Productivity Growth in Thailand

Pranee Tinakorn
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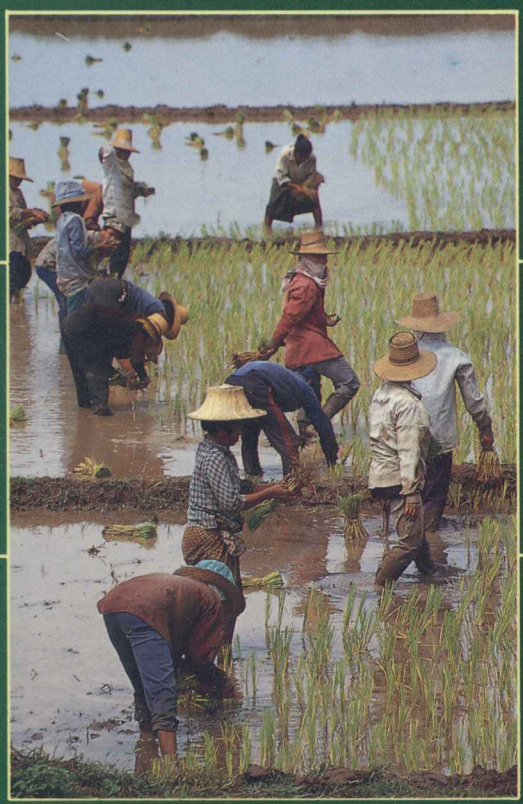

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Preface

This study is a research report in the project *Research and Information Development for Macroeconomic Policy Formulation* undertaken by the Thailand Development Research Institute (TDRI) for the National Economic and Social Development Board (NESDB).

The authors express their appreciation to NESDB for financial support. Thanks are also due to the research assistants and supporting staff of TDRI's Macroeconomic Policy and Human Resources and Social Development Programs and the Publications Office. The authors would like to acknowledge a working paper on productivity analysis written by Professor Darl Bien during his visit to TDRI in December 1992.

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Pranee Tinakorn
Chalongphob Sussangkarn

Executive Summary

The word "productivity" is often associated with "labor productivity" or "capital productivity," which is only a partial measurement of productivity. Since the growth of output is a result of the increase in all factor inputs, including technical progress, it is interesting to probe into such an analysis.

The objective of this study is to analyze the sources of output growth in Thailand by using the Solow-Denison growth accounting framework. This framework has been used in many studies in explaining the sources of economic growth for other countries, such as the United States, Japan, Korea and some European countries. The analysis starts with a general form of production function from which the growth rate of output is expressed as a configuration of the rate of inputs weighted by their respective output elasticities plus a shift factor referred to as the total factor productivity, or TFP. Under the assumption of profit maximization and producer's equilibrium, the output elasticity with respect to each input, which is unobservable and must be estimated from an assumed form of production function, is replaced by the share of factor income, which is observable. This makes it possible to measure TFP as the difference between the growth of output and the growth of each input weighted by its income share. This framework is known as the growth accounting analysis and the TFP measure is commonly called the rate of technical change. Although this approach is quite appealing and has been done for many countries, the analysis had never been done for Thailand until this study.

In applying this framework to Thailand's data, we are faced with many data problems which have been discussed in detail in the text. The TFP measurement for the Thai economy is found to be at the average rate of 2.6 percent per year during 1972 to 1990, without adjustment for improved quality of factor inputs. Adjustments for qualitative changes in input, particularly labor, are possible only after 1977, when the National Statistical office's (NSO) surveys of wage data became available. From 1978 to 1990, the average adjusted TFP growth for Thailand was 1.2 percent a year. This translates into about a 15.8 percent contribution to output growth. The remaining part of growth could be explained by the changes in the various factor inputs, as follows: 37.2 percent from capital; 1.2

percent from land; and 45.8 percent from labor, with 19.7 percent represents improved labor quality.

These figures can be compared to those calculated for Korea from 1972 to 1982 by Kim and Park (1985) who used the same framework of analysis. The contribution of TFP to output growth in Korea for the above period was found to be around 20.8 percent, that of capital around 29.8 percent and that of labor around 49.4 percent, with 28.8 percent was from improved labor quality.

Separate TFP estimates are also produced for agriculture, industry and services. It is observed that, in general, the TFP figures by sector are lower than that for the whole economy. Our explanation for this phenomenon is that the resource allocation must have contributed to the aggregate TFP figure, whereas this effect is not present within the individual sector. Another possible explanation is that when we go down to smaller producing units we may be able to better capture the contribution of inputs and, hence, are left with smaller residual or TFP. However, it is also possible that technical progress is embodied in the recently acquired capital goods, especially in the non-agricultural sector where we observed a rather rapid pace of capital accumulation.

During 1981 to 1990, it is found that in agriculture TFP accounts for about 25.7 percent of the total output growth, while land accounts for only 1.7 percent, and capital for 20.4 percent. The remaining part of growth, about 52.2 percent, comes from the increase in both quantity and quality of labor. In the non-agricultural sector, it is found that the contribution of TFP to growth is rather small, about 2.2 percent in both the industry and services sectors. Capital input appears to have a major contribution in the non-agricultural sector, especially in industry where the contribution of capital is found to be around 61.5 percent of the total output growth.

The implication of such findings is that Thailand's rapid growth in the past decade or so has been achieved by adding more labor, more capital and more land to production. Some productivity improvements have been achieved, but these may have been through importing more efficient and modern machinery and through the employment of better or more productive workers.

This finding is quite in line with the general belief that the high growth rate in the non-agricultural sector in the past has been sustained through imported technology. This situation is unlike those of other newly industrialized countries where some local industries have attained independence from imported technology through indigenous research and development, something which appears to have attracted little attention in Thailand.

The final part of the research project investigates possible determinants of productivity growth by using econometric techniques. It is found that the pace of capital accumulation has the greatest influence on TFP. Another important determinant is the increase in foreign exposure, which has an effect on the market size and can improve productivity through foreign competition. A third variable is the effect of resource allocation which, in our study, is measured by the shift of labor from the low marginal product sector (agriculture) to the higher one (non-agriculture).

There must be other important determinants of TFP, such as research and innovations especially at the plant level, but we are not able to quantify and use them in the estimated equation. Other important determinants of TFP that we

cannot measure include the expertise of workers acquired through the process of learning by doing, managerial improvement, business reorganization, and government policies and/or regulatory measures. All these can affect the utilization of resources and hence productivity.

บทสรุปสำหรับผู้บริหาร

โดยทั่วไปเรามักจะรู้จักประสิทธิภาพการผลิตของแรงงาน (Labor Productivity) หรือประสิทธิภาพการผลิตของทุน (Capital Productivity) ซึ่งเป็นการวัดประสิทธิภาพการผลิตแบบบางส่วน (Partial Productivity) เท่านั้น เนื่องจากผลผลิตรวมของระบบเศรษฐกิจเพิ่มขึ้นโดยการใช้ปัจจัยการผลิตทุกชนิดเพิ่มขึ้น ดังนั้น นักเศรษฐศาสตร์จึงคิดวิธีวัดผลของการเพิ่มปัจจัยการผลิตทุกชนิดที่มีต่อการเพิ่มของผลผลิต

งานวิจัยนี้มีจุดประสงค์ที่จะวัดผลของการเพิ่มปัจจัยการผลิต และความก้าวหน้าทางเทคโนโลยี ต่อผลผลิต โดยใช้กรอบการวิเคราะห์แบบโซโลว์-เดนิสัน (Solow-Denison) ในการคำนวณหาที่มาของการเจริญเติบโตของผลผลิตในระบบเศรษฐกิจไทย โดยพิจารณาปัจจัยการผลิตหลัก ซึ่งได้แก่ แรงงาน ทุน และที่ดิน กรอบการวิเคราะห์นี้ใช้กันอย่างแพร่หลายในการคำนวณที่มาของการเจริญเติบโตในระบบเศรษฐกิจอื่นๆ เช่น สหรัฐอเมริกา ประเทศในยุโรป ญี่ปุ่น และเกาหลี เป็นต้น กล่าวโดยย่อแล้ว กรอบการวิเคราะห์นี้อธิบายว่า อัตราการเพิ่มขึ้นของผลผลิตโดยพิจารณาทางด้านอุปทาน (Supply Side) จะมาจากอัตราการเพิ่มขึ้นของปัจจัยการผลิตถ่วงน้ำหนักด้วยความยืดหยุ่นของผลผลิตต่อปัจจัยการผลิตนั้น ส่วนที่เหลือคือ ผลที่มาจากความก้าวหน้าทางเทคโนโลยี หรือประสิทธิภาพของการผลิตรวม (Total Factor Productivity-TFP) ค่าความยืดหยุ่นดังกล่าวนี้เราสังเกตไม่ได้ และมักจะต้องประมาณการจากสมการการผลิต (Production Function) อย่างไรก็ตาม ภายใต้ข้อสมมุติที่ผู้ผลิตแสวงหากำไรสูงสุดและอยู่ในภาวะดุลยภาพ ค่าความยืดหยุ่นนี้จะเท่ากับสัดส่วนรายได้ที่แต่ละปัจจัยการผลิตได้รับต่อมูลค่าผลผลิตรวม ซึ่งสัดส่วนดังกล่าวนี้ในหลักการแล้วสามารถ

คำนวณได้จากข้อมูลในบัญชีรายได้ประชาชาติ ดังนั้นภายใต้กรอบการวิเคราะห์นี้ เราสามารถคำนวณผลของการเพิ่มขึ้นของปัจจัยการผลิต และผลของความก้าวหน้าทางเทคโนโลยี หรือ TFP ต่อการเจริญเติบโตทางเศรษฐกิจได้ การคำนวณดังกล่าวนี้มีศัพท์ที่เรียกว่า การวิเคราะห์บัญชีของการเจริญเติบโต (Growth Accounting Analysis)

ในการใช้กรอบการวิเคราะหดังกล่าวกับข้อมูลของระบบเศรษฐกิจไทย (ซึ่งมีปัญหาบางประการและมีการกล่าวถึงในรายงานวิจัยแล้ว) เราพบว่าในช่วงปี ค.ศ. 1972 (พ.ศ. 2515) ถึง ค.ศ. 1990 (พ.ศ. 2533) อัตราการเพิ่มของ TFP คิดเป็นประมาณร้อยละ 2.6 ต่อปี ซึ่งตัวเลขนี้ยังมิได้หักคุณภาพของแรงงานออก การหักคุณภาพของแรงงานต้องอาศัยข้อมูลเกี่ยวกับค่าจ้าง ซึ่งสำนักงานสถิติแห่งชาติเริ่มสำรวจในปี ค.ศ. 1977 (พ.ศ. 2520) เมื่อมีการคำนึงถึงคุณภาพที่ดีขึ้นของแรงงาน เราพบว่าในช่วงปี ค.ศ. 1978 (พ.ศ. 2521) ถึง ค.ศ. 1990 (พ.ศ. 2533) อัตราการเพิ่มของ TFP มีประมาณร้อยละ 1.2 ต่อปี ในขณะที่อัตราการเจริญเติบโตเฉลี่ยประมาณร้อยละ 7.6 หรืออาจตีความได้ว่า อัตราความก้าวหน้าทางเทคโนโลยีมีสัดส่วนประมาณร้อยละ 15.8 ของการเติบโตรวมของเศรษฐกิจ ในขณะที่ปัจจัยทุนมีสัดส่วนประมาณร้อยละ 37.2 ที่ดินประมาณร้อยละ 1.2 และแรงงานร้อยละ 45.8 โดยที่ร้อยละ 19.7 เป็นผลมาจากคุณภาพที่ดีขึ้นของแรงงาน

ข้อมูลการวิเคราะห์อัตราการเติบโตของเศรษฐกิจไทยข้างต้นสามารถนำมาเปรียบเทียบกับข้อมูลของประเทศเกาหลี ซึ่ง Kim and Park (1985) ใช้กรอบการวิเคราะห์แบบเดียวกันสำหรับเศรษฐกิจเกาหลีในช่วงปี ค.ศ. 1972 ถึง 1982 และพบว่า อัตราการเพิ่มของ TFP มีสัดส่วนประมาณร้อยละ 20.8 ของอัตราการเติบโตรวมของเศรษฐกิจเกาหลี ในขณะที่ปัจจัยทุนมีสัดส่วนประมาณร้อยละ 29.8 และแรงงานประมาณร้อยละ 49.4 โดยที่ร้อยละ 28.8 เป็นผลจากคุณภาพที่ดีขึ้นของแรงงาน

งานวิจัยนี้ได้ใช้กรอบการวิเคราะห์ข้างต้นสำหรับสาขาเศรษฐกิจหลักๆ ด้วย เช่น ภาคเกษตร ภาคอุตสาหกรรม และภาคบริการ โดยทั่วไปเราพบว่า อัตราการเพิ่มของ TFP ในสาขาย่อยมีน้อยกว่าเศรษฐกิจรวม เหตุผลหลักเป็นเพราะในตัวเลข TFP รวมนั้นมีผลจากการเคลื่อนย้ายทรัพยากรระหว่างสาขารวมอยู่ด้วย และเราพบว่าในช่วงปี ค.ศ. 1978-1990 การเพิ่มขึ้นของปัจจัยการผลิตได้เคลื่อนย้ายสู่สาขานอกการเกษตรมากขึ้น และสาขานอกการเกษตรมีศักยภาพในการเพิ่มผลผลิตมากกว่าสาขาการเกษตร จึงทำให้ผลผลิตรวมเพิ่มขึ้น ผลดังกล่าวนี้ไม่สามารถวัดได้ในแต่ละสาขา แต่จะปรากฏอยู่ในผลผลิตรวมของระบบเศรษฐกิจ

ผลจากการวิเคราะห์แยกสาขาในช่วงปี ค.ศ. 1981-1990 โดยใช้ข้อมูลในราคาปี ค.ศ. 1972 เราพบว่า TFP ของภาคการเกษตรมีสัดส่วนประมาณร้อยละ 25.7 ของอัตราการ

เติบโตของผลผลิตในภาคนี้ ในขณะที่ที่ดินมีสัดส่วนเพียงร้อยละ 1.7 ปัจจัยทุนประมาณร้อยละ 20.4 ส่วนที่เหลือประมาณร้อยละ 52.1 มาจากแรงงานทั้งในด้านปริมาณและคุณภาพ สำหรับการวิเคราะห์ในภาคนอกการเกษตรพบว่า TFP มีอิทธิพลน้อย คิดเป็นประมาณร้อยละ 2.2 ของอัตราการเติบโตของผลผลิตทั้งในภาคอุตสาหกรรมและบริการ ปัจจัยการผลิตในด้านทุนและแรงงานมีผลต่อการเพิ่มผลผลิตของภาคนอกการเกษตรอย่างมาก โดยเฉพาะอย่างยิ่งในภาคอุตสาหกรรมนั้น ปัจจัยทุนมีสัดส่วนถึงร้อยละ 61.5 ของอัตราการเติบโตของผลผลิต จากข้อมูลที่คำนวณได้นี้แสดงว่า ในอดีตที่ผ่านมา การเพิ่มขึ้นของผลผลิตในภาคอุตสาหกรรมส่วนใหญ่เป็นผลมาจากการใช้ปัจจัยการผลิตเพิ่มขึ้นมากกว่าเป็นผลจากความก้าวหน้าทางเทคโนโลยี ซึ่งอาจจะสอดคล้องกับข้อสังเกตโดยทั่วไปว่า ภาคอุตสาหกรรมของไทยมักจะนำเข้าเทคโนโลยีสำเร็จรูปที่มาพร้อมกับเครื่องมือเครื่องจักรใหม่ๆ แต่มิได้มีความพยายามที่จะค้นคว้าวิจัยเพื่อพัฒนาเทคโนโลยขึ้นเองภายในประเทศ ซึ่งต่างจากประสบการณ์ของประเทศอุตสาหกรรมใหม่ทั้งหลายที่ให้ความสนใจในเรื่องนี้

นอกจากนี้ งานวิจัยนี้ยังได้ใช้วิธีการทางเศรษฐมิติเพื่อหาตัวแปรที่มีอิทธิพลต่อการเพิ่มขึ้นของ TFP และพบว่าปัจจัยที่สำคัญคือ อัตราการสะสมทุน ซึ่งมีอิทธิพลค่อนข้างมาก ในขณะที่การเคลื่อนย้ายของแรงงานและการเปิดประเทศสู่ตลาดโลกก็มีผลทางบวกต่อ TFP เช่นกัน อย่างไรก็ตาม มีปัจจัยอื่นๆ ที่ผู้วิจัยเชื่อว่ามีอิทธิพลต่อ TFP หรือความก้าวหน้าทางเทคโนโลยี แต่ผู้วิจัยไม่สามารถวัดและนำมาวิเคราะห์เชิงเศรษฐมิติได้ เช่น การค้นคว้าวิจัย ซึ่งก่อให้เกิดขบวนการนวัตกรรมในการผลิต (Innovation) การปรับองค์กร ความสามารถของผู้บริหาร ประสบการณ์และความเชี่ยวชาญของผู้ใช้แรงงาน รวมถึงนโยบายต่างๆ ของรัฐที่มีผลต่อการใช้ทรัพยากรอย่างมีประสิทธิภาพด้วย

Chapter 1

Introduction

There are many factors that determine the size of a country's output, and the changes in these factors cause the output to change. We may classify the factors causing output to change into the demand and supply sides. On the demand side, the analysis is based on the input-output framework, where the change in total output can be decomposed into various demand elements, such as the expansion of domestic demand, the expansion of exports, and the effect of import substitution.[1] On the supply side, the analysis is based on the concept of production function which spells out the relationship between factor inputs and output. The studies on this side are usually known as productivity studies.[2]

Most of the productivity studies in Thailand in the past rely on some specific form of production function. The estimates of a production function are then used to derive the total factor productivity index. However, there is another approach whereby the growth of output can be explained without any assumed form of production function. This approach is known as the growth-accounting analysis. With the assumption of profit maximization, the growth-accounting approach replaces the output elasticity with respect to each input, which is unobservable and must be estimated from a production function, by the share of factor income, which is observable. This makes it possible to account for the growth of output in a given period by the growth of each input weighted by its income share. The remaining residual is known as the total factor productivity (TFP) or technical change. Although this approach is quite appealing and has been done for many countries,[3] the analysis has never been done for the aggregate economy of Thailand.

In the past three decades, the Thai economy has had a remarkable record of growth, and the uneven growth rates in different sectors have led to a rapid

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1 Examples of such studies for Thailand are Narongchai (1975), Narongchai et al. (1983), and Juanjai et al. (1986).

2 Examples of such studies for Thailand on the aggregate economy are Wilaiwan (1972), Narongchai et al. (1983), and Kitti (1988); on the industrial sector and subsector are Paitoon (1982), Ardkit (1984), Narongchai et al. (1987) and Pornsook (1989).

3 See, for example, Denison (1967), Denison and Chung (1976), Kim and Park (1985), Hulten (1990), and Elias (1992).

transformation in the structure of production. Since the contribution to the overall high growth rate came mainly from the industrial and services sectors, we saw their increasing shares while that of the agricultural sector declined from 38.2 percent of Gross Domestic Product (GDP) in 1960 to only 14.4 percent in 1990. (See details in Tables 1.1 and 1.2.) It should be interesting to find out how factor inputs have played their parts in generating such a remarkable high growth record. In particular, as Thailand's economic advantage in abundant land and labor supplies are diminishing, the understanding of the past productivity performance should help to make plans for a sustainable growth path in the future.

Table 1.1 Gross Domestic Product by Industrial Origin and Percentage Distribution

(Millions of Baht and Percentage)

	At 1962 prices		At 1972 prices		
	1960	1969	1970	1980	1990p
Agriculture[1]	21,399.5	25,257.0	42,064.0	61,770.0	90,711.0
of which	(38.2)	(31.3)	(27.0)	(20.6)	(14.4)
- Crops	15,874.0	24,542.0	26,723.0	39,783.0	56,070.0
	(28.3)	(21.8)	(17.2)	(13.3)	(8.9)
Industry[2]	10,896.5	29,233.0	39,201.0	92,287.0	226,402.0
of which	(19.4)	(26.0)	(25.2)	(30.8)	(35.8)
- Manufacturing	7,320.0	18,821.0	24,893.0	64,494.0	156,043.0
	(13.1)	(16.7)	(16.0)	(21.7)	(24.7)
Services[3]	23,773.4	48,056.0	74,429.0	145,415.0	314,497.0
of which	(42.4)	(42.7)	(47.8)	(48.6)	(49.8)
- Banking, insurance	1,088.6	4,104.0	3,846.0	8,286.0	33,656.0
and real estate	(1.9)	(3.6)	(2.5)	(2.8)	(5.3)
GDP	56,069.4	112,546.0	155,694.0	299,472.0	631,610.0
	(100)	(100)	(100)	(100)	(100)

Notes: [1] Agriculture includes crops, livestock, fisheries and forestry.

[2] Industry includes mining and quarrying, manufacturing, construction, and electricity and water supply.

[3] Services include transportation and communication, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings, public administration and defense and other services.

The 1990 data are preliminary.

Source: NESDB. The series of GDP at 1972 prices was revised down to only 1970. Therefore, the 1962 price series cannot be connected wih the 1972 price series.

Table 1.2 Growth Rates of GDP by Industrial Origin

(Percentage)

	At 1962 prices	At 1972 prices	
	1960-1969	1970-1980	1980-1990
Agriculture	5.7	3.9	3.9
of which			
- Crops	4.9	4.0	3.5
Industry	11.6	8.9	9.4
of which			
- Manufacturing	11.1	10.1	9.2
Services	8.1	6.9	8.0
of which			
- Banking, insurance and real estate	15.9	8.0	15.0
GDP	8.0	6.7	7.8

Note: Growth rates are calculated approximately as an average compound rate over the specified period.

See other notes and source in Table 1.1.

This research report is an attempt to use the growth-accounting framework with the available data in Thailand. In cases where the needed data are unavailable or not appropriately measured, we need to come up with some estimates that will be explained along in the text. The organization of this report is the following. Chapter 1 introduces and Chapter 2 presents the theoretical framework of our study. In Chapter 3, the measurement of input data and their income shares will be discussed, along with the estimated sources of growth from changes in input quantities. Chapter 4 provides estimates on sources of growth when changes in the quality of input are accounted for. Chapter 5 discusses the results of growth accounting by economic sector, and Chapter 6 probes into the various possible determinants of the total factor productivity. Chapter 7 concludes the report.

Chapter 2

Theory and Measurement of Productivity

2.1 THEORETICAL FRAMEWORK

A production function expresses the technical or the engineering relation between input and output. It is a process of transforming various inputs, such as labor, capital, land, raw materials, etc., into the output of goods and services. In its simplest form, productivity is often measured as a ratio of output to inputs. There can be as many indices of productivity as there are factors of production. For example, we may have productivity indices for labor, or Y/L, and for capital, or Y/K, where Y, L and K are respectively output, labor input and capital input. These are known as "partial" productivity indices. Partial productivity ratios may be useful in measuring saving in particular inputs achieved over time but they do not measure over-all changes in productive efficiency which is affected by many other factors, such as changes in composition of inputs (factor substitution), managerial innovation, new techniques, etc. This leads to the measurement of TFP.

The total factor productivity index is defined as output per unit of all inputs combined. The total factor productivity index is sometimes referred to as the index of "technical progress," or "technical change," or "advance of knowledge," or "the residual," or "the measure of our ignorance." (See, for example, Griliches 1963, Jorgenson and Griliches 1967, and Nadiri 1970.)

The concept of TFP came about because the use of input variables to explain the movement in output has often left a large portion of output unexplained. The unexplained part, or the residual, is viewed loosely as the effect of technical progress. With a specific form of production function it is quite straightforward to arrive at an index of technical progress. However, the studies of many economists during the 1950s through the 1970s have shown that we can use the Divisia index approach to measure technical change without specific information about the production function. (See, for example, Solow 1957, Domar 1961, Jorgenson and Griliches 1967 and Star and Hall 1976). The following provides a simplified version of their framework.

Let $y(t)$ = output at time t
$x(t)$ = input at time t

We write the production function in a general form as

$$y(t) = f(x(t), t) \quad \ldots\ldots (1)$$

$$\frac{dy}{dt} = \frac{\delta f(.)}{\delta x}\frac{dx}{dt} + \frac{df(.)}{dt}$$

or
$$\dot{y} = \frac{\delta f(.)}{\delta x}\dot{x} + \dot{f}(.) \quad \ldots\ldots (2)$$

where the dot over a variable indicates differentiation with respect to time.

Divide equation (2) by (1) and we get

$$\frac{\dot{y}}{y} = \frac{\delta f(.)}{\delta x}\frac{\dot{x}}{f(.)} + \frac{\dot{f}(.)}{f(.)} \quad \ldots\ldots (3)$$

$$= \frac{\delta f(.)}{\delta x}\frac{\dot{x}}{f(.)}\cdot\frac{x}{x} + \frac{\dot{f}(.)}{f(.)}$$

$$= \frac{\delta f(.)}{\delta x}\frac{x}{f(.)}\cdot\frac{\dot{x}}{x} + \frac{\dot{f}(.)}{f(.)}$$

Since $\frac{\delta f(.)}{\delta x}\frac{x}{f(.)} = \eta$, output elasticity with respect to input x,

therefore

$$\frac{\dot{y}}{y} = \eta\frac{\dot{x}}{x} + \frac{\dot{f}(.)}{f(.)} \quad \ldots\ldots (4)$$

or the rate of change in output ($\dot{y}/y$) can be decomposed into two parts: the rate of change in input ($\dot{x}/x$) weighted by output elasticity (η) and the shift of production function through time [$\dot{f}(.)/f(.)$]. This last part is considered the rate of technical progress or TFP and has been called by various names as already mentioned. We can write

$$\frac{\dot{f}(.)}{f(.)} = \frac{\dot{y}}{y} - \eta \frac{\dot{x}}{x} \quad \text{..... (5)}$$

Equation (5) states that technical progress can be measured by the difference between output growth and input growth weighted by η.

We can extend the above framework to the case of n inputs as follows:

let $y(t)$ = output at time t

$x(t)$ = $(x_1(t), x_2(t), \ldots x_n(t))$; input vector

$y(t)$ = $f(x(t), t)$

then
$$\frac{\dot{y}(t)}{y(t)} = \frac{\dot{f}(.)}{f(.)} + \sum_{i=1}^{n} \frac{\delta f(.)}{\delta x_i(t)} \cdot \frac{d x_i(t)}{d t} \cdot \frac{1}{f(.)}$$

$$\frac{\dot{y}}{y} = \frac{\dot{f}(.)}{f(.)} + \sum_{i=1}^{n} \left[\frac{\delta f(.)}{\delta x_i(t)} \cdot \frac{x_i(t)}{f(.)} \right] \frac{\dot{x}_i(t)}{x_i(t)}$$

$$\frac{\dot{y}}{y} = \frac{\dot{f}(.)}{f(.)} + \sum_{i=1}^{n} \eta_i \frac{\dot{x}_i(t)}{x_i(t)}$$

or
$$\frac{\dot{f}(.)}{f(.)} = \frac{\dot{y}}{y} - \sum_{i=1}^{n} \eta_i \frac{\dot{x}_i(t)}{x_i(t)} \quad \text{..... (6)}$$

where
$$\eta_i = \frac{\delta f(.)}{\delta x_i(t)} \cdot \frac{x_i(t)}{f(.)} = \frac{\delta y(t)}{\delta x_i(t)} \cdot \frac{x_i(t)}{y(t)}$$

which is output elasticity with respect to input i.

Equation (6) states that technical change is simply the difference between output growth and the sum of all input growth weighted by output elasticity with respect to each input.

In order to measure $\dot{f}(.)/f(.)$, all terms on the right-hand side of equation 6 must be observable. While the rates of change in output and input are observable, the output elasticities with respect to input i, i=1, ...n, are not. Fortunately, this difficulty is subdued with the assumption of profit maximization and producer's equilibrium. Under this assumption, firms will employ each factor input where its marginal product equals its real cost.

Let $W_i(t)$ = price of input i
$P(t)$ = price of output

then $\frac{\delta f(.)}{\delta x_i(t)} = \frac{Wi(t)}{P(t)}$

or $\eta_i = \frac{\delta f(.)}{\delta x_i(t)} \cdot \frac{x_i(t)}{y(t)} = \frac{W_i(t)x_i(t)}{P(t).y(t)}$

Or η_i = elasticity of output with respect to input i = share of cost of input i in total revenue, which can be computed from observable data. Equation 6, which measures the growth rate of technical progress, becomes

$$\frac{\dot{f}(.)}{f(.)} = \frac{\dot{y}}{y} - \sum_{i=1}^{n} \beta_i \frac{\dot{x}_i(t)}{x_i(t)} \quad \text{..... (7)}$$

where $\beta_i = W_i(t)\, x_i(t)/P(t)\, y(t)$ = share of receipts going to input i.
Note that the production function f(x, t) can be written as

$$f(x, t) = \Phi\,(x(t)) \cdot A(t)$$

where A(t) represents a shift in the production function over time.

Then

$$\frac{\dot{A}}{A} = \frac{\dot{y}}{y} - \sum_{i=1}^{n} \beta_i \frac{\dot{x}_i(t)}{x_i(t)} \quad \text{..... (8)}$$

Equation 8 gives the growth rate of technical progress rather than an index of technical progress. We can find the definite integral of (8) to get at the index. Integrating with respect to time from the initial period O to the terminal period T gives us

$$\frac{A(T)}{A(O)} = \left[\frac{Y(T)}{Y(O)}\right] e^{-\sum_{i=1}^{n} \int_0^T \beta_i \frac{\dot{x}_i}{x_i}\, dt} \quad \text{..... (9)}$$

One can set A(O) = 1 and speak of A(T) as an index of technical progress.
Star (1974) reported that Richter (1966) suggested the following discrete approximation to the index.

$$\frac{\Delta A(t)}{A(t)} = \frac{\Delta Y(t)}{Y(t)} - \sum_{i=1}^{n} \beta_i(t) \frac{\Delta x_i(t)}{x_i(t)} \quad \text{..... (10)}$$

This approximation was used by Jorgenson and Griliches (1967), among others, but Star believed there was little justification of this approximation. Instead, he suggested the following approximation.

$$A(T) \cong \frac{Y(T)}{Y(O)} \Big/ \prod_{i=1}^{n} \left[\frac{x_i(T)}{x_i(O)} \right]^{\bar{\beta}_i} \quad \text{..... (11)}$$

where $\bar{\beta}_i = \left[\frac{\beta_i(T) + \beta_i(O)}{2} \right]$,

which he claimed to have no estimation error if the actual mean income share is equal to the estimated share or if each input grows at a constant geometric rate. This approximation is also likely to have a small approximation error when we use data observations that are widely spaced in time. The convenient calculation of equation 11 is apparent—if we want to measure the residual or the technical progress between 1970 and 1990, only data for the end points are needed. The derivation of the approximation and its error are presented in Star and Hall (1976) in which it is concluded that the data for the intervening years are superfluous.

2.2 MEASUREMENT OF VARIABLES

The above approach comes from the theory of production function in economic analysis. Thus, all variables should be measured in real physical units. However, at the aggregate level it is impossible to add up output in different physical units. Therefore, the usual measure for output is the flow of goods and services during an accounting period. It is well-known that economists use value added at constant prices to measure real output at the national level.

Labor input has been measured as the number of persons employed or in terms of man-hours. Capital and land are usually measured as stocks. Klein (1962:85) suggested that, in cases where it is possible to measure man-hours (flow of labor services), machine-hours (flow of capital consumption) and land depletion (flow of land use), it is preferable to use the flow variables. Furthermore, so far as there is no undeveloped frontier land in an economy, land can be regarded as a fixed factor of production and excluded from the estimated relation. This is often done in most empirical work on the aggregate production function for the industrialized countries.

If the quantities of output and input are measured accurately, the growth in total output should be largely explained by the growth in total input. Jorgenson and Griliches (1967) argued that associated with the theory of production is a system of social accounts for real product and real factor input. Within the framework of social accounting, they proceeded to show that, if real product and real factor input are accurately accounted for, the observed growth in TFP is negligible. By correcting for the errors of aggregation in combining investment and consumption goods, errors in measurement of labor and capital services, and errors of

measurement in the prices of investment goods, they could increase the explanation of the growth rate of output by the growth rate of inputs for the U.S. economy during 1945-1965 from 52.4 percent to 96.7 percent, which means a significant reduction in the residual.

Star (1974) also demonstrated that, with proper disaggregation of inputs and adjustment for their qualities, he could achieve a significant reduction in the growth rate of the residuals (or what is often called technical progress) for 17 manufacturing industries in the U.S. during 1950-1960.

In summary, it seems inappropriate to name the unexplained portion of output growth "technological progress" unless we have made full account for changes in both the quantities and qualities of input variables over time.

2.3 GROWTH ACCOUNTING

It is clear from the above analysis that if we can construct appropriate indices to account for the increase in both quantities and qualities of all factor inputs, then the residual may justifiably be called technical change. Even then, the term "technical change" still covers a wide range of effects. Among these is the structural change in the economy. For example, a structural shift of employment from the sector with low marginal product to the one with higher marginal product should lead to an improvement in resource allocation, which should result in higher output per unit of input. Another contribution to higher output per unit of input may be due to the enlargement of markets, which makes the reduction in unit cost possible. There may also be some irregularities, such as weather, that affect output.

The pioneer economist who attempted to account for growth along the above line of reasoning is Edward F. Denison. (See Denison 1967, Denison 1974, Denison 1979 and Denison and Chung 1976, for example). Growth accounting by Denison's method was used by Kim and Park (1985) to construct indices for the various sources of growth for Korea during 1963-1982. This method, though depending on the analytical framework on the production function of an economy, does not require an explicit and estimated form of the production function. Instead, it requires a detailed analysis of relevant statistical data. Briefly speaking, the growth accounting method starts with identifying what measure of output is to be used and dividing it into income shares among relevant factor inputs. The share of national income earned by each factor of production and the rate of increase in the quantity of each factor will be used to calculate the contribution of each factor input to the growth of output.

In measuring the rate of increase in each factor input, one must be careful to account for changes in both quantities and various qualities of that factor. For example, the various qualitative characteristics of labor input are age/sex composition, education, experience, health, etc. Analogously, one might try to measure the various qualitative aspects of capital input. However, Denison did not consider it desirable or possible to measure qualitative changes in capital input. He treated the unmeasured qualitative improvement of capital goods as part of the neutral technical progress that increases TFP. The TFP is, of course, the residual between the growth of output and the growth of both quantities and qualities of all possible inputs.

Figure 1 summarizes the steps of growth accounting used by Denison and his followers which first split the growth of output into changes in factor input and changes in TFP. These two are further classified into various possible components. Although it would be desirable to account for all components shown in this diagram, data availability, or lack of it, prevents us from probing into many items.

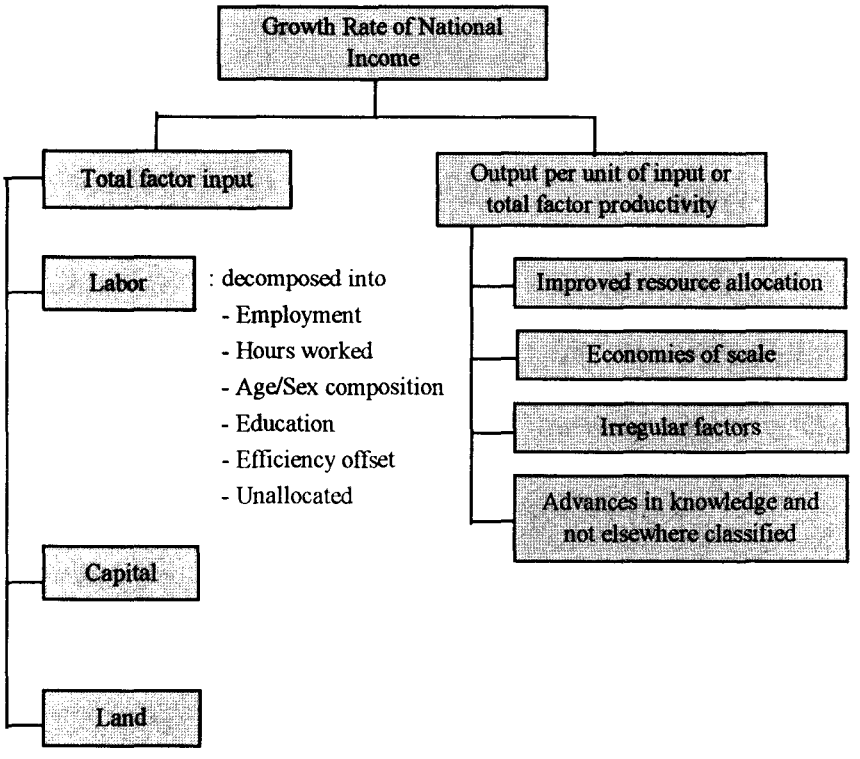

Figure 1 Sources of Growth of National Income

Chapter 3

Estimates of the Sources of Growth

This report chose the early 1970s as the starting period of analysis even though it may sound more appealing to start from the early 1960s when the country began to have its economic and development plan. There are at least three reasons for choosing the early 1970s. First, the output data and the factor income shares have to come from the national income account. However, all the national income account data were revised during the 1980s but the revision only went back to the year 1970. If we were to go far beyond 1970, we would face a problem of inconsistent data. Second, capital stock is an important input in the production process and it needs to be accounted for in the growth accounting analysis. The National Economic and Social Development Board (NESDB) has revised its estimates of the capital stock based on 1988 prices and the new series of capital stock only goes back to 1970. The third reason concerns the availability of the wage data. A time series of the average wage or its index is required to make adjustment for the factor income shares in the national income account. The available estimates on wages only go back to 1972.

From the analytical framework described in the previous chapter, it is clear that we need to be careful in our measurement of output and input data. Furthermore, we should try to account for the changes in the input quality. We will now proceed to discuss our choice of the variables and, later on, present estimates of the TFP based on the selected data.

3.1 MEASUREMENT OF OUTPUT AND INPUT DATA

3.1.1 Output

The most commonly used variable in assessing the total value of goods and services produced by a nation in a given period is the GDP. If we add to GDP the net factor income from abroad and subtract the indirect taxes less subsidies and the

provision for consumption of fixed capital, we arrive at the national income.[4] Kim and Park (1985: 32-33) argued that among the various national accounts aggregates, national income is considered the best measure for analyzing the long-term growth trend of national output. The reason given by them is that depreciation allowances and net factor income paid abroad (in the case of Korea, this has been persistently negative) are not directly related to national welfare and economic growth. By exclusion of indirect taxes less government subsidies, national income is already valued at factor cost which is also preferred to valuation at market prices because the inclusion of indirect taxes less subsidies in the weights for different output components may cause some statistical distortions in the long-term growth trend of real output when the composition of output changes.

Although it may be preferable to use the national income at constant factor cost as the measure of real income for Thailand, such data are not available from the national income account. Only the current values of national income have been calculated. Therefore, in this study, we resort to the use of GDP at constant prices as the measure of real income and use the growth rate of GDP in the calculation for TFP. Table 3.1 provides data on the structure of GDP at constant 1972 prices and the overall growth rates for the period under study.

3.1.2 Inputs

Land Input

In the industrialized countries, land is usually regarded as a fixed factor of production and, therefore, ignored in the growth accounting exercise. However, this treatment does not sound appropriate for Thailand since land is an important factor in the agricultural output. Even though the importance of the agricultural sector in total output has been declining over the past three decades, it remains an important sector in comparison to other subsectors of the economy. In terms of employment, the agricultural sector still employs the largest share of the labor force. In the past, the expansion of agricultural output has been made possible partly by pushing the frontier land. Therefore, we feel it imperative to account for land as an important factor input. The variable we use is the total area under cultivation for rice and other crops as presented in Table 3.2 and its index and growth in Table 3.3.

Capital Input

Capital is an important input in the process of production. Its contribution to the growth of output should be increasing as a country moves from the labor-intensive technique of production to the capital-intensive one. Unlike land, capital cannot be regarded as a fixed factor of production in the analysis of long-term growth trend. While researchers in other studies have to come up with their estimates of the capital stock series, such as Wilaiwan (1972) and Kitti (1988), the

[4] Gross National Product (GNP) = GDP + Net factor income from abroad.
National Income = GNP - Indirect taxes less subsidies - Provision for consumption of fixed capital.

timing of our study is quite fortunate, because the NESDB has just released its estimate of the capital stock for the whole economy. We, therefore, proceed to use the series of capital stock in constant prices as provided by the NESDB.[5]

Table 3.1 GDP at 1972 Prices

Year	Agricul-ture	Non-Agriculture		Total	GDP	Index	Growth Rate
		Industry[1]	Services[2]				
1970	42,064	39,201	74,429	113,630	155,694	91.54	
1971	43,875	42,737	76,808	119,545	163,420	96.09	4.96
1972	43,130	46,353	80,593	126,946	170,076	100.00	4.07
1973	47,201	51,234	88,410	139,644	186,845	109.86	9.86
1974	48,577	53,376	93,026	146,402	194,979	114.64	4.35
1975	50,700	55,860	97,868	153,728	204,428	120.20	4.85
1976	53,764	65,015	104,815	169,830	223,594	131.47	9.38
1977	55,000	75,226	115,501	190,727	245,727	144.48	9.90
1978	61,856	83,683	125,839	209,522	271,378	159.56	10.44
1979	60,726	89,085	135,986	225,071	285,797	168.04	5.31
1980	61,770	92,287	145,415	237,702	299,472	176.08	4.78
1981	65,093	97,596	155,750	253,346	318,439	187.23	6.33
1982	67,082	100,650	163,648	264,298	331,380	194.84	4.06
1983	70,061	108,801	176,546	285,347	355,408	208.97	7.25
1984	73,977	118,067	188,694	306,761	380,738	223.86	7.13
1985	78,539	117,933	197,641	315,574	394,113	231.73	3.51
1986	78,775	127,236	207,478	334,714	413,489	243.12	4.92
1987	78,601	143,483	230,551	374,034	452,635	266.14	9.47
1988	86,629	168,468	257,370	425,838	512,467	301.32	13.22
1989	92,386	195,804	286,005	481,809	574,195	337.61	12.05
1990E	90,711	226,402	314,497	540,899	631,610	371.37	10.00

E = Estimated.

Notes: [1] Industry includes mining and quarrying, manufacturing, construction, and electricity and water supply.

[2] Services include transportation and communication, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings, public administration and defense, and other services.

Source: NESDB.

[5] In the studies of both Korea (Kim and Park 1985) and Japan (Denison and Chung 1976), the index of input of capital is obtained by taking the weighted average of gross fixed capital stock (weight of 3/4) and net fixed capital stock (weight of 1/4) for each year. They did not offer a clear explanation on the issue but the reason seems to be their suspicion of depreciation series. However, with this weighting, the weighted index should not be much different from the index of gross capital stock alone.

Table 3.2 Factor Inputs

Year	Employment ('000)	Average Weekly Hours Per Worker	Cultivated Land (rai)			Capital Stock at 1988 Prices (Million Baht)	
			Rice	Other Crops[1]	Total	Gross	Net
1971	16,619	53.0484	47,520,295	14,406,531	61,926,826	1,966,509	1,056,409
1972	16,130	49.3339	45,732,019	15,393,755	61,125,774	2,016,149	1,099,244
1973	17,043	52.5654	51,793,562	17,824,475	69,618,037	2,075,885	1,150,304
1974	17,159	53.8626	50,372,025	19,689,567	70,061,592	2,138,913	1,202,710
1975	18,182	53.0398	56,110,159	19,657,868	75,768,027	2,208,816	1,260,039
1976	18,411	53.1963	53,923,616	20,396,845	74,320,461	2,293,552	1,330,222
1977	20,293	52.1820	56,529,670	23,750,765	80,280,435	2,403,438	1,422,379
1978	21,722	54.8892	62,259,184	26,985,294	89,244,478	2,517,445	1,515,746
1979	21,214	54.8002	59,416,208	24,847,443	84,263,651	2,652,963	1,626,438
1980	22,508	54.8613	60,109,585	26,955,616	87,065,201	2,817,814	1,761,856
1981	24,350	52.8769	59,970,299	30,075,623	90,045,922	2,999,959	1,910,395
1982	24,815	47.6232	60,133,792	30,135,212	90,269,004	3,168,196	2,042,362
1983	25,165	54.1202	62,595,983	31,176,861	93,772,844	3,374,569	2,207,862
1984	25,983	54.5118	62,329,326	32,235,757	94,565,083	3,596,494	2,383,616
1985	25,837	53.9139	63,421,850	34,688,358	98,110,208	3,813,595	2,550,448
1986	26,674	54.2237	61,571,082	31,882,454	93,453,536	4,018,836	2,702,553
1987	27,623	53.2243	58,474,033	31,870,605	90,344,638	4,277,195	2,903,120
1988	29,448	53.4980	64,695,441	34,169,765	98,865,206	4,613,337	3,172,872
1989	30,686	54.7866	65,218,295	35,137,868	100,356,163	5,046,320	3,527,209
1990	30,940	51.8955	61,910,147	34,195,819	96,105,966	5,644,438	4,023,489

Note: [1] Major crops only (maize, mungbean, cassava, sugarcane, groundnut, soybean, cotton, kenaf).

Sources: 1. Employment and average weekly hour data are from NSO, *Report of the Labor Force Survey* (Round 2), 1971-1983, and (Round 3), 1984-1990.
2. Cultivated area is from MOAC, *Agricultural Statistics of Thailand*, various issues.
3. Capital stock data are provided by NESDB.

Labor Input

Among the three inputs we need to measure, labor input is the richest in terms of its availability both in quantity and quality. The National Statistical Office (NSO) started to conduct the labor force survey in 1963 and continues to do so up to the present time. In the early period, the timing of the survey in each round was not always consistent. In 1970, the labor force survey was not conducted, as the NSO was mobilizing its resources to undertake the Census on Population and Housing. The regular biannual survey started in 1971, with the first round conducted during January and March and the second round during July-September. This was done consistently until 1984 when the NSO started to have three rounds of labor force surveys annually. The exception was again in 1980 when the Population and Housing Census was conducted, and only the second round (July-September) of the labor force survey was available.

Table 3.3 Index and Growth of Factor Inputs

Year	Employment		Average Weekly Hours Per Worker		Total Working Hours	
	Index	Growth	Index	Growth	Index	Growth
1971	103.03		107.53		110.79	
1972	100.00	-2.94	100.00	-7.00	100.00	-9.74
1973	105.66	5.66	106.55	6.55	112.58	12.58
1974	106.38	0.68	109.18	2.47	116.15	3.17
1975	112.72	5.96	107.51	-1.53	121.19	4.34
1976	114.14	1.26	107.83	0.29	123.08	1.56
1977	125.81	10.22	105.77	-1.91	133.07	8.12
1978	134.66	7.03	111.26	5.19	149.82	12.59
1979	131.51	-2.34	111.08	-0.16	146.08	-2.50
1980	139.54	6.11	111.20	0.11	155.16	6.22
1981	150.96	8.18	107.18	-3.62	161.79	4.27
1982	153.84	1.91	96.53	-9.94	148.51	-8.21
1983	156.01	1.41	109.70	13.64	171.14	15.24
1984	161.08	3.25	110.50	0.72	177.99	4.00
1985	160.18	-0.56	109.28	-1.10	175.04	-1.66
1986	165.37	3.24	109.91	0.57	181.76	3.84
1987	171.25	3.56	107.89	-1.84	184.76	1.65
1988	182.57	6.61	108.44	0.51	197.99	7.16
1989	190.24	4.20	111.05	2.41	211.26	6.70
1990	191.82	0.83	105.19	-5.28	201.78	-4.49

Year	Cultivated Land		Net Capital	
	Index	Growth	Index	Growth
1971	101.31		96.10	
1972	100.00	-1.29	100.00	4.05
1973	113.89	13.89	104.65	4.65
1974	114.62	0.64	109.41	4.56
1975	123.95	8.14	114.63	4.77
1976	121.59	-1.91	121.01	5.57
1977	131.34	8.02	129.40	6.93
1978	146.00	11.17	137.89	6.56
1979	137.85	-5.58	147.96	7.30
1980	142.44	3.32	160.28	8.33
1981	147.31	3.42	173.79	8.43
1982	147.68	0.25	185.80	6.91
1983	153.41	3.88	200.85	8.10
1984	154.71	0.84	216.84	7.96
1985	160.51	3.75	232.02	7.00
1986	152.89	-4.75	245.86	5.96
1987	147.80	-3.33	264.10	7.42
1988	161.74	9.43	288.64	9.29
1989	164.18	1.51	320.88	11.17
1990	157.23	-4.24	366.02	14.07

Source: See Table 3.2.

We chose the second round Labor Force Surveys (LFS) during 1971-1983 and the third round LFS during 1984-1990 to form a time series of data needed for labor input for the following reasons. First, the third-round survey during 1984-1990 is conducted in August, which is the middle month of the second-round survey during 1971-1983. The timing is considered fairly consistent. Second, the period during July, August and September is in the rainy season when the agricultural population is most active in the fields and is, therefore, included in the survey in a higher number than in the first round. Ideally, one might want to form a series of the average employment between the dry and the rainy seasons, but this would cause a problematic calculation in terms of other measurable qualities, such as age, sex and the level of education. Third, even if one might want to spend a lot of time computing the average from the two rounds of surveys in each year, one would end up having an inconsistent series since in 1980 only the second round is available.

Of course, we are aware that by using only the second round during 1971-1983 and the third round during 1984-1990 (or the rainy season series), we run the risk of creating a bias in the calculation of TFP for the agricultural and nonagricultural subsectors. During the rainy season, the labor force tends to move into the agricultural sector and we observe a reduction of employment in the nonagricultural sector. (See Table 3.4.) There would be a downward bias in the TFP for the agricultural sector and an upward bias for the nonagricultural sector. However, this bias should more or less cancel out when we look at the overall economy.

There is also another point about the LFS that needs to be mentioned. During 1971-1988 the employment data covered those of age 11 and over, but since 1989 this has changed to age 13 and over. We, therefore, adjusted the figure so that the data in 1989 and 1990 would include the 11-12 year age group as in the previous surveys. This approach is easier than adjusting the 1971-1988 employment data to conform to the most recent one since data tapes for the earlier surveys are not available and we have to rely on the published reports, which are rigid and less manageable than data tapes.

Another measure widely used for measuring the change in the quantity of labor input is the total man-hours worked or total working hours. This variable can be obtained from the product of total employment and average weekly hours of work. The average weekly hours worked per worker is shown in Table 3.2. This data is not readily available from the LFS reports but has to be calculated from the table on employed persons by age group and hours worked. From this table we can compute the average weekly hours worked per person by averaging the mid-point from each range of hours worked weighted by the share of employed workers in each range.[6] The product of the index of employment and the index of average weekly hours per worker provides an index for the total working hours. The similar cross product was also used by Kim and Park (1985) for Korea.

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[6] In the 1971-1982 surveys, the top range was 90+ hours per week; we used 90 as this implies working hours of close to 13 hours a day for seven days a week which sounds rather debilitating enough. In the 1983-1989 surveys, the top range in the report was 50+ hours. We used the average between 50 and the top range of 1982 as the mid-point. The calculation for 1990 was like that done for the 1971-1982 surveys, as the range went up to 90+ hours.

Table 3.4 Employment from Different Rounds of LFS, 1971-1989

(Number in Thousands)

Year	Round 1			Round 2 (1971-1983) Round 3 (1984-1989)			Difference in Employment		
	Total	Ag	Non-Ag	Total	Ag	Non-Ag	Total	Ag	Non-Ag
1971	16,590.5	12,321.7	4,268.8	16,618.6	13,157.7	3,461.0	28.1	836.0	(807.9)
1972	15,986.4	10,651.9	5,334.5	16,129.8	11,642.2	4,487.6	143.4	990.3	(846.9)
1973	16,465.6	11,073.0	5,392.6	17,042.7	12,270.5	4,772.2	577.1	1,197.5	(620.5)
1974	13,643.8	7,055.7	6,588.1	17,159.1	11,226.3	5,932.9	3,515.3	4,170.6	(655.3)
1975	14,171.2	8,281.5	5,889.6	18,181.7	13,270.1	4,911.6	4,010.6	4,988.6	(978.1)
1976	13,815.7	8,643.9	5,171.7	18,410.9	13,948.5	4,462.5	4,595.3	5,304.6	(709.3)
1977	15,950.8	9,716.2	6,234.6	20,292.5	14,920.1	5,372.4	4,341.7	5,203.9	(862.2)
1978	16,679.7	10,473.8	6,205.9	21,722.2	16,016.0	5,706.2	5,042.5	5,542.2	(499.7)
1979	16,798.4	9,680.7	7,117.7	21,213.5	15,016.7	6,196.8	4,415.1	5,336.0	(920.9)
1980				22,507.7	15,940.8	6,566.9			
1981	17,364.4	9,277.5	8,086.9	24,349.8	17,526.4	6,823.4	6,985.4	8,248.9	(1,263.5)
1982	18,375.5	9,601.4	8,774.1	24,814.6	16,982.1	7,832.5	6,439.1	7,380.7	(941.6)
1983	20,621.9	11,526.5	9,095.4	25,165.4	17,399.4	7,766.0	4,543.5	5,872.9	(1,329.4)
1984	22,304.0	13,396.6	8,907.4	25,983.0	18,128.6	7,854.4	3,679.0	4,732.0	(1,053.0)
1985	22,586.9	13,381.3	9,205.6	25,837.0	17,672.3	8,164.7	3,250.1	4,291.0	(1,040.9)
1986	23,464.0	13,594.8	9,869.2	26,674.4	17,812.9	8,861.5	3,210.4	4,218.1	(1,007.7)
1987	25,172.6	14,262.1	10,910.5	27,622.7	17,786.8	9,835.9	2,450.1	3,524.7	(1,074.6)
1988	25,972.5	15,179.5	10,793.0	29,448.2	19,574.0	9,874.2	3,475.7	4,394.5	(918.8)
1989*	26,280.0	15,071.7	11,208.3	30,615.6	20,402.0	10,213.6	4,335.6	5,330.3	(994.7)

Note: * The total employment in both rounds of the 1989 survey does not include the 11-12 year age group as in the previous surveys. This makes the total number a little different from that shown in Table 3.2, which includes the 11-12 year age group.

Source: NSO, *Report of the Labor Force Survey*, various issues.

As there is a change in the number of employment and average hours worked, the labor force of the country has also undergone many changes in personal characteristics, such as age-sex composition, educational attainment and intersectoral shifts of workers. These qualitative changes in labor input need to be accounted for, as they, too, have impact on the labor productivity and the TFP. However, we will postpone discussion on the measurement of these qualitative aspects until Chapter 4.

3.2 ESTIMATES OF FACTOR INCOME SHARES

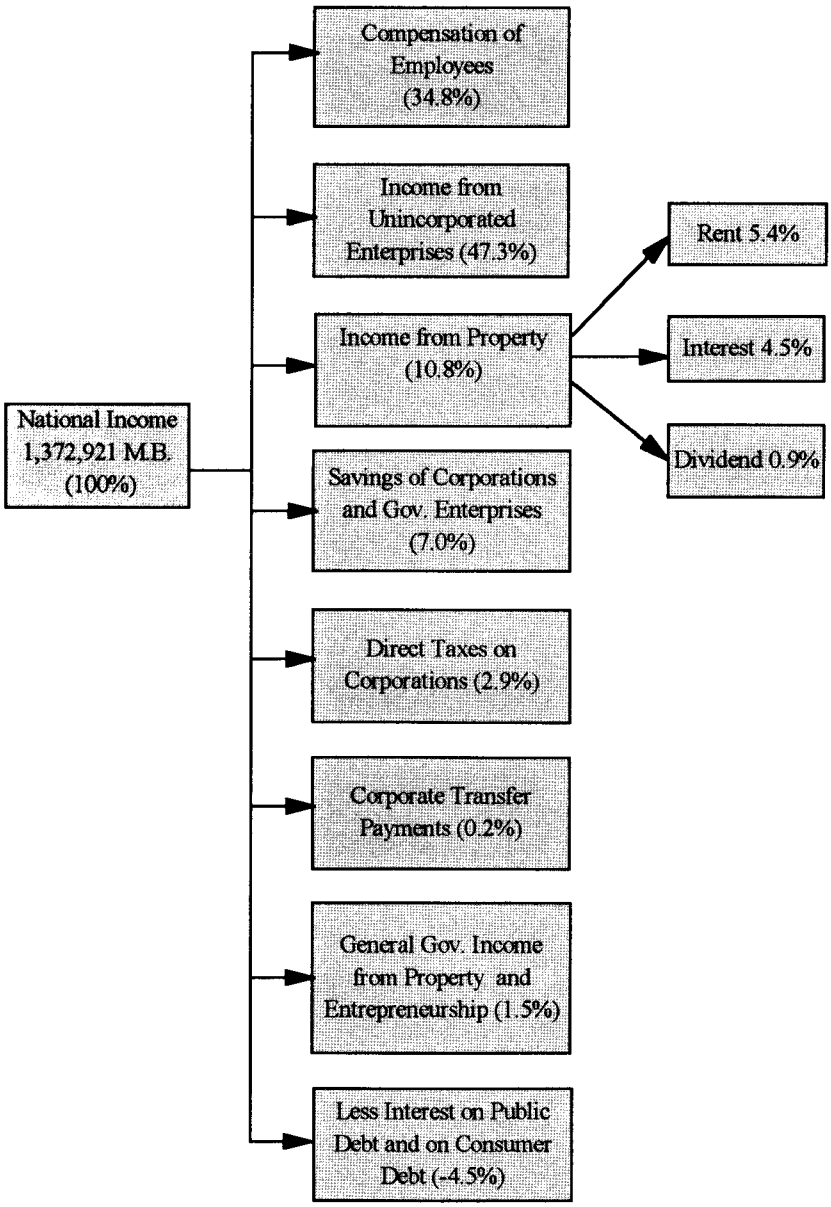
As described in Section 2.1, the assumption of profit maximization and producers' equilibrium enables us to use the factor income shares in place of output elasticity with respect to each input in the framework of growth accounting. On the surface, it appears that the national income account should provide such data. However, when one gets his/her hands soiled with statistics, one realizes that the problem is not as convenient as it may have originally appeared. This section describes the nature of the national income statistics of Thailand and how we adapt them for our estimates.

In Thailand, the national income in the national accounts is divided into compensation of employees, income from unincorporated enterprises, income from property, savings of corporations and government enterprises, direct taxes on corporations, corporate transfer payments, general government income from property and entrepreneurship, and less the interest on the public debt and consumers' debt. The shares of each of these items in 1989 are shown in Figure 2.

It is obvious that one cannot use the above breakdown right away to compute the income shares for each input factor. We can see that in 1989 about 47.3 percent of the national income is the income from unincorporated enterprises and it is the largest item. But it is a mixed income category including both proprietors' earnings from their invested capital, entrepreneurship and the imputed wages for the proprietors' family labor services. Another observation is that if we were to take the share of interest and dividend as the factor income share we would be plainly wrong as the share of capital would be only 5.4 percent. The income share of capital should be larger than this and is, in fact, obscured in the unincorporated enterprises' income, in the savings of corporations and government enterprises, and in the general government income from property and entrepreneurship.

We, therefore, proceed to estimate the factor income shares as follows. From the social accounting matrix (SAM) in 1987, built by Chalongphob Sussangkarn, the share of total wage payment in total value added is 50.8 percent, which is much higher than the 36.3 percent obtained from the national income account of the same year. This is because SAM has already taken care of the own account workers while these people's earnings are lumped in the income of the unincorporated enterprises in the national income.

The average wage in 1987 is computed by dividing the total wage payment (577, 522.6 m. baht) with the total employment figure (27.6227 m.) in the same year. The average wage per employed worker in 1987 from SAM is about 20,907.5 baht. When this figure is compared with the wage series computed from the LFS by Nipon Poapongsakorn and Pattamawadee Suzuki (1992), it is found that the SAM 1987 wage is about 6 percent lower than that series. We, therefore, use the ratio of SAM wage and the LFS wage in 1987 (as calculated by Nipon and Pattamawadee 1992) to adjust the remaining LFS wage for other years. The adjustment is made because the LFS wage series as calculated by Nipon and Pattamawadee are those of private employees only while we want to have an average wage for all employees to calculate the labor income share. Although the adjustment is constant in every year, it is necessary since the annual TFP calculation will be affected by the product of factor income share and the rate of change of corresponding factor input. The time series of the LFS wage and the so called SAM wage are presented in Table 3.5.



Source: NESDB (old series of national income data).

Figure 2 Distribution of National Income in 1989

Table 3.5 Average Wage of Workers in All Sectors, 1972-1990

Year	Average Wage 1 of Unskilled Workers		Average Wage 2 of All Private Workers	Combined Average Wage 3 (from 1 and 2)	Imputed Wage 4 Based on SAM 1987
	Baht/Day)	(Baht/Year)	(Baht/Year)	(Baht/Year)	(Baht/Year)
1972	21.24	6,372		6,889.6	6,474.5
1973	24.11	7,233		7,820.5	7,349.3
1974	27.30	8,190		8,855.3	8,321.7
1975	33.90	10,170		10,996.1	10,333.6
1976	33.85	10,155		10,979.9	10,318.3
1977	n.a.	-	11,472	11,472.0	10,780.8
1978	37.84	11,352	11,880	11,880.0	11,164.2
1979	43.04	12,912	13,656	13,656.0	12,833.2
1980	50.72	15,216	16,452	16,452.0	15,460.7
1981			17,772	17,772.0	16,701.2
1982			18,132	18,132.0	17,039.5
1983			20,544	20,544.0	19,306.2
1984			22,044	22,044.0	20,715.8
1985			21,864	21,864.0	20,546.6
1986			22,140	22,140.0	20,806.0
1987			22,248	22,248.0	20,907.5
1988			24,744	24,744.0	23,253.1
1989			25,848	25,848.0	24,290.6
1990			29,448	29,448.0	27,673.7

n.a. = Not available.

Notes: 1 The yearly data are computed from the daily wage by using 25 days per month and 12 months per year.

2 This series was presented in Nipon and Pattamawadee (1992) in monthly wage. We translated it into yearly wage.

3 This combined series is computed by using the 1980 ratio to adjust the wage data during 1972-1976 of the unskilled workers.

4 The total wage payment in SAM 1987 was 577,522.6 million baht and the total employment in 1987 was 27.6227 million. This renders and average wage for all workers in 1987 as 20,907.5 baht. We then use the 1987 ratio between Nipon's series and SAM 1987 wage to adjust Nipon's series down.

Sources: 1. The first column is from Nipon (1981).
2. The third column is from Nipon and Pattamawadee (1992).
3. The second, fourth and fifth columns are derived as described in the above notes.

It should be noted that the LFS wage series in Table 3.5 is obtained from two sources. The series 1977 to 1990 is from Nipon and Pattamawadee (1992) as already mentioned. The series between 1972 to 1980 is obtained from Nipon (1981) which compiled wage data from different sources because during the earlier period wage data were not yet available in the LFS. Since the series 1972 to 1980 is for the average wage for the unskilled workers while the series 1977 to 1990 is the average wage for all workers, we observe some difference for the overlapping years. We decided to use the 1980 ratio between the two series and adjusted the 1972-1976 upward in order to have a complete series for the whole period of 1972-1990. As we could not find an average wage for 1971, we have to start our analysis of growth accounting in 1972 even though the 1971 data on other variables for growth accounting are available.

From the SAM wage series, which we multiply by the LFS employment for each year, the result is the estimated total wage payment for all workers whether employed or own-account. The share of this variable in the value added at factor cost (to be consistent with SAM) provides us with the income share of labor. The income share of land is obtained by using the National Income Account (NIA) series of total rent as a share in the value added at factor cost. The share of capital and profit from entrepreneurship is calculated as a residual. Table 3.6 presents the above described estimates for factor income shares. Before these factor income shares are used to calculate the TFP, they are smoothed by a three-year moving average to reduce the effects of business fluctuations on annual data. This practice is often done in similar studies for other countries. (See Kim and Park 1985.) The three-year moving average method causes us to lose the beginning and end points. However, since we have a limited series of data, the original values of the end points are retained in our calculation.

3.3 ESTIMATED SOURCES OF GROWTH

The data on the growth rates of output and various factor inputs together with their estimated income shares can now be used to calculate the TFP according to the growth accounting framework described in Chapter 2. Table 3.7 provides such calculation based on the number of employment as labor input, whereas Table 3.8 is based on total working hours.

Although the long-term trends of the growth in the number of employment and total working hours are similar, the different fluctuations from year to year produce different yearly estimates of TFP. The difference is lessened as we look at the period average and, in fact, when we take the average for the whole period of 1972-1990, the estimates of TFP by using the number of employment and total working hours are quite close, 2.6067 (Table 3.7) and 2.5850 (Table 3.8) respectively. Since the index of total working hours is a more correct measurement of the flow of labor services, we will describe the contribution of various factor inputs to the overall growth of GDP during the period 1972-1990 as shown in Table 3.8.

Table 3.6 Factor Income Shares by Using Imputed Wage Series Based on SAM 1987

Year	Wage (SAM 1987) Baht/Year	LFS Employ-ment M. Person	Total Payment M. Baht	Current GDP at Factor Cost M. Baht	Factor Income Shares		
					Wage Share	Rent Share	Capital, etc.
1972	6,474.5	16.1298	104,432.4	151,735	0.6883	0.0863	0.2254
1973	7,349.3	17.0427	125,251.9	198,805	0.6300	0.0821	0.2879
1974	8,321.7	17.1591	142,792.9	246,725	0.5788	0.0765	0.3447
1975	10,333.6	18.1817	187,882.4	271,477	0.6921	0.0735	0.2344
1976	10,318.3	18.4109	189,969.2	311,282	0.6103	0.0695	0.3202
1977	10,780.8	20.2925	218,769.4	358,749	0.6098	0.0669	0.3233
1978	11,164.2	21.7222	242,511.0	435,269	0.5572	0.0595	0.3833
1979	12,833.2	21.2135	272,237.1	494,365	0.5507	0.0588	0.3905
1980	15,460.7	22.5077	347,984.8	582,286	0.5976	0.0588	0.3436
1981	16,701.2	24.3498	406,670.9	675,424	0.6021	0.0592	0.3387
1982	17,039.5	24.8146	422,828.4	732,628	0.5771	0.0600	0.3629
1983	19,306.2	25.1654	485,848.2	805,548	0.6031	0.0604	0.3365
1984	20,715.8	25.9830	538,258.6	857,704	0.6276	0.0584	0.3140
1985	20,546.6	25.8370	530,862.5	900,482	0.5895	0.0577	0.3528
1986	20,806.0	26.6744	554,987.6	968,319	0.5731	0.0586	0.3683
1987	20,907.5	27.6227	577,521.6	1,103,466	0.5234	0.0568	0.4198
1988	23,253.1	29.4482	684,761.9	1,303,997	0.5251	0.0522	0.4227
1989	24,290.6	30.6862	745,386.2	1,540,075	0.4840	0.0485	0.4675
1990	27,673.7	30.9401	856,227.0	1,756,788	0.4874	0.0458	0.4668

Note: Value added from SAM 1987 = 1,137,680.7 m. baht which is about 3 percent higher than the value of GDP at factor cost in the same year as reported in the national account.

Sources: NESDB, NSO and TDRI.

We can see that GDP grew at an annual average rate of 7.4 percent. Of this amount, 4.82 percentage points, or about 65.1 percent of GDP growth, was accounted for by the increase in various factor inputs. The remaining 2.58 percentage points, or about 34.9 percent, was contributed by the increase in TFP.

We have also used the Star's approximation formula which only needs the end point data. It can be seen that the Star's approximation formula yielded quite a close estimate of TFP during the same period, but it is a bit on the low side. However, since the Star's formula does not allow us to separate out the contribution of various inputs, we, therefore, leave it out in the subsequent analysis.

Table 3.7 Growth Accounting by Using Number of Employment as Labor Input (in percentage)

Period	GDP	Labor	Land	Net Capital	TFP
1972-1976 (3rd Plan)	6.5015	1.3056	0.3068	1.3237	3.5654
1977-1981 (4th Plan)	7.3538	3.3412	0.2565	2.6813	0.9848
1982-1986 (5th Plan)	5.3742	1.0925	0.0481	2.4945	1.7392
1987-1990 (6th Plan)	11.1826	1.4690	0.0472	4.6681	4.5203
1972-1990	7.4146	1.9439	0.1708	2.6931	2.6067
Contribution	100.0	26.2	2.3	36.3	35.2
Estimated TFP Based on Star's Approximation Formula: (by using end points 1972-1990)					2.5

Source: Calculated as described in the text. See Appendix Table A-34.

Table 3.8 Growth Accounting by Using Total Working Hours as Labor Input (in percentage)

Period	GDP	Labor	Land	Net Capital	TFP
1972-1976 (3rd Plan)	6.5015	1.3954	0.3068	1.3237	3.4756
1977-1981 (4th Plan)	7.3538	3.3505	0.2565	2.6813	1.0655
1982-1986 (5th Plan)	5.3742	1.5844	0.0481	2.4945	1.2473
1987-1990 (6th Plan)	11.1826	1.4239	0.0472	4.6681	5.0434
1972-1990	7.4146	1.9656	0.1708	2.6931	2.5850
Contribution	100.0	26.5	2.3	36.3	34.9
Estimated TFP Based on Star's Approximation Formula: (by using end points 1972-1990)					2.4

Source: Calculated as described in the text. See Appendix Table A-35.

From Table 3.8, the average contribution to GDP growth during 1972-1990 of various factor inputs is: 36.3 percent from capital, 26.5 percent from labor and only 2.3 percent from land. The division of the 1972-1990 period into subperiods concurrent with each national economic and social development plan shows that the contribution of these various factors and TFP exhibits some fluctuation. Land appears to be an exception to the previous statement as it has a rather clear declining trend in its contribution to GDP growth.

Since the above growth accounting calculation came from the use of wage series adjusted to match the average imputed wage in SAM 1987, it appears sensible to check the sensitivity of our calculation by adding to and subtracting from the SAM 1987 wage series by 10 percentage points. These adjusted wages are then used to calculate wage shares and other factor shares for the growth accounting calculation. The results of these adjustments are shown in Tables A-36 and A-37 in the Appendix. The increase of the average wage by 10 percent implies an increase in the wage share in total income. Since rent share remains the same and capital share is a residual, this has an effect of lowering the share of capital in total income. The result is an increase in the average TFP for the 1972-1990 period due to the fact that the growth of capital input is on the average higher than the growth of labor input. The increased wage share was multiplied by a series of lower growth rates, whereas the decreased capital share was multiplied by a series of higher growth rates. The net effect is to lower the contribution of all factor inputs combined and raise that of TFP. The average annual TFP for the period 1972-1990 increased to about 2.8016. The same argument in reverse can be applied to the case of a 10 percent reduction in the average wage. This latter case renders an average annual TFP of 2.3584 for the same period. Since the differences of these two cases from the base case (2.585) are less than 10 percent, our data approach appears to be reasonable. (See details in Appendix Tables A-36 and A-37.)

However, all the above discussion is based on the calculation of TFP without accounting for the changes in input qualities. Similar studies for other countries[7] have demonstrated that the adjustment of inputs for their qualitative changes could increase the explanations of the output growth rate by various inputs significantly. Or, in other words, the adjustment for qualitative changes in inputs could reduce the contribution of TFP. Without qualitative adjustments in the input factor, the TFP calculation in Tables 3.7 and 3.8 should not be taken seriously. These two tables serve as a first-step calculation before we incorporate qualitative changes into the calculation. Such adjustments will be discussed in the next chapter.

[7] See, for example, Jorgenson and Griliches (1967) and Star (1974).

Chapter 4

Changes in Input Qualities and Adjusted Sources of Growth

The measurement of the TFP without allowance for the qualitative changes in factor inputs not only leaves a large part of output growth unexplained but also makes our results incomparable with those done for other countries. Most studies using this growth accounting framework take account of the changes in factor qualities. In this chapter, we will discuss the changes in input qualities, and adjusted measurement of the TFP, and then look at some international comparison.

4.1 QUALITATIVE CHANGES IN INPUTS

Ideally, one should try to account for the qualitative changes in all factor inputs. However, as in other TFP studies, capital is an input whose quality is often not measured. The quality changes embodied in each vintage of capital is a complicated issue and not easily measurable. For example, the new type of capital may be of any of these characteristics: labor saving, capital saving, or neutral. Furthermore, these technical characteristics do not remain constant over time or over different productive units, which raises aggregation problems. To make the matter even worse, economists do not have a uniform agreement on the precise definition of bias in technical progress.[8] These complications can be differentiated for analytical purposes but they cannot be actually distinguished. It is no surprise then that Denison considers it neither desirable nor possible to measure qualitative changes in capital goods. We also follow this line of reasoning, as did Kim and

[8] Nadiri (1970) explained that there are several ways of defining bias in technical progress. Hick's definition measures the bias in technical change along a constant capital-labor (K/L) ratio; Harrod's definition measures the bias along a constant capital-output (K/Y) ratio; and Solow's definition measures the bias along a constant labor-output (L/Y) ratio.

