

EMPLOYMENT AND UNEMPLOYMENT  
IN THAILAND : THE CURRENT SITUATION AND THE PROJECTION

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## Introduction

The study on projection is divided into 3 main parts: the executive summary, the trends and composition of employment and unemployment and the projection. The trends and composition section is aimed at looking at the current employment and unemployment pattern by utilizing the existing labor force survey data for two rounds. In particular, the pattern of labor utilization among wet and dry season is a fascinating study in itself. It indicates the complicated rural labor markets in Thailand which interlinks farm and non-farm sector through migration both rural-rural and rural-urban and inter and intra regional migration. In addition the details such as more breakdowns among different age groups, economic subsectors and occupations are added. The trends 1977-1981 are also reported. The main highlight of this section is the utilization of labor among the two periods and the inclusion of the analysis of underemployment. It is aimed basically to supplement the projection study.

The projection study itself concentrates on the main task of projection employment, open unemployment and seasonal unemployment by regions by 3 economic sectors, sex and three age groups. The limitation of this project in being discussed in details and it is important to judge this projection on those grounds. The research felt that it is about time to adjust the definitions used in LFS and we hope that the appendix<sup>1</sup> which is a theoretical paper explaining the way rural labor market operates will be a step in the right direction.

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<sup>1</sup>See Appendix F. in Section III : A projection into the future.

## 1. Executive Summary.

### 1. The trends and Composition of Employment and unemployment.

1. The research has carefully investigated the pattern of labor utilization between the wet and dry seasons. The understanding of such relationship will be beneficial in terms of policy implication especially in promoting rural industries in the future.

2. For Northeast and North, the pattern of migration between wet season and dry season confirms the hypothesis of workers move from primary employment to non-primary employment. It is so true for Northeast that labor supply in modern sector employment depends a great deal on the availability of labor supply during the dry season. In trying to depend on a more permanent supply of labor in the Northeast and the North is very difficult.

3. Bangkok and Central regions display a similar pattern of labor utilization but quite different from the two previously mentioned regions. Modern sectors employment do not indicate an significant increase during the dry seasons. However for 1981, construction is being confirmed by the hypothesis of rural-urban migration during the dry season, However it is yet too early to tell that there is no significant shift of labor supply from the dry season to Bangkok. However it is true that manufacturing and service sectors in Bangkok and in Central region do possess more permanent pattern of employment without too much fluctuations.

4. The limitation of data both on sampling techniques and timing of the surveys can be attributed to some of confusion pattern of employment.

5. Open unemployment by new definition is getting more serious overtime and the seriousness appears to be in the Northeast.

6. Underemployment is declining but still serious in the Northeast. Underemployment is a problem of young labor force and also non-primary employment especially in Bangkok.

7. Seasonal unemployment is increasing overtime and it is still a problem of primary employment.

## 2. A Projection into the Future

### 2.1 Summary and Conclusion

The present study attempted to project future unemployment and seasonal unemployment problems by region, sex, age and education. On the supply side, labor force was estimated from NESDB's low fertility assumption of population growth and labor force participation rates of the labor Force Survey. On the demand side, employment was estimated from income elasticities of employment and two sets of economic growth assumptions. Some of the main results from the study are:

1. The growth rate of labor force would be lower than that of the past. It would be 2.9 percent per year between 1981-1990 and 2.7 percent per year between 1990-1995 as compared to the 4 percent per year between 1971-1981. The declining growth rate of labor force is attributed to the rapidly declining population growth rate of the past. The growth rate of labor force in the NESDB projection for 1981-1991 would be 2.7 percent per year which is quite close to the growth rate utilized in this study.<sup>1</sup>

2. The growth rate of employment for the whole country during 1981-1995 would be 3 percent per year under the high growth scenario and 2.3 percent under the low growth scenario. Employment growth would be most rapid in Bangkok at above 4 percent per year

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<sup>1</sup>National Economic and Social Development Board, "Trends in the Thai Economy under the Sixth Development Plan and Recommendations on Aggregate Targets for the Economy", September 1984. (mimeograph)

under both growth scenarios. The growth rate of employment in this study which is for the period 1981-1995 is much higher than the 1.9 percent per year projected by the NESDB.<sup>1</sup>

