capital-Labor Ratios
(cagr, %)

	Sector	1974-79	1979-83	1983-88	1974-88
1	palay	-0.75	-3.70	-0.54	-1.53
2	corn	10.51	-0.61	7.32	6.09
3	coconut and copra	13.02	3.68	-1.16	5.11
4	sugarcane	4.18	-5.20	-10.23	-3.84
5	other crops	-13.45	44.73	-14.09	-0.02
6	livestock and poultry	-11.32	24.50	-7.14	-0.67
7	fisheries	2.13	0.52	30.75	11.04
8	forestry and logging	-19.49	-4.30	4.54	-7.14
9	metallic mining	-13.10	30.70	-9.61	-0.97
10	non-metallic mining and quarrying	-7.33	17.23	10.93	5.68
11	food manufacturing	7.89	-0.68	-13.25	-2.53
12	beverages	11.79	19.74	-5.10	7.53
13	tobacco products	4.15	24.72	-25.80	-2.85
14	textile manufactures	-4.75	5.99	-10.38	-3.91
15	wearing apparel, made-up textile goods	18.81	-24.83	-6.12	-4.17
16	lumber, plywood, veneer products	-2.40	-0.19	-14.37	-6.26
17	furniture and fixtures	5.86	-5.97	-8.18	-2.73
18	paper and paper products	-18.43	5.39	-19.70	-12.72
19	printing, publishing, allied industries	7.69	-2.79	-7.35	-0.89
20	leather, leather products exc. footwear	-1.42	-5.89	-2.75	-3.19
21	rubber products	2.40	-8.42	0.89	-1.34
22	chemical products	4.82	5.92	2.62	4.34
23	petroleum refineries, other petroleum	-18.87	-16.35	23.01	-5.04
24	nonmetallic mineral products	-14.12	1.46	-6.62	-7.20
25	basic metals	4.19	27.32	16.15	14.70
26	metal prods, exc, mach., trans, equipt.	3.53	1.80	-10.98	-2.38
27	machinery except electrical	4.63	-10.00	-8.57	-4.49
28	electrical machinery apparatus,	4.75	-1.44	9.14	4.46
29	transport equipment	0.83	12.93	-16.20	-2.51
30	miscellaneous manufactures and scrap	-2.97	-0.69	-20.79	-9.16
31	construction	4.62	1.48	-10.85	-2.05
32	electricity, gas and water services	-3.17	4.97	1.84	0.89
33	transportation services	7.04	12.49	-83.25	-44.02
34	storage and warehousing	41.69	-12.57	-22.51	-0.50
35	communication	10.19	-7.39	-3.86	-0.13
36	trade	20.86	-16.66	8.05	4.42
37	financial institutions	6.58	6.89	-9.09	0.78
38	real estate	24.10	-23.62	-2.11	-0.74
39	private services	18.89	-13.04	-6.53	-0.22

By sources of growth, Table 12 shows that the consumption expenditure still determines the major portion of employment growth but its share has considerably declined from 56.75% in 1974 to 52.5% in 1988. The fastest increase in share has been

exports, from 18.26% in 1974 to 29.04% in 1988, by then the second largest source of employment growth. Indeed only exports increased its share in employment generation. That of investment declined from 21.27% in 1974 to 16.42% in 1988, for government from 3.72% in 1974 to 2.04% in 1988.

Table 12
Employment Generated by Component of Final Demand

Year	Personal Consumption Expenditure	Government Consumption Expenditure	Gross Fixed Capital Formation	Exports	Total Domestic Final Demand
A. Percentage Composition of Employment by Component					
1974	56.75	3.72	21.27	18.26	100.00
1979	54.13	4.62	22.71	18.53	100.00
1983	55.81	2.95	20.80	20.44	100.00
1988	52.50	2.04	16.42	29.04	100.00
B. Compounded Annual Growth Rate per Component					
1974-79	7.22	13.07	9.66	8.56	8.23
1979-83	-1.99	-13.08	-4.84	-0.32	-2.73
1983-88	-15.31	-20.37	-18.23	-8.03	-14.26
1974-88	-3.94	-7.46	-5.17	-0.15	-3.40
C. Percentage Composition of Informal Employment by Component					
1974	59.88	3.54	16.19	20.39	100.00
1979	58.24	4.77	19.24	17.75	100.00
1983	59.81	3.13	15.15	21.91	100.00
1988	59.53	0.62	12.85	27.00	100.00
D. Compounded Annual Growth Rate per Component					
1974-79	-0.18	6.56	3.90	-2.38	0.37
1979-83	-2.34	-12.71	-8.60	2.26	-2.98
1983-88	-15.56	-38.86	-18.22	-11.87	-15.48
1974-88	-6.56	-17.46	-8.05	-4.62	-6.52