Park (1985) for Korea, and treat the possible effect of unmeasured qualitative improvement of capital goods as part of the technical progress.

Before we discuss the qualitative adjustments made for land and labor inputs, it seems appropriate to point out that, due to the availability of wage data needed to adjust for labor quality, the analysis has to start in 1977. The NSO has collected wage data in the LFS since 1977 up to the present time, which provides us with a time series of wage structure across industry, sex and level of education to account for the qualitative changes in labor. Prior to 1977, there were scant wage data from various sources,[9] but they contain inadequate information for our analysis.

Land

The time series of area under cultivation during 1971-1990 shown in Table 3.2 reveals an increasing trend of land use. Ammar et al. (1991:10) noted that the 1960s was the period of most rapid expansion in the total farm area, at the expense of forest land. The land expansion became less rapid during the 1970s and 1980s when cultivated area grew at an annual average rate of 3.9 percent and 1.0 percent respectively.[10]

While area under cultivation is expanding, the area under irrigation has also been increasing, as the government poured a sizable amount of investment into irrigation, especially during the 1960s and 1970s. However, the pace of investment in irrigation has slackened off since the mid 1980s, partly because of the increasing cost and partly because of declining rice prices (Ammar et al. 1991:16-18). The average rate of annual increase in area under irrigation came down from 6.3 percent during 1971-1980 to about 3.5 percent during 1980-1990.[11] Since access to irrigation should improve the quality of land, and also enables farmers to grow rice during the dry season, the increase in irrigated area should lead to an increase in agricultural production, ceteris paribus. It seems appropriate, therefore, to use the index of irrigated area to adjust the index of area under cultivation.

The data on accumulated irrigated area and area under cultivation together with their indices are shown in Table 4.1. The adjusted index of land input displays a much higher growth trend than the unadjusted one. There are some reasons to believe that this index has an upward bias. First, the utilization of irrigation structures depends on the amount of water stored during the monsoon season. If the stored water is inadequate, and if agricultural use has to compete with other uses (such as electricity generation), then the benefit of irrigation structures on land quality is lessened. Second, Ammar et al. (1991:18) pointed out that most of the irrigation structures were designed for rice production. To the extent that the actual cultivation in the recent past has moved away from rice, the relevance of irrigation on land improvement becomes uncertain.

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[9] Nipon Poapongsakorn (1981) attempted to collect a time series of wages from various sources, but his series are not as detailed or as structured as needed in this study.

[10] Approximated compound rates from data in Table 3.2.

[11] Approximated compound rates from data in Table 3.9.

Table 4.1 Irrigated Area and Index of Adjusted Land Input

Year	Accumulated Irrigated Area (rai)	Cultivated Area (rai)	Proportion of Irrigated Area (%)	Index of Proportion of Irrigated Area	Index of Cultivated Area	Index of Adjusted Land Input
1971	10,891,110	61,926,826	17.59	87.76	77.14	67.70
1972	11,394,010	61,125,774	18.64	93.02	76.14	70.82
1973	12,334,310	69,618,037	17.72	88.41	86.72	76.67
1974	12,769,960	70,061,592	18.23	90.95	87.27	79.38
1975	13,057,560	75,768,027	17.23	86.00	94.38	81.16
1976	15,277,984	74,320,461	20.56	102.58	92.58	94.97
1977	16,087,830	80,280,435	20.04	100.00	100.00	100.00
1978	17,136,533	89,244,478	19.20	95.82	111.17	106.52
1979	18,040,235	84,263,651	21.41	106.84	104.96	112.14
1980	18,842,670	87,065,201	21.64	108.00	108.45	117.12
1981	19,821,560	90,045,922	22.01	109.85	112.16	123.21
1982	20,752,290	90,269,004	22.99	114.72	112.44	128.99
1983	21,656,124	93,772,844	23.09	115.24	116.81	134.61
1984	22,866,122	94,565,083	24.18	120.66	117.79	142.13
1985	23,889,148	98,110,208	24.35	121.51	122.21	148.49
1986	24,447,077	93,453,536	26.16	130.54	116.41	151.96
1987	24,975,732	90,344,638	27.64	137.95	112.54	155.25
1988	25,755,531	98,865,206	26.05	130.00	123.15	160.09
1989	25,989,010	100,356,163	25.90	129.23	125.01	161.54
1990	26,487,934	96,105,966	27.56	137.53	119.71	164.65

Source: MOAC, *Agricultural Statistics of Thailand*, various issues.

In view of the above upward bias, plus the fact that the reported area under cultivation already includes the second cropping of rice, we reach the conclusion that the index of cultivated area has taken account of the impact of "effective" irrigation and there is no need to further adjust it by the index of irrigated area. One may consider the use of fertilizers and pesticides as positive factors on the yield of agricultural output and use its index as a proxy for land quality.[12] However, due to the complications that some chemicals have on the environment, it seems preferrable to be satisfied with the index of cultivated area inclusive of "effective irrigation." It is also probably more appropriate to treat any positive impact of fertilizers and pesticides as part of the technical progress, or as advances in knowledge.

[12] Ammar et al. (1991:22) used fertilizer prices as one explanatory variable to account for the growth of agricultural output. They admitted (ibid., 23) that it was a supply function but, nevertheless, went about using this equation for a growth accounting exercise.

Labor

A qualitative change of labor input may come from several different factors. In his analysis of growth rates for eight Western European countries and the United States in the postwar years (1950-1962), Denison (1967) measured the age-sex composition and the education of the labor force as representing the qualitative changes in labor input. He also considered the effect of the length of hours on the quality of work. Similar analysis was done for Japan for the period 1953-1971 (Denison and Chung 1976) and for Korea during 1963-1982 (Kim and Park 1985). We will follow the same type of analysis for Thailand with some modification due to the nature of our available data, which will be explained where appropriate.

The distribution of hours worked between males and females at different ages may change over time. These changes may influence output per hour due to different labor content. The age-sex composition index will measure the change in value of labor input which accompanies changes in the age-sex composition of workers. Due to the data limitation for Korea, Kim and Park (1985:116) used the composition of employment by age-sex brackets instead of the composition of working hours by age-sex. They argued that there is no definite reason to expect that average weekly hours will systematically vary among the workers by age and sex distribution, which would significantly change their results.

In the case of Thailand, the Labor Force Surveys report hours worked by age and sex composition. However, the hours are reported in ranges such as "under 10 hours per week," "between 10 to 19 hours per week," etc. We have used these statistics to estimate the average hours worked per week and the total working hours indices as reported in Tables 3.2 and 3.3 in Section 3.1.2. The mid-point of each range was used in our estimation with the exception of the top open-end range. Tables 4.2 and 4.3 present, respectively, the distribution of employment and total working hours by age and sex composition. We can see that the distribution across age and sex and the trend over time in these two tables are quite similar although there are some differences in each cell. This lends support to Kim and Park's (1985) argument in using the distribution of employment instead of working hours. It can be observed from both tables that the share in working hours of both men and women under the age of 20 has been declining, while that of men and women between the age of 20 to 29 has been increasing during 1977-1990. There also seems to be a slightly increasing trend for workers of older ages, but the trend is not quite as clear as the above two groups.

The shift in the age-sex composition of employment and working hours should have an impact on output if the marginal products of different groups are not the same. This argument also applies to the different levels of education among workers. Other things being equal, the value of the output of workers with more education is expected to be higher than that of workers with less education.

Table 4.2 Distribution of Employed Persons Working During Survey Period by Age Group and Sex

(Percentage)

Year	<20	20-29	30-39	40-49	50 & Over	Total
			MALE			
1977	10.58	14.48	12.59	8.49	8.02	54.17
1978	10.61	14.21	12.20	8.18	7.75	52.95
1979	9.96	14.51	12.69	8.52	7.98	53.66
1980	9.97	14.23	12.46	8.27	7.76	52.69
1981	10.14	16.22	11.81	7.20	7.41	52.78
1982	10.25	16.03	12.04	7.15	7.44	52.92
1983	10.22	16.12	12.31	7.32	7.40	53.37
1984	9.65	16.27	12.54	7.35	7.52	53.33
1985	9.53	16.43	12.91	7.62	7.55	54.05
1986	9.53	16.45	12.90	7.71	7.33	53.91
1987	8.91	16.50	12.58	7.98	7.95	53.93
1988	9.06	16.39	12.27	7.77	7.86	53.35
1989	8.63	16.75	12.40	7.70	7.68	53.17
1990	8.08	16.60	12.70	7.91	8.05	53.34
			FEMALE			
1977	11.03	12.39	10.19	6.76	5.47	45.83
1978	11.04	12.82	10.61	6.98	5.60	47.05
1979	10.24	12.65	10.82	7.02	5.62	46.34
1980	10.28	12.94	10.91	7.24	5.94	47.31
1981	10.40	14.06	10.11	6.76	5.90	47.22
1982	10.28	13.76	10.28	6.69	6.07	47.08
1983	10.06	13.71	10.51	6.63	5.72	46.63
1984	9.87	13.74	10.59	6.69	5.77	46.67
1985	9.57	13.59	10.53	6.58	5.69	45.95
1986	9.53	13.42	10.76	6.64	5.75	46.09
1987	8.91	13.89	10.49	6.74	6.03	46.07
1988	8.77	14.20	10.68	6.83	6.16	46.65
1989	8.63	14.27	10.99	6.73	6.22	46.83
1990	8.03	14.07	11.13	6.90	6.54	46.66
			MALE & FEMALE			Grand
Year	<20	20-29	30-39	40-49	50 & Over	Total
1977	21.6	26.9	22.8	15.3	13.5	100.0
1978	21.7	27.0	22.8	15.2	13.4	100.0
1979	20.2	27.2	23.5	15.5	13.6	100.0
1980	20.3	27.2	23.4	15.5	13.7	100.0
1981	20.5	30.3	21.9	14.0	13.3	100.0
1982	20.5	29.8	22.3	13.8	13.5	100.0
1983	20.3	29.8	22.8	13.9	13.1	100.0
1984	19.5	30.0	23.1	14.0	13.3	100.0
1985	19.1	30.0	23.4	14.2	13.2	100.0
1986	19.1	29.9	23.7	14.3	13.1	100.0
1987	17.8	30.4	23.1	14.7	14.0	100.0
1988	17.8	30.6	23.0	14.6	14.0	100.0
1989	17.3	31.0	23.4	14.4	13.9	100.0
1990	16.1	30.7	23.8	14.8	14.6	100.0

Sources: LFS (Round 2), July - September 1977-1983.
LFS (Round 3), August 1984-1990.

Table 4.3 Distribution of Total Working Hours by Age Group and Sex

(Percentage)

Year	MALE					
	<20	20-29	30-39	40-49	50 & Over	Total
1977	11.09	14.92	12.64	8.40	7.47	54.51
1978	11.13	14.41	12.42	8.37	7.40	53.73
1979	10.52	14.90	12.82	8.51	7.45	54.20
1980	10.37	14.62	12.72	8.49	7.51	53.70
1981	10.47	16.65	12.49	7.38	7.22	53.90
1982	10.56	16.81	12.73	7.52	7.37	55.00
1983	10.20	16.48	12.71	7.54	7.36	54.30
1984	9.83	16.58	12.83	7.57	7.47	54.28
1985	9.68	16.82	13.35	7.88	7.43	55.18
1986	9.77	16.85	13.15	7.93	7.13	54.83
1987	8.93	16.89	13.03	8.27	7.86	54.99
1988	9.05	16.81	12.76	8.11	7.81	54.54
1989	8.82	17.23	12.73	7.96	7.60	54.34
1990	7.88	17.31	13.53	8.44	7.83	54.99
Year	FEMALE					
	<20	20-29	30-39	40-49	50 & Over	Total
1977	11.31	12.40	10.10	6.57	5.11	45.49
1978	11.29	12.49	10.55	6.81	5.13	46.27
1979	10.64	12.48	10.63	6.86	5.19	45.80
1980	10.54	12.65	10.61	7.06	5.44	46.30
1981	10.43	13.65	9.97	6.58	5.46	46.10
1982	10.12	13.09	9.90	6.42	5.47	45.00
1983	9.98	13.38	10.36	6.59	5.39	45.70
1984	9.91	13.29	10.49	6.59	5.44	45.72
1985	9.52	13.22	10.29	6.54	5.26	44.82
1986	9.60	13.08	10.57	6.55	5.37	45.17
1987	8.87	13.59	10.27	6.61	5.68	45.01
1988	8.52	13.86	10.50	6.76	5.83	45.46
1989	8.62	13.90	10.77	6.62	5.74	45.66
1990	7.99	13.60	10.91	6.79	5.72	45.01
Year	MALE & FEMALE					Grand
	<20	20-29	30-39	40-49	50 & Over	Total
1977	22.39	27.32	22.74	14.97	12.58	100.0
1978	22.42	26.90	22.87	15.18	12.53	100.0
1979	21.16	27.38	23.45	15.37	12.64	100.0
1980	20.91	27.28	23.32	15.55	12.94	100.0
1981	20.90	30.30	22.17	13.96	12.68	100.0
1982	20.68	29.90	22.63	13.94	12.85	100.0
1983	20.19	29.85	23.07	14.13	12.75	100.0
1984	19.74	29.87	23.32	14.16	12.91	100.0
1985	19.20	30.04	23.64	14.42	12.69	100.0
1986	19.37	29.93	23.72	14.48	12.50	100.0
1987	17.80	30.48	23.30	14.88	13.53	100.0
1988	17.57	30.67	23.26	14.87	13.64	100.0
1989	17.44	31.13	23.51	14.58	13.34	100.0
1990	15.87	30.91	24.44	15.23	13.55	100.0

Sources: LFS (Round 2), July - September 1977-1983.
LFS (Round 3), August 1984-1990.

Table 4.4 presents the composition of workers by sex and level of education. Both male and female workers are grouped according to the level of their educational attainment as follows.

Group 1 includes workers with elementary education[13] and lower, including those with no formal education and not elesewhere classified (which is only a small percentage).

Group 2 includes workers with secondary education (both upper and lower), including those who receive any short-course vocational education.

Group 3 includes workers with vocational education.

Group 4 includes those with university education, both academic and high level technical-vocational.

Group 5 includes those with teacher training education.

It can be observed that the composition of workers in Group 1 (lowest educational attainment) has been gradually declining for both male and female workers. At the same time, the share of workers with higher education in the other four categories has increased. Denison (1967:79) argues that the more educated groups earn more and contribute more to the national product. If workers with more education earn twice as much, on the average, as otherwise similar individuals with less education, they should be counted as twice as much labor. The reason for this comes from the rationale of profit maximization (or cost minimization), whereby workers are paid at the value of their marginal products.

Table 4.4 Composition of Workers by Sex and Education: All Sectors

(Percentage)

	MALE					
Year	**1**	**2**	**3**	**4**	**5**	**Total**
1977	49.4	2.9	0.7	0.5	0.6	54.2
1978	47.9	3.2	0.6	0.5	0.7	53.0
1979	48.1	3.3	0.7	0.7	0.8	53.7
1980	47.1	3.3	0.7	0.7	0.8	52.7
1981	46.9	3.4	0.8	0.7	0.9	52.8
1982	46.3	3.7	0.9	0.8	1.1	52.9
1983	45.8	4.2	0.9	1.3	1.2	53.4
1984	46.0	3.9	1.3	1.1	1.1	53.3
1985	46.1	4.6	1.2	1.2	1.0	54.0
1986	44.8	5.2	1.5	1.4	1.0	53.9
1987	44.2	5.5	1.6	1.6	1.0	53.9
1988	43.6	5.6	1.5	1.8	0.9	53.4
1989	43.6	5.5	1.3	1.8	0.8	53.2
1990	43.4	5.6	1.5	2.0	0.9	53.3

(Continued on page 34)

[13] Perhaps it should be noted here that up to the year 1960 (B.E. 2503) the elementary school system was Prathom 1 to Prathom 4. Since 1960, it was changed to Prathom 1 to Prathom 7 and, then, since 1977 (B.E. 2520) up to the present time, it was changed to Prathom 1 to Prathom 6. This may cause some mix-up of Group 1 and Group 2 for workers of older ages.

Table 4.4 (Continued)

(Percentage)

Year	FEMALE 1	2	3	4	5	Total
1977	43.6	1.0	0.4	0.3	0.5	45.8
1978	44.7	1.1	0.5	0.3	0.6	47.0
1979	43.7	1.1	0.5	0.4	0.6	46.3
1980	44.4	1.3	0.5	0.4	0.7	47.3
1981	44.1	1.3	0.6	0.5	0.7	47.2
1982	43.5	1.5	0.7	0.5	0.9	47.1
1983	42.6	1.4	0.9	0.6	1.0	46.6
1984	42.7	1.7	0.8	0.6	0.9	46.7
1985	41.7	1.7	0.8	0.8	0.9	46.0
1986	41.3	1.9	0.9	1.1	1.0	46.1
1987	40.5	2.3	1.0	1.1	1.1	46.1
1988	40.8	2.4	1.0	1.5	1.0	46.6
1989	40.8	2.7	1.0	1.4	0.9	46.8
1990	40.3	2.8	1.0	1.6	0.9	46.7
	MALE & FEMALE					Grand
Year	1	2	3	4	5	Total
1977	93.0	4.0	1.1	0.8	1.2	100.0
1978	92.6	4.3	1.0	0.8	1.3	100.0
1979	91.8	4.4	1.3	1.1	1.5	100.0
1980	91.6	4.6	1.3	1.1	1.5	100.0
1981	90.9	4.8	1.4	1.2	1.7	100.0
1982	89.9	5.2	1.6	1.3	2.0	100.0
1983	88.5	5.6	1.8	1.9	2.2	100.0
1984	88.6	5.6	2.1	1.7	2.0	100.0
1985	87.9	6.3	2.0	2.0	1.9	100.0
1986	86.0	7.1	2.3	2.5	2.0	100.0
1987	84.8	7.8	2.6	2.7	2.2	100.0
1988	84.3	8.0	2.5	3.3	1.9	100.0
1989	84.5	8.2	2.3	3.3	1.7	100.0
1990	83.8	8.4	2.5	3.5	1.8	100.0

Notes: 1 = No education, elementary and not elsewhere classified.
2 = Secondary and short course vocational.
3 = Vocational.
4 = University.
5 = Teacher training.

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

In order to compute the age-sex composition index and the quality index of education, we need to use the relative earnings of these various categories of workers as weights for their contribution to the total output. The average wage of each category of workers can be tabulated from the LFS since 1977. Table 4.5 presents the wage differential index of workers by age-sex composition with the male workers in the 30-39 age bracket being the reference point (i.e., their wage is

set equal to 100). The following observations should be noted. First, the average wages received by female workers are lower in every age-bracket. Second, the wage differentials between other groups and the reference group appear to narrow down over time with the exception of female workers aged 50 and over. Third, the percentage of wage differentials between male and female workers in the age brackets of under 20, 20-29, and 30-39 also appear to narrow down over time. The wage differentials between male and female workers in older age (40 and over) brackets, however, appear to widen. Finally, the structure of wage differentials among workers of different ages in Thailand is not similar to that of more developed countries where the average wage increases consistently with the age of workers. This is supported by the rationale that age is a proxy of experience and it is expected to be positively correlated with wages on the average. For example, the wage differential index for Japan and Korea keep increasing with older-age brackets until retirement.[14] But, in the case of Thailand, we can observe a decline in the average wage after the age of 40 during the late 1970s and early 1980s. However, since the mid-1980s, the decline in the average wage takes place after the age of 50.

Such an observation led us to investigate the average years of education of workers in each age bracket as shown in Table 4.6. The data reveal that workers in older age brackets, both male and female, have fewer average years of education than workers of younger age. This may be an explanation for our observation of declining wage index for workers of ages over 40 and 50. The effect of experience coming with age appears unable to outweigh the effect of education. Table 4.7 presents the wage differential index among workers of different educational attainment. The average wage of workers with the lowest category of education (Group 1) is set as the reference point. We can observe that, in general, the average wage increases with higher levels of education. However, the wage gap between the elementary and secondary educated workers appears to narrow down over time.

It should be pointed out that both the wage differential index by age-sex composition and that by educational level, as shown in Tables 4.5 and 4.7, are not independent of each other. In fact, the wage differential index by age and sex composition contains the effect of education and the wage differential index by educational level also contains the effect of age and sex. We believe that it is more appropriate to compute such an index of age, sex and education simultaneously. While such computation may not be possible for other countries, it is possible in the case of Thailand, as the data tapes of the LFS during 1977-1990 are available to us. The wage differential index by age, sex and education during 1977 to 1990 is presented in Table 4.8 with the average wage of a male worker, age 30-39, attaining elementary education as a reference point, i.e., their wage is set equal to 1.0. The share of employment by age, sex and education is shown in Table 4.9. Both of these tables can be combined to obtain a composition of the labor quality in each year.

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[14] See Denison and Chung (1976:187) and Kim and Park (1985:115). For Korea, the average wage of male workers in the 30-39 age bracket is also the reference point, as it is in this study.

Table 4.5 Average Wage of Private Employees and Wage Differential Index by Age-Sex Composition

a) Averaged Wage (Baht/Month)

Year	MALE				
	Under 20	20-29	30-39	40-49	50 and over
1977	494.5	1,014.2	1,673.9	1,163.3	1,018.8
1978	574.5	1,102.6	1,457.0	1,435.9	1,289.8
1979	637.9	1,307.3	1,673.3	1,659.1	1,496.9
1980	789.7	1,476.5	2,000.1	2,157.2	1,854.7
1981	844.4	1,626.3	2,252.3	2,167.6	1,857.2
1982	818.2	1,655.8	2,408.6	2,403.7	2,044.6
1983	1,008.4	1,770.2	2,673.8	2,597.3	2,138.9
1984	1,032.9	1,835.0	2,653.3	2,891.3	2,485.6
1985	1,054.6	1,925.7	2,763.1	3,215.3	2,332.4
1986	1,012.2	1,958.4	2,796.4	3,532.8	2,341.2
1987	1,007.5	1,891.3	2,711.1	3,432.1	2,581.8
1988	1,101.7	2,044.9	2,962.9	3,788.1	3,087.1
1989	1,150.4	1,899.9	2,897.9	2,885.9	2,893.5
1990	1,213.4	2,161.2	3,133.0	3,458.5	2,879.4
Year	FEMALE				
	Under 20	20-29	30-39	40-49	50 and over
1977	415.7	865.5	785.0	941.3	849.1
1978	521.1	948.7	936.1	693.2	646.6
1979	604.7	1,088.1	1,000.9	788.9	642.7
1980	710.7	1,263.7	1,299.1	1,001.9	848.3
1981	866.4	1,348.4	1,441.9	1,030.0	719.3
1982	747.4	1,336.6	1,430.5	1,116.5	897.0
1983	803.3	1,548.7	1,719.8	1,256.5	947.3
1984	989.6	1,507.3	1,932.1	1,422.1	1,002.8
1985	790.9	1,561.2	2,016.4	1,491.5	1,150.7
1986	831.3	1,586.2	1,946.4	1,505.7	1,153.1
1987	860.0	1,670.6	2,078.6	1,482.0	1,313.7
1988	891.3	1,654.2	2,061.1	1,649.9	1,299.2
1989	1,036.1	1,699.6	2,058.5	2,041.8	1,255.5
1990	1,292.0	2,263.7	2,367.1	2,454.3	1,592.1

(Continued on next page 37)

Table 4.5 (Continued)

b) Wage Differential Index

	MALE				
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 and over**
1977	29.54	60.59	100.00	69.50	60.86
1978	39.43	75.68	100.00	98.55	88.53
1979	38.13	78.13	100.00	99.15	89.46
1980	39.48	73.82	100.00	107.85	92.73
1981	37.49	72.20	100.00	96.24	82.46
1982	33.97	68.75	100.00	99.80	84.89
1983	37.71	66.21	100.00	97.14	79.99
1984	38.93	69.16	100.00	108.97	93.68
1985	38.17	69.69	100.00	116.36	84.41
1986	36.20	70.03	100.00	126.33	83.72
1987	37.16	69.76	100.00	126.59	95.23
1988	37.18	69.02	100.00	127.85	104.19
1989	39.70	65.56	100.00	99.59	99.85
1990	38.73	68.98	100.00	110.39	91.90
	FEMALE				
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 and over**
1977	24.83	51.70	46.90	56.23	50.73
1978	35.77	65.12	64.25	47.58	44.38
1979	36.14	65.03	59.82	47.15	38.41
1980	35.53	63.18	64.95	50.09	42.41
1981	38.47	59.87	64.02	45.73	31.93
1982	31.03	55.49	59.39	46.35	37.24
1983	30.04	57.92	64.32	46.99	35.43
1984	37.30	56.81	72.82	53.60	37.79
1985	28.63	56.50	72.97	53.98	41.65
1986	29.73	56.72	69.60	53.84	41.23
1987	31.72	61.62	76.67	54.66	48.46
1988	30.08	55.83	69.56	55.68	43.85
1989	35.75	58.65	71.04	70.46	43.33
1990	36.57	64.07	67.00	69.47	45.06

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table 4.6 Average Years of Education of Private Employees by Age-Sex Group

	MALE					
Year	< 20	20-29	30-39	40-49	>=50	All
1977	4.26	5.36	4.96	3.89	2.92	4.69
1978	4.38	5.48	5.07	4.05	3.16	4.81
1979	4.44	5.44	5.10	4.08	3.38	4.83
1980	4.46	5.57	5.09	4.15	3.29	4.90
1981	4.62	5.49	5.22	4.30	3.51	4.99
1982	4.59	5.39	5.44	4.37	2.99	4.96
1983	4.92	5.88	5.60	4.49	3.66	5.32
1984	5.18	5.90	5.36	4.47	3.86	5.33
1985	5.68	6.60	5.73	4.97	3.59	5.81
1986	6.07	6.81	6.12	5.21	3.74	6.10
1987	6.05	6.81	5.93	5.53	3.93	6.12
1988	6.26	7.06	5.77	5.54	4.35	6.25
1989	6.07	6.99	5.98	4.84	4.18	6.17
1990	6.42	7.45	6.35	5.37	4.18	6.54
	FEMALE					
Year	< 20	20-29	30-39	40-49	>=50	All
1977	4.05	5.19	4.07	2.95	1.42	4.14
1978	4.14	5.10	5.10	3.17	1.65	4.21
1979	4.13	5.18	4.22	2.97	1.88	4.24
1980	4.30	5.29	4.67	3.05	2.04	4.44
1981	4.28	5.35	4.72	3.19	2.11	4.51
1982	4.36	5.22	4.30	3.10	2.03	4.37
1983	4.74	5.81	4.95	3.26	2.24	5.32
1984	5.36	5.86	4.83	3.16	2.15	5.02
1985	5.51	6.42	5.25	3.86	2.69	5.51
1986	5.65	6.78	5.12	3.90	2.44	5.63
1987	5.77	7.05	5.91	3.91	2.57	6.08
1988	5.85	7.25	5.38	4.25	3.22	6.02
1989	6.12	7.15	5.49	4.62	2.64	6.13
1990	6.21	7.75	5.73	4.67	2.93	6.45
	MALE & FEMALE					
Year	< 20	20-29	30-39	40-49	>=50	All
1977	4.16	5.30	4.66	3.57	2.40	4.48
1978	4.26	5.33	4.73	3.74	2.61	4.57
1979	4.29	5.34	4.80	3.67	2.86	4.60
1980	4.38	5.46	4.95	3.75	2.80	4.72
1981	4.46	5.44	5.04	3.86	2.95	4.79
1982	4.48	5.32	5.01	3.88	2.61	4.72
1983	4.83	5.85	5.36	4.01	3.09	5.13
1984	5.27	5.89	5.16	3.97	3.26	5.20
1985	5.59	6.52	5.56	4.57	3.27	5.69
1986	5.86	6.80	5.71	4.73	3.32	5.90
1987	5.91	6.92	5.92	4.98	3.49	6.10
1988	6.05	7.14	5.61	5.08	3.93	6.15
1989	6.09	7.05	5.81	4.77	3.74	6.16
1990	6.31	7.58	6.10	5.11	3.75	6.50

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), July-September 1984-1990.

Table 4.7 Average Wage of Private Employees and Wage Differential Index by Educational Class

a) Average Wage (Baht/Month)

Year	Elementary and Others	Secondary and Short Course	Vocational	Teacher Training	University
1977	798.1	1,722.7	1,983.9	1,766.6	3,305.5
1978	854.1	1,514.4	1,884.8	1,362.4	3,472.9
1979	970.7	1,785.0	2,351.5	1,682.1	3,874.2
1980	1,158.9	2,028.5	2,692.8	2,175.6	4,933.8
1981	1,247.9	2,241.2	2,843.0	2,389.9	5,141.3
1982	1,256.8	2,376.8	3,263.4	2,780.7	5,458.2
1983	1,405.4	2,537.0	3,223.2	2,704.9	5,872.6
1984	1,557.9	2,379.1	3,402.1	2,817.7	5,819.9
1985	1,459.8	2,501.8	3,628.6	2,751.0	6,442.0
1986	1,403.0	2,552.3	3,704.3	3,289.9	6,000.4
1987	1,438.6	2,375.0	3,349.0	3,101.6	6,014.1
1988	1,453.3	2,605.4	3,769.3	3,112.3	6,497.9
1989	1,523.8	2,634.9	3,324.6	3,009.6	6,165.2
1990	1,813.6	2,834.9	3,968.9	5,073.1	7,121.9

b) Wage Differential Index (Elementary & Others = 100)

Year	Elementary and Others	Secondary and Short Course	Vocational	Teacher Training	University
1977	100.0	215.9	248.6	221.3	414.2
1978	100.0	177.3	220.7	159.5	406.6
1979	100.0	183.9	242.2	173.3	399.1
1980	100.0	175.0	232.3	187.7	425.7
1981	100.0	179.6	227.8	191.5	412.0
1982	100.0	189.1	259.7	221.3	434.3
1983	100.0	180.5	229.3	192.5	417.9
1984	100.0	152.7	218.4	180.9	373.6
1985	100.0	171.4	248.6	188.5	441.3
1986	100.0	181.9	264.0	234.5	427.7
1987	100.0	165.1	232.8	215.6	418.0
1988	100.0	179.3	259.4	214.2	447.1
1989	100.0	172.9	218.2	197.5	404.6
1990	100.0	156.3	218.8	279.7	392.7

Note: Calculated from average wage of private employees under each educational level.

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table 4.8 Wage Differential Index by Age, Sex and Education (Male 30-39, Ele. + Oth. = 1.0)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.3187	1.2913	1.0699		0.4611
	20-29	0.5365	0.7206	0.9595	1.5720	0.6755
	30-39	1.0000	1.8665	1.8339	3.7697	1.0078
	40-49	0.6444	1.7486	3.6806	3.7657	1.8857
	>=50	0.5944	2.1598	3.8042	4.8122	1.7834
1978	<=19	0.4751	0.7149	0.9575		0.5913
	20-29	0.7811	1.1793	1.7887	2.8277	1.0520
	30-39	1.0000	1.8880	2.5739	4.3636	1.9767
	40-49	1.0041	2.4763	2.3589	7.2534	1.3268
	>=50	0.9043	3.0526	3.6594	4.7602	1.6148
1979	<=19	0.4844	0.7198	1.6012		0.6163
	20-29	0.8396	1.2948	1.8233	2.9461	1.2688
	30-39	1.0000	2.1210	3.3566	4.7967	3.3002
	40-49	1.0112	2.4943	4.0926	8.1887	2.0983
	>=50	0.9166	4.2510	5.8861	8.8795	1.8629
1980	<=19	0.5065	0.7346	1.3071		1.0433
	20-29	0.8266	1.1767	1.6229	2.6279	1.5163
	30-39	1.0000	2.0085	2.9233	4.8842	2.0626
	40-49	0.9901	5.4320	3.9093	5.7540	2.8885
	>=50	1.0256	2.7015	4.7562	6.1155	0.8257
1981	<=19	0.4980	0.8072	1.3020	1.5821	1.0433
	20-29	0.8669	1.1610	1.6101	2.6631	1.5332
	30-39	1.0000	2.3446	2.8579	5.5816	2.1624
	40-49	1.0450	2.7634	3.6320	5.9044	2.6508
	>=50	0.8968	2.7246	4.7819	6.6369	2.4672
1982	<=19	0.4809	0.7468	1.1465	1.5821	1.0433
	20-29	0.8472	1.2878	1.7828	3.0856	1.8158
	30-39	1.0000	2.2472	3.0615	5.4207	3.4414
	40-49	1.0777	3.0196	5.1592	7.4843	2.9249
	>=50	1.0476	3.2842	4.9347	8.5049	3.6219
1983	<=19	0.5156	0.6456	1.1258		
	20-29	0.7724	1.1078	1.4626	2.3975	1.6862
	30-39	1.0000	2.0404	2.8039	4.6279	1.7459
	40-49	1.0006	2.6590	3.9315	7.6418	2.1897
	>=50	0.9326	2.5025	4.0639	7.4484	1.5881

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Table 4.8 (Continued)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.4774	0.6646	0.8930		1.4704
	20-29	0.7396	1.1479	1.3726	2.1900	0.9206
	30-39	1.0000	1.7048	2.6182	4.3026	2.2409
	40-49	1.0895	2.4520	3.3027	8.3573	2.6986
	>=50	0.9540	3.0599	5.3331	6.4632	2.5540
1985	<=19	0.5077	0.5272	0.6456		0.3049
	20-29	0.7807	1.0067	1.3139	2.0232	1.2118
	30-39	1.0000	1.6361	2.7776	4.4812	1.1183
	40-49	1.1409	2.2832	3.4613	9.2489	1.9017
	>=50	0.9594	2.7729	4.7860	5.4107	2.2468
1986	<=19	0.4790	0.6358	0.8342	1.7126	
	20-29	0.7523	1.0365	1.4939	2.3830	1.6034
	30-39	1.0000	1.9973	2.3054	4.2566	2.1264
	40-49	0.9966	3.8875	5.8013	7.5609	4.7077
	>=50	0.9825	2.6390	5.1070	5.8101	2.2575
1987	<=19	0.5031	0.7036	0.7182	1.7126	
	20-29	0.8264	1.1188	1.3539	1.9957	1.6464
	30-39	1.0000	2.0132	2.6149	4.8256	2.6078
	40-49	1.1866	2.2844	4.6667	9.1625	2.2476
	>=50	1.0077	3.5688	7.2179	9.0163	2.0042
1988	<=19	0.5102	0.6094	0.9522	1.7126	
	20-29	0.7511	1.2839	1.3509	1.9083	1.7807
	30-39	1.0000	1.7680	2.6043	5.6734	1.9641
	40-49	1.0514	2.4643	5.9400	8.7081	1.9521
	>=50	1.0852	4.0172	4.6129	7.5965	2.4183
1989	<=19	0.5284	0.8268	1.0078		
	20-29	0.7494	1.0725	1.2534	1.9919	1.0702
	30-39	1.0000	1.9230	2.3914	4.3234	2.0550
	40-49	0.9646	2.7924	4.0488	8.4217	2.6372
	>=50	1.0424	3.4855	2.3917	9.9902	2.7515
1990	<=19	0.5323	0.6605	1.1210	1.8431	
	20-29	0.8061	1.0173	1.2458	2.2180	1.5391
	30-39	1.0000	1.6558	2.4562	4.0811	3.2801
	40-49	1.0561	3.1188	2.9673	6.6872	3.6244
	>=50	0.9846	2.6892	3.9931	10.0665	3.0847

(Continued on page 42)

Table 4.8 (Continued)

		ALL SECTORS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2883	0.4914	0.6261	1.2816	0.7596
	20-29	0.4450	1.0458	1.1953	1.9246	1.0202
	30-39	0.3504	1.2370	3.3952	2.4111	1.2027
	40-49	0.3485	1.4243	2.1636	3.7416	1.7753
	>=50	0.4278	3.1035	4.1301	1.9144	1.8140
1978	<=19	0.4328	0.7204	1.1502	2.1393	1.5450
	20-29	0.5785	1.1604	1.7932	2.8358	1.4342
	30-39	0.5654	1.8741	2.3222	3.8815	1.5577
	40-49	0.4721	1.8363	2.4629	6.3998	2.0461
	>=50	0.4700	1.8928	3.1785	5.0024	1.7837
1979	<=19	0.4598	0.7379	1.2977		1.1874
	20-29	0.6221	1.3689	1.5833	2.7261	1.3093
	30-39	0.5620	1.6552	2.6256	3.8256	1.6051
	40-49	0.5298	1.8774	2.6150	5.9551	1.8235
	>=50	0.4465	1.7423	1.9143	2.3628	3.0124
1980	<=19	0.4546	0.7210	1.2083		1.3459
	20-29	0.6201	1.1265	1.6394	2.3160	1.5474
	30-39	0.5728	1.7757	2.3187	4.2462	2.0717
	40-49	0.5707	1.6803	3.1595	4.8128	2.0847
	>=50	0.4638	1.8672	1.1219	6.9657	2.8560
1981	<=19	0.5114	0.9593	1.4524		0.9149
	20-29	0.6318	1.1489	1.7564	2.3546	1.6117
	30-39	0.6174	1.6389	2.1972	3.5405	2.0414
	40-49	0.5507	1.6863	2.8826	3.6974	1.6668
	>=50	0.3940	2.1271	1.5846	1.4805	2.6004
1982	<=19	0.4442	0.7051	0.8153		0.9149
	20-29	0.5972	1.1272	1.8305	2.5655	1.6989
	30-39	0.6025	1.9569	2.7758	4.9580	1.7436
	40-49	0.5519	2.3065	3.8443	3.5654	2.4050
	>=50	0.4761	2.9668	2.0472	5.3333	2.6029
1983	<=19	0.4121	0.6446	0.7646	1.2766	0.9149
	20-29	0.6036	1.0954	1.5697	2.0456	1.4197
	30-39	0.6112	1.6837	2.2867	3.8455	1.9827
	40-49	0.5432	2.1043	2.0220	4.4398	2.3369
	>=50	0.4091	2.2463	2.5966	7.9801	2.4666
1984	<=19	0.4482	0.6707	1.5978		0.9149
	20-29	0.5221	1.0555	1.4239	2.2665	1.5191
	30-39	0.6176	1.5987	2.7740	3.2616	3.3057
	40-49	0.5661	2.5010	3.1802	3.5114	2.7397
	>=50	0.4185	2.0974	6.2009	6.8942	3.1004

(Continued on page 43)

Table 4.8 (Continued)

		ALL SECTORS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1985	<=19	0.3677	0.4932	0.7606	1.2766	0.4840
	20-29	0.5504	0.9292	1.2486	1.7772	1.1553
	30-39	0.6382	1.7117	2.3594	4.1738	2.0412
	40-49	0.5322	1.7140	4.0393	4.8119	1.4900
	>=50	0.4725	2.6705	1.4521	5.8083	1.9750
1986	<=19	0.4023	0.5414	0.7508		
	20-29	0.5789	0.9146	1.2705	1.7597	1.1679
	30-39	0.7209	1.3526	2.1583	3.3937	1.5640
	40-49	0.6444	1.6235	2.3080	4.2197	1.4772
	>=50	0.4760	2.0667	2.6609	4.1138	2.0200
1987	<=19	0.4382	0.6131	0.7004	1.2766	0.6271
	20-29	0.6798	0.8939	1.3226	1.8214	1.2060
	30-39	0.7284	1.3643	2.6083	3.6996	1.4951
	40-49	0.6181	1.7736	2.7031	4.5585	2.0831
	>=50	0.6068	2.3745	2.6609	5.0289	4.3810
1988	<=19	0.3944	0.7453	1.0712	1.2766	0.7702
	20-29	0.5939	0.9102	1.1938	1.5983	1.1225
	30-39	0.6583	1.4148	2.8494	3.2673	1.6117
	40-49	0.5754	1.7164	3.5088	4.2405	2.0692
	>=50	0.5162	1.6193	3.8697	8.6421	1.8126
1989	<=19	0.4687	0.7585	0.6478		0.5746
	20-29	0.6270	0.9533	1.2187	1.6413	1.0925
	30-39	0.7000	1.4452	1.9534	3.5025	1.6401
	40-49	0.6602	2.2676	3.7494	5.4461	1.5751
	>=50	0.5612	5.5077	2.9696	7.2895	1.8120
1990	<=19	0.5027	0.6885	1.0545	0.4139	0.8692
	20-29	0.6776	0.9723	1.3345	1.8789	1.2634
	30-39	0.6484	1.2635	1.8901	2.9612	3.0820
	40-49	0.6467	2.0252	4.1092	5.7304	1.7831
	>=50	0.5628	2.7018	2.0695	4.7038	2.7004

Note: Calculated from average wages of private employees alone. In cases where the private employees' wages are not available, the average of the same category of the closest adjacent years is used as the index. This adjustment is done only for the cells which contain non-zero share of employment.

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 4.9 Employment Share Classified by Age, Sex and Education

		ALL SECTORS										
		Male					Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	0.10439	0.00339	0.00005	0.00000	0.00026	0.11077	0.00179	0.00013	***	0.00014	
	20-29	0.12363	0.01163	0.00410	0.00211	0.00301	0.11427	0.00491	0.00254	0.00176	0.00307	
	30-39	0.10678	0.00921	0.00228	0.00179	0.00178	0.09727	0.00313	0.00090	0.00070	0.00178	
	40-49	0.07679	0.00321	0.00056	0.00057	0.00076	0.06690	0.00064	0.00014	0.00019	0.00038	
	>=50	0.07403	0.00209	0.00026	0.00030	0.00061	0.05440	0.00036	0.00004	0.00006	0.00013	
	All	0.48562	0.02954	0.00726	0.00476	0.00642	0.44362	0.01083	0.00375	0.00271	0.00550	1.00000
1978	<=19	0.10290	0.00442	0.00007	0.00000	0.00009	0.10970	0.00166	0.00013	0.00001	0.00022	
	20-29	0.12074	0.01205	0.00339	0.00244	0.00401	0.11595	0.00481	0.00315	0.00182	0.00379	
	30-39	0.10406	0.01063	0.00174	0.00186	0.00177	0.09936	0.00348	0.00123	0.00085	0.00157	
	40-49	0.07514	0.00336	0.00049	0.00055	0.00083	0.06795	0.00086	0.00023	0.00019	0.00032	
	>=50	0.07237	0.00242	0.00033	0.00034	0.00059	0.05547	0.00038	0.00007	0.00006	0.00018	
	All	0.47521	0.03288	0.00603	0.00519	0.00728	0.44843	0.01119	0.00481	0.00292	0.00607	1.00000
1979	<=19	0.09840	0.00402	0.00018	0.00000	0.00005	0.10274	0.00183	0.00018	0.00000	0.00015	
	20-29	0.12072	0.01287	0.00445	0.00333	0.00412	0.11412	0.00473	0.00380	0.00236	0.00438	
	30-39	0.10611	0.01117	0.00205	0.00203	0.00208	0.10076	0.00347	0.00133	0.00095	0.00157	
	40-49	0.07631	0.00327	0.00062	0.00098	0.00089	0.06893	0.00066	0.00018	0.00026	0.00037	
	>=50	0.07290	0.00232	0.00031	0.00037	0.00103	0.05602	0.00031	0.00006	0.00009	0.00018	
	All	0.47444	0.03365	0.00762	0.00672	0.00817	0.44256	0.01099	0.00554	0.00366	0.00665	1.00000
1980	<=19	0.09669	0.00373	0.00005	0.00000	0.00003	0.10112	0.00180	0.00015	0.00000	0.00019	
	20-29	0.11714	0.01466	0.00443	0.00266	0.00423	0.11290	0.00633	0.00386	0.00222	0.00474	
	30-39	0.10705	0.00981	0.00236	0.00255	0.00228	0.10054	0.00353	0.00153	0.00117	0.00180	
	40-49	0.07621	0.00350	0.00067	0.00084	0.00097	0.07031	0.00093	0.00020	0.00024	0.00045	
	>=50	0.07331	0.00221	0.00024	0.00046	0.00075	0.05818	0.00054	0.00011	0.00012	0.00020	
	All	0.47039	0.03391	0.00776	0.00651	0.00826	0.44305	0.01312	0.00585	0.00376	0.00738	1.00000

(Continued on page 45)

Table 4.9 (Continued)

Year	Age	ALL SECTORS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1981	<=19	0.09810	0.00390	0.00020	***	0.00004	0.10159	0.00212	0.00026	0.00000	0.00008	
	20-29	0.13325	0.01620	0.00454	0.00305	0.00549	0.12225	0.00705	0.00424	0.00277	0.00495	
	30-39	0.10043	0.00931	0.00248	0.00269	0.00227	0.09230	0.00329	0.00154	0.00158	0.00180	
	40-49	0.06566	0.00354	0.00092	0.00081	0.00083	0.06546	0.00094	0.00034	0.00030	0.00052	
	>=50	0.07041	0.00229	0.00023	0.00038	0.00067	0.05806	0.00046	0.00009	0.00008	0.00023	
	All	0.46785	0.03523	0.00837	0.00693	0.00930	0.43967	0.01387	0.00647	0.00473	0.00758	1.00000
1982	<=19	0.09886	0.00393	0.00026	***	0.00006	0.10132	0.00239	0.00040	0.00000	0.00002	
	20-29	0.12737	0.01777	0.00569	0.00290	0.00609	0.11948	0.00826	0.00465	0.00278	0.00595	
	30-39	0.09962	0.00950	0.00276	0.00293	0.00274	0.09445	0.00369	0.00174	0.00155	0.00230	
	40-49	0.06304	0.00381	0.00088	0.00113	0.00108	0.06411	0.00117	0.00046	0.00045	0.00065	
	>=50	0.06889	0.00239	0.00030	0.00024	0.00107	0.06001	0.00039	0.00012	0.00007	0.00029	
	All	0.45779	0.03740	0.00989	0.00720	0.01105	0.43936	0.01590	0.00737	0.00485	0.00921	1.00000
1983	<=19	0.09699	0.00485	0.00039	0.00000	0.00000	0.09824	0.00208	0.00020	0.00001	0.00004	
	20-29	0.12604	0.01861	0.00522	0.00568	0.00565	0.11484	0.00705	0.00553	0.00344	0.00623	
	30-39	0.10076	0.01118	0.00249	0.00499	0.00364	0.09428	0.00361	0.00202	0.00203	0.00315	
	40-49	0.06503	0.00451	0.00094	0.00141	0.00132	0.06271	0.00130	0.00089	0.00059	0.00075	
	>=50	0.06949	0.00259	0.00041	0.00052	0.00105	0.05622	0.00047	0.00012	0.00012	0.00032	
	All	0.45831	0.04175	0.00945	0.01259	0.01166	0.42629	0.01452	0.00875	0.00620	0.01049	1.00000
1984	<=19	0.08962	0.00645	0.00042	0.00000	0.00001	0.09420	0.00416	0.00023	0.00000	0.00010	
	20-29	0.13010	0.01678	0.00650	0.00466	0.00460	0.11655	0.00777	0.00495	0.00303	0.00513	
	30-39	0.10393	0.00895	0.00405	0.00432	0.00418	0.09530	0.00360	0.00201	0.00238	0.00265	
	40-49	0.06498	0.00465	0.00144	0.00121	0.00122	0.06358	0.00138	0.00050	0.00040	0.00104	
	>=50	0.07095	0.00226	0.00036	0.00060	0.00106	0.05684	0.00046	0.00012	0.00012	0.00021	
	All	0.45958	0.03910	0.01276	0.01079	0.01106	0.42648	0.01738	0.00781	0.00592	0.00912	1.00000

(Continued on page 46)

Table 4.9 (Continued)

Year	Age	ALL SECTORS										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1985	<=19	0.08832	0.00646	0.00049	0.00000	0.00002	0.09049	0.00475	0.00045	0.00001	0.00002	
	20-29	0.12787	0.02100	0.00630	0.00516	0.00398	0.11463	0.00718	0.00492	0.00447	0.00467	
	30-39	0.10695	0.01069	0.00326	0.00472	0.00352	0.09404	0.00357	0.00191	0.00285	0.00294	
	40-49	0.06663	0.00513	0.00142	0.00160	0.00142	0.06245	0.00152	0.00053	0.00050	0.00075	
	>=50	0.07124	0.00257	0.00028	0.00046	0.00095	0.05568	0.00040	0.00012	0.00012	0.00058	
	All	0.46101	0.04585	0.01174	0.01193	0.00990	0.41729	0.01743	0.00794	0.00795	0.00896	1.00000
1986	<=19	0.08528	0.00927	0.00062	0.00001	0.00000	0.09086	0.00418	0.00032	0.00000	0.00000	
	20-29	0.12536	0.02185	0.00759	0.00637	0.00335	0.10932	0.00880	0.00566	0.00597	0.00440	
	30-39	0.10179	0.01240	0.00488	0.00513	0.00480	0.09468	0.00354	0.00178	0.00353	0.00405	
	40-49	0.06660	0.00542	0.00140	0.00240	0.00123	0.06143	0.00205	0.00087	0.00111	0.00091	
	>=50	0.06837	0.00318	0.00025	0.00062	0.00086	0.05638	0.00049	0.00009	0.00023	0.00029	
	All	0.44740	0.05211	0.01475	0.01454	0.01024	0.41267	0.01906	0.00873	0.01084	0.00966	1.00000
1987	<=19	0.07803	0.01044	0.00067	0.00001	0.00000	0.08351	0.00482	0.00079	0.00001	***	
	20-29	0.12136	0.02469	0.00804	0.00748	0.00337	0.10994	0.01170	0.00652	0.00660	0.00416	
	30-39	0.10023	0.01061	0.00498	0.00528	0.00473	0.08984	0.00392	0.00209	0.00348	0.00558	
	40-49	0.06866	0.00618	0.00131	0.00239	0.00130	0.06255	0.00223	0.00069	0.00084	0.00113	
	>=50	0.07395	0.00323	0.00054	0.00071	0.00108	0.05921	0.00034	0.00016	0.00017	0.00043	
	All	0.44222	0.05515	0.01554	0.01588	0.01048	0.40505	0.02301	0.01025	0.01111	0.01131	1.00000
1988	<=19	0.07892	0.01080	0.00091	0.00001	0.00000	0.08129	0.00570	0.00067	0.00003	0.00004	
	20-29	0.11976	0.02514	0.00776	0.00890	0.00234	0.11223	0.01137	0.00561	0.00909	0.00369	
	30-39	0.09762	0.01090	0.00467	0.00538	0.00413	0.09109	0.00378	0.00276	0.00444	0.00476	
	40-49	0.06575	0.00604	0.00117	0.00301	0.00167	0.06259	0.00263	0.00084	0.00087	0.00136	
	>=50	0.07337	0.00292	0.00048	0.00090	0.00093	0.06027	0.00055	0.00017	0.00019	0.00049	
	All	0.43542	0.05580	0.01498	0.01821	0.00908	0.40747	0.02403	0.01005	0.01461	0.01035	1.00000

(Continued on page 47)

Table 4.9 (Continued)

Year	Age	ALL SECTORS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.11458	0.00662	0.00046	0.00000	0.00000	0.11018	0.00537	0.00047	0.00000	0.00005	
	20-29	0.10965	0.02660	0.00785	0.00797	0.00233	0.08857	0.01270	0.00574	0.00744	0.00267	
	30-39	0.09806	0.01172	0.00415	0.00657	0.00412	0.08086	0.00386	0.00242	0.00398	0.00469	
	40-49	0.06780	0.00650	0.00127	0.00206	0.00169	0.05256	0.00224	0.00084	0.00123	0.00136	
	>=50	0.07398	0.00330	0.00069	0.00135	0.00081	0.05144	0.00028	0.00022	0.00023	0.00048	
	All	0.46408	0.05475	0.01442	0.01796	0.00896	0.38360	0.02445	0.00968	0.01287	0.00923	1.00000
1990	<=19	0.11022	0.00790	0.00033	0.00009	0.00000	0.10757	0.00665	0.00033	***	0.00002	
	20-29	0.11040	0.02450	0.00743	0.00765	0.00175	0.09971	0.01302	0.00530	0.00793	0.00262	
	30-39	0.09084	0.01086	0.00385	0.00666	0.00389	0.08628	0.00391	0.00242	0.00474	0.00436	
	40-49	0.06166	0.00569	0.00130	0.00240	0.00125	0.05782	0.00198	0.00067	0.00134	0.00124	
	>=50	0.06861	0.00233	0.00065	0.00117	0.00088	0.05827	0.00044	0.00021	0.00044	0.00041	
	All	0.44172	0.05128	0.01357	0.01796	0.00777	0.40965	0.02601	0.00893	0.01445	0.00865	1.00000

Notes: Calculated from all types of employment (private, public, state enterprises).
*** Indicates that the share is less than five decimal points.

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

As we can observe some irregularities in the annual average wages among each category of workers which carry on into the wage differential index, we decided to take the three-year moving average of the adjusted composition of workers.[15] That of 1977 is taken to be the base year, and the index of the qualitative changes in the age, sex and educational composition of workers is presented in Table 4.10. The combined index of total labor input is also shown in the same table. The combined index of labor input represents the index of labor adjusted for quality, which presents a higher growth trend than either the index of employment or the index of total working hours. The average growth rate of the adjusted labor input during 1978-1990 increases to around 6 percent per year.

Table 4.10 Indices of Labor Input

Year	Total Employment	Average Weekly Hours	Total Working Hours	Index of Age-Sex-Education	Total Labor Input
1977	100.00	100.00	100.00	100.00	100.00
1978	107.05	105.19	112.60	107.49	121.04
1979	104.55	105.02	109.79	120.39	132.18
1980	110.93	105.13	116.62	123.78	144.36
1981	120.00	101.33	121.60	126.17	153.42
1982	122.30	91.26	111.62	126.62	141.33
1983	124.07	103.71	128.68	126.49	162.77
1984	128.09	104.46	133.81	124.99	167.25
1985	127.37	103.32	131.60	127.34	167.57
1986	131.50	103.91	136.64	133.40	182.28
1987	136.17	102.00	138.89	137.66	191.19
1988	145.16	102.52	148.83	139.27	207.27
1989	151.22	104.99	158.77	137.75	218.79
1990	152.49	99.45	151.66	137.68	208.80
Average Annual Increase					
1978-1981	4.75	0.38	5.15	6.06	11.43
1982-1986	1.86	0.78	2.65	1.14	3.80
1987-1990	3.79	-1.05	2.75	0.81	3.57
1978-1990	3.34	0.099	3.45	2.55	6.08
1981-1990	3.26	-0.39	2.85	1.09	3.96

Source: Calculated as described in the text.

[15] The irregularities are sometimes due to the samples contained in each survey, but we are not ready to selectively cut off any sample and its weight in the LFS tapes. However, we hope that by taking moving averages, these irregularities will be smoothed out.

4.2 ADJUSTED SOURCES OF GROWTH

The growth of the adjusted labor input can be used to represent the percentage change of labor input in the Denison growth accounting framework described in Chapter 2. Table 4.11 presents a summary result of the computation (using net capital stock), while Appendix Tables A-38, A-39, A-42 and A-43 provide yearly estimates. The use of adjusted labor input in the growth accounting exercise yields a higher contribution of labor and, thereby, a lower TFP.

During 1978-1990, the average annual growth of TFP, from using the unadjusted labor input, was about 2.27 percent. It reduces to only 0.77 percent when the qualitative changes in labor are taken into account. However, if we leave out the first three years of the period under study and take the ten-year average during 1981-1990, the annual growth of TFP would increase from 0.77 percent to 2.08 percent. This is due to the fact that during 1979-1980 the GDP growth rates were slower and the improvement of labor quality was higher than the later periods.

Table 4.11 Growth Accounting with Adjustment for Improved Quality in Labor (using Net Capital Stock)

Period	Real Growth of Output	Labor		Land	Net Capital	TFP	
		Unadjusted	Adjusted			Unadjusted	Adjusted
(a) Using the GDP data at 1972 prices							
1978-1981	6.7176	2.9884	6.5930	0.1897	2.7558	0.7806	-2.8240
1982-1986	5.3742	1.5844	2.2352	0.0481	2.4945	1.2473	0.5964
1987-1990	11.1826	1.4239	1.8716	0.0472	4.6681	5.0434	4.5957
1978-1990	7.5748	1.9670	3.4642	0.0914	3.2446	2.2717	0.7745
Contribution	(100.0)	(25.97)	(45.73)	(1.21)	(42.83)	(29.99)	(10.22)
1981-1990	7.7935	1.6145	2.2380	0.0632	3.4082	2.7076	2.0841
Contribution	(100.0)	(20.72)	(28.72)	(0.81)	(43.73)	(37.74)	(26.74)
(b) Using the GDP data at 1988 prices							
1981-1990	7.9448	1.5655	2.1684	0.0675	3.5339	2.7779	2.1751
Contribution	(100.0)	(19.70)	(27.29)	(0.85)	(44.48)	(34.96)	(27.38)

Sources: Appendix Tables A-38, A-39, A-42, A-43.

Since there are different views about what measures of capital (gross or net stock) best measure changes in capital services, we also performed the growth accounting exercise by using a composite index of capital. This composite index, viewed as a compromise, was an average of 0.75 of gross capital stock and 0.25 of net capital stock. This method followed that done for Japan (during 1953-1971) by Denison and Chung (1976) and that done for Korea (during 1963-1982) by Kim and Park (1985).[16]

The composite index of capital stock exhibits slower growth rates than the net capital stock and, as a consequence, the growth of TFP is pushed up. The yearly calculation of growth accounting (using a composite index of capital stock) is shown in Appendix Tables A-40, A-41, A-44 and A-45, and the summary result is presented in Table 4.12. We can see that the average growth rate of TFP, after taking account of improved labor quality during 1978-1990, increased from 0.77 (with net capital stock) to about 1.2 (with composite index of capital stock).

The TFP's average growth of 1.2 percent per year during 1978-1990 implies a 15.8 percent contribution of the technical progress to the growth of output. The remaining part of output growth came from the contribution of various factor inputs as follows: 37.2 percent from capital, 1.2 percent from land, 26 percent from quantitative changes in labor and about 19.7 percent from improved labor quality.

Since the NESDB has recently released a new set of national income data based on 1988 prices, we also employed these so-called "rebased" data to calculate the income shares of each factor input for the computation of TFP.[17] The results are shown in part (b) of Tables 4.11 and 4.12. It can be observed that the growth of TFP using the rebased 1988 price series during 1980-1990 was a little higher than that using the 1972 price series. The major reason came from the fact that the average growth of output from the 1988 price series was higher, about 7.94 percent during 1981-1990 compared to the old series growth rate of 7.79 percent.

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16 Denison (1967:140) explained that: "In principle, the selection of a capital input measure should depend on the changes that occur in the ability of a capital good to contribute to net production as the good grows older (within the span of its economic service life). Use of net stock with depreciation computed by the straight line formula would imply that this ability drops very rapidly—that it is reduced by one-fourth when one-fourth of the service life has passed, and by nine-tenths when nine-tenths of the service life has passed. Use of gross stock would imply that this ability is constant throughout the service life of a capital good."

17 Since the discussion of differences in national income data based on 1972 prices and on 1988 prices would detour us from the main focus of our study, we preferred to take these data at face value for the moment and concentrated on the changes they made on the accounting of output growth.

Table 4.12 Growth Accounting with Adjustment for Improved Quality in Labor (using Composite Index of Capital Stock)

Period	Real Growth of Output	Labor		Land	Composite Capital Index	TFP	
		Un-adjusted	Adjusted			Un-adjusted	Adjusted
(a) Using the GDP data at 1972 prices							
1978-1981	6.7176	2.9884	6.5930	0.1897	2.4447	1.2948	-2.3098
1982-1986	5.3742	1.5844	2.2352	0.0481	2.2079	1.5339	0.8830
1987-1990	11.1826	1.4239	1.8716	0.0472	4.1634	5.5481	5.1004
1978-1990	7.5748	1.9670	3.4642	0.0914	2.8209	2.6955	1.1983
Contribution	(100.0)	(25.97)	(45.73)	(1.21)	(37.24)	(35.58)	(15.82)
1981-1990	7.7935	1.6145	2.2380	0.0632	3.0134	3.1023	2.4788
Contribution	(100.0)	(20.72)	(28.72)	(0.81)	(38.67)	(39.81)	(31.80)
(b) Using the GDP data at 1988 prices							
1981-1990	7.9448	1.5655	2.1684	0.0675	3.1253	3.1865	2.5836
Contribution	(100.0)	(19.70)	(27.29)	(0.85)	(39.34)	(40.10)	(32.52)

Sources: Appendix Tables A-40, A-41, A-44, A-45.

4.3 INTERNATIONAL COMPARISON

Although there are quite a number of studies about TFP in many countries,[18] we do not feel comfortable in comparing the results for Thailand with all of them. There are several reasons for this. One of them concerns the different levels of development among countries during the time period of study. Another is the different conceptual framework of analysis. Even if the framework of analysis is the same, the data approach may be different due to its nature of availability in each country.

Since we have conducted our analysis following the same approach as Kim and Park (1985), which used Denison growth accounting framework for Korea, we feel that at least there is one thing in common. We also have explored whether to make a comparison with Japan as its growth accounting was done by Denison and Chung (1976). The study period for Japan is 1952-1971, that for Korea is 1963-1982, and our study for Thailand is 1978-1990. At present, these three countries

[18] See, for example, Correa (1970) for nine countries in Latin America, Ikemoto (1986) for 10 countries in Asia (including Thailand), Denison and Chung (1976) for Japan and 10 other Western European countries, including the U.S. and Canada.

are obviously at different stages of development. However, it may be interesting for our comparison to examine whether these three countries had any common characteristic during the time period of their TFP study.

Figures A.1 through A.4 in the Appendix (which employ data in Appendix Tables A-79 through A-84) portray respectively the following statistics for Japan, Korea and Thailand: current GDP per capita in U.S. dollar, the proportion of agriculture in GDP, the proportion of manufacturing in GDP, and the degree of openness. It can be seen that both Japan and Korea were well ahead of Thailand in their income per capita. Although the picture reveals that Thailand's GDP per capita during 1978-1990 was, on average, not too different from that of Korea during 1963-1982, the fact that inflation causes the present dollar to be less valuable than the past dollar leaves us to admit their different stages of development during their TFP study period. Other observations, such as the structure of production and the degree of openness, also draw us to the conclusion that these economies are very much different during the time period of their TFP study. By comparison, Japan (during its TFP study period) is more different from Thailand (in this study) than Korea (during its TFP study period). The authors feel that, if an international comparison is to be made, it is more reasonable to compare Thailand with Korea, given their common framework of analysis.

As Figures A.1-A.4 reveal that the Korean economy during 1972-1982 appears closer to the Thai economy during 1978-1990, we feel we should not pay much attention to comparing their 1963-1972 figures.[19] The comparison of sources of growth for Korea during 1972-1982 and for Thailand during 1978-1990 in Table 4.13 shows that their average growth of income or output differed only a little, by 0.5 percentage point. The contribution of land for Korea's growth was zero while that for Thailand was small, 0.09. In Thailand, the contribution of capital was larger, 2.82, as compared to 2.10 for Korea. The contribution of labor input was almost of the same magnitude, 3.48 for Korea and 3.46 for Thailand. However, the composition of labor input was quite different, as there appears to be a higher contribution from the improved quality of labor in Thailand, 1.49, as compared to 0.59 in Korea (combined contribution of age, sex and education). The growth of TFP in Korea during 1972-1982 was 1.47, while that of Thailand during 1978-1990 was 1.2. Again, as already mentioned, the analogous figures for Thailand would change if we take the average of 1981-1990 for comparison since the contribution of labor (both quantity and quality) was lower during the later period while the average growth rate of GDP was a little higher. This rendered a higher growth of TFP in Thailand, 2.48, for the 1981-1990 period.

[19] The study by Kim and Park (1985) covers the 1963-1982 period and they separate the calculation into two subperiods: 1963-1972 and 1972-1982, while our study for Thailand covers the period 1978-1990.

Table 4.13 Growth Accounting Comparison: Thailand and Korea

	Korea (a)		Thailand (b)	
	1963-1972	**1972-1982**	**1978-1990**	**1981-1990**
Output Growth	8.22	7.05	7.57	7.79
Factor Input	4.19	5.58	6.37	5.31
Labor	3.05	3.48	3.46	2.24
Employment	2.36	2.03	1.92	1.83
Average Weekly Hours	0.32	0.45	0.05	-0.22
Age-Sex-Education	0.30	0.59	1.49	0.63
Others (c)	0.07	0.41	-	-
Capital	1.14	2.10	2.82	3.01
Land	0.00	0.00	0.09	0.06
Total Factor Productivity (TFP)	**4.03**	**1.47**	**1.20**	**2.48**

Notes: (a) Whole economy, as in the case of Thailand.
(b) Using the calculation based on the composite capital index, as in the case of Korea.
(c) Efficiency offset and unallocated, not calculated in the case of Thailand.

Source: Kim and Park (1985) for data on Korea, and Table 4.12 in this study for data on Thailand.

Chapter 5

Growth Accounting by Economic Sector

The analysis of growth accounting and the calculation of the TFP for each economic sector essentially follows the same analytical framework as in the analysis for the whole economy. Originally, the intended breakdown was for three sectors: agriculture, industry and services. The agriculture sector includes crops, livestock, fishing, forestry and other agricultural activities. The industry sector includes mining and quarrying, manufacturing, construction, electricity and other utilities. The services sector includes transportation and communication, commerce, banking, insurance and real estate, public administration, and other services. However, due to the increasing importance of the manufacturing subsector in the Thai economy, a separate calculation for this subsector was also provided.

5.1 OUTPUT, INPUT AND QUALITY ADJUSTMENT

As in the case of the aggregate economy, GDP at 1972 and 1988 prices was used as the measure of output for each sector. It can be observed that the average growth rate of GDP during 1981-1990 from the rebased series at 1988 prices for the industry sector, including manufacturing, was higher than that from the 1972 price series. The reverse is true for the agriculture and services and other sectors.

As for the input data, employment in each sector can be tabulated from the LFS to represent the labor input. Although it would be preferable to use the total working hours as labor input, it was found that hours reported in agriculture were a mixture of both on- and off-farm work, which includes non-agricultural activities. Instead of going through a complicated estimation of working hours to come up with a confusing measure of labor input, we decided to use the number of employment as the index of labor input at the sectoral level. To the extent that the index of average weekly hours worked in the whole economy represents the trend

for each sector, the difference between using employment numbers and total working hours during the period 1977-1990 should not be large.[20]

We can observe from the data shown in Tables 5.1-5.4 that the average growth rate of employment in agriculture during 1978-1990 was around 2.3 percent per year, which is lowest compared to the figure of 7.5 percent in industry, 7.2 percent in manufacturing and 5.1 percent in services and other sectors.

The changing composition of labor due to age, sex and education in each sector can be seen in Tables 5.5 through 5.12. We have the following general observations. First, the sex composition of workers in agriculture changed very little during the period of our study, whereas the share of female workers in other sectors has slightly increased. Second, the share of workers under 20 years of age has declined in all sectors. The decline was more prominent in agriculture than in other sectors. Third, the educational composition of workers reveals that the share of workers with the lowest educational attainment (elementary level) has declined in all sectors. However, this decline was very slow in agriculture and most rapid in the services sector.

As explained earlier, so long as workers of younger age earn less, as do those of lower education, the shifting of worker composition away from these groups indicates an improved contribution to output. We, therefore, use the average wages earned by each group to adjust for their changing quality. The wage differential index by age, sex and education for each sector is presented in Appendix Tables A-13 through A-16[21] and the adjusted composition of workers in Tables A-23 through A-26. A three-year moving average of this composition was calculated to smooth out the yearly fluctuations, and its index indicates the quality improvement of the labor input due to age, sex and education.

We can observe from the labor quality index in Tables 5.1-5.4 that the quality improvement of labor in the services sector was highest among the three sectors. Its index of age-sex-education ran from 100 in 1977 to 161.4 in 1990, rendering an average improvement of about 3.8 percent per year. The improved quality of labor in agriculture was lowest as the index of age-sex-education exhibited a slow rate of about 1.15 percent per year during 1978-1990. It was rather

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[20] The index of average weekly hours for the whole economy in 1977 was 105.77 (based on 1972 = 100), while that in 1990 was 105.19. See Table 3.3.

[21] It should be mentioned here that there were many empty cells at higher educational levels in the sectoral tables for average wage of private employees by age, sex and education, whereas the corresponding cells for employment share were not. This is because the employment share was based on all employed workers, while the average wage was based on private employees alone. We went around this problem by assuming that the wage structure by education in agriculture was the same as that of the whole economy, based on those attaining elementary education equals 1.0 (Table A-11), and the wage structure by education in other sectors was the same as that of the whole economy, based on those attaining secondary education equals 1.0. (Table A-12). The wage index of elementary educated workers in agriculture and that of both elementary and secondary educated workers in other sectors were kept as calculated from the LFS. Thereby, we obtained the wage differential index by sex, age and education for each sector as appearing in Tables A-13 (agriculture), A-14 (manufacturing), A-15 (industry) and A-16 (services and others).

surprising to find that the improved quality of labor in manufacturing and industry was only a little above that in agriculture.

The index of age-sex-education can be combined with that of employment to yield an index of adjusted labor input. The average growth of adjusted labor input during 1978-1990 was highest in the services sector, 9.14 percent per year. Those of industry and manufacturing were, respectively, 8.62 percent and 8.69 percent, while that of agriculture was only around 3.43 percent.

The other important factor inputs are land and capital. The area under cultivation was used as the index of land input in agriculture. Although land use for non-agricultural activities should be increasing, as industrial zones and estates have been expanding, we are unable to come up with an estimate of land use for non-agricultural activities, and it is assumed to be inclusive in the capital input. This was also consistent with our treatment of factor income shares, to be discussed later.

The capital stock series by sector were from those estimated by the NESDB for the period 1970-1990. One can see from Tables 5.1-5.4 that the average real growth during 1978-1990 of net capital stock for the industry sector is highest, around 11.6 percent per year, while that of manufacturing alone was 10.8 percent. Among all 11 sectors, the growth of capital stock in agriculture grew at the slowest rate, around 2.5 percent per year during 1978-1990.[22] This has reduced the share of agricultural capital stock in the total net capital stock by about half, from 16.5 percent in 1977 to only 8.5 percent in 1990. The sector in which the capital stock grew fastest during the period of our study is that of electricity and water supply, which is included under industry.

Tables 5.1-5.4 also provide the composite index of capital stock, which is three-fourths of gross capital stock plus one-fourth of net capital stock. The growth rates of this index are lower than that of the net capital stock for all sectors. This is due mainly to the weight given to the gross capital stock and its larger base. As explained earlier, most other similar studies employed the composite capital index in their growth accounting exercise due to the not-so-reliable nature of depreciation data included in the calculation of net capital stock. In this study, we used both indices to do the growth accounting calculation, but the discussion on productivity would focus on the estimates based on the composite index.

[22] Details by sector are presented in Appendix Tables A-5.1 and A-6.1.