3. Open unemployment rates are quite sensitive to economic growth rates. Under the high growth scenario of about 6 percent growth per year, unemployment problems could be reduced significantly in the future. However, if general economic growth were only 5 percent per year, the rate of unemployment would increase in all regions except Bangkok. Although the methodology, of this study is different from the NESDB's projection of employment in the Fifth Plan, the results are quite similar. Under the high growth scenario in this study which is close to the NESDB's economic growth assumption of 6.4 percent per annum, open unemployment would not in general be a serious problem although seasonal unemployment would remain a problem to contend with. Other than this general statement, not much comparison can be made between this study and the projections made by the NESDB. The scantily available projection results of the NESDB runs up to only 1986 which is the last year of the Fifth Plan while the projections in this study is for 1990 and 1995.

4. At the regional level, open unemployment rates in the Northeastern region show an increasing trend while they show declining trends in Bangkok irrespective of economic growth scenarios. Under the high growth scenario, open unemployment rates would decline in all regions except for the Northeast. Under the low growth scenario, unemployment rates would increase in all regions except Bangkok.

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<sup>1</sup>National Economic and Social Development Board and World Bank, "Medium Term Outlook of the Thai Economy", the Siam Project on Macro Economic Management of the Thai Economy, June 1983.

5. Projected unemployment by sex do not in general show significant differences. Although the rate of unemployment in the Central region became relatively more serious for male workers as compared to female workers while in the Southern region it became relatively more serious for female workers as compared to male workers, general movements in unemployment rates of the other regions for both male and female workers are more or less in the same direction. This can be explained by the larger differences between the male and female labor force growth rates in these two regions.

6. Projected open unemployment by educational groups under both growth scenarios show that the problem would be serious for those with secondary and above secondary schooling in all regions except for those with secondary education in Bangkok.

7. In terms of age group, open unemployment would not be serious for those between 11-19 years of age in all regions under both economic growth scenarios. In age group 20-34 years, the open unemployment rate was not serious under the high growth scenario, but it was more serious under the low growth scenario especially in the Northeastern and Southern regions which have sustained increasing trends. Unemployment problems was found to be serious in all regions under both growth scenarios for those in the age group of 35 years upwards.

8. Under both the high and low growth scenarios, the projection results show that the rate of seasonal unemployment would be reduced slightly. However, the sheer numbers of those seasonally

unemployed make this a serious problem to contend with in the future. Seasonal unemployment rates under the low growth scenario were not higher than those found under the high growth scenario. The low growth scenario affected mainly the open unemployment rates rather than seasonal unemployment rates.

9. At the regional level, seasonal unemployment would not be a problem in the Southern region while it would remain problematic in the Central, Northern and Northeastern regions irrespective of economic growth scenarios. This is especially true of the Northeastern region which would continue to contribute more than half of all those seasonally unemployed in the country. The Northern region and Bangkok, on the other hand, would witness significant reductions in the seasonal unemployment rates.

10. Projected seasonal unemployment rates show that they were higher for female workers than for male workers similar to past. Nevertheless, seasonal unemployment rates would not increase for both groups.

11. The rate of seasonal unemployment would decline for all educational groups. This would be most significant for those with below elementary education and above secondary schooling.

12. The most significant reduction in seasonal unemployment rates would be among those 11-19 years of age. Nevertheless, the seasonal unemployment rate would remain significant and not much different for all the three age groups.

## 2.2 Policy Implications and Recommendations

As has been stated, it was found in the study that unemployment problems are quite sensitive to the economy's growth rate. Under a 6 percent per year growth, open unemployment was found not to be a serious problem. However, seasonal unemployment would remain a serious problem to contend with despite the decline in such rates. Under such a scenario, the strategy and effort should then be placed on solving this latter type of unemployment.