Employment growth was negative from 1974 to 1988. It registered 8.23% increase from 1974 to 1979, a high-growth period, but turned negative onwards as the economy slowed down. Since the long-term growth was -3.4%, employment clearly was severely affected by the 1983-85 recession and has yet to recover to the level before 1974. All components of demand showed negative employment growth but the lowest rate was registered by exports, a mere -0.15% from 1974 to 1988. Consumption was the second lowest at -3.94%.

As for informal employment, the share of consumption was even larger and did not decrease substantially, from 59.88% in 1974 to 59.53% in 1988. This does confirm the estimates that the substantial portion of informal sector employment is in the services sector which is by and large consumption-driven. The share of exports increased also, from 20.39% in 1974 to 27% in 1988. But the fact that the share of informal employment is much lower than for formal employment in 1988 suggest that a substantial portion of manufacturing activity is already modernizing. The decrease in employment growth in fact is even greater for the employment sector, at -6.52% overall, with -6.56% for consumption and -4.62% for exports.

V. Conclusions

The analysis shows that substantial labor productivity has occurred throughout the Philippine economy during this period when the country was gradually shifting towards a more outward-oriented industrialization policy. The main source of growth has been consumption expenditure and export growth but the fastest increase has been by export growth followed by consumption expenditure. The same pattern can be said for informal sector employment.

However substantial investment has not been undertaken during this same period. Capital stock and capital-labor ratios for most sectors has declined. This could also explain why the decrease in employment multipliers has been rapid. Insufficient investment has not created jobs and whatever investment that materialized may have been directed towards capital-intensive production processes. Given the high rate of growth of labor force during this period, it is not surprising why the rates on unemployment and underemployment have been quite substantial since the 1980s.

Employment growth therefore would need to be sourced in both the formal and informal sectors. Both show a remarkable responsiveness to consumption expenditure and export growth. An export promotion program can therefore promote greater job generation in both formal and informal sectors and the subsequent increase in income

will increase consumption expenditure and thus promote greater employment once more, more so in the informal sector. However, one can also argue that greater investment can induce further employment growth. If this demand component di not seem to have generated as much employment as the other two, it will mainly be due to its low level during this time period. Much of the investment in the formal sector could well have been remitted abroad.

It is quite encouraging that the sectors with the highest employment multiplier also happen to be the main export commodities of the country. Maintaining growth in these exports can indeed generate the necessary jobs, both in the formal and informal sectors. But much still needs to be done to maintain productivity growth in these sectors toi maintain their international competitiveness. Moreover, investments need to be channelled to these sectors and to agriculture to realize more employment. Policies therefore would have to address bottlenecks in the flow of investment and capital to these areas, specially in the informal sector.

APPENDIX

DATA SOURCES

The data for the input-output analyses were obtained from several sources as described below. These can be classified into four: the commodity flow tables; the labor coefficients; the capital stock and depreciation coefficients; and the sectoral price deflators.

1) **Commodity flow tables**

Benchmark tables are available for 1961, 1965, 1974, 1979, 1985 and 1988. These were based on surveys of establishments with at least five employees. A RAS update was prepared for 1983 and 1990. The 1961 and 1965 tables were published in *The Statistical Reporter* (1968, 1971) whilst all others except 1988 have been published separately in manual form. The tables for 1988 are available in computer disks and have

yet to be published. These tables were all developed by the Bureau of Census and Statistics (BCS), later the National Census and Statistics Office (NCSO), now known as the National Statistics Office (NSO). Only competitive transactions tables are available for 1961, 1965, 1974 and 1979. Noncompetitive transactions tables are also available for 1969, 1985 and 1988. Imports transactions tables are also available for 1969, 1979, 1985 and 1988. Commodity-by-industry tables began to be developed in 1985 and are included in the published manual; the 1988 and 1990 tables are also available in disk.