Table 5.1 Indices of Output and Input in Agriculture

	GDP at 1972 Prices		GDP at 1988 Prices		Employment		Age-Sex-Education		Adjusted Labor		Land		Net Capital		Composite Capital Index	
Year	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth
1977	100.00				100.00		100.00		100.00		100.00		100.00		100.00	
1978	112.47	12.47			107.35	7.35	99.08	-0.92	106.36	6.36	111.16	11.16	104.23	4.23	103.65	3.65
1979	110.41	-1.83			100.65	-6.24	102.85	3.81	103.52	-2.67	104.96	-5.58	104.32	0.08	102.84	-0.79
1980	112.31	1.72	100.00		106.84	6.15	100.53	-2.26	107.41	3.76	108.45	3.33	105.37	1.01	102.89	0.05
1981	118.35	5.38	105.12	5.12	117.47	9.95	106.39	5.82	124.97	16.35	112.16	3.42	107.93	2.43	103.84	0.92
1982	121.97	3.06	107.72	2.47	113.82	-3.11	105.61	-0.73	120.21	-3.81	112.44	0.25	109.17	1.15	104.10	0.25
1983	127.38	4.44	112.86	4.77	116.62	2.46	102.72	-2.74	119.79	-0.35	116.80	3.88	111.72	2.34	105.47	1.32
1984	134.50	5.59	117.85	4.42	121.50	4.19	101.62	-1.08	123.47	3.07	117.79	0.85	112.67	0.85	105.24	-0.22
1985	142.80	6.17	123.16	4.51	118.45	-2.52	110.63	8.87	131.04	6.13	122.21	3.75	116.40	3.31	107.91	2.53
1986	143.23	0.30	123.63	0.38	119.39	0.80	122.31	10.55	146.02	11.43	116.41	-4.75	121.69	4.54	112.42	4.18
1987	142.91	-0.22	123.71	0.07	119.21	-0.15	123.66	1.11	147.42	0.96	112.53	-3.33	124.05	1.94	113.67	1.12
1988	157.51	10.21	136.72	10.51	131.19	10.05	120.29	-2.73	157.81	7.05	123.15	9.43	127.39	2.69	116.37	2.37
1989	167.97	6.65	149.93	9.66	137.20	4.58	114.86	-4.52	157.58	-0.15	125.00	1.51	131.05	2.88	119.29	2.51
1990	164.93	-1.81	144.34	-3.73	132.73	-3.26	114.50	-0.31	151.98	-3.55	119.71	-4.23	137.83	5.17	124.60	4.45
Average Growth Rate																
1978-1990		4.01				2.33		1.15		3.43		1.51		2.51		1.72
1981-1990		3.98		3.82		2.30		1.43		3.71		1.08		2.73		1.94

Source: Calculated from data from NESDB, NSO and MOAC.

Table 5.2 Indices of Output and Input in Industry

Year	GDP at 1972 Prices		GDP at 1988 Prices		Employment		Age-Sex-Education		Adjusted Labor		Net Capital		Composite Capital Index	
	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth
1977	100.00				100.00		100.00		100.00		100.00		100.00	
1978	111.24	11.24			106.79	6.79	101.62	1.62	108.52	8.52	110.77	10.77	109.70	9.70
1979	118.42	6.46			126.66	18.60	100.26	-1.33	126.99	17.02	123.97	11.91	121.70	10.95
1980	122.68	3.59	100.00		131.99	4.21	102.71	2.44	135.57	6.76	138.19	11.47	133.86	9.99
1981	129.74	5.75	107.06	7.06	133.08	0.82	105.31	2.54	140.15	3.38	156.13	12.98	148.85	11.20
1982	133.80	3.13	112.57	5.14	151.77	14.05	105.60	0.27	160.26	14.35	173.24	10.96	163.73	9.99
1983	144.63	8.10	124.41	10.52	142.79	-5.92	111.45	5.54	159.14	-0.70	194.87	12.49	181.83	11.06
1984	156.95	8.52	134.59	8.19	157.44	10.26	110.76	-0.62	174.38	9.58	220.24	13.01	203.08	11.69
1985	156.77	-0.11	136.50	1.42	160.48	1.93	114.43	3.31	183.64	5.31	237.43	7.81	217.77	7.23
1986	169.14	7.89	147.45	8.02	160.66	0.11	113.95	-0.42	183.07	-0.31	251.75	6.03	230.95	6.05
1987	190.74	12.77	168.28	14.13	185.06	15.19	118.03	3.58	218.43	19.31	272.41	8.20	249.09	7.86
1988	223.95	17.41	195.86	16.39	189.32	2.30	119.48	1.23	226.21	3.56	310.71	14.06	279.85	12.35
1989	260.29	16.23	230.18	17.52	208.50	10.13	118.32	-0.97	246.70	9.06	356.43	14.71	316.37	13.05
1990	300.96	15.63	267.36	16.15	247.14	18.54	116.06	-1.91	286.83	16.27	415.01	16.44	361.84	14.37
Average Growth Rate														
1978-1990		8.97				7.46		1.17		8.62		11.60		10.42
1981-1990		9.53		10.45		6.74		1.25		7.98		11.67		10.48

Source: Calculated from data from NESDB and NSO.

Table 5.3 Indices of Output and Input in Manufacturing

Year	GDP at 1972 Prices		GDP at 1988 Prices		Employment		Age-Sex-Education		Adjusted Labor		Net Capital		Composite Capital Index	
	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth
1977	100.00				100.00		100.00		100.00		100.00		100.00	
1978	108.73	8.73			111.14	11.14	103.05	3.05	114.54	14.54	108.98	8.98	107.77	7.77
1979	117.72	8.27			129.77	16.76	110.78	7.49	143.76	25.51	120.47	10.54	117.74	9.25
1980	121.11	2.88	100.00		134.63	3.74	111.12	0.31	149.59	4.06	129.14	7.20	124.98	6.15
1981	128.73	6.29	106.28	6.28	131.04	-2.66	115.72	4.14	151.63	1.36	140.20	8.57	134.31	7.47
1982	132.00	2.54	109.10	2.65	151.01	15.24	115.36	-0.31	174.20	14.88	145.93	4.09	139.22	3.66
1983	143.09	8.40	121.31	11.19	138.62	-8.20	123.74	7.26	171.53	-1.53	162.91	11.63	153.64	10.36
1984	152.76	6.76	128.82	6.20	149.44	7.80	124.22	0.39	185.63	8.22	176.93	8.61	165.15	7.50
1985	151.83	-0.61	127.06	-1.37	155.53	4.08	126.43	1.78	196.64	5.93	186.12	5.19	173.26	4.91
1986	168.23	10.80	139.56	9.84	155.70	0.11	119.10	-5.79	185.44	-5.69	198.73	6.78	185.30	6.95
1987	190.64	13.32	161.94	16.04	183.51	17.86	118.46	-0.53	217.39	17.23	223.55	12.49	206.26	11.31
1988	222.65	16.79	190.98	17.93	185.21	0.93	117.64	-0.70	217.88	0.23	263.93	18.06	237.17	14.99
1989	255.82	14.90	221.61	16.04	209.28	13.00	120.68	2.58	252.56	15.92	314.82	19.28	275.79	16.28
1990	290.83	13.68	256.91	15.93	236.80	13.15	119.79	-0.74	283.65	12.31	374.41	18.93	319.25	15.76
Average Growth Rate														
1978-1990		8.67				7.15		1.46		8.69		10.80		9.41
1981-1990		9.29		10.07		6.13		0.81		6.89		11.36		9.92

Source: Calculated from data from NESDB and NSO.

Table 5.4 Indices of Output and Input in Services and Others

	GDP at 1972 Prices		GDP at 1988 Prices		Employment		Age-Sex-Education		Adjusted Labor		Net Capital		Composite Capital Index	
Year	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth	Index	Growth
1977	100.00				100.00		100.00		100.00		100.00		100.00	
1978	108.95	8.95			105.93	5.93	105.61	5.61	111.88	11.88	106.12	6.12	104.45	4.45
1979	117.74	8.06			109.86	3.71	120.45	14.05	132.33	18.28	114.57	7.97	110.91	6.19
1980	125.90	6.93	100.00		117.51	6.95	123.83	2.81	145.51	9.96	125.15	9.23	119.15	7.43
1981	134.85	7.11	105.53	5.53	124.07	5.59	127.82	3.22	158.58	8.98	135.78	8.50	127.61	7.09
1982	141.69	5.07	112.54	6.65	142.89	15.17	137.18	7.33	196.02	23.61	145.21	6.95	135.17	5.93
1983	152.85	7.88	115.81	2.91	145.41	1.76	136.52	-0.49	198.51	1.27	156.72	7.93	144.32	6.77
1984	163.37	6.88	121.25	4.69	140.75	-3.20	141.93	3.97	199.77	0.64	168.82	7.71	154.08	6.76
1985	171.12	4.74	129.59	6.87	147.85	5.05	139.08	-2.01	205.63	2.93	181.28	7.38	164.30	6.64
1986	179.63	4.98	137.28	5.94	167.02	12.96	146.50	5.34	244.68	18.99	192.49	6.18	173.50	5.60
1987	199.61	11.12	150.97	9.98	182.12	9.04	145.68	-0.56	265.31	8.43	208.05	8.08	186.04	7.23
1988	222.83	11.63	169.27	12.12	181.12	-0.55	146.83	0.79	265.93	0.23	226.26	8.75	200.51	7.78
1989	247.62	11.13	185.32	9.48	181.28	0.09	155.11	5.64	281.18	5.74	251.54	11.17	220.26	9.85
1990	272.29	9.96	209.70	13.16	187.98	3.70	161.38	4.04	303.36	7.89	287.89	14.45	248.66	12.90
Average Growth Rate														
1978-1990		8.03				5.09		3.83		9.14		8.49		7.28
1981-1990		8.05		7.73		4.96		2.73		7.87		8.71		7.65

Source: Calculated from data from NESDB and NSO.

Table 5.5 Composition of Workers by Age and Sex: Agriculture

	Male					
Year	Under 20	20-29	30-39	40-49	50 & Over	Total
1977	12.43	13.05	11.09	8.12	8.11	52.80
1978	12.11	12.69	10.75	7.67	7.87	51.09
1979	11.57	12.95	10.97	8.31	8.38	52.17
1980	11.52	12.47	10.57	7.95	7.97	50.48
1981	11.83	14.88	10.30	6.70	7.52	51.23
1982	12.16	14.74	10.19	6.52	7.80	51.40
1983	12.44	14.66	10.19	6.93	7.82	52.04
1984	11.79	15.03	10.50	6.68	7.67	51.67
1985	11.80	15.55	10.71	7.02	8.02	53.10
1986	11.93	15.66	10.57	7.03	7.71	52.89
1987	11.31	15.77	10.80	7.44	8.31	53.62
1988	11.14	15.79	10.23	7.18	8.26	52.60
1989	9.58	16.19	11.82	8.82	10.48	56.89
1990	9.93	15.69	10.93	7.33	8.77	52.64
	Female					
Year	Under 20	20-29	30-39	40-49	50 & Over	Total
1977	12.51	11.93	10.06	6.98	5.72	47.20
1978	12.52	12.53	10.60	7.29	5.98	48.91
1979	11.55	12.13	10.65	7.44	6.05	47.83
1980	11.99	12.55	10.77	7.70	6.51	49.52
1981	11.88	13.61	9.93	7.01	6.34	48.77
1982	11.90	13.46	9.91	6.77	6.56	48.60
1983	11.73	13.12	9.95	6.82	6.35	47.96
1984	11.53	13.65	10.02	6.86	6.25	48.33
1985	11.06	13.11	9.84	6.76	6.13	46.90
1986	11.25	13.04	9.92	6.59	6.30	47.11
1987	10.49	13.08	9.32	6.72	6.76	46.38
1988	10.35	13.42	9.85	7.11	6.68	47.40
1989	8.68	11.65	9.59	6.63	6.56	43.11
1990	9.15	13.40	10.49	7.06	7.26	47.36

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.6 Composition of Workers by Age and Sex: Industry

	Male					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	8.88	21.74	16.58	9.58	7.17	63.95
1978	10.79	21.56	15.90	9.01	6.77	64.04
1979	10.29	21.15	16.63	8.34	6.25	62.66
1980	10.55	21.78	16.52	8.57	6.84	64.26
1981	9.26	24.34	15.25	7.99	6.39	63.23
1982	10.35	22.96	15.34	7.62	6.57	62.84
1983	8.50	23.08	16.84	8.30	5.98	62.70
1984	7.67	22.34	18.11	8.58	6.96	63.65
1985	7.04	22.28	18.24	8.47	6.39	62.41
1986	8.38	21.62	17.75	9.32	5.93	62.99
1987	7.33	22.70	14.64	8.66	6.84	60.16
1988	7.85	22.68	16.94	7.97	6.91	62.35
1989	7.77	23.11	16.40	7.83	5.98	61.10
1990	7.73	22.28	15.01	7.89	6.13	59.04
	Female					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	8.99	13.20	7.24	3.73	2.89	36.05
1978	9.11	13.26	7.11	3.63	2.85	35.96
1979	9.31	13.49	7.93	3.71	2.91	37.34
1980	7.85	12.89	8.21	3.66	3.13	35.74
1981	7.97	14.15	7.94	3.80	2.92	36.77
1982	8.02	13.93	7.74	4.27	3.20	37.16
1983	7.75	13.97	9.10	3.77	2.71	37.30
1984	7.22	12.84	9.10	4.44	2.74	36.35
1985	7.01	14.59	9.17	3.80	3.01	37.59
1986	6.96	14.12	10.09	3.48	2.35	37.01
1987	6.29	17.05	9.76	4.15	2.60	39.84
1988	6.98	14.50	9.69	3.47	3.01	37.65
1989	6.76	15.56	9.14	4.13	3.31	38.90
1990	7.85	16.22	9.23	4.33	3.33	40.96

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.7 Composition of Workers by Age and Sex: Manufacturing

	Male					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	8.28	21.13	13.96	7.33	6.47	57.17
1978	11.04	21.10	13.21	6.65	6.10	58.11
1979	10.19	19.65	14.12	6.19	5.73	55.88
1980	10.23	21.08	13.77	6.30	6.49	57.87
1981	8.66	22.09	13.43	5.49	6.11	55.79
1982	10.40	21.00	13.28	5.79	5.83	56.31
1983	8.73	20.94	14.54	5.95	4.84	54.99
1984	8.21	20.08	13.78	6.91	6.28	55.25
1985	6.47	20.38	15.91	6.50	6.09	55.35
1986	7.42	19.52	15.85	6.69	5.51	55.00
1987	6.48	20.97	11.82	6.71	6.22	52.20
1988	8.12	20.92	13.89	5.94	5.84	54.71
1989	7.54	20.02	12.99	5.85	4.84	51.23
1990	7.73	20.00	11.75	5.65	4.95	50.08
	Female					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	10.09	16.19	8.40	4.51	3.64	42.83
1978	10.59	15.54	8.15	4.29	3.31	41.89
1979	10.82	16.17	9.33	4.26	3.54	44.12
1980	9.01	15.41	9.60	4.23	3.88	42.13
1981	9.36	17.48	9.32	4.34	3.71	44.21
1982	9.09	16.66	9.01	4.92	4.01	43.69
1983	9.31	16.69	11.21	4.41	3.39	45.01
1984	8.98	15.77	11.12	5.24	3.64	44.75
1985	8.33	17.12	10.79	4.60	3.81	44.65
1986	8.39	17.81	11.76	4.14	2.91	45.00
1987	7.53	20.70	11.38	4.92	3.26	47.80
1988	8.51	17.45	11.28	4.27	3.78	45.29
1989	8.81	19.78	10.86	4.93	4.39	48.77
1990	9.40	19.96	11.07	5.25	4.24	49.92

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.8 Composition of Workers by Age and Sex: Services and Others

	Male					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	3.80	16.80	16.83	9.49	8.07	54.99
1978	4.26	16.92	16.47	9.86	7.73	55.24
1979	3.76	16.69	16.94	9.34	7.45	54.18
1980	3.81	16.72	17.33	9.27	7.45	54.59
1981	4.01	17.19	15.90	8.76	7.48	53.34
1982	3.95	16.72	16.40	8.98	6.73	52.78
1983	3.72	17.62	17.14	8.16	6.70	53.34
1984	3.12	17.36	16.78	9.05	7.29	53.61
1985	3.35	16.26	17.36	9.15	6.61	52.74
1986	2.95	16.38	17.49	8.95	6.87	52.63
1987	3.25	15.39	16.37	9.12	7.54	51.67
1988	3.49	14.98	16.00	9.40	7.16	51.03
1989	3.66	15.54	16.80	9.45	7.24	52.70
1990	2.90	15.64	16.69	9.62	7.20	51.74
	Female					
Year	**Under 20**	**20-29**	**30-39**	**40-49**	**50 & Over**	**Total**
1977	5.92	13.87	12.13	7.36	5.74	45.01
1978	5.84	13.82	12.38	7.33	5.39	44.76
1979	5.70	14.14	13.15	7.26	5.57	45.82
1980	5.25	14.42	12.91	7.45	5.39	45.41
1981	5.88	15.72	11.98	7.34	5.74	46.66
1982	6.13	14.64	12.83	7.67	5.95	47.22
1983	5.63	15.53	13.04	7.36	5.11	46.66
1984	5.41	14.56	13.46	7.29	5.66	46.39
1985	6.01	14.63	13.54	7.44	5.64	47.26
1986	5.70	14.18	13.53	8.24	5.72	47.37
1987	5.95	14.54	14.01	8.09	5.75	48.33
1988	4.98	16.38	13.67	7.70	6.24	48.97
1989	5.28	14.48	14.03	7.61	5.90	47.30
1990	4.90	14.64	14.19	8.05	6.48	48.26

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.9 Composition of Workers by Education: Agriculture

	Male & Female				
Year	Ele. + Oth.	Sec. + Sh.	Vocat.	Univ.	Teach.
1977	98.71	1.17	0.04	0.01	0.07
1978	98.71	1.16	0.05	0.01	0.07
1979	98.54	1.27	0.08	0.02	0.09
1980	98.46	1.34	0.13	0.01	0.06
1981	98.10	1.65	0.14	0.03	0.08
1982	97.69	1.97	0.20	0.03	0.11
1983	97.58	2.02	0.25	0.06	0.09
1984	97.05	2.34	0.37	0.12	0.12
1985	96.59	2.85	0.30	0.08	0.19
1986	96.42	3.02	0.28	0.14	0.14
1987	95.15	3.93	0.40	0.36	0.16
1988	95.00	4.22	0.46	0.23	0.08
1989	94.81	4.24	0.45	0.41	0.09
1990	94.79	4.31	0.44	0.32	0.15

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.10 Composition of Workers by Education: Industry

	Male & Female				
Year	Ele. + Oth.	Sec. + Sh.	Vocat.	Univ.	Teach.
1977	89.28	7.13	2.14	1.27	0.19
1978	87.66	8.65	2.17	1.32	0.20
1979	88.28	7.75	2.21	1.57	0.19
1980	87.55	8.40	2.11	1.67	0.27
1981	86.83	8.55	2.47	1.83	0.33
1982	86.85	8.33	2.43	2.15	0.24
1983	83.52	10.23	3.17	2.57	0.50
1984	82.92	10.18	4.33	2.27	0.30
1985	81.65	11.37	3.82	2.72	0.43
1986	77.64	13.91	4.48	3.22	0.74
1987	78.99	12.95	3.77	3.50	0.79
1988	74.50	14.87	4.69	5.47	0.47
1989	79.09	12.18	4.46	3.85	0.42
1990	75.74	14.60	4.78	4.44	0.44

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.11 Composition of Workers by Education: Manufacturing

	Male & Female				
Year	**Ele. + Oth.**	**Sec. + Sh.**	**Vocat.**	**Univ.**	**Teach.**
1977	89.64	7.38	1.77	0.98	0.23
1978	88.39	8.49	1.83	1.11	0.18
1979	88.82	7.96	1.73	1.32	0.16
1980	87.78	8.66	1.97	1.35	0.24
1981	87.61	8.46	2.10	1.50	0.33
1982	87.17	8.45	2.13	2.03	0.22
1983	84.26	10.67	2.67	1.97	0.44
1984	85.15	10.29	2.49	1.78	0.29
1985	81.45	12.37	3.58	2.17	0.44
1986	79.28	14.11	3.44	2.67	0.50
1987	79.01	13.74	3.78	2.95	0.53
1988	73.41	15.86	4.90	5.27	0.56
1989	77.93	13.74	4.37	3.46	0.50
1990	74.15	16.03	5.15	4.17	0.50

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table 5.12 Composition of Workers by Education: Services and Others

	Male & Female				
Year	**Ele. + Oth.**	**Sec. + Sh.**	**Vocat.**	**Univ.**	**Teach.**
1977	71.27	14.00	4.84	3.64	6.24
1978	69.31	15.16	4.61	3.98	6.94
1979	68.33	14.23	5.21	4.83	7.41
1980	67.76	14.56	5.09	4.82	7.76
1981	65.05	15.00	5.79	5.53	8.63
1982	65.61	14.09	5.72	5.23	9.35
1983	60.71	15.33	6.36	7.56	10.05
1984	61.66	14.96	6.84	6.84	9.70
1985	62.20	15.16	6.50	7.91	8.24
1986	59.25	16.02	7.44	9.27	8.03
1987	59.45	15.77	7.88	8.61	8.30
1988	57.30	15.71	7.48	11.27	8.23
1989	59.13	16.90	6.57	9.98	7.42
1990	56.75	16.54	6.87	12.37	7.46

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

5.2 ESTIMATES OF FACTOR INCOME SHARES

The nature of data from the national income account does not allow a direct calculation of factor income shares, not only for the whole economy but for each sector as well.[23] We, therefore, have to estimate the share of income going to each factor input by, again, using the 1987 social accounting matrix (SAM 1987).

The total wage payment in each sector was obtained from SAM 1987, and the number of employment from the LFS in Round 3 was used to calculate an average wage for the year 1987. We also calculated from the LFS a series of average yearly wage by sector (presented in Appendix Table A-46). We could observe that in agriculture the SAM 1987 imputed wage was lower than the LFS average wage, whereas the opposite was observed in the other sectors. This is due to the fact that the LFS average wage was for private employees, whereas the SAM 1987 wage embraced all employees. The above observation indicates that the self-employed workers in agriculture, on average, earned less than those privately employed. On the other hand, the self-employed and non-privately employed workers in the other sectors, on average, earned more than those privately employed. We then used the ratio of the SAM 1987 wage over the average LFS wage in 1987 to adjust the LFS wage series and arrived at the series of imputed wage based on SAM 1987 for each sector.[24]

The imputed wage for all workers and the number of employment in each sector can be combined to produce the estimates of the total wage income received by all workers. This amount over the total income in each sector is the estimate of the income share of labor. The above described data are presented in Tables 5.13-5.16, respectively, for the agriculture, industry, manufacturing and services sectors.

For agriculture, the national income account provides estimates of total farm rent from which the rental income share can be computed. Although imputed rent is supposed to be included in the NESDB national income data, the rental income share in agriculture turned out to be rather small and was in the range of 5 to 7 percent of total income in agriculture during 1977-1990.[25] The remaining part of income is lumped together under the share of income going to capital and other remaining unclassified factors.

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[23] The NESDB only publishes the distribution of national income for the whole economy, and the published data are not adequate for the derivation of factor income shares. See the discussion in Section 3.2.

[24] It is likely that, in reality, the annual ratio of the average wage of all workers to that of private employees could vary from year to year. This means that our imputed wages and, hence, the resulting income shares are not without error.

[25] See NESDB. *Coverage, Sources and Calculation Method of National Income by Income Approach.* Bangkok: Division of National Income. Unpublished document in Thai.

Table 5.13 Factor Income Shares in Agriculture (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Agriculture (M. Person)	Total Wage Payment (M. Baht)	Current GDP in Agriculture at Factor Cost (M. Baht)
1977	3,692.1	14.9201	55,086.5	99,399
1978	4,058.6	16.0160	65,002.5	119,093
1979	4,676.2	15.0167	70,221.1	133,562
1980	5,331.8	15.9408	84,993.2	152,302
1981	5,521.5	17.5264	96,772.0	162,404
1982	5,439.1	16.9821	92,367.3	156,155
1983	6,101.2	17.3994	106,157.2	184,972
1984	7,025.8	18.1286	127,367.9	174,431
1985	5,345.8	17.6723	94,472.6	169,156
1986	5,401.7	17.8129	96,219.9	177,379
1987(a)	5,731.2	17.7868	101,939.7	204,787
1988	5,616.9	19.5740	109,945.2	249,530
1989	6,035.8	20.4700	123,552.8	265,663
1990	6,771.7	19.8035	134,103.4	253,683

Year	Wage Share	Rent Share (b)	Capital, etc.
1977	0.5542	0.0577	0.3881
1978	0.5458	0.0491	0.4051
1979	0.5258	0.0514	0.4228
1980	0.5581	0.0572	0.3847
1981	0.5959	0.0656	0.3385
1982	0.5915	0.0716	0.3369
1983	0.5739	0.0663	0.3598
1984	0.7302	0.0653	0.2045
1985	0.5585	0.0604	0.3811
1986	0.5425	0.0552	0.4023
1987(a)	0.4978	0.0566	0.4456
1988	0.4406	0.0489	0.5105
1989	0.4651	0.0485	0.4864
1990	0.5286	0.0527	0.4187

Notes: (a) Total wages in agriculture in SAM 1987 amount to 101,939.7 million baht and total number of employment is 17.7868 million. This renders an average imputed wage of 5,731.2 baht.

(b) Calculated from total farm rent in the national income account.

Source: Calculated as described in the text by using data from NESDB, NSO and TDRI.

Table 5.14 Factor Income Shares in Industry (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Agriculture (M. Person)	Total Wage Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)	Wage Share	Property Income Share
1977	24,807.5	1.7535	43,499.9	99,046	0.4392	0.5608
1978	25,805.5	1.8726	48,323.4	122,890	0.3932	0.6068
1979	29,266.4	2.2209	64,997.7	140,829	0.4615	0.5385
1980	35,548.6	2.3145	82,277.2	171,115	0.4808	0.5192
1981	39,528.6	2.3335	92,239.9	201,950	0.4567	0.5433
1982	41,344.6	2.6613	110,030.4	218,648	0.5032	0.4968
1983	45,823.7	2.5038	114,733.4	242,360	0.4734	0.5266
1984	50,475.1	2.7607	139,346.6	278,786	0.4998	0.5002
1985	50,138.9	2.8140	141,090.9	299,868	0.4705	0.5295
1986	53,977.2	2.8172	152,064.6	321,934	0.4723	0.5277
1987 (a)	49,137.5	3.2450	159,451.2	374,516	0.4257	0.5743
1988	59,470.5	3.3197	197,424.2	467,820	0.4220	0.5780
1989	52,949.2	3.6560	193,582.3	565,645	0.3422	0.6578
1990	59,304.5	4.3337	257,007.9	647,209	0.3971	0.6029

Note: (a) Total wages in industry in SAM 1987 amount to 159,451.2 million baht and total number of employment is 3.245 million. This renders an average imputed wage of 49,137.5 baht.

Source: Calculated as described in the text by using data from NESDB, NSO and TDRI.

Table 5.15 Factor Income Shares in Manufacturing (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 Imputed Wage	Employment in Mfg.	Total Wage Payment	Current GDP in Mfg. at Factor Cost (M. Baht)	Wage Share	Property Income Share
1977	23,408.2	1.3273	31,069.70	63,866	0.4865	0.5135
1978	21,905.5	1.4752	32,314.99	78,935	0.4094	0.5906
1979	26,455.4	1.7225	45,569.43	92,516	0.4926	0.5074
1980	32,249.4	1.7869	57,626.45	111,661	0.5161	0.4839
1981	34,397.1	1.7393	59,826.88	135,493	0.4415	0.5585
1982	37,015.3	2.0043	74,189.77	140,289	0.5288	0.4712
1983	41,033.9	1.8399	75,498.27	154,801	0.4877	0.5123
1984	44,450.8	1.9835	88,168.16	174,506	0.5052	0.4948
1985	48,963.3	2.0644	101,079.84	183,956	0.5495	0.4505
1986	51,003.2	2.0666	105,403.21	206,531	0.5104	0.4896
1987(a)	48,279.5	2.4357	117,594.38	242,831	0.4843	0.5157
1988	59,115.8	2.4583	145,324.37	306,481	0.4742	0.5258
1989	54,111.8	2.7778	150,311.76	361,460	0.4158	0.5842
1990	59,033.9	3.1430	185,543.55	388,444	0.4777	0.5223

Note: (a) Total wages in manufacturing in SAM 1987 amount to 117,594.38 million baht and total number of employment is 2.4357 million. This renders an average imputed wage of 48,279.5 baht.

Source: Calculated as described in the text by using data from NESDB, NSO and TDRI.

Table 5.16 Factor Income Shares in Services and Other Sectors (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Services (M. Person)	Total Wage Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)	Wage Share	Property Income Share
1977	23,539.8	3.6189	85,188.2	160,304	0.5314	0.4686
1978	23,320.2	3.8336	89,400.3	193,286	0.4625	0.5375
1979	27,354.7	3.9759	108,759.6	219,974	0.4944	0.5056
1980	32,572.7	4.2524	138,512.1	258,869	0.5351	0.4649
1981	38,844.2	4.4899	174,406.6	311,070	0.5607	0.4393
1982	38,968.9	5.1712	201,515.9	357,825	0.5632	0.4368
1983	42,952.6	5.2622	226,025.2	378,216	0.5976	0.4024
1984	43,891.6	5.0937	223,570.6	404,487	0.5527	0.4473
1985	47,890.4	5.3507	256,247.2	431,430	0.5939	0.4061
1986	46,879.0	6.0443	283,350.7	469,006	0.6042	0.3958
1987 (a)	47,964.9	6.5909	316,131.9	524,163	0.6031	0.3969
1988	50,716.2	6.5545	332,419.3	586,647	0.5666	0.4334
1989	52,923.6	6.5602	347,189.4	708,767	0.4898	0.5102
1990	66,620.3	6.8029	453,211.2	855,896	0.5295	0.4705

Note: (a) Total wages in services and other sectors in SAM 1987 amount to 316,131.9 million baht and total number of employment is 6.5909 million. This renders an average imputed wage of 47,964.9 baht.

Source: Calculated as described in the text by using data from NESDB, NSO and TDRI.

For manufacturing, industry, and services and other sectors, it is not possible to estimate the share of rental income from existing data. Therefore, the remaining part of income from wages had to be lumped under property income share. To the extent that land use in these sectors did not expand at the same rate as capital use, these figures of property income share would produce an upward bias in the combined contribution of capital and land to growth. However, if land use expanded at the same rate as capital, lumping the income shares of both inputs would produce the same residual as when capital and land were separated.[26]

It should also be noted here that growth accounting for each sector was also done by using the income data based on 1988 prices. All relevant rebased data were used to calculate another set of factor income shares, the series of which are presented in Appendix Tables A-30 - A-33.

5.3 ESTIMATED SOURCES OF GROWTH

The estimates of factor income shares and the growth rates of output and input can be used to calculate the contribution to growth and the TFP according to the framework described in Chapter 2. The results of these estimates for each sector are shown in Tables 5.17-5.20.

We can observe that, during the early years, the TFPs for these sectors were either very low or even negative. This is mainly because, during the late 1970s and early 1980s, we experienced the second oil crisis followed by a world-wide recession. While many countries had zero or negative economic growth, Thailand still managed to attain some growth, but at slower rates. Since the TFP appears to have close association with economic growth, when growth picked up during the late 1980s we also obtained higher estimates of TFP than in the earlier period. The growth of agriculture, however, did not follow the above pattern as its output depends on other noneconomic factors, such as weather, as well. Its average growth during the late 1970s and early 1980s was higher than that in the late 1980s. Yet we observed that the estimated TFP in agriculture was low in the early period and became higher later on, just like in other sectors. This is due to the fact that the contribution of labor and land to output had slowed down and, consequently, a larger part of growth was left unexplained as TFP.

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[26] From $\frac{\dot{Y}}{Y} = \alpha\frac{\dot{N}}{N} + \beta\frac{\dot{K}}{K} + \gamma\frac{\dot{L}}{L} + TFP$

where Y = output, N = labor, K = capital, and L = land; α, γ are income shares; and dot indicates the rate of change with respect to time.

If $\frac{\dot{L}}{L} = \frac{\dot{K}}{K}$ then $\frac{\dot{Y}}{Y} = \alpha\frac{\dot{N}}{N} + (\beta + \gamma)\frac{\dot{K}}{K} + TFP.$

Table 5.17 Growth Accounting in Agriculture

Period	Real Growth of Income	Labor		Land	Composite Capital Index	TFP	
		Unadjusted	Adjusted			Unadjusted	Adjusted
(a) Using the GDP data at 1972 prices							
1978-1981	4.4344	2.4560	3.4032	0.1775	0.3770	1.4239	0.4766
1982-1986	3.9106	0.2438	1.8567	0.0575	0.5920	3.0173	1.4044
1987-1990	3.7063	1.2997	0.4839	0.0418	1.2110	1.1538	1.9697
1978-1990	4.0089	1.2494	1.9101	0.0896	0.7163	1.9536	1.2929
Contribution	(100.0)	(31.2)	(47.6)	(2.2)	(17.9)	(48.7)	(32.2)
1981-1990	3.9758	1.2205	2.0732	0.0676	0.8130	1.8746	1.0220
Contribution	(100.0)	(30.7)	(52.1)	(1.7)	(20.4)	(47.2)	(25.7)
(b) Using the GDP data at 1988 prices							
1981-1990	3.8187	1.2148	2.0903	0.0736	0.8215	1.7087	0.8333
Contribution	(100.0)	(31.8)	(54.7)	(1.9)	(21.5)	(44.7)	(21.8)

Source: Calculated as described in the text.

Table 5.18 Growth Accounting in Industry

Period	Real Growth of Income	Labor		Composite Capital Index	TFP	
		Unadjusted	Adjusted		Unadjusted	Adjusted
(a) Using the GDP data at 1972 prices						
1978-1981	6.7611	3.3923	4.0059	5.6851	-2.3162	-2.9299
1982-1986	5.5038	1.9433	2.7067	4.7885	-1.2280	-1.9914
1987-1990	15.5089	4.5919	4.8574	7.2269	3.6900	3.4245
1978-1990	8.9691	3.2041	3.7682	5.8147	-0.0496	-0.6137
Contribution	(100.0)	(35.7)	(42.0)	(64.8)	(-0.6)	(-6.8)
1981-1990	9.5307	2.8479	3.4585	5.8671	0.8157	0.2051
Contribution	(100.0)	(29.9)	(36.3)	(61.5)	(8.6)	(2.2)
(b) Using the GDP data at 1988 prices						
1981-1990	10.4540	2.8995	3.5405	5.7362	1.8183	1.1773
Contribution	(100.0)	(27.7)	(33.9)	(54.9)	(17.4)	(11.2)

Note: Including mining and quarrying, manufacturing, construction, electricity and public utilities.

Source: Calculated as described in the text.

Table 5.19 Growth Accounting in Manufacturing

Period	Real Growth of Income	Labor		Composite Capital Index	TFP	
		Unadjusted	Adjusted		Unadjusted	Adjusted
(a) Using the GDP data at 1972 prices						
1978-1981	6.5420	3.3921	5.3563	3.9985	-0.8486	-2.8128
1982-1986	5.5786	1.8880	2.1690	3.2690	0.4217	0.1407
1987-1990	14.6737	5.2420	5.3235	7.8683	1.5634	1.4819
1978-1990	8.6735	3.3828	4.1203	4.9086	0.3821	-0.3554
Contribution	(100.0)	(39.0)	(47.5)	(56.6)	(4.4)	(-4.1)
1981-1990	9.2874	2.9088	3.2815	5.1585	1.2201	0.8474
Contribution	(100.0)	(31.3)	(35.3)	(55.5)	(13.1)	(9.1)
(b) Using the GDP data at 1988 prices						
1981-1990	10.0725	2.7162	3.0803	5.4401	1.9162	1.5522
Contribution	(100.0)	(27.0)	(30.6)	(54.0)	(19.0)	(15.4)

Source: Calculated as described in the text.

Table 5.20 Growth Accounting in Services and Others

Period	Real Growth of Income	Labor		Composite Capital Index	TFP	
		Unadjusted	Adjusted		Unadjusted	Adjusted
(a) Using the GDP data at 1972 prices						
1978-1981	7.7638	2.8910	6.3079	3.0037	1.8690	-1.5478
1982-1986	5.9104	3.7156	5.5513	2.6517	-0.4569	-2.2926
1987-1990	10.9603	1.7434	3.0416	4.3489	4.8681	3.5698
1978-1990	8.0345	2.8551	5.0119	3.2822	1.8972	-0.2596
Contribution	(100.0)	(35.5)	(62.4)	(40.9)	(23.6)	(-3.2)
1981-1990	8.0501	2.8640	4.4891	3.3825	1.8036	0.1785
Contribution	(100.0)	(35.6)	(55.8)	(42.0)	(22.4)	(2.2)
(b) Using the GDP data at 1988 prices						
1981-1990	7.7318	2.6396	4.1390	3.7368	1.3553	-0.1441
Contribution	(100.0)	(34.1)	(53.5)	(48.3)	(17.5)	(-1.8)

Note: Including transportation and communications, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings, public administration and defense, and other services.

Source: Calculated as described in the text.

In order for us not to be confused by so many figures contained in each detailed subperiod, it seems preferable to concentrate on the average figure for the whole period under study, which is 1978-1990. The data on sources of growth by sector during 1978-1990 are presented in Table 5.21. Since we also performed the growth accounting by using the data based on 1988 prices, the series of which only go back to 1981, the averages for 1981-1990, computed from both sets of data, are also provided in Table 5.22.

Based on the averages during 1978-1990, we observed that, except for agriculture, the TFP for all other sectors were negative but the sizes were small. This is due to the fact that during this period the growth of all factor inputs combined could explain all and a little more than the growth of output. For manufacturing and industry, the major contribution came from capital, while for services the major contribution was from labor, particularly the improved quality of labor. In agriculture, we obtained a positive figure for the TFP, which accounted for about 32 percent of the total growth in output. The contribution of capital in agriculture was small in comparison to other sectors; and the contribution of labor in agriculture came more from the increase in quantity than quality.

Table 5.21 Sources of Growth by Sector, 1978-1990 (Based on 1972 Prices)

	Agriculture	Manufacturing	Industry	Services and Others
Growth Rate of Output	4.01 (100.0)	8.67 (100.0)	8.97 (100.0)	8.03 (100.0)
Total Factor Input	2.72 (67.8)	9.03 (104.1)	9.58 (106.8)	8.29 (103.2)
Labor	1.91 (47.6)	4.12 (47.5)	3.77 (42.0)	5.01 (62.4)
Employment	1.25 (31.2)	3.38 (39.0)	3.20 (35.7)	2.85 (35.5)
Quality Changes (Age-Sex-Education)	0.66 (16.4)	0.74 (8.5)	0.57 (6.3)	2.16 (26.9)
Capital	0.72 (17.9)	4.91 (56.6)	5.81 (64.8)	3.28 (40.9)
Land	0.09 (2.2)	-	-	-
Total Factor Productivity (TFP)	1.29 (32.2)	-0.36 (-4.1)	-0.61 (-6.8)	-0.26 (-3.2)

Sources: Tables 5.17-5.20.

Table 5.22 Sources of Growth by Sector, 1981-1990

	Based on 1972 Prices			
	Agriculture	**Manufacturing**	**Industry**	**Services and Others**
Growth Rate of Output	3.97 (100.0)	9.28 (100.0)	9.53 (100.0)	8.05 (100.0)
Total Factor Input	2.95 (74.3)	8.44 (90.9)	9.33 (97.8)	7.87 (97.8)
Labor	2.07 (52.1)	3.28 (35.3)	3.46 (36.3)	4.49 (55.8)
Employment	1.22 (30.7)	2.91 (31.3)	2.85 (29.9)	2.86 (35.6)
Quality Changes (Age-Sex-Education)	0.85 (21.4)	0.37 (4.0)	0.61 (6.4)	1.63 (20.2)
Capital	0.81 (20.4)	5.16 (55.5)	5.87 (61.5)	3.38 (42.0)
Land	0.07 (1.7)	-	-	-
Total Factor Productivity (TFP)	1.02 (25.7)	0.85 (9.1)	0.21 (2.2)	0.18 (2.2)
	Based on 1988 Prices			
	Agriculture	**Manufacturing**	**Industry**	**Services and Others**
Growth Rate of Output	3.82 (100.0)	10.07 (100.0)	10.45 (100.0)	7.73 (100.0)
Total Factor Input	2.98 (78.2)	8.52 (84.6)	9.28 (88.8)	7.88 (101.8)
Labor	2.09 (54.7)	3.08 (30.6)	3.54 (33.9)	4.14 (53.5)
Employment	1.21 (31.7)	2.72 (27.0)	2.90 (27.8)	2.64 (34.1)
Quality Changes (Age-Sex-Education)	0.88 (23.0)	0.36 (3.6)	0.64 (6.1)	1.50 (19.4)
Capital	0.82 (21.5)	5.44 (54.0)	5.74 (54.9)	3.74 (48.3)
Land	0.07 (1.9)	-	-	-
Total Factor Productivity (TFP)	0.83 (21.8)	1.55 (15.4)	1.18 (11.2)	-0.14 (-1.8)

Sources: Tables 5.17-5.20.

It is quite possible that, for other non-agricultural sectors, the expansion of land use is less than the expansion of capital stock, which would produce an upward bias in the contribution of input and, consequently, a downward bias in the calculated TFP. Coupled with the effect of slower GDP growth during the early years, the average TFP growth of the non-agricultural sectors was negative.

The TFP figures for the period 1981-1990, based on the 1972 prices, were positive for all sectors. However, their contribution to the total growth of output in the non-agricultural sectors was small. The major contributing factors to the growth of output were still labor and capital with labor being more important in agriculture and services, and capital being more important in manufacturing and industry. Similar patterns were observed from the set of data based on 1988 prices, with some changes in the magnitude.

It is quite visible that the contribution of capital to output in the non-agricultural sectors was quite high, ranging from about 40 to 65 percent. This is because the rates of capital accumulation in these sectors, particularly in manufacturing, construction, and electricity and water supply, were quite high during the period under study. The process of capital accumulation not only involves a quantitative increase in productive capacity but also a qualitative improvement. New machines are likely to embody advanced technical progress in their design. Therefore, a build-up of capital stock not only provides more machines but better machines. If this reasoning sounds plausible, then, perhaps, we should not be too concerned to obtain very small residual (or very small TFP) in the manufacturing, industry and services sectors.

Another reason that may have caused us to obtain an overestimated contribution of capital (and an underestimated TFP) is that during the time of economic slowdown there existed excess capacity or underutilization of the capital structures in the economy. Since we did not measure the flow of capital services, but used instead the growth of capital stock to calculate the contribution of capital to the output growth, this may have caused an upward bias in the estimated contribution of capital.

Our finding that the growth of output in Thailand was mainly due to the growth of factor inputs rather than TFP was similar to that found by Kitti Limskul (1988). However, since he derived his own estimates of capital stock, had different sectoral breakdown, and used the parametric estimates from the translog production function, we feel that our estimates and his of TFP by sector are not comparable.[27] Yet both studies found that input factors contribute prominently to the growth of output.

The implication of such findings is that the rapid growth in the past decade or so has been achieved mainly by adding more labor, capital and land into production. Some technological or productivity improvements have been achieved, but these may have been through the importation of more efficient and modern machinery and through the employment of better or more productive workers.

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[27] Kitti (1988:63) found that the TFP growth of the manufacturing, electricity and water, transportation and communication, banking and the public sectors ranged between 1 and 3 percent, while the following sectors had negative TFP growth: agriculture, mining, construction and business services.

The results of the sectoral TFP calculation are rather unexpected as the agricultural sector appears to have been more successful in using new technology to increase output. This could be a result of both the increasing limitation in pushing the land frontier and the availability of research and extension services in the agricultural sector. The contribution of technology to the growth of output in agriculture during 1981-1990 averaged about one-fourth, compared to the average figure of less than one-tenth in the non-agricultural sectors. It, thus, appears that the high growth rate of output in the non-agricultural sectors in the past has been sustained through imported technology, in the shape of new machinery and equipment. This situation is unlike that in other newly industrialized countries, where some local industries have attained independence from imported technology through indigenous research and development, something which seems to have attracted little attention in Thailand in the past.

If one compares the TFP figures of the whole economy with those of each sector, one may be puzzled about why the weighted relationship does not hold. Particularly, if we look at the period 1981-1990, the TFP growth of the whole economy based on the 1988 prices was 2.21, while those of agriculture, industry and services were, respectively, 0.83, 1.18 and -0.14. This is because the TFP of the whole economy cannot be viewed as an average figure of each individual sector weighted by its share. Such a relationship holds only for the growth figures, not the TFP figures, which constitute only one component of growth, as can be illustrated in the following exposition.

For the sake of simplicity, assume a two-sector model with two factor inputs.

Let Y = total output

G_y = growth of $Y = Y/Y$

Y^A = output in agriculture

$G_Y{}^A$ = growth of $Y^A = Y^A/Y^A$

Y^N = non-agricultural output

$G_Y{}^N$ = growth of $Y^N = Y^N/Y^N$

K = capital input

L = labor input

G_K = growth of capital

G_L = growth of labor

C = income share of capital

W = income share of labor

The superscripted A or N indicates whether the variable belongs to the agricultural or the non-agricultural sector.

The following relationships hold by definition (equations 12-15) and by the growth-accounting framework (equations 16-18).

$$Y = Y^A + Y^N \quad \text{.....(12)}$$

$$K = K^A + K^N \quad \text{..... (13)}$$

$$L = L^A + L^N \quad \text{..... .(14)}$$

$$G_Y = \frac{Y^A}{Y} G_Y{}^A + \frac{Y^N}{Y} G_Y{}^N \quad \text{..... (15)}$$

$$G_Y = G_K \,.\, C + G_L \,.\, W + TFP \quad \text{..... (16)}$$

$$G_Y{}^A = G_K{}^A \,.\, C^A + G_L{}^A \,.\, W^A + TFP^A \quad \text{..... (17)}$$

$$G_Y{}^N = G_K{}^N \,.\, C^N + G_L{}^N \,.\, W^N + TFP^N \quad \text{..... (18)}$$

The right hand sides of equations 15 and 16 are equal. Thus

$$G_K \,.\, C + G_L \,.\, W + TFP = \frac{Y^A}{Y} G_Y{}^A + \frac{Y^N}{Y} G_Y{}^N$$

Substitute the expression for $G_Y{}^A$ and $G_Y{}^N$ from equations 17 and 18, and we obtain

$$G_K \,.\, C + G_L \,.\, W + TFP = \frac{Y^A}{Y} [G_K{}^A \,.\, C^A + G_L{}^A \,.\, W^A + TFP^A] + \frac{Y^N}{Y} [G_K{}^N \,.\, C^N + G_L{}^N \,.\, W^N + TFP^N] \quad \text{.. (19)}$$

Or

$$G_K \,.\, C + G_L \,.\, W + TFP = \frac{Y^A}{Y} [G_K{}^A \,.\, C^A + G_L{}^A \,.\, W^A] + \frac{Y^N}{Y} [G_K{}^N \,.\, C^N + G_L{}^N \,.\, W^N] + [\frac{Y^A}{Y} TFP^A + \frac{Y^N}{Y} TFP^N] \quad \text{..... (20)}$$

$$TFP = \frac{Y^A}{Y} [G_K{}^A \,.\, C^A + G_L{}^A \,.\, W^A] + \frac{Y^N}{Y} [G_K{}^N \,.\, C^N + G_L{}^N \,.\, W^N] - [G_K \,.\, C + G_L \,.\, W] + [\frac{Y^A}{Y} TFP^A + \frac{Y^N}{Y} TFP^N] \quad \text{..... (21)}$$

It is clear from equation 21 that the TFP figure for the whole economy is not simply a weighted average of TFP from each sector, but that it involves the growth of factor inputs and factor income shares in each sector and in the whole economy as well.

For illustrative purposes, we may assume that the TFP growth in each sector, i.e., TFP^A and TFP^N, is zero; then equation 21, with some rearrangement, becomes

$$TFP = \left(\frac{Y^A}{Y} G_K{}^A \cdot C^A + \frac{Y^N}{Y} G_K{}^N \cdot C^N - G_K \cdot C\right)$$

$$+ \left(\frac{Y^A}{Y} G_L{}^A \cdot W^A + \frac{Y^N}{Y} G_L{}^N \cdot W^N - G_L \cdot W\right) \quad \ldots\ldots (22)$$

Again for the sake of simplicity, let us consider one factor at a time, such as labor. The growth of labor in the whole economy (G_L) is a weighted average of the growth of labor in each sector as shown in the following equation.

$$G_L = \frac{L^A}{L} G_L{}^A + \frac{L^N}{L} G_L{}^N \quad \ldots\ldots (23)$$

If there is a labor reallocation away from the agricultural sector, even when the total labor input remains constant, that means

$$G_L = 0$$

$$G_L{}^A < 0$$

$$G_L{}^N > 0$$

and $\frac{L^A}{L}$ decreases while $\frac{L^N}{L}$ increases.

The same reasoning holds for capital. One can work out the algebra and see that even if the growth rates of labor and capital for the whole economy are both zero and there is no TFP growth in both the agriculture and the non-agricultural sector, one still can obtain a number for TFP growth of the whole economy due to the reallocation of input between sectors. Thus, the TFP growth of the whole economy is not just a simple weighted average of the TFP growth of each subsector; it also involves the impact of factor reallocation and the contribution of factor inputs to each subsector's output.

Table 5.23 reveals that, while both labor and capital inputs are increasing, there is a shift of both factor inputs into the non-agricultural sector. Furthermore, the growth rate of capital in the non-agricultural sector appears to outpace the growth of employment; but this does not take place in agriculture. The data on the capital-labor ratio, as shown in Table 5.24, show that the capital-labor ratio in the whole economy (at 1988 prices) grew from 118,440 baht per worker in 1977 to 182,431 baht per worker in 1990. This amounts to an average annual growth rate of about 3.2 percent. Almost all of this growth came from the capital accumulation

in the non-agricultural sectors. In fact, although the stock of capital in the agricultural sector has been growing, we observe a slightly decreasing trend of its capital-labor ratio, which decreased from 25,090 baht per worker in 1977 to 24,120 baht per worker in 1990, while that for industry increased from 265,107 baht in 1977 to 322,676 baht in 1990 and that for services and other sectors increased from 432,239 baht per worker to 553,942 baht. In general, the capital-labor ratios in the non-agricultural sectors are more than 10 times that in agriculture.

Table 5.23 Distribution of Employment and Gross Capital Stock by Sector

Year	Agriculture	Industry	Manufacturing	Services and Others	Total
a) Employment					
1977	73.53	8.64	6.54	17.83	100.00
1978	73.73	8.62	6.79	17.65	100.00
1979	70.79	10.47	8.12	18.74	100.00
1980	70.82	10.28	7.94	18.89	100.00
1981	71.98	9.58	7.14	18.44	100.00
1982	68.44	10.72	8.08	20.84	100.00
1983	69.14	9.95	7.31	20.91	100.00
1984	69.77	10.63	7.63	19.60	100.00
1985	68.40	10.89	7.99	20.71	100.00
1986	66.78	10.56	7.75	22.66	100.00
1987	64.39	11.75	8.82	23.86	100.00
1988	66.47	11.27	8.35	22.26	100.00
1989	66.64	11.93	9.05	21.43	100.00
1990	64.01	14.01	10.16	21.99	100.00
b) Gross Capital Stock (1988 prices)					
1977	15.58	19.34	13.77	65.08	100.00
1978	16.33	17.65	11.49	66.02	100.00
1979	15.33	18.53	11.89	66.14	100.00
1980	14.39	19.10	11.86	66.51	100.00
1981	13.58	19.83	11.95	66.59	100.00
1982	12.85	20.59	11.71	66.56	100.00
1983	12.18	21.37	12.11	66.45	100.00
1984	11.36	22.30	12.19	66.34	100.00
1985	10.95	22.51	12.05	66.54	100.00
1986	10.81	22.65	12.23	66.54	100.00
1987	10.24	22.93	12.77	66.83	100.00
1988	9.71	23.74	13.54	66.55	100.00
1989	9.09	24.40	14.31	66.51	100.00
1990	8.46	24.77	14.72	66.76	100.00

Note: Industry includes mining and quarrying, manufacturing, construction, and electricity and water supply. Services and others include transportation and communications, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings, public administration and defense, and services.

Source: Calculated from data from NESDB and NSO.

Table 5.24 Capital Labor Ratio by Sector (Gross Capital Stock at 1988 prices, baht per worker)

Year	Agriculture	Industry	Manufacturing	Services and Others	Total
1977	25,090	265,107	249,362	432,239	118,440
1978	25,673	237,270	196,139	433,523	115,893
1979	27,086	221,304	183,108	441,339	125,060
1980	25,445	232,494	186,992	440,712	125,193
1981	23,238	254,999	206,033	444,920	123,203
1982	23,967	245,159	185,176	407,788	127,675
1983	23,617	288,044	222,092	426,142	134,096
1984	22,529	290,513	220,988	468,435	138,417
1985	23,630	305,010	222,633	474,274	147,602
1986	24,392	323,127	237,924	442,405	150,663
1987	24,626	302,198	224,212	433,710	154,843
1988	22,882	329,962	254,005	468,390	156,659
1989	22,475	337,238	260,663	511,470	164,828
1990	24,120	322,676	264,294	553,942	182,431

Note: Industry includes mining and quarrying, manufacturing, construction, and electricity and water supply. Services and others include transportation and communications, wholesale and retail trade, banking, insurance and real estate, ownership of dwellings, public administration and defense, and services.

Source: Calculated from data from NESDB and NSO.

The shift of resources into sectors that are more productive should bring about higher growth rates in the economy. This appears to be the case for Thailand, since the average output per worker in the non-agricultural sector is much higher than that of agriculture. Such data can be seen in Table 5.25, which shows that the GDP per worker in the non-agriculture sector is about eight to 11 times that of agriculture if measured at 1972 prices, and about nine to 12 times if measured at 1988 prices.

It, thus, appears that the shift of factor inputs into the non-agricultural sectors, the relatively more capital intensive nature of non-agricultural production, and the higher average labor productivity in the non-agricultural sectors provide an explanation for the higher growth of TFP in the whole economy than in each sector alone.

Table 5.25 GDP Per Worker by Economic Sector (baht/worker/year)

Year	Agriculture	Manufacturing	Industry[a]	Services and Others[b]	All Sectors
a) At 1972 Prices					
1977	3,686.3	40,424.2	42,900.5	31,916.1	12,109.3
1978	3,862.1	39,545.1	44,688.1	32,825.3	12,493.1
1979	4,043.9	36,669.4	40,112.1	34,202.6	13,472.4
1980	3,875.0	36,366.9	39,873.4	34,196.0	13,305.3
1981	3,714.0	39,710.8	41,823.9	34,689.0	13,077.7
1982	3,950.2	35,335.5	37,820.4	31,646.0	13,354.3
1983	4,026.6	41,726.7	43,454.3	33,549.8	14,122.9
1984	4,080.7	41,321.9	42,767.1	37,044.6	14,653.4
1985	4,444.2	39,460.9	41,909.4	36,937.4	15,253.8
1986	4,422.4	43,677.1	45,164.0	34,326.2	15,501.3
1987	4,419.1	41,995.7	44,216.6	34,980.2	16,386.3
1988	4,425.7	48,596.2	50,748.0	39,266.2	17,402.3
1989	4,513.2	49,412.8	53,556.9	43,596.8	18,711.8
1990	4,580.6	49,647.0	52,242.6	46,229.5	20,414.0
b) At 1988 Prices					
1980	11,578.8	118,098.9	118,983.8	106,708.9	40,596.5
1981	11,070.3	128,956.5	126,349.3	106,649.8	39,741.8
1982	11,707.9	114,870.5	116,485.0	98,754.4	41,084.8
1983	11,972.4	139,135.3	136,830.8	99,867.5	42,774.3
1984	11,998.6	137,058.2	134,256.5	108,014.4	43,811.5
1985	12,863.3	129,884.2	133,587.1	109,895.3	46,106.6
1986	12,810.4	142,514.8	144,136.0	103,060.1	47,130.5
1987	12,837.9	140,308.7	142,814.2	103,941.6	49,844.8
1988	12,891.9	163,948.3	162,478.5	117,183.3	52,967.7
1989	13,518.7	168,356.9	173,381.6	128,181.8	57,078.1
1990	13,452.9	172,497.8	169,897.6	139,871.2	63,161.8

Notes: (a) Includes mining and quarrying, manufacturing, construction, electricity and water supply.
(b) Includes all other sectors except agriculture and industry.

Source: Calculated from data from NESDB and NSO.

Chapter 6

Determinants of Productivity

According to Denison's method of growth accounting, the remaining part of output growth not explained by the growth of total factor input can be further attributed to the gains from resource reallocation, from economies of scale, from irregular factors such as favourable or unfavourable weather conditions and, finally, from advances in knowledge and miscellaneous determinants. The calculation of these factors requires some assumed figures of output responses to the shifting of factor input. For example, Denison and Chung (1976) assumed that a reduction of labor input in the agricultural sector by 1 percent would result in a decline of agricultural output by 0.25 percent due to the existence of underemployment. They also assumed that a 1 percent increase in labor input in the non-agricultural sector would increase that sector's output by a fraction equivalent to the share of labor income in the non-agricultural sector. Kim and Park (1985) also followed Denison and Chung's assumptions for Korea, with some modification.

Instead of following the above approach, we would rather take the calculated TFP as our observed residual and use regression estimates to look for various possible factors that influence the productivity. The analysis here focuses only on the TFP of the aggregate economy, as we are of the opinion that the sectoral estimates are biased due to the limited nature of our available data. First, the various factors that may influence the technical progress of an economy are discussed, and then an acceptable regression estimate is presented.

6.1 FACTORS INFLUENCING TFP

Theoretically, there are many factors that influence the technical progress, or TFP, of an economy. First, as already mentioned, the shifting of labor, or "resource allocation," from an activity with low marginal productivity to a higher one should increase the overall output. In Thailand, we have observed a gradual shift of labor employment away from the agricultural sector, which is known to have lower productivity than the other sectors. The share of labor employed in the non-agricultural sectors has increased from around 26.5 percent in 1977 to about 36

percent in 1990. A time series of this variable during 1977 to 1990 is used as an explanatory variable.

Another type of labor reallocation is the shift from the self-employment category to the wage-and-salary worker category. There are, however, two issues involved here. One is self-employed workers in agriculture and the other in non-agricultural. If we want to include this effect, we should separate it into two variables, and we need to be careful even in the agricultural sector alone to measure the hours spent on agricultural and non-agricultural activities. Given the time and data constraint, it is decided that this type of labor reallocation should be left for other interested researchers to explore.

Another important variable that may influence technical progress is the gain from economies of scale. The enlargement of markets makes it possible or worthwhile to invest in new plants or machines with modern technology so as to reduce the unit cost of production. The size of the nation's output appears to be the best proxy for this effect. However, using the size of GDP is similar to using a trend variable. We, therefore, consider another variable related to this issue and often used in other similar studies, which is the foreign trade variable. The enlargement of markets comes not only from the increased domestic demand but also from external demand. Thus, foreign trade is also another important source of growth. In addition to its effect on the economy of scale, exposure to foreign competition may improve productivity since it may increase entrepreneurial efforts and improve technical efficiency.[28]

Productivity growth may also be related to the pace of investment reflected in the growth of the economy's capital stock. It may indicate the speed at which new technology embodied in new machines is adopted. In this study, we use the growth of the composite index of capital stock, which is a weighted average of gross (weight of three-quarters) and net (weight of one-quarter) capital stock. Trial regressions showed that the coefficient of this weighted variable was in between the coefficients of the growth of gross capital stock and net capital stock.

The role of the capital stock on productivity is sometimes split into that of the private and the public sectors by some researchers. For example, Lynde and Richmond (1993) examine the impact of the stock of public capital on output levels and productivity growth rates in the U.S. and find that much of the decline in productivity can be explained by a fall in the public capital-labor ratio. The services of public capital, like infrastructure, are found to be an important part of the production process in the U.S.[29] In this research, the trial estimates of the growth of

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[28] Tybout (1992) found that exposure to increased foreign competition is associated with improvements in the average level of technical efficiency, reductions in the cross-plant dispersion in technical efficiency, and reductions in plant size. In addition, his work suggests no clear link between trade policies and patterns of entry and exit of firms.

[29] The result of Lynde and Richmond's (1993) analysis supports previous findings by Aschauer (1989) and Munnell (1990), both of whom found a significant contribution of public capital to output and productivity. Aschauer assumed a Cobb-Douglas production function and estimated the elasticity of output with respect to public capital to be 0.39, while Lynde and Richmond used a translog function and estimated an average elasticity of 0.20.

public capital on the TFP did not turn out to be significant, while the growth of private capital or the growth of total capital stock alone was significant.

Apart from the three main factors mentioned above (i.e., resource allocation, foreign exposure, and pace of capital accumulation), there are yet other variables contributing to technical progress. Research and innovations, whether done by the public or the private sector, can contribute to advances in technical knowledge and the way output is produced. Other factors, such as managerial improvement, business reorganization, government policies and/or regulatory measures, can also affect the utilization of resources and, hence, the output per unit of input. However, these factors, important as they are, are not easily quantifiable. Given the limited number of observations that we have (1978-1990), we settled with the three main factors in the regression estimate.

6.2 REGRESSION ESTIMATE

Using the growth rate of the capital stock to represent the pace of the capital accumulation (GK), the growth rate of the ratio of exports to GDP to represent the exposure of the economy to foreign markets (GXRATIO), and the growth of the labor share in the non-agricultural sectors to represent the impact of resource allocation (GSHRNA), we obtained the following estimate for the TFP.[30]

$$TFP = -9.018 + 1.278\,GK + 0.135\,GXRATIO + 0.187\,GSHRNA \quad \ldots\ldots (24)$$
$$(-2.480)\quad (2.657)\quad (1.123)\quad (1.161)$$

$R^2 = 0.513$

Adjusted $R^2 = 0.351$

F-Statistic = 3.160

Standard Error of Regression = 3.273

Log Likelihood = -31.471

Durbin-Watson Statistic = 1.775

Sample period 1978 - 1990

Figures in parentheses indicate t statistics.

Given the number of observations and the rather oscillating pattern of our calculated TFP, the above equation is the best statistical estimate we can obtain. It is noticeable that the explanatory power of the equation, as measured by R^2 and adjusted R^2, is not impressive. However, the F-statistic indicates a significant joint influence of the explanatory variables at the 90 percent confidence level. The

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[30] The method of estimation is ordinary least squares since prior reasoning does not point to the problem of simultaneity. Another estimation problem that may arise is that regressors may not be nonstochastic. Yet, as pointed out by Kmenta (1986:338), if regressors are nonstochastic but independent of the error terms, the desirable properties and feasibility of least squares estimation do not change.

Durbin-Watson statistic also indicates that we can accept the null hypothesis of no autocorrelation in the error terms at 0.01 level of significance.[30]

We can see that all three explanatory variables have a positive influence on TFP. Only the t-statistic for the coefficient of the growth of capital accumulation is statistically significant above the 90 percent confidence level. Our confidence level drops to 80 percent when it comes to the coefficients of the growth rates of the export ratio to GDP and the share of labor in the non-agricultural sector.[31] Since all the variables are expressed in percentage growth rates, the size of their coefficient also indicates the magnitude of their relative influence. The regression estimate suggests that the pace of capital accumulation has the greatest influence on TFP, while the increase in foreign exposure and the resource allocation variables have a much smaller magnitude of influence.

In fact, there must be other important determinants of TFP, such as research and innovations, managerial improvement, business reorganization, etc., but we are not able to quantify and use them in the equation. This may be a reason for the unexplained part of the variation in our calculated TFP.

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30 See critical values for F-statistic and Durbin-Watson statistic in any econometrics textbook.

31 Although it is common to use the 90 or 95 percent confidence level, it is not statistically wrong to go down in the level of confidence. For example, the table on percentiles of the t distribution provided in Pindyck and Rubinfeld (1991: 563) shows the probability that the t value will exceed each number in the table in absolute value (or two-tailed test) from 0.01 (99.0 percent confidence level) to 0.80 (20 percent confidence level).

Chapter 7

Summary and Concluding Remarks

Economists have long been interested in analyzing the sources of output growth, which is commonly known as growth accounting analysis. The approach to this issue may be split into two kinds: the parametric approach and the non-parametric approach. The parametric approach assumes a particular form of production function (e.g., Cobb-Douglas, Constant Elasticity of Substitution-CES, or Translog Production Function) and employs time series data of both output and various inputs in estimating the function. The non-parametric approach needs no assumed form of production function and long-time series of data are also not needed. In fact, the availability of two end points of relevant data are adequate for the growth accounting analysis, as has been explained in Chapter 2 of this study. This latter approach is commonly known as the Solow-Denison growth accounting analysis.

This research examines past patterns and sources of growth in Thailand by using the Solow-Denison supply-side growth accounting framework. This framework had been used in many studies in explaining the supply-side sources of growth for other countries. This research is the first such attempt at the non-parametric growth accounting approach for the Thai economy.

According to this framework, output growth comes from the contribution of various factors of production weighted by the output elasticity with respect to each input. The need to obtain the parameters for output elasticity is subdued by the assumption of profit maximization and producers' equilibrium, whereby factor inputs are employed up to the point of equality between their marginal product and real cost. Thus, the output elasticity with respect to each input can be replaced by the factor income share. The remaining part of output growth, not accounted for by the weighted growth of inputs, is commonly known among economists as the change in TFP, or technical progress, or, simply, the residual.

The TFP measurement for the Thai economy based on the above framework was found to average about 2.6 percent a year during 1972 to 1990, without adjustment for improved quality of factor inputs. Adjustments for qualitative changes in input, particularly labor, are possible only after 1977, when

wage data became available. From 1978 to 1990, the average adjusted TFP growth for Thailand was 1.2 percent a year. This translates into about a 15.8 percent contribution to output growth. The major part of growth could be explained by the changes in the various factor inputs as follows: 37.2 percent from capital; 1.2 percent from land; and 45.8 percent from labor, with 19.7 percent represents improved labor quality. These figures are not markedly different from those calculated for Korea from 1972 to 1982 by Kim and Park (1985), who used the same framework of analysis. The contribution of TFP to output growth in Korea for the above period was found to be around 20.8 percent, that of capital around 29.8 percent and that of labor around 49.4 percent, of which 28.8 percent was from improved labor quality.

Separate TFP estimates were also produced for agriculture, industry and services sectors. It was observed that, in general, the TFP figures by sector are lower than that for the whole economy. Our explanation for this phenomenon was that the resource allocation must have contributed to the aggregate TFP figure, whereas this effect is not present within the individual sector. Another possible explanation is that, when we go down to smaller producing units, we may be able to better capture the contribution of inputs and, hence, are left with smaller residual, or TFP. However, it is also possible that technical progress is embodied in the recently acquired capital goods, especially in the non-agricultural sector where we observed a rather rapid pace of capital accumulation (about 7.5 percent per year compared to only 1.9 percent per year in agriculture from 1977 to 1990). The high rate of capital accumulation with likely embodied technical progress could be an explanation for the low or negative TFP in the non-agricultural sector.

The final part of this research probes into various possible determinants of productivity growth, using econometric techniques. It is found that the pace of capital accumulation has the greatest influence on TFP, while the influence of the increase in foreign exposure and the resource allocation is of smaller magnitude. However, the regression still left almost half of our calculated TFP unexplained. In fact, there must be other important determinants of TFP, but we are not able to quantify and use them in the equation. Other quite important determinants of TFP that we cannot measure are the experiences and expertise acquired by workers through the process of learning by doing, managerial improvement, business reorganization, research and innovations at the plant level, and government policies and/or regulatory measures. All these affect the utilization of resources and, hence, the productivity.

It is hoped that this research provides some important facts about the sources of growth and productivity that will be useful for future policy formulation. However, we would like to point out that our fact finding is constrained by the availability of data needed for such calculation as well as by the limited number of observations. For example, the factor income shares were not directly available from the national income account but had to be estimated based on the SAM 1987. We also used the capital stock instead of the flow of capital services to arrive at the contribution of capital. These exemplary shortcomings of our calculation are hoped to be subdued in future research.

Appendixes

Appendix Tables

Appendix Figures

Appendix Tables

Table A-1.1 Gross Domestic Product at Current Factor Cost by Industrial Origin

(Millions of Baht)

Industrial Origin	1970	1971	1972	1973	1974
Agriculture	37,923	36,392	42,856	61,314	75,162
Crops	24,322	21,854	26,653	41,559	50,847
Livestock	3,899	4,193	4,436	4,374	7,238
Fisheries	2,608	2,903	3,528	4,352	4,114
Forestry	2,330	2,337	2,504	3,649	4,286
Agricultural services	1,002	1,233	1,519	2,029	2,654
Simple agricultural processing products	3,762	3,872	4,216	5,351	6,023
Mining and quarrying	4,001	4,242	4,355	4,659	6,384
Manufacturing	18,328	20,361	24,095	33,810	42,053
Construction	7,653	7,806	7,731	8,689	10,472
Electricity and water supply	1,618	1,927	2,275	2,712	3,240
Transportation and communication	8,925	9,654	10,378	12,444	15,299
Wholesale and retail trade	18,441	18,964	19,551	27,814	35,213
Banking, insurance and real estate	3,296	3,640	3,810	4,960	6,704
Ownership of dwellings	8,424	8,976	9,429	10,647	12,464
Public administration and defense	6,721	7,251	7,880	9,131	11,448
Services	15,958	17,663	19,375	22,625	28,286
Gross domestic product at factor cost	**131,288**	**136,876**	**151,735**	**198,805**	**246,725**
Plus: Net factor income payment from the rest of the world	221	(138)	(609)	(872)	(94)
Gross national product at factor cost	**131,509**	**136,738**	**151,126**	**197,933**	**246,631**
Less: Provision for consumption of fixed capital	10,174	11,568	13,018	14,773	17,229
National income (NNP)	**121,335**	**125,170**	**138,108**	**183,160**	**229,402**

(Continued on page 96)

Table A-1.1 (Continued)

(Millions of Baht)

Industrial Origin	1975	1976	1977	1978
Agriculture	81,141	92,018	99,399	119,093
Crops	55,306	62,383	62,759	77,318
Livestock	7,556	8,271	10,521	9,961
Fisheries	5,128	5,707	7,856	10,340
Forestry	4,082	5,411	5,710	7,001
Agricultural services	3,090	3,249	3,772	4,480
Simple agricultural processing products	5,979	6,997	8,781	9,993
Mining and quarrying	5,962	7,668	10,707	14,075
Manufacturing	44,105	54,051	63,866	78,935
Construction	11,342	14,861	19,296	23,898
Electricity and water supply	3,707	3,942	5,177	5,982
Transportation and communication	16,382	19,821	22,090	26,982
Wholesale and retail trade	42,935	45,906	53,199	64,169
Banking, insurance and real estate	6,965	7,704	9,318	11,752
Ownership of dwellings	13,339	14,737	16,236	17,617
Public administration and defense	13,368	14,680	16,336	19,829
Services	32,231	35,894	43,125	52,937
Gross domestic product at factor cost	**271,477**	**311,282**	**358,749**	**435,269**
Plus: Net factor income payment from the rest of the world	(13)	(884)	(1,277)	(3,622)
Gross national product at factor cost	**271,464**	**310,398**	**357,472**	**431,647**
Less: Provision for consumption of fixed capital	20,253	23,424	27,063	31,647
National income (NNP)	**251,211**	**286,974**	**330,409**	**400,000**

Industrial Origin	1979	1980	1981	1982
Agriculture	133,562	152,302	162,404	156,155
Crops	86,023	101,218	105,526	99,798
Livestock	12,394	15,431	15,768	13,933
Fisheries	9,454	8,107	10,609	10,975
Forestry	8,914	8,347	9,267	8,312
Agricultural services	4,288	5,447	6,681	7,006
Simple agricultural processing products	12,489	13,752	14,553	16,131
Mining and quarrying	15,183	18,044	18,289	22,371
Manufacturing	92,516	111,661	135,493	140,289
Construction	26,426	33,783	36,959	40,089
Electricity and water supply	6,704	7,627	11,209	15,899
Transportation and communication	31,822	37,587	45,415	54,989
Wholesale and retail trade	67,495	74,262	100,130	109,323
Banking, insurance and real estate	13,809	16,435	18,390	21,369
Ownership of dwellings	19,475	22,650	25,722	29,244
Public administration and defense	23,484	30,711	33,281	39,697
Services	63,889	77,224	88,132	103,203
Gross domestic product at factor cost	**494,365**	**582,286**	**675,424**	**732,628**
Plus: Net factor income payment from the rest of the world	(6,225)	(5,394)	(12,035)	(12,930)
Gross national product at factor cost	**488,140**	**576,892**	**663,389**	**719,698**
Less: Provision for consumption of fixed capital	37,203	43,358	50,001	57,020
National income (NNP)	**450,937**	**533,534**	**613,388**	**662,678**

(Continued on page 97)

Table A-1.1 (Continued)

(Millions of Baht)

Industrial Origin	1983	1984	1985	1986
Agriculture	184,972	174,431	169,156	177,379
Crops	120,730	112,665	104,803	106,674
Livestock	18,920	16,809	14,910	19,683
Fisheries	12,357	11,332	12,756	15,310
Forestry	8,763	8,938	8,733	8,651
Agricultural services	6,175	6,791	7,438	7,109
Simple agricultural processing products	18,027	17,896	20,516	19,952
Mining and quarrying	24,152	30,488	36,509	32,545
Manufacturing	154,801	174,506	183,956	206,531
Construction	46,319	55,218	55,891	55,611
Electricity and water supply	17,088	18,574	23,540	27,247
Transportation and communication	60,190	69,134	77,354	86,057
Wholesale and retail trade	100,948	97,199	95,374	108,880
Banking, insurance and real estate	25,408	30,722	32,324	34,812
Ownership of dwellings	33,046	35,505	39,268	42,148
Public administration and defense	44,582	45,019	48,545	50,580
Services	114,042	126,908	138,565	146,529
Gross domestic product at factor cost	**805,548**	**857,704**	**900,482**	**968,319**
Plus: Net factor income payment from the rest of the world	(6,701)	(11,451)	(17,597)	(22,437)
Gross national product at factor cost	**798,847**	**846,253**	**882,885**	**945,882**
Less: Provision for consumption of fixed capital	64,696	72,976	81,436	93,431
National income (NNP)	**734,151**	**773,277**	**801,449**	**852,451**

Industrial Origin	1987	1988	1989	1990E
Agriculture	204,787	249,530	265,663	253,683
Crops	122,431	159,769	167,096	149,541
Livestock	22,351	24,508	28,481	31,888
Fisheries	19,823	21,638	21,241	22,508
Forestry	9,439	8,632	7,303	5,347
Agricultural services	8,061	8,729	9,221	9,441
Simple agricultural processing products	22,682	26,254	32,321	34,958
Mining and quarrying	36,261	45,027	57,678	70,466
Manufacturing	242,831	306,481	361,460	388,444
Construction	64,226	82,067	105,090	140,959
Electricity and water supply	31,198	34,245	41,417	47,340
Transportation and communication	92,958	106,839	116,955	136,274
Wholesale and retail trade	118,644	125,019	177,523	225,933
Banking, insurance and real estate	47,481	61,741	82,142	104,445
Ownership of dwellings	45,572	46,164	49,178	48,443
Public administration and defense	52,700	56,397	64,326	74,603
Services	166,808	190,487	218,643	266,198
Gross domestic product at factor cost	**1,103,466**	**1,303,997**	**1,540,075**	**1,756,788**
Plus: Net factor income payment from the rest of the world	(22,394)	(24,770)	(23,404)	(21,144)
Gross national product at factor cost	**1,081,072**	**1,279,227**	**1,516,671**	**1,735,644**
Less: Provision for consumption of fixed capital	103,215	118,512	143,750	160,995
National income (NNP)	**977,857**	**1,160,715**	**1,372,921**	**1,574,649**

E = Estimated.