On the other hand, a low growth of 5 percent per year would result in serious open unemployment problems. Seasonal unemployment also would remain a major problem to be tackled under such a case. The problem of underemployment is also quite likely to get more serious as those openly unemployed would be forced to compete for a living somehow. The conditions faced under the low growth scenario would thus be much more complex and difficult to solve considering the greater variety and seriousness of unemployment problems.

Since it is widely believed that a low growth scenario is more likely in the future, the government should be prepared to solve most types of unemployment problems. A comprehensive strategy package should thus be drawn up.

One of the major findings of the investigation is that both open unemployment and seasonal unemployment are most serious in the Northeastern region. Since this is also the region with the largest share of the labor force in the country, it may not be too bold to

state that, if unemployment problems in the Northeastern region could be solved, about half of all unemployment problems in Thailand could eventually disappear.

The recommendation here is therefore to formulate a strategy which would aim at reducing unemployment in this region. A greater absorptive capacity of labor in the Northeast could also lead to less unemployment problems in other regions through the reduction of migrant workers to those regions.

Since the primary sector in the Northeastern region could not be expected to grow as fast as in the past due to the land constraint and it is difficult to promote more labor-intensive technology than those existing at present (especially during peak labor demand periods), the secondary and service sectors would have to be able to absorb a large proportion of the labor force. Past absorptive capacity in these two sectors has, however, been found to be lacking.

If unemployment problems in the Northeast were to be solved, there may have to be a greater effort at promoting industrialization in the region. Nevertheless, the strategy should not be towards the promotion of large modern industrial enterprises which are capital-intensive since this would not help to absorb labor sufficiently. Furthermore, large-scale industries would not help spread employment opportunities over a wider area.

An ideal strategy would be to promote small-scale rural industries which interact with or could be linked up with the local

economy. A greater effort should be placed on identifying such industries. These could be rural industries linked to the primary sector or they could be industries producing products for the local population. Industries which require little capital outlay could provide for the flexibility of producing only during the slack period in the agricultural sector. This would help reduce the problem of seasonal unemployment.

Another result from the study is the increasingly serious problem of unemployment of those with higher education. It is quite likely that, as the country become more developed, there would be a much greater demand for skilled labor. However, education alone, without any consideration given to the type of skill demand in the labor market, would only lead to excess supply of those highly educated in certain fields and excess demand which could not be met in others.

It is thus increasingly imperative for the government to seriously consider manpower planning. The postponement of unemployment problems in the past through the provision of higher education has now provided a flood of highly educated people who, however, do not have the necessary skills required in the labor market. The projection shows that, if past supply patterns were not reversed, there would be increasingly serious unemployment problems for those with higher education. These people tend to have rising expectations from their education which, if not met, could lead to serious social and political problems. A redesign of the educational system may seem to be in order.

Among the three age groups included in this study, government policies to solve open unemployment problems should be directed at those 35 years upwards, since this is where the problem is most serious. In view of the fact that labor skill requirements in the economy change through development, job retraining programs may be required for the unemployed in this age group so as to help facilitate adjustments in the labor market.

II

TRENDS AND COMPOSITION OF CURRENT EMPLOYMENT  
AND UNEMPLOYMENT

## II. Trends and Composition of Current Employment and Unemployment.

### Introduction

Although the main focus of this research is to project the employment and unemployment into the future 1990 and 1995 (next section). This section attempts to discuss the current employment and unemployment in a more disaggregated fashion. Because of time limitation and data availability, the employment and unemployment projection will be confined to few basic sets of variables. The addition of this section will allow the readers to look into more details such as further breakdowns in the productive sectors beyond primary, secondary and tertiary sectors, further disaggregation in age groups, occupational breakdowns and rural/urban. Some historical trends will be discussed. In addition, the projection will not be attempted for underemployment but there is discussion of underemployment in this section. In summary, this review of the current situation will simply add to main part of our study : the projection.

### Breakdown of Economic Subsectors

Since the projection cannot be conducted for economic sectors beyond the traditional breakdown of the primary, secondary and tertiary. This section will attempt to breakdown further among the secondary and tertiary sector. In addition, information is available in two rounds.