The 1961, 1965, 1969, 1985 and 1990 tables could not be used for the model because of the absence of complete establishment data (either from the Census of Establishments, CE, or the Annual Survey of Establishments, ASE) for those years, as will be discussed in detail below. Since as noted the data were obtained from establishments with at least five employees, of necessity, the bulk of informal sector activity could not be incorporated in these tables. Moreover all tables omit detailed purchase and output transactions of government although this is included among the production sectors. Government thus appears as an aggregate expenditure in the final demand matrices. The NSO explained that as a matter of policy and habit the government does not divulge detailed information on its sectoral transactions.

The primary input tables include wages and salaries or compensation of employees; operating surplus or other value-added; indirect taxes less subsidies; and depreciation. These data are available for all the benchmark tables. Since the 1983 tables are based on a RAS update, only compensation and operating surplus are included. The final demand matrices include private consumption expenditures, general government consumption expenditures, gross fixed capital formation, change in stocks or inventories, exports and imports.

a) **Sectoral classification for long-term analysis**

The 60-sector industry classification scheme for 1974 to 1988 appears in the Table A-1. Based on interviews with Mr. Celso Morante of the NSO, disaggregated

tables are available on computer disk for all the years with benchmark tables. However in general the 60-sector tables are the most reliable because the larger tables have involved a degree of extrapolation for many of the more disaggregated sectors. For the analysis of long-term productivity changes across sectors, the 60-sector tables were aggregated by the author into 39-sector tables to standardize sectoral analysis from 1974 to 1988. The resulting aggregated sectoral classification appears in Table A-2. A number of sectors need to be explained in terms of their aggregation.

One would note that banana appears as a separate sector beginning in 1979, which reflects its emergence as a major export commodity in the 1970s. However in the ASE and CE this sector appeared separately only in 1988. Thus this was aggregated with the other crops category in 1979 and 1983 to conform with the ASE/CE data. In contrast, a reflection of the decline in economic importance is the disappearance by 1979 of tobacco, coffee and cacao, and abaca and other fiber crops as separate categories and their incorporation into the other crops category. All these are aggregated as other crops in the 39 sector classification.

Copper, gold and other precious metals, chromium and nickel all appeared as separate categories in 1988. In 1974, only gold appeared separately. In 1974 and 1979, all are lumped together in metallic mining. Sand, stone and quarrying appear as separate entry in 1988, otherwise in other years this was incorporated in the nonmetallic mining sector. Food manufacturing appeared as a single category in 1988 only. For 1979 and 1983, it was disaggregated into meat and meat products, rice and corn milling, milk and other dairy products, coconut oil and its products, flour and other grain mill products, and animal feeds. In 1974, the disaggregation reached only up to meat products, dairy products, rice milling, and sugar milling. In the 39-sector tables these sectors are aggregated as food manufacturing.

Lumber and plywood, and wood and cork products appear separately in all years except 1988 when they were consolidated. Basic industrial chemicals, drugs and other

medicines, fertilizers, and other chemical products are separate sectors in 1979 and 1983. In 1974, the categories were basic industrial chemicals, coconut oil and other oils and fats, and other chemical products. These were all aggregated into chemicals and other chemical products in 1988. Cement is a separate sector in 1974, 1979 and 1983 and is incorporated into nonmetallic mineral products in 1988.

Motor vehicle manufacture and manufacture of other transport equipment are separate sectors in 1974 but are subsequently aggregated into transport equipment manufacture. Similarly, scrap appears as a separate sector in 1974 only and is incorporated into miscellaneous manufacture afterwards. Electricity is a sector separate from gas and steam in 1974 and 1983 but these are integrated as one in 1979 and 1988. In 1974, gas and steam is incorporated in water services. In the 39 sector tables, electricity, gas, steam and water services appear as one sector.