Source: NESDB, National Income of Thailand.

Table A-1.2 Gross Domestic Product at Current Factor Cost by Industrial Origin (Rebased Series)

(Millions of Baht)

Industrial Origin	1980	1981	1982	1983
Agriculture	153,401	161,851	155,449	184,100
Crops	100,486	104,024	98,452	119,379
Livestock	17,025	17,413	15,224	20,120
Fisheries	8,342	10,712	10,936	12,400
Forestry	8,495	9,439	8,533	9,052
Agricultural services	5,691	6,901	7,270	7,783
Simple agricultural processing products	13,362	13,362	15,034	15,366
Mining and quarrying	7,631	7,949	10,686	11,867
Manufacturing	113,565	137,637	142,394	162,380
Construction	28,403	33,517	38,471	44,951
Electricity and water supply	7,709	11,121	15,827	17,112
Transportation and communication	34,629	41,239	53,714	56,028
Wholesale and retail trade	81,505	101,789	128,171	107,833
Banking, insurance and real estate	17,008	17,585	20,794	25,140
Ownership of dwellings	22,534	26,040	30,392	34,927
Public administration and defense	30,718	33,361	39,815	44,704
Services	89,146	103,542	118,518	127,445
Gross domestic product at factor cost	**586,249**	**675,631**	**754,231**	**816,487**
Plus: Net factor income payment from the rest of the world	(5,394)	(12,035)	(12,922)	(6,701)
Gross national product at factor cost	**580,855**	**663,596**	**741,309**	**809,786**
Less: Provision for consumption of fixed capital	46,659	54,584	63,140	72,442
National income (NNP)	**534,196**	**609,012**	**678,169**	**737,344**

Industrial Origin	1984	1985	1986	1987
Agriculture	173,000	166,380	176,809	203,709
Crops	110,152	103,235	103,917	120,372
Livestock	17,641	15,866	20,682	23,628
Fisheries	11,852	13,108	15,626	20,102
Forestry	9,399	9,216	9,655	10,721
Agricultural services	8,073	8,663	8,659	8,824
Simple agricultural processing products	15,883	16,292	18,270	20,062
Mining and quarrying	16,037	22,263	17,717	20,029
Manufacturing	181,604	190,696	216,736	258,426
Construction	51,549	52,964	54,755	60,777
Electricity and water supply	18,564	24,896	28,821	33,213
Transportation and communication	64,655	77,292	88,310	99,087
Wholesale and retail trade	118,101	136,021	130,106	146,690
Banking, insurance and real estate	29,820	31,645	33,449	45,652
Ownership of dwellings	38,579	42,745	46,598	49,989
Public administration and defense	45,090	48,679	50,681	52,726
Services	135,352	148,950	162,386	179,946
Gross domestic product at factor cost	**872,351**	**942,531**	**1,006,368**	**1,150,244**
Plus: Net factor income payment from the rest of the world	(11,451)	(17,598)	(22,437)	(22,394)
Gross national product at factor cost	**860,900**	**924,933**	**983,931**	**1,127,850**
Less: Provision for consumption of fixed capital	82,543	92,958	104,016	116,507
National income (NNP)	**778,357**	**831,975**	**879,915**	**1,011,343**

(Continued on page 99)

Table A-1.2 (Continued)

(Millions of Baht)

Industrial Origin	1988	1989	1990
Agriculture	251,591	278,837	278,384
Crops	157,372	174,804	164,087
Livestock	25,922	29,797	32,897
Fisheries	25,233	27,449	32,268
Forestry	10,266	8,247	6,832
Agricultural services	9,835	10,539	10,748
Simple agricultural processing products	22,963	28,001	31,552
Mining and quarrying	24,022	28,897	31,352
Manufacturing	308,447	392,688	471,266
Construction	71,149	97,981	127,912
Electricity and water supply	35,229	42,391	47,608
Transportation and communication	115,943	136,861	155,392
Wholesale and retail trade	189,106	225,061	278,021
Banking, insurance and real estate	53,197	65,626	89,691
Ownership of dwellings	52,654	56,686	60,461
Public administration and defense	56,488	64,621	76,560
Services	199,136	230,697	274,316
Gross domestic product at factor cost	**1,356,962**	**1,620,366**	**1,890,963**
Plus: Net factor income payment from the rest of the world	(24,770)	(23,347)	(27,118)
Gross national product at factor cost	**1,332,192**	**1,597,019**	**1,863,845**
Less: Provision for consumption of fixed capital	133,421	157,125	191,123
National income (NNP)	**1,198,771**	**1,439,894**	**1,672,722**

Source: NESDB, National Income of Thailand (Rebased Series).

Table A-2.1 National Income in Current Prices

(Millions of Baht)

Year	Compensation of Employees	Income from Unincorporated Enterprises		
		Farm Income	Others	Total
1970	27,661	32,524	43,797	76,321
1971	30,627	30,301	46,461	76,762
1972	34,557	35,379	48,308	83,687
1973	42,616	49,291	63,768	113,059
1974	52,737	61,946	79,453	141,399
1975	62,666	66,836	85,108	151,944
1976	74,084	74,429	96,790	171,219
1977	86,577	77,658	119,765	197,423
1978	107,657	94,263	144,442	238,705
1979	131,877	100,874	156,184	257,058
1980	171,495	114,643	173,657	288,300
1981	198,599	120,401	202,613	323,014
1982	233,256	110,182	220,688	330,870
1983	268,096	132,040	214,468	346,508
1984	286,813	121,201	237,146	358,347
1985	3,042,227	113,889	241,233	355,122
1986	319,012	122,574	267,138	389,712
1987	354,745	142,957	320,005	462,962
1988	4,078,868	178,850	371,365	550,215
1989	478,289	182,921	466,140	649,061
1990E	556,372	169,586	522,403	691,989

Year	Income from Property Received by Household and Private Non-Profit Institutions					
	Rent					
	Farm			Nonfarm		Total Rent
	Actual Rent	Imputed Rent	Total Farm	Residential	Non-Residential	
1970	333	2,223	2,556	7,677	1,582	11,815
1971	323	2,105	2,428	8,148	1,552	12,128
1972	401	2,503	2,904	8,512	1,684	13,100
1973	577	3,921	4,498	9,612	2,203	16,313
1974	633	4,252	4,885	11,257	2,729	18,871
1975	668	4,409	5,077	11,949	2,919	19,945
1976	691	4,517	5,208	13,172	3,256	21,636
1977	767	4,970	5,737	14,422	3,840	23,999
1978	796	5,047	5,843	15,487	4,554	25,884
1979	853	6,011	6,864	17,008	5,196	29,068
1980	1,081	7,628	8,709	195,228	5,979	34,216
1981	1,323	9,324	10,647	22,177	7,154	39,978
1982	1,324	9,854	11,178	25,234	7,521	43,933
1983	1,448	10,809	12,257	28,434	7,967	48,658
1984	1,356	10,029	11,385	30,074	8,620	50,079
1985	1,304	8,916	10,220	32,973	8,799	51,992
1986	1,360	8,430	9,790	37,093	9,833	56,716
1987	1,527	10,059	11,586	39,774	11,279	62,639
1988	1,697	10,519	12,216	41,922	13,909	68,047
1989	1,808	11,075	12,883	45,200	16,609	746,922
1990E	1,866	11,506	13,372	47,507	19,551	80,430

(Continued on page 101)

Table A-2.1 (Continued)

(Millions of Baht)

Year	Income from Property Received by Household and Private Non-Profit Institutions			Savings of Corporations and Gov. Enterprises	Direct Taxes on Corporations
	Interest	Dividend	Total		
1970	1,617	341	13,773	3,171	903
1971	2,123	345	14,596	2,970	981
1972	2,471	410	15,981	4,161	1,006
1973	3,128	718	20,159	7,537	1,503
1974	4,270	897	24,038	9,254	2,789
1975	5,138	935	26,018	8,105	3,629
1976	6,969	1,100	29,705	9,936	3,733
1977	8,549	1,184	33,732	11,029	4,696
1978	10,541	1,496	37,921	13,635	6,459
1979	13,149	2,104	44,321	16,087	7,857
1980	21,842	1,975	58,033	14,179	9,625
1981	29,029	2,602	71,609	16,328	13,467
1982	37,322	2,705	83,960	15,886	12,881
1983	43,882	3,122	95,662	23,171	13,325
1984	55,788	3,873	109,740	27,530	14,753
1985	65,845	4,085	121,922	28,883	15,526
1986	62,554	4,004	123,274	31,374	15,705
1987	52,573	6,521	121,733	47,263	18,003
1988	62,612	9,427	140,086	67,452	27,908
1989	61,438	11,782	147,912	95,648	40,152
1990E	79,095	17,446	176,971	120,629	61,636

Year	Corporate Transfer Payment	General Gov. Income from Property and Enterpreneurship	Interest on Public Debt	Interest on Consumers' Debt	National Income
1970	221	1,091	1,442	364	121,335
1971	201	1,259	1,790	436	125,170
1972	262	1,359	2,460	445	138,108
1973	366	1,639	3,135	584	183,160
1974	435	2,853	3,426	677	229,402
1975	607	2,743	3,455	1,046	251,211
1976	821	2,803	3,816	1,511	286,974
1977	899	2,801	4,836	19,112	330,409
1978	1,021	3,310	6,011	2,697	400,000
1979	1,172	3,565	7,793	3,207	450,937
1980	1,291	5,315	10,929	3,775	533,534
1981	1,520	8,075	14,690	4,534	613,388
1982	1,717	7,884	18,641	5,135	662,678
1983	1,746	13,224	21,519	6,062	734,151
1984	2,116	8,491	26,303	8,210	773,277
1985	1,981	13,273	30,291	9,194	801,449
1986	1,865	15,737	35,933	8,295	852,451
1987	2,025	17,325	36,667	9,532	977,857
1988	2,687	17,045	40,034	12,512	1,160,715
1989	3,063	20,086	44,399	16,891	1,372,921
1990E	3,922	23,400	39,790	20,480	1,574,649

E = Estimated.

Source: NESDB.

Table A-2.2 National Income in Current Prices (Rebased Series)

(Millions of Baht)

Year	Compensation of Employees	Income from Unincorporated Enterprises		
		Farm Income	Others	Total
1980	171,561	112,833	174,275	287,108
1981	196,172	118,280	197,812	316,092
1982	233,235	109,069	233,038	342,127
1983	261,644	140,273	210,695	350,968
1984	277,252	125,892	236,944	362,836
1985	294,853	116,624	265,352	381,976
1986	309,794	126,009	286,463	412,472
1987	343,902	135,655	357,233	492,888
1988	393,083	152,323	438,343	590,666
1989	458,191	161,181	531,901	693,062
1990	545,388	161,230	559,904	721,134

Year	Income from Property Received by Household and Private Non-Profit Institutions					
	Rent					
	Farm			Nonfarm		
	Actual Rent	Imputed Rent	Total Farm	Residential	Non-Residential	Total Rent
1980	1,080	8,302	9,382	18,435	7,483	35,300
1981	1,374	10,541	11,915	21,294	8,709	41,918
1982	1,324	10,720	12,044	24,868	10,815	47,727
1983	1,363	10,918	12,281	28,414	11,814	52,509
1984	1,361	10,953	12,314	30,970	14,966	58,250
1985	1,610	11,020	12,630	33,644	16,618	62,892
1986	1,854	10,778	12,632	35,869	19,016	67,517
1987	1,867	11,210	13,077	37,616	21,461	72,154
1988	1,908	11,837	13,745	38,731	24,333	76,809
1989	2,038	12,437	14,475	40,605	29,944	85,024
1990	1,734	10,411	12,145	42,164	35,334	89,643

Year	Income from Property Received by Household and Private Non-Profit Institutions			Savings of Corporations and Gov. Enterprises	Direct Taxes on Corporations
	Interest	Dividend	Total		
1980	22,040	2,219	59,559	14,357	9,625
1981	29,015	2,950	73,883	16,727	13,467
1982	37,392	2,959	88,078	16,048	12,861
1983	44,740	3,295	100,544	24,186	13,325
1984	564,000	4,462	119,112	28,300	14,753
1985	66,706	4,410	134,008	30,050	15,526
1986	63,510	4,067	135,094	33,400	15,705
1987	54,106	6,693	132,953	50,345	18,003
1988	64,709	8,696	150,216	69,590	27,908
1989	91,644	11,998	188,666	97,909	40,152
1990	135,241	16,650	241,534	138,365	61,602

(Continued on page 103)

Table A-2.2 (Continued)

(Millions of Baht)

Year	Corporate Transfer Payment	General Gov. Income from Property and Enterpreneurship	Interest on Public Debt	Interest on Consumers' Debt	National Income
1980	1,341	5,315	10,905	3,765	534,196
1981	1,685	8,075	14,600	4,489	609,012
1982	1,829	7,884	18,778	5,135	678,169
1983	1,790	13,224	22,275	6,062	737,344
1984	2,247	8,493	26,762	7,910	778,357
1985	2,051	13,273	30,519	9,243	831,975
1986	1,970	15,737	35,959	8,298	879,915
1987	2,136	17,325	36,695	9,514	1,011,343
1988	2,868	17,045	40,061	12,544	1,196,771
1989	3,241	19,985	44,421	16,911	1,439,894
1990	4,989	23,210	39,971	23,529	1,672,722

Source: NESDB.

Table A-3.1 Gross National Product and National Income at Current Market Prices by Industrial Origin

(Millions of Baht)

Industrial Origin	1970	1971	1972	1973
Agriculture	38,163	36,666	43,130	61,523
Crops	24,429	21,990	26,787	41,641
Livestock	3,925	4,224	4,467	4,396
Fisheries	2,612	2,908	3,533	4,356
Forestry	2,433	2,439	2,608	3,750
Agricultural services	1,002	1,233	1,519	2,029
Simple agricultural processing products	3,762	3,872	4,216	5,351
Mining and quarrying	4,382	4,636	4,787	5,127
Manufacturing	23,503	26,934	31,311	42,643
Construction	7,818	7,985	7,967	8,967
Electricity and water supply	1,624	1,932	2,288	2,725
Transportation and communication	9,161	9,897	10,711	12,806
Wholesale and retail trade	27,108	26,520	27,719	39,082
Banking, insurance and real estate	3,646	4,010	4,283	5,631
Ownership of dwellings	8,520	9,120	9,578	10,791
Public administration and defense	6,721	7,251	7,880	9,131
Services	16,739	18,466	20,422	23,684
Gross domestic product (GDP)	**147,385**	**153,417**	**170,076**	**222,110**
Plus: Net factor income payment from the rest of the world	221	(138)	(609)	(872)
Gross national product (GNP)	**147,606**	**153,279**	**169,467**	**221,238**
Less: Indirect taxes less subsidies	16,097	16,541	18,341	23,305
Provision for consumption of fixed capital	10,174	11,568	13,018	14,773
National income (NNP)	**121,335**	**125,170**	**138,108**	**183,160**
Per capita GNP (Baht)	4,058	4,104	4,420	5,623

(Continued on page 104)

Table A-3.1 (Continued)

(Millions of Baht)

Industrial Origin	1974	1975	1976	1977
Agriculture	75,420	81,521	92,460	99,970
Crops	50,957	55,469	62,531	62,943
Livestock	7,264	7,591	8,303	10,561
Fisheries	4,118	5,131	5,711	7,859
Forestry	4,404	4,261	5,669	6,054
Agricultural services	2,654	3,090	3,249	3,772
Simple agricultural processing products	6,023	5,979	6,997	8,781
Mining and quarrying	7,201	6,582	8,513	12,358
Manufacturing	53,475	56,636	68,186	81,432
Construction	10,698	11,594	15,093	19,717
Electricity and water supply	3,048	3,417	3,922	4,885
Transportation and communication	15,666	16,790	20,200	22,330
Wholesale and retail trade	52,815	58,177	62,118	74,248
Banking, insurance and real estate	7,588	8,019	8,874	10,676
Ownership of dwellings	12,643	13,546	14,963	16,492
Public administration and defense	11,448	13,368	14,680	16,336
Services	29,204	33,669	37,507	45,085
Gross domestic product (GDP)	**279,206**	**303,319**	**346,516**	**403,529**
Plus: Net factor income payment from the rest of the world	(94)	(13)	(884)	(1,277)
Gross national product (GNP)	**279,112**	**303,306**	**345,632**	**402,252**
Less: Indirect taxes less subsidies	32,481	31,842	35,234	44,780
Provision for consumption of fixed capital	17,229	20,253	23,424	27,063
National income (NNP)	**229,402**	**251,211**	**286,974**	**330,409**
Per capita GNP (Baht)	6,916	7,328	8,136	9,234

(Continued on page 105)

Table A-3.1 (Continued)

(Millions of Baht)

Industrial Origin	1978	1979	1980	1981
Agriculture	119,638	134,148	152,852	162,987
Crops	77,537	86,240	101,437	105,748
Livestock	10,009	12,444	15,448	15,828
Fisheries	10,345	9,461	8,115	10,617
Forestry	7,274	9,226	8,613	9,560
Agricultural services	4,480	4,288	5,447	6,681
Simple agricultural processing products	9,993	12,489	13,752	14,553
Mining and quarrying	16,608	18,498	22,147	21,556
Manufacturing	97,658	117,611	139,936	169,461
Construction	24,393	27,004	34,764	38,135
Electricity and water supply	5,667	6,499	6,289	10,901
Transportation and communication	27,462	32,179	37,863	45,850
Wholesale and retail trade	90,299	96,875	110,176	137,491
Banking, insurance and real estate	13,650	16,336	19,926	22,639
Ownership of dwellings	17,910	19,813	22,798	26,025
Public administration and defense	19,829	23,484	30,711	33,281
Services	55,112	66,414	81,047	91,869
Gross domestic product (GDP)	**488,226**	**558,861**	**658,509**	**760,195**
Plus: Net factor income payment from the rest of the world	(3,622)	(6,225)	(5,394)	(12,035)
Gross national product (GNP)	**484,604**	**552,636**	**653,115**	**748,160**
Less: Indirect taxes less subsidies	52,957	64,496	76,233	84,725
Provision for consumption of fixed capital	31,647	37,203	43,358	50,001
National income (NNP)	**400,000**	**450,937**	**533,534**	**613,388**
Per capita GNP (Baht)	10,858	12,098	13,980	15,673

(Continued on page 106)

Table A-3.1 (Continued)

(Millions of Baht)

Industrial Origin	1982	1983	1984	1985
Agriculture	156,839	185,628	175,190	169,895
Crops	100,065	121,030	113,069	105,221
Livestock	13,999	18,985	16,883	14,995
Fisheries	10,984	12,365	11,339	12,763
Forestry	8,654	9,046	9,212	8,962
Agricultural services	7,006	6,175	6,791	7,438
Simple agricultural processing products	16,131	18,027	17,896	20,516
Mining and quarrying	25,110	26,403	32,954	40,167
Manufacturing	176,360	194,344	218,050	224,456
Construction	41,500	47,985	56,092	56,824
Electricity and water supply	15,672	17,067	18,618	23,590
Transportation and communication	55,639	60,809	69,530	78,076
Wholesale and retail trade	143,902	147,443	154,891	153,130
Banking, insurance and real estate	26,120	31,145	34,426	35,988
Ownership of dwellings	29,774	33,851	37,253	41,091
Public administration and defense	39,697	44,582	45,091	48,545
Services	109,389	120,797	131,389	142,637
Gross domestic product (GDP)	**820,002**	**910,054**	**973,412**	**1,014,399**
Plus: Net factor income payment from the rest of the world	(12,930)	(6,701)	(11,451)	(17,598)
Gross national product (GNP)	**807,072**	**903,353**	**961,961**	**996,801**
Less: Indirect taxes less subsidies	87,374	104,506	115,708	113,917
Provision for consumption of fixed capital	57,020	64,696	72,976	81,436
National income (NNP)	**662,722**	**734,151**	**773,277**	**801,449**
Per capita GNP (Baht)	16,559	18,164	18,968	19,287

(Continued on page 107)

Table A-3.1 (Continued)

(Millions of Baht)

Industrial Origin	1986	1987	1988	1989	1990E
Agriculture	178,140	205,592	250,384	266,379	254,523
Crops	106,997	122,809	160,179	167,521	164,641
Livestock	19,784	22,445	24,623	28,582	32,006
Fisheries	15,319	19,835	21,655	21,252	22,519
Forestry	8,979	9,757	8,944	7,482	5,540
Agricultural services	7,109	8,061	8,729	9,221	9,441
Simple agricultural processing products	19,952	22,682	26,254	32,321	34,958
Mining and quarrying	34,607	38,491	47,657	60,648	73,500
Manufacturing	258,644	299,327	373,326	453,258	535,396
Construction	56,572	66,097	84,791	112,283	146,817
Electricity and water supply	27,300	31,266	34,315	41,499	47,367
Transportation and communication	85,368	92,943	106,696	123,047	138,752
Wholesale and retail trade	171,035	195,696	240,080	272,748	312,738
Banking, insurance and real estate	37,208	50,366	64,979	87,845	312,738
Ownership of dwellings	44,842	48,802	52,697	58,430	64,355
Public administration and defense	50,580	52,700	56,397	64,326	74,603
Services	151,072	171,867	195,655	235,515	278,630
Gross domestic product (GDP)	**1,095,368**	**1,253,147**	**1,506,977**	**1,775,978**	**2,051,208**
Plus: Net factor income payment from the rest of the world	(22,437)	(22,394)	(24,770)	(23,404)	(21,144)
Gross national product (GNP)	**1,072,931**	**1,230,753**	**1,482,207**	**1,752,574**	**2,030,064**
Less: Indirect taxes less subsidies	127,049	149,681	202,980	235,903	294,420
Provision for consumption of fixed capital	93,431	103,215	118,512	143,750	160,995
National income (NNP)	**852,451**	**977,857**	**1,160,715**	**1,372,921**	**1,574,649**
Per capita GNP (Baht)	20,377	22,960	27,179	31,608	36,032

E = Estimated.

Source: NESDB, National Income of Thailand.

Table A-3.2 Gross National Product and National Income at Current Market Prices by Industrial Origin (Rebased Series)

(Millions of Baht)

Industrial Origin	1980	1981	1982	1983
Agriculture	153,960	162,390	156,098	184,752
Crops	100,705	104,246	98,719	119,679
Livestock	17,077	17,466	15,283	20,178
Fisheries	8,350	10,720	10,946	12,408
Forestry	8,775	9,695	8,846	9,338
Agricultural services	5,691	6,901	7,270	7,783
Simple agricultural processing products	13,362	13,362	15,034	15,366
Mining and quarrying	11,727	11,208	13,416	14,106
Manufacturing	142,504	172,143	179,438	203,837
Construction	29,383	34,696	39,890	46,632
Electricity and water supply	6,373	10,814	15,601	17,093
Transportation and communication	34,894	41,648	54,350	56,613
Wholesale and retail trade	116,711	138,594	161,738	152,380
Banking, insurance and real estate	20,503	21,833	25,542	30,875
Ownership of dwellings	22,682	26,344	30,922	35,732
Public administration and defense	30,718	33,361	39,815	44,704
Services	93,027	107,325	124,759	134,265
Gross domestic product (GDP)	**662,482**	**760,356**	**841,569**	**920,989**
Plus: Net factor income payment from the rest of the world	(5,394)	(12,035)	(12,922)	(6,701)
Gross national product (GNP)	**657,088**	**748,321**	**828,647**	**914,288**
Less: Indirect taxes less subsidies	76,233	84,725	87,338	104,502
Provision for consumption of fixed capital	46,659	54,584	63,140	72,442
National income (NNP)	**534,196**	**609,012**	**678,169**	**737,344**
Per capita GNP (Baht)	14,065	15,682	17,012	18,404

(Continued on page 109)

Table A-3.2 (Continued)

(Millions of Baht)

Industrial Origin	1984	1985	1986	1987
Agriculture	173,642	167,026	177,537	204,521
Crops	110,438	103,532	104,237	120,750
Livestock	17,696	15,927	20,752	23,725
Fisheries	11,860	13,115	15,634	20,115
Forestry	9,692	9,497	9,985	11,045
Agricultural services	8,073	8,663	8,659	8,824
Simple agricultural processing products	15,883	16,292	18,270	20,062
Mining and quarrying	18,543	25,962	19,753	22,221
Manufacturing	226,360	231,598	270,605	315,291
Construction	52,427	53,903	55,715	62,641
Electricity and water supply	18,609	24,955	28,888	33,279
Transportation and communication	65,078	78,075	88,202	99,344
Wholesale and retail trade	175,026	193,810	189,986	223,129
Banking, insurance and real estate	33,491	35,271	37,102	49,980
Ownership of dwellings	39,728	43,934	47,899	51,773
Public administration and defense	45,090	48,679	50,681	52,726
Services	140,076	153,283	167,029	185,008
Gross domestic product (GDP)	**988,070**	**1,056,496**	**1,133,397**	**1,299,913**
Plus: Net factor income payment from the rest of the world	(11,451)	(17,598)	(22,437)	(22,394)
Gross national product (GNP)	**976,619**	**1,038,898**	**1,110,960**	**1,277,519**
Less: Indirect taxes less subsidies	115,719	113,965	127,029	149,669
Provision for consumption of fixed capital	82,543	92,958	104,016	116,507
National income (NNP)	**778,357**	**831,975**	**879,915**	**1,011,343**
Per capita GNP (Baht)	19,287	20,141	21,157	23,911

(Continued on page 110)

Table A-3.2 (Continued)

(Millions of Baht)

Industrial Origin	1988	1989	1990
Agriculture	252,346	279,690	279,081
Crops	157,783	175,229	164,547
Livestock	26,022	29,876	32,984
Fisheries	25,254	27,461	32,278
Forestry	10,489	8,584	6,972
Agricultural services	9,835	10,539	10,748
Simple agricultural processing products	22,963	28,001	31,552
Mining and quarrying	26,599	31,805	34,362
Manufacturing	403,034	497,053	595,873
Construction	74,449	102,124	133,438
Electricity and water supply	35,298	42,465	47,687
Transportation and communication	116,611	138,085	157,319
Wholesale and retail trade	266,257	306,725	377,527
Banking, insurance and real estate	66,220	87,203	122,063
Ownership of dwellings	55,416	60,457	66,238
Public administration and defense	56,488	64,621	76,560
Services	207,086	246,248	291,952
Gross domestic product (GDP)	**1,559,804**	**1,856,476**	**2,182,100**
Plus: Net factor income payment from the rest of the world	(24,770)	(23,347)	(27,118)
Gross national product (GNP)	**1,535,034**	**1,833,129**	**2,154,982**
Less: Indirect taxes less subsidies	202,842	236,110	291,137
Provision for consumption of fixed capital	133,421	157,125	191,123
National income (NNP)	**1,198,771**	**1,439,894**	**1,672,722**
Per capita GNP (Baht)	28,256	33,200	38,426

Source: NESDB, National Income of Thailand (Rebased Series).

Table A-4.1 Gross National Product at 1972 Prices by Industrial Origin

(Millions of Baht)

Industrial Origin	1970	1971	1972	1973
Agriculture	42,064	43,875	43,130	47,201
Crops	26,723	27,699	26,787	30,619
Livestock	4,159	4,326	4,467	4,448
Fisheries	3,233	3,320	3,533	3,327
Forestry	2,683	2,823	2,608	2,618
Agricultural services	1,341	1,427	1,519	1,756
Simple agricultural processing products	3,925	4,280	4,216	4,433
Mining and quarrying	4,452	4,791	4,787	4,532
Manufacturing	24,893	27,649	31,311	36,238
Construction	8,233	8,340	7,967	7,793
Electricity and water supply	1,623	1,957	2,288	2,671
Transportation and communication	10,052	10,265	10,711	11,662
Wholesale and retail trade	27,074	26,992	27,719	31,422
Banking, insurance and real estate	3,846	4,208	4,283	4,879
Ownership of dwellings	8,708	9,104	9,578	10,130
Public administration and defense	6,895	7,342	7,880	8,590
Services	17,854	18,897	20,422	21,727
Gross domestic product (GDP)	**155,694**	**163,420**	**170,076**	**186,845**
Plus: Net factor income payment from the rest of the world	311	(220)	(609)	(560)
Gross national product (GNP)	**156,005**	**163,200**	**169,467**	**186,285**
Per capita GNP (Baht)	4,289	4,370	4,420	4,735

Industrial Origin	1974	1975	1976	1977
Agriculture	48,577	50,700	53,764	55,000
Crops	31,125	32,606	34,762	33,815
Livestock	4,845	5,118	5,618	6,228
Fisheries	3,302	3,491	3,427	4,249
Forestry	2,981	2,898	3,078	2,884
Agricultural services	1,850	1,959	2,061	2,233
Simple agricultural processing products	4,474	4,628	4,818	5,591
Mining and quarrying	4,714	4,264	5,054	6,172
Manufacturing	38,477	40,708	46,943	53,655
Construction	7,329	7,625	9,354	11,161
Electricity and water supply	2,856	3,263	3,664	4,238
Transportation and communication	12,431	12,445	13,205	14,604
Wholesale and retail trade	33,367	34,860	37,880	41,969
Banking, insurance and real estate	5,287	5,304	5,634	6,303
Ownership of dwellings	10,708	11,235	11,753	12,339
Public administration and defense	8,782	9,694	10,594	11,671
Services	22,451	24,330	25,749	28,615
Gross domestic product (GDP)	**194,979**	**204,428**	**223,594**	**245,727**
Plus: Net factor income payment from the rest of the world	330	322	(392)	(601)
Gross national product (GNP)	**195,309**	**204,750**	**223,202**	**245,126**
Per capita GNP (Baht)	4,839	4,947	5,254	5,627

(Continued on page 112)

Table A-4.1 (Continued)

(Millions of Baht)

Industrial Origin	1978	1979	1980	1981
Agriculture	61,856	60,726	61,770	65,093
Crops	39,563	38,742	39,783	42,083
Livestock	6,998	7,337	7,461	7,629
Fisheries	4,050	3,335	3,143	3,977
Forestry	2,613	2,993	2,610	2,325
Agricultural services	2,426	2,192	2,265	2,467
Simple agricultural processing products	6,206	6,127	6,508	6,612
Mining and quarrying	7,435	7,691	7,917	7,638
Manufacturing	58,337	63,163	64,984	69,069
Construction	13,037	12,855	13,478	14,298
Electricity and water supply	4,874	5,376	5,908	6,591
Transportation and communication	15,717	17,932	20,045	20,641
Wholesale and retail trade	45,593	46,779	50,677	55,096
Banking, insurance and real estate	7,467	8,131	8,286	8,353
Ownership of dwellings	12,945	13,665	14,289	14,929
Public administration and defense	12,272	14,125	15,437	16,822
Services	31,845	35,354	36,681	39,909
Gross domestic product (GDP)	**271,378**	**285,797**	**299,472**	**318,439**
Plus: Net factor income payment from the rest of the world	(1,767)	(2,778)	(1,404)	(353)
Gross national product (GNP)	**269,611**	**283,019**	**298,068**	**318,086**
Per capita GNP (Baht)	6,041	6,196	6,380	6,601

Industrial Origin	1982	1983	1984	1985
Agriculture	67,082	70,061	73,977	78,539
Crops	43,311	45,788	48,775	51,620
Livestock	8,177	8,464	8,971	9,352
Fisheries	3,745	4,008	3,974	4,105
Forestry	2,209	2,188	2,185	2,117
Agricultural services	2,456	2,084	2,283	2,420
Simple agricultural processing products	7,184	7,529	7,789	8,925
Mining and quarrying	8,077	7,988	9,535	9,901
Manufacturing	70,823	76,773	81,962	81,463
Construction	14,202	15,787	17,547	16,635
Electricity and water supply	7,548	8,253	9,023	9,934
Transportation and communication	22,711	24,536	27,074	28,171
Wholesale and retail trade	54,508	57,617	62,074	64,162
Banking, insurance and real estate	9,158	10,524	11,534	11,772
Ownership of dwellings	15,490	16,059	16,649	17,357
Public administration and defense	17,820	20,103	19,958	21,358
Services	43,961	47,707	51,405	54,821
Gross domestic product (GDP)	**331,380**	**355,408**	**380,738**	**394,113**
Plus: Net factor income payment from the rest of the world	(3,444)	(1,076)	(2,954)	(4,965)
Gross national product (GNP)	**327,936**	**354,332**	**377,784**	**389,148**
Per capita GNP (Baht)	6,728	7,125	7,449	7,530

(Continued on page 113)

Table A-4.1 (Continued)

(Millions of Baht)

Industrial Origin	1986	1987	1988	1989	1990E
Agriculture	78,775	78,601	86,629	92,386	90,711
Crops	49,275	47,296	54,125	58,680	56,070
Livestock	10,931	11,560	12,238	13,326	14,330
Fisheries	4,460	5,093	5,296	4,951	4,878
Forestry	2,339	2,243	1,922	1,417	982
Agricultural services	2,295	2,534	2,641	2,610	2,564
Simple agricultural processing products	9,475	9,875	10,407	11,402	11,887
Mining and quarrying	9,814	10,546	12,790	15,102	18,138
Manufacturing	90,263	102,289	119,464	137,260	156,043
Construction	16,159	18,307	22,206	26,926	33,032
Electricity and water supply	11,000	12,341	14,008	16,516	19,189
Transportation and communication	30,190	32,699	36,207	40,650	45,069
Wholesale and retail trade	67,610	76,359	87,852	100,984	111,436
Banking, insurance and real estate	11,952	15,784	19,614	25,163	33,656
Ownership of dwellings	18,027	18,971	20,205	21,427	22,693
Public administration and defense	22,232	22,946	23,982	23,691	24,063
Services	57,467	63,792	69,510	74,090	77,580
Gross domestic product (GDP)	**413,489**	**452,635**	**512,467**	**574,195**	**631,610**
Plus: Net factor income payment from the rest of the world	(6,554)	(6,386)	(6,711)	(5,725)	(4,640)
Gross national product (GNP)	**406,935**	**446,249**	**505,756**	**568,470**	**626,970**
Per capita GNP (Baht)	7,728	8,325	9,274	10,252	11,128

E = Estimated.

Source: NESDB, National Income of Thailand.

Table A-4.2 Gross National Product at 1988 Prices by Industrial Origin

(Millions of Baht)

Industrial Origin	1980	1981	1982	1983
Agriculture	184,576	194,023	198,825	208,312
Crops	113,768	120,954	123,193	131,122
Livestock	18,855	18,331	18,880	19,868
Fisheries	16,238	19,275	20,847	21,036
Forestry	13,217	11,992	11,254	11,241
Agricultural services	7,843	8,505	8,475	8,736
Simple agricultural processing products	14,655	14,966	16,176	16,309
Mining and quarrying	6,861	8,327	11,022	11,659
Manufacturing	211,031	224,294	230,235	255,995
Construction	41,882	44,690	48,008	53,772
Electricity and water supply	15,614	17,525	20,732	21,171
Transportation and communication	65,669	60,230	69,607	72,308
Wholesale and retail trade	163,680	177,866	183,928	181,627
Banking, insurance and real estate	28,292	26,922	29,738	34,657
Ownership of dwellings	43,299	44,740	45,896	46,804
Public adminstration and defense	37,756	41,454	43,514	48,074
Services	115,073	127,635	137,996	142,053
Gross domestic product (GDP)	**913,733**	**967,706**	**1,019,501**	**1,076,432**
Plus: Net factor income payment from the rest of the world	(3,049)	(9,285)	(9,595)	(3,627)
Gross national product (GNP)	**910,384**	**958,421**	**1,009,906**	**1,072,805**
Per capita GNP (Baht)	19,493	20,085	20,733	21,594

Industrial Origin	1984	1985	1986	1987
Agriculture	217,518	227,324	228,191	228,346
Crops	139,171	146,934	141,776	136,696
Livestock	20,008	20,601	23,012	24,912
Fisheries	20,429	20,193	21,816	24,558
Forestry	11,503	11,424	12,274	11,745
Agricultural services	8,980	9,403	9,225	9,164
Simple agricultural processing products	17,427	18,769	20,088	21,271
Mining and quarrying	16,167	21,553	21,511	24,107
Manufacturing	271,855	268,133	294,521	341,750
Construction	59,390	59,269	60,138	66,060
Electricity and water supply	23,230	26,959	29,890	31,515
Transportation and communication	80,548	85,922	92,046	100,585
Wholesale and retail trade	189,102	197,432	207,211	229,859
Banking, insurance and real estate	37,181	38,145	39,404	51,834
Ownership of dwellings	48,023	49,433	50,647	52,575
Public adminstration and defense	47,448	50,913	52,329	53,717
Services	147,891	166,172	181,289	196,499
Gross domestic product (GDP)	**1,138,353**	**1,191,255**	**1,257,177**	**1,376,847**
Plus: Net factor income payment from the rest of the world	(10,806)	(18,768)	(23,761)	(23,310)
Gross national product (GNP)	**1,127,547**	**1,172,487**	**1,233,416**	**1,353,537**
Per capita GNP (Baht)	22,267	22,731	23,489	25,334

(Continued on page 115)

Table A-4.2 (Continued)

(Millions of Baht)

Industrial Origin	1988	1989	1990
Agriculture	252,346	276,729	266,414
Crops	157,783	175,033	163,046
Livestock	26,022	28,432	29,175
Fisheries	25,254	27,936	30,067
Forestry	10,489	8,551	6,389
Agricultural services	9,835	10,019	9,655
Simple agricultural processing products	22,963	26,758	28,082
Mining and quarrying	26,599	28,404	31,457
Manufacturing	403,034	467,666	542,169
Construction	74,449	95,554	114,420
Electricity and water supply	35,298	42,259	48,233
Transportation and communication	116,611	128,754	147,103
Wholesale and retail trade	266,257	295,668	341,084
Banking, insurance and real estate	66,220	82,834	109,467
Ownership of dwellings	55,416	58,213	60,756
Public adminstration and defense	56,488	57,277	61,366
Services	207,086	218,157	231,760
Gross domestic product (GDP)	**1,559,804**	**1,751,515**	**1,954,229**
Plus: Net factor income payment from the rest of the world	(24,770)	(20,381)	(14,408)
Gross national product (GNP)	**1,535,034**	**1,731,134**	**1,939,821**
Per capita GNP (Baht)	28,256	31,353	34,589

Source: NESDB, National Income of Thailand.

Table A-5.1 Gross Capital Stock by Sector at 1988 Prices

(Millions of Baht)

ITEMS	1970	1971	1972	1973
1. Agriculture	383,313	382,581	378,484	375,291
2. Mining and quarrying	18,847	19,606	21,347	21,409
3. Manufacturing	169,596	180,098	193,616	214,155
4. Construction	34,517	35,292	35,555	35,508
5. Electricity and water supply	36,707	40,736	45,340	49,797
6. Transportation and communication	413,889	427,871	437,589	448,570
7. Banking, insurance and real estate	258,069	258,011	259,086	268,919
8. Wholesale and retail trade	57,783	60,361	66,279	65,629
9. Ownership of dwellings	288,720	295,099	303,153	313,062
10. Public administration	14,181	15,587	16,948	17,725
11. Services	247,015	251,268	258,752	265,818
TOTAL	**1,922,637**	**1,966,509**	**2,016,149**	**2,075,885**

ITEMS	1974	1975	1976	1977
1. Agriculture	407,827	407,158	399,841	397,437
2. Mining and quarrying	22,325	17,199	18,599	20,300
3. Manufacturing	205,560	224,972	248,044	269,071
4. Construction	35,539	36,239	41,701	42,155
5. Electricity and water supply	53,437	58,197	64,845	74,836
6. Transportation and communication	459,461	476,262	490,911	517,608
7. Banking, insurance and real estate	273,744	279,868	288,887	302,192
8. Wholesale and retail trade	66,616	71,358	72,602	74,986
9. Ownership of dwellings	324,861	339,531	357,675	379,542
10. Public administration	18,073	18,654	19,771	20,895
11. Services	271,469	279,377	290,677	304,415
TOTAL	**2,138,913**	**2,208,816**	**2,293,552**	**2,403,438**

ITEMS	1978	1979	1980	1981
1. Agriculture	411,178	406,748	405,621	407,274
2. Mining and quarrying	21,670	24,337	27,509	29,765
3. Manufacturing	289,344	315,404	334,136	358,353
4. Construction	46,636	52,442	57,226	62,920
5. Electricity and water supply	86,661	99,312	119,237	144,001
6. Transportation and communication	527,827	562,221	598,370	631,794
7. Banking, insurance and real estate	308,097	314,510	333,384	346,532
8. Wholesale and retail trade	74,647	77,207	79,677	80,279
9. Ownership of dwellings	406,527	438,339	471,537	516,410
10. Public administration	21,898	23,122	25,080	31,491
11. Services	322,959	339,320	366,037	391,139
TOTAL	**2,517,445**	**2,652,963**	**2,817,814**	**2,999,959**

(Continued on page 117)

Table A-5.1 (Continued)

(Millions of Baht)

ITEMS	1982	1983	1984	1985
1. Agriculture	407,012	410,920	408,411	417,601
2. Mining and quarrying	46,868	51,343	66,993	73,303
3. Manufacturing	371,149	408,627	438,330	459,603
4. Construction	69,171	70,131	77,386	81,061
5. Electricity and water supply	165,244	191,104	219,310	244,330
6. Transportation and communication	654,055	687,934	711,740	734,851
7. Banking, insurance and real estate	355,056	361,689	374,303	391,645
8. Wholesale and retail trade	81,740	84,125	85,974	89,772
9. Ownership of dwellings	568,938	633,756	704,614	775,099
10. Public administration	38,336	44,885	53,517	62,035
11. Services	410,626	430,056	455,917	484,296
TOTAL	**3,168,196**	**3,374,569**	**3,596,494**	**3,813,595**

ITEMS	1986	1987	1988	1989	1990
1. Agriculture	434,499	438,021	447,898	458,527	477,653
2. Mining and quarrying	69,576	62,290	62,171	63,480	68,854
3. Manufacturing	491,693	546,113	624,420	722,037	830,690
4. Construction	83,806	88,539	103,149	114,294	136,482
5. Electricity and water supply	265,237	283,692	305,636	331,514	362,345
6. Transportation and communication	751,947	780,993	815,354	876,904	982,163
7. Banking, insurance and real estate	398,895	418,534	448,133	483,655	545,335
8. Wholesale and retail trade	90,734	94,840	96,469	100,343	109,338
9. Ownership of dwellings	858,099	961,651	1,073,466	1,217,564	1,387,641
10. Public administration	70,671	77,720	83,396	89,540	97,903
11. Services	503,680	524,802	553,247	588,463	646,033
TOTAL	**4,018,836**	**4,277,195**	**4,613,337**	**5,046,320**	**5,644,438**

Source: NESDB.

Table A-5.2 Gross Capital Stock by Type of Capital at 1988 Prices

(Millions of Baht)

ITEMS	1970	1971	1972	1973	1974
Private	1,652,254	1,672,595	1,697,687	1,736,240	1,781,560
Construction	701,399	711,312	723,762	739,078	757,640
Equipment	950,855	961,283	973,925	997,162	1,023,920
Public	270,383	293,914	318,462	339,645	357,353
Construction	171,424	186,931	201,925	215,781	226,984
Equipment	98,959	106,983	116,537	123,864	130,369
Total	1,922,637	1,966,509	2,016,149	2,075,885	2,138,913
Construction	872,823	898,243	925,687	954,859	984,624
Equipment	1,049,814	1,068,266	1,090,462	1,121,026	1,154,289

ITEMS	1975	1976	1977	1978	1979
Private	1,826,498	1,875,319	1,940,957	2,002,411	2,079,492
Construction	779,880	806,298	837,468	874,050	916,807
Equipment	1,046,618	1,069,021	1,103,489	1,128,361	1,162,685
Public	382,318	418,233	462,481	515,033	573,471
Construction	244,001	269,872	301,574	336,771	372,848
Equipment	138,317	148,361	160,907	178,262	200,623
Total	2,208,816	2,293,552	2,403,438	2,517,444	2,652,963
Construction	1,023,881	1,076,170	1,139,042	1,210,821	1,289,655
Equipment	1,184,935	1,217,382	1,264,396	1,306,623	1,363,308

ITEMS	1980	1981	1982	1983	1984
Private	2,168,191	2,269,315	2,366,111	2,495,216	2,631,267
Construction	973,326	1,032,456	1,098,190	1,181,130	1,273,937
Equipment	1,194,865	1,236,859	1,267,921	1,314,086	1,357,330
Public	649,622	730,643	802,085	879,354	965,228
Construction	425,157	482,993	541,335	600,291	665,857
Equipment	224,465	247,650	260,750	279,063	299,371
Total	2,817,813	2,999,958	3,168,196	3,374,570	3,596,495
Construction	1,398,483	1,515,449	1,639,525	1,781,421	1,939,794
Equipment	1,419,330	1,484,509	1,528,671	1,593,149	1,656,701

ITEMS	1985	1986	1987	1988	1989	1990
Private	2,756,971	2,884,793	3,075,937	3,345,162	3,704,719	4,201,956
Construction	1,360,816	1,459,804	1,581,765	1,728,617	1,930,223	2,173,621
Equipment	1,396,155	1,424,989	1,494,172	1,616,545	1,774,496	2,028,335
Public	1,056,624	1,134,043	1,201,258	1,268,176	1,341,601	1,442,482
Construction	733,186	792,002	844,590	904,418	9,700,009	1,053,196
Equipment	323,438	342,041	356,668	363,758	371,592	389,286
Total	3,813,595	4,018,836	4,277,195	4,613,338	5,046,320	5,644,438
Construction	2,094,002	2,251,806	2,426,355	2,633,035	2,900,232	3,226,817
Equipment	1,719,593	1,767,030	1,850,840	1,980,303	2,146,088	2,417,621

Source: NESDB.

Table A-6.1 Net Capital Stock by Sector at 1988 Prices

(Millions of Baht)

ITEMS	1970	1971	1972	1973
1. Agriculture	213,207	216,735	218,619	220,832
2. Mining and quarrying	10,187	10,662	11,749	11,986
3. Manufacturing	88,272	94,852	103,293	115,923
4. Construction	19,078	19,478	19,506	19,208
5. Electricity and water supply	27,709	30,100	32,893	35,349
6. Transportation and communication	233,819	245,689	255,502	266,948
7. Banking, insurance and real estate	126,040	127,638	129,898	137,955
8. Wholesale and retail trade	30,723	32,502	36,185	36,516
9. Ownership of dwellings	141,426	147,385	154,871	164,028
10. Public administration	8,850	9,332	9,755	9,658
11. Services	118,719	122,036	126,971	131,900
TOTAL	**1,018,030**	**1,056,409**	**1,099,244**	**1,150,304**

ITEMS	1974	1975	1976	1977
1. Agriculture	243,084	246,689	245,957	248,536
2. Mining and quarrying	12,731	10,011	10,927	12,050
3. Manufacturing	112,557	124,902	139,866	154,077
4. Construction	18,841	18,766	21,446	21,346
5. Electricity and water supply	36,794	39,080	42,959	49,717
6. Transportation and communication	277,077	289,092	301,484	323,795
7. Banking, insurance and real estate	143,547	150,002	157,839	168,632
8. Wholesale and retail trade	37,862	41,482	42,789	44,849
9. Ownership of dwellings	174,846	188,260	204,806	224,659
10. Public administration	9,241	9,207	9,700	10,259
11. Services	136,131	142,548	152,449	164,458
TOTAL	**1,202,710**	**1,260,039**	**1,330,222**	**1,422,379**

ITEMS	1978	1979	1980	1981
1. Agriculture	259,049	259,266	261,893	268,249
2. Mining and quarrying	13,032	14,864	16,924	18,453
3. Manufacturing	167,916	185,609	198,971	216,017
4. Construction	23,670	26,880	29,341	32,873
5. Electricity and water supply	58,116	66,684	82,535	102,972
6. Transportation and communication	333,207	358,942	385,987	411,618
7. Banking, insurance and real estate	175,230	182,445	198,866	209,222
8. Wholesale and retail trade	45,398	47,868	50,357	51,140
9. Ownership of dwellings	249,133	277,819	307,211	347,418
10. Public administration	10,759	11,615	12,952	17,185
11. Services	180,237	194,445	216,819	235,194
TOTAL	**1,515,746**	**1,626,438**	**1,761,856**	**1,910,395**

(Continued on page 120)

Table A-6.1 (Continued)

(Millions of Baht)

ITEMS	1982	1983	1984	1985
1. Agriculture	271,329	277,669	280,027	289,302
2. Mining and quarrying	29,460	32,849	43,483	48,685
3. Manufacturing	224,848	251,002	272,615	286,766
4. Construction	36,943	37,998	43,264	45,738
5. Electricity and water supply	119,652	140,375	163,014	181,981
6. Transportation and communication	426,135	449,681	463,930	478,227
7. Banking, insurance and real estate	216,644	223,584	234,649	248,810
8. Wholesale and retail trade	52,509	54,661	56,441	59,670
9. Ownership of dwellings	394,251	452,093	514,580	575,311
10. Public administration	21,311	24,703	29,218	33,350
11. Services	249,279	263,245	282,395	302,609
TOTAL	**2,042,362**	**2,207,862**	**2,383,616**	**2,550,448**

ITEMS	1986	1987	1988	1989	1990
1. Agriculture	302,440	308,306	316,601	325,715	342,559
2. Mining and quarrying	46,830	42,588	43,283	44,849	49,198
3. Manufacturing	306,198	344,437	406,649	485,063	576,885
4. Construction	47,736	51,106	64,353	74,537	94,278
5. Electricity and water supply	196,369	207,992	222,695	240,959	263,995
6. Transportation and communication	487,585	508,395	535,322	585,279	670,936
7. Banking, insurance and real estate	255,231	270,766	294,667	324,394	374,600
8. Wholesale and retail trade	60,591	63,812	65,506	68,880	75,987
9. Ownership of dwellings	646,925	737,046	833,227	958,838	1,107,057
10. Public administration	37,263	39,573	40,920	42,582	45,993
11. Services	315,385	329,099	349,649	376,115	422,000
TOTAL	**2,702,553**	**2,903,120**	**3,172,872**	**3,527,209**	**4,023,489**

Source: NESDB.

Table A-6.2 Net Capital Stock by Type of Capital at 1988 Prices

(Millions of Baht)

ITEMS	1970	1971	1972	1973	1974
Private	827,169	851,989	881,154	922,623	969,379
Construction	322,220	332,533	345,156	360,363	378,469
Equipment	504,949	519,456	535,998	652,260	590,910
Public	190,861	204,421	218,090	227,680	233,331
Construction	126,756	138,511	149,452	158,977	165,629
Equipment	64,105	65,910	68,638	68,703	67,702
Total	1,018,030	1,056,410	1,099,244	1,150,303	1,202,710
Construction	448,976	471,044	494,608	519,340	544,098
Equipment	569,054	585,366	604,636	630,963	658,612

ITEMS	1975	1976	1977	1978	1979
Private	1,014,372	1,062,065	1,124,566	1,181,395	1,251,603
Construction	399,837	424,882	454,087	488,004	527,275
Equipment	614,535	637,183	670,479	693,391	724,328
Public	245,667	268,157	297,814	334,352	374,835
Construction	177,757	198,226	223,897	252,367	281,006
Equipment	67,910	69,931	73,917	81,985	93,829
Total	1,260,039	1,330,222	1,422,380	1,515,747	1,626,438
Construction	577,594	623,108	677,984	740,371	808,281
Equipment	682,445	707,114	744,396	775,376	818,157

ITEMS	1980	1981	1982	1983	1984
Private	1,331,168	1,421,006	1,505,054	1,618,397	1,735,647
Construction	579,214	632,620	691,356	765,682	848,066
Equipment	751,954	788,386	813,698	852,715	887,581
Public	430,688	489,390	537,308	589,464	647,969
Construction	324,826	373,038	420,599	467,606	519,924
Equipment	105,862	116,352	116,709	121,858	128,045
Total	1,761,856	1,910,396	2,042,362	2,207,861	2,383,616
Construction	904,040	1,005,658	1,111,955	1,233,288	136,990
Equipment	857,816	904,738	930,407	974,573	1,015,626

ITEMS	1985	1986	1987	1988	1989	1990
Private	1,840,549	1,946,341	2,111,462	2,346,460	2,660,050	3,090,312
Construction	922,836	1,007,792	1,113,339	1,240,901	1,419,242	1,634,563
Equipment	917,713	938,549	998,123	1,105,559	1,240,808	1,455,749
Public	709,899	756,213	791,658	826,413	867,160	933,176
Construction	572,672	615,746	651,561	693,440	739,793	802,098
Equipment	137,227	140,467	140,097	132,973	127,367	131,078
Total	2,550,448	2,702,554	2,903,120	3,172,873	3,527,210	4,023,488
Construction	1,495,508	1,623,538	1,764,900	1,934,341	2,159,035	2,436,661
Equipment	1,054,940	1,079,016	1,138,220	1,238,532	1,368,175	1,586,827

Source: NESDB.

Table A-7 Employed Persons Working During Survey Period by Age Group and Sex

(Unit: Thousands)

Year	Male					
	<20	20-29	30-39	40-49	50 & Over	Total
1971	1,925.9	2,271.8	1,998.4	1,373.6	1,363.6	8,933.3
1972	1,928.3	2,293.1	2,031.0	1,375.7	1,298.1	8,926.2
1973	1,987.1	2,447.1	2,193.6	1,477.0	1,335.6	9,440.3
1974	1,757.8	2,529.0	2,266.0	1,551.2	1,388.2	9,492.3
1975	1,855.7	2,625.1	2,326.5	1,594.1	1,462.0	9,863.1
1976	1,878.5	2,662.9	2,396.1	1,633.9	1,532.1	10,103.4
1977	2,146.7	2,937.8	2,554.2	1,723.3	1,627.7	10,989.7
1978	2,304.5	3,086.0	2,649.4	1,777.3	1,684.0	11,504.2
1979	2,113.6	3,077.3	2,690.7	1,806.5	1,693.1	11,381.2
1980	2,243.6	3,202.6	2,804.8	1,861.1	1,745.5	11,857.6
1981	2,468.2	3,949.0	2,875.1	1,754.0	1,803.0	12,849.3
1982	2,543.3	3,978.6	2,988.6	1,774.5	1,846.5	13,131.5
1983	2,573.2	4,058.5	3,097.7	1,842.9	1,863.7	13,436.0
1984	2,507.7	4,227.3	3,260.0	1,910.6	1,954.7	13,860.3
1985	2,462.5	4,246.9	3,337.3	1,969.4	1,950.6	13,966.7
1986	2,538.8	4,390.0	3,442.2	2,056.0	1,955.2	14,382.2
1987	2,642.6	4,558.0	3,476.6	2,205.9	2,196.3	14,899.4
1988	2,668.9	4,827.9	3,614.4	2,287.2	2,314.9	15,713.3
1989	2,648.7	5,140.4	3,806.5	2,364.5	2,358.8	16,318.9
1990	2,498.4	5,135.7	3,929.6	2,447.3	2,492.1	16,503.1
Year	Female					
	<20	20-29	30-39	40-49	50 & Over	Total
1971	1,915.5	2,000.3	1,663.2	1,129.1	977.3	7,685.4
1972	1,871.3	1,909.4	1,568.3	1,051.1	803.5	7,203.6
1973	2,005.2	1,949.2	1,653.0	1,107.4	887.5	7,602.4
1974	1,830.7	2,064.0	1,721.0	1,171.3	879.9	7,666.8
1975	1,941.4	2,254.4	1,840.9	1,254.6	1,026.5	8,317.8
1976	1,951.6	2,237.9	1,867.2	1,240.2	1,010.8	8,307.6
1977	2,237.2	2,513.8	2,067.1	1,372.2	1,109.3	9,299.6
1978	2,398.7	2,784.1	2,304.2	1,515.1	1,216.6	10,218.7
1979	2,171.2	2,682.6	2,295.9	1,488.1	1,192.6	9,830.4
1980	2,314.4	2,911.9	2,455.3	1,629.1	1,337.8	10,648.5
1981	2,531.5	3,422.2	2,462.5	1,646.2	1,435.5	11,497.9
1982	2,551.6	3,415.1	2,551.3	1,659.3	1,506.0	11,683.3
1983	2,531.4	3,451.3	2,645.5	1,668.1	1,440.7	11,737.0
1984	2,564.9	3,571.8	2,753.4	1,738.5	1,500.2	12,128.8
1985	2,473.3	3,511.3	2,721.4	1,699.5	1,470.2	11,875.7
1986	2,543.8	3,579.4	2,870.3	1,771.1	1,533.1	12,297.7
1987	2,462.0	3,838.6	2,898.8	1,863.6	1,666.3	12,729.0
1988	2,583.1	4,182.5	3,146.6	2,011.6	1,815.7	13,739.5
1989	2,649.1	4,378.5	3,373.4	2,065.0	1,908.7	14,374.7
1990	2,485.3	4,352.0	3,442.5	2,133.8	2,023.3	14,436.9

(Continued on page 123)

Table A-7 (Continued)

(Unit: Thousands)

Year	Male & Female				Grand Total
	20-29	30-39	40-49	50 & Over	
1971	3,841.4	4,272.0	3,661.6	2,502.7	16,618.6
1972	3,799.5	4,202.5	3,599.4	2,426.8	16,129.8
1973	3,992.3	4,396.3	3,846.6	2,584.4	17,042.6
1974	3,588.5	4,593.0	3,987.0	2,722.5	17,159.1
1975	3,797.1	4,879.5	4,167.4	2,848.7	18,181.2
1976	3,830.1	4,900.8	4,263.3	2,874.0	18,411.1
1977	4,383.9	5,451.6	4,621.3	3,095.5	20,289.3
1978	4,703.2	5,870.1	4,953.6	3,292.4	21,719.9
1979	4,284.8	5,759.9	4,986.6	3,294.6	21,211.6
1980	4,558.0	6,114.5	5,260.1	3,490.2	22,506.1
1981	4,999.7	7,371.2	5,337.6	3,400.2	24,347.2
1982	5,094.9	7,393.7	5,539.9	3,433.8	24,814.8
1983	5,104.6	7,509.8	5,743.2	3,511.0	25,173.0
1984	5,072.6	7,799.1	6,013.4	3,649.1	25,989.1
1985	4,935.8	7,758.2	6,058.7	3,668.9	25,842.4
1986	5,082.6	7,969.4	6,312.5	3,827.1	26,679.9
1987	4,924.6	8,396.6	6,375.4	4,069.2	27,628.4
1988	5,252.0	9,010.4	6,761.0	4,298.8	29,452.8
1989	5,297.9	9,518.9	7,179.9	4,429.5	30,693.7
1990	4,983.7	9,487.7	7,372.1	4,581.1	30,940.1

Sources: LFS (Round 2), July - September 1971-1983.
LFS (Round 3), August 1984-1990.

Table A-8 Total Working Hours by Age Group and Sex

(Unit : Thousands)

Year	Male					
	< 20	20-29	30-39	40-49	50 & Over	Total
1971	103,087.1	122,874.8	107,752.2	74,063.6	71,765.3	479,543.0
1972	95,788.1	117,274.1	104,208.2	71,213.7	63,300.3	451,784.3
1973	109,372.4	132,199.8	118,264.6	78,728.2	67,750.3	506,315.3
1974	96,987.2	139,215.8	124,706.7	84,268.7	72,816.7	517,994.9
1975	100,518.4	143,387.9	126,355.3	85,667.4	75,768.0	531,696.9
1976	103,138.5	145,881.8	128,619.2	85,797.9	78,451.5	541,888.8
1977	117,365.5	157,942.5	133,807.0	88,938.0	79,084.5	577,137.5
1978	132,671.0	171,805.5	148,072.5	99,796.5	88,265.0	640,610.5
1979	122,273.0	173,188.5	149,025.5	98,919.0	86,638.5	630,044.5
1980	128,003.0	180,565.5	156,998.0	104,816.0	92,667.0	663,049.5
1981	134,732.0	214,293.5	156,950.5	95,036.5	92,933.0	693,945.5
1982	124,835.0	198,702.5	150,477.5	88,861.5	87,120.0	649,996.5
1983	139,003.4	224,464.9	173,217.2	102,762.2	100,253.5	739,701.2
1984	139,307.0	234,928.8	181,800.1	107,211.5	105,772.7	769,020.1
1985	134,931.1	234,382.6	186,042.0	109,796.1	103,588.1	768,739.9
1986	141,321.2	243,809.9	190,176.9	114,711.8	103,146.0	793,165.9
1987	131,380.9	248,416.7	191,642.5	121,639.0	115,563.3	808,642.4
1988	142,594.3	264,894.9	201,076.5	127,760.1	123,044.8	859,370.7
1989	148,306.4	289,732.0	214,125.1	133,870.8	127,740.6	913,775.0
1990	126,489.8	277,887.4	217,250.4	135,478.1	125,775.6	882,881.3
Year	Female					
	< 20	20-29	30-39	40-49	50 & Over	Total
1971	100,425.3	104,792.9	87,840.6	59,602.9	49,387.0	402,048.7
1972	90,949.0	90,723.9	75,558.6	50,537.4	36,191.6	343,960.4
1973	105,328.8	100,184.1	85,810.2	55,905.7	42,309.5	389,538.2
1974	98,966.7	108,933.0	90,644.6	62,717.3	44,979.4	406,240.9
1975	101,867.6	117,501.7	95,228.1	66,117.8	51,916.8	432,631.9
1976	104,871.9	118,872.1	97,945.4	65,086.1	50,736.5	437,511.9
1977	119,719.5	131,307.0	106,913.5	69,562.0	54,096.5	481,598.5
1978	134,587.0	148,862.5	125,799.0	81,158.5	61,170.5	551,577.5
1979	123,714.5	145,048.5	123,514.0	79,795.5	60,282.0	532,354.5
1980	130,156.0	156,238.0	130,998.5	87,120.5	67,150.5	571,663.5
1981	134,281.5	175,757.4	128,405.0	84,720.0	70,292.0	593,455.9
1982	119,558.0	154,676.5	116,939.0	75,911.0	64,678.5	531,763.0
1983	136,008.3	182,255.4	141,113.5	89,804.7	73,485.5	622,667.4
1984	140,418.0	188,275.8	148,577.2	93,352.0	77,069.6	647,692.6
1985	132,639.1	184,204.8	143,313.5	91,137.1	73,230.2	624,524.7
1986	138,931.0	189,197.4	152,949.1	94,761.9	77,678.0	653,517.4
1987	130,393.2	199,812.0	150,975.2	97,225.1	83,454.8	661,860.3
1988	134,177.3	218,316.1	165,367.1	106,590.9	91,844.9	716,296.4
1989	144,921.6	233,781.9	181,178.9	111,383.3	96,563.3	767,829.0
1990	128,271.1	218,425.8	175,207.1	109,042.9	91,820.7	722,767.6

(Continued on page 125)

Table A-8 (Continued)

(Unit : Thousands)

Year	Male & Female					Grand Total
	< 20	20-29	30-39	40-49	50 & Over	
1971	203,512.4	227,667.7	195,592.8	133,666.5	121,152.3	881,591.6
1972	186,737.1	207,998.0	179,766.8	121,751.0	99,491.8	795,744.7
1973	214,701.1	232,383.9	204,074.8	134,633.9	110,059.8	895,853.5
1974	195,953.9	248,148.8	215,351.2	146,985.9	117,796.0	924,235.8
1975	202,386.0	260,889.6	221,583.4	151,785.2	127,684.7	964,328.8
1976	208,010.4	264,753.9	226,564.5	150,884.0	129,188.0	979,400.7
1977	237,085.0	289,249.5	240,720.5	158,500.0	133,181.0	1,058,736.0
1978	267,258.0	320,668.0	273,871.5	180,955.0	149,435.5	1,192,188.0
1979	245,987.5	318,237.0	272,539.5	178,714.5	146,920.5	1,162,399.0
1980	258,159.0	336,803.5	287,996.5	191,936.5	159,817.5	1,234,713.0
1981	269,013.5	390,050.9	285,355.5	179,756.5	163,225.0	1,287,401.4
1982	244,393.0	353,379.0	267,416.5	164,772.5	151,798.5	1,181,759.5
1983	275,011.7	406,720.3	314,330.8	192,566.9	173,739.0	1,362,368.7
1984	279,725.0	423,204.6	330,377.3	200,563.5	182,842.3	1,416,712.7
1985	267,570.1	418,587.4	329,355.5	200,933.1	176,818.3	1,393,264.6
1986	280,252.3	433,007.2	343,126.0	209,473.7	180,824.1	1,446,683.3
1987	261,774.0	448,228.7	342,617.7	218,864.1	199,018.2	1,470,502.7
1988	276,771.6	483,211.1	366,443.6	234,351.1	214,889.7	1,575,667.0
1989	293,228.0	523,513.9	395,304.0	245,254.1	224,304.0	1,681,604.0
1990	254,760.9	496,313.2	392,457.5	244,521.0	217,596.3	1,605,648.9

Sources: LFS (Round 2), July-September 1971-1983.
LFS (Round 3), August 1984-1990.

Table A-9 Composition of Workers by Sex and Education: All Sectors

(Unit: Thousands)

Year	Male					
	1	2	3	4	5	Total
1971	8,362.7	416.2	37.8	50.9	65.6	8,933.3
1972	8,294.1	444.1	56.9	46.7	84.3	8,926.1
1973	8,733.2	494.0	79.7	64.2	69.2	9,440.3
1974	8,591.4	634.8	77.5	71.0	117.6	9,492.3
1975	9,098.8	508.1	75.7	68.4	112.9	9,863.9
1976	9,375.0	480.1	80.0	72.3	96.0	10,103.4
1977	10,024.0	592.1	144.2	100.3	129.3	10,989.9
1978	10,409.9	695.4	126.0	115.3	155.6	11,502.2
1979	10,208.0	695.2	154.3	148.9	174.9	11,381.3
1980	10,612.1	740.9	165.2	155.0	184.5	11,857.7
1981	11,409.3	836.2	195.4	182.6	227.0	12,850.5
1982	11,495.5	916.3	228.3	210.6	280.2	13,130.9
1983	11,537.3	1,049.1	237.1	315.9	293.1	13,432.5
1984	11,944.8	1,014.9	330.9	278.9	287.0	13,856.5
1985	11,914.3	1,183.7	303.0	307.0	255.5	13,963.5
1986	11,937.5	1,389.1	392.8	386.4	272.6	14,378.4
1987	12,218.9	1,522.4	428.3	437.4	289.0	14,896.0
1988	12,825.2	1,642.5	440.8	535.2	267.0	15,710.7
1989	13,393.9	1,689.9	404.4	566.6	260.4	16,315.2
1990	13,439.6	1,733.2	459.3	608.0	263.1	16,503.1
Year	Female					
	1	2	3	4	5	Total
1971	7,457.3	137.3	21.2	29.9	39.6	7,685.4
1972	6,914.4	152.2	38.2	29.9	69.0	7,203.7
1973	7,287.7	162.8	44.0	30.7	77.1	7,602.4
1974	7,261.7	214.7	54.6	37.6	98.3	7,666.8
1975	7,973.0	177.3	42.6	32.2	92.8	8,317.8
1976	7,979.1	158.6	45.9	35.3	88.7	8,307.6
1977	8,853.3	212.5	73.1	54.4	109.3	9,302.6
1978	9,702.7	232.3	98.5	62.0	124.5	10,220.0
1979	9,273.2	231.0	112.0	78.6	137.4	9,832.2
1980	9,997.1	284.0	120.3	88.0	160.6	10,650.0
1981	10,735.4	324.9	145.1	111.9	182.0	11,499.3
1982	10,803.7	366.8	165.6	120.1	227.5	11,683.7
1983	10,731.5	363.6	219.5	154.8	263.5	11,732.9
1984	11,084.5	450.2	202.2	152.9	236.7	12,126.5
1985	10,784.8	448.7	204.5	204.2	231.3	11,873.5
1986	11,011.1	507.1	232.3	288.1	257.4	12,296.0
1987	11,191.8	634.5	282.5	305.8	312.1	12,726.7
1988	12,002.2	706.6	295.1	429.2	304.4	13,737.5
1989	12,532.1	833.8	297.9	434.6	272.6	14,371.0
1990	12,475.1	877.6	302.2	489.1	292.9	14,436.9

(Continued on page 127)

Table A-9 (Continued)

(Unit: Thousands)

Year	Male & Female					Grand Total
	1	2	3	4	5	
1971	15,820.0	553.5	59.0	80.8	105.3	16,618.6
1972	15,208.5	596.3	95.1	76.6	153.3	16,129.8
1973	16,020.9	656.8	123.7	94.9	146.4	17,042.7
1974	15,853.1	849.5	132.1	108.6	215.9	17,159.1
1975	17,071.7	685.4	118.3	100.6	205.7	18,181.7
1976	17,354.1	638.7	125.9	107.6	184.7	18,410.9
1977	18,877.3	804.6	217.3	154.7	238.6	20,292.5
1978	20,112.6	927.7	224.5	177.3	280.1	21,722.2
1979	19,481.2	926.2	266.3	227.5	312.3	21,213.5
1980	20,609.2	1,024.9	285.5	243.0	345.1	22,507.7
1981	22,144.7	1,161.1	340.5	294.5	409.0	24,349.8
1982	22,299.2	1,283.1	393.9	330.7	507.7	24,814.6
1983	22,268.8	1,412.7	456.6	470.7	556.6	25,165.4
1984	23,029.3	1,465.1	533.1	431.8	523.7	25,983.0
1985	22,699.1	1,632.4	507.5	511.2	486.8	25,837.0
1986	22,948.6	1,896.2	625.1	674.5	530.0	26,674.4
1987	23,410.7	2,156.9	710.8	743.2	601.1	27,622.7
1988	24,827.4	2,349.1	735.9	964.4	571.4	29,448.2
1989	25,926.1	2,523.7	702.3	1,001.2	533.0	30,686.3
1990	25,914.7	2,610.8	761.5	1,097.1	556.0	30,940.1

Notes: 1 = No education, elementary and not elsewhere classified.
2 = Secondary and short-course vocational.
3 = Vocational.
4 = University.
5 = Teacher training.

Sources: LFS (Round 2), July-September 1971-1983.
LFS (Round 3), August 1984-1990.