The availability of information in two rounds will allow us to understand the linkage of labor utilization among primary and other modern sectors by regions.

Tables 1 and 2 indicate the number and proportion of employed persons regionally and by economic subsectors. Reading vertically is the percentage share of each region employment in relation to total employment for the country. Reading horizontally is the number of the each subsector employment within a particular region. Percentage can be calculated from reading such a row.

Tables 3,4 show the comparative aspects of employment between two rounds. Here are the following preliminary findings :

1. Since the data in round 1 are collected during the dry season and the collection of data in round 2 during the wet season, the hypothesis is that there will be a significant reduction of primary employment and a significant increase in non-primary employment in round 1. The main reason is a significant amount of migration taking place between the dry and the wet seasons.

2. Such hypothesis is being confirmed clearly in to two poorest regions, the North and the Northeast which indicates the pattern of rural - rural migration from farm employment to non-farm employment during the dry season. The implication is very clear - it means that manufacturing employment in the North and the Northeast is being influenced a great deal by the temporary shift of employment from the farm sector. Manufacturing sector employment in the two regions depends

TABLE 1

EMPLOYED WORKERS CLASSIFIED BY INDUSTRIAL SECTORS, REGION  
AND RURAL/URBAN AREAS.....1981  
(ROUND 1)

(Unit: thousand persons)

Region	Sectors	Primary	Secondary			Tertiary			Total	
			Mining	Manufacturing	Construction	Electricity	Commerce	Transport		Service
Bangkok		233.0 ( 2.50)	0.8 ( 1.10)	589.4 (28.20)	118.5 (15.20)	27.8 (37.20)	552.9 (27.50)	128.3 (28.90)	561.9 (21.40)	2,212.6 (12.7)
Urban		25.1 ( 0.30)	0.5 ( 0.70)	434.3 (20.80)	93.4 (12.00)	23.7 (31.70)	497.4 (24.80)	113.8 (25.70)	511.4 (19.40)	1,699.6 ( 9.8)