Transportation appears as one sector in 1974. This is disaggregated to land transport, water transport and air transport subsequently. In 1979 and 1983, land transport is further disaggregated to busline operation, other passenger land transport and road freight; in addition, services incidental to transport appears as a separate sector. For the 39 sector tables, these are all aggregated into transportation services.

Banks, non-banks and insurance are three separate sectors in 1988 but are aggregated as one -- financial institutions -- in 1979 and 1983. In 1974, insurance appears as separate from banks and nonbanks.

Finally, private education, private health services, and hotels and restaurants appear as separate categories in 1979, 1983 and 1988. Private business services, recreational services and other personal services are separate sectors in 1988 but are aggregated into other private services in 1979 and 1983. In 1974, these are all aggregated in private services. Ownership of dwellings appears as a separate sector in 1988 only and is incorporated into real estate in all other years.

Table A-1
Production Sectors
Input-Output Tables

Code	1974	Code	1979
1	palay	1	palay
2	corn	2	corn
3	fruits and nuts	3	coconut including copra
4	vegetables	4	sugarcane
5	root crops	5	banana
6	coffee	6	other crops including agri services
7	sugar cane	7	livestock
8	coconut including copra	8	poultry
9	tobacco	9	fisheries
10	abaca	10	forestry and logging
11	other crops	11	metallic mining
12	livestock	12	non-metallic mining
13	poultry	13	rice and corn milling
14	other agricultural activities	14	sugar milling and refining
15	fisheries	15	milk and other dairy products
16	forestry and logging	16	coconut, vegetable, animal oils
17	gold and silver mining	17	refined coconut and vegetable oil
18	other metallic mining	18	meat and meat products
19	non-metallic mining	19	flour and other grain products
20	meat products	20	animal feeds
21	dairy products	21	other food manufactures
22	rice milling	22	beverage industries
23	sugar milling	23	tobacco manufactures
24	other manufactured foods	24	textile and textile goods
25	beverages	25	wearing apparel and footwear
26	tobacco products	26	leather and leather products
27	textile manufactures	27	lumber, plywood and veneer
28	wearing apparel	28	other wood, cane, cork products
29	lumber	29	furniture and fixtures
30	plywood	30	paper and paper products
31	furniture	31	publishing and printing
32	paper	32	rubber and plastic products
33	printing	33	drugs and medicines
34	leather	34	basic industrial chemicals
35	rubber products	35	fertilizer
36	basic industrial chemicals	36	other chemicals and chemical products
37	coconut oil	37	petroleum products and coal
38	other chemical products	38	cement
39	petroleum and its products	39	other non-metallic mineral products
40	hydraulic cement	40	basic metals
41	other non-metallic mineral products	41	fabricated metal products
42	basic metals	42	machinery except electrical
43	metal products	43	electrical machinery
44	machinery except electrical	44	transportation equipment
45	electrical machinery	45	miscellaneous manufactures
46	motor vehicles	46	construction
47	other transport equipment	47	electricity
48	miscellaneous manufactures	48	gas and steam except liquefied petroleum
49	scrap	49	waterworks and supply

50	electricity, gas, water	50	busline operations
51	construction	51	other land passenger transport
52	trade	52	road freight transportation
53	banking and financial institutions	53	water transportation
54	insurance	54	air transportation
55	real estate	55	services incidental to transport
56	transportation services	56	communication
57	storage/warehousing	57	storage and warehousing
58	communications	58	wholesale and retail trade
59	private services	59	finance and insurance
60	government services	60	real estate
61	notional industry	61	government services
		62	private educational services
		63	private health services
		64	hotels and restaurants
		65	other private services
		66	notional industry