Table A-10 Average Wage of Private Employees Classified by Education and Age Group

(Baht per Month)

		ALL SECTORS					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	448.5	1,817.4	1,505.8		649.0	494.5
	20-29	755.1	1,014.2	1,350.5	2,212.5	950.7	1,014.2
	30-39	1,407.4	2,626.9	2,581.1	5,305.5	1,418.5	1,673.9
	40-49	906.9	2,460.9	5,180.1	5,299.9	2,654.0	1,163.3
	>=50	836.6	3,039.8	5,354.1	6,772.7	2,510.0	1,018.8
	All	929.3	1,893.9	2,136.7	3,656.4	1,330.9	1,101.6
1978	<=19	559.9	842.5	1,128.4		696.8	574.5
	20-29	920.5	1,389.7	2,107.8	3,332.2	1,239.7	1,102.6
	30-39	1,178.4	2,224.8	3,033.1	5,142.1	2,329.3	1,457.0
	40-49	1,183.2	2,918.1	2,779.7	8,547.3	1,563.5	1,435.9
	>=50	1,065.7	3,597.2	4,312.2	5,609.4	1,902.9	1,289.8
	All	989.5	1,608.8	2,044.4	3,643.8	1,416.4	1,132.9
1979	<=19	621.8	924.0	2,055.4		791.2	637.9
	20-29	1,077.7	1,662.1	2,340.5	3,781.8	1,628.7	1,307.3
	30-39	1,283.7	2,722.6	4,308.8	6,157.3	4,236.4	1,673.3
	40-49	1,298.0	3,201.8	5,253.6	10,511.6	2,693.5	1,659.1
	>=50	1,176.6	5,456.8	7,555.8	11,398.3	2,391.4	1,496.9
	All	1,128.2	1,919.2	2,645.5	4,198.4	1,795.9	1,313.4
1980	<=19	774.0	1,122.6	1,997.4			789.7
	20-29	1,263.1	1,798.2	2,480.1	4,015.8	2,317.1	1,476.5
	30-39	1,528.1	3,069.2	4,467.1	7,463.7	3,151.9	2,000.1
	40-49	1,513.0	8,300.7	5,973.9	8,792.8	4,413.9	2,157.2
	>=50	1,567.3	4,128.3	7,268.1	9,345.3	1,261.8	1,854.7
	All	1,341.5	2,165.9	2,980.5	5,493.8	2,383.3	1,572.1
1981	<=19	817.3	1,325.0	2,137.0	2,596.8		844.4
	20-29	1,422.9	1,905.6	2,642.8	4,371.0	2,516.5	1,626.3
	30-39	1,641.3	3,848.2	4,690.8	9,161.3	3,549.2	2,252.3
	40-49	1,715.1	4,535.7	5,961.3	9,691.1	4,351.0	2,167.6
	>=50	1,471.9	4,471.9	7,848.7	10,893.5	4,049.5	1,857.2
	All	1,439.9	2,436.3	3,080.4	5,709.1	2,489.8	1,701.3
1982	<=19	800.1	1,242.6	1,907.5			818.2
	20-29	1,409.5	2,142.6	2,966.3	5,133.7	3,021.0	1,655.8
	30-39	1,663.8	3,738.9	5,093.7	9,019.0	5,725.8	2,408.6
	40-49	1,793.1	5,023.9	8,583.7	12,452.2	4,866.4	2,403.7
	>=50	1,743.0	5,464.3	8,210.4	14,150.3	6,026.1	2,044.6
	All	1,477.2	2,559.3	3,651.8	5,887.1	3,232.8	1,768.3
1983	<=19	991.5	1,241.3	2,164.8			1,008.4
	20-29	1,485.1	2,130.1	2,812.4	4,610.0	3,242.4	1,770.2
	30-39	1,922.8	3,923.4	5,391.5	8,898.7	3,357.2	2,673.8
	40-49	1,924.0	5,112.8	7,559.7	14,694.1	4,210.5	2,597.3
	>=50	1,793.2	4,812.0	7,814.3	14,322.2	3,053.8	2,138.9
	All	1,645.5	2,687.5	3,563.1	6,658.9	2,914.0	1,981.4

(Continued on page 129)

Table A-10 (Continued)

(Baht per Month)

		ALL SECTORS					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	997.4	1,388.4	1,865.6		3,072.0	1,032.9
	20-29	1,545.1	2,398.2	2,867.6	4,575.4	1,923.3	1,835.0
	30-39	2,089.2	3,561.7	5,470.0	8,988.9	4,681.6	2,653.3
	40-49	2,276.2	5,122.8	6,900.0	17,460.0	5,638.0	2,891.3
	>=50	1,993.0	6,392.8	11,141.9	13,502.9	5,335.9	2,485.6
	All	1,810.3	2,632.8	3,588.2	6,536.0	2,493.6	2,089.8
1985	<=19	1,049.0	1,089.2	1,333.8		630.0	1,054.6
	20-29	1,612.9	2,079.8	2,714.4	4,179.9	2,503.5	1,925.7
	30-39	2,066.0	3,380.1	5,738.6	9,258.1	2,310.5	2,763.1
	40-49	2,357.0	4,717.0	7,151.0	19,108.2	3,929.0	3,215.3
	>=50	1,982.0	5,728.8	9,887.8	11,178.4	4,642.0	2,332.4
	All	1,764.8	2,620.7	4,016.7	7,506.4	2,757.2	2,204.3
1986	<=19	949.7	1,260.5	1,653.8			1,012.2
	20-29	1,491.5	2,055.0	2,961.7	4,724.4	3,178.9	1,958.4
	30-39	1,982.6	3,959.9	4,570.7	8,439.0	4,215.7	2,796.4
	40-49	1,975.9	7,707.3	11,501.4	14,990.0	9,333.3	3,532.8
	>=50	1,947.9	5,231.9	10,125.0	11,518.9	4,475.7	2,341.2
	All	1,618.6	2,829.2	4,323.8	6,977.2	4,042.6	2,220.2
1987	<=19	952.1	1,331.4	1,359.1			1,007.5
	20-29	1,563.8	2,117.3	2,562.1	3,776.7	3,115.6	1,891.3
	30-39	1,892.4	3,809.8	4,948.4	9,131.7	4,935.0	2,711.1
	40-49	2,245.5	4,323.0	8,831.1	17,338.8	4,253.3	3,432.1
	>=50	1,907.0	6,753.5	13,659.0	17,062.2	3,792.7	2,581.8
	All	1,648.7	2,689.4	3,856.2	7,092.5	4,070.5	2,179.0
1988	<=19	1,043.4	1,246.1	1,947.2			1,101.7
	20-29	1,535.8	2,625.4	2,762.3	3,902.1	3,641.2	2,044.9
	30-39	2,044.8	3,615.2	5,325.2	11,600.9	4,016.1	2,962.9
	40-49	2,149.8	5,039.0	12,146.0	17,806.4	3,991.7	3,788.1
	>=50	2,219.0	8,214.3	9,432.4	15,533.3	4,945.0	3,087.1
	All	1,710.0	2,880.6	4,000.9	8,049.7	3,729.0	2,384.5
1989	<=19	1,087.4	1,701.4	2,073.9			1,150.4
	20-29	1,542.1	2,207.0	2,579.1	4,098.7	2,202.3	1,899.9
	30-39	2,057.7	3,957.1	4,920.8	8,896.4	4,228.6	2,897.9
	40-49	1,984.8	5,746.0	8,331.4	17,329.7	5,426.7	2,885.9
	>=50	2,144.9	7,172.2	4,921.5	20,557.3		2,893.5
	All	1,701.9	2,881.1	3,588.5	7,283.4	3,411.2	2,224.6
1990	<=19	1,285.9	1,595.8	2,708.3	4,452.9		1,368.3
	20-29	1,947.5	2,457.9	3,010.0	5,358.7	3,718.5	2,437.1
	30-39	2,416.0	4,000.5	5,934.1	9,859.9	7,924.9	3,533.0
	40-49	2,551.6	7,535.0	7,169.1	16,156.4	8,756.7	3,900.0
	>=50	2,378.9	6,497.2	9,647.4	24,320.8	7,452.7	3,247.0
	All	2,069.8	3,120.1	4,176.1	8,285.7	6,094.0	2,777.7

(Continued on page 130)

Table A-10 (Continued)

(Baht per Month)

		ALL SECTORS					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	405.8	691.5	881.1	1,803.8	1,069.1	415.7
	20-29	626.3	1,471.8	1,682.3	2,708.6	1,435.9	865.5
	30-39	493.1	1,740.9	4,778.4	3,393.5	1,692.7	785.0
	40-49	490.5	2,004.6	3,045.1	5,265.9	2,498.6	941.3
	>=50	602.1	4,367.9	5,812.7	2,694.4	2,553.1	849.1
	All	591.8	1,289.0	1,732.7	2,660.9	2,189.1	720.2
1978	<=19	510.0	848.9	1,355.3	2,520.9	1,820.7	521.1
	20-29	681.7	1,367.4	2,113.1	3,341.7	1,690.1	948.7
	30-39	666.3	2,208.5	2,736.5	4,573.9	1,835.5	936.1
	40-49	556.3	2,163.9	2,902.3	7,541.5	2,411.1	693.2
	>=50	553.9	2,230.4	3,745.6	5,894.8	2,101.9	646.6
	All	657.3	1,242.6	1,691.1	3,177.7	1,335.9	773.3
1979	<=19	590.2	947.3	1,665.8		1,524.2	604.7
	20-29	798.6	1,757.3	2,032.4	3,499.4	1,680.7	1,088.1
	30-39	721.4	2,124.7	3,370.3	4,910.8	2,060.4	1,000.9
	40-49	680.1	2,409.9	3,356.8	7,644.4	2,340.8	788.9
	>=50	573.2	2,236.6	2,457.4	3,033.1	3,866.9	642.7
	All	735.8	1,434.0	1,961.2	3,260.8	1,594.0	868.2
1980	<=19	694.6	1,101.8	1,846.5		2,056.7	710.7
	20-29	947.6	1,721.5	2,505.2	3,539.1	2,364.6	1,263.7
	30-39	875.3	2,713.5	3,543.3	6,488.7	3,165.8	1,299.1
	40-49	872.1	2,567.6	4,828.0	7,354.6	3,185.6	1,001.9
	>=50	708.7	2,853.3	1,714.4	10,644.4	4,364.4	848.3
	All	884.7	1,697.6	2,348.7	3,841.6	2,049.0	1,060.9
1981	<=19	839.3	1,574.5	2,383.9			866.4
	20-29	1,037.1	1,885.8	2,882.9	3,864.8	2,645.4	1,348.4
	30-39	1,013.4	2,689.9	3,606.3	5,811.1	3,350.6	1,441.9
	40-49	903.9	2,767.9	4,731.4	6,068.7	2,735.7	1,030.0
	>=50	646.7	3,491.3		2,430.1	4,268.1	719.3
	All	984.5	1,824.8	2,537.4	4,147.5	2,293.3	1,168.2
1982	<=19	739.0	1,173.1	1,356.5			747.4
	20-29	993.7	1,875.5	3,045.5	4,268.4	2,826.7	1,336.6
	30-39	1,002.4	3,255.9	4,618.4	8,249.1	2,901.0	1,430.5
	40-49	918.2	3,837.5	6,396.1	5,932.1	4,001.4	1,116.5
	>=50	792.2	4,936.1	3,406.1	8,873.4	4,330.7	897.0
	All	953.0	1,955.1	2,750.5	4,465.7	2,438.5	1,141.8
1983	<=19	792.4	1,239.5	1,470.2			803.3
	20-29	1,160.5	2,106.2	3,018.4	3,933.4	2,729.9	1,548.7
	30-39	1,175.2	3,237.5	4,396.9	7,394.3	3,812.4	1,719.8
	40-49	1,044.5	4,046.3	3,888.1	8,537.0	4,493.4	1,256.5
	>=50	786.7	4,319.2	4,993.0	15,344.6	4,742.9	947.3
	All	1,089.2	2,125.0	2,856.1	4,587.2	2,581.1	1,325.4

(Continued on page 131)

Table A-10 (Continued)

(Baht per Month)

		ALL SECTORS					
		Female					
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**	**All**
1984	<=19	936.3	1,401.3	3,338.0			989.6
	20-29	1,090.7	2,205.1	2,974.8	4,735.2	3,173.7	1,507.3
	30-39	1,290.4	3,340.0	5,795.5	6,814.1	6,906.3	1,932.1
	40-49	1,182.7	5,225.0	6,644.0	7,336.0	5,723.8	1,422.1
	>=50	874.3	4,381.9	12,954.9		6,477.4	1,002.8
	All	1,206.2	1,892.5	3,118.7	4,748.2	3,063.9	1,441.2
1985	<=19	759.6	1,019.0	1,571.5		1,000.0	790.9
	20-29	1,137.1	1,919.8	2,579.7	3,671.8	2,386.8	1,561.2
	30-39	1,318.5	3,536.4	4,874.4	8,623.1	4,217.1	2,016.4
	40-49	1,099.4	3,541.0	8,345.1	9,941.4	3,078.4	1,491.5
	>=50	976.3	5,517.3	3,000.0	12,000.0	4,080.3	1,150.7
	All	1,055.7	2,205.0	3,113.5	5,097.0	2,744.8	1,435.8
1986	<=19	797.6	1,073.4	1,488.4			831.3
	20-29	1,147.7	1,813.2	2,518.9	3,488.7	2,315.5	1,586.2
	30-39	1,429.3	2,681.6	4,278.9	6,728.3	3,100.7	1,946.4
	40-49	1,277.5	3,218.7	4,575.7	8,365.8	2,928.7	1,505.7
	>=50	943.8	4,097.3		8,156.0	4,004.7	1,153.1
	All	1,125.2	1,861.6	2,785.9	4,655.1	2,698.3	1,463.1
1987	<=19	829.3	1,160.1	1,325.3			860.0
	20-29	1,286.4	1,691.6	2,502.9	3,446.8	2,282.2	1,670.6
	30-39	1,378.4	2,581.8	4,935.9	7,001.0	2,829.2	2,078.6
	40-49	1,169.7	3,356.3	5,115.3	8,626.3	3,942.0	1,482.0
	>=50	1,148.3	4,493.4		9,516.6	8,290.4	1,313.7
	All	1,168.2	1,793.7	2,838.0	4,698.4	2,735.6	1,549.6
1988	<=19	806.5	1,524.1	2,190.3		1,575.0	891.3
	20-29	1,214.4	1,861.2	2,441.0	3,268.2	2,295.2	1,654.2
	30-39	1,346.2	2,893.1	5,826.4	6,680.9	3,295.6	2,061.1
	40-49	1,176.7	3,509.7	7,174.8	8,671.1	4,231.1	1,649.9
	>=50	1,055.5	3,311.2	7,912.8	17,671.4	3,706.3	1,299.2
	All	1,124.1	2,064.6	3,496.6	4,311.6	2,746.0	1,555.1
1989	<=19	964.4	1,560.8	1,333.1		1,182.4	1,036.1
	20-29	1,290.2	1,961.7	2,507.9	3,377.3	2,248.0	1,699.6
	30-39	1,440.4	2,973.9	4,019.6	7,207.2	3,375.0	2,058.5
	40-49	1,358.6	4,666.1	7,715.4	11,206.6	3,241.1	2,041.8
	>=50	1,154.8	11,333.3		15,000.0	3,728.6	1,255.5
	All	1,240.6	2,120.0	2,916.5	4,707.7	2,668.2	1,635.3
1990	<=19	1,214.6	1,663.4	2,547.7	1,000.0	2,100.0	1,292.0
	20-29	1,637.1	2,349.2	3,224.3	4,539.5	3,052.3	2,263.7
	30-39	1,566.6	3,052.6	4,566.4	7,154.2	7,446.2	2,367.1
	40-49	1,562.4	4,892.9	9,927.8	13,844.6	4,307.9	2,454.3
	>=50	1,359.6	6,527.5	5,000.0	11,364.4	6,524.2	1,592.1
	All	1,486.3	2,367.1	3,656.6	5,719.2	4,458.6	2,050.0

Note: Calculated from wages of private employees alone.

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table A-11 Wage Structure by Age, Sex and Education (Male, Ele.+Oth. = 1.0)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	1.0000	4.0523	3.3574		1.4470
	20-29	1.0000	1.3432	1.7886	2.9302	1.2591
	30-39	1.0000	1.8665	1.8339	3.7697	1.0078
	40-49	1.0000	2.7136	5.7120	5.8441	2.9265
	>=50	1.0000	3.6335	6.3998	8.0956	3.0002
	All	1.0000	2.0380	2.2993	3.9346	1.4322
1978	<=19	1.0000	1.5047	2.0154		1.2445
	20-29	1.0000	1.5097	2.2899	3.6200	1.3467
	30-39	1.0000	1.8880	2.5739	4.3636	1.9767
	40-49	1.0000	2.4663	2.3493	7.2239	1.3214
	>=50	1.0000	3.3756	4.0466	5.2638	1.7856
	All	1.0000	1.6260	2.0662	3.6826	1.4315
1979	<=19	1.0000	1.4861	3.3057		1.2724
	20-29	1.0000	1.5423	2.1717	3.5090	1.5112
	30-39	1.0000	2.1210	3.3566	4.7967	3.3002
	40-49	1.0000	2.4666	4.0473	8.0980	2.0751
	>=50	1.0000	4.6380	6.4219	9.6878	2.0325
	All	1.0000	1.7011	2.3449	3.7213	1.5918
1980	<=19	1.0000	1.4505	2.5807		2.0598
	20-29	1.0000	1.4237	1.9635	3.1793	1.8345
	30-39	1.0000	2.0085	2.9233	4.8842	2.0626
	40-49	1.0000	5.4863	3.9484	5.8116	2.9173
	>=50	1.0000	2.6340	4.6374	5.9627	0.8051
	All	1.0000	1.6145	2.2217	4.0951	1.7765
1981	<=19	1.0000	1.6211	2.6146	3.1772	2.0951
	20-29	1.0000	1.3393	1.8573	3.0719	1.7686
	30-39	1.0000	2.3446	2.8579	5.5816	2.1624
	40-49	1.0000	2.6445	3.4757	5.6503	2.5368
	>=50	1.0000	3.0382	5.3323	7.4008	2.7512
	All	1.0000	1.6920	2.1393	3.9650	1.7292
1982	<=19	1.0000	1.5530	2.3840	3.2899	2.1695
	20-29	1.0000	1.5201	2.1045	3.6422	2.1433
	30-39	1.0000	2.2472	3.0615	5.4207	3.4414
	40-49	1.0000	2.8018	4.7871	6.9445	2.7140
	>=50	1.0000	3.1349	4.7104	8.1182	3.4572
	All	1.0000	1.7325	2.4721	3.9853	2.1885
1983	<=19	1.0000	1.2520	2.1834		
	20-29	1.0000	1.4343	1.8937	3.1041	2.1832
	30-39	1.0000	2.0404	2.8039	4.6279	1.7459
	40-49	1.0000	2.6574	3.9291	7.6372	2.1884
	>=50	1.0000	2.6834	4.3577	7.9869	1.7030
	All	1.0000	1.6333	2.1654	4.0467	1.7709

(Continued on page 133)

Table A-11 (Continued)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	1.0000	1.3921	1.8705		3.0800
	20-29	1.0000	1.5521	1.8559	2.9611	1.2447
	30-39	1.0000	1.7048	2.6182	4.3026	2.2409
	40-49	1.0000	2.2506	3.0314	7.6707	2.4769
	>=50	1.0000	3.2076	5.5904	6.7751	2.6773
	All	1.0000	1.4543	1.9821	3.6104	1.3774
1985	<=19	1.0000	1.0383	1.2715		0.6006
	20-29	1.0000	1.2894	1.6829	2.5914	1.5521
	30-39	1.0000	1.6361	2.7776	4.4812	1.1183
	40-49	1.0000	2.0012	3.0339	8.1068	1.6669
	>=50	1.0000	2.8904	4.9887	5.6399	2.3420
	All	1.0000	1.4850	2.2760	4.2534	1.5623
1986	<=19	1.0000	1.3272	1.7414	3.5751	
	20-29	1.0000	1.3778	1.9857	3.1675	2.1313
	30-39	1.0000	1.9973	2.3054	4.2566	2.1264
	40-49	1.0000	3.9006	5.8208	7.5863	4.7235
	>=50	1.0000	2.6860	5.1980	5.9136	2.2978
	All	1.0000	1.7479	2.6713	4.3106	2.4976
1987	<=19	1.0000	1.3984	1.4275	3.4040	
	20-29	1.0000	1.3539	1.6384	2.4151	1.9923
	30-39	1.0000	2.0132	2.6149	4.8256	2.6078
	40-49	1.0000	1.9252	3.9328	7.7216	1.8941
	>=50	1.0000	3.5414	7.1626	8.9472	1.9888
	All	1.0000	1.6313	2.3390	4.3019	2.4689
1988	<=19	1.0000	1.1943	1.8663	3.3564	
	20-29	1.0000	1.7095	1.7986	2.5408	2.3710
	30-39	1.0000	1.7680	2.6043	5.6734	1.9641
	40-49	1.0000	2.3439	5.6498	8.2827	1.8567
	>=50	1.0000	3.7017	4.2507	7.0000	2.2284
	All	1.0000	1.6846	2.3397	4.7074	2.1807
1989	<=19	1.0000	1.5647	1.9073		
	20-29	1.0000	1.4311	1.6725	2.6579	1.4281
	30-39	1.0000	1.9230	2.3914	4.3234	2.0550
	40-49	1.0000	2.8950	4.1975	8.7310	2.7341
	>=50	1.0000	3.3438	2.2945	9.5842	2.6397
	All	1.0000	1.6929	2.1085	4.2795	2.0043
1990	<=19	1.0000	1.2410	2.1061	3.4628	
	20-29	1.0000	1.2621	1.5456	2.7516	1.9094
	30-39	1.0000	1.6558	2.4562	4.0811	3.2801
	40-49	1.0000	2.9531	2.8097	6.3319	3.4319
	>=50	1.0000	2.7312	4.0554	10.2235	3.1328
	All	1.0000	1.5075	2.0177	4.0032	2.9443

(Continued on page 134)

Table A-11 (Continued)

		ALL SECTORS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.9047	1.5419	1.9646	4.0219	2.3837
	20-29	0.8294	1.9493	2.2281	3.5873	1.9017
	30-39	0.3504	1.2370	3.3952	2.4111	1.2027
	40-49	0.5408	2.2104	3.3577	5.8066	2.7552
	>=50	0.7197	5.2211	6.9481	3.2207	3.0517
	All	0.6369	1.3871	1.8646	2.8634	2.3557
1978	<=19	0.9109	1.5163	2.4208	4.5026	3.2519
	20-29	0.7406	1.4855	2.2956	3.6303	1.8361
	30-39	0.5654	1.8741	2.3222	3.8815	1.5577
	40-49	0.4702	1.8289	2.4529	6.3738	2.0378
	>=50	0.5197	2.0930	3.5148	5.5316	1.9724
	All	0.6643	1.2559	1.7091	3.2116	1.3501
1979	<=19	0.9493	1.5235	2.6791		2.4514
	20-29	0.7410	1.6305	1.8858	3.2471	1.5595
	30-39	0.5620	1.6552	2.6256	3.8256	1.6051
	40-49	0.5239	1.8566	2.5860	5.8892	1.8033
	>=50	0.4872	1.9010	2.0886	2.5779	3.2866
	All	0.6522	1.2711	1.7383	2.8902	1.4128
1980	<=19	0.8974	1.4235	2.3857		2.6572
	20-29	0.7502	1.3629	1.9834	2.8019	1.8721
	30-39	0.5728	1.7757	2.3187	4.2462	2.0717
	40-49	0.5764	1.6971	3.1911	4.8610	2.1055
	>=50	0.4522	1.8205	1.0939	6.7916	2.7847
	All	0.6594	1.2654	1.7507	2.8636	1.5274
1981	<=19	1.0269	1.9264	2.9167		1.8373
	20-29	0.7288	1.3253	2.0261	2.7162	1.8592
	30-39	0.6174	1.6389	2.1972	3.5405	2.0414
	40-49	0.5270	1.6138	2.7586	3.5383	1.5950
	>=50	0.4394	2.3719	1.7670	1.6509	2.8997
	All	0.6838	1.2673	1.7623	2.8805	1.5927
1982	<=19	0.9236	1.4662	1.6954		1.9025
	20-29	0.7050	1.3306	2.1607	3.0283	2.0054
	30-39	0.6025	1.9569	2.7758	4.9580	1.7436
	40-49	0.5121	2.1401	3.5671	3.3083	2.2315
	>=50	0.4545	2.8319	1.9541	5.0908	2.4846
	All	0.6452	1.3235	1.8620	3.0230	1.6507
1983	<=19	0.7993	1.2501	1.4829	2.4758	1.7743
	20-29	0.7814	1.4182	2.0324	2.6485	1.8382
	30-39	0.6112	1.6837	2.2867	3.8455	1.9827
	40-49	0.5429	2.1030	2.0208	4.4371	2.3354
	>=50	0.4387	2.4086	2.7844	8.5570	2.6449
	All	0.6619	1.2914	1.7357	2.7877	1.5686

(Continued on page 135)

Table A-11 (Continued)

		ALL SECTORS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.9388	1.4049	3.3467		1.9164
	20-29	0.7059	1.4271	1.9253	3.0646	2.0540
	30-39	0.6176	1.5987	2.7740	3.2616	3.3057
	40-49	0.5196	2.2955	2.9189	3.2229	2.5147
	>=50	0.4387	2.1986	6.5001	7.2269	3.2501
	All	0.6663	1.0454	1.7227	2.6228	1.6924
1985	<=19	0.7241	0.9714	1.4981	2.5143	0.9533
	20-29	0.7050	1.1902	1.5994	2.2765	1.4798
	30-39	0.6382	1.7117	2.3594	4.1738	2.0412
	40-49	0.4665	1.5023	3.5405	4.2177	1.3060
	>=50	0.4926	2.7837	1.5136	6.0544	2.0587
	All	0.5982	1.2494	1.7642	2.8882	1.5553
1986	<=19	0.8398	1.1302	1.5672		
	20-29	0.7695	1.2157	1.6888	2.3390	1.5524
	30-39	0.7209	1.3526	2.1583	3.3937	1.5640
	40-49	0.6465	1.6290	2.3158	4.2339	1.4822
	>=50	0.4845	2.1035	2.7083	4.1871	2.0559
	All	0.6952	1.1501	1.7211	2.8760	1.6670
1987	<=19	0.8710	1.2185	1.3920	2.5374	1.2464
	20-29	0.8226	1.0817	1.6005	2.2041	1.4594
	30-39	0.7284	1.3643	2.6083	3.6996	1.4951
	40-49	0.5209	1.4947	2.2780	3.8416	1.7555
	>=50	0.6022	2.3563	2.6405	4.9904	4.3474
	All	0.7086	1.0880	1.7214	2.8498	1.6593
1988	<=19	0.7730	1.4607	2.0993	2.5019	1.5096
	20-29	0.7908	1.2119	1.5895	2.1281	1.4945
	30-39	0.6583	1.4148	2.8494	3.2673	1.6117
	40-49	0.5473	1.6326	3.3374	4.0334	1.9681
	>=50	0.4757	1.4922	3.5659	7.9635	1.6702
	All	0.6574	1.2074	2.0448	2.5214	1.6059
1989	<=19	0.8869	1.4354	1.2260		1.0874
	20-29	0.8366	1.2721	1.6262	2.1900	1.4578
	30-39	0.7000	1.4452	1.9534	3.5025	1.6401
	40-49	0.6845	2.3509	3.8871	5.6461	1.6329
	>=50	0.5384	5.2838	2.8489	6.9932	1.7383
	All	0.7290	1.2457	1.7137	2.7661	1.5678
1990	<=19	0.9445	1.2935	1.9812	0.7776	1.6331
	20-29	0.8406	1.2063	1.6556	2.3310	1.5673
	30-39	0.6484	1.2635	1.8901	2.9612	3.0820
	40-49	0.6123	1.9176	3.8909	5.4259	1.6883
	>=50	0.5715	2.7439	2.1018	4.7771	2.7425
	All	0.7181	1.1436	1.7667	2.7632	2.1542

Note: Calculated from Table 4.8 by setting the average wage of male workers with elementary education = 1.0.

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table A-12 Wage Structure by Age, Sex and Education (Male, Sec. + Sh. = 1.0)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2468	1.0000	0.8285		0.3571
	20-29	0.7445	1.0000	1.3316	2.1816	0.9374
	30-39	0.5358	1.0000	0.9826	2.0197	0.5400
	40-49	0.3685	1.0000	2.1049	2.1536	1.0785
	>=50	0.2752	1.0000	1.7613	2.2280	0.8257
	All	0.4907	1.0000	1.1282	1.9307	0.7028
1978	<=19	0.6646	1.0000	1.3393		0.8270
	20-29	0.6624	1.0000	1.5168	2.3978	0.8921
	30-39	0.5297	1.0000	1.3633	2.3112	1.0470
	40-49	0.4055	1.0000	0.9526	2.9291	0.5358
	>=50	0.2962	1.0000	1.1988	1.5594	0.5290
	All	0.6150	1.0000	1.2707	2.2648	0.8804
1979	<=19	0.6729	1.0000	2.2244		0.8562
	20-29	0.6484	1.0000	1.4081	2.2753	0.9799
	30-39	0.4715	1.0000	1.5826	2.2615	1.5560
	40-49	0.4054	1.0000	1.6408	3.2830	0.8413
	>=50	0.2156	1.0000	1.3846	2.0888	0.4382
	All	0.5879	1.0000	1.3785	2.1876	0.9358
1980	<=19	0.6894	1.0000	1.7792		1.4201
	20-29	0.7024	1.0000	1.3792	2.2332	1.2886
	30-39	0.4979	1.0000	1.4555	2.4318	1.0269
	40-49	0.1823	1.0000	0.7197	1.0593	0.5318
	>=50	0.3796	1.0000	1.7606	2.2637	0.3056
	All	0.6194	1.0000	1.3761	2.5365	1.1004
1981	<=19	0.6169	1.0000	1.6129	1.9599	1.2924
	20-29	0.7467	1.0000	1.3868	2.2937	1.3206
	30-39	0.4265	1.0000	1.2190	2.3807	0.9223
	40-49	0.3781	1.0000	1.3143	2.1366	0.9593
	>=50	0.3291	1.0000	1.7551	2.4360	0.9055
	All	0.5910	1.0000	1.2644	2.3433	1.0219
1982	<=19	0.6439	1.0000	1.5351	2.1184	1.3969
	20-29	0.6579	1.0000	1.3844	2.3961	1.4100
	30-39	0.4450	1.0000	1.3624	2.4122	1.5314
	40-49	0.3569	1.0000	1.7086	2.4786	0.9686
	>=50	0.3190	1.0000	1.5025	2.5896	1.1028
	All	0.5772	1.0000	1.4269	2.3003	1.2632
1983	<=19	0.7987	1.0000	1.7439		
	20-29	0.6972	1.0000	1.3203	2.1642	1.5221
	30-39	0.4901	1.0000	1.3742	2.2681	0.8557
	40-49	0.3763	1.0000	1.4786	2.8740	0.8235
	>=50	0.3727	1.0000	1.6239	2.9764	0.6346
	All	0.6123	1.0000	1.3258	2.4777	1.0843

(Continued on page 137)

Table A-12 (Continued)

		ALL SECTORS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.7184	1.0000	1.3437		2.2126
	20-29	0.6443	1.0000	1.1958	1.9079	0.8020
	30-39	0.5866	1.0000	1.5358	2.5238	1.3144
	40-49	0.4443	1.0000	1.3469	3.4083	1.1006
	>=50	0.3118	1.0000	1.7429	2.1122	0.8347
	All	0.6876	1.0000	1.3629	2.4826	0.9471
1985	<=19	0.9631	1.0000	1.2246		0.5784
	20-29	0.7755	1.0000	1.3051	2.0098	1.2037
	30-39	0.6112	1.0000	1.6978	2.7390	0.6836
	40-49	0.4997	1.0000	1.5160	4.0509	0.8329
	>=50	0.3460	1.0000	1.7260	1.9513	0.8103
	All	0.6734	1.0000	1.5327	2.8642	1.0521
1986	<=19	0.7535	1.0000	1.3121	2.6937	
	20-29	0.7258	1.0000	1.4412	2.2990	1.5469
	30-39	0.5007	1.0000	1.1543	2.1311	1.0646
	40-49	0.2564	1.0000	1.4923	1.9449	1.2110
	>=50	0.3723	1.0000	1.9352	2.2016	0.8555
	All	0.5721	1.0000	1.5283	2.4662	1.4289
1987	<=19	0.7151	1.0000	1.0208	2.4341	
	20-29	0.7386	1.0000	1.2101	1.7838	1.4715
	30-39	0.4967	1.0000	1.2989	2.3969	1.2953
	40-49	0.5194	1.0000	2.0428	4.0108	0.9839
	>=50	0.2824	1.0000	2.0225	2.5264	0.5616
	All	0.6130	1.0000	1.4338	2.6372	1.5135
1988	<=19	0.8373	1.0000	1.5626	2.8103	
	20-29	0.5850	1.0000	1.0521	1.4863	1.3869
	30-39	0.5656	1.0000	1.4730	3.2090	1.1109
	40-49	.0.4266	1.0000	2.4104	3.5337	0.7922
	>=50	0.2701	1.0000	1.1483	1.8910	0.6020
	All	0.5936	1.0000	1.3889	2.7944	1.2945
1989	<=19	0.6391	1.0000	1.2189		
	20-29	0.6987	1.0000	1.1686	1.8572	0.9979
	30-39	0.5200	1.0000	1.2435	2.2482	1.0686
	40-49	0.3454	1.0000	1.4499	3.0159	0.9444
	>=50	0.2991	1.0000	0.6862	2.8663	0.7894
	All	0.5907	1.0000	1.2455	2.5280	1.1840
1990	<=19	0.8058	1.0000	1.6971	2.7904	
	20-29	0.7923	1.0000	1.2246	2.1802	1.5129
	30-39	0.6039	1.0000	1.4833	2.4647	1.9810
	40-49	0.3386	1.0000	0.9514	2.1442	1.1621
	>=50	0.3661	1.0000	1.4849	3.7433	1.1471
	All	0.6634	1.0000	1.3385	2.6556	1.9531

(Continued on page 138)

Table A-12 (Continued)

		All Sectors				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2233	0.3805	0.4848	0.9925	0.5882
	20-29	0.6175	1.4513	1.6588	2.6708	1.4159
	30-39	0.1877	0.6627	1.8191	1.2918	0.6444
	40-49	0.1993	0.8146	1.2373	2.1398	1.0153
	>=50	0.1981	1.4369	1.9122	0.8864	0.8399
	All	0.3125	0.6806	0.9149	1.4050	1.1559
1978	<=19	0.6054	1.0077	1.6088	2.9923	2.1611
	20-29	0.4906	0.9840	1.5206	2.4047	1.2162
	30-39	0.2995	0.9926	1.2300	2.0558	0.8250
	40-49	0.1907	0.7416	0.9946	2.5844	0.8263
	>=50	0.1540	0.6200	1.0412	1.6387	0.5843
	All	0.4085	0.7724	1.0511	1.9752	0.8303
1979	<=19	0.6388	1.0252	1.8028		1.6496
	20-29	0.4805	1.0572	1.2228	2.1054	1.0112
	30-39	0.2650	0.7804	1.2379	1.8037	0.7568
	40-49	0.2124	0.7527	1.0484	2.3875	0.7311
	>=50	0.1050	0.4099	0.4503	0.5558	0.7086
	All	0.3834	0.7472	1.0219	1.6991	0.8306
1980	<=19	0.6187	0.9814	1.6448		1.8320
	20-29	0.5270	0.9573	1.3932	1.9681	1.3150
	30-39	0.2852	0.8841	1.1545	2.1141	1.0315
	40-49	0.1051	0.3093	0.5816	0.8860	0.3838
	>=50	0.1717	0.6912	0.4153	2.5784	1.0572
	All	0.4085	0.7838	1.0844	1.7737	0.9461
1981	<=19	0.6335	1.1884	1.7992		1.1334
	20-29	0.5442	0.9896	1.5128	2.0281	1.3882
	30-39	0.2633	0.6990	0.9371	1.5101	0.8707
	40-49	0.1993	0.6102	1.0431	1.3380	0.6032
	>=50	0.1446	0.7807	0.5816	0.5434	0.9544
	All	0.4041	0.7490	1.0415	1.7023	0.9413
1982	<=19	0.5947	0.9441	1.0917		1.2250
	20-29	0.4638	0.8753	1.4214	1.9922	1.3193
	30-39	0.2681	0.8708	1.2352	2.2063	0.7759
	40-49	0.1828	0.7638	1.2731	1.1808	0.7965
	>=50	0.1450	0.9033	0.6233	1.6239	0.7926
	All	0.3724	0.7639	1.0747	1.7449	0.9528
1983	<=19	0.6384	0.9985	1.1844	1.9775	1.4172
	20-29	0.5448	0.9888	1.4170	1.8465	1.2816
	30-39	0.2995	0.8252	1.1207	1.8847	0.9717
	40-49	0.2043	0.7914	0.7605	1.6697	0.8789
	>=50	0.1635	0.8976	1.0376	3.1888	0.9856
	All	0.4053	0.7907	1.0627	1.7069	0.9604

(Continued on page 139)

Table A-12 (Continued)

		ALL SECTORS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.6744	1.0093	2.4042		1.3767
	20-29	0.4548	0.9195	1.2405	1.9745	1.3234
	30-39	0.3623	0.9378	1.6272	1.9132	1.9391
	40-49	0.2309	1.0200	1.2970	1.4320	1.1173
	>=50	0.1368	0.6854	2.0265	2.2530	1.0132
	All	0.4581	0.7188	1.1846	1.8035	1.1637
1985	<=19	0.6974	0.9355	1.4428	2.4214	0.9181
	20-29	0.5467	0.9231	1.2404	1.7655	1.1476
	30-39	0.3901	1.0462	1.4421	2.5512	1.2476
	40-49	0.2331	0.7507	1.7691	2.1076	0.6526
	>=50	0.1704	0.9631	0.5237	2.0947	0.7122
	All	0.4028	0.8414	1.1880	1.9449	1.0473
1986	<=19	0.6328	0.8516	1.1809		
	20-29	0.5585	0.8823	1.2258	1.6977	1.1268
	30-39	0.3609	0.6772	1.0806	1.6991	0.7830
	40-49	0.1658	0.4176	0.5937	1.0854	0.3800
	>=50	0.1804	0.7831	1.0083	1.5589	0.7654
	All	0.3977	0.6580	0.9847	1.6454	0.9537
1987	<=19	0.6228	0.8714	0.9954	1.8145	0.8913
	20-29	0.6076	0.7990	1.1821	1.6280	1.0779
	30-39	0.3618	0.6777	1.2956	1.8376	0.7426
	40-49	0.2706	0.7764	1.1833	1.9955	0.9119
	>=50	0.1700	0.6653	0.7456	1.4091	1.2276
	All	0.4344	0.6670	1.0552	1.7470	1.0172
1988	<=19	0.6472	1.2231	1.7577	2.0949	1.2639
	20-29	0.4626	0.7089	0.9298	1.2448	0.8742
	30-39	0.3724	0.8003	1.6117	1.8480	0.9116
	40-49	0.2335	0.6965	1.4239	1.7208	0.8397
	>=50	0.1285	0.4031	0.9633	2.1513	0.4512
	All	0.3902	0.7167	1.2138	1.4967	0.9533
1989	<=19	0.5668	0.9174	0.7835		0.6950
	20-29	0.5846	0.8889	1.1363	1.5303	1.0186
	30-39	0.3640	0.7515	1.0158	1.8213	0.8529
	40-49	0.2364	0.8121	1.3427	1.9503	0.5641
	>=50	0.1610	1.5802	0.8520	2.0914	0.5199
	All	0.4306	0.7358	1.0123	1.6340	0.9261
1990	<=19	0.7611	1.0423	1.5965	0.6266	1.3159
	20-29	0.6660	0.9558	1.3118	1.8469	1.2419
	30-39	0.3916	0.7630	1.1415	1.7883	1.8613
	40-49	0.2073	0.6494	1.3176	1.8374	0.5717
	>=50	0.2093	1.0047	0.7696	1.7491	1.0042
	All	0.4764	0.7586	1.1720	1.8330	1.4290

Note: Calculated from Table 4.8 by setting the average wage of male workers with secondary education = 1.0.

Sources: LFS (Round 2), 1977-1983.
LFS (Round 3), 1984-1990.

Table A-13 Wage Index of Private Employees (Adjusted, Male 30-39, Ele. + Oth. = 1.0): Agriculture

		AGRICULTURE				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.59183	2.39830	1.98704		0.85640
	20-29	0.73810	0.99139	1.32015	2.16278	0.92936
	30-39	1.00000	1.86646	1.83390	3.76970	1.00785
	40-49	0.70761	1.92019	4.04187	4.13536	2.07083
	>=50	0.75962	2.76009	4.86143	6.14955	2.27901
1978	<=19	0.77695	1.16910	1.56582		0.96690
	20-29	0.89590	1.35252	2.05148	3.24311	1.20654
	30-39	1.00000	1.88803	2.57391	4.36361	1.97668
	40-49	1.15564	2.85011	2.71495	8.34825	1.52710
	>=50	1.01592	3.42934	4.11098	5.34762	1.81406
1979	<=19	0.71123	1.05693	2.35107		0.90498
	20-29	0.85891	1.32465	1.86529	3.01395	1.29799
	30-39	1.00000	2.12097	3.35661	4.79666	3.30024
	40-49	0.86040	2.12228	3.48228	6.96752	1.78538
	>=50	0.84025	3.89705	5.39602	8.14020	1.70783
1980	<=19	0.74017	1.07359	1.91015		1.52464
	20-29	0.81457	1.15966	1.59939	2.58978	1.49432
	30-39	1.00000	2.00846	2.92329	4.88424	2.06258
	40-49	0.92395	5.06904	3.64812	5.36957	2.69547
	>=50	0.79239	2.08718	3.67463	4.72481	0.63792
1981	<=19	0.77834	1.26175	2.03505	2.47292	1.63073
	20-29	0.90979	1.21846	1.68978	2.79480	1.60906
	30-39	1.00000	2.34456	2.85792	5.58160	2.16238
	40-49	0.89422	2.36478	3.10802	5.05261	2.26844
	>=50	0.82911	2.51897	4.42106	6.13610	2.28102
1982	<=19	0.85518	1.32812	2.03878	2.81344	1.85530
	20-29	0.99283	1.50916	2.08935	3.61605	2.12792
	30-39	1.00000	2.24721	3.06153	5.42074	3.44144
	40-49	1.13605	3.18298	5.43835	7.88926	3.08318
	>=50	1.04730	3.28322	4.93320	8.50224	3.62077
1983	<=19	0.69880	0.87490	1.52573		
	20-29	0.72131	1.03458	1.36597	2.23902	1.57479
	30-39	1.00000	2.04042	2.80394	4.62787	1.74594
	40-49	0.94753	2.51793	3.72297	7.23646	2.07357
	>=50	0.88634	2.37842	3.86241	7.07910	1.50940

(Continued on page 141)

Table A-13 (Continued)

		AGRICULTURE				
		Male				
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**
1984	<=19	0.72215	1.00527	1.35077		2.22425
	20-29	0.66921	1.03867	1.24200	1.98163	0.83300
	30-39	1.00000	1.70482	2.61823	4.30258	2.24087
	40-49	0.97389	2.19183	2.95224	7.47044	2.41227
	>=50	0.80750	2.59013	4.51425	5.47083	2.16190
1985	<=19	0.76436	0.79366	0.97191		0.45906
	20-29	0.92119	1.18782	1.55027	2.38722	1.42980
	30-39	1.00000	1.63606	2.77762	4.48118	1.11835
	40-49	1.06928	2.13989	3.24406	8.66846	1.78238
	>=50	0.89491	2.58665	4.46450	5.04724	2.09591
1986	<=19	0.96696	1.28335	1.68384	3.45699	
	20-29	1.07904	1.48667	2.14265	3.41786	2.29975
	30-39	1.00000	1.99733	2.30544	4.25657	2.12640
	40-49	0.98886	3.85718	5.75598	7.50186	4.67094
	>=50	1.28612	3.45449	6.68522	7.60554	2.95517
1987	<=19	0.97041	1.35706	1.38527	3.30327	
	20-29	1.25835	1.70370	2.06164	3.03898	2.50703
	30-39	1.00000	2.01323	2.61494	4.82555	2.60782
	40-49	1.02405	1.97148	4.02740	7.90728	1.93969
	>=50	1.23787	4.38383	8.86632	11.07547	2.46190
1988	<=19	0.79434	0.94870	1.48245	2.66616	
	20-29	1.01947	1.74281	1.83365	2.59031	2.41713
	30-39	1.00000	1.76798	2.60427	5.67337	1.96406
	40-49	0.99005	2.32058	5.59356	8.20030	1.83828
	>=50	0.98149	3.63323	4.17200	6.87044	2.18719
1989	<=19	0.77522	1.21298	1.47855		
	20-29	1.01333	1.45022	1.69474	2.69327	1.44710
	30-39	1.00000	1.92305	2.39138	4.32336	2.05495
	40-49	1.00562	2.91123	4.22113	8.78012	2.74943
	>=50	0.85108	2.84583	1.95278	8.15689	2.24656
1990	<=19	0.80823	1.00300	1.70222	2.79873	
	20-29	1.06293	1.34152	1.64285	2.92479	2.02956
	30-39	1.00000	1.65584	2.45616	4.08107	3.28014
	40-49	0.93043	2.74764	2.61422	5.89144	3.19313
	>=50	0.90568	2.47354	3.67285	9.25917	2.83732

(Continued on page 142)

Table A-13 (Continued)

		AGRICULTURE				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.50070	0.91255	1.16272	2.38028	1.41077
	20-29	0.64374	1.43878	1.64454	2.64781	1.40366
	30-39	0.51106	1.23697	3.39520	2.41114	1.20269
	40-49	0.49978	1.56410	2.37595	4.10882	1.94960
	>=50	1.00554	3.96604	5.27786	2.44649	2.31814
1978	<=19	0.85321	1.17806	1.88080	3.49831	2.52656
	20-29	0.77569	1.33084	2.05663	3.25235	1.64492
	30-39	0.78383	1.87412	2.32219	3.88148	1.55765
	40-49	0.76708	2.11353	2.83467	7.36585	2.35491
	>=50	0.91760	2.12633	3.57079	5.61967	2.00383
1979	<=19	0.68039	1.08353	1.90547		1.74349
	20-29	0.62372	1.40049	1.61975	2.78894	1.33944
	30-39	0.63359	1.65519	2.62555	3.82557	1.60506
	40-49	0.65370	1.59739	2.22499	5.06702	1.55155
	>=50	0.71820	1.59729	1.75494	2.16610	2.76159
1980	<=19	0.65441	1.05366	1.76583		1.96680
	20-29	0.64858	1.11016	1.61560	2.28235	1.52491
	30-39	0.65993	1.77568	2.31873	4.24618	2.07170
	40-49	0.83970	1.56799	2.94837	4.49126	1.94538
	>=50	0.74147	1.44259	0.86677	5.38162	2.20656
1981	<=19	0.72242	1.49943	2.27015		1.43003
	20-29	0.69885	1.20577	1.84332	2.47114	1.69148
	30-39	0.89351	1.63886	2.19719	3.54047	2.04137
	40-49	0.78803	1.44308	2.46679	3.16404	1.42632
	>=50	0.71843	1.96657	1.46503	1.36882	2.40416
1982	<=19	0.76865	1.25386	1.44991		1.62696
	20-29	0.80965	1.32104	2.14518	3.00657	1.99101
	30-39	0.72613	1.95692	2.77582	4.95802	1.74362
	40-49	0.83360	2.43130	4.05235	3.75838	2.53513
	>=50	0.82112	2.96588	2.04653	5.33159	2.60211
1983	<=19	0.58447	0.87357	1.03622	1.73008	1.23989
	20-29	0.73138	1.02298	1.46600	1.91040	1.32589
	30-39	0.71438	1.68371	2.28667	3.84548	1.98268
	40-49	0.67785	1.99268	1.91477	4.20425	2.21290
	>=50	0.64690	2.13487	2.46788	7.58439	2.34428

(Continued on page 143)

Table A-13 (Continued)

		AGRICULTURE				
		Female				
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**
1984	<=19	0.64311	1.01457	2.41683		1.38391
	20-29	0.62816	0.95506	1.28843	2.05086	1.37455
	30-39	0.77563	1.59872	2.77401	3.26160	3.30573
	40-49	0.80160	2.23556	2.84271	3.13876	2.44900
	>=50	0.63929	1.77539	5.24881	5.83567	2.62441
1985	<=19	0.79018	0.74250	1.14509	1.92181	0.72866
	20-29	0.88078	1.09645	1.47332	2.09705	1.36316
	30-39	0.83572	1.71172	2.35936	4.17384	2.04121
	40-49	0.74395	1.60640	3.78578	4.50993	1.39653
	>=50	0.78869	2.49114	1.35454	5.41817	1.84233
1986	<=19	0.81562	1.09288	1.51545		
	20-29	0.81443	1.31176	1.82231	2.52388	1.67513
	30-39	0.83678	1.35256	2.15828	3.39370	1.56399
	40-49	0.92897	1.61084	2.28996	4.18675	1.46568
	>=50	0.87296	2.70532	3.48320	5.38515	2.64419
1987	<=19	0.88780	1.18248	1.35084	2.46231	1.20955
	20-29	0.93527	1.36120	2.01400	2.77356	1.83642
	30-39	0.80944	1.36432	2.60833	3.69960	1.49505
	40-49	0.78045	1.53062	2.33283	3.93400	1.79775
	>=50	1.07022	2.91674	3.26859	6.17746	5.38147
1988	<=19	0.70508	1.16033	1.66757	1.98740	1.19911
	20-29	0.81782	1.23551	1.62039	2.16953	1.52360
	30-39	0.79849	1.41485	2.84937	3.26725	1.61167
	40-49	0.77984	1.61632	3.30420	3.99324	1.94854
	>=50	0.89811	1.46457	3.49985	7.81611	1.63932
1989	<=19	0.67284	1.11278	0.95040		0.84297
	20-29	0.75352	1.28903	1.64790	2.21922	1.47718
	30-39	0.81016	1.44524	1.95340	3.50249	1.64014
	40-49	0.78840	2.36407	3.90899	5.67784	1.64210
	>=50	0.74690	4.49693	2.42464	5.95182	1.47946
1990	<=19	0.78298	1.04547	1.60127	0.62852	1.31988
	20-29	0.82007	1.28218	1.75981	2.47769	1.66597
	30-39	0.78473	1.26349	1.89007	2.96116	3.08203
	40-49	0.86063	1.78421	3.62017	5.04845	1.57089
	>=50	0.77633	2.48507	1.90355	4.32653	2.48384

Note: Calculated as described in Chapter 5.

Table A-14 Wage Index of Private Employees (Adjusted, Male 30-39, Ele. + Oth. = 1.0): Manufacturing

		MANUFACTURING				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2947	1.9775	1.6384		0.7061
	20-29	0.5572	0.8030	1.0693	1.7518	0.7528
	30-39	1.0000	1.1676	1.1472	2.3582	0.6305
	40-49	0.8110	1.4514	3.0551	3.1258	1.5653
	>=50	0.8224	1.5531	2.7356	3.4605	1.2824
	All	0.6304	1.1513	1.2989	2.2227	0.8091
1978	<=19	0.4858	0.5299	0.7097		0.4383
	20-29	0.7299	0.8960	1.3590	2.1484	0.7993
	30-39	1.0000	1.6209	2.2098	3.7463	1.6971
	40-49	1.1118	1.9052	1.8149	5.5806	1.0208
	>=50	1.1194	2.8629	3.4319	4.4643	1.5144
	All	0.7731	1.1701	1.4869	2.6502	1.0302
1979	<=19	0.4185	0.5235	1.1644		0.4482
	20-29	0.7382	0.9904	1.3946	2.2533	0.9704
	30-39	1.0000	1.6882	2.6717	3.8180	2.6269
	40-49	1.0774	1.8347	3.0105	6.0235	1.5435
	>=50	0.9401	5.9328	8.2149	12.3926	2.6000
	All	0.7514	1.3657	1.8825	2.9876	1.2780
1980	<=19	0.4462	0.5260	0.9359		0.7470
	20-29	0.7200	0.9157	1.2629	2.0449	1.1799
	30-39	1.0000	1.8500	2.6926	4.4988	1.8998
	40-49	1.0791	1.9271	1.3869	2.0414	1.0247
	>=50	1.0918	2.2288	3.9240	5.0454	0.6812
	All	0.7661	1.2013	1.6531	3.0471	1.3219
1981	<=19	0.4307	0.6560	1.0580	1.2857	0.8478
	20-29	0.7667	0.8589	1.1912	1.9701	1.1343
	30-39	1.0000	1.7738	2.1622	4.2228	1.6360
	40-49	1.0139	1.7886	2.3507	3.8215	1.7157
	>=50	1.0949	1.9604	3.4407	4.7755	1.7752
	All	0.7738	1.1735	1.4838	2.7500	1.1993
1982	<=19	0.4249	0.5927	0.9099	1.2557	0.8280
	20-29	0.7793	1.0394	1.4390	2.4905	1.4656
	30-39	1.0000	1.7212	2.3449	4.1519	2.6359
	40-49	1.2823	2.0995	3.5871	5.2037	2.0336
	>=50	1.3943	2.0567	3.0903	5.3260	2.2681
	All	0.8033	1.2568	1.7933	2.8911	1.5876
1983	<=19	0.4230	0.4763	0.8306		
	20-29	0.7129	0.8211	1.0841	1.7769	1.2498
	30-39	1.0000	1.6099	2.2123	3.6514	1.3776
	40-49	1.1390	1.8099	2.6761	5.2017	1.4905
	>=50	1.0608	1.5422	2.5044	4.5901	0.9787
	All	0.7542	1.0713	1.4203	2.6544	1.1616

(Continued on page 145)

Table A-14 (Continued)

		MANUFACTURING				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.5117	0.6805	0.9143		1.5056
	20-29	0.8367	0.9410	1.1252	1.7953	0.7547
	30-39	1.0000	2.3974	3.6819	6.0505	3.1512
	40-49	1.3899	2.0534	2.7658	6.9987	2.2599
	>=50	1.3919	3.0856	5.3777	6.5173	2.5754
	All	0.9193	1.1624	1.5843	2.8858	1.1010
1985	<=19	0.3885	0.4147	0.5079		0.2399
	20-29	0.7287	0.7798	1.0178	1.5673	0.9387
	30-39	1.0000	1.3077	2.2202	3.5818	0.8939
	40-49	1.2699	2.3539	3.5685	9.5353	1.9606
	>=50	1.5022	4.9203	8.4923	9.6008	3.9868
	All	0.8727	1.0616	1.6271	3.0406	1.1169
1986	<=19	0.3687	0.5622	0.7377	1.5145	
	20-29	0.6636	0.7004	1.0094	1.6102	1.0834
	30-39	1.0000	1.6801	1.9392	3.5804	1.7886
	40-49	1.0134	3.4901	5.2081	6.7879	4.2264
	>=50	1.2416	1.7094	3.3080	3.7634	1.4623
	All	0.7614	1.1769	1.7987	2.9026	1.6817
1987	<=19	0.3832	0.5332	0.5443	1.2980	
	20-29	0.6261	0.7963	0.9636	1.4204	1.1718
	30-39	1.0000	1.5400	2.0003	3.6914	1.9949
	40-49	1.3171	2.2784	4.6544	9.1383	2.2417
	>=50	1.0203	3.4852	7.0488	8.8051	1.9572
	All	0.7544	1.0087	1.4464	2.6602	1.5267
1988	<=19	0.3965	0.4830	0.7548	1.3575	
	20-29	0.6128	0.7172	0.7546	1.0659	0.9947
	30-39	1.0000	1.5088	2.2225	4.8418	1.6762
	40-49	1.1748	2.0441	4.9271	7.2232	1.6192
	>=50	1.1823	2.7924	3.2065	5.2805	1.6810
	All	0.7503	0.9417	1.3079	2.6314	1.2190
1989	<=19	0.4746	0.4913	0.5988		
	20-29	0.6321	0.8852	1.0345	1.6440	0.8833
	30-39	1.0000	1.4431	1.7946	3.2444	1.5421
	40-49	1.0544	1.5824	2.2943	4.7723	1.4944
	>=50	1.1899	3.5849	2.4599	10.2752	2.8300
	All	0.7661	1.0891	1.3564	2.7531	1.2894
1990	<=19	0.4697	0.5158	0.8755	1.4394	
	20-29	0.7424	0.7642	0.9359	1.6662	1.1562
	30-39	1.0000	1.3563	2.0118	3.3427	2.6867
	40-49	1.2114	2.1957	2.0891	4.7081	2.5517
	>=50	1.3478	2.5660	3.8101	9.6052	2.9434
	All	0.8190	0.9075	1.2146	2.4099	1.7725

(Continued on page 146)

Table A-14 (Continued)

		MANUFACTURING				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.3003	0.4731	0.9587	1.9626	1.1632
	20-29	0.4464	1.2981	1.3321	2.1447	1.1370
	30-39	0.5010	0.8306	2.1239	1.5083	0.7524
	40-49	0.4583	1.1460	1.7959	3.1057	1.4736
	>=50	0.5540	1.5445	2.9699	1.3767	1.3045
	All	0.4087	1.0109	1.0533	1.6176	1.3308
1978	<=19	0.4045	0.5309	0.8525	1.5857	1.1452
	20-29	0.5397	0.7816	1.3624	2.1546	1.0897
	30-39	0.7834	1.6556	1.9937	3.3324	1.3373
	40-49	0.5684	0.9389	1.8949	4.9238	1.5742
	>=50	0.5202		2.9809	4.6914	1.6728
	All	0.5293	0.9175	1.2300	2.3112	0.9716
1979	<=19	0.4253	0.5237	0.9437		0.8635
	20-29	0.6050	0.8719	1.2110	2.0851	1.0014
	30-39	0.5739	1.0504	2.0899	3.0450	1.2776
	40-49	0.5932	3.0337	1.9235	4.3805	1.3413
	>=50	0.4808		2.6717	3.2977	4.2042
	All	0.5350	0.8363	1.3956	2.3204	1.1343
1980	<=19	0.4339	0.5723	0.8652		0.9636
	20-29	0.5993	0.7964	1.2757	1.8021	1.2041
	30-39	0.6633	1.3143	2.1358	3.9111	1.9082
	40-49	0.5637	0.9544	1.1209	1.7075	0.7396
	>=50	0.6627	1.3417	0.9256	5.7468	2.3563
	All	0.5575	0.9085	1.3027	2.1307	1.1365
1981	<=19	0.4355	0.7108	1.1803		0.7435
	20-29	0.6024	0.8104	1.2994	1.7420	1.1924
	30-39	0.6387	1.2199	1.6623	2.6786	1.5444
	40-49	0.6510	0.6987	1.8657	2.3931	1.0788
	>=50	0.5049	1.9578	1.1402	1.0653	1.8711
	All	0.5610	0.8551	1.2222	1.9978	1.1046
1982	<=19	0.4359	0.5896	0.6471		0.7261
	20-29	0.6528	0.8720	1.4774	2.0707	1.3713
	30-39	0.6922	1.3052	2.1261	3.7975	1.3355
	40-49	0.7336	1.7324	2.6729	2.4790	1.6721
	>=50	0.6335	1.5619	1.2820	3.3399	1.6300
	All	0.6011	0.9837	1.3508	2.1930	1.1975
1983	<=19	0.3993	0.5530	0.5641	0.9418	0.6750
	20-29	0.5884	0.7924	1.1634	1.5161	1.0523
	30-39	0.6497	1.0481	1.8042	3.0341	1.5643
	40-49	0.6842	1.2524	1.3764	3.0221	1.5907
	>=50	0.4710		1.6002	4.9177	1.5200
	All	0.5611	0.8212	1.1385	1.8286	1.0289

(Continued on page 147)

Table A-14 (Continued)

		MANUFACTURING				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.6190	0.6039	1.6360		0.9368
	20-29	0.6441	0.9263	1.1673	1.8580	1.2453
	30-39	0.8055	1.2817	3.9010	4.5866	4.6487
	40-49	0.7454	1.4894	2.6632	2.9405	2.2943
	>=50	0.9070		6.2528	6.9519	3.1264
	All	0.6873	0.9016	1.3770	2.0964	1.3528
1985	<=19	0.3680	0.5065	0.5984	1.0042	0.3808
	20-29	0.5905	0.8275	0.9673	1.3768	0.8950
	30-39	0.7547	1.4178	1.8858	3.3362	1.6315
	40-49	0.6125	0.7780	4.1643	4.9609	1.5362
	>=50	0.8067		2.5766	10.3063	3.5044
	All	0.5872	0.8637	1.2612	2.0647	1.1118
1986	<=19	0.4283	0.5002	0.6639		
	20-29	0.5462	0.7234	0.8585	1.1890	0.7892
	30-39	0.7077	0.8549	1.8155	2.8546	1.3156
	40-49	0.6164	1.4806	2.0720	3.7883	1.3262
	>=50	0.5985	1.3064	1.7236	2.6647	1.3084
	All	0.5658	0.7313	1.1589	1.9365	1.1225
1987	<=19	0.4181	0.4560	0.5308	0.9675	0.4753
	20-29	0.6274	0.6259	0.9413	1.2964	0.8583
	30-39	0.6760	1.0358	1.9953	2.8301	1.1437
	40-49	0.5899	0.7498	2.6960	4.5464	2.0776
	>=50	0.4813	1.7058	2.5985	4.9111	4.2783
	All	0.5954	0.6426	1.0645	1.7623	1.0261
1988	<=19	0.3822	0.6434	0.8490	1.0119	0.6105
	20-29	0.5397	0.6740	0.6668	0.8928	0.6270
	30-39	0.6687	1.0671	2.4317	2.7883	1.3754
	40-49	0.6387	1.6212	2.9105	3.5174	1.7164
	>=50	0.7864	2.5620	2.6899	6.0073	1.2599
	All	0.5499	0.7881	1:1430	1.4094	0.8976
1989	<=19	0.4706	0.5696	0.3849		0.3414
	20-29	0.5536	0.6800	1.0059	1.3546	0.9017
	30-39	0.7472	1.0233	1.4659	2.6284	1.2308
	40-49	0.7970	1.4660	2.1247	3.0861	0.8925
	>=50	0.5656		3.0543	7.4974	1.8637
	All	0.5920	0.7087	1.1024	1.7795	1.0086
1990	<=19	0.5078	0.5514	0.8235	0.3232	0.6788
	20-29	0.6049	0.7455	1.0025	1.4115	0.9490
	30-39	0.6950	1.0525	1.5481	2.4254	2.5244
	40-49	0.7771	1.6303	2.8930	4.0344	1.2554
	>=50	0.7897	1.7797	1.9747	4.4882	2.5767
	All	0.6171	0.7375	1.0635	1.6635	1.2968

Note: Calculated as described in Chapter 5.

Table A-15 Wage Index of Private Employees (Adjusted, Male 30-39, Ele. + Oth. = 1.0): Industry

		INDUSTRY				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.4278	1.9855	1.6450		0.7090
	20-29	0.9627	0.8720	1.1612	1.9023	0.8174
	30-39	1.0000	1.7277	1.6976	3.4895	0.9329
	40-49	0.9033	1.8488	3.8917	3.9817	1.9939
	>=50	0.8922	1.7906	3.1538	3.9894	1.4785
1978	<=19	0.4792	0.4836	0.6477		0.3999
	20-29	0.7311	0.7801	1.1832	1.8705	0.6959
	30-39	1.0000	1.2972	1.7685	2.9982	1.3581
	40-49	1.0357	1.5943	1.5187	4.6700	0.8542
	>=50	0.9313	2.7720	3.3230	4.3226	1.4664
1979	<=19	0.4753	0.5181	1.1525		0.4436
	20-29	0.8312	0.9945	1.4004	2.2628	0.9745
	30-39	1.0000	1.7475	2.7655	3.9520	2.7191
	40-49	1.0816	1.8162	2.9800	5.9626	1.5279
	>=50	0.9684	5.8411	8.0878	12.2009	2.5598
1980	<=19	0.5082	0.5062	0.9006		0.7189
	20-29	0.7770	0.9140	1.2606	2.0412	1.1778
	30-39	1.0000	1.6729	2.4348	4.0681	1.7179
	40-49	0.9762	1.6956	1.2203	1.7961	0.9016
	>=50	1.0725	2.2363	3.9372	5.0624	0.6835
1981	<=19	0.4824	0.6136	0.9896	1.2025	0.7930
	20-29	0.8359	0.8136	1.1284	1.8663	1.0745
	30-39	1.0000	1.7260	2.1040	4.1091	1.5919
	40-49	1.0525	1.5247	2.0039	3.2577	1.4626
	>=50	0.9309	1.9748	3.4660	4.8106	1.7883
1982	<=19	0.4850	0.5966	0.9158	1.2637	0.8334
	20-29	0.8982	1.0089	1.3968	2.4174	1.4226
	30-39	1.0000	1.6694	2.2744	4.0270	2.5566
	40-49	1.1968	2.2808	3.8969	5.6531	2.2093
	>=50	1.2184	1.9075	2.8661	4.9396	2.1036
1983	<=19	0.4990	0.4797	0.8366		
	20-29	0.7722	0.8071	1.0656	1.7466	1.2285
	30-39	1.0000	1.4683	2.0177	3.3303	1.2564
	40-49	0.9793	1.7412	2.5745	5.0041	1.4339
	>=50	0.8862	1.5801	2.5660	4.7031	1.0028

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Table A-15 (Continued)

		INDUSTRY				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.6056	0.6722	0.9032		1.4873
	20-29	0.8908	0.9027	1.0795	1.7223	0.7240
	30-39	1.0000	1.5715	2.4135	3.9661	2.0657
	40-49	1.1908	1.9147	2.5790	6.5261	2.1073
	>=50	1.2820	2.6508	4.6200	5.5990	2.2126
1985	<=19	0.4686	0.4312	0.5280		0.2494
	20-29	0.7656	0.7701	1.0051	1.5478	0.9270
	30-39	1.0000	1.2977	2.2031	3.5544	0.8870
	40-49	1.1100	2.1842	3.3113	8.8481	1.8193
	>=50	1.1394	4.3777	7.5558	8.5421	3.5472
1986	<=19	0.3975	0.5071	0.6654	1.3661	
	20-29	0.6756	0.7955	1.1466	1.8289	1.2306
	30-39	1.0000	1.6914	1.9524	3.6047	1.8008
	40-49	0.9173	3.7901	5.6559	7.3714	4.5897
	>=50	1.0406	1.6427	3.1790	3.6166	1.4053
1987	<=19	0.4537	0.6041	0.6167	1.4706	
	20-29	0.7402	0.8858	1.0719	1.5800	1.3034
	30-39	1.0000	1.6624	2.1593	3.9846	2.1534
	40-49	1.1900	2.2504	4.5972	9.0260	2.2141
	>=50	0.9984	3.3137	6.7020	8.3719	1.8609
1988	<=19	0.4784	0.5347	0.8355	1.5027	
	20-29	0.7228	1.0815	1.1379	1.6074	1.4999
	30-39	1.0000	1.5333	2.2585	4.9201	1.7033
	40-49	1.0655	2.2053	5.3156	7.7929	1.7469
	>=50	1.0947	2.8609	3.2851	5.4100	1.7223
1989	<=19	0.5409	0.6177	0.7529		
	20-29	0.7310	0.9757	1.1402	1.8120	0.9736
	30-39	1.0000	1.6171	2.0109	3.6354	1.7280
	40-49	1.0400	1.8547	2.6892	5.5937	1.7516
	>=50	1.1438	4.3446	2.9812	12.4528	3.4298
1990	<=19	0.5223	0.5679	0.9639	1.5848	
	20-29	0.7870	0.8227	1.0074	1.7936	1.2446
	30-39	1.0000	1.3679	2.0290	3.3714	2.7097
	40-49	1.0933	2.2532	2.1438	4.8313	2.6185
	>=50	1.0950	2.0399	3.0289	7.6359	2.3399

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Table A-15 (Continued)

		INDUSTRY				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.4921	0.4751	0.9626	1.9706	1.1679
	20-29	0.6395	1.2155	1.4465	2.3289	1.2346
	30-39	0.6668	0.9210	3.1428	2.2319	1.1133
	40-49	0.6954	0.9579	2.2876	3.9561	1.8771
	>=50	0.7105	2.0619	3.4239	1.5871	1.5039
1978	<=19	0.4035	0.3695	0.7780	1.4470	1.0451
	20-29	0.5436	0.7123	1.1862	1.8758	0.9487
	30-39	0.6554	1.5119	1.5955	2.6669	1.0702
	40-49	0.4994	0.9107	1.5857	4.1204	1.3173
	>=50	0.4051	1.6200	2.8864	4.5425	1.6198
1979	<=19	0.4694	0.4767	0.9341		0.8547
	20-29	0.6574	0.8904	1.2161	2.0939	1.0056
	30-39	0.5874	1.0046	2.1632	3.1519	1.3224
	40-49	0.6280	2.7048	1.9041	4.3362	1.3278
	>=50	0.2593	1.1781	2.6304	3.2466	4.1392
1980	<=19	0.4577	0.5130	0.8326		0.9273
	20-29	0.6193	0.6937	1.2734	1.7989	1.2019
	30-39	0.6004	1.2885	1.9313	3.5367	1.7255
	40-49	0.4996	1.4829	0.9862	1.5023	0.6507
	>=50	0.4245	1.6015	0.9287	5.7661	2.3642
1981	<=19	0.5172	0.7456	1.1039		0.6954
	20-29	0.6204	0.7444	1.2309	1.6501	1.1295
	30-39	0.5992	1.0508	1.6175	2.6064	1.5028
	40-49	0.5743	0.9623	1.5905	2.0401	0.9196
	>=50	0.2908	2.3236	1.1486	1.0731	1.8848
1982	<=19	0.4883	0.5447	0.6513		0.7308
	20-29	0.6779	0.8102	1.4341	2.0100	1.3310
	30-39	0.6789	1.3791	2.0621	3.6833	1.2953
	40-49	0.6021	1.5182	2.9037	2.6931	1.8166
	>=50	0.4961	1.8535	1.1890	3.0975	1.5118
1983	<=19	0.4152	0.4114	0.5682	0.9486	0.6798
	20-29	0.6064	0.8098	1.1436	1.4903	1.0343
	30-39	0.6484	0.9577	1.6455	2.7673	1.4268
	40-49	0.6680	1.2120	1.3241	2.9073	1.5302
	>=50	0.3254	1.6150	1.6396	5.0388	1.5574

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Table A-15 (Continued)

		INDUSTRY				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1984	<=19	0.6542	0.5754	1.6161		0.9254
	20-29	0.5938	0.8474	1.1198	1.7825	1.1947
	30-39	0.6838	1.2066	2.5571	3.0066	3.0472
	40-49	0.7352	1.5912	2.4834	2.7420	2.1394
	>=50	0.7242	1.6150	5.3718	5.9724	2.6859
1985	<=19	0.3741	0.4805	0.6221	1.0440	0.3958
	20-29	0.5594	0.8406	0.9552	1.3596	0.8838
	30-39	0.7280	1.4516	1.8714	3.3106	1.6190
	40-49	0.6319	0.7965	3.8642	4.6034	1.4255
	>=50	0.7450	1.6150	2.2925	9.1699	3.1180
1986	<=19	0.4439	0.5243	0.5988		
	20-29	0.5660	0.7622	0.9751	1.3506	0.8964
	30-39	0.6896	0.9252	1.8278	2.8740	1.3245
	40-49	0.6463	1.5599	2.2501	4.1139	1.4402
	>=50	0.6089	1.3764	1.6564	2.5608	1.2574
1987	<=19	0.4735	0.5223	0.6014	1.0962	0.5385
	20-29	0.6922	0.7144	1.0471	1.4420	0.9548
	30-39	0.8269	1.1938	2.1538	3.0549	1.2345
	40-49	0.6671	0.8586	2.6629	4.4906	2.0521
	>=50	0.8888	1.9533	2.4707	4.6695	4.0678
1988	<=19	0.4272	0.7319	0.9399	1.1201	0.6758
	20-29	0.6854	0.7806	1.0055	1.3463	0.9455
	30-39	0.6983	0.9937	2.4711	2.8335	1.3977
	40-49	0.6720	1.6033	3.1400	3.7948	1.8517
	>=50	0.6022	1.9533	2.7559	6.1546	1.2908
1989	<=19	0.5546	0.6903	0.4840		0.4292
	20-29	0.6724	0.8749	1.1087	1.4930	0.9938
	30-39	0.8327	1.2415	1.6426	2.9452	1.3792
	40-49	0.8386	1.7766	2.4904	3.6173	1.0462
	>=50	0.6727		3.7016	9.0864	2.2586
1990	<=19	0.5538	0.6231	0.9067	0.3559	0.7474
	20-29	0.6494	0.8333	1.0792	1.5194	1.0216
	30-39	0.7308	1.1665	1.5614	2.4462	2.5461
	40-49	0.7856	1.8257	2.9687	4.1400	1.2882
	>=50	0.7754	2.0477	1.5698	3.5680	2.0484

Note: Calculated as described in Chapter 5.