Rural		207.9 ( 2.20)	0.3 ( 0.40)	155.1 ( 7.40)	25.1 ( 3.20)	4.1 ( 5.50)	55.5 ( 2.70)	14.5 ( 3.20)	50.5 ( 2.00)	515.4 ( 3.0)
Central		2,046.3 (22.10)	16.7 (22.40)	543.4 (26.00)	225.2 (28.90)	19.7 (26.30)	488.8 (24.40)	94.6 (21.30)	516.6 (19.60)	3,951.3 (22.7)
Urban		24.4 ( 0.30)	0.9 ( 1.20)	72.7 ( 3.50)	14.2 ( 1.80)	4.6 ( 6.10)	119.9 ( 5.90)	23.2 ( 5.20)	129.8 ( 4.90)	389.7 ( 2.2)
Rural		2,021.9 (21.80)	15.8 (21.20)	470.7 (22.50)	211.0 (27.10)	15.1 (20.20)	368.9 (18.40)	71.4 ( 1.60)	386.8 (14.70)	3,561.4 (20.5)
Norht		2,219.9 (23.90)	6.6 ( 8.90)	364.6 (17.50)	151.6 (19.50)	8.2 (10.90)	398.5 (19.90)	57.7 (13.00)	449.1 (17.10)	3,656.2 (21.0)
Urban		10.9 ( 0.10)	0.4 ( 0.50)	42.1 ( 2.00)	9.9 ( 1.30)	4.4 ( 5.90)	100.6 ( 5.00)	16.7 ( 3.80)	113.5 ( 4.30)	298.5 ( 1.72)
Rural		2,209.0 (23.80)	5.2 ( 8.30)	322.5 (15.40)	141.7 (18.20)	3.8 ( 5.10)	297.9 (14.90)	41.0 ( 9.20)	335.6 (12.80)	3,357.7 (19.3)
Northeast		2,892.1 (31.20)	11.4 (15.30)	432.5 (20.70)	225.4 (28.90)	6.9 ( 9.20)	362.4 (18.10)	108.8 (24.50)	813.9 (30.90)	4,853.4 (27.9)
Urban		9.8 ( 0.10)	0.2 ( 0.30)	28.0 ( 1.30)	7.8 ( 1.00)	1.2 ( 1.60)	67.3 ( 3.40)	14.8 ( 3.30)	92.8 ( 3.50)	221.9 ( 1.3)
Rural		2,882.3 (31.10)	11.2 (15.10)	404.5 (19.40)	218.6 (27.90)	5.7 ( 7.60)	295.1 (14.70)	94.0 (21.20)	721.1 (27.40)	4,632.5 (26.7)
South		1,887.9 (20.30)	38.4 (51.60)	157.9 ( 7.60)	56.9 ( 7.30)	11.8 (15.80)	204.2 (10.20)	53.5 (12.10)	289.6 (11.00)	2,700.2 (15.5)
Urban		27.4 ( 0.30)	2.9 ( 3.90)	40.7 ( 1.90)	12.8 ( 1.60)	3.6 ( 4.80)	77.7 ( 3.90)	17.8 ( 4.00)	87.0 ( 3.30)	269.9 ( 1.5)
Rural		1,860.5 (20.00)	35.5 (47.70)	117.2 ( 5.60)	44.1 ( 5.70)	8.2 (11.00)	126.5 ( 6.30)	35.7 ( 8.10)	202.6 ( 7.70)	2,430.3 (13.9)
Whole Kingdom		9,279.6 (100.0)	74.4 (100.0)	2,088.1 (100.0)	778.9 (100.0)	74.8 (100.0)	2,007.2 (100.0)	443.3 (100.0)	2,631.6 (100.0)	17,377.9 (100.0)
Urban		97.8 ( 1.10)	5.1 ( 6.80)	617.9 (29.60)	138.2 (17.70)	37.8 (50.50)	863.1 (43.00)	186.5 (42.10)	934.7 (35.50)	2,881.0 (16.58)
Rural		9,181.8 (99.90)	69.3 (93.10)	1,470.2 (70.40)	640.7 (82.30)	37.0 (49.50)	1,144.1 (57.00)	256.8 (57.90)	1,696.9 (64.50)	14,496.8 (83.42)