Code	1983	Code	1988
1	palay	1	palay
2	corn	2	corn
3	coconut	3	coconut and copra in farms
4	sugarcane	4	sugarcane
5	banana	5	banana
6	other crops	6	other crops and agricultural services
7	livestock and its products	7	livestock
8	poultry and its products	8	poultry
9	fishery	9	fishery
10	forestry and logging	10	forestry and logging
11	metallic mining	11	copper
12	non-metallic mining and quarrying	12	gold and other precious metals
13	rice and corn milling	13	chromium
14	sugar milling and refining	14	nickel
15	milk and other dairy products	15	other metallic minerals
16	coconut oil, cake and meal	16	sand, stone and quarrying
17	refined cooking oil and margarine	17	other non-metallic minerals
18	meat and meat products	18	food manufacturing
19	flour and other grain mill products	19	beverage industries
20	animal feeds	20	tobacco manufactures
21	other processed foods	21	textiles, textile goods
22	beverage	22	wearing apparel and footwear
23	tobacco manufactures	23	wood and cork products
24	textiles and textile goods	24	furniture and fixtures
25	wearing apparel and footwear	25	paper and paper products
26	lumber, plywood and veneer	26	publishing and printing
27	other wood, cork and cane products	27	leather and leather products
28	furniture and fixtures	28	rubber products
29	paper and paper products	29	chemical and chemical products
30	publishing and printing	30	petroleum refineries
31	leather and leather products	31	non-metallic mineral products
32	rubber and plastic products	32	basic metal industries
33	drugs and medicines	33	fabricated metal products
34	basic industrial chemicals	34	machinery except electrical

35	fertilizer	35	electrical machinery
36	other chemical products	36	transport equipment
37	petroleum products	37	miscellaneous manufactures
38	cement manufacture	38	construction
39	other non-metallic mineral products	39	electricity and gas
40	basic metal industries	40	water
41	metal products	41	land transport services
42	machinery except electrical	42	water transport services
43	electrical machinery	43	air transport services
44	transport equipment	44	storage, services for transport
45	miscellaneous manufactures including	45	communication
46	construction	46	trade
47	electricity	47	banking services
48	gas and steam	48	non-banks
49	water works	49	insurance
50	busline operation	50	real estate
51	other passenger land transport	51	ownership of dwellings
52	road freight transport	52	government services
53	water transport	53	private education
54	air transport	54	private health
55	supporting, allied services, transport	55	private business services
56	communications	56	recreational services
57	storage and warehousing	57	personal and household services
58	wholesale and retail trade	58	hotels and restaurants
59	banks, non-banks and insurance	59	other private services
60	real estate, ownership of dwellings	60	unclassified
61	government services		
62	private education services		
63	private health services		
64	hotels and restaurants		
65	other private services		
66	notional industry		

Table A-2
Production Sectors
Input-Output Tables
40-Sector Aggregation

Code	Sector
1	palay
2	corn
3	coconut and copra
4	sugarcane
5	other crops
6	livestock and poultry
7	fisheries
8	forestry and logging
9	metallic mining
10	non-metallic mining and quarrying
11	food manufacturing
12	beverages
13	tobacco products
14	textile manufactures
15	wearing apparel and made-up textile goods
16	lumber and plywood and veneer plants
17	furniture and fixtures
18	paper and paper products
19	printing, publishing, and allied industries
20	leather and leather products except footwear
21	rubber products
22	chemical products
23	petroleum refineries, other petroleum products
24	nonmetallic mineral products
25	basic metals
26	metal producst except machinery and transport equipment
27	machinery except electrical
28	electrical machinery, apparatus and appliances
29	transport equipment
30	miscellaneous manufactures and scrap
31	construction
32	electricity, gas and water services
33	transportation services
34	storage and warehousing
35	communication
36	trade
37	financial institutions
38	real estate
39	private services

b) **Input-output tables by year**

For each of the benchmark tables, some input-output sectors are aggregated to conform to available data from the ASE and CE.

For 1974, the tables have 61 sectors. The following are aggregated: vegetables (04) and tubers and root crops (05); tobacco (09) and other crops (11); livestock (12) and poultry (13); lumber (29) and plywood and veneer (30); miscellaneous manufacture (48) and scrap (49). Government service (60) and notional industry (61) are excluded. For 1979, the tables have 65 sectors. The following are aggregated: banana (05) and other crops (06); crude coconut, vegetable and animal oils and fats (16) and refined coconut and vegetable oil and margarine (17); busline operation (50), other passenger land transport (51), road freight transport (52). Government service is again excluded.