Table A-16 Wage Index of Private Employees (Adjusted, Male 30-39, Ele. + Oth. = 1.0): Services and Others

		SERVICES AND OTHERS				
		Male				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2687	0.4132	0.3423		0.1475
	20-29	0.3917	0.6955	0.9262	1.5174	0.6520
	30-39	1.0000	1.5794	1.5518	3.1899	0.8528
	40-49	0.5007	1.3734	2.8908	2.9577	1.4811
	>=50	0.4291	1.8903	3.3295	4.2117	1.5609
1978	<=19	0.4833	0.6354	0.8511		0.5255
	20-29	0.7745	0.9916	1.5041	2.3778	0.8846
	30-39	1.0000	1.6341	2.2278	3.7768	1.7109
	40-49	1.0022	2.1071	2.0072	6.1720	1.1290
	>=50	0.9394	2.5533	3.0608	3.9815	1.3506
1979	<=19	0.4515	0.6490	1.4438		0.5557
	20-29	0.7847	0.9637	1.3570	2.1926	0.9443
	30-39	1.0000	1.4291	2.2617	3.2320	2.2237
	40-49	1.0001	2.0349	3.3389	6.6807	1.7119
	>=50	1.0563	2.1758	3.0126	4.5447	0.9535
1980	<=19	0.5036	0.5920	1.0533		0.8407
	20-29	0.8734	0.7789	1.0742	1.7394	1.0036
	30-39	1.0000	1.3702	1.9943	3.3321	1.4071
	40-49	1.1769	5.3663	3.8621	5.6845	2.8535
	>=50	1.1825	1.9339	3.4048	4.3779	0.5911
1981	<=19	0.4479	0.6123	0.9876	1.2001	0.7914
	20-29	0.7550	0.9693	1.3443	2.2234	1.2801
	30-39	1.0000	1.7869	2.1782	4.2541	1.6481
	40-49	1.1300	2.4371	3.2031	5.2072	2.3379
	>=50	1.1206	2.2211	3.8983	5.4105	2.0113
1982	<=19	0.4288	0.5731	0.8798	1.2141	0.8006
	20-29	0.7572	0.9542	1.3210	2.2863	1.3454
	30-39	1.0000	1.6064	2.1885	3.8750	2.4601
	40-49	0.9946	2.1654	3.6997	5.3670	2.0975
	>=50	1.1813	3.1095	4.6722	8.0524	3.4292
1983	<=19	0.6286	0.6662	1.1617		
	20-29	0.9239	1.0783	1.4237	2.3336	1.6413
	30-39	1.0000	1.9070	2.6207	4.3254	1.6318
	40-49	1.3284	2.6562	3.9273	7.6337	2.1874
	>=50	1.3334	2.4171	3.9252	7.1941	1.5339

(Continued on page 153)

Table A-16 (Continued)

		SERVICES AND OTHERS				
		Male				
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**
1984	<=19	0.3892	0.3692	0.4961		0.8169
	20-29	0.7192	0.9620	1.1503	1.8353	0.7715
	30-39	1.0000	1.2771	1.9613	3.2230	1.6786
	40-49	1.1091	2.0202	2.7211	6.8854	2.2234
	>=50	0.8617	2.2828	3.9787	4.8217	1.9054
1985	<=19	0.6717	0.5051	0.6186		0.2922
	20-29	0.7977	1.0896	1.4221	2.1899	1.3116
	30-39	1.0000	1.6526	2.8057	4.5265	1.1297
	40-49	1.3189	2.4210	3.6703	9.8073	2.0165
	>=50	1.1227	1.7271	2.9810	3.3701	1.3994
1986	<=19	0.4130	0.5174	0.6789	1.3937	
	20-29	0.7959	1.0283	1.4821	2.3641	1.5907
	30-39	1.0000	1.6333	1.8853	3.4808	1.7389
	40-49	1.2042	2.7000	4.0292	5.2513	3.2697
	>=50	1.0117	2.7329	5.2888	6.0168	2.3379
1987	<=19	0.3742	0.6388	0.6521	1.5549	
	20-29	0.8276	1.0682	1.2926	1.9054	1.5719
	30-39	1.0000	1.8344	2.3826	4.3968	2.3761
	40-49	1.2273	1.8558	3.7910	7.4432	1.8258
	>=50	1.0674	3.0084	6.0846	7.6006	1.6895
1988	<=19	0.4985	0.6076	0.9495	1.7077	
	20-29	0.7307	0.9999	1.0520	1.4862	1.3868
	30-39	1.0000	1.4344	2.1129	4.6029	1.5935
	40-49	1.0756	1.9155	4.6172	6.7689	1.5174
	>=50	1.2166	3.8405	4.4100	7.2623	2.3119
1989	<=19	0.4446	0.9229	1.1250		
	20-29	0.7491	0.9116	1.0653	1.6930	0.9097
	30-39	1.0000	1.7104	2.1270	3.8454	1.8278
	40-49	1.0477	3.2558	4.7207	9.8192	3.0748
	>=50	1.1232	1.8192	1.2483	5.2143	1.4361
1990	<=19	0.5282	0.7016	1.1908	1.9578	
	20-29	0.8007	1.0288	1.2599	2.2430	1.5565
	30-39	1.0000	1.6804	2.4926	4.1416	3.3288
	40-49	1.1416	3.0738	2.9245	6.5908	3.5722
	>=50	1.0894	2.6382	3.9173	9.8755	3.0262

(Continued on page 154)

Table A-16 (Continued)

		SERVICES AND OTHERS				
		Female				
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.
1977	<=19	0.2046	0.2888	0.2003	0.4101	0.2430
	20-29	0.3748	0.5803	1.1538	1.8577	0.9848
	30-39	0.3063	0.8714	2.8730	2.0403	1.0177
	40-49	0.4143	1.0244	1.6993	2.9387	1.3944
	>=50	0.2336	1.0524	3.6147	1.6756	1.5877
1978	<=19	0.3368	0.6125	1.0223	1.9014	1.3733
	20-29	0.5798	0.8740	1.5079	2.3846	1.2060
	30-39	0.5454	1.2241	2.0099	3.3595	1.3482
	40-49	0.5319	1.3934	2.0957	5.4457	1.7410
	>=50	0.4734	1.3237	2.6586	4.1841	1.4919
1979	<=19	0.3231	0.5964	1.1701		1.0707
	20-29	0.5212	1.0362	1.1784	2.0289	0.9744
	30-39	0.5823	1.2143	1.7691	2.5777	1.0815
	40-49	0.4794	1.1444	2.1334	4.8584	1.4877
	>=50	0.4262	1.2224	0.9798	1.2093	1.5418
1980	<=19	0.3998	0.6425	0.9737		1.0845
	20-29	0.5881	0.9937	1.0851	1.5329	1.0242
	30-39	0.6692	1.4919	1.5819	2.8968	1.4134
	40-49	0.6415	1.3157	3.1213	4.7547	2.0595
	>=50	0.4604	1.5369	0.8031	4.9865	2.0445
1981	<=19	0.4113	0.7332	1.1017		0.6940
	20-29	0.6050	0.9207	1.4665	1.9659	1.3457
	30-39	0.5554	1.1950	1.6746	2.6984	1.5559
	40-49	0.6235	1.3417	2.5423	3.2609	1.4700
	>=50	0.3925	1.3490	1.2918	1.2070	2.1199
1982	<=19	0.3080	0.4679	0.6257		0.7021
	20-29	0.4516	0.7732	1.3563	1.9009	1.2588
	30-39	0.6422	1.4598	1.9843	3.5442	1.2464
	40-49	0.6352	1.6380	2.7568	2.5568	1.7246
	>=50	0.4454	2.0182	1.9383	5.0495	2.4644
1983	<=19	0.3867	0.6557	0.7890	1.3173	0.9441
	20-29	0.6654	1.0179	1.5279	1.9911	1.3819
	30-39	0.6657	1.6128	2.1372	3.5941	1.8531
	40-49	0.6940	2.0111	2.0199	4.4350	2.3344
	>=50	0.5299	2.0925	2.5080	7.7076	2.3824

(Continued on page 155)

Table A-16 (Continued)

		SERVICES AND OTHERS				
		Female				
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**
1984	<=19	0.2728	0.4524	0.8876		0.5082
	20-29	0.5134	0.7303	1.1933	1.8995	1.2731
	30-39	0.6445	1.1098	2.0780	2.4433	2.4763
	40-49	0.5647	1.7735	2.6201	2.8930	2.2572
	>=50	0.3957	1.5205	4.6261	5.1433	2.3130
1985	<=19	0.2742	0.4131	0.7288	1.2232	0.4638
	20-29	0.4838	0.8074	1.3515	1.9237	1.2505
	30-39	0.6180	1.5438	2.3832	4.2161	2.0619
	40-49	0.5865	1.7389	4.2831	5.1024	1.5800
	>=50	0.4483	2.4054	0.9044	3.6177	1.2301
1986	<=19	0.2816	0.4874	0.6110		
	20-29	0.5019	0.8500	1.2605	1.7458	1.1587
	30-39	0.9909	1.3511	1.7649	2.7752	1.2790
	40-49	0.8335	1.2641	1.6030	2.9307	1.0260
	>=50	0.4997	1.9902	2.7556	4.2603	2.0919
1987	<=19	0.3204	0.5480	0.6359	1.1591	0.5694
	20-29	0.5583	0.8321	1.2628	1.7390	1.1514
	30-39	0.7074	1.1994	2.3766	3.3709	1.3622
	40-49	0.6778	1.6113	2.1959	3.7031	1.6922
	>=50	0.4855	2.1254	2.2431	4.2393	3.6931
1988	<=19	0.2809	0.4726	1.0681	1.2729	0.7680
	20-29	0.4380	0.7096	0.9297	1.2448	0.8742
	30-39	0.8212	1.2755	2.3117	2.6508	1.3076
	40-49	0.6522	1.2903	2.7274	3.2962	1.6084
	>=50	0.4744	1.3337	3.6995	8.2619	1.7328
1989	<=19	0.3685	0.6953	0.7232		0.6414
	20-29	0.5532	0.8079	1.0359	1.3950	0.9286
	30-39	0.6185	1.2355	1.7374	3.1153	1.4588
	40-49	0.6711	2.1987	4.3716	6.3498	1.8364
	>=50	0.7195	4.6779	1.5500	3.8047	0.9458
1990	<=19	0.3840	0.6199	1.1201	0.4397	0.9233
	20-29	0.7325	0.8974	1.3496	1.9001	1.2776
	30-39	0.6300	1.0992	1.9181	3.0051	3.1277
	40-49	0.6193	1.7620	4.0499	5.6477	1.7574
	>=50	0.6382	2.7101	2.0303	4.6145	2.6492

Note: Calculated as described in Chapter 5.

Table A-17 Employed Persons Classified by Sex, Education and Age Group: All Sectors

		ALL SECTORS												
		Male						Female						Grand
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	Total
1977	<=19	2,209,132	71,805	1,154		5,578	2,287,669	2,344,313	37,857	2,769	55	2,880	2,387,874	4,675,543
	20-29	2,616,457	246,188	86,845	44,661	63,687	3,057,838	2,418,416	103,948	53,815	37,304	64,964	2,678,447	5,736,285
	30-39	2,259,781	194,887	48,147	37,788	37,592	2,578,195	2,058,567	66,221	18,949	14,741	37,728	2,196,206	4,774,401
	40-49	1,625,119	68,007	11,955	12,071	16,028	1,733,180	1,415,744	13,596	2,946	4,102	8,046	1,444,434	3,177,614
	>=50	1,566,716	44,244	5,588	6,283	12,939	1,635,770	1,151,376	7,588	793	1,179	2,707	1,163,643	2,799,413
	All	10,277,205	625,131	153,689	100,803	135,824	11,292,652	9,388,416	229,210	79,272	57,381	116,325	9,870,604	21,163,256
1978	<=19	2,285,194	98,080	1,595		1,932	2,386,801	2,436,348	36,789	2,880	153	4,838	2,481,008	4,867,809
	20-29	2,681,521	267,694	75,387	54,094	89,026	3,167,722	2,575,024	106,803	69,938	40,409	84,194	2,876,368	6,044,090
	30-39	2,311,126	236,017	38,686	41,299	39,199	2,666,327	2,206,730	77,381	27,282	18,801	34,809	2,365,003	5,031,330
	40-49	1,668,685	74,659	10,922	12,277	18,383	1,784,926	1,508,971	19,124	5,138	4,130	7,053	1,544,416	3,329,342
	>=50	1,607,284	53,679	7,230	7,546	13,170	1,688,909	1,231,797	8,501	1,566	1,284	3,913	1,247,061	2,935,970
	All	10,553,810	730,129	133,820	115,216	161,710	11,694,685	9,958,870	248,598	106,804	64,777	134,807	10,513,856	22,208,541
1979	<=19	2,175,400	88,890	3,979		1,151	2,269,420	2,271,290	40,362	4,032		3,303	2,318,987	4,588,407
	20-29	2,668,734	284,482	98,452	73,598	91,133	3,216,399	2,522,773	104,466	83,929	52,202	96,827	2,860,197	6,076,596
	30-39	2,345,746	246,917	45,384	44,948	46,034	2,729,029	2,227,419	76,612	29,314	21,033	34,777	2,389,155	5,118,184
	40-49	1,687,028	72,316	13,787	21,688	19,575	1,814,394	1,523,857	14,559	3,890	5,717	8,109	1,556,132	3,370,526
	>=50	1,611,503	51,193	6,921	8,232	22,707	1,700,556	1,238,359	6,891	1,413	2,030	3,891	1,252,584	2,953,140
	All	10,488,411	743,798	168,523	148,466	180,600	11,729,798	9,783,698	242,890	122,578	80,982	146,907	10,377,055	22,106,853
1980	<=19	2,198,722	84,741	1,232		740	2,285,435	2,299,476	41,022	3,414		4,362	2,348,274	4,633,709
	20-29	2,663,724	333,411	100,852	60,590	96,264	3,254,841	2,567,444	143,886	87,754	50,506	107,783	2,957,373	6,212,214
	30-39	2,434,254	223,089	53,764	57,906	51,784	2,820,797	2,286,296	80,184	34,899	26,704	40,934	2,469,017	5,289,814
	40-49	1,733,105	79,661	15,246	19,093	22,152	1,869,257	1,598,972	21,122	4,482	5,558	10,301	1,640,435	3,509,692
	>=50	1,666,988	50,166	5,460	10,358	16,963	1,749,935	1,322,972	12,203	2,529	2,624	4,554	1,344,882	3,094,817
	All	10,696,793	771,068	176,554	147,947	187,903	11,980,265	10,075,160	298,417	133,078	85,392	167,934	10,759,981	22,740,246

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Table A-17 (Continued)

Year	Age	ALL SECTORS												Grand Total
		Male						Female						
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	
1981	<=19	2,426,407	96,358	4,926	91	957	2,528,739	2,512,682	52,475	6,327		1,918	2,573,402	5,102,141
	20-29	3,295,603	400,645	112,399	75,490	135,671	4,019,808	3,023,671	174,414	104,939	68,444	122,516	3,493,984	7,513,792
	30-39	2,483,953	230,187	61,239	66,537	56,246	2,898,162	2,282,932	81,470	38,138	38,958	44,488	2,485,986	5,384,148
	40-49	1,623,966	87,504	22,718	20,030	20,580	1,774,798	1,619,041	23,221	8,297	7,402	12,874	1,670,835	3,445,633
	>=50	1,741,338	56,704	5,779	9,279	16,588	1,829,688	1,435,946	11,455	2,246	2,093	5,672	1,457,412	3,287,100
	All	11,571,267	871,398	207,061	171,427	230,042	13,051,195	10,874,272	343,035	159,947	116,897	187,468	11,681,619	24,732,814
1982	<=19	2,545,445	101,162	6,733	82	1,588	2,655,010	2,608,696	61,446	10,376		531	2,681,049	5,336,059
	20-29	3,279,450	457,542	146,417	74,722	156,913	4,115,044	3,076,180	212,610	119,643	71,680	153,092	3,633,205	7,748,249
	30-39	2,564,989	244,664	71,137	75,476	70,479	3,026,745	2,431,831	95,129	44,838	39,962	59,240	2,671,000	5,697,745
	40-49	1,623,143	98,020	22,568	28,977	27,862	1,800,570	1,650,580	30,069	11,901	11,575	16,682	1,720,807	3,521,377
	>=50	1,773,714	61,436	7,792	6,104	27,573	1,876,619	1,544,966	10,027	3,010	1,751	7,464	1,567,218	3,443,837
	All	11,786,741	962,824	254,647	185,361	284,415	13,473,988	11,312,253	409,281	189,768	124,968	237,009	12,273,279	25,747,267
1983	<=19	2,442,446	122,256	9,819			2,574,521	2,474,116	52,333	4,944	136	889	2,532,418	5,106,939
	20-29	3,174,225	468,724	131,412	143,042	142,363	4,059,766	2,891,989	177,491	139,159	86,675	157,008	3,452,322	7,512,088
	30-39	2,537,450	281,560	62,710	125,542	91,752	3,099,014	2,374,320	91,025	50,795	51,225	79,311	2,646,676	5,745,690
	40-49	1,637,629	113,561	23,673	35,454	33,145	1,843,462	1,579,361	32,808	22,453	14,971	18,974	1,668,567	3,512,029
	>=50	1,750,023	65,240	10,258	13,085	26,366	1,864,972	1,415,827	11,933	2,912	3,105	8,061	1,441,838	3,306,810
	All	11,541,773	1,051,341	237,872	317,123	293,626	13,441,735	10,735,613	365,590	220,263	156,112	264,243	11,741,821	25,183,556
1984	<=19	2,329,894	167,754	11,040		191	2,508,879	2,449,216	108,258	5,941		2,496	2,565,911	5,074,790
	20-29	3,382,484	436,355	168,898	121,171	119,478	4,228,386	3,030,251	202,097	128,622	78,793	133,265	3,573,028	7,801,414
	30-39	2,702,139	232,753	105,293	112,228	108,744	3,261,157	2,477,645	93,655	52,366	61,817	68,973	2,754,456	6,015,613
	40-49	1,689,421	120,942	37,312	31,529	31,664	1,910,868	1,652,907	35,810	13,002	10,283	26,977	1,738,979	3,649,847
	>=50	1,844,608	58,836	9,277	15,585	27,448	1,955,754	1,477,863	12,040	3,066	3,001	5,511	1,501,481	3,457,235
	All	11,948,546	1,016,640	331,820	280,513	287,525	13,865,044	11,087,882	451,860	202,997	153,894	237,222	12,133,855	25,998,899

(Continued on page 158)

Table A-17 (Continued)

Year	Age	ALL SECTORS												Grand Total
		Male						Female						
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	
1985	<=19	2,283,253	167,035	12,579		633	2,463,500	2,339,508	122,909	11,511	168	433	2,474,529	4,938,029
	20-29	3,305,843	542,899	162,832	133,306	102,974	4,247,854	2,963,429	185,669	127,272	115,474	120,780	3,512,624	7,760,478
	30-39	2,764,953	276,321	84,267	122,000	90,929	3,338,470	2,431,118	92,325	49,474	73,741	75,952	2,722,610	6,061,080
	40-49	1,722,583	132,646	36,762	41,249	36,799	1,970,039	1,614,570	39,316	13,721	12,875	19,498	1,699,980	3,670,019
	>=50	1,841,697	66,492	7,186	11,767	24,548	1,951,690	1,439,538	10,364	3,206	3,231	14,995	1,471,334	3,423,024
	All	11,918,329	1,185,393	303,626	308,322	255,883	13,971,553	10,788,163	450,583	205,184	205,489	231,658	11,881,077	25,852,630
1986	<=19	2,276,115	247,302	16,582	313		2,540,312	2,425,067	111,621	8,580			2,545,268	5,085,580
	20-29	3,345,839	583,310	202,684	170,034	89,389	4,391,256	2,917,788	234,801	151,167	159,352	117,447	3,580,555	7,971,811
	30-39	2,716,956	330,944	130,258	136,983	128,054	3,443,195	2,527,153	94,531	47,426	94,146	108,132	2,871,388	6,314,583
	40-49	1,777,609	144,615	37,329	64,148	32,716	2,056,417	1,639,705	54,681	23,266	29,655	24,398	1,771,705	3,828,122
	>=50	1,824,964	84,805	6,778	16,620	23,034	1,956,201	1,504,892	13,037	2,488	6,260	7,812	1,534,489	3,490,690
	All	11,941,483	1,390,976	393,631	388,098	273,193	14,387,381	11,014,605	508,671	232,927	289,413	257,789	12,303,405	26,690,786
1987	<=19	2,156,653	288,549	18,515	327		2,464,044	2,308,137	133,160	21,867	215	128	2,463,507	4,927,551
	20-29	3,354,243	682,488	222,172	206,819	93,258	4,558,980	3,038,609	323,431	180,164	182,533	115,067	3,839,804	8,398,784
	30-39	2,770,210	293,175	137,719	145,956	130,669	3,477,729	2,483,138	108,286	57,822	96,112	154,353	2,899,711	6,377,440
	40-49	1,897,677	170,715	36,093	66,172	35,827	2,206,484	1,728,817	61,706	18,988	23,304	31,238	1,864,053	4,070,537
	>=50	2,043,837	89,372	15,058	19,529	29,772	2,197,568	1,636,525	9,530	4,559	4,797	11,890	1,667,301	3,864,869
	All	12,222,620	1,524,299	429,557	438,803	289,526	14,904,805	11,195,226	636,113	283,400	306,961	312,676	12,734,376	27,639,181
1988	<=19	2,325,402	318,147	26,796	382		2,670,727	2,395,045	167,984	19,625	851	1,269	2,584,774	5,255,501
	20-29	3,528,662	740,650	228,529	262,254	68,881	4,828,976	3,306,858	335,014	165,161	267,802	108,773	4,183,608	9,012,584
	30-39	2,876,258	321,260	137,484	158,495	121,823	3,615,320	2,683,975	111,381	81,455	130,691	140,336	3,147,838	6,763,158
	40-49	1,937,287	178,109	34,346	88,783	49,347	2,287,872	1,844,049	77,597	24,765	25,491	40,207	2,012,109	4,299,981
	>=50	2,161,750	86,063	14,250	26,575	27,405	2,316,043	1,775,726	16,113	5,018	5,584	14,364	1,816,805	4,132,848
	All	12,829,359	1,644,229	441,405	536,489	267,456	15,718,938	12,005,653	708,089	296,024	430,419	304,949	13,745,134	29,464,072

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Table A-17 (Continued)

Year	Age	ALL SECTORS												Grand Total
		Male						Female						
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Total	
1989	<=19	3,340,225	193,089	13,496			3,546,810	3,211,807	156,491	13,585		1,410	3,383,293	6,930,103
	20-29	3,196,465	775,306	228,761	232,298	68,052	4,500,882	2,581,741	370,217	167,334	216,891	77,714	3,413,897	7,914,779
	30-39	2,858,631	341,669	120,960	191,652	120,143	3,633,055	2,357,209	112,497	70,546	116,013	136,574	2,792,839	6,425,894
	40-49	1,976,357	189,603	37,152	60,194	49,311	2,312,617	1,532,032	65,179	24,348	35,818	39,510	1,696,887	4,009,504
	>=50	2,156,492	96,206	19,974	39,492	23,693	2,335,857	1,499,429	8,271	6,295	6,586	13,968	1,534,549	3,870,406
	All	13,528,170	1,595,873	420,343	523,636	261,199	16,329,221	11,182,218	712,655	282,108	375,308	269,176	12,821,465	29,150,686
1990	<=19	3,730,470	267,273	11,181	2,988		4,011,912	3,640,656	224,919	11,195	123	788	3,877,681	7,889,593
	20-29	3,736,504	829,370	251,585	258,924	59,298	5,135,681	3,374,925	440,667	179,377	268,385	88,656	4,352,010	9,487,691
	30-39	3,074,450	367,528	130,427	225,530	131,694	3,929,629	2,920,143	132,489	81,982	160,341	147,524	3,442,479	7,372,108
	40-49	2,087,088	192,566	44,131	81,072	42,413	2,447,270	1,956,886	67,136	22,535	45,267	41,968	2,133,792	4,581,062
	>=50	2,322,077	78,973	21,931	39,438	29,699	2,492,118	1,972,275	15,002	7,121	14,998	13,954	2,023,350	4,515,468
	All	14,950,589	1,735,710	459,255	607,952	263,104	18,016,610	13,864,885	880,213	302,210	489,114	292,890	15,829,312	33,845,922

Sources: LFS (Round 2), July-September, 1977-1983.
LFS (Round 3), August, 1984-1990.

Table A-18 Employed Persons Classified by Sector, Sex, Education and Age: Agriculture

		AGRICULTURE					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	1,816,252	37,620			741	1,854,613
	20-29	1,881,194	56,564	3,053	756	6,016	1,947,583
	30-39	1,624,083	28,073	1,103	1,014		1,654,273
	40-49	1,200,268	10,930	61			1,211,259
	>=50	1,201,946	4,999	1,316		1,380	1,209,641
	All	7,723,743	138,186	5,533	1,770	8,137	7,877,369
1978	<=19	1,883,065	54,666				1,937,731
	20-29	1,969,593	48,908	3,336	1,366	7,102	2,030,305
	30-39	1,681,999	36,385	1,427	727		1,720,538
	40-49	1,219,049	7,448			1,084	1,227,581
	>=50	1,249,319	8,320	2,051	123	190	1,260,003
	All	8,003,025	155,727	6,814	2,216	8,376	8,176,158
1979	<=19	1,690,465	43,329				1,733,794
	20-29	1,865,680	60,287	4,748	2,886	6,932	1,940,533
	30-39	1,607,424	34,411	2,248	79		1,644,162
	40-49	1,232,198	12,976	224		168	1,245,566
	>=50	1,242,067	8,105	1,723	324	4,086	1,256,305
	All	7,637,834	159,108	8,943	3,289	11,186	7,820,360
1980	<=19	1,795,132	42,141				1,837,273
	20-29	1,890,519	81,991	9,864	347	4,813	1,987,534
	30-39	1,659,404	21,320	3,232	805	662	1,685,423
	40-49	1,255,699	10,437	1,614	107		1,267,857
	>=50	1,260,825	8,069	976	110	497	1,270,477
	All	7,861,579	163,958	15,686	1,369	5,972	8,048,564
1981	<=19	2,026,648	45,455	1,107			2,073,210
	20-29	2,455,656	130,791	11,191	2,456	7,655	2,607,749
	30-39	1,773,020	28,483	2,469	951	724	1,805,647
	40-49	1,160,987	11,514	2,043			1,174,544
	>=50	1,309,473	6,758	813	385	1,544	1,318,973
	All	8,725,784	223,001	17,623	3,792	9,923	8,980,123
1982	<=19	2,002,007	61,787	535			2,064,329
	20-29	2,336,956	133,830	18,375	1,162	12,215	2,502,538
	30-39	1,702,638	25,843	1,193	136	840	1,730,650
	40-49	1,092,834	10,588	2,463	1,201	153	1,107,239
	>=50	1,307,726	12,531	1,204	681	2,324	1,324,466
	All	8,442,161	244,579	23,770	3,180	15,532	8,729,222
1983	<=19	2,087,217	73,714	4,074			2,165,005
	20-29	2,379,190	139,242	21,316	4,860	6,731	2,551,339
	30-39	1,730,690	39,355	1,424	750	363	1,772,582
	40-49	1,186,987	15,959	1,465	175	481	1,205,067
	>=50	1,344,711	13,096	854		2,823	1,361,484
	All	8,728,795	281,366	29,133	5,785	10,398	9,055,477

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Table A-18 (Continued)

		AGRICULTURE					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	2,028,001	104,624	4,531			2,137,156
	20-29	2,531,800	142,484	33,405	7,775	8,946	2,724,410
	30-39	1,860,562	31,560	3,099	6,184	2,642	1,904,047
	40-49	1,191,784	18,678	690	546		1,211,698
	>=50	1,380,017	10,183	464	629	127	1,391,420
	All	8,992,164	307,529	42,189	15,134	11,715	9,368,731
1985	<=19	1,976,977	99,964	7,983		633	2,085,557
	20-29	2,481,631	214,472	26,259	9,538	16,406	2,748,306
	30-39	1,856,309	34,061	939	1,064	1,394	1,893,767
	40-49	1,215,909	20,443	4,120	115	585	1,241,172
	>=50	1,397,077	15,351	160	268	4,191	1,417,047
	All	8,927,903	384,291	39,461	10,985	23,209	9,385,849
1986	<=19	1,970,019	144,638	10,495			2,125,152
	20-29	2,554,772	193,714	22,590	8,915	9,638	2,789,629
	30-39	1,825,901	44,879	8,027	1,901	2,729	1,883,437
	40-49	1,231,661	19,077	1,085			1,251,823
	>=50	1,355,833	11,979	219		5,381	1,373,412
	All	8,938,186	414,287	42,416	10,816	17,748	9,423,453
1987	<=19	1,809,418	198,107	4,065			2,011,590
	20-29	2,441,905	256,457	43,374	47,764	15,948	2,805,448
	30-39	1,860,739	48,253	9,688	460	2,494	1,921,634
	40-49	1,291,828	29,492	964	603		1,322,887
	>=50	1,454,958	18,800	60		3,907	1,477,725
	All	8,858,848	551,109	58,151	48,827	22,349	9,539,284
1988	<=19	1,975,281	197,910	7,872			2,181,063
	20-29	2,676,921	327,425	57,346	22,162	7,577	3,091,431
	30-39	1,934,890	51,396	7,775	4,936	2,972	2,001,969
	40-49	1,380,062	23,782		1,693	302	1,405,839
	>=50	1,587,681	25,998	743	849	1,312	1,616,583
	All	9,554,835	626,511	73,736	29,640	12,163	10,296,885
1989	<=19	1,576,032	125,423				1,701,455
	20-29	2,473,317	296,053	50,373	55,169	459	2,875,371
	30-39	2,023,896	65,834	3,092	4,538	2,609	2,099,969
	40-49	1,528,342	35,322	1,460	1,639		1,566,763
	>=50	1,828,248	23,457	3,011	2,640	4,511	1,861,867
	All	9,429,835	546,090	57,935	63,986	7,580	10,105,425
1990	<=19	1,816,418	148,109	1,448			1,965,975
	20-29	2,704,672	322,433	46,891	28,165	4,237	3,106,398
	30-39	2,042,074	87,855	16,151	13,380	5,075	2,164,535
	40-49	1,420,565	30,190		229	91	1,451,075
	>=50	1,718,069	12,533	2,319	462	3,473	1,736,856
	All	9,701,798	601,120	66,809	42,236	12,876	10,424,839

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Table A-18 (Continued)

		AGRICULTURE					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	1,849,507	16,678				1,866,185
	20-29	1,766,253	12,799	53	337	966	1,780,408
	30-39	1,494,675	5,769	65	99	886	1,501,494
	40-49	1,040,181	545				1,040,726
	>=50	852,391	1,216				853,607
	All	7,003,007	37,007	118	436	1,852	7,042,420
1978	<=19	1,995,725	7,971			191	2,003,887
	20-29	1,988,413	13,255	420		2,413	2,004,501
	30-39	1,688,277	7,834	135			1,696,246
	40-49	1,165,578	83	272			1,165,933
	>=50	956,003	1,069			145	957,217
	All	7,793,996	30,212	827		2,749	7,827,784
1979	<=19	1,719,728	11,909				1,731,637
	20-29	1,802,302	11,444	2,396		2,619	1,818,761
	30-39	1,588,784	6,950				1,595,734
	40-49	1,114,804	498	138			1,115,440
	>=50	906,746		106			906,852
	All	7,132,364	30,801	2,640		2,619	7,168,424
1980	<=19	1,892,927	16,032	728		1,072	1,910,759
	20-29	1,970,060	23,471	4,598	220	2,284	2,000,633
	30-39	1,711,896	4,838		131		1,716,865
	40-49	1,224,543	3,412				1,227,955
	>=50	1,036,311	1,381	113			1,037,805
	All	7,835,737	49,134	5,439	351	3,356	7,894,017
1981	<=19	2,068,228	14,445				2,082,673
	20-29	2,341,696	35,026	5,490	1,473	2,644	2,386,329
	30-39	1,726,227	12,136	152		1,585	1,740,100
	40-49	1,224,315	4,081	145			1,228,541
	>=50	1,109,576	1,012	782	100		1,111,470
	All	8,470,042	66,700	6,569	1,573	4,229	8,549,113
1982	<=19	1,994,534	25,962	1,047			2,021,543
	20-29	2,221,053	52,365	9,315	1,527	1,864	2,286,124
	30-39	1,674,729	7,286	162	266		1,682,443
	40-49	1,145,466	3,415	271	108		1,149,260
	>=50	1,112,514	907	119		666	1,114,206
	All	8,148,296	89,935	10,914	1,901	2,530	8,253,576
1983	<=19	2,014,435	24,439	2,068			2,040,942
	20-29	2,228,286	34,231	11,063	3,996	5,605	2,283,181
	30-39	1,723,872	6,889		103		1,730,864
	40-49	1,181,523	3,512	1,073	101		1,186,209
	>=50	1,103,232	1,507	59			1,104,798
	All	8,251,348	70,578	14,263	4,200	5,605	8,345,994

(Continued on page 163)

Table A-18 (Continued)

		AGRICULTURE					
		Female					
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**	**All**
1984	<=19	2,035,516	51,738	332		2,337	2,089,923
	20-29	2,389,867	49,786	20,445	7,414	7,291	2,474,803
	30-39	1,803,120	9,624	3,355		128	1,816,227
	40-49	1,240,181	3,677			230	1,244,088
	>=50	1,135,355	1,239				1,136,594
	All	8,604,039	116,064	24,132	7,414	9,986	8,761,635
1985	<=19	1,891,822	61,152	1,447	168		1,954,589
	20-29	2,251,926	45,303	10,511	1,910	7,597	2,317,247
	30-39	1,728,789	8,296	1,353	303		1,738,741
	40-49	1,189,608	4,177	198			1,193,983
	>=50	1,081,278				2,973	1,084,251
	All	8,143,423	118,928	13,509	2,381	10,570	8,288,811
1986	<=19	1,946,491	55,528	1,546			2,003,565
	20-29	2,242,720	55,564	6,083	14,271	5,266	2,323,904
	30-39	1,756,836	9,648		624	745	1,767,853
	40-49	1,172,702	2,175				1,174,877
	>=50	1,121,104	200			576	1,121,880
	All	8,239,853	123,115	7,629	14,895	6,587	8,392,079
1987	<=19	1,805,340	57,586	3,469			1,866,395
	20-29	2,221,621	75,900	7,262	15,375	6,308	2,326,466
	30-39	1,647,126	9,495	1,453		159	1,658,233
	40-49	1,191,582	4,065				1,195,647
	>=50	1,202,389	796	54			1,203,239
	All	8,068,058	147,842	12,238	15,375	6,467	8,249,980
1988	<=19	1,924,464	95,006	5,768	851		2,026,089
	20-29	2,517,878	84,011	8,995	13,912	1,639	2,626,435
	30-39	1,912,536	12,979	1,627	533	1,072	1,928,747
	40-49	1,383,964	6,644	268	514	79	1,391,469
	>=50	1,303,835	1,646			1,490	1,306,971
	All	9,042,677	200,286	16,658	15,810	4,280	9,279,711
1989	<=19	1,467,139	74,751				1,541,891
	20-29	1,926,130	106,348	21,396	6,802	8,521	2,069,197
	30-39	1,695,356	6,463		987	149	1,702,954
	40-49	1,157,368	20,113	639			1,178,120
	>=50	1,163,798			519		1,164,316
	All	7,409,791	207,675	22,035	8,308	8,669	7,656,478
1990	<=19	1,716,573	95,025			343	1,811,941
	20-29	2,477,467	132,039	15,385	14,713	13,204	2,652,808
	30-39	2,051,603	13,538	4,169	4,709	3,324	2,077,343
	40-49	1,388,728	8,764	256	622		1,398,370
	>=50	1,435,344	2,258		548		1,438,150
	All	9,069,715	251,624	19,810	20,592	16,871	9,378,612

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table A-19 Employed Persons Classified by Sector, Sex, Education and Age: Manufacturing

		MANUFACTURING					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	102,996	6,879	117			109,992
	20-29	230,191	30,184	11,619	6,813	2,049	280,856
	30-39	153,957	22,608	5,172	3,548	231	185,516
	40-49	90,426	5,666	654	645		97,391
	>=50	80,503	4,757	220	486	76	86,042
	All	658,073	70,094	17,782	11,492	2,356	759,797
1978	<=19	152,596	10,198	230			163,024
	20-29	252,332	40,103	11,688	6,681	739	311,543
	30-39	158,056	27,362	4,484	4,721	322	194,945
	40-49	89,719	6,280	1,047	950	174	98,170
	>=50	85,899	2,873	799	273	274	90,118
	All	738,602	86,816	18,248	12,625	1,509	857,800
1979	<=19	163,187	11,355	1,049		112	175,703
	20-29	273,825	37,742	13,460	12,400	1,478	338,905
	30-39	200,859	35,596	3,116	3,896		243,467
	40-49	95,187	7,472	2,800	1,266	104	106,829
	>=50	94,240	3,601	109	737	142	98,829
	All	827,298	95,766	20,534	18,299	1,836	963,733
1980	<=19	172,692	10,007	101			182,800
	20-29	300,891	50,107	15,122	8,626	2,050	376,796
	30-39	198,240	32,623	7,227	7,838	115	246,043
	40-49	99,298	10,106	2,149	1,100		112,653
	>=50	109,446	5,205	500	543	236	115,930
	All	880,567	108,048	25,099	18,107	2,401	1,034,222
1981	<=19	140,811	9,417	534			150,762
	20-29	305,684	48,912	18,030	9,169	2,708	384,503
	30-39	188,220	31,750	6,087	7,432	233	233,722
	40-49	83,455	7,939	1,584	1,935	610	95,523
	>=50	101,878	3,158	215	963	109	106,323
	All	820,048	101,176	26,450	19,499	3,660	970,833
1982	<=19	198,026	10,260	507			208,793
	20-29	331,646	54,633	19,829	14,523	710	421,341
	30-39	210,402	27,521	10,454	16,333	1,871	266,581
	40-49	101,934	10,603	1,624	2,028		116,189
	>=50	111,089	4,335	323	910	362	117,019
	All	953,097	107,352	32,737	33,794	2,943	1,129,923
1983	<=19	147,121	12,626	1,106			160,853
	20-29	292,011	65,654	16,416	8,741	2,926	385,748
	30-39	203,841	41,909	8,256	13,237	633	267,876
	40-49	89,115	16,084	1,613	2,785		109,597
	>=50	81,600	5,236	128	1,105	1,159	89,228
	All	813,688	141,509	27,519	25,868	4,718	1,013,302

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Table A-19 (Continued)

		MANUFACTURING					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	141,026	21,860	57			162,943
	20-29	299,319	70,501	16,584	10,711	1,574	398,689
	30-39	228,692	20,926	13,323	9,725	1,061	273,727
	40-49	117,355	12,910	4,319	2,696		137,280
	>=50	119,707	3,121	355	1,280	155	124,618
	All	906,099	129,318	34,638	24,412	2,790	1,097,257
1985	<=19	108,000	24,523	1,144			133,667
	20-29	284,872	86,248	30,759	15,703	3,683	421,265
	30-39	254,624	47,618	14,468	10,590	1,528	328,828
	40-49	110,132	17,325	4,058	2,890		134,405
	>=50	119,199	3,972	51	979	1,690	125,891
	All	876,827	179,686	50,480	30,162	6,901	1,144,056
1986	<=19	127,957	22,834	2,751			153,542
	20-29	262,417	92,343	28,651	18,186	2,288	403,885
	30-39	239,040	59,179	10,658	15,521	3,495	327,893
	40-49	110,829	18,679	5,444	3,242	228	138,422
	>=50	105,881	6,428	1,310	466		114,085
	All	846,124	199,463	48,814	37,415	6,011	1,137,827
1987	<=19	129,078	21,594	7,353			158,025
	20-29	321,108	128,743	30,604	27,796	2,969	511,220
	30-39	223,464	34,546	15,758	13,236	1,139	288,143
	40-49	140,916	16,647	2,823	3,307		163,693
	>=50	144,807	4,052	718	1,456	577	151,610
	All	959,373	205,582	57,256	45,795	4,685	1,272,691
1988	<=19	133,181	51,540	15,166			199,887
	20-29	301,461	114,830	40,953	53,805	3,732	514,781
	30-39	251,875	54,623	19,452	14,963	949	341,862
	40-49	102,145	22,492	3,369	17,760	383	146,149
	>=50	127,904	9,072	2,160	3,906	553	143,595
	All	916,566	252,557	81,100	90,434	5,617	1,346,274
1989	<=19	201,992	30,139	5,131			237,262
	20-29	387,417	150,563	54,093	33,631	4,713	630,417
	30-39	307,003	50,668	25,328	21,366	4,629	408,994
	40-49	153,348	23,660	2,861	2,913	1,281	184,063
	>=50	133,843	13,771	1,992	2,758		152,364
	All	1,183,603	268,801	89,405	60,668	10,623	1,613,100
1990	<=19	185,462	50,747	4,302	1,595		242,106
	20-29	355,374	141,564	76,573	48,916	4,270	626,697
	30-39	253,802	60,964	23,228	26,672	3,401	368,067
	40-49	147,687	16,816	6,896	3,647	1,849	176,895
	>=50	140,409	7,386	3,155	3,767	415	155,132
	All	1,082,734	277,477	114,154	84,597	9,935	1,568,897

(Continued on page 166)

Table A-19 (Continued)

		MANUFACTURING					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	129,520	4,332	202		92	134,146
	20-29	195,531	14,051	4,131	1,007	462	215,182
	30-39	102,803	7,380	1,046	335	99	111,663
	40-49	57,804	1,704	167	204		59,879
	>=50	47,644	581	179			48,404
	All	533,302	28,048	5,725	1,546	653	569,274
1978	<=19	150,779	5,496	88			156,363
	20-29	199,509	19,084	6,722	3,103	1,019	229,437
	30-39	106,720	11,142	1,618	676	135	120,291
	40-49	60,683	2,440	268			63,391
	>=50	48,557	330				48,887
	All	566,248	38,492	8,696	3,779	1,154	618,369
1979	<=19	178,084	8,400	159			186,643
	20-29	247,215	21,721	5,902	3,298	685	278,821
	30-39	147,576	9,327	3,032	760	282	160,977
	40-49	71,747	1,166	288	282		73,483
	>=50	59,953	859		213		61,025
	All	704,575	41,473	9,381	4,553	967	760,949
1980	<=19	153,339	7,335	347			161,021
	20-29	242,603	20,879	6,314	3,943	1,697	275,436
	30-39	151,481	15,281	2,704	1,944	151	171,561
	40-49	72,776	2,124	571	100		75,571
	>=50	67,921	1,116	115		109	69,261
	All	688,120	46,735	10,051	5,987	1,957	752,850
1981	<=19	155,923	6,363	606			162,892
	20-29	267,297	24,947	6,515	3,621	1,784	304,164
	30-39	145,912	11,193	2,372	2,624	153	162,254
	40-49	72,429	2,685	172	204	102	75,592
	>=50	63,091	902	423	100		64,516
	All	704,652	46,090	10,088	6,549	2,039	769,418
1982	<=19	176,766	5,063	593			182,422
	20-29	287,567	35,188	7,029	3,576	1,034	334,394
	30-39	157,564	17,643	2,059	3,030	449	180,745
	40-49	94,511	3,662	318	240	55	98,786
	>=50	79,710	603		123		80,436
	All	796,118	62,159	9,999	6,969	1,538	876,783
1983	<=19	164,929	5,959	590			171,478
	20-29	255,465	26,564	14,732	7,718	3,122	307,601
	30-39	181,708	17,391	5,279	2,018	190	206,586
	40-49	76,461	3,384	834	511		81,190
	>=50	60,306	1,764	252	96		62,418
	All	738,869	55,062	21,687	10,343	3,312	829,273

(Continued on page 167)

Table A-19 (Continued)

		MANUFACTURING					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	156,935	20,492	942			178,369
	20-29	261,001	32,420	11,069	7,049	1,559	313,098
	30-39	196,747	17,641	2,223	3,159	1,010	220,780
	40-49	98,444	3,695	652	824	368	103,983
	>=50	71,652	686				72,338
	All	784,779	74,934	14,886	11,032	2,937	888,568
1985	<=19	155,699	16,013	396			172,108
	20-29	288,388	37,259	17,000	9,935	1,226	353,808
	30-39	197,742	16,800	4,729	3,046	772	223,089
	40-49	88,527	4,163	521	1,635	144	94,990
	>=50	76,274	1,690	805			78,769
	All	806,630	75,925	23,451	14,616	2,142	922,764
1986	<=19	153,611	17,937	2,019			173,567
	20-29	289,739	50,089	14,674	10,660	3,219	368,381
	30-39	212,042	17,561	5,601	7,163	993	243,360
	40-49	79,306	6,079			205	85,590
	>=50	59,356	855				60,211
	All	794,054	92,521	22,294	17,823	4,417	931,109
1987	<=19	160,596	20,949	1,859	215		183,619
	20-29	364,986	85,546	29,216	18,677	6,226	504,651
	30-39	248,408	17,406	3,912	6,270	1,509	277,505
	40-49	114,041	4,740		858	384	120,023
	>=50	78,824	725				79,549
	All	966,855	129,366	34,987	26,020	8,119	1,165,347
1988	<=19	171,295	32,081	5,242		813	209,431
	20-29	299,255	68,697	25,649	30,787	4,943	429,331
	30-39	240,430	20,062	7,368	7,367	2,291	277,518
	40-49	88,306	14,674	1,257	835		105,072
	>=50	90,466	2,238		341		93,045
	All	889,752	137,752	39,516	39,330	8,047	1,114,397
1989	<=19	228,890	42,336	5,072		989	277,287
	20-29	458,631	91,830	33,899	36,711	1,684	622,755
	30-39	300,527	19,949	9,228	10,235	2,101	342,040
	40-49	143,627	9,740		1,257	485	155,109
	>=50	138,209					138,209
	All	1,269,884	163,855	48,199	48,203	5,259	1,535,400
1990	<=19	234,958	57,578	1,975			294,511
	20-29	426,940	129,586	32,805	32,262	3,753	625,346
	30-39	294,385	29,819	11,042	10,176	1,447	346,869
	40-49	153,503	7,256	655	2,320	613	164,347
	>=50	130,243	485	799	1,225		132,752
	All	1,240,029	224,724	47,276	45,983	5,813	1,563,825

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table A-20 Employed Persons Classified by Sector, Sex, Education and Age: Industry

		INDUSTRY					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	146,937	9,222	117			156,276
	20-29	313,917	38,738	17,257	10,652	2,094	382,658
	30-39	243,688	32,077	9,342	6,382	300	291,789
	40-49	156,571	8,894	1,344	1,711	66	168,586
	>=50	118,443	6,563	273	759	76	126,114
	All	979,556	95,494	28,333	19,504	2,536	1,125,423
1978	<=19	190,374	12,010	230			202,614
	20-29	323,234	53,343	16,370	10,498	1,241	404,686
	30-39	243,140	39,050	8,912	7,073	322	298,497
	40-49	154,276	10,726	2,371	1,568	274	169,215
	>=50	119,831	5,119	1,083	599	392	127,024
	All	1,030,855	120,248	28,966	19,738	2,229	1,202,036
1979	<=19	214,782	13,244	1,049		112	229,187
	20-29	379,780	50,445	22,807	16,396	1,756	471,184
	30-39	307,167	47,952	6,999	7,979	295	370,392
	40-49	166,844	11,190	4,607	2,781	253	185,675
	>=50	132,353	5,042	328	1,371	221	139,315
	All	1,200,926	127,873	35,790	28,527	2,637	1,395,753
1980	<=19	230,666	13,921	101			244,688
	20-29	404,760	64,303	19,426	14,097	2,625	505,211
	30-39	313,199	45,134	11,546	12,556	868	383,303
	40-49	176,431	15,717	3,362	3,247	107	198,864
	>=50	150,067	6,457	1,098	747	236	158,605
	All	1,275,123	145,532	35,533	30,647	3,836	1,490,671
1981	<=19	202,162	13,939	534			216,635
	20-29	453,352	71,687	27,323	12,713	4,492	569,567
	30-39	285,732	45,115	10,423	15,321	233	356,824
	40-49	162,790	13,970	5,090	4,292	719	186,861
	>=50	141,980	5,565	431	1,394	109	149,479
	All	1,246,016	150,276	43,801	33,720	5,553	1,479,366
1982	<=19	261,922	13,430	776			276,128
	20-29	481,978	80,852	29,012	19,684	1,210	612,736
	30-39	328,577	38,481	17,768	21,985	2,471	409,282
	40-49	177,953	16,663	3,998	4,475	108	203,197
	>=50	165,437	7,600	606	1,141	528	175,312
	All	1,415,867	157,026	52,160	47,285	4,317	1,676,655
1983	<=19	197,332	14,994	1,178			213,504
	20-29	437,033	91,232	29,542	18,698	3,181	579,686
	30-39	327,287	56,420	13,292	23,999	1,947	422,945
	40-49	172,500	24,817	4,310	5,261	1,505	208,393
	>=50	137,835	7,365	2,256	1,694	1,159	150,309
	All	1,271,987	194,828	50,578	49,652	7,792	1,574,837

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Table A-20 (Continued)

		INDUSTRY					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	183,559	27,622	1,138			212,319
	20-29	462,764	90,385	38,867	24,013	2,228	618,257
	30-39	395,204	43,864	42,789	17,407	1,865	501,129
	40-49	194,608	27,621	11,447	3,681		237,357
	>=50	180,216	8,166	1,378	2,412	387	192,559
	All	1,416,351	197,658	95,619	47,513	4,480	1,761,621
1985	<=19	166,422	31,041	1,144			198,607
	20-29	436,160	115,102	47,515	25,618	3,886	628,281
	30-39	404,714	62,457	20,937	22,107	4,137	514,352
	40-49	197,911	25,279	7,837	7,741		238,768
	>=50	169,461	6,252	1,816	979	1,751	180,259
	All	1,374,668	240,131	79,249	56,445	9,774	1,760,267
1986	<=19	169,730	63,536	3,319			236,585
	20-29	400,554	117,967	60,488	29,266	2,288	610,563
	30-39	370,329	81,751	19,223	23,904	6,200	501,407
	40-49	203,752	26,657	15,453	17,062	228	263,152
	>=50	156,289	8,480	1,468	1,105		167,342
	All	1,300,654	298,391	99,951	71,337	8,716	1,779,049
1987	<=19	190,155	40,215	7,804			238,174
	20-29	496,834	154,941	45,597	36,659	3,970	738,001
	30-39	366,247	57,002	23,969	25,945	2,643	475,806
	40-49	228,568	29,572	4,611	18,736		281,487
	>=50	210,546	6,633	1,970	2,255	877	222,281
	All	1,492,350	288,363	83,951	83,595	7,490	1,955,749
1988	<=19	185,263	59,800	15,855			260,918
	20-29	455,671	167,230	53,057	74,607	3,869	754,434
	30-39	424,030	78,130	29,213	29,024	2,943	563,340
	40-49	203,955	29,009	9,807	22,042	383	265,196
	>=50	207,301	12,532	3,005	6,397	553	229,788
	All	1,476,220	346,701	110,937	132,070	7,748	2,073,676
1989	<=19	343,957	43,868	6,006			393,832
	20-29	778,063	231,908	90,613	64,565	6,452	1,171,601
	30-39	656,139	75,434	47,411	47,104	5,419	831,507
	40-49	331,615	46,864	8,163	8,000	2,258	396,900
	>=50	271,454	18,712	6,416	6,575		303,157
	All	2,381,228	416,786	158,609	126,244	14,129	3,096,996
1990	<=19	261,149	66,975	4,897	1,834		334,855
	20-29	589,626	201,081	100,938	68,593	5,371	965,609
	30-39	483,317	86,137	32,840	43,790	4,310	650,394
	40-49	291,115	27,962	9,639	11,080	2,188	341,984
	>=50	242,236	12,623	4,593	5,869	415	265,736
	All	1,867,443	394,778	152,907	131,166	12,284	2,558,578

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Table A-20 (Continued)

		INDUSTRY					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	153,396	4,491	202		92	158,181
	20-29	208,999	15,040	5,723	2,015	462	232,239
	30-39	115,758	8,017	2,957	542	168	127,442
	40-49	63,285	1,847	208	339		65,679
	>=50	50,032	581	179			50,792
	All	591,470	29,976	9,269	2,896	722	634,333
1978	<=19	165,264	5,709	88			171,061
	20-29	215,110	20,104	8,582	3,814	1,304	248,914
	30-39	116,248	13,108	2,692	1,283	135	133,466
	40-49	64,939	2,706	455			68,100
	>=50	53,078	439				53,517
	All	614,639	42,066	11,817	5,097	1,439	675,058
1979	<=19	198,026	8,636	648			207,310
	20-29	263,512	22,655	8,603	4,665	983	300,418
	30-39	160,130	10,971	3,772	1,309	438	176,620
	40-49	80,345	1,495	387	282	100	82,609
	>=50	63,535	1,036		213		64,784
	All	765,548	44,793	13,410	6,469	1,521	831,741
1980	<=19	174,428	7,335	347			182,110
	20-29	261,769	22,079	7,981	5,074	2,147	299,050
	30-39	167,275	16,226	4,114	2,631	282	190,528
	40-49	81,238	2,514	671	398		84,821
	>=50	71,152	1,116	223		109	72,600
	All	755,862	49,270	13,336	8,103	2,538	829,109
1981	<=19	179,257	6,497	704			186,458
	20-29	289,083	26,099	8,944	4,880	2,008	331,014
	30-39	166,619	11,958	3,340	3,644	153	185,714
	40-49	83,816	4,026	463	409	102	88,816
	>=50	66,678	1,101	423	100		68,302
	All	785,453	49,681	13,874	9,033	2,263	860,304
1982	<=19	208,232	5,209	593			214,034
	20-29	320,834	36,008	8,280	5,226	1,305	371,653
	30-39	179,204	18,821	3,563	4,315	689	206,592
	40-49	108,663	4,445	318	411	55	113,892
	>=50	84,470	777		123		85,370
	All	901,403	65,260	12,754	10,075	2,049	991,541
1983	<=19	187,847	6,277	590			194,714
	20-29	288,512	29,609	19,417	9,360	3,972	350,870
	30-39	196,779	19,302	7,463	4,451	672	228,667
	40-49	87,081	5,166	1,441	912		94,600
	>=50	65,614	1,865	252	227		67,958
	All	825,833	62,219	29,163	14,950	4,644	936,809

(Continued on page 171)

Table A-20 (Continued)

		INDUSTRY					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1984	<=19	177,986	20,965	942			199,893
	20-29	289,731	37,598	16,913	9,292	1,826	355,360
	30-39	220,228	19,835	5,299	5,280	1,151	251,793
	40-49	115,304	4,925	954	824	843	122,850
	>=50	75,274	686				75,960
	All	878,523	84,009	24,108	15,396	3,820	1,005,856
1985	<=19	179,884	17,466	396			197,746
	20-29	338,027	38,366	20,282	13,245	1,560	411,480
	30-39	228,491	18,836	5,360	5,074	772	258,533
	40-49	99,583	4,316	1,451	1,815	144	107,309
	>=50	82,268	1,690	1,052			85,010
	All	928,253	80,674	28,541	20,134	2,476	1,060,078
1986	<=19	176,363	18,177	2,019			196,559
	20-29	308,644	50,395	16,518	12,291	10,891	398,739
	30-39	250,662	18,456	7,603	7,215	993	284,929
	40-49	90,814	6,648	435	69	418	98,384
	>=50	65,450	855		156		66,461
	All	891,933	94,531	26,575	19,731	12,302	1,045,072
1987	<=19	181,316	21,035	1,859	215		204,425
	20-29	397,585	87,131	30,757	22,319	16,374	554,166
	30-39	285,113	18,247	5,750	6,679	1,509	317,298
	40-49	127,853	5,637	135	858	384	134,867
	>=50	83,917	725				84,642
	All	1,075,784	132,775	38,501	30,071	18,267	1,295,398
1988	<=19	193,866	32,277	5,242		813	232,198
	20-29	337,944	75,981	27,578	35,707	4,943	482,153
	30-39	276,569	21,396	9,787	12,074	2,291	322,117
	40-49	95,770	15,646	2,387	1,740		115,543
	>=50	97,382	2,403		341		100,126
	All	1,001,531	147,703	44,994	49,862	8,047	1,252,137
1989	<=19	285,347	50,232	5,937		1,158	342,674
	20-29	581,323	114,191	40,911	49,517	2,540	788,482
	30-39	402,953	24,750	16,996	15,488	2,970	463,156
	40-49	190,375	11,402	3,481	3,722	568	209,548
	>=50	167,800					167,800
	All	1,627,799	200,574	67,325	68,728	7,235	1,971,662
1990	<=19	275,526	62,658	1,975			340,159
	20-29	487,815	134,624	36,439	39,914	4,195	702,987
	30-39	336,522	32,050	12,347	17,099	1,932	399,950
	40-49	174,344	7,443	2,142	3,112	613	187,654
	>=50	140,587	969	1,545	1,225		144,326
	All	1,414,794	237,744	54,448	61,350	6,740	1,775,076

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table A-21 Employed Persons Classified by Sector, Sex, Education and Age: Services and Others

		SERVICES AND OTHERS					
		Male					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	124,885	8,487	510		3,957	137,839
	20-29	330,146	137,861	58,768	31,861	50,457	609,093
	30-39	369,714	133,697	37,313	32,267	37,361	610,352
	40-49	259,153	47,820	10,592	10,447	15,962	343,974
	>=50	238,781	32,596	4,065	5,590	11,482	292,514
	All	1,322,679	360,461	111,248	80,165	119,219	1,993,772
1978	<=19	141,420	19,215	853		1,932	163,420
	20-29	338,447	145,977	48,859	40,663	75,096	649,042
	30-39	369,765	158,944	28,224	36,087	38,789	631,809
	40-49	285,496	55,994	8,552	11,008	17,024	378,074
	>=50	232,860	40,014	4,095	6,824	12,689	296,482
	All	1,367,988	420,144	90,583	94,582	145,530	2,118,827
1979	<=19	132,745	15,784	786		201	149,516
	20-29	323,452	149,019	59,856	54,231	77,670	664,228
	30-39	393,727	159,421	36,176	38,835	46,019	674,178
	40-49	276,988	47,623	8,748	18,907	19,265	371,531
	>=50	229,183	37,380	4,870	6,639	18,400	296,472
	All	1,356,095	409,227	110,436	118,612	161,555	2,155,925
1980	<=19	140,787	20,337	584		740	162,448
	20-29	341,096	172,186	61,971	50,748	86,083	712,084
	30-39	448,545	152,208	38,848	48,254	50,369	738,224
	40-49	294,280	52,818	9,943	15,884	22,045	394,970
	>=50	252,720	35,385	3,386	9,611	16,230	317,332
	All	1,477,428	432,934	114,732	124,497	175,467	2,325,058
1981	<=19	151,016	24,566	3,704	91	812	180,189
	20-29	342,364	180,109	63,555	66,053	120,906	772,987
	30-39	402,377	154,493	47,535	55,314	55,305	715,024
	40-49	280,451	61,246	15,585	16,483	19,970	393,735
	>=50	264,999	44,058	4,535	7,999	14,936	336,527
	All	1,441,207	464,472	134,914	145,940	211,929	2,398,462
1982	<=19	180,042	18,370	4,475		1,588	204,475
	20-29	371,228	212,418	75,099	67,436	139,346	865,527
	30-39	493,803	175,567	51,238	61,109	67,663	849,380
	40-49	324,899	69,763	16,500	26,155	27,706	465,023
	>=50	270,929	40,205	5,991	6,773	24,576	348,474
	All	1,640,901	516,323	153,303	161,473	260,879	2,732,879
1983	<=19	157,897	33,548	4,567			196,012
	20-29	358,001	238,250	80,553	119,483	132,451	928,738
	30-39	479,473	185,784	47,994	100,792	89,442	903,485
	40-49	278,142	72,785	17,897	30,017	31,159	430,000
	>=50	267,477	44,780	7,149	11,391	22,385	353,182
	All	1,540,990	575,147	158,160	261,683	275,437	2,811,417

(Continued on page 173)

Table A-21 (Continued)

		SERVICES AND OTHERS					
		Male					
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**	**All**
1984	<=19	118,335	35,507	5,371		191	159,404
	20-29	387,921	203,486	96,626	89,383	108,305	885,721
	30-39	446,373	157,328	59,405	88,638	104,236	855,980
	40-49	303,029	74,643	25,176	27,302	31,664	461,814
	>=50	284,374	40,488	7,435	12,544	26,935	371,776
	All	1,540,032	511,452	194,013	217,867	271,331	2,734,695
1985	<=19	139,854	36,029	3,451			179,334
	20-29	388,051	213,326	89,058	98,149	82,682	871,266
	30-39	503,930	179,803	62,390	98,830	85,398	930,351
	40-49	308,763	86,923	24,805	33,394	36,214	490,099
	>=50	275,159	44,888	5,210	10,520	18,606	354,383
	All	1,615,757	560,969	184,914	240,893	222,900	2,825,433
1986	<=19	136,367	39,128	2,767	313		178,575
	20-29	390,512	271,629	119,606	131,853	77,463	991,063
	30-39	520,726	204,313	103,008	111,178	119,125	1,058,350
	40-49	342,196	98,880	20,791	47,086	32,488	541,441
	>=50	312,842	64,347	5,092	15,515	17,653	415,449
	All	1,702,643	678,297	251,264	305,945	246,729	3,184,878
1987	<=19	157,079	50,227	6,646	327		214,279
	20-29	415,504	271,090	133,202	122,396	73,340	1,015,532
	30-39	543,224	187,919	104,061	119,550	125,531	1,080,285
	40-49	377,282	111,651	30,518	46,833	35,827	602,111
	>=50	378,333	63,939	13,028	17,273	24,987	497,560
	All	1,871,422	684,826	287,455	306,379	259,685	3,409,767
1988	<=19	164,859	60,437	3,070	382		228,748
	20-29	396,069	245,995	118,126	165,484	57,435	983,109
	30-39	517,338	191,733	100,497	124,535	115,908	1,050,011
	40-49	353,271	125,317	24,539	65,048	48,663	616,838
	>=50	366,767	47,533	10,502	19,329	25,540	469,671
	All	1,798,304	671,015	256,734	374,778	247,546	3,348,377
1989	<=19	223,543	54,574	9,793			287,910
	20-29	490,364	379,603	126,799	152,192	72,751	1,221,709
	30-39	666,244	258,687	91,090	172,703	132,611	1,321,335
	40-49	453,543	139,760	33,867	60,823	55,465	743,458
	>=50	424,664	70,448	13,955	37,014	23,223	569,304
	All	2,258,357	903,073	275,505	422,731	284,050	4,143,716
1990	<=19	141,931	49,679	4,836	1,155		197,601
	20-29	442,206	305,857	103,757	162,166	49,689	1,063,675
	30-39	549,059	193,536	81,436	168,360	122,309	1,114,700
	40-49	375,408	134,413	34,492	69,763	40,134	654,210
	>=50	361,772	53,816	15,020	33,107	25,811	489,526
	All	1,870,376	737,301	239,541	434,551	237,943	3,519,712

(Continued on page 174)

Table A-21 (Continued)

		SERVICES AND OTHERS					
		Female					
Year	Age	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1977	<=19	199,270	10,677	1,947	55	2,530	214,479
	20-29	299,894	69,994	42,928	32,826	57,340	502,982
	30-39	322,934	50,055	16,140	14,139	36,575	439,843
	40-49	241,505	10,624	2,738	3,763	8,046	266,676
	>=50	197,720	5,790	614	1,179	2,707	208,010
	All	1,261,323	147,140	64,367	51,962	107,198	1,631,990
1978	<=19	204,795	14,423	2,031	88	2,638	223,975
	20-29	298,813	68,602	54,755	35,061	72,862	530,093
	30-39	344,426	54,965	23,432	17,518	34,429	474,770
	40-49	249,487	16,264	4,410	4,130	7,053	281,344
	>=50	193,028	6,993	1,566	1,284	3,768	206,639
	All	1,290,549	161,247	86,194	58,081	120,750	1,716,821
1979	<=19	205,473	15,857	2,747		2,795	226,872
	20-29	304,066	64,505	63,864	45,701	84,443	562,579
	30-39	385,206	58,323	25,506	20,153	34,090	523,278
	40-49	259,136	12,566	3,364	5,864	7,909	288,839
	>=50	209,021	5,778	1,307	1,710	3,891	221,707
	All	1,362,902	157,029	96,788	73,428	133,128	1,823,275
1980	<=19	204,121	14,077	2,180		3,039	223,417
	20-29	318,334	90,247	62,550	46,416	96,702	614,249
	30-39	393,141	58,363	31,338	26,480	40,592	549,914
	40-49	282,661	15,097	3,909	5,326	10,301	317,294
	>=50	210,688	9,597	2,193	2,624	4,446	229,548
	All	1,408,945	187,381	102,170	80,846	155,080	1,934,422
1981	<=19	233,644	24,965	4,050		1,918	264,577
	20-29	355,173	103,649	78,197	56,811	113,028	706,858
	30-39	367,598	57,009	34,568	36,731	42,575	538,481
	40-49	287,177	15,022	7,689	7,192	12,874	329,954
	>=50	239,911	9,342	1,041	1,894	5,672	257,860
	All	1,483,503	209,987	125,545	102,628	176,067	2,097,730
1982	<=19	289,848	20,794	6,468		406	317,516
	20-29	373,380	101,973	82,508	58,264	141,810	757,935
	30-39	466,192	61,766	39,899	38,315	58,011	664,183
	40-49	337,949	20,644	11,002	11,076	16,445	397,116
	>=50	288,925	8,068	2,891	1,628	6,797	308,309
	All	1,756,294	213,245	142,768	109,283	223,469	2,445,059
1983	<=19	271,834	21,617	2,287	136	889	296,763
	20-29	375,191	113,651	108,678	73,319	147,431	818,270
	30-39	453,670	64,833	43,332	46,671	78,639	687,145
	40-49	310,758	24,131	19,939	13,958	18,974	387,760
	>=50	246,981	8,561	2,601	2,878	8,061	269,082
	All	1,658,434	232,793	176,837	136,962	253,994	2,459,020

(Continued on page 175)

Table A-21 (Continued)

		SERVICES AND OTHERS					
		Female					
Year	**Age**	**Ele.+Oth.**	**Sec.+Sh.**	**Vocat.**	**Univ.**	**Teach.**	**All**
1984	<=19	235,715	35,555	4,668		160	276,098
	20-29	350,653	114,713	91,264	62,087	124,148	742,865
	30-39	454,297	64,196	43,712	56,537	67,694	686,436
	40-49	297,422	27,207	12,048	9,459	25,904	372,040
	>=50	267,233	10,115	3,066	3,001	5,511	288,926
	All	1,605,320	251,786	154,758	131,084	223,417	2,366,365
1985	<=19	267,802	44,291	9,669		433	322,195
	20-29	373,477	102,001	96,479	100,319	111,622	783,898
	30-39	473,838	65,193	42,762	68,364	75,180	725,337
	40-49	325,379	30,823	12,072	11,059	19,354	398,687
	>=50	275,992	8,674	2,154	3,231	12,022	302,073
	All	1,716,488	250,982	163,136	182,973	218,611	2,532,190
1986	<=19	302,213	37,916	5,015			345,144
	20-29	366,425	128,842	128,565	132,790	101,290	857,912
	30-39	519,655	66,428	39,823	86,308	106,394	818,608
	40-49	376,189	45,859	22,831	29,586	23,980	498,445
	>=50	318,339	11,983	2,488	6,104	7,237	346,151
	All	1,882,821	291,028	198,722	254,788	238,901	2,866,260
1987	<=19	321,481	54,539	16,539		128	392,687
	20-29	419,402	160,400	142,145	144,840	92,385	959,172
	30-39	550,900	80,544	50,619	89,434	152,685	924,182
	40-49	409,382	52,004	18,854	22,446	30,854	533,540
	>=50	350,219	8,009	4,505	4,797	11,890	379,420
	All	2,051,384	355,496	232,662	261,517	287,942	3,189,001
1988	<=19	276,715	40,701	8,615		456	326,487
	20-29	451,037	175,022	128,588	218,183	102,191	1,075,021
	30-39	494,871	77,006	70,041	118,084	136,973	896,975
	40-49	364,315	55,307	22,110	23,237	40,128	505,097
	>=50	374,509	12,065	5,018	5,243	12,873	409,708
	All	1,961,447	360,101	234,372	364,747	292,621	3,213,288
1989	<=19	346,125	58,203	9,964		493	414,785
	20-29	514,702	212,833	133,572	197,571	79,910	1,138,588
	30-39	661,012	100,475	65,585	119,329	156,753	1,103,154
	40-49	445,636	44,783	24,381	38,206	45,682	598,688
	>=50	423,615	9,682	7,369	7,192	16,351	464,208
	All	2,391,090	425,976	240,871	362,297	299,189	3,719,424
1990	<=19	258,797	64,603	9,220	123	445	333,188
	20-29	409,643	174,004	127,553	213,758	71,256	996,214
	30-39	532,019	86,901	65,466	138,533	142,267	965,186
	40-49	393,814	50,929	20,137	41,533	41,354	547,767
	>=50	396,344	11,775	5,575	13,225	13,954	440,873
	All	1,990,617	388,212	227,951	407,172	269,276	3,283,228

Sources: LFS (Round 2), July-September 1977-1983.
LFS (Round 3), August 1984-1990.