Source: The Labor Force Survey.

Note: In bracket are percentage.

TABLE 2

EMPLOYED WORKERS CLASSIFIED BY INDUSTRIAL SECTORS, REGION  
AND RURAL/URBAN AREAS.....1981  
(ROUND 2)

(Unit: thousand persons)

Region	Sectors	Primary	Secondary				Tertiary			Total
			Mining	Manufacturing	Construction	Electricity	Commerce	Transport	Service	
Bangkok		294.0 ( 1.70)	2.0 ( 3.30)	619.3 (35.60)	111.2 (23.80)	24.9 (35.30)	624.5 (30.50)	129.2 (32.80)	613.2 (29.80)	2,418.3 ( 9.90)
Urban		29.2 ( 0.20)	2.0 ( 3.30)	456.5 (26.20)	88.1 (18.80)	21.1 (30.00)	559.8 (27.40)	114.7 (29.10)	559.1 (27.20)	1,850.5 ( 7.50)
Rural		264.8 ( 1.50)	- ( - )	162.8 ( 9.30)	23.1 ( 4.90)	3.8 ( 5.30)	64.7 ( 3.10)	14.5 ( 3.70)	54.1 ( 2.20)	587.8 ( 2.40)
Central		3,091.1 (17.60)	10.7 (17.50)	555.7 (31.90)	140.4 (30.00)	18.5 (26.20)	507.8 (24.80)	96.1 (24.40)	486.6 (23.70)	4,895.9 (20.10)
Urban		26.2 ( 0.10)	0.8 ( 1.30)	72.3 ( 4.10)	14.5 ( 3.10)	4.0 ( 5.70)	139.7 ( 6.80)	26.3 ( 6.70)	133.9 ( 6.50)	417.7 ( 1.70)
Rural		3,054.9 (17.50)	9.9 (16.20)	483.4 (27.80)	125.9 (27.00)	14.5 (20.50)	368.1 (18.00)	69.8 (17.70)	352.7 (17.20)	4,478.2 (16.40)
North		4,341.7 (24.80)	1.4 ( 2.30)	201.9 (11.60)	84.4 (18.10)	8.6 (12.20)	384.1 (18.80)	43.5 (11.10)	340.6 (16.60)	5,406.2 (22.20)
Urban		19.6 ( 0.10)	- ( - )	40.8 ( 2.30)	7.9 ( 1.70)	5.0 ( 7.10)	109.0 ( 5.30)	16.3 ( 4.10)	114.4 ( 5.60)	313.6 ( 1.30)
Rural		4,322.1 (24.70)	1.4 ( 2.30)	161.1 ( 9.20)	76.5 (16.40)	3.6 ( 5.10)	275.1 (13.40)	27.2 ( 6.90)	226.2 (11.00)	5,093.2 (20.90)
Northeast		7,961.7 (45.40)	1.3 ( 2.10)	181.1 (10.40)	56.4 (12.10)	8.8 (12.50)	299.6 (14.20)	68.8 (17.50)	357.9 (17.40)	8,925.6 (36.60)
Urban		25.4 ( 0.10)	- ( - )	31.1 ( 1.80)	7.4 ( 1.60)	1.2 ( 1.70)	72.3 ( 3.50)	15.1 ( 3.80)	92.1 ( 4.50)	244.6 ( 1.00)
Rural		7,936.3 (45.30)	1.3 ( 2.10)	150.0 ( 8.60)	49.0 (10.50)	7.6 (10.80)	217.3 (10.60)	53.7 (13.60)	265.8 (12.90)	8,681.0 (35.60)
Sourth		1,849.5 (10.60)	45.3 (74.30)	183.3 (10.50)	74.8 (16.00)	9.4 (13.30)	240.1 (11.70)	55.3 (14.05)	257.0 (12.50)	2,714.7 (11.14)
Urban		24.3 ( 0.10)	3.4 ( 5.60)	45.8 ( 2.60)	14.4 ( 3.10)	3.1 ( 4.40)	87.0 ( 4.30)	16.8 ( 4.30)	92.9 ( 4.50)	287.6 ( 1.20)
Rural		1,825.2 (10.50)	41.9 (68.70)	137.5 ( 7.90)	60.4 (12.90)	6.3 ( 8.90)	153.1 ( 7.50)	38.5 ( 9.80)	164.1 ( 8.00)	2,427.0 ( 9.90)
Whole Kingdom		17,528.3 (100.0)	61.0 (100.0)	1,741.8 (100.0)	467.6 (100.0)	70.6 (100.0)	2,046.3 (100.0)	393.5 (100.0)	2,055.9 (100.0)	24,363.0 (100.0)
Urban		124.9 ( 0.70)	6.4 (10.50)	646.7 (37.10)	132.6 (28.40)	34.6 (49.00)	967.9 (47.30)	189.5 (48.20)	992.6 (48.30)	3,095.2 (12.70)
Rural		17,403.4 (99.30)	54.6 (89.50)	1,095.1 (62.90)	335.0 (71.60)	36.0 (50.90)	1,078.4 (52.70)	204.0 (52.80)	1,063.3 (51.70)	21,269.8 (87.30)

Source: National Statistical Office, Report of the Labor Force Survey ... 1981

Note: In bracket are percentage.

TABLE 3

COMPARISON OF EMPLOYED PERSONS AMONG ECONOMIC  
SUBSECTORS OF ROUND 1 AND ROUND 2

(Round 1 - Round 2)

(Unit: thousand persons)

Economic Subsector	Bangkok	Central	North	Northeast	South
Industry	1	-1,034.8	-2,121.8	-5,069.6	38.4
Commerce	2	6.0	5.2	10.1	13.1
Manufacturing	9	-12.3	162.7	251.4	-25.4
Construction	3	84.8	67.2	169.0	-17.9
Electricity	0	1.2	0.4	1.9	2.4
Transport	6	-19.0	14.4	72.8	-35.9
Transportation	4	-1.5	14.2	40.0	-1.8
Services	5	30.0	108.5	456.0	32.6

Source: The Labor Force Survey, 1981.