For 1983, the tables have 66 sectors. Only banana (05) and other crops (06) are aggregated. Again government service is excluded. As already noted, these tables are RAS updates of 1979. The value-added matrix has no entries on indirect business taxes less subsidies, imports and depreciation. Only compensation for employees and operating surplus appear. For 1988, a total of 60 sectors appear. The following are aggregated: ownership of dwellings (51) and real estate (50); unclassified (60) and other private services (59). Again government service is excluded.

2) **Labor coefficients**

The basic sources of employment on a sectoral level are the ASE and the CE. In certain years and for certain sectors, the data series are separated for small establishments (those with less than twenty employees) and for large establishments (those with twenty or more employees). The available data include employment, salaries and wages earned, contributions to Social Security. These data are further disaggregated by geographic region and by gender. Employment data cover total employment which include paid employment and unpaid employment, i.e., unpaid workers, working owners and family labor.

The sectors are grouped into ten industry groups as shown in Table A-3. For groups I to VII, paid employment is further disaggregated into workers directly engaged in production (i.e., productive labor), managers, executives and other supervisors, and other employees including general secretarial and administrative staff. However, this disaggregation is not available for all of groups VIII to X. These data series exclude direct tax payments and informal sector activity.

For 1974, the available ASE covers groups V to X only. Thus the data from the CE of 1975 is used because this is complete and covers all industry groups. Similarly for 1979, the ASE covers groups I, II, IV to IX so that the data for the CE of 1978 is used again because of completeness. For 1983, the CE covers groups IV to X and the ASE for 1982 covers groups I to III for both large and small establishments; the data from these two data series are consolidated. 1988 is the only input-output year with a complete CE for all groups.

Table A-3

I	Agriculture	VI	Utilities
II	Fishery	VII	Construction
III	Forestry and Logging	VIII	Commerce
IV	Mining and Quarrying	IX	Transportation and Communication
V	Manufacturing	X	Services

For 1961, 1965 and 1969, no ASE nor CE data are available for group I; in fact information from this group begins from 1975 only. The 1961 CE omitted this group. The 1967 CE excluded groups I and II. Between 1967 and 1972, no data for groups III, IV, VI, VII, IX and X are available. For 1969, ASE data are available for groups V and VIII only. For 1985, CE covers groups IV to X only. The data for groups I and II are available for 1982 and 1988 only. For group III, the data are available for 1978 and 1988 only. Thus, because of incomplete data for these years, the benchmark tables for 1961, 1965, 1969 and 1985 cannot be used to compute for employment multipliers.

Incidentally, much as in the commodity flow tables, the ASE and CE do not cover government transactions.

3) **Capital stock and depreciation**

Capital stock data are also obtained from the ASE and CE much as for labor. Capital stock is defined as the end-of -year book value of fixed assets. For 1979, because the available data are beginning-of-the-year book value of fixed assets, the end-of-year value is estimated by adding to the beginning-of-the-year value the capital expenditures less the depreciation for the year. Depreciation data are available for all the benchmark tables except for 1983 because this is a RAS update. The depreciation data for 1983 is obtained from the 1982 ASE and the 1983 CE, much as for labor.

4) **Sectoral price deflators**

Data on sectoral price deflators is available from the National Statistical Coordination Board (NSCB), specifically the *Philippine Statistical Yearbook*, published annually. The base year used in this paper is 1972, though the more recent data now use 1985 as the base year. Because the data are at a more aggregated level than the 60-sectors of the input-output tables, the price deflator for an aggregated sector is used for all the subsectors.

Therefore, the deflator for mining and quarrying is applied to metallic mining and nonmetallic mining and quarrying. The deflator for food manufacturing is applied to rice and corn milling, sugar milling, milk and other dairy products, coconut oil and its products, refined cooking oil and other vegetable oils, meat and meat products, flour and other grain mill products, and animal feeds. The deflator for lumber, wood and cork products is applied to both products of lumber and plywood and other wood and cork products. The deflator for chemical products is applied to drugs and medicines, basic industrial chemicals, fertilizer and other chemical products. The deflator for nonmetallic mineral products is applied to cement manufacture and other nonmetallic mineral products.