Table A-22 Composition of Employment Share Adjusted by Wage Differential Index: All Sectors

Year	Age	ALL SECTORS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1977	<=19	0.03326	0.00438	0.00006	0.00000	0.00012	0.03194	0.00088	0.00008	0.00000	0.00010	
	20-29	0.06633	0.00838	0.00394	0.00332	0.00203	0.05085	0.00514	0.00304	0.00339	0.00313	
	30-39	0.10678	0.01719	0.00417	0.00673	0.00179	0.03408	0.00387	0.00304	0.00168	0.00214	
	40-49	0.04948	0.00562	0.00208	0.00215	0.00143	0.02331	0.00092	0.00030	0.00073	0.00067	
	>=50	0.04400	0.00452	0.00100	0.00143	0.00109	0.02328	0.00111	0.00015	0.00011	0.00023	
	All	0.29985	0.04009	0.01125	0.01363	0.00646	0.16346	0.01192	0.00661	0.00591	0.00627	0.56545
1978	<=19	0.04889	0.00316	0.00007	0.00000	0.00005	0.04748	0.00119	0.00015	0.00001	0.00034	
	20-29	0.09432	0.01421	0.00607	0.00689	0.00422	0.06708	0.00558	0.00565	0.00516	0.00544	
	30-39	0.10406	0.02006	0.00448	0.00811	0.00349	0.05618	0.00653	0.00285	0.00329	0.00244	
	40-49	0.07544	0.00832	0.00116	0.00401	0.00110	0.03208	0.00158	0.00057	0.00119	0.00065	
	>=50	0.06545	0.00738	0.00119	0.00162	0.00096	0.02607	0.00072	0.00022	0.00029	0.00031	
	All	0.38816	0.05313	0.01297	0.02063	0.00982	0.22889	0.01560	0.00944	0.00994	0.00918	0.75776
1979	<=19	0.04766	0.00289	0.00029	0.00000	0.00003	0.04724	0.00135	0.00024	0.00000	0.00018	
	20-29	0.10135	0.01666	0.00812	0.00981	0.00523	0.07100	0.00647	0.00601	0.00644	0.00573	
	30-39	0.10611	0.02369	0.00689	0.00975	0.00687	0.05663	0.00574	0.00348	0.00364	0.00252	
	40-49	0.07717	0.00816	0.00255	0.00803	0.00186	0.03652	0.00124	0.00046	0.00154	0.00067	
	>=50	0.06681	0.00984	0.00184	0.00331	0.00191	0.02501	0.00054	0.00012	0.00022	0.00053	
	All	0.39910	0.06124	0.01969	0.03090	0.01590	0.23640	0.01534	0.01031	0.01184	0.00963	0.81035
1980	<=19	0.04897	0.00274	0.00007	0.00000	0.00003	0.04596	0.00130	0.00018	0.00000	0.00026	
	20-29	0.09682	0.01725	0.00720	0.00700	0.00642	0.07001	0.00713	0.00633	0.00514	0.00733	
	30-39	0.10705	0.01970	0.00691	0.01244	0.00470	0.05759	0.00626	0.00356	0.00499	0.00373	
	40-49	0.07546	0.01903	0.00262	0.00483	0.00281	0.04013	0.00156	0.00062	0.00118	0.00094	
	>=50	0.07518	0.00596	0.00114	0.00279	0.00062	0.02698	0.00100	0.00012	0.00080	0.00057	
	All	0.40348	0.06468	0.01794	0.02706	0.01458	0.24067	0.01725	0.01081	0.01211	0.01283	0.82141

(Continued on page 177)

Table A-22 (Continued)

Year	Age	ALL SECTORS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1981	<=19	0.04885	0.00314	0.00026	0.00001	0.00004	0.05195	0.00204	0.00037	0.00000	0.00007	
	20-29	0.11551	0.01881	0.00732	0.00813	0.00841	0.07724	0.00810	0.00745	0.00652	0.00798	
	30-39	0.10043	0.02182	0.00708	0.01502	0.00492	0.05699	0.00540	0.00339	0.00558	0.00367	
	40-49	0.06861	0.00978	0.00334	0.00478	0.00221	0.03605	0.00158	0.00097	0.00111	0.00087	
	>=50	0.06314	0.00625	0.00112	0.00249	0.00165	0.02288	0.00099	0.00014	0.00013	0.00060	
	All	0.39654	0.05980	0.01912	0.03043	0.01723	0.24511	0.01811	0.01232	0.01334	0.01319	0.82519
1982	<=19	0.04754	0.00293	0.00030	0.00001	0.00006	0.04500	0.00168	0.00033	0.00000	0.00002	
	20-29	0.10791	0.02288	0.01014	0.00895	0.01107	0.07135	0.00931	0.00851	0.00714	0.01010	
	30-39	0.09962	0.02135	0.00846	0.01589	0.00942	0.05690	0.00723	0.00483	0.00770	0.00401	
	40-49	0.06794	0.01150	0.00452	0.00842	0.00317	0.03538	0.00269	0.00178	0.00160	0.00156	
	>=50	0.07217	0.00784	0.00149	0.00202	0.00388	0.02857	0.00116	0.00024	0.00036	0.00075	
	All	0.39518	0.06650	0.02491	0.03529	0.02760	0.23720	0.02207	0.01569	0.01680	0.01644	0.85768
1983	<=19	0.05001	0.00313	0.00044	0.00000	0.00000	0.04049	0.00134	0.00015	0.00001	0.00003	
	20-29	0.09735	0.02062	0.00763	0.01362	0.00953	0.06931	0.00772	0.00867	0.00704	0.00885	
	30-39	0.10076	0.02281	0.00698	0.02307	0.00636	0.05762	0.00609	0.00461	0.00782	0.00624	
	40-49	0.06507	0.01199	0.00370	0.01076	0.00288	0.03407	0.00274	0.00180	0.00264	0.00176	
	>=50	0.06481	0.00648	0.00166	0.00387	0.00166	0.02300	0.00106	0.00030	0.00098	0.00079	
	All	0.37800	0.06503	0.02041	0.05132	0.02043	0.22449	0.01895	0.01553	0.01849	0.01767	0.83032
1984	<=19	0.04278	0.00429	0.00038	0.00000	0.00001	0.04222	0.00279	0.00037	0.00000	0.00009	
	20-29	0.09622	0.01927	0.00892	0.01021	0.00423	0.06085	0.00820	0.00704	0.00687	0.00779	
	30-39	0.10393	0.01526	0.01060	0.01857	0.00937	0.05886	0.00576	0.00559	0.00776	0.00877	
	40-49	0.07080	0.01141	0.00474	0.01013	0.00329	0.03599	0.00344	0.00159	0.00139	0.00284	
	>=50	0.06768	0.00692	0.00190	0.00387	0.00270	0.02379	0.00097	0.00073	0.00080	0.00066	
	All	0.38141	0.05715	0.02654	0.04278	0.01960	0.22171	0.02116	0.01532	0.01682	0.02015	0.82264

(Continued on page 178)

Table A-22 (Continued)

Year	Age	ALL SECTORS										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1985	<=19	0.04484	0.00341	0.00031	0.00000	0.00001	0.03327	0.00234	0.00034	0.00001	0.00001	
	20-29	0.09983	0.02114	0.00828	0.01043	0.00483	0.06309	0.00667	0.00615	0.00794	0.00540	
	30-39	0.10695	0.01749	0.00905	0.02115	0.00393	0.06001	0.00611	0.00452	0.01191	0.00600	
	40-49	0.07602	0.01171	0.00492	0.01476	0.00271	0.03324	0.00261	0.00214	0.00240	0.00112	
	>=50	0.06834	0.00713	0.00133	0.00246	0.00213	0.02631	0.00107	0.00018	0.00073	0.00115	
	All	0.39598	0.06088	0.02389	0.04880	0.01361	0.21592	0.01880	0.01333	0.02299	0.01368	0.82788
1986	<=19	0.04085	0.00589	0.00052	0.00002	0.00000	0.03655	0.00226	0.00024	0.00000	0.00000	
	20-29	0.09431	0.02265	0.01134	0.01518	0.00537	0.06328	0.00805	0.00720	0.01051	0.00514	
	30-39	0.10179	0.02477	0.01125	0.02185	0.01020	0.06826	0.00479	0.00383	0.01197	0.00634	
	40-49	0.06638	0.02106	0.00811	0.01817	0.00577	0.03959	0.00333	0.00201	0.00469	0.00135	
	>=50	0.06718	0.00838	0.00130	0.00362	0.00195	0.02684	0.00101	0.00025	0.00096	0.00059	
	All	0.37051	0.08275	0.03252	0.05884	0.02329	0.23452	0.01944	0.01353	0.02813	0.01342	0.87695
1987	<=19	0.03926	0.00735	0.00048	0.00002	0.00000	0.03660	0.00295	0.00055	0.00001	0.00000	
	20-29	0.10029	0.02763	0.01088	0.01493	0.00556	0.07473	0.01046	0.00862	0.01203	0.00502	
	30-39	0.10023	0.02135	0.01303	0.02548	0.01233	0.06544	0.00535	0.00546	0.01286	0.00835	
	40-49	0.08147	0.01411	0.00609	0.02194	0.00291	0.03866	0.00396	0.00186	0.00384	0.00235	
	>=50	0.07452	0.01154	0.00393	0.00637	0.00216	0.03593	0.00082	0.00044	0.00087	0.00188	
	All	0.39577	0.08198	0.03441	0.06874	0.02296	0.25136	0.02354	0.01693	0.02961	0.01760	0.94290
1988	<=19	0.04027	0.00658	0.00087	0.00002	0.00000	0.03206	0.00425	0.00071	0.00004	0.00003	
	20-29	0.08995	0.03228	0.01048	0.01699	0.00416	0.06666	0.01035	0.00669	0.01453	0.00414	
	30-39	0.09762	0.01928	0.01215	0.03052	0.00812	0.05997	0.00535	0.00788	0.01449	0.00768	
	40-49	0.06913	0.01490	0.00692	0.02624	0.00327	0.03601	0.00452	0.00295	0.00367	0.00282	
	>=50	0.07962	0.01173	0.00223	0.00685	0.00225	0.03111	0.00089	0.00066	0.00164	0.00088	
	All	0.37659	0.08477	0.03265	0.08062	0.01780	0.22581	0.02536	0.01889	0.03437	0.01555	0.91241

(Continued on page 179)

Table A-22 (Continued)

Year	Age	ALL SECTORS										
		Male					Female					All
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.06055	0.00548	0.00047	0.00000	0.00000	0.05164	0.00407	0.00030	0.00000	0.00003	
	20-29	0.08218	0.02853	0.00984	0.01587	0.00250	0.05553	0.01211	0.00700	0.01221	0.00291	
	30-39	0.09806	0.02254	0.00992	0.02842	0.00847	0.05660	0.00558	0.00473	0.01394	0.00768	
	40-49	0.06540	0.01816	0.00516	0.01739	0.00446	0.03470	0.00507	0.00313	0.00669	0.00213	
	>=50	0.07711	0.01150	0.00164	0.01353	0.00224	0.02887	0.00156	0.00064	0.00165	0.00087	
	All	0.38330	0.08621	0.02703	0.07521	0.01767	0.22734	0.02839	0.01580	0.03449	0.01362	0.90906
1990	<=19	0.05866	0.00522	0.00037	0.00016	0.00000	0.05408	0.00458	0.00035	0.00000	0.00002	
	20-29	0.08899	0.02493	0.00926	0.01697	0.00270	0.06756	0.01266	0.00707	0.01490	0.00331	
	30-39	0.09084	0.01798	0.00946	0.02719	0.01276	0.05595	0.00495	0.00458	0.01403	0.01343	
	40-49	0.06512	0.01774	0.00387	0.01602	0.00454	0.03739	0.00402	0.00274	0.00766	0.00221	
	>=50	0.06755	0.00627	0.00259	0.01173	0.00271	0.03279	0.00120	0.00044	0.00208	0.00111	
	All	0.37116	0.07214	0.02555	0.07207	0.02271	0.24777	0.02741	0.01518	0.03867	0.02008	0.91274

Note: Calculated as described in the text.

Table A-23 Composition of Employment Share Adjusted by Wage Differential Index: Agriculture

Year	Age	AGRICULTURE										
		Male					Female					All
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1977	<=19	0.07205	0.00605	0.00000	0.00000	0.00004	0.06207	0.00102	0.00000	0.00000	0.00000	
	20-29	0.09307	0.00376	0.00027	0.00011	0.00037	0.07621	0.00123	0.00001	0.00006	0.00009	
	30-39	0.10885	0.00351	0.00014	0.00026	0.00000	0.05120	0.00048	0.00001	0.00002	0.00007	
	40-49	0.05693	0.00141	0.00002	0.00000	0.00000	0.03484	0.00006	0.00000	0.00000	0.00000	
	>=50	0.06120	0.00092	0.00043	0.00000	0.00021	0.05745	0.00032	0.00000	0.00000	0.00000	
	All	0.39209	0.01565	0.00085	0.00037	0.00063	0.28177	0.00311	0.00002	0.00008	0.00016	0.69472
1978	<=19	0.09142	0.00399	0.00000	0.00000	0.00000	0.10640	0.00059	0.00000	0.00000	0.00003	
	20-29	0.11026	0.00413	0.00043	0.00028	0.00054	0.09638	0.00110	0.00005	0.00000	0.00025	
	30-39	0.10510	0.00429	0.00023	0.00020	0.00000	0.08269	0.00092	0.00002	0.00000	0.00000	
	40-49	0.08803	0.00133	0.00000	0.00000	0.00010	0.05587	0.00001	0.00005	0.00000	0.00000	
	>=50	0.07931	0.00178	0.00053	0.00004	0.00002	0.05481	0.00014	0.00000	0.00000	0.00002	
	All	0.47411	0.01553	0.00118	0.00052	0.00066	0.39614	0.00276	0.00012	0.00000	0.00030	0.89131
1979	<=19	0.08021	0.00306	0.00000	0.00000	0.00000	0.07806	0.00086	0.00000	0.00000	0.00000	
	20-29	0.10691	0.00533	0.00059	0.00058	0.00060	0.07500	0.00107	0.00026	0.00000	0.00023	
	30-39	0.10724	0.00487	0.00050	0.00003	0.00000	0.06716	0.00077	0.00000	0.00000	0.00000	
	40-49	0.07073	0.00184	0.00005	0.00000	0.00002	0.04862	0.00005	0.00002	0.00000	0.00000	
	>=50	0.06963	0.00211	0.00062	0.00018	0.00047	0.04345	0.00000	0.00001	0.00000	0.00000	
	All	0.43473	0.01720	0.00177	0.00078	0.00109	0.31229	0.00275	0.00029	0.00000	0.00023	0.77112
1980	<=19	0.08334	0.00284	0.00000	0.00000	0.00000	0.07770	0.00106	0.00008	0.00000	0.00013	
	20-29	0.09659	0.00596	0.00099	0.00006	0.00045	0.08015	0.00163	0.00047	0.00003	0.00022	
	30-39	0.10409	0.00269	0.00059	0.00025	0.00009	0.07086	0.00054	0.00000	0.00003	0.00000	
	40-49	0.07277	0.00332	0.00037	0.00004	0.00000	0.06450	0.00034	0.00000	0.00000	0.00000	
	>=50	0.06267	0.00106	0.00022	0.00003	0.00002	0.04820	0.00012	0.00001	0.00000	0.00000	
	All	0.41946	0.01586	0.00218	0.00037	0.00056	0.34140	0.00369	0.00055	0.00007	0.00035	0.78450

(Continued on page 181)

Table A-23 (Continued)

Year	Age	AGRICULTURE										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1981	<=19	0.08999	0.00327	0.00013	0.00000	0.00000	0.08524	0.00124	0.00000	0.00000	0.00000	
	20-29	0.12745	0.00909	0.00108	0.00039	0.00070	0.09336	0.00241	0.00058	0.00021	0.00026	
	30-39	0.10115	0.00381	0.00040	0.00030	0.00009	0.08799	0.00113	0.00002	0.00000	0.00018	
	40-49	0.05923	0.00155	0.00036	0.00000	0.00000	0.05504	0.00034	0.00002	0.00000	0.00000	
	>=50	0.06194	0.00097	0.00021	0.00013	0.00020	0.04548	0.00011	0.00007	0.00001	0.00000	
	All	0.43975	0.01870	0.00218	0.00083	0.00099	0.36710	0.00523	0.00068	0.00022	0.00044	0.83611
1982	<=19	0.10081	0.00483	0.00006	0.00000	0.00000	0.09027	0.00192	0.00009	0.00000	0.00000	
	20-29	0.13662	0.01189	0.00226	0.00025	0.00153	0.10589	0.00407	0.00118	0.00027	0.00022	
	30-39	0.10026	0.00342	0.00022	0.00004	0.00017	0.07161	0.00084	0.00003	0.00008	0.00000	
	40-49	0.07310	0.00198	0.00079	0.00056	0.00003	0.05623	0.00049	0.00006	0.00002	0.00000	
	>=50	0.08065	0.00242	0.00035	0.00034	0.00050	0.05379	0.00016	0.00001	0.00000	0.00010	
	All	0.49144	0.02455	0.00368	0.00119	0.00222	0.37778	0.00748	0.00137	0.00037	0.00032	0.91041
1983	<=19	0.08382	0.00371	0.00036	0.00000	0.00000	0.06766	0.00123	0.00012	0.00000	0.00000	
	20-29	0.09862	0.00828	0.00167	0.00063	0.00061	0.09365	0.00201	0.00093	0.00044	0.00043	
	30-39	0.09946	0.00461	0.00023	0.00020	0.00004	0.07077	0.00067	0.00000	0.00002	0.00000	
	40-49	0.06463	0.00231	0.00031	0.00007	0.00006	0.04602	0.00040	0.00012	0.00002	0.00000	
	>=50	0.06849	0.00179	0.00019	0.00000	0.00024	0.04101	0.00018	0.00001	0.00000	0.00000	
	All	0.41502	0.02070	0.00276	0.00090	0.00095	0.31912	0.00449	0.00118	0.00049	0.00043	0.76603
1984	<=19	0.08078	0.00580	0.00034	0.00000	0.00000	0.07220	0.00290	0.00004	0.00000	0.00018	
	20-29	0.09345	0.00816	0.00229	0.00085	0.00041	0.08280	0.00262	0.00145	0.00084	0.00055	
	30-39	0.10262	0.00297	0.00045	0.00147	0.00033	0.07714	0.00085	0.00051	0.00000	0.00002	
	40-49	0.06402	0.00226	0.00011	0.00022	0.00000	0.05483	0.00045	0.00000	0.00000	0.00003	
	>=50	0.06146	0.00145	0.00012	0.00019	0.00002	0.04003	0.00012	0.00000	0.00000	0.00000	
	All	0.40233	0.02064	0.00330	0.00273	0.00075	0.32701	0.00694	0.00201	0.00084	0.00079	0.76735

(Continued on page 182)

Table A-23 (Continued)

Year	Age	AGRICULTURE										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1985	<=19	0.08550	0.00449	0.00044	0.00000	0.00002	0.08458	0.00257	0.00009	0.00002	0.00000	
	20-29	0.12934	0.01441	0.00230	0.00129	0.00133	0.11222	0.00281	0.00088	0.00023	0.00059	
	30-39	0.10503	0.00315	0.00015	0.00027	0.00009	0.08174	0.00080	0.00018	0.00007	0.00000	
	40-49	0.07356	0.00248	0.00076	0.00006	0.00006	0.05007	0.00038	0.00004	0.00000	0.00000	
	>=50	0.07074	0.00225	0.00004	0.00008	0.00050	0.04825	0.00000	0.00000	0.00000	0.00031	
	All	0.46416	0.02678	0.00369	0.00169	0.00199	0.37686	0.00656	0.00119	0.00032	0.00090	0.88413
1986	<=19	0.10693	0.01042	0.00099	0.00000	0.00000	0.08911	0.00341	0.00013	0.00000	0.00000	
	20-29	0.15474	0.01617	0.00272	0.00171	0.00124	0.10252	0.00409	0.00062	0.00202	0.00050	
	30-39	0.10249	0.00503	0.00104	0.00045	0.00033	0.08252	0.00073	0.00000	0.00012	0.00007	
	40-49	0.06836	0.00413	0.00035	0.00000	0.00000	0.06115	0.00020	0.00000	0.00000	0.00000	
	>=50	0.09788	0.00232	0.00008	0.00000	0.00089	0.05493	0.00003	0.00000	0.00000	0.00009	
	All	0.53039	0.03807	0.00518	0.00216	0.00246	0.39024	0.00846	0.00075	0.00214	0.00065	0.98051
1987	<=19	0.09870	0.01511	0.00032	0.00000	0.00000	0.09010	0.00383	0.00026	0.00000	0.00000	
	20-29	0.17273	0.02456	0.00503	0.00816	0.00225	0.11680	0.00581	0.00082	0.00240	0.00065	
	30-39	0.10460	0.00546	0.00142	0.00012	0.00037	0.07495	0.00073	0.00021	0.00000	0.00001	
	40-49	0.07436	0.00327	0.00022	0.00027	0.00000	0.05228	0.00035	0.00000	0.00000	0.00000	
	>=50	0.10124	0.00463	0.00003	0.00000	0.00054	0.07234	0.00013	0.00001	0.00000	0.00000	
	All	0.55164	0.05304	0.00702	0.00855	0.00315	0.40646	0.01084	0.00131	0.00240	0.00066	1.04508
1988	<=19	0.08015	0.00959	0.00060	0.00000	0.00000	0.06931	0.00563	0.00049	0.00009	0.00000	
	20-29	0.13940	0.02915	0.00537	0.00293	0.00094	0.10519	0.00530	0.00074	0.00154	0.00013	
	30-39	0.09884	0.00464	0.00103	0.00143	0.00030	0.07801	0.00094	0.00024	0.00009	0.00009	
	40-49	0.06979	0.00282	0.00000	0.00071	0.00003	0.05513	0.00055	0.00005	0.00010	0.00001	
	>=50	0.07960	0.00482	0.00016	0.00030	0.00015	0.05982	0.00012	0.00000	0.00000	0.00012	
	All	0.46778	0.05103	0.00716	0.00537	0.00141	0.36745	0.01254	0.00152	0.00182	0.00035	0.91643

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Table A-23 (Continued)

Year	Age	AGRICULTURE										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.06879	0.00857	0.00000	0.00000	0.00000	0.05558	0.00468	0.00000	0.00000	0.00000	
	20-29	0.14110	0.02417	0.00481	0.00837	0.00004	0.08171	0.00772	0.00199	0.00085	0.00071	
	30-39	0.11395	0.00713	0.00042	0.00110	0.00030	0.07733	0.00053	0.00000	0.00019	0.00001	
	40-49	0.08653	0.00579	0.00035	0.00081	0.00000	0.05137	0.00268	0.00014	0.00000	0.00000	
	>=50	0.08760	0.00376	0.00033	0.00121	0.00057	0.04894	0.00000	0.00000	0.00017	0.00000	
	All	0.49797	0.04941	0.00590	0.01149	0.00091	0.31493	0.01560	0.00213	0.00122	0.00072	0.90028
1990	<=19	0.07413	0.00750	0.00012	0.00000	0.00000	0.06787	0.00502	0.00000	0.00000	0.00002	
	20-29	0.14517	0.02184	0.00389	0.00416	0.00043	0.10259	0.00855	0.00137	0.00184	0.00111	
	30-39	0.10312	0.00735	0.00200	0.00276	0.00084	0.08130	0.00086	0.00040	0.00070	0.00052	
	40-49	0.06674	0.00419	0.00000	0.00007	0.00001	0.06035	0.00079	0.00005	0.00016	0.00000	
	>=50	0.07857	0.00157	0.00043	0.00022	0.00050	0.05627	0.00028	0.00000	0.00012	0.00000	
	All	0.46774	0.04244	0.00645	0.00720	0.00179	0.36838	0.01550	0.00181	0.00282	0.00165	0.91578

Note: Calculated as described in Chapter 5.

Table A-24 Composition of Employment Share Adjusted by Wage Differential Index: Manufacturing

Year	Age	MANUFACTURING										
		Male					Female					All
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1977	<=19	0.02284	0.01024	0.00014	0.00000	0.00000	0.02927	0.00154	0.00015	0.00000	0.00008	
	20-29	0.09651	0.01824	0.00935	0.00898	0.00116	0.06567	0.01372	0.00414	0.00162	0.00040	
	30-39	0.11584	0.01986	0.00446	0.00630	0.00011	0.03875	0.00461	0.00167	0.00038	0.00006	
	40-49	0.05518	0.00619	0.00150	0.00152	0.00000	0.01993	0.00147	0.00023	0.00048	0.00000	
	>=50	0.04981	0.00556	0.00045	0.00127	0.00007	0.01986	0.00068	0.00040	0.00000	0.00000	
	All	0.34017	0.06008	0.01591	0.01806	0.00134	0.17349	0.02202	0.00658	0.00248	0.00053	0.64067
1978	<=19	0.05022	0.00366	0.00011	0.00000	0.00000	0.04132	0.00198	0.00005	0.00000	0.00000	
	20-29	0.12476	0.02434	0.01076	0.00972	0.00040	0.07295	0.01010	0.00620	0.00453	0.00075	
	30-39	0.10707	0.03005	0.00671	0.01198	0.00037	0.05664	0.01250	0.00219	0.00153	0.00012	
	40-49	0.06757	0.00811	0.00129	0.00359	0.00012	0.02337	0.00155	0.00034	0.00000	0.00000	
	>=50	0.06514	0.00557	0.00186	0.00083	0.00028	0.01711	0.00000	0.00000	0.00000	0.00000	
	All	0.41477	0.07172	0.02073	0.02612	0.00117	0.21138	0.02613	0.00878	0.00606	0.00087	0.78774
1979	<=19	0.03960	0.00345	0.00071	0.00000	0.00003	0.04391	0.00255	0.00009	0.00000	0.00000	
	20-29	0.11721	0.02167	0.01088	0.01620	0.00083	0.08672	0.01098	0.00414	0.00399	0.00040	
	30-39	0.11646	0.03484	0.00483	0.00862	0.00000	0.04910	0.00568	0.00367	0.00134	0.00021	
	40-49	0.05946	0.00795	0.00489	0.00442	0.00009	0.02468	0.00205	0.00032	0.00072	0.00000	
	>=50	0.05137	0.01239	0.00052	0.00530	0.00021	0.01671	0.00000	0.00000	0.00041	0.00000	
	All	0.38409	0.08030	0.02183	0.03454	0.00117	0.22112	0.02126	0.00823	0.00645	0.00061	0.77960
1980	<=19	0.04311	0.00295	0.00005	0.00000	0.00000	0.03723	0.00235	0.00017	0.00000	0.00000	
	20-29	0.12123	0.02567	0.01069	0.00987	0.00135	0.08136	0.00930	0.00451	0.00398	0.00114	
	30-39	0.11093	0.03377	0.01089	0.01973	0.00012	0.05623	0.01124	0.00323	0.00425	0.00016	
	40-49	0.05996	0.01090	0.00167	0.00126	0.00000	0.02296	0.00113	0.00036	0.00010	0.00000	
	>=50	0.06687	0.00649	0.00110	0.00153	0.00009	0.02519	0.00084	0.00006	0.00000	0.00014	
	All	0.40210	0.07978	0.02439	0.03239	0.00157	0.22296	0.02486	0.00832	0.00833	0.00145	0.80616

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Table A-24 (Continued)

Year	Age	MANUFACTURING										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1981	<=19	0.03485	0.00355	0.00032	0.00000	0.00000	0.03902	0.00260	0.00041	0.00000	0.00000	
	20-29	0.13467	0.02414	0.01234	0.01038	0.00177	0.09253	0.01162	0.00486	0.00362	0.00122	
	30-39	0.10816	0.03236	0.00756	0.01803	0.00022	0.05355	0.00785	0.00227	0.00404	0.00014	
	40-49	0.04862	0.00816	0.00214	0.00425	0.00060	0.02709	0.00108	0.00018	0.00028	0.00006	
	>=50	0.06410	0.00356	0.00043	0.00264	0.00011	0.01830	0.00101	0.00028	0.00006	0.00000	
	All	0.39039	0.07177	0.02279	0.03531	0.00270	0.23050	0.02416	0.00800	0.00801	0.00142	0.79504
1982	<=19	0.04193	0.00303	0.00023	0.00000	0.00000	0.03839	0.00149	0.00019	0.00000	0.00000	
	20-29	0.12879	0.02830	0.01422	0.01802	0.00052	0.09354	0.01529	0.00518	0.00369	0.00071	
	30-39	0.10485	0.02361	0.01222	0.03379	0.00246	0.05435	0.01148	0.00218	0.00573	0.00030	
	40-49	0.06514	0.01109	0.00290	0.00526	0.00000	0.03455	0.00316	0.00042	0.00030	0.00005	
	>=50	0.07719	0.00444	0.00050	0.00242	0.00041	0.02516	0.00047	0.00000	0.00020	0.00000	
	All	0.41789	0.07047	0.03007	0.05949	0.00339	0.24600	0.03188	0.00797	0.00993	0.00105	0.87814
1983	<=19	0.03378	0.00326	0.00050	0.00000	0.00000	0.03574	0.00179	0.00018	0.00000	0.00000	
	20-29	0.11298	0.02926	0.00966	0.00843	0.00198	0.08159	0.01142	0.00930	0.00635	0.00178	
	30-39	0.11063	0.03662	0.00991	0.02623	0.00047	0.06408	0.00989	0.00517	0.00332	0.00016	
	40-49	0.05509	0.01580	0.00234	0.00786	0.00000	0.02839	0.00230	0.00062	0.00084	0.00000	
	>=50	0.04698	0.00438	0.00017	0.00275	0.00062	0.01542	0.00000	0.00022	0.00026	0.00000	
	All	0.35945	0.08932	0.02259	0.04528	0.00307	0.22521	0.02540	0.01549	0.01077	0.00194	0.79852
1984	<=19	0.03634	0.00749	0.00003	0.00000	0.00000	0.04892	0.00623	0.00078	0.00000	0.00000	
	20-29	0.12612	0.03341	0.00940	0.00968	0.00060	0.08466	0.01512	0.00651	0.00660	0.00098	
	30-39	0.11516	0.02526	0.02470	0.02963	0.00168	0.07981	0.01139	0.00437	0.00730	0.00236	
	40-49	0.08214	0.01335	0.00602	0.00950	0.00000	0.03695	0.00277	0.00087	0.00122	0.00043	
	>=50	0.08391	0.00485	0.00096	0.00420	0.00020	0.03273	0.00000	0.00000	0.00000	0.00000	
	All	0.44367	0.08436	0.04110	0.05302	0.00248	0.28306	0.03551	0.01252	0.01511	0.00377	0.97460

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Table A-24 (Continued)

Year	Age	MANUFACTURING										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1985	<=19	0.02030	0.00492	0.00028	0.00000	0.00000	0.02772	0.00392	0.00011	0.00000	0.00000	
	20-29	0.10044	0.03254	0.01515	0.01191	0.00167	0.08240	0.01492	0.00796	0.00662	0.00053	
	30-39	0.12320	0.03013	0.01554	0.01835	0.00066	0.07221	0.01152	0.00431	0.00492	0.00061	
	40-49	0.06767	0.01973	0.00701	0.01333	0.00000	0.02624	0.00157	0.00105	0.00392	0.00011	
	>=50	0.08663	0.00946	0.00021	0.00455	0.00326	0.02977	0.00000	0.00100	0.00000	0.00000	
	All	0.39824	0.09678	0.03819	0.04814	0.00559	0.23833	0.03193	0.01444	0.01546	0.00125	0.88835
1986	<=19	0.02280	0.00621	0.00098	0.00000	0.00000	0.03180	0.00434	0.00065	0.00000	0.00000	
	20-29	0.08416	0.03126	0.01398	0.01415	0.00120	0.07649	0.01751	0.00609	0.00613	0.00123	
	30-39	0.11554	0.04806	0.00999	0.02686	0.00302	0.07253	0.00726	0.00491	0.00988	0.00063	
	40-49	0.05429	0.03151	0.01370	0.01064	0.00047	0.02363	0.00435	0.00000	0.00000	0.00013	
	>=50	0.06354	0.00531	0.00209	0.00085	0.00000	0.01717	0.00054	0.00000	0.00000	0.00000	
	All	0.34034	0.12234	0.04075	0.05250	0.00469	0.22162	0.03400	0.01165	0.01601	0.00199	0.84588
1987	<=19	0.02029	0.00472	0.00164	0.00000	0.00000	0.02754	0.00392	0.00040	0.00009	0.00000	
	20-29	0.08246	0.04205	0.01210	0.01619	0.00143	0.09393	0.02196	0.01128	0.00993	0.00219	
	30-39	0.09166	0.02182	0.01293	0.02004	0.00093	0.06887	0.00740	0.00320	0.00728	0.00071	
	40-49	0.07613	0.01556	0.00539	0.01240	0.00000	0.02759	0.00146	0.00000	0.00160	0.00033	
	>=50	0.06060	0.00579	0.00208	0.00526	0.00046	0.01556	0.00051	0.00000	0.00000	0.00000	
	All	0.33113	0.08994	0.03413	0.05389	0.00282	0.23350	0.03524	0.01489	0.01889	0.00323	0.81767
1988	<=19	0.02146	0.01012	0.00465	0.00000	0.00000	0.02661	0.00839	0.00181	0.00000	0.00020	
	20-29	0.07507	0.03347	0.01256	0.02331	0.00151	0.06564	0.01882	0.00695	0.01117	0.00126	
	30-39	0.10236	0.03349	0.01757	0.02944	0.00065	0.06534	0.00870	0.00728	0.00835	0.00128	
	40-49	0.04877	0.01868	0.00675	0.05213	0.00025	0.02292	0.00967	0.00149	0.00119	0.00000	
	>=50	0.06146	0.01030	0.00281	0.00838	0.00038	0.02891	0.00233	0.00000	0.00083	0.00000	
	All	0.30912	0.10606	0.04434	0.11327	0.00278	0.20941	0.04790	0.01753	0.02154	0.00274	0.87470

(Continued on page 187)

Table A-24 (Continued)

Year	Age	MANUFACTURING										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.03045	0.00470	0.00098	0.00000	0.00000	0.03421	0.00766	0.00062	0.00000	0.00011	
	20-29	0.07778	0.04233	0.01777	0.01756	0.00132	0.08063	0.01983	0.01083	0.01579	0.00048	
	30-39	0.09751	0.02322	0.01444	0.02202	0.00227	0.07132	0.00648	0.00430	0.00854	0.00082	
	40-49	0.05135	0.01189	0.00208	0.00442	0.00061	0.03636	0.00453	0.00000	0.00123	0.00014	
	>=50	0.05058	0.01568	0.00156	0.00900	0.00000	0.02483	0.00000	0.00000	0.00000	0.00000	
	All	0.30767	0.09783	0.03683	0.05299	0.00420	0.24735	0.03851	0.01575	0.02557	0.00155	0.82824
1990	<=19	0.02780	0.00836	0.00120	0.00073	0.00000	0.03808	0.01013	0.00052	0.00000	0.00000	
	20-29	0.08421	0.03453	0.02288	0.02602	0.00158	0.08244	0.03084	0.01050	0.01454	0.00114	
	30-39	0.08102	0.02639	0.01492	0.02846	0.00292	0.06531	0.01002	0.00546	0.00788	0.00117	
	40-49	0.05711	0.01179	0.00460	0.00548	0.00151	0.03808	0.00378	0.00060	0.00299	0.00025	
	>=50	0.06041	0.00605	0.00384	0.01155	0.00039	0.03283	0.00028	0.00050	0.00176	0.00000	
	All	0.31055	0.08712	0.04743	0.07224	0.00639	0.25674	0.05504	0.01758	0.02716	0.00255	0.88280

Note: Calculated as described in Chapter 5.

Table A-25 Composition of Employment Share Adjusted by Wage Differential Index: Industry

Year	Age	INDUSTRY										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1977	<=19	0.03572	0.01040	0.00011	0.00000	0.00000	0.04289	0.00121	0.00011	0.00000	0.00006	
	20-29	0.17174	0.01920	0.01139	0.01151	0.00097	0.07595	0.01039	0.00470	0.00267	0.00032	
	30-39	0.13848	0.03149	0.00901	0.01266	0.00016	0.04386	0.00420	0.00528	0.00069	0.00011	
	40-49	0.08037	0.00934	0.00297	0.00387	0.00007	0.02501	0.00101	0.00027	0.00076	0.00000	
	>=50	0.06005	0.00668	0.00049	0.00172	0.00006	0.02020	0.00068	0.00035	0.00000	0.00000	
	All	0.48635	0.07712	0.02397	0.02976	0.00127	0.20791	0.01748	0.01071	0.00412	0.00049	0.85919
1978	<=19	0.04860	0.00309	0.00008	0.00000	0.00000	0.03552	0.00112	0.00004	0.00000	0.00000	
	20-29	0.12589	0.02217	0.01032	0.01046	0.00046	0.06229	0.00763	0.00542	0.00381	0.00066	
	30-39	0.12953	0.02699	0.00840	0.01130	0.00023	0.04059	0.01056	0.00229	0.00182	0.00008	
	40-49	0.08512	0.00911	0.00192	0.00390	0.00012	0.01728	0.00131	0.00038	0.00000	0.00000	
	>=50	0.05945	0.00756	0.00192	0.00138	0.00031	0.01145	0.00038	0.00000	0.00000	0.00000	
	All	0.44860	0.06892	0.02263	0.02704	0.00112	0.16713	0.02100	0.00813	0.00563	0.00074	0.77095
1979	<=19	0.04583	0.00308	0.00054	0.00000	0.00002	0.04173	0.00185	0.00027	0.00000	0.00000	
	20-29	0.14171	0.02252	0.01434	0.01666	0.00077	0.07777	0.00906	0.00470	0.00439	0.00044	
	30-39	0.13790	0.03762	0.00869	0.01416	0.00036	0.04223	0.00495	0.00366	0.00185	0.00026	
	40-49	0.08101	0.00912	0.00616	0.00744	0.00017	0.02265	0.00182	0.00033	0.00055	0.00006	
	>=50	0.05754	0.01322	0.00119	0.00751	0.00025	0.00740	0.00055	0.00000	0.00031	0.00000	
	All	0.46400	0.08557	0.03093	0.04577	0.00158	0.19178	0.01822	0.00896	0.00710	0.00076	0.85465
1980	<=19	0.05053	0.00304	0.00004	0.00000	0.00000	0.03442	0.00162	0.00012	0.00000	0.00000	
	20-29	0.13557	0.02534	0.01056	0.01240	0.00133	0.06989	0.00660	0.00438	0.00393	0.00111	
	30-39	0.13501	0.03255	0.01212	0.02202	0.00064	0.04329	0.00901	0.00343	0.00401	0.00021	
	40-49	0.07425	0.01149	0.00177	0.00251	0.00004	0.01750	0.00161	0.00029	0.00026	0.00000	
	>=50	0.06938	0.00622	0.00186	0.00163	0.00007	0.01302	0.00077	0.00009	0.00000	0.00011	
	All	0.46473	0.07863	0.02635	0.03857	0.00209	0.17811	0.01961	0.00831	0.00820	0.00143	0.82604

(Continued on page 189)

Table A-25 (Continued)

Year	Age	INDUSTRY										
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	All
1981	<=19	0.04168	0.00366	0.00023	0.00000	0.00000	0.03963	0.00207	0.00033	0.00000	0.00000	
	20-29	0.16197	0.02493	0.01318	0.01014	0.00206	0.07666	0.00830	0.00471	0.00344	0.00097	
	30-39	0.12212	0.03328	0.00937	0.02691	0.00016	0.04267	0.00537	0.00231	0.00406	0.00010	
	40-49	0.07323	0.00910	0.00436	0.00598	0.00045	0.02057	0.00166	0.00031	0.00036	0.00004	
	>=50	0.05649	0.00470	0.00064	0.00287	0.00008	0.00829	0.00109	0.00021	0.00005	0.00000	
	All	0.45550	0.07567	0.02777	0.04589	0.00275	0.18782	0.01850	0.00787	0.00790	0.00111	0.83078
1982	<=19	0.04761	0.00300	0.00027	0.00000	0.00000	0.03811	0.00106	0.00014	0.00000	0.00000	
	20-29	0.16225	0.03057	0.01519	0.01783	0.00065	0.08151	0.01093	0.00445	0.00394	0.00065	
	30-39	0.12315	0.02408	0.01515	0.03318	0.00237	0.04560	0.00973	0.00275	0.00596	0.00033	
	40-49	0.07982	0.01424	0.00584	0.00948	0.00009	0.02452	0.00253	0.00035	0.00041	0.00004	
	>=50	0.07554	0.00543	0.00065	0.00211	0.00042	0.01571	0.00054	0.00000	0.00014	0.00000	
	All	0.48837	0.07733	0.03709	0.06261	0.00352	0.20544	0.02479	0.00769	0.01045	0.00102	0.91832
1983	<=19	0.03920	0.00286	0.00039	0.00000	0.00000	0.03105	0.00103	0.00013	0.00000	0.00000	
	20-29	0.13437	0.02932	0.01253	0.01300	0.00156	0.06966	0.00955	0.00884	0.00555	0.00164	
	30-39	0.13031	0.03298	0.01068	0.03182	0.00097	0.05080	0.00736	0.00489	0.00490	0.00038	
	40-49	0.06726	0.01720	0.00442	0.01048	0.00086	0.02316	0.00249	0.00076	0.00106	0.00000	
	>=50	0.04863	0.00463	0.00230	0.00317	0.00046	0.00850	0.00120	0.00016	0.00046	0.00000	
	All	0.41977	0.08700	0.03033	0.05848	0.00385	0.18317	0.02163	0.01479	0.01197	0.00202	0.83300
1984	<=19	0.04016	0.00671	0.00037	0.00000	0.00000	0.04208	0.00436	0.00055	0.00000	0.00000	
	20-29	0.14896	0.02948	0.01516	0.01494	0.00058	0.06217	0.01151	0.00684	0.00598	0.00079	
	30-39	0.14280	0.02491	0.03732	0.02495	0.00139	0.05441	0.00865	0.00490	0.00574	0.00127	
	40-49	0.08374	0.01911	0.01067	0.00868	0.00000	0.03063	0.00283	0.00086	0.00082	0.00065	
	>=50	0.08348	0.00782	0.00230	0.00488	0.00031	0.01970	0.00040	0.00000	0.00000	0.00000	
	All	0.49915	0.08803	0.06582	0.05345	0.00228	0.20899	0.02775	0.01315	0.01254	0.00271	0.97386

(Continued on page 190)

Table A-25 (Continued)

Year	Age	INDUSTRY										
		Male					Female					All
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1985	<=19	0.02765	0.00475	0.00021	0.00000	0.00000	0.02386	0.00298	0.00009	0.00000	0.00000	
	20-29	0.11840	0.03143	0.01693	0.01406	0.00128	0.06705	0.01144	0.00687	0.00639	0.00049	
	30-39	0.14350	0.02874	0.01636	0.02786	0.00130	0.05898	0.00969	0.00356	0.00596	0.00044	
	40-49	0.07789	0.01958	0.00920	0.02429	0.00000	0.02231	0.00122	0.00199	0.00296	0.00007	
	>=50	0.06846	0.00970	0.00487	0.00297	0.00220	0.02173	0.00097	0.00086	0.00000	0.00000	
	All	0.43590	0.09419	0.04757	0.06917	0.00478	0.19393	0.02629	0.01336	0.01530	0.00100	0.90151
1986	<=19	0.02389	0.01141	0.00078	0.00000	0.00000	0.02772	0.00337	0.00043	0.00000	0.00000	
	20-29	0.09583	0.03323	0.02456	0.01895	0.00100	0.06185	0.01360	0.00570	0.00588	0.00346	
	30-39	0.13113	0.04896	0.01329	0.03051	0.00395	0.06120	0.00605	0.00492	0.00734	0.00047	
	40-49	0.06618	0.03577	0.03095	0.04453	0.00037	0.02078	0.00367	0.00035	0.00010	0.00021	
	>=50	0.05759	0.00493	0.00165	0.00142	0.00000	0.01411	0.00042	0.00000	0.00014	0.00000	
	All	0.37462	0.13431	0.07123	0.09541	0.00532	0.18567	0.02711	0.01140	0.01346	0.00414	0.92267
1987	<=19	0.02654	0.00747	0.00148	0.00000	0.00000	0.02641	0.00338	0.00034	0.00007	0.00000	
	20-29	0.11312	0.04221	0.01503	0.01782	0.00159	0.08465	0.01915	0.00991	0.00990	0.00481	
	30-39	0.11265	0.02915	0.01592	0.03180	0.00175	0.07252	0.00670	0.00381	0.00628	0.00057	
	40-49	0.08366	0.02047	0.00652	0.05202	0.00000	0.02623	0.00149	0.00011	0.00119	0.00024	
	>=50	0.06466	0.00676	0.00406	0.00581	0.00050	0.02294	0.00044	0.00000	0.00000	0.00000	
	All	0.40063	0.10606	0.04301	0.10744	0.00384	0.23275	0.03115	0.01417	0.01743	0.00562	0.96211
1988	<=19	0.02665	0.00961	0.00398	0.00000	0.00000	0.02490	0.00710	0.00148	0.00000	0.00017	
	20-29	0.09903	0.05438	0.01815	0.03606	0.00174	0.06965	0.01783	0.00834	0.01445	0.00141	
	30-39	0.12750	0.03602	0.01984	0.04294	0.00151	0.05807	0.00639	0.00727	0.01029	0.00096	
	40-49	0.06534	0.01924	0.01567	0.05165	0.00020	0.01935	0.00754	0.00225	0.00199	0.00000	
	>=50	0.06823	0.01078	0.00297	0.01041	0.00029	0.01763	0.00141	0.00000	0.00063	0.00000	
	All	0.38675	0.13003	0.06062	0.14105	0.00374	0.18960	0.04028	0.01934	0.02736	0.00253	1.00130

(Continued on page 191)

Table A-25 (Continued)

Year	Age	INDUSTRY										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.03670	0.00535	0.00089	0.00000	0.00000	0.03122	0.00684	0.00057	0.00000	0.00010	
	20-29	0.11221	0.04464	0.02038	0.02308	0.00124	0.07711	0.01971	0.00895	0.01459	0.00050	
	30-39	0.12945	0.02407	0.01881	0.03379	0.00185	0.06620	0.00606	0.00551	0.00900	0.00081	
	40-49	0.06804	0.01715	0.00433	0.00883	0.00078	0.03150	0.00400	0.00171	0.00266	0.00012	
	>=50	0.06126	0.01604	0.00377	0.01615	0.00000	0.02227	0.00000	0.00000	0.00000	0.00000	
	All	0.40766	0.10724	0.04819	0.08185	0.00387	0.22831	0.03661	0.01673	0.02624	0.00152	0.95822
1990	<=19	0.03147	0.00878	0.00109	0.00067	0.00000	0.03521	0.00901	0.00041	0.00000	0.00000	
	20-29	0.10708	0.03817	0.02346	0.02839	0.00154	0.07310	0.02589	0.00907	0.01399	0.00099	
	30-39	0.11153	0.02719	0.01538	0.03407	0.00269	0.05675	0.00863	0.00445	0.00965	0.00114	
	40-49	0.07344	0.01454	0.00477	0.01235	0.00132	0.03160	0.00314	0.00147	0.00297	0.00018	
	>=50	0.06120	0.00594	0.00321	0.01034	0.00022	0.02515	0.00046	0.00056	0.00101	0.00000	
	All	0.38472	0.09462	0.04791	0.08582	0.00578	0.22182	0.04711	0.01596	0.02763	0.00231	0.93368

Note: Calculated as described in Chapter 5.

Table A-26 Composition of Employment Share Adjusted by Wage Differential Index: Services and Others

Year	Age	SERVICES AND OTHERS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1977	<=19	0.00926	0.00097	0.00005	0.00000	0.00016	0.01125	0.00085	0.00011	0.00001	0.00017	
	20-29	0.03566	0.02645	0.01501	0.01333	0.00907	0.03100	0.01120	0.01366	0.01682	0.01557	
	30-39	0.10197	0.05824	0.01597	0.02839	0.00879	0.02728	0.01203	0.01279	0.00796	0.01027	
	40-49	0.03579	0.01811	0.00844	0.00852	0.00652	0.02760	0.00300	0.00128	0.00305	0.00309	
	>=50	0.02826	0.01699	0.00373	0.00649	0.00494	0.01274	0.00168	0.00061	0.00054	0.00119	
	All	0.21094	0.12076	0.04321	0.05674	0.02949	0.10986	0.02876	0.02845	0.02838	0.03029	0.68687
1978	<=19	0.01782	0.00318	0.00019	0.00000	0.00026	0.01798	0.00230	0.00054	0.00004	0.00094	
	20-29	0.06834	0.03774	0.01916	0.02521	0.01732	0.04517	0.01563	0.02153	0.02180	0.02291	
	30-39	0.09640	0.06772	0.01639	0.03553	0.01730	0.04898	0.01754	0.01228	0.01534	0.01210	
	40-49	0.07460	0.03076	0.00448	0.01771	0.00501	0.03460	0.00591	0.00241	0.00586	0.00320	
	>=50	0.05703	0.02664	0.00327	0.00708	0.00447	0.02382	0.00241	0.00109	0.00140	0.00147	
	All	0.31419	0.16604	0.04348	0.08554	0.04436	0.17055	0.04380	0.03784	0.04445	0.04062	0.99087
1979	<=19	0.01506	0.00257	0.00029	0.00000	0.00003	0.01668	0.00238	0.00081	0.00000	0.00075	
	20-29	0.06378	0.03609	0.02041	0.02988	0.01843	0.03983	0.01680	0.01891	0.02330	0.02068	
	30-39	0.09895	0.05726	0.02056	0.03154	0.02572	0.05637	0.01780	0.01134	0.01305	0.00927	
	40-49	0.06962	0.02435	0.00734	0.03174	0.00829	0.03122	0.00361	0.00180	0.00716	0.00296	
	>=50	0.06084	0.02044	0.00369	0.00758	0.00441	0.02239	0.00177	0.00032	0.00052	0.00151	
	All	0.30824	0.14071	0.05229	0.10075	0.05687	0.16649	0.04236	0.03318	0.04404	0.03516	0.98009
1980	<=19	0.01665	0.00283	0.00014	0.00000	0.00015	0.01916	0.00212	0.00050	0.00000	0.00077	
	20-29	0.06994	0.03148	0.01563	0.02072	0.02028	0.04396	0.02105	0.01593	0.01670	0.02325	
	30-39	0.10531	0.04896	0.01819	0.03775	0.01664	0.06177	0.02044	0.01164	0.01801	0.01347	
	40-49	0.08131	0.06654	0.00902	0.02120	0.01477	0.04257	0.00466	0.00286	0.00595	0.00498	
	>=50	0.07016	0.01607	0.00271	0.00988	0.00225	0.02277	0.00346	0.00041	0.00307	0.00213	
	All	0.34337	0.16588	0.04568	0.08955	0.05409	0.19022	0.05174	0.03135	0.04373	0.04461	1.06022

(Continued on page 193)

Table A-26 (Continued)

Year	Age	SERVICES AND OTHERS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1981	<=19	0.01504	0.00335	0.00081	0.00002	0.00014	0.02138	0.00407	0.00099	0.00000	0.00030	
	20-29	0.05749	0.03883	0.01900	0.03266	0.03442	0.04779	0.02123	0.02550	0.02484	0.03383	
	30-39	0.08949	0.06140	0.02303	0.05234	0.02027	0.04541	0.01515	0.01288	0.02204	0.01473	
	40-49	0.07048	0.03320	0.01110	0.01909	0.01038	0.03983	0.00448	0.00435	0.00522	0.00421	
	>=50	0.06605	0.02176	0.00393	0.00963	0.00668	0.02095	0.00280	0.00030	0.00051	0.00267	
	All	0.29856	0.15854	0.05788	0.11374	0.07190	0.17535	0.04773	0.04402	0.05261	0.05574	1.07607
1982	<=19	0.01491	0.00203	0.00076	0.00000	0.00025	0.01724	0.00188	0.00078	0.00000	0.00006	
	20-29	0.05429	0.03914	0.01916	0.02978	0.03621	0.03257	0.01523	0.02161	0.02139	0.03448	
	30-39	0.09537	0.05447	0.02166	0.04573	0.03215	0.05782	0.01741	0.01529	0.02623	0.01396	
	40-49	0.06241	0.02917	0.01179	0.02711	0.01122	0.04146	0.00653	0.00586	0.00547	0.00548	
	>=50	0.06181	0.02414	0.00541	0.01053	0.01628	0.02485	0.00314	0.00108	0.00159	0.00324	
	All	0.28878	0.14896	0.05877	0.11315	0.09610	0.17394	0.04419	0.04462	0.05467	0.05721	1.08040
1983	<=19	0.01883	0.00424	0.00101	0.00000	0.00000	0.01994	0.00269	0.00034	0.00003	0.00016	
	20-29	0.06276	0.04874	0.02176	0.05290	0.04125	0.04737	0.02195	0.03151	0.02770	0.03866	
	30-39	0.09097	0.06722	0.02386	0.08272	0.02769	0.05730	0.01984	0.01757	0.03183	0.02765	
	40-49	0.07011	0.03668	0.01334	0.04348	0.01293	0.04092	0.00921	0.00764	0.01175	0.00840	
	>=50	0.06767	0.02054	0.00532	0.01555	0.00652	0.02483	0.00340	0.00124	0.00421	0.00364	
	All	0.31034	0.17743	0.06529	0.19465	0.08839	0.19036	0.05709	0.05830	0.07551	0.07851	1.29586
1984	<=19	0.00903	0.00257	0.00052	0.00000	0.00003	0.01261	0.00315	0.00081	0.00000	0.00002	
	20-29	0.05469	0.03837	0.02179	0.03216	0.01638	0.03529	0.01642	0.02135	0.02312	0.03098	
	30-39	0.08751	0.03939	0.02284	0.05600	0.03430	0.05740	0.01397	0.01781	0.02708	0.03286	
	40-49	0.06589	0.02956	0.01343	0.03685	0.01380	0.03293	0.00946	0.00619	0.00536	0.01146	
	>=50	0.04804	0.01812	0.00580	0.01186	0.01006	0.02073	0.00302	0.00278	0.00303	0.00250	
	All	0.26515	0.12801	0.06438	0.13687	0.07457	0.15895	0.04602	0.04894	0.05859	0.07782	1.05931

(Continued on page 194)

Table A-26 (Continued)

Year	Age	SERVICES AND OTHERS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1985	<=19	0.01753	0.00340	0.00040	0.00000	0.00000	0.01371	0.00342	0.00132	0.00000	0.00004	
	20-29	0.05778	0.04339	0.02364	0.04012	0.02024	0.03372	0.01537	0.02434	0.03602	0.02605	
	30-39	0.09406	0.05546	0.03267	0.08350	0.01801	0.05466	0.01879	0.01902	0.05380	0.02893	
	40-49	0.07601	0.03928	0.01699	0.06113	0.01363	0.03562	0.01000	0.00965	0.01053	0.00571	
	>=50	0.05766	0.01447	0.00290	0.00662	0.00486	0.02309	0.00389.	0.00036	0.00218	0.00276	
	All	0.30304	0.15599	0.07660	0.19136	0.05674	0.16080	0.05147	0.05469	0.10253	0.06349	1.21672
1986	<=19	0.00931	0.00335	0.00031	0.00007	0.00000	0.01406	0.00305	0.00051	0.00000	0.00000	
	20-29	0.05136	0.04616	0.02929	0.05151	0.02036	0.03039	0.01810	0.02678	0.03831	0.01940	
	30-39	0.08605	0.05515	0.03209	0.06395	0.03423	0.08509	0.01483	0.01162	0.03958	0.02249	
	40-49	0.06810	0.04412	0.01384	0.04086	0.01755	0.05181	0.00958	0.00605	0.01433	0.00407	
	>=50	0.05230	0.02906	0.00445	0.01543	0.00682	0.02629	0.00394	0.00113	0.00430	0.00250	
	All	0.26712	0.17784	0.07999	0.17183	0.07897	0.20765	0.04951	0.04608	0.09652	0.04845	1.22396
1987	<=19	0.00891	0.00486	0.00066	0.00000	0.00000	0.01561	0.00453	0.00159	0.00000	0.00001	
	20-29	0.05211	0.04388	0.02609	0.03534	0.01747	0.03549	0.02023	0.02720	0.03817	0.01612	
	30-39	0.08232	0.05224	0.03757	0.07966	0.04520	0.05906	0.01464	0.01823	0.04569	0.03152	
	40-49	0.07017	0.03140	0.01753	0.05283	0.00991	0.04205	0.01270	0.00627	0.01260	0.00791	
	>=50	0.06120	0.02915	0.01201	0.01990	0.00640	0.02576	0.00258	0.00153	0.00308	0.00665	
	All	0.27471	0.16153	0.09387	0.18772	0.07898	0.17797	0.05467	0.05483	0.09954	0.06222	1.24604
1988	<=19	0.01253	0.00560	0.00044	0.00010	0.00000	0.01185	0.00293	0.00140	0.00000	0.00005	
	20-29	0.04411	0.03749	0.01894	0.03748	0.01214	0.03011	0.01893	0.01822	0.04139	0.01361	
	30-39	0.07884	0.04191	0.03236	0.08736	0.02815	0.06194	0.01497	0.02468	0.04770	0.02730	
	40-49	0.05791	0.03658	0.01727	0.06710	0.01125	0.03621	0.01088	0.00919	0.01167	0.00984	
	>=50	0.06800	0.02782	0.00706	0.02139	0.00900	0.02708	0.00245	0.00283	0.00660	0.00340	
	All	0.26138	0.14940	0.07607	0.21343	0.06054	0.16718	0.05015	0.05632	0.10737	0.05420	1.19604

(Continued on page 195)

Table A-26 (Continued)

Year	Age	SERVICES AND OTHERS										All
		Male					Female					
		Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	Ele.+Oth.	Sec.+Sh.	Vocat.	Univ.	Teach.	
1989	<=19	0.01264	0.00641	0.00140	0.00000	0.00000	0.01622	0.00515	0.00092	0.00000	0.00004	
	20-29	0.04672	0.04401	0.01718	0.03277	0.00842	0.03621	0.02187	0.01760	0.03505	0.00944	
	30-39	0.08473	0.05627	0.02464	0.08446	0.03083	0.05200	0.01579	0.01449	0.04728	0.02908	
	40-49	0.06043	0.05787	0.02033	0.07595	0.02169	0.03803	0.01252	0.01355	0.03085	0.01067	
	>=50	0.06066	0.01630	0.00222	0.02455	0.00424	0.03876	0.00576	0.00145	0.00348	0.00197	
	All	0.26518	0.18085	0.06577	0.21773	0.06517	0.18122	0.06108	0.04801	0.11666	0.05119	1.25287
1990	<=19	0.01102	0.00512	0.00085	0.00033	0.00000	0.01461	0.00589	0.00152	0.00001	0.00006	
	20-29	0.05205	0.04625	0.01922	0.05347	0.01137	0.04411	0.02295	0.02530	0.05971	0.01338	
	30-39	0.08071	0.04781	0.02984	0.10250	0.05985	0.04927	0.01404	0.01846	0.06119	0.06541	
	40-49	0.06300	0.06073	0.01483	0.06759	0.02107	0.03585	0.01319	0.01199	0.03448	0.01068	
	>=50	0.05793	0.02087	0.00865	0.04806	0.01148	0.03718	0.00469	0.00166	0.00897	0.00543	
	All	0.26471	0.18079	0.07338	0.27194	0.10377	0.18102	0.06076	0.05893	0.16436	0.09497	1.45463

Note : Calculated as described in Chapter 5.

Table A-27 Factor Income Shares by Using Imputed Wage Series Based on SAM 1987 (Old and Rebased Series)

Year	Wage (SAM 1987) Baht/Year	LFS Employment M. Person	Total Payment M. Baht	Current GDP at Factor Cost M. Baht	Wage Share	Rent Share
1972	6,474.5	16.1298	104,432.4	151,735	0.6883	0.0863
1973	7,349.3	17.0427	125,251.9	198,805	0.6300	0.0821
1974	8,321.7	17.1591	142,792.9	246,725	0.5788	0.0765
1975	10,333.6	18.1817	187,882.4	271,477	0.6921	0.0735
1976	10,318.3	18.4109	189,969.2	311,282	0.6103	0.0695
1977	10,780.8	20.2925	218,769.4	358,749	0.6098	0.0669
1978	11,164.2	21.7222	242,511.0	435,269	0.5572	0.0595
1979	12,833.2	21.2135	272,237.1	494,365	0.5507	0.0588
1980	15,460.7	22.5077	347,984.8	582,286	0.5976	0.0588
1981	16,701.2	24.3498	406,670.9	675,424	0.6021	0.0592
1982	17,039.5	24.8146	422,828.4	732,628	0.5771	0.0600
1983	19,306.2	25.1654	485,848.2	805,548	0.6031	0.0604
1984	20,715.8	25.9830	538,258.6	857,704	0.6276	0.0584
1985	20,546.6	25.8370	530,862.5	900,482	0.5895	0.0577
1986	20,806.0	26.6744	554,987.6	968,319	0.5731	0.0586
1987	20,907.5	27.6227	577,521.6	1,103,466	0.5234	0.0568
1988	23,253.1	29.4482	684,761.9	1,303,997	0.5251	0.0522
1989	24,290.6	30.6862	745,386.2	1,540,075	0.4840	0.0485
1990	27,673.7	30.9401	856,227.0	1,756,788	0.4874	0.0458

Year	Capital, etc.	Current GDP at Factor Cost M. Baht (Rebased 1988)	Rent (Rebased)	Wage Share (1988)	Rent Share (1988)	Capital, etc. (1988)
1972	0.2254	-	-	-	-	-
1973	0.2879	-	-	-	-	-
1974	0.3447	-	-	-	-	-
1975	0.2344	-	-	-	-	-
1976	0.3202	-	-	-	-	-
1977	0.3233	-	-	-	-	-
1978	0.3833	-	-	-	-	-
1979	0.3905	-	-	-	-	-
1980	0.3436	586,249	35,300	0.5936	0.0602	0.3462
1981	0.3387	675,631	41,918	0.6019	0.0620	0.3360
1982	0.3629	754,231	47,727	0.5606	0.0633	0.3761
1983	0.3365	816,487	52,509	0.5950	0.0643	0.3406
1984	0.3140	872,351	58,250	0.6170	0.0668	0.3162
1985	0.3528	942,531	62,892	0.5632	0.0667	0.3700
1986	0.3683	1,006,368	67,517	0.5515	0.0671	0.3814
1987	0.4198	1,150,244	72,154	0.5021	0.0627	0.4352
1988	0.4227	1,356,962	76,809	0.5046	0.0566	0.4388
1989	0.4675	1,620,366	85,024	0.4600	0.0525	0.4875
1990	0.4668	1,890,963	89,643	0.4528	0.0474	0.4998

Note: Value added from SAM 1987 = 1,137,680.7 million baht which is about 3 percent higher than the value of GDP at factor cost in the same year as reported in the national account.

Sources: NESDB, NSO and TDRI.

Table A-28 Factor Income Shares by Using Imputed Wage Series Based on SAM 1987 + 10%

Year	Wage SAM 1987 (+ 10%) (Baht/Year)	LFS Employment (M. Person)	Total Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)	Wage Share	Rent Share	Capital, etc.
1972	7,122.0	16.1298	114,875.6	151,735	0.7571	0.0863	0.1566
1973	8,084.2	17.0427	137,777.1	198,805	0.6930	0.0821	0.2249
1974	9,153.9	17.1591	157,072.2	246,725	0.6366	0.0765	0.2869
1975	11,367.0	18.1817	206,670.7	271,477	0.7613	0.0735	0.1652
1976	11,350.1	18.4109	208,966.1	311,282	0.6713	0.0695	0.2592
1977	11,858.9	20.2925	240,646.3	358,749	0.6708	0.0669	0.2623
1978	12,280.6	21.7222	266,762.1	435,269	0.6129	0.0595	0.3276
1979	14,116.5	21.2135	299,460.8	494,365	0.6057	0.0588	0.3355
1980	17,006.8	22.5077	382,783.3	582,286	0.6574	0.0588	0.2838
1981	18,371.3	24.3498	447,338.0	675,424	0.6623	0.0592	0.2785
1982	18,743.5	24.8146	465,111.2	732,628	0.6349	0.0600	0.3051
1983	21,236.8	25.1654	534,433.1	805,548	0.6634	0.0604	0.2762
1984	22,787.4	25.9830	592,084.5	857,704	0.6903	0.0584	0.2513
1985	22,601.3	25.8370	583,948.8	900,482	0.6485	0.0577	0.2938
1986	22,886.6	26.6744	610,486.3	968,319	0.6305	0.0586	0.3109
1987	22,998.3	27.6227	635,273.8	1,103,466	0.5757	0.0568	0.3675
1988	25,578.4	29.4482	753,238.1	1,303,997	0.5776	0.0522	0.3702
1989	26,719.7	30.6863	819,927.5	1,540,075	0.5324	0.0485	0.4191
1990	30,441.1	30.9401	941,849.7	1,756,788	0.5361	0.0458	0.4181

Source: Calculated as described in the text.

Table A-29 Factor Income Shares by Using Imputed Wage Series Based on SAM 1987 - 10%

	Wage SAM 1987 (- 10%) (Baht/Year)	LFS Employment (M. Person)	Total Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)	Wage Share	Rent Share	Capital, etc.
1972	5,827.1	16.1298	93,989.2	151,735	0.6194	0.0863	0.2943
1973	6,614.4	17.0427	112,726.7	198,805	0.5670	0.0821	0.3509
1974	7,489.5	17.1591	128,513.6	246,725	0.5209	0.0765	0.4026
1975	9,300.2	18.1817	169,094.2	271,477	0.6229	0.0735	0.3036
1976	9,286.5	18.4109	170,972.3	311,282	0.5493	0.0695	0.3812
1977	9,702.7	20.2925	196,892.4	358,749	0.5488	0.0669	0.3843
1978	10,047.8	21.7222	218,259.9	435,269	0.5014	0.0595	0.4391
1979	11,549.9	21.2135	245,013.4	494,365	0.4956	0.0588	0.4456
1980	13,914.6	22.5077	313,186.3	582,286	0.5379	0.0588	0.4033
1981	15,031.1	24.3498	366,003.8	675,424	0.5419	0.0592	0.3989
1982	15,335.6	24.8146	380,545.5	732,628	0.5194	0.0600	0.4206
1983	17,375.6	25.1654	437,263.4	805,548	0.5428	0.0604	0.3968
1984	18,644.2	25.9830	484,432.8	857,704	0.5648	0.0584	0.3768
1985	18,491.9	25.8370	477,776.3	900,482	0.5306	0.0577	0.4117
1986	18,725.4	26.6744	499,488.8	968,319	0.5158	0.0586	0.4256
1987	18,816.8	27.6227	519,769.4	1,103,466	0.4710	0.0568	0.4722
1988	20,927.8	29.4482	616,285.7	1,303,997	0.4726	0.0522	0.4752
1989	21,861.5	30.6863	670,849.8	1,540,075	0.4356	0.0485	0.5159
1990	24,906.3	30.9401	770,604.3	1,756,788	0.4386	0.0458	0.5156

Source: Calculated as described in the text.

Table A-30 Factor Income Shares in Agriculture (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Agriculture (M. Person)	Total Wage Payment (M. Baht)	Current GDP in Agriculture at Factor Cost (M. Baht)
1977	3,692.1	14.9201	55,086.5	99,399
1978	4,058.6	16.0160	65,002.5	119,093
1979	4,676.2	15.0167	70,221.1	133,562
1980	5,331.8	15.9408	84,993.2	152,302
1981	5,521.5	17.5264	96,772.0	162,404
1982	5,439.1	16.9821	92,367.3	156,155
1983	6,101.2	17.3994	106,157.2	184,972
1984	7,025.8	18.1286	127,367.9	174,431
1985	5,345.8	17.6723	94,472.6	169,156
1986	5,401.7	17.8129	96,219.9	177,379
1987[a]	5,731.2	17.7868	101,939.7	204,787
1988	5,616.9	19.5740	109,945.2	249,530
1989	6,035.8	20.4700	123,552.8	265,663
1990	6,771.7	19.8035	134,103.4	253,683

Year	Wage Share	Rent Share[b]	Capital, etc.	GDP (1988)	Rent (1988)	Wage Share (1988)	Rent Share (1988)	Capital (1988)
1977	0.5542	0.0577	0.3881	-	-	-	-	-
1978	0.5458	0.0491	0.4051	-	-	-	-	-
1979	0.5258	0.0514	0.4228	-	-	-	-	-
1980	0.5581	0.0572	0.3847	153,401	9,382	0.5541	0.0612	0.3848
1981	0.5959	0.0656	0.3385	161,851	11,915	0.5979	0.0736	0.3285
1982	0.5915	0.0716	0.3369	155,449	12,044	0.5942	0.0775	0.3283
1983	0.5739	0.0663	0.3598	184,100	12,281	0.5766	0.0667	0.3567
1984	0.7302	0.0653	0.2045	173,000	12,314	0.7362	0.0712	0.1926
1985	0.5585	0.0604	0.3811	166,380	12,630	0.5678	0.0759	0.3563
1986	0.5425	0.0552	0.4023	176,809	12,632	0.5442	0.0714	0.3844
1987[a]	0.4978	0.0566	0.4456	203,709	13,077	0.5004	0.0642	0.4354
1988	0.4406	0.0489	0.5105	251,591	13,745	0.4370	0.0546	0.5084
1989	0.4651	0.0485	0.4864	278,837	14,475	0.4431	0.0519	0.5050
1990	0.5286	0.0527	0.4187	278,384	12,145	0.4817	0.0436	0.4747

Notes: [a] Total wages in agriculture in SAM 1987 amount to 101,939.7 million baht and total number of employment is 17.7868 million. This renders an average imputed wage of 5,731.2 baht.

[b] Calculated from total farm rent in the national income account.

Source: Calculated as described in the text by using data from NESDB and TDRI.

Table A-31 Factor Income Shares in Industry (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Industry (M. Person)	Total Wage Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)
1977	24,807.5	1.7535	43,499.9	99,046
1978	25,805.5	1.8726	48,323.4	122,890
1979	29,266.4	2.2209	64,997.7	140,829
1980	35,548.6	2.3145	82,277.2	171,115
1981	39,528.6	2.3335	92,239.9	201,950
1982	41,344.6	2.6613	110,030.4	218,648
1983	45,823.7	2.5038	114,733.4	242,360
1984	50,475.1	2.7607	139,346.6	278,786
1985	50,138.9	2.8140	141,090.9	299,896
1986	53,977.2	2.8172	152,064.6	321,934
1987[a]	49,137.5	3.2450	159,451.2	374,516
1988	59,470.5	3.3197	197,424.2	467,820
1989	52,949.2	3.6560	193,582.3	565,645
1990	59,304.5	4.3337	257,007.9	647,209

Year	Wage Share	Property Income Share	GDP (1988)	Wage Share (1988)	Capital, etc. (1988)
1977	0.4392	0.5608	-	-	-
1978	0.3932	0.6068	-	-	-
1979	0.4615	0.5385	-	-	-
1980	0.4808	0.5192	157,308	0.5230	0.4770
1981	0.4567	0.5433	190,224	0.4849	0.5151
1982	0.5032	0.4968	207,378	0.5306	0.4694
1983	0.4734	0.5266	236,310	0.4855	0.5145
1984	0.4998	0.5002	267,754	0.5204	0.4796
1985	0.4705	0.5295	290,819	0.4852	0.5148
1986	0.4723	0.5277	318,029	0.4781	0.5219
1987[a]	0.4257	0.5743	372,445	0.4281	0.5719
1988	0.4220	0.5780	438,847	0.4499	0.5501
1989	0.3422	0.6578	561,957	0.3445	0.6555
1990	0.3971	0.6029	678,138	0.3790	0.6210

Note: [a] Total wages in industry in SAM 1987 amount to 159,451.2 million baht and total number of employment is 3.245 million. This renders an average imputed wage of 49,137.5 baht.

Source: Calculated as described in the text by using data from NESDB and TDRI.

Table A-32 Factor Income Shares in Manufacturing (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Manufacturing (M. Person)	Total Wage Payment (M. Baht)	Current GDP in Manufacturing at Factor Cost (M. Baht)
1977	23,408.2	1.3273	31,069.7	63,866
1978	21,905.5	1.4752	32,314.9	78,935
1979	26,455.4	1.7225	45,569.4	92,516
1980	32,249.4	1.7869	57,626.4	111,661
1981	34,397.1	1.7393	59,826.8	135,493
1982	37,015.3	2.0043	74,189.7	140,289
1983	41,033.9	1.8399	75,498.2	154,801
1984	44,450.8	1.9835	88,168.1	174,506
1985	48,963.3	2.0644	101,079.8	183,956
1986	51,003.2	2.0666	105,403.2	206,531
1987[a]	48,279.5	2.4357	117,594.3	242,831
1988	59,115.8	2.4583	145,324.3	306,481
1989	54,111.8	2.7778	150,311.7	361,460
1990	59,033.9	3.1430	185,543.6	388,444

Year	Wage Share	Property Income Share	GDP (1988)	Wage Share (1988)	Capital, etc. (1988)
1977	0.4865	0.5135	-	-	-
1978	0.4094	0.5906	-	-	-
1979	0.4926	0.5074	-	-	-
1980	0.5161	0.4839	113,565	0.5074	0.4926
1981	0.4415	0.5585	137,637	0.4347	0.5653
1982	0.5288	0.4712	142,394	0.5210	0.4790
1983	0.4877	0.5123	162,380	0.4649	0.5351
1984	0.5052	0.4948	181,604	0.4855	0.5145
1985	0.5495	0.4505	190,696	0.5301	0.4699
1986	0.5104	0.4896	216,736	0.4863	0.5137
1987[a]	0.4843	0.5157	258,426	0.4550	0.5450
1988	0.4742	0.5258	308,447	0.4711	0.5289
1989	0.4158	0.5842	392,688	0.3828	0.6172
1990	0.4777	0.5223	471,266	0.3937	0.6063

Note: [a] Total wages in manufacturing in SAM 1987 amount to 117,594.3 million baht and total number of employment is 2.4357 million. This renders an average imputed wage of 48,279.5 baht.

Source: Calculated as described in the text by using data from NESDB and TDRI.