TABLE 4  
 RATIO OF EMPLOYED PERSONS BY ECONOMICS SUBSECTORS  
 (ROUND 1/ROUND 2)

(Unit: percent)

Economic Sectors	Region				
	Bangkok	Central	North	Northeast	South
Primary	79.3	66.4	51.1	36.3	102.1
Mining	40.0	156.1	471.4	876.9	128.9
Manufacturing	95.2	97.8	180.6	238.8	86.1
Construction	106.5	160.4	179.6	399.6	76.1
Electricity	111.6	106.5	95.3	78.4	125.5
Commerce	88.5	96.3	103.7	125.1	85.1
Transportation	99.3	98.4	132.6	158.1	96.7
Services	91.6	106.2	131.8	227.4	112.7

Source: The Labor Force Survey, 1981.

a great deal on the availability of labor supply in the dry season. To promote industries in the two regions will not be easy since the labor supply is no reliable for the whole year. This is also true for the service sector employment.

3. The hypothesis is not confirmed however for Bangkok and the Central region. Admittedly this is a surprise. However the construction sector employment which is very sensitive to migration confirms the hypothesis. The information concerning the construction worker appears to indicate that there is a significant rural migration to Bangkok and to the central region. However if such migration takes place why does it manifest itself in manufacturing and service sectors. Here are some of the possible explanations.

3.1 The pattern of employment in manufacturing and service sectors in Bangkok and Central regions appear to be more permanent. It means a migrant without experience or some skill cannot simply walk in and expect to find work.

3.2 There is an ample evidence that there is enough rural-urban (Bangkok) migration but it appears that many migrants are not selected in the surveys. Unlike construction sector, the migrants stay at the construction sites and the survey can include them since the surveys normally go to the households for the selection of the samples. For manufacturing and in particular the service sector which is mostly informal sector, the survey may simply do not include them. To improve the accuracy of such information, the timing of survey could be changed and include the samples at the work location rather than the households.

4. The comparison in tables 3,4 offer a fascinating pattern of employment among the two rounds. Despite the fact that hypothesis is not confirmed in the Bangkok and Central region, it doesn't mean for us to accept that migration is not important. It simply means that further refinement of data collection may be needed before making a definite conclusion. In addition, the modern sector employment pattern in the more advanced regions can be of different nature.

#### Employment Pattern by Occupation Among the Two Rounds

Since occupation is an indicator for skill composition in addition to education, Tables 5, 6, 7, 8 indicate employment pattern by occupation regionally and the pattern between the wet and dry season.

Here are the following preliminary conclusion:

1. The definition of professional/management category reflects the bias favoring those workers who are school teachers and government officials. Regionally the share of such category is relatively high. It does not however reflect the degree of business activities as appear to represent the Bangkok region.
2. The hypothesis is that if migration takes place during the dry, there will be a significant reduction for agricultural workers and a significant increase for blue collar workers. The hypothesis (Tables 7,8) is confirmed for the regions Northeast, North and to a lesser extent the Central region. To be expected the increase in clerical/sales for the North and the Northeast is seen also in tables 7,8 which confirms the hypothesis that service sector employment is significant during the dry season.

TABLE 5

EMPLOYED WORKERS CLASSIFIED BY OCCUPATION, REGION  
AND RURAL/URBAN AREAS....1981  
(ROUND 1)

(Unit: thousand persons)