The deflator for electricity, gas and water is applied to these three sectors disaggregated. The deflator for land transport is applied to busline operation, other passenger land transport, and road freight transport. The sole deflator for communications, storage and warehousing is applied to communication service and storage and warehousing. Finally, the deflator for finance, insurance and real estate is applied to banks, nonbanks and real estate.

BIBLIOGRAPHY

Balassa, Bela (1980). "The Process of Industrial Development and Alternative Development Strategies". *World Bank Staff Working Paper No. 438.* Washington, DC: The World Bank, October.

Baldwin, Robert (1975). *Foreign Trade Regimes and Economic Development: The Philippines.* New York: National Bureau of Economic Research.

Bautista, Romeo and Power, John (1982). *Industrial Promotion Policies in the Philippines.* Manila: Philippine Institute of Development Studies.

Bhattacharya, Amarendra and Linn, Johannes (1988). "Trade and Industrial Policies in the Developing Countries of East Asia". *World Bank Discussion Paper No. 27.* Washington, DC: The World Bank.

Golay, Frank (1961). *The Philippines: Public Policy and National Economic Development.* Ithaca: Cornell University Press.

Jurado, Gonzalo and Castro, Judy (1979). "The Informal Sector in the Greater Manila Area 1976: An Overview". *Philippine Review of Economics and Business.* 16(1 and 2).

Medalla, Erlinda (1990). "An Assessment of Trade and Industrial Policy 1986-1989. *Working Paper Series No. 90-07.* Manila: Philippine Institute of Development Studies, January.

Myint, Hla.(1986). "Organizational Dualism and Economic Development". *Asian Development Review.* 2(1). pp. 24-42.

National Census and Statistics Office.(1969, 1974, 1979, 1983, 1985, 1988). *The Inter-Industry Accounts of the Philippines.* Manila: National Economic and Development Authority.

_____ (1974, 1979, 1982). *Annual Survey of Establishments.* Manila: National Economic and Development Authority.

_____ (1975, 1978, 1983, 1988). *Census of Establishments.* Manila: National Economic and Development Authority.

_____(1985, 1988). *Family Income and Expenditure Survey*. Manila: National Economic and Development Authority.

National Statistical Coordination Board (1993). *Philippine Statistical Yearbook 1992*. Manila: National Economic and Development Authority.

Power, John and Sicat, Gerardo (1971). *The Philippines: Industrialization and Trade Policies*. London: Oxford University Press.

Quesada, Ramon (1988). "The Informal Sector: Boom or Bane to the Economy?" Paper presented to the Conference on the Informal Sector, Manila: Center for Research and Communication, 26 February.

Templo, Ofelia and de Leon, Teresita (1992). "The Urban Informal Sector in the Philippines: Recent Developments and Future Policy Directions". Paper presented at the Seminar on Employment Policies for the Urban Sector in East and Southeast Asia, Bangkok, 12-16 October .

Todaro, Michael (1994). *Economic Development.* New York: Longman Inc. Fourth Edition.

Valdepeñas, Vicente (1970). *The Protection and Development of Philippine Manufacturing.* Manila: Ateneo de Manila University Press.

Wolff, Edward (1975). "The Rate of Surplus Value in Puerto Rico". *Journal of Political Economy*. 83, October, pp. 935-949.

_____. (1977)."Capitalist Development, Surplus Value, and Reproduction: An Empirical Examination of Puerto Rico". In *The Subtle Anatomy of Capitalism.* Edited by Jesse Schwartz. Santa Monica, CA: Goodyear Publishing Co., Inc., pp. 140-149.

_____ and Angel Luis Ruiz.(1995) "Productivity Growth, Import Leakage and Employment Growth in Puerto Rico, 1967-1982". Paper for presentation at the Eleventh International Conference on Input-Output Techniques. New Delhi, India, 27 November - 1 December.