Table A-33 Factor Income Shares in Services and Other Sectors (by using Imputed Wage Series Based on SAM 1987)

Year	Imputed Wage Based on SAM 1987 (Baht/Year)	Employment in Services (M. Person)	Total Wage Payment (M. Baht)	Current GDP at Factor Cost (M. Baht)
1977	23,539.8	3.6189	85,188.2	160,304
1978	23,320.2	3.8336	89,400.3	193,286
1979	27,354.7	3.9759	108,759.6	219,974
1980	32,572.7	4.2524	138,512.1	258,869
1981	38,844.2	4.4899	174,406.6	311,070
1982	38,968.9	5.1712	201,515.9	357,825
1983	42,952.6	5.2622	226,025.2	378,216
1984	43,891.6	5.0937	223,570.6	404,487
1985	47,890.4	5.3507	256,247.2	431,430
1986	46,879.0	6.0443	283,350.7	469,006
1987[a]	47,964.9	6.5909	316,131.9	524,163
1988	50,716.2	6.5545	332,419.3	586,647
1989	52,923.6	6.5602	347,189.4	708,767
1990	66,620.3	6.8029	453,211.2	855,896

Year	Wage Share	Property Income Share	GDP (1988)	Wage Share (1988)	Capital, etc. (1988)
1977	0.5314	0.4686	-	-	-
1978	0.4625	0.5375	-	-	-
1979	0.4944	0.5056	-	-	-
1980	0.5351	0.4649	275,540	0.5027	0.4973
1981	0.5607	0.4393	323,556	0.5390	0.4610
1982	0.5632	0.4368	391,404	0.5149	0.4851
1983	0.5976	0.4024	396,077	0.5707	0.4293
1984	0.5527	0.4473	431,597	0.5180	0.4820
1985	0.5939	0.4061	485,332	0.5280	0.4720
1986	0.6042	0.3958	511,530	0.5539	0.4461
1987[a]	0.6031	0.3969	574,090	0.5507	0.4493
1988	0.5666	0.4334	666,524	0.4987	0.5013
1989	0.4898	0.5102	779,572	0.4454	0.5546
1990	0.5295	0.4705	934,441	0.4850	0.5150

Note: [a] Total wages in services and other sectors in SAM 1987 amount to 316,132 million baht and total number of employment is 6.5909 million. This renders an average imputed wage of 47,964.9 baht.

Source: Calculated as described in the text by using data from NESDB and TDRI.

Table A-34 Growth Accounting by Using Employment as Labor Input

Year	GDP at 1972 Prices	Employment	Land	Net Capital	TFP
1972	4.0729	-2.0246	-0.1116	0.9141	5.2950
1973	9.8597	3.5787	1.1341	1.3286	3.8183
1974	4.3533	0.4332	0.0493	1.3167	2.5542
1975	4.8462	3.7349	0.5959	1.4290	-0.9137
1976	9.3754	0.8058	-0.1337	1.6300	7.0733
1977	9.8987	6.0436	0.5237	2.3713	0.9602
1978	10.4388	4.0370	0.6893	2.4006	3.3118
1979	5.3133	-1.3304	-0.3295	2.7202	4.2529
1980	4.7849	3.5608	0.1959	2.9774	-1.9492
1981	6.3335	4.8451	0.2031	2.9371	-1.6518
1982	4.0639	1.1411	0.0148	2.3902	0.5177
1983	7.2509	0.8699	0.2313	2.7372	3.4124
1984	7.1270	1.9670	0.0497	2.6622	2.4481
1985	3.5129	-0.3368	0.2183	2.4148	1.2166
1986	4.9164	1.8214	-0.2739	2.2680	1.1009
1987	9.4672	1.9217	-0.1859	2.9952	4.7362
1988	13.2186	3.3732	0.4951	4.0574	5.2928
1989	12.0453	2.1017	0.0736	5.0515	4.8184
1990	9.9992	0.3912	-0.1940	6.5682	3.2338

Source: Calculated as described in the text.

Table A-35 Growth Accounting by Using Total Working Hours as Labor Input

Year	GDP at 1972 Prices	Total Working Hours	Land	Net Capital	TFP
1972	4.0729	-6.7020	-0.1116	0.9141	9.9725
1973	9.8597	7.9552	1.1341	1.3286	-0.5522
1974	4.3533	2.0074	0.0493	1.3167	0.9799
1975	4.8462	2.7201	0.5959	1.4290	0.1011
1976	9.3754	0.9962	-0.1337	1.6300	6.8829
1977	9.8987	4.7988	0.5237	2.3713	2.2050
1978	10.4388	7.2169	0.6893	2.4006	0.1320
1979	5.3133	-1.4205	-0.3295	2.7202	4.3430
1980	4.7849	3.6298	0.1959	2.9774	-2.0183
1981	6.3335	2.5274	0.2031	2.9371	0.6658
1982	4.0639	-4.8753	0.0148	2.3902	6.5341
1983	7.2509	9.2097	0.2313	2.7372	-4.9274
1984	7.1270	2.4202	0.0497	2.6622	1.9949
1985	3.5129	-0.9877	0.2183	2.4148	1.8674
1986	4.9164	2.1548	-0.2739	2.2680	0.7675
1987	9.4672	0.8900	-0.1859	2.9952	5.7679
1988	13.2186	3.6532	0.4951	4.0574	5.0128
1989	12.0453	3.3538	0.0736	5.0515	3.5663
1990	9.9992	-2.2014	-0.1940	6.5682	5.8265

Source: Calculated as described in the text.

Table A-36 Growth Accounting by Using Total Working Hours as Labor Input (Wage SAM 1987 + 10%)

Year	GDP at 1972 Prices	Total Working Hours	Land	Net Capital	TFP
1972	4.0729	-7.3722	-0.1116	0.6351	10.9218
1973	9.8597	8.7507	1.1406	1.0445	-1.0762
1974	4.3533	2.2082	0.0487	1.3069	0.7895
1975	4.8462	2.9921	0.5986	0.7875	0.4679
1976	9.3754	1.0958	-0.1328	1.4437	6.9687
1977	9.8987	5.2787	0.5365	1.8172	2.2663
1978	10.4388	7.9386	0.6644	2.1506	-0.3147
1979	5.3133	-1.5625	-0.3282	2.4497	4.7542
1980	4.7849	3.9928	0.1955	2.3631	-1.7665
1981	6.3335	2.7802	0.2027	2.3479	1.0027
1982	4.0639	-5.3628	0.0149	2.1079	7.3039
1983	7.2509	10.1307	0.2344	2.2378	-5.3521
1984	7.1270	2.6623	0.0493	2.0003	2.4151
1985	3.5129	-1.0864	0.2163	2.0564	2.3266
1986	4.9164	2.3703	-0.2781	1.8544	0.9698
1987	9.4672	0.9790	0.1890	2.7273	5.9499
1988	13.2186	4.0186	0.4923	3.4395	5.2682
1989	12.0453	3.6892	0.0731	4.6804	3.6025
1990	9.9992	-2.4216	-0.1940	5.8824	6.7323

Source: Calculated as described in the text.

Table A-37 Growth Accounting by Using Total Working Hours as Labor Input (Wage SAM 1987 - 10%)

Year	GDP at 1972 Prices	Total Working Hours	Land	Net Capital	TFP
1972	4.0729	-6.0318	-0.1116	1.1932	9.0232
1973	9.8597	7.1597	1.1406	1.6298	-0.0704
1974	4.3533	1.8067	0.0487	1.8343	0.6636
1975	4.8462	2.4481	0.5986	1.4473	0.3522
1976	9.3754	0.8966	-0.1328	2.1235	6.4881
1977	9.8987	4.3189	0.5365	2.6622	2.3811
1978	10.4388	6.4952	0.6644	2.8821	0.3972
1979	5.3133	-1.2784	-0.3282	3.2540	3.6685
1980	4.7849	3.2668	0.1955	3.3583	-2.0357
1981	6.3335	2.2747	0.2027	3.3632	0.4930
1982	4.0639	-4.3877	0.0149	2.9053	5.5315
1983	7.2509	8.2887	0.2344	3.2153	-4.4876
1984	7.1270	2.1782	0.0493	2.9995	1.9000
1985	3.5129	-0.8889	0.2163	2.8817	1.3038
1986	4.9164	1.9393	-0.2781	2.5380	0.7171
1987	9.4672	0.8010	-0.1890	3.5041	5.3511
1988	13.2186	3.2879	0.4923	4.4153	5.0230
1989	12.0453	3.0184	0.0731	5.7615	3.1922
1990	9.9992	-1.9813	-0.1940	7.2539	4.9206

Source: Calculated as described in the text.

Table A-38 Growth Accounting: All Sectors (using Net Capital and Unadjusted Labor)

Year	GDP at 1972 Prices	Labor (Total Working Hours)	Land	Net Capital	TFP
1978	10.4388	7.2166	0.6893	2.4006	0.1323
1979	5.3133	-1.4202	-0.3295	2.7202	4.3428
1980	4.7849	3.6298	0.1959	2.9774	-2.0183
1981	6.3335	2.5274	0.2031	2.9371	0.6658
1982	4.0639	-4.8753	0.0148	2.3902	6.5341
1983	7.2509	9.2096	0.2313	2.7372	-4.9273
1984	7.1270	2.4203	0.0497	2.6622	2.3255
1985	3.5129	-0.9877	0.2183	2.4148	1.8674
1986	4.9164	2.1548	-0.2739	2.2680	0.7675
1987	9.4672	0.8900	-0.1859	2.9952	5.7679
1988	13.2186	3.6532	0.4951	4.0574	5.0128
1989	12.0453	3.3538	0.0736	5.0515	3.5663
1990	9.9992	-2.2014	-0.1940	6.5682	6.5516

Source: Calculated as described in the text.

Table A-39 Growth Accounting: All Sectors (using Net Capital and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Land	Net Capital	TFP
1978	10.4388	12.0481	0.6893	2.4006	-4.6992
1979	5.3133	5.2296	-0.3295	2.7202	-2.3071
1980	4.7849	5.3773	0.1959	2.9774	-3.7658
1981	6.3335	3.7171	0.2031	2.9371	-0.5239
1982	4.0639	-4.6813	0.0148	2.3902	6.3402
1983	7.2509	9.1401	0.2313	2.7372	-4.8578
1984	7.1270	1.6707	0.0497	2.6622	2.7445
1985	3.5129	0.1150	0.2183	2.4148	0.7648
1986	4.9164	4.9318	-0.2739	2.2680	-2.0095
1987	9.4672	2.6442	-0.1859	2.9952	4.0137
1988	13.2186	4.2964	0.4951	4.0574	4.3696
1989	12.0453	2.7727	0.0736	5.0515	4.1474
1990	9.9992	-2.2269	-0.1940	6.5682	5.8519

Source: Calculated as described in the text.

Table A-40 Growth Accounting: All Sectors (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1972 Prices	Labor (Total Working Hours)	Land	Composite Capital Index	TFP
1978	10.4388	7.2166	0.6893	1.9117	0.6212
1979	5.3133	-1.4202	-0.3295	2.1975	4.8654
1980	4.7849	3.6298	0.1959	2.4280	-1.4689
1981	6.3335	2.5274	0.2031	2.4414	1.1615
1982	4.0639	-4.8753	0.0148	2.0665	6.8578
1983	7.2509	9.2096	0.2313	2.3521	-4.5422
1984	7.1270	2.4203	0.0497	2.3316	2.3255
1985	3.5129	-0.9877	0.2183	2.1785	2.1038
1986	4.9164	2.1548	-0.2739	2.1109	0.9246
1987	9.4672	0.8900	-0.1859	2.7113	6.0518
1988	13.2186	3.6532	0.4951	3.6153	5.4550
1989	12.0453	3.3538	0.0736	4.4840	4.1338
1990	9.9992	-2.2014	-0.1940	5.8429	6.5516

Source: Calculated as described in the text.

Table A-41 Growth Accounting: All Sectors (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Land	Composite Capital Index	TFP
1978	10.4388	12.0481	0.6893	1.9117	-4.2103
1979	5.3133	5.2296	-0.3295	2.1975	-1.7844
1980	4.7849	5.3773	0.1959	2.4280	-3.2164
1981	6.3335	3.7171	0.2031	2.4414	-0.0282
1982	4.0639	-4.6813	0.0148	2.0665	6.6639
1983	7.2509	9.1401	0.2313	2.3521	-4.4727
1984	7.1270	1.6707	0.0497	2.3316	30.751
1985	3.5129	0.1150	0.2183	2.1785	1.0012
1986	4.9164	4.9318	-0.2739	2.1109	-1.8524
1987	9.4672	2.6442	-0.1859	2.7113	4.2977
1988	13.2186	4.2964	0.4951	3.6153	4.8118
1989	12.0453	2.7727	0.0736	4.4840	4.7149
1990	9.9992	-2.2269	-0.1940	5.8429	6.5772

Source: Calculated as described in the text.

Table A-42 Growth Accounting: All Sectors, Using Rebased Series (using Net Capital and Unadjusted Labor)

Year	GDP at 1988 Prices	Labor (Total Working Hours)	Land	Net Capital	TFP
1981	5.9069	2.4979	0.2117	2.9743	0.2230
1982	5.3523	-4.8074	0.0157	2.4242	7.7199
1983	5.5842	9.0041	0.2515	2.7902	-6.4615
1984	5.7524	2.3686	0.0557	2.7248	0.6033
1985	4.6472	-0.9567	0.2507	2.4909	2.8623
1986	5.5338	2.0690	-0.3110	2.3590	1.4167
1987	9.5189	0.8573	-0.2067	3.1056	5.7628
1988	13.2881	3.5012	0.5401	4.2165	5.0303
1989	12.2907	3.1824	0.0787	5.3082	3.7214
1990	11.5736	-2.0618	-0.2115	6.9449	6.9019

Source: Calculated as described in the text.

Table A-43 Growth Accounting: All Sectors, Using Rebased Series (using Net Capital and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Land	Net Capital	TFP
1981	5.9069	3.6737	0.2117	2.9743	-0.9529
1982	5.3523	-4.6162	0.0157	2.4242	7.5287
1983	5.5842	8.9624	0.2515	2.7902	-6.4199
1984	5.7524	1.6294	0.0557	2.7248	1.3425
1985	4.6472	0.1112	0.2507	2.4909	1.7944
1986	5.5338	4.7292	-0.3110	2.3590	-1.2435
1987	9.5189	2.5407	-0.2067	3.1056	4.0793
1988	13.2881	4.1123	0.5401	4.2165	4.4192
1989	12.2907	2.6264	0.0787	5.3082	4.2773
1990	11.5736	-2.0856	-0.2115	6.9449	6.9258

Source: Calculated as described in the text.

Table A-44 Growth Accounting: All Sectors, Using Rebased Series (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1988 Prices	Labor (Total Working Hours)	Land	Composite Capital Index	TFP
1981	5.9069	2.4979	0.2117	2.4723	0.7249
1982	5.3523	-4.8074	0.0157	2.0959	8.0482
1983	5.5842	9.0041	0.2515	2.3976	-6.0689
1984	5.7524	2.3686	0.0557	2.3864	0.9417
1985	4.6472	-0.9567	0.2507	2.2471	3.1061
1986	5.5338	2.0690	-0.3110	2.1956	1.5801
1987	9.5189	0.8573	-0.2067	2.8112	6.0571
1988	13.2881	3.5012	0.5401	3.7569	5.4899
1989	12.2907	3.1824	0.0787	4.7119	4.3178
1990	11.5736	-2.0618	-0.2115	6.1781	7.6688

Source: Calculated as described in the text.

Table A-45 Growth Accounting: All Sectors, Using Rebased Series (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Land	Composite Capital Index	TFP
1981	5.9069	3.6737	0.2117	2.4723	-0.4509
1982	5.3523	-4.6162	0.0157	2.0959	7.8570
1983	5.5842	8.9624	0.2515	2.3976	-6.0273
1984	5.7524	1.6294	0.0557	2.3864	1.6808
1985	4.6472	0.1112	0.2507	2.2471	2.0382
1986	5.5338	4.7292	-0.3110	2.1956	-1.0801
1987	9.5189	2.5407	-0.2067	2.8112	4.3737
1988	13.2881	4.1123	0.5401	3.7569	4.8787
1989	12.2907	2.6264	0.0787	4.7119	4.8737
1990	11.5736	-2.0856	-0.2115	6.1781	7.6927

Source: Calculated as described in the text.

Table A-46 Average Yearly Wage by Sector[a]

Year	Agriculture, Forestry, Hunting and Fishing	Manufacturing	Industry[b]	Services and Others[c]
1977	7,395	12,483.8	12,522.6	14,309.5
1978	8,129	11,682.4	13,026.4	14,176.0
1979	9,366	14,108.9	14,733.4	16,628.5
1980	10,679	17,198.9	17,944.6	19,800.4
1981	11,059	18,344.3	19,953.7	23,612.8
1982	10,894	19,740.6	20,870.4	23,688.6
1983	12,220	21,883.8	23,131.4	26,110.2
1984	14,072	23,706.0	25,479.4	26,681.0
1985	10,707	26,112.6	25,309.7	29,111.8
1986	10,819	27,200.5	27,247.2	28,497.0
1987	11,479	25,747.9	24,804.2	29,157.1
1988	11,250	31,527.0	30,020.2	30,829.6
1989	12,089	28,858.3	26,728.3	32,171.4
1990	13,563	31,483.3	29,936.4	40,497.4

Notes: [a] The wage series are calculated from wages of private employees in the LFS weighted by employment in each subsector, using (Round 2), July-September 1977-1983 and (Round 3), August 1984-1990.

[b] Includes mining and quarrying, manufacturing, construction, and electricity, and public utilities.

[c] Includes commerce, transport, storage and communication and services.

Source: Calculated as described in the text.

Table A-47 Growth Accounting in Agriculture (using Net Capital and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Land	Net Capital	TFP
1978	12.4655	3.9805	0.5886	1.7146	6.1818
1979	-1.8268	-3.3893	-0.2934	0.0339	1.8220
1980	1.7192	3.4455	0.1933	0.3871	-2.3067
1981	5.3796	5.7872	0.2216	0.8577	-1.4867
1982	3.0556	-1.8233	0.0170	0.3962	4.4657
1983	4.4408	1.5527	0.2628	0.7019	1.9234
1984	5.5894	2.6020	0.0542	0.2676	2.6656
1985	6.1668	-1.5363	0.2261	1.0908	6.3863
1986	0.3005	0.4240	-0.2752	1.8605	-1.7115
1987	-0.2209	-0.0723	-0.1783	0.8783	-0.8485
1988	10.2136	4.7006	0.4842	1.2937	3.7351
1989	6.6456	2.1886	0.0755	1.3584	3.0231
1990	-1.8130	-1.6179	-0.2142	2.3403	-2.3212

Source: Calculated as described in the text.

Table A-48 Growth Accounting in Agriculture (using Net Capital and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Land	Net Capital	TFP
1978	12.4655	3.4451	0.5886	1.7146	6.7172
1979	-1.8268	-1.4494	-0.2934	0.0339	-0.1179
1980	1.7192	2.1046	0.1933	0.3871	-0.9658
1981	5.3796	9.5124	0.2216	0.8577	-5.2121
1982	3.0556	-2.2383	0.0170	0.3962	4.8807
1983	4.4408	-0.2191	0.2628	0.7019	3.6952
1984	5.5894	1.9066	0.0542	0.2676	3.3610
1985	6.1668	3.7424	0.2261	1.0908	1.1075
1986	0.3005	6.0921	-0.2752	1.8605	-7.3769
1987	-0.2209	0.4748	-0.1783	0.8783	-1.3957
1988	10.2136	3.2968	0.4842	1.2937	5.1389
1989	6.6456	-0.0703	0.0755	1.3584	5.2821
1990	-1.8130	-1.7657	-0.2142	2.3403	-2.1735

Source: Calculated as described in the text.

Table A-49 Growth Accounting in Agriculture (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Land	Composite Capital Index	TFP
1978	12.4655	3.9805	0.5886	1.4797	6.4166
1979	-1.8268	-3.3893	-0.2934	-0.3175	2.1734
1980	1.7192	3.4455	0.1933	0.0192	-1.9388
1981	5.3796	5.7872	0.2216	0.3267	-0.9558
1982	3.0556	-1.8233	0.0170	0.0865	4.7754
1983	4.4408	1.5527	0.2628	0.3968	2.2285
1984	5.5894	2.6020	0.0542	-0.0706	3.0038
1985	6.1668	-1.5363	0.2261	0.8346	6.6424
1986	0.3005	0.4240	-0.2725	1.7125	-1.5635
1987	-0.2209	-0.0723	-0.1783	0.5054	-0.4756
1988	10.2136	4.7006	0.4842	1.1414	3.8874
1989	6.6456	2.1886	0.0755	1.1851	3.1964
1990	-1.8130	-1.6179	-0.2142	2.0120	-1.9929

Source: Calculated as described in the text.

Table A-50 Growth Accounting in Agriculture (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Land	Composite Capital Index	TFP
1978	12.4655	3.4451	0.5886	1.4797	6.9520
1979	-1.8268	-1.4494	-0.2934	-0.3175	0.2336
1980	1.7192	2.1046	0.1933	0.0192	-0.5979
1981	5.3796	9.5124	0.2216	0.3267	-4.6811
1982	3.0556	-2.2383	0.0170	0.0865	5.1904
1983	4.4408	-0.2191	0.2628	0.3968	4.0003
1984	5.5894	1.9066	0.0542	-0.0706	3.6992
1985	6.1668	3.7424	0.2261	0.8346	1.3637
1986	0.3005	6.0921	-0.2725	1.7125	-7.2315
1987	-0.2209	0.4748	-0.1783	0.5054	-1.0227
1988	10.2136	3.2968	0.4842	1.1414	5.2912
1989	6.6456	-0.0703	0.0755	1.1851	5.4554
1990	-1.8130	-1.7657	-0.2142	2.0120	-1.8452

Source: Calculated as described in the text.

Table A-51 Growth Accounting in Agriculture Using Rebased Series (using Net Capital and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Land	Net Capital	TFP
1981	5.1182	5.7896	0.2419	0.8426	-1.7559
1982	2.4750	-1.8310	0.0182	0.3879	3.8998
1983	4.7715	1.5621	0.2785	0.6835	2.2474
1984	4.4193	2.6273	0.0604	0.2563	1.4753
1985	4.5081	-1.5507	0.2731	1.0303	4.7554
1986	0.3814	0.4276	-0.3348	1.7802	-1.4917
1987	0.0679	-0.0724	-0.2111	0.8586	-0.5072
1988	10.5104	4.6238	0.5368	1.2993	4.0505
1989	9.6625	2.0780	0.0755	1.4278	6.0812
1990	-3.7275	-1.5058	-0.2022	2.5331	-4.5525

Source: Calculated as described in the text.

Table A-52 Growth Accounting in Agriculture Using Rebased Series (using Net Capital and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Land	Net Capital	TFP
1981	5.1182	9.5164	0.2419	0.8426	-5.4827
1982	2.4750	-2.2477	0.0182	0.3879	4.3166
1983	4.7715	-0.2205	0.2785	0.6835	4.0299
1984	4.4193	1.9251	0.0604	0.2563	2.1775
1985	4.5081	3.7774	0.2731	1.0303	-0.5727
1986	0.3814	6.1443	-0.3348	1.7802	-7.2083
1987	0.0679	0.4750	-0.2111	0.8586	-1.0546
1988	10.5104	3.2429	0.5368	1.2993	5.4314
1989	9.6625	-0.0668	0.0755	1.4278	8.2259
1990	-3.7275	-1.6433	-0.2022	2.5331	-4.4150

Source: Calculated as described in the text.

Table A-53 Growth Accounting in Agriculture Using Rebased Series (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Land	Composite Capital Index	TFP
1981	5.1182	5.7896	0.2419	0.3210	-1.2343
1982	2.4750	-1.8310	0.0182	0.0847	4.2030
1983	4.7715	1.5621	0.2785	0.3864	2.5445
1984	4.4193	2.6273	0.0604	-0.0676	1.7993
1985	4.5081	-1.5507	0.2731	0.7884	4.9973
1986	0.3814	0.4276	-0.3348	1.6385	-1.3500
1987	0.0679	-0.0724	-0.2111	0.4941	-0.1427
1988	10.5104	4.6238	0.5368	1.1463	4.2035
1989	9.6625	2.0780	0.0755	1.2457	6.2633
1990	-3.7275	-1.5058	-0.2022	2.1777	-4.1972

Source: Calculated as described in the text.

Table A-54 Growth Accounting in Agriculture Using Rebased Series (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Land	Composite Capital Index	TFP
1981	5.1182	9.5164	0.2419	0.3210	-4.9611
1982	2.4750	-2.2477	0.0182	0.0847	4.6198
1983	4.7715	-0.2205	0.2785	0.3864	4.3270
1984	4.4193	1.9251	0.0604	-0.0676	2.5014
1985	4.5081	3.7774	0.2731	0.7884	-0.3307
1986	0.3814	6.1443	-0.3348	1.6385	-7.0666
1987	0.0679	0.4750	-0.2111	0.4941	-0.6900
1988	10.5104	3.2429	0.5368	1.1463	5.5844
1989	9.6625	-0.0668	0.0755	1.2457	8.4081
1990	-3.7275	-1.6433	-0.2022	2.1777	-4.0597

Source: Calculated as described in the text.

Table A-55 Growth Accounting in Industry (using Net Capital and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Net Capital	TFP
1978	11.24	2.9294	6.1246	2.1881
1979	6.46	8.2800	6.6105	-8.4352
1980	3.59	1.9654	6.1226	-4.4936
1981	5.75	0.3942	6.7465	-1.3880
1982	3.13	6.7106	5.7239	-9.3053
1983	8.10	-2.9118	6.3432	4.6670
1984	8.52	4.9376	6.7510	-3.1722
1985	-0.11	0.9284	4.0541	-5.0960
1986	7.89	0.0519	3.2797	4.5568
1987	12.77	6.6815	4.5944	1.4933
1988	17.41	0.9131	8.4845	8.0157
1989	16.23	3.9215	9.0173	3.2875
1990	15.63	6.8517	10.3602	-1.5850

Source: Calculated as described in the text.

Table A-56 Growth Accounting in Industry (using Net Capital and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1978	11.24	3.6749	6.1246	1.4426
1979	6.46	7.5756	6.6105	-7.7308
1980	3.59	3.1514	6.1226	-5.6796
1981	5.75	1.6218	6.7465	-2.6156
1982	3.13	6.8579	5.7239	-9.4526
1983	8.10	-0.3462	6.3432	2.1014
1984	8.52	4.6103	6.7510	-2.8448
1985	-0.11	2.5513	4.0541	-6.7189
1986	7.89	-0.1399	3.2797	4.7486
1987	12.77	8.4968	4.5944	-0.3220
1988	17.41	1.4128	8.4845	7.5159
1989	16.23	3.5066	9.0173	3.7023
1990	15.63	6.0134	10.3602	-0.7467

Source: Calculated as described in the text.

Table A-57 Growth Accounting in Industry (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Composite Capital Index	TFP
1978	11.24	2.9294	5.5143	2.7983
1979	6.46	8.2800	6.0735	-7.8982
1980	3.59	1.9654	5.3315	-3.7026
1981	5.75	0.3942	5.8210	-0.4625
1982	3.13	6.7106	5.2172	-8.7986
1983	8.10	-2.9118	5.6152	5.3949
1984	8.52	4.9376	6.0643	-2.4855
1985	-0.11	0.9284	3.7543	-4.7962
1986	7.89	0.0519	3.2914	4.5451
1987	12.77	6.6815	4.3991	1.6885
1988	17.41	0.9131	7.4494	9.0508
1989	16.23	3.9215	7.9983	4.3064
1990	15.63	6.8517	9.0610	-0.2858

Source: Calculated as described in the text.

Table A-58 Growth Accounting in Industry (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1978	11.24	3.6749	5.5143	2.0529
1979	6.46	7.5756	6.0735	-7.1938
1980	3.59	3.1514	5.3315	-4.8886
1981	5.75	1.6218	5.8210	-1.6901
1982	3.13	6.8579	5.2172	-8.9459
1983	8.10	-0.3462	5.6152	2.8293
1984	8.52	4.6103	6.0643	-2.1581
1985	-0.11	2.5513	3.7543	-6.4191
1986	7.89	-0.1399	3.2914	4.7369
1987	12.77	8.4968	4.3991	-0.1268
1988	17.41	1.4128	7.4494	8.5510
1989	16.23	3.5066	7.9983	4.7213
1990	15.63	6.0134	9.0610	0.5525

Source: Calculated as described in the text.

Table A-59 Growth Accounting in Industry Using Rebased Series (using Net Capital and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Net Capital	TFP
1981	7.0620	0.4210	6.3233	0.3178
1982	5.1422	7.0276	5.4765	-7.3620
1983	10.5162	-3.0304	6.0928	7.4538
1984	8.1860	5.0998	6.5454	-3.4592
1985	1.4224	0.9549	3.9470	-3.4795
1986	8.0194	0.0527	3.2336	4.7330
1987	14.1289	6.8644	4.4955	2.7690
1988	16.3882	0.9380	8.3318	7.1183
1989	17.5207	3.9621	8.9582	4.6003
1990	16.1538	6.7050	10.4903	-1.0415

Source: Calculated as described in the text.

Table A-60 Growth Accounting in Industry Using Rebased Series (using Net Capital and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1981	7.0620	1.7319	6.3233	-0.9931
1982	5.1422	7.1818	5.4765	-7.5162
1983	10.5162	-0.3603	6.0928	4.7837
1984	8.1860	4.7616	6.5454	-3.1210
1985	1.4224	2.6240	3.9470	-5.1486
1986	8.0194	-0.1422	3.2336	4.9280
1987	14.1289	8.7294	4.4955	0.9040
1988	16.3882	1.4515	8.3318	6.6049
1989	17.5207	3.5430	8.9582	5.0195
1990	16.1538	5.8846	10.4903	-0.2211

Source: Calculated as described in the text.

Table A-61 Growth Accounting in Industry Using Rebased Series (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Composite Capital Index	TFP
1981	7.0620	0.4210	5.4558	1.1852
1982	5.1422	7.0276	4.9917	-6.8771
1983	10.5162	-3.0304	5.3936	8.1530
1984	8.1860	5.0998	5.8796	-2.7934
1985	1.4224	0.9549	3.6552	-3.1876
1986	8.0194	0.0527	3.2452	4.7215
1987	14.1289	6.8644	4.3045	2.9600
1988	16.3882	0.9380	7.3153	8.1348
1989	17.5207	3.9621	7.9469	5.6126
1990	16.1538	6.7050	9.1747	0.2740

Source: Calculated as described in the text.

Table A-62 Growth Accounting in Industry Using Rebased Series (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1981	7.0620	1.7319	5.4558	-0.1257
1982	5.1422	7.1818	4.9917	-7.0314
1983	10.5162	-0.3603	5.3936	5.4828
1984	8.1860	4.7616	5.8796	-2.4552
1985	1.4224	2.6240	3.6552	-4.8568
1986	8.0194	-0.1422	3.2452	4.9165
1987	14.1289	8.7294	4.3045	1.0950
1988	16.3882	1.4515	7.3153	7.6214
1989	17.5207	3.5430	7.9469	6.0318
1990	16.1538	5.8846	9.1747	1.0944

Source: Calculated as described in the text.

Table A-63 Growth Accounting in Manufacturing (using Net Capital and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Net Capital	TFP
1978	8.7261	5.1570	4.8250	-1.2559
1979	8.2726	7.9239	5.5563	-5.2076
1980	2.8830	1.8073	3.7190	-2.6433
1981	6.2862	-1.3199	4.3222	3.2839
1982	2.5395	7.4052	2.1012	-6.9669
1983	8.4012	-4.1608	5.7314	6.8306
1984	6.7589	4.0128	4.1835	-1.4374
1985	-0.6088	2.1278	2.4828	-5.2194
1986	10.8025	0.0549	3.2885	7.4591
1987	13.3233	8.7443	6.3741	-1.7951
1988	16.7907	0.4250	9.7879	6.5777
1989	14.8965	5.9251	10.4920	-1.5206
1990	13.6842	5.8735	10.4729	-2.6622

Source: Calculated as described in the text.

Table A-64 Growth Accounting in Manufacturing (using Net Capital and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1978	8.7261	6.7269	4.8250	-2.8258
1979	8.2726	12.0603	5.5563	-9.3440
1980	2.8830	1.9616	3.7190	-2.7976
1981	6.2862	0.6763	4.3222	1.2877
1982	2.5395	7.2327	2.1012	-6.7944
1983	8.4012	-0.7779	5.7314	3.4477
1984	6.7589	4.2262	4.1835	-1.6509
1985	-0.6088	3.0941	2.4828	-6.1857
1986	10.8025	-2.9302	3.2885	10.4441
1987	13.3233	8.4356	6.3741	-1.4865
1988	16.7907	0.1037	9.7879	6.8991
1989	14.8965	7.2562	10.4920	-2.8517
1990	13.6842	5.4986	10.4729	-2.2873

Source: Calculated as described in the text.

Table A-65 Growth Accounting in Manufacturing (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Composite Capital Index	TFP
1978	8.7261	5.1570	4.1721	-0.6030
1979	8.2726	7.9239	4.8802	-4.5314
1980	2.8830	1.8073	3.1749	-2.0992
1981	6.2862	-1.3199	3.7668	3.8393
1982	2.5395	7.4052	1.8798	-6.7455
1983	8.4012	-4.1608	5.1026	7.4594
1984	6.7589	4.0128	3.6425	-0.8964
1985	-0.6088	2.1278	2.3491	-5.0857
1986	10.8025	0.0549	3.3712	7.3764
1987	13.3233	8.7443	5.7737	-1.1947
1988	16.7907	0.4250	8.1208	8.2448
1989	14.8965	5.9251	8.8604	0.1110
1990	13.6842	5.8735	8.7183	-0.9075

Source: Calculated as described in the text.

Table A-66 Growth Accounting in Manufacturing (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1978	8.7261	6.7269	4.1721	-2.1729
1979	8.2726	12.0603	4.8802	-8.6678
1980	2.8830	1.9616	3.1749	-2.2535
1981	6.2862	0.6763	3.7668	1.8431
1982	2.5395	7.2327	1.8798	-6.5730
1983	8.4012	-0.779	5.1026	4.0766
1984	6.7589	4.2262	3.6425	-1.1098
1985	-0.6088	3.0941	2.3491	-6.0519
1986	10.8025	-2.9302	3.3712	10.3614
1987	13.3233	8.4356	5.7737	-0.8861
1988	16.7907	0.1037	8.1208	8.5661
1989	14.8965	7.2562	8.8604	-1.2201
1990	13.6842	5.4986	8.7183	-0.5326

Source: Calculated as described in the text.

Table A-67 Growth Accounting in Manufacturing Using Rebased Series (using Net Capital and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Net Capital	TFP
1981	6.2849	-1.2992	4.3889	3.1952
1982	2.6488	7.2149	2.1522	-6.7184
1983	11.1886	-4.0232	5.9266	9.2851
1984	6.1954	3.8517	4.3613	-2.0175
1985	-1.3691	2.0419	2.5922	-6.0032
1986	9.8414	0.0523	3.4527	6.3364
1987	16.0359	8.4093	6.6084	1.0182
1988	17.9324	0.4048	10.1811	7.3464
1989	16.0364	5.4051	11.2636	-0.6323
1990	15.9308	5.1043	11.5805	-0.7539

Source: Calculated as described in the text.

Table A-68 Growth Accounting in Manufacturing Using Rebased Series (using Net Capital and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1981	6.2849	0.6657	4.3889	1.2304
1982	2.6488	7.0469	2.1522	-6.5503
1983	11.1886	-0.7522	5.9266	6.0142
1984	6.1954	4.0565	4.3613	-2.2224
1985	-1.3691	2.9691	2.5922	-6.9304
1986	9.8414	-2.7923	3.4527	9.1810
1987	16.0359	8.1124	6.6084	1.3151
1988	17.9324	0.0987	10.1811	7.6525
1989	16.0364	6.6194	11.2636	-1.8466
1990	15.9308	4.7785	11.5805	-0.4281

Source: Calculated as described in the text.

Table A-69 Growth Accounting in Manufacturing Using Rebased Series (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Composite Capital Index	TFP
1981	6.2849	-1.2992	3.8249	3.7592
1982	2.6488	7.2149	1.9254	-6.4916
1983	11.1886	-4.0232	5.2763	9.9354
1984	6.1954	3.8517	3.7972	-1.4535
1985	-1.3691	2.0419	2.4525	-5.8635
1986	9.8414	0.0523	3.5395	6.2496
1987	16.0359	8.4093	5.9859	1.6407
1988	17.9324	0.4048	8.4471	9.0804
1989	16.0364	5.4051	9.5119	1.1193
1990	15.9308	5.1043	9.6402	1.1863

Source: Calculated as described in the text.

Table A-70 Growth Accounting in Manufacturing Using Rebased Series (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1981	6.2849	0.6657	3.8249	1.7943
1982	2.6488	7.0469	1.9254	-6.3235
1983	11.1886	-0.7522	5.2763	6.6645
1984	6.1954	4.0565	3.7972	-1.6583
1985	-1.3691	2.9691	2.4525	-6.7907
1986	9.8414	-2.7923	3.5395	9.0941
1987	16.0359	8.1124	5.9859	1.9375
1988	17.9324	0.0987	8.4471	9.3866
1989	16.0364	6.6194	9.5119	-0.0949
1990	15.9308	4.7785	9.6402	1.5121

Source: Calculated as described in the text.

Table A-71 Growth Accounting in Services (using Net Capital and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Net Capital	TFP
1978	8.95	2.9432	3.0833	2.9241
1979	8.06	1.8461	4.0038	2.2136
1980	6.93	3.6863	4.3378	-1.0903
1981	7.11	3.0885	3.7975	0.2212
1982	5.07	8.7074	2.9606	-6.5971
1983	7.88	1.0051	3.4000	3.4764
1984	6.88	-1.8617	3.2293	5.5133
1985	4.74	2.9445	3.0749	-1.2779
1986	4.98	7.7829	2.4711	-5.2768
1987	11.12	5.3473	3.3030	2.4705
1988	11.63	-0.3055	3.9118	8.0262
1989	11.13	0.0463	5.2668	5.8130
1990	9.96	1.8855	7.0862	0.9903

Source: Calculated as described in the text.

Table A-72 Growth Accounting in Services (using Net Capital and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1978	8.95	5.8923	3.0833	-0.0250
1979	8.06	9.0915	4.0038	-5.0318
1980	6.93	5.2798	4.3378	-2.6838
1981	7.11	4.9679	3.7975	-1.6582
1982	5.07	13.5489	2.9606	-11.4386
1983	7.88	0.7230	3.4000	3.7585
1984	6.88	0.3714	3.2293	3.2802
1985	4.74	1.7104	3.0749	-0.0438
1986	4.98	11.4028	2.4711	-8.8967
1987	11.12	4.9856	3.3030	2.8321
1988	11.63	0.1283	3.9118	7.5924
1989	11.13	3.0319	5.2668	2.8274
1990	9.96	4.0207	7.0862	-1.1449

Source: Calculated as described in the text.

Table A-73 Growth Accounting in Services (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1972 Prices	Employment	Composite Capital Index	TFP
1978	8.95	2.9432	2.2431	3.7642
1979	8.06	1.8461	3.1100	3.1074
1980	6.93	3.6863	3.4914	-0.2439
1981	7.11	3.0885	3.1704	0.8483
1982	5.07	8.7074	2.5273	-6.1638
1983	7.88	1.0051	2.9017	3.9747
1984	6.88	-1.8617	2.8298	5.9128
1985	4.74	2.9445	2.7636	-0.9666
1986	4.98	7.7829	2.2362	-5.0418
1987	11.12	5.3473	2.9541	2.8194
1988	11.63	-0.3055	3.4757	8.4624
1989	11.13	0.0463	4.6426	6.4371
1990	9.96	1.8855	6.3231	1.7534

Source: Calculated as described in the text.

Table A-74 Growth Accounting in Services (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1972 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1978	8.95	5.8923	2.2431	0.8152
1979	8.06	9.0915	3.1100	-4.1380
1980	6.93	5.2798	3.4914	-1.8374
1981	7.11	4.9679	3.1704	-1.0311
1982	5.07	13.5489	2.5273	-11.0053
1983	7.88	0.7230	2.9017	4.2568
1984	6.88	0.3714	2.8298	3.6797
1985	4.74	1.7104	2.7636	0.2675
1986	4.98	11.4028	2.2362	-8.6618
1987	11.12	4.9856	2.9541	3.1810
1988	11.63	0.1283	3.4757	8.0285
1989	11.13	3.0319	4.6426	3.4515
1990	9.96	4.0207	6.3231	-0.3818

Source: Calculated as described in the text.

Table A-75 Growth Accounting in Services Using Rebased Series (using Net Capital and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Net Capital	TFP
1981	5.5266	2.8979	4.0876	-1.4589
1982	6.6476	8.2170	3.1852	-4.7545
1983	2.9067	0.9406	3.6907	-1.7245
1984	4.6944	-1.7255	3.5573	2.8626
1985	6.8747	2.6908	3.4463	0.7376
1986	5.9367	7.0543	2.8187	-3.9362
1987	9.9760	4.8331	3.7625	1.3804
1988	12.1169	-0.2752	4.3926	7.9995
1989	9.4815	0.0417	5.8508	3.5890
1990	13.1565	1.7210	7.7288	3.7066

Source: Calculated as described in the text.

Table A-76 Growth Accounting in Services Using Rebased Series (using Net Capital and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Net Capital	TFP
1981	5.5266	4.6612	4.0876	-3.2222
1982	6.6476	12.7858	3.1852	-9.3233
1983	2.9067	0.6766	3.6907	-1.4606
1984	4.6944	0.3443	3.5573	0.7928
1985	6.8747	1.5630	3.4463	1.8654
1986	5.9367	10.3353	2.8187	-7.2173
1987	9.9760	4.5062	3.7625	1.7073
1988	12.1169	0.1156	4.3926	7.6087
1989	9.4815	2.7321	5.8508	0.8986
1990	13.1565	3.6699	7.7288	1.7577

Source: Calculated as described in the text.

Table A-77 Growth Accounting in Services Using Rebased Series (using Composite Capital Index and Unadjusted Labor)

Year	GDP at 1988 Prices	Employment	Composite Capital Index	TFP
1981	5.5266	2.8979	3.4126	-0.7838
1982	6.6476	8.2170	2.7190	-4.2883
1983	2.9067	0.9406	3.1498	-1.1837
1984	4.6944	-1.7255	3.1173	3.3027
1985	6.8747	2.6908	3.0974	1.0865
1986	5.9367	7.0543	2.5507	-3.6682
1987	9.9760	4.8331	3.3650	1.7779
1988	12.1169	-0.2752	3.9029	8.4892
1989	9.4815	0.0417	5.1574	4.2824
1990	13.1565	1.7210	6.8965	4.5389

Source: Calculated as described in the text.

Table A-78 Growth Accounting in Services Using Rebased Series (using Composite Capital Index and Adjusted Labor)

Year	GDP at 1988 Prices	Labor Adjusted for Age-Sex-Education	Composite Capital Index	TFP
1981	5.5266	4.6612	3.4126	-2.5471
1982	6.6476	12.7858	2.7190	-8.8571
1983	2.9067	0.6766	3.1498	-0.9197
1984	4.6944	0.3443	3.1173	1.2329
1985	6.8747	1.5630	3.0974	2.2142
1986	5.9367	10.3353	2.5507	-6.9493
1987	9.9760	4.5062	3.3650	2.1048
1988	12.1169	0.1156	3.9029	8.0984
1989	9.4815	2.7321	5.1574	1.5920
1990	13.1565	3.6699	6.8965	2.5900

Source: Calculated as described in the text.

Table A-79 Gross Domestic Product of Japan (at Current Prices)

Year	GDP (Billion US$)	Population (Million)	GDP per Capita (US$)
1952	17.22	86.25	199.62
1953	19.45	87.45	222.36
1954	21.61	88.76	243.47
1955	23.82	89.82	265.25
1956	26.90	90.76	296.40
1957	30.79	91.56	336.28
1958	32.02	92.39	346.59
1959	36.01	93.29	385.95
1960	43.28	94.10	459.94
1961	54.11	94.95	569.87
1962	60.59	95.83	632.23
1963	69.22	96.81	714.98
1964	82.61	97.83	844.39
1965	90.63	98.88	916.53
1966	104.80	99.79	1,050.24
1967	123.03	100.83	1,220.15
1968	147.53	101.96	1,446.95
1969	173.55	103.17	1,682.20
1970	204.64	104.34	1,961.24
1971	235.79	105.70	2,230.72

Source: International Financial Statistics.

Table A-80 Gross Domestic Product of Korea (at Current Prices)

Year	GDP (Billion US$)	Population (Million)	GDP Per Capita (US$)
1963	3.85	26.90	142.98
1964	2.78	27.68	100.43
1965	2.94	28.33	103.64
1966	3.78	28.96	130.39
1967	4.58	30.13	152.17
1968	5.79	30.84	187.76
1969	7.00	31.54	221.82
1970	8.60	32.24	266.83
1971	9.05	32.88	275.37
1972	10.45	33.51	311.96
1973	13.63	34.10	399.56
1974	15.64	34.69	450.81
1975	21.12	35.28	598.75
1976	28.92	35.85	806.62
1977	37.34	36.41	1,025.62
1978	50.26	36.97	1,359.55
1979	64.72	37.53	1,724.41
1980	57.65	38.12	1,512.24
1981	67.78	38.72	1,750.59
1982	72.71	39.33	1,848.64

Source: International Financial Statistics.

Table A-81 Gross Domestic Product of Thailand (at Current Prices)

Year	GDP (Billion US$)	Population (Million)	GDP Per Capita (US$)
1972	8.18	38.34	213.26
1973	10.77	39.35	273.78
1974	13.70	40.36	339.55
1975	14.88	41.39	359.60
1976	16.99	42.48	399.84
1977	19.78	43.56	454.08
1978	24.01	44.63	537.92
1979	27.37	45.68	599.16
1980	32.16	46.72	688.39
1981	34.84	47.74	729.84
1982	35.65	48.74	731.49
1983	39.57	49.73	795.60
1984	41.18	50.71	811.95
1985	37.35	51.68	722.69
1986	41.65	52.65	791.02
1987	48.72	53.60	908.83
1988	59.58	54.54	1,092.48
1989	69.11	55.45	1,246.36
1990	80.16	56.34	1,422.72

Source: International Financial Statistics.

Table A-82 Structure of Production and Degree of Openness: Japan (1953-1971)

Year	Proportion of Agriculture in GDP	Proportion of Manufacturing in GDP	Degree of Openness (X+M) / GDP
1953	0.22	0.24	0.32
1954	0.22	0.24	0.29
1955	0.23	0.23	0.29
1956	0.20	0.26	0.32
1957	0.18	0.27	0.34
1958	0.18	0.26	0.29
1959	0.17	0.27	0.30
1960	0.15	0.29	0.26
1961	0.14	0.30	0.26
1962	0.13	0.29	0.24
1963	0.12	0.29	0.25
1964	0.11	0.29	0.25
1965	0.11	0.28	0.25
1966	0.11	0.28	0.25
1967	0.11	0.29	0.24
1968	0.10	0.30	0.24
1969	0.09	0.30	0.25
1970	0.08	0.30	0.26
1971	0.07	0.30	0.26

Sources: World Tables 1976, 1987.
UN National Account Statistics 1960, 1964.

Table A-83 Structure of Production and Degree of Openness: Korea (1963-1983)

Year	Proportion of Agriculture in GDP	Proportion of Manufacturing in GDP	Degree of Openness (X+M) / GDP
1963	0.45	0.14	0.23
1964	0.48	0.15	0.21
1965	0.41	0.17	0.26
1966	0.38	0.18	0.33
1967	0.35	0.18	0.37
1968	0.32	0.19	0.44
1969	0.32	0.19	0.45
1970	0.31	0.19	0.44
1971	0.32	0.19	0.48
1972	0.31	0.21	0.52
1973	0.28	0.24	0.73
1974	0.26	0.28	0.73
1975	0.27	0.29	0.71
1976	0.26	0.31	0.72
1977	0.25	0.31	0.72
1978	0.23	0.31	0.71
1979	0.21	0.32	0.70
1980	0.17	0.34	0.85
1981	0.18	0.33	0.89
1982	0.17	0.32	0.84
1983	0.16	0.33	0.86

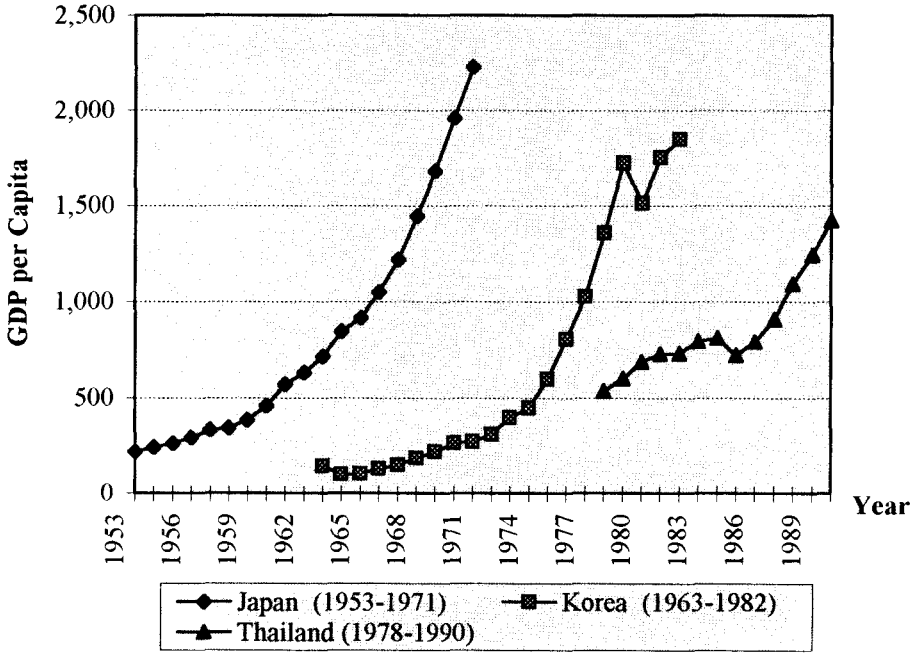
Sources: World Tables 1976, 1987.
UN National Account Statistics 1960, 1964.

Table A-84 Structure of Production and Degree of Openness: Thailand (1972-1990)

Year	Proportion of Agriculture in GDP	Proportion of Manufacturing in GDP	Degree of Openness (X+M) / GDP
1972	0.25	0.18	0.37
1973	0.28	0.19	0.39
1974	0.27	0.19	0.46
1975	0.27	0.19	0.41
1976	0.27	0.20	0.43
1977	0.25	0.20	0.45
1978	0.25	0.20	0.44
1979	0.24	0.21	0.52
1980	0.23	0.21	0.55
1981	0.21	0.22	0.54
1982	0.19	0.22	0.49
1983	0.20	0.21	0.48
1984	0.18	0.22	0.49
1985	0.17	0.22	0.51
1986	0.16	0.24	0.51
1987	0.16	0.24	0.59
1988	0.17	0.25	0.70
1989	0.15	0.26	0.76
1990	0.12	0.26	0.80

Sources: World Tables 1976, 1987.
UN National Account Statistics 1960, 1964.

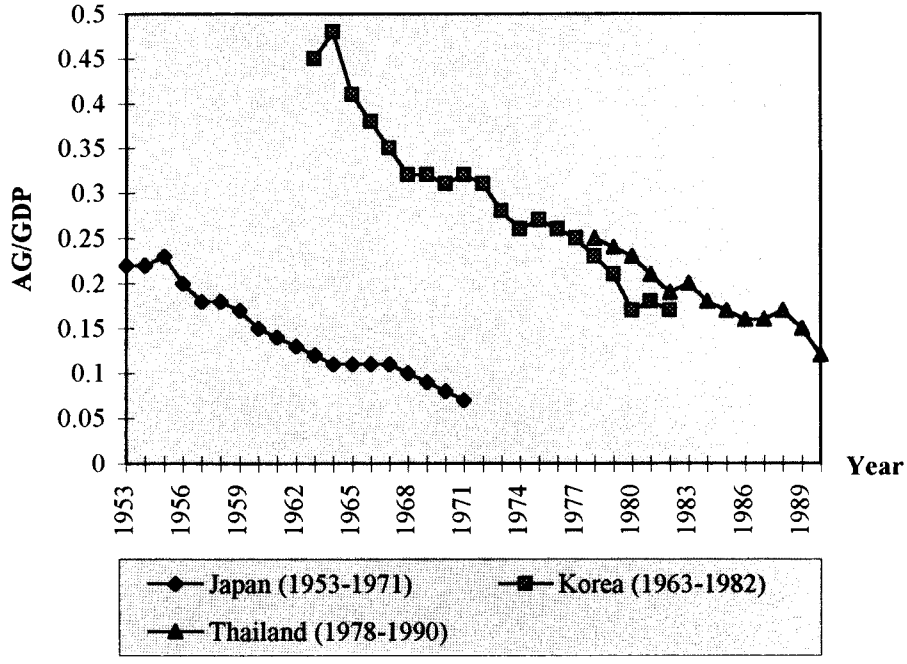
Appendix Figures



Note: The parentheses indicate the time period during which the country's TFP was estimated.

Sources: Appendix Tables A-79-A-81.

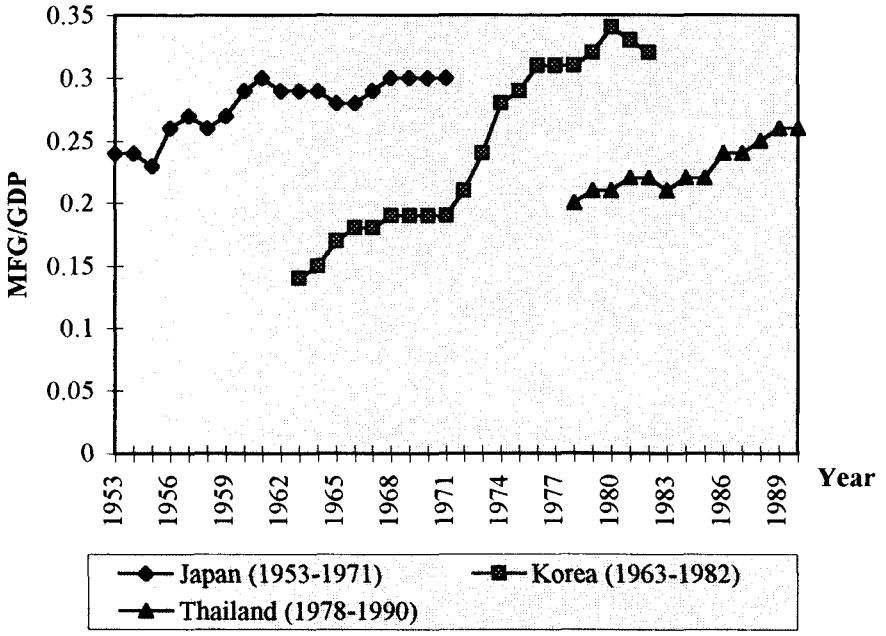
Figure A-1 GDP Per Capita (US$)



Note: The parentheses indicate the time period during which the country's TFP was estimated.

Sources: Appendix Tables A-82-A-84.

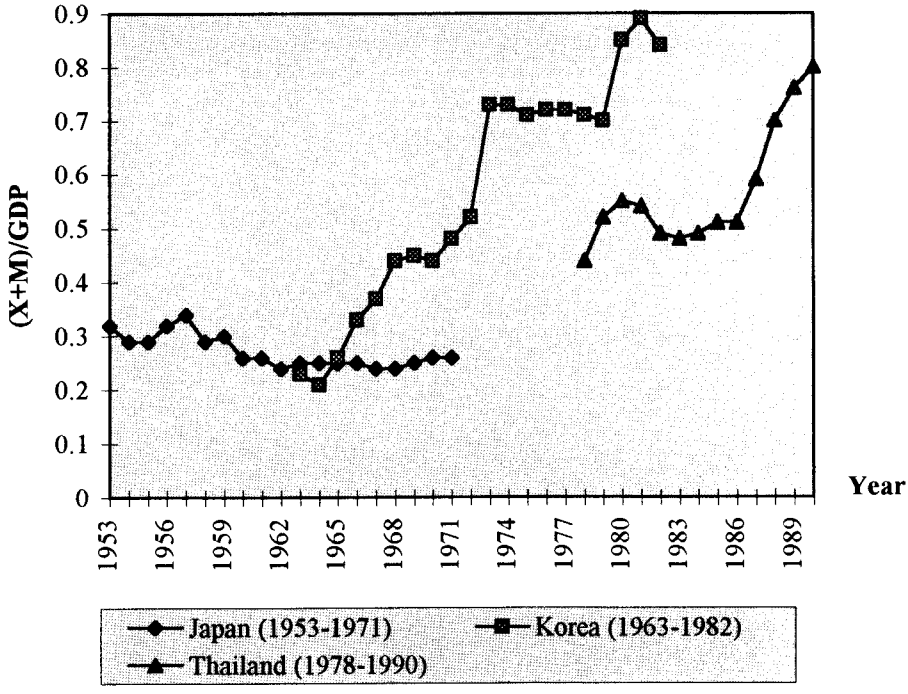
Figure A-2 Proportion of Agriculture in GDP



Note: The parentheses indicate the time period during which the country's TFP was estimated.

Sources: Appendix Tables A-82-A-84.

Figure A-3 Proportion of Manufacturing in GDP



Note: The parentheses indicate the time period during which the country's TFP was estimated.

Sources: Appendix Tables A-82-A-84.

Figure A-4 Degree of Openness

References

Ammar Siamwalla, Direk Patmasiriwat, and Suthad Setboonsarng. 1987. *Productivity and Competitiveness in Thai Agriculture: Some Lessons from the Past.* 1987 TDRI Year-End Conference on Efficiency and Competitiveness of the Thai Economy [vol. 5]. Bangkok: Thailand Development Research Institute.

Ammar Saimwalla, Suthad Setboonsarng, and Direk Patamasiriwat. 1991. *Thai Agriculture: Resources, Institutions and Policies.* Bangkok: Thailand Development Research Institute.

Ardkit Suntornwat. 1984. "Productivity, Technological Progress, and Industrial Structure: A Case Study of Paper Industry in Thailand." Master's thesis, Faculty of Economics, Thammasat University.

Aschauer, D.A. 1989. "Is Public Expenditure Productive?" *Journal of Monetary Economics* (March): 177-200.

Correa, H. 1970. "Sources of Economic Growth in Latin America." *Southern Economic Journal* 37(1): 17-31.

Denison, E.F. 1967. *Why Growth Rates Differ: Postwar Experience in Nine Western Countries.* Washingtion D.C.: Brookings Institution.

_____. 1974. *Accounting for the United States Economic Growth.* Washington, D.C.: Brookings Institution.

_____. 1979. *Accounting for Slower Economic Growth: The United States in the 1970s.* Washington, D.C.: Brookings Institution.

Denison, E.F., and W.K. Chung. 1976. *How Japan's Economy Grew So Fast: The Sources of Postwar Expansion.* Washington, D.C.: Brookings Institution.

Domar, E. 1961. "On the Measurement of Technical Change." *Economic Journal* 71: 709-729.

Elias, V.C. 1992. *Sources of Economic Growth: A Study of Seven Latin American Economies.* San Francisco: International Center for Economic Growth, ICS Press.

Griliches, Z. 1963. "The Sources of Measured Productivity Growth: United States Agriculture, 1940-60." *Journal of Political Economy* 71: 331-346.

Hulten, C.R., ed. 1990. *Productivity Growth in Japan and the United States.* Chicago: University of Chicago Press.

IBRD. 1976, 1987. *World Tables.* Washington, D.C.: World Bank.

Ikemoto, Y. 1986. "Technical Progress and Level of Technology in Asian Countries, 1970-80: A Translog Index Approach." *The Developing Economies* XXIV(4): 368-390.

IMF. *International Financial Statistics.* Various Issues.

Jorgenson, D.W., and Z. Griliches. 1967. "The Explanation of Productivity Change." *Review of Economic Studies* 30(3): 249-283.

Juanjai Ajanant, Supote Chunanuntatham, and Sorrayuth Meenaphant. 1986. *Trade and Industrialization of Thailand.* Bangkok: Social Science Association of Thailand.

Kim, Kwang-suk, and J. Park. 1985. *Sources of Economic Growth in Korea 1963-1982.* Seoul: Korea Development Institute.

Kitti Limskul. 1988. *The Sectoral Capital Stock, Employment and Sources of Economic Growth in Thailand 1960-1986,* International Economic Conflict Discussion Paper, No. 40. Nagoya, Japan.

Klein, L.R. 1962. *Introduction to Econometrics.* Englewood Cliffs, N.J.: Prentice Hall.

Kmenta, Jan. 1986. *Elements of Econometrics.* 2d ed. New York: Macmillan.

Lynde, C., and J. Richmond. 1993. "Public Capital and Total Factor Productivity." *International Economic Review* 34(2): 401-414.

Ministry of Agriculture and Cooperatives (MOAC). *Agricultural Statistics of Thailand.* Various Issues.

Munnell, A.H. 1990. "Why Has Productivity Growth Declined? Productivity and Public Investment." *New England Economic Review* (January/February).

Nadiri, M.I. 1970. "Some Approaches to the Theory and Measurement of Total Factor Productivity: A Survey." *Journal of Economic Literature* 8(4): 1137-77.

Narongchai Akrasanee. 1975. "Import Substitution, Export Expansion and Sources of Industrial Growth in Thailand." In *Asian Industrial Development,* edited by N. Suzuki. Tokyo: Institute of Developing Economies.

Narongchai Akrasanee, Paitoon Wiboonchutikula, Supote Chunanuntatham, and Juanjai Ajanant. 1987. *Productivity Changes and International Competitiveness of Thai Industries.* 1987 TDRI Year-End Conference on Efficiency and Competitiveness of the Thai Economy [vol. 3]. Bangkok: Thailand Development Research Institute.

Narongchai Akrasanee, Sunthorn Thamruanglerd, and Chalermpoj Iamkamala. 1983. *Sources of Industrial Growth in Thailand.* Research Report supported by the Center for Research and Communication, Manila, the Philippines.

National Economic and Social Development Board (NESDB). *National Income Account,* Various Issues.

_____. 1993. Captial Stock of Thailand: 1970-1990. Bangkok.

National Statistical Office (NSO). *Report of the Labor Force Survey,* Various Issues.

Nipon Poapongsakorn. 1981. "Wages: The Matter of the Poor." In Faculty of Economics Annual Symposium, Thammasat University, Bangkok. (in Thai)

Nipon Poapongsakorn, and Pattamawadee Suzuki. 1992. *The Change of Labor Market Toward Labor Shortage.* 1992 TDRI Year-End Conference on Thailand's Economic Structure: Towards Balanced Development? Bangkok: Thailand Development Research Institute. (in Thai)

Paitoon Wiboonchutikula. 1982. "The Total Factor Productivity Growth of Manufacturing Industries in Thailand, 1963-1976." Ph.D. diss., University of Minnesota.

Pindyck, R.S., and D.L. Rubinfeld. 1991. *Econometric Models and Economic Forecasts.* New York: McGraw-Hill.

Pornsook Amonvadekul. 1989. "Changes in International Competitiveness: A Case Study of the Electrical Machinery Industry." Master's thesis, Faculty of Economics, Thammasat University.

Richter, M.K. 1966. "Invariance Axioms and Economic Indexes." *Econometrica* 34(4): 739-755.

Robinson, S. 1971. "Sources of Growth in Less Developed Countries: A Cross-Section Study." *Quarterly Journal of Economics* 85(3): 391-408.

Solow, R.M. 1957. "Technical Change and the Aggregate Production Function." *Review of Economics and Statistics* 39(3): 312-320.

_____. 1962. "Technical Progress, Capital Formation, and Economic Growth." *American Economic Review* LII(2): 76-86.

Star, S. 1974. "Accounting for the Growth of Output." *American Economic Review* (March): 123-135.

Star, S. and R.E. Hall. 1976. "An Approximate Divisia Index of Total Factor Productivity." *Econometrica* 44(2): 257-263.

Tybout, J.R. 1992. "Linking Trade and Productivity: New Research Directions." *The World Bank Economic Review* 6(2): 189-211.

United Nations. *National Account Statistics.* Various Issues.

Wilaiwan Wannitikul. 1972. "Productivity Growth in Thailand: 1950-1969." Master's thesis, Faculty of Economics, Thammasat University.

ความหลากหลายของพันธุ์พืช

โดย อภิชาติ ขาวสอาด อัมมาร สยามวาลา และกอบกุล รายะนาคร

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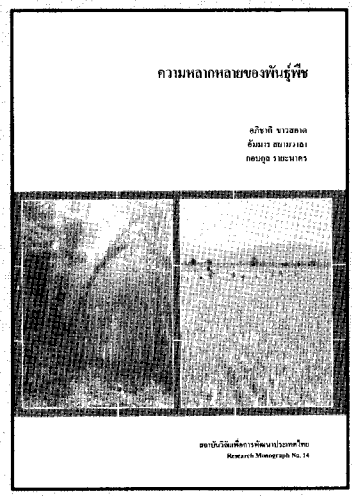

ปัญหาเรื่องความหลากหลายทางชีวภาพได้กลายเป็นประเด็นถกเถียงกัน เพราะไทยจะต้องตัดสินใจว่าจะให้สัตยาบันแก่อนุสัญญาว่าด้วยความหลากหลายทางชีวภาพหรือไม่ ประเด็นที่พึงถกเถียงกันนั้น ต้องพิจารณา ในหลายมิติ ทั้งทางด้านชีววิทยา เกษตรกรรม เศรษฐกิจ ความสัมพันธ์ระหว่างประเทศ และกฎหมาย

หนังสือเล่มนี้รวมงาน 3 ชิ้นที่เกี่ยวกับความหลากหลายของพันธุ์พืชมานำเสนอ งานชิ้นแรก อภิชาติ ขาวสอาด ให้ข้อมูลเกี่ยวกับความหลากหลายของพืชพันธุ์ที่มีอยู่ในประเทศไทยจากมุมมองของนักชีววิทยา งานชิ้นสุดท้าย กอบกุล รายะนาคร วิเคราะห์อนุสัญญาว่าด้วยความหลากหลายทางชีวภาพในแง่กฎหมาย บทความชิ้นกลางโดย อัมมาร สยามวาลา จึงทำหน้าที่เชื่อมต่อว่าการอนุรักษ์พันธุ์พืช ซึ่งในที่สุดแล้วต้องดำเนินการกับตัวพืชนั้นจะถูกกระทบกระเทือนโดยกรอบทางกฎหมายอย่างไร และไทยจะต้องอนุวัตรกฎหมายในประเทศตามกรอบกว้าง ๆ ของอนุสัญญาว่าด้วยความหลากหลายทางชีวภาพอย่างไรเพื่อรักษาผลประโยชน์ของเราไว้

วิวัฒนาการของการบุกเบิกที่ดินทำกินในเขตป่า: กรณีศึกษาภาคเหนือตอนบน

โดย อานันท์ กาญจนพันธุ์ และมิ่งสรรพ์ ขาวสอาด

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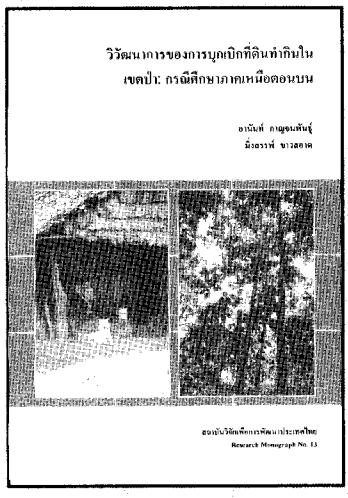

การศึกษาครั้งนี้สิ้นสุดลงหลายปีก่อนปัญหาการปฏิรูปที่ดิน ซึ่งมีการออกเอกสารสิทธิ ส.ป.ก. 4-01 ให้ผู้มีฐานะร่ำรวยที่จังหวัดภูเก็ต แต่ผู้เขียนเห็นว่า ความจริงที่ได้จากการศึกษานี้ยังคงเป็นความจริงอยู่ โดยเฉพาะประเด็นที่ว่า นโยบายที่สมมุติเอาว่าคนที่ใช้พื้นที่ป่าและครอบครองเขตป่าเป็นคนยากไร้เสมอไป เป็นนโยบายที่ไม่สอดคล้องกับความเป็นจริง และยังยืนยันด้วยว่านโยบายที่ใช้การออกเอกสารสิทธิอย่างเดียวเพื่อแก้ปัญหาการบุกเบิกที่ดินทำกินในเขตป่านั้นจะไม่สามารถบรรลุเป้าหมายได้ หากปราศจากการมีส่วนร่วมของท้องถิ่นในการจัดการเขตป่า และการพัฒนาศักยภาพขององค์กรท้องถิ่นควบคู่ไปด้วย

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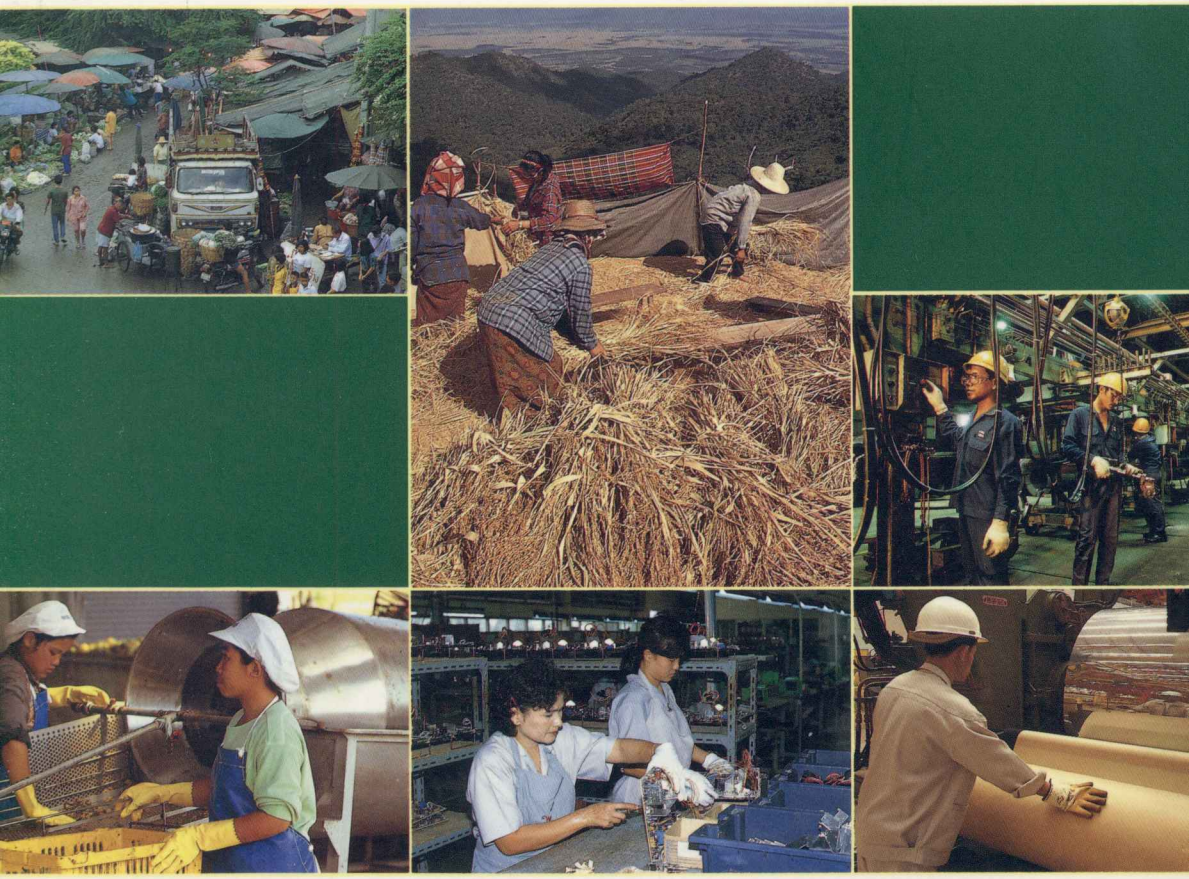
Productivity Growth in Thailand

The word "productivity" is often associated with "labor productivity" or "capital productivity," which is only a partial measurement of productivity. Since the growth of output is a result of the increase in all factor inputs, including technical progress, it is interesting to probe into such an analysis.

The objective of this study is to analyze the sources of output growth in Thailand by using the Solow-Denison growth accounting framework. This framework has been used in many studies in explaining the sources of economic growth for other countries, such as the United States, Japan, Korea and some European countries. For Thailand, this is the first attempt to apply the growth accounting framework to the macroeconomic data.



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