Region	Occupation Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Bangkok	297.2 (30.08)	651.2 (27.34)	234.6 ( 2.53)	1,029.9 (21.68)	2,213.8 (12.74)
Urban	273.4 (27.67)	584.8 (24.55)	27.4 ( 0.30)	814.4 (17.14)	1,700.4 ( 9.78)
Rural	23.8 ( 2.41)	66.4 ( 2.79)	207.2 ( 2.23)	215.5 ( 4.54)	513.4 ( 2.96)
Central	199.4 (20.18)	595.0 (24.98)	2,045.3 (22.09)	1,112.8 (23.42)	3,953.3 (22.75)
Urban	53.2 ( 5.38)	152.0 ( 6.38)	25.4 ( 0.27)	159.4 ( 3.35)	390.4 ( 2.25)
Rural	146.2 (14.80)	443.0 (18.60)	2,019.9 (21.82)	953.4 (20.07)	3,562.9 (20.50)
North	146.0 (14.78)	470.3 (19.74)	2,221.6 (23.99)	819.0 (17.24)	3,657.5 (21.04)
Urban	53.1 ( 5.37)	123.8 ( 5.20)	11.2 ( 0.12)	110.8 ( 2.33)	299.3 ( 1.72)
Rural	92.9 ( 9.41)	346.5 (14.54)	2,210.4 (23.87)	708.2 (14.91)	3,358.2 (19.32)
Northeast	211.0 (21.35)	418.1 (17.55)	2,847.3 (30.45)	1,377.9 (29.00)	4,854.9 (27.95)
Urban	42.3 ( 4.28)	78.9 ( 3.31)	9.1 ( 0.10)	91.6 ( 1.93)	222.2 ( 1.28)
Rural	168.7 (17.07)	339.2 (14.24)	2,838.2 (30.65)	1,286.3 (27.07)	4,632.7 (26.65)
South	133.7 (13.53)	246.5 (10.35)	1,909.5 (20.62)	410.5 ( 8.64)	2,700.9 (15.54)
Urban	35.0 ( 3.54)	95.5 ( 4.01)	26.7 ( 0.29)	112.7 ( 2.37)	270.3 ( 1.56)
Rural	98.7 ( 9.99)	151.0 ( 6.34)	1,882.8 (20.33)	297.8 ( 6.27)	2,430.6 (13.98)
Whole Kingdom	988.1 (100.0)	2,382.0 (100.0)	9,258.8 (100.0)	4,751.3 (100.0)	17,380.9 (100.0)
Urban	457.4 (46.29)	1,035.4 (43.47)	100.1 ( 1.08)	1,289.6 (27.14)	2,882.9 (16.59)
Rural	530.7 (53.71)	1,346.6 (56.53)	9,158.7 (98.92)	3,461.7 (72.86)	14,498.0 (83.41)

Source: The Labor Force Survey.

Note: In bracket are percentage.

TABLE 6

EMPLOYED WORKERS CLASSIFIED BY OCCUPATION, REGION  
AND RURAL/URBAN AREAS..1981  
(ROUND 2)

(Unit: thousand persons)

Region \ Occupation	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Bangkok	333.7 (32.07)	726.3 (30.34)	295.4 ( 1.68)	1,062.7 (31.29)	2,418.1 ( 9.92)
Urban	305.6 (29.37)	652.1 (27.24)	30.6 ( 0.17)	842.3 (24.80)	1,830.6 ( 7.51)
Rural	28.1 ( 2.70)	74.2 ( 3.10)	264.8 ( 1.51)	220.4 ( 6.49)	587.5 ( 2.41)
Central	209.5 (20.14)	620.7 (25.93)	3,066.6 (17.49)	999.4 (29.42)	4,896.2 (20.09)
Urban	55.5 ( 5.33)	175.5 ( 7.33)	26.2 ( 0.15)	160.3 ( 4.72)	417.5 ( 1.71)
Rural	154.0 (14.81)	445.2 (18.60)	3,040.4 (17.34)	839.1 (24.70)	4,478.7 (18.38)
Norht	156.4 (15.03)	437.3 (18.27)	4,348.3 (24.80)	463.3 (13.64)	5,405.3 (22.18)
Urban	61.0 ( 5.86)	127.0 ( 5.31)	20.2 ( 0.12)	104.4 ( 3.07)	312.6 ( 1.28)
Rural	95.4 ( 9.17)	310.3 (12.96)	4,328.1 (24.68)	358.9 (10.57)	5,092.7 (20.90)
Northeast	208.8 (20.07)	327.7 (13.69)	7,957.3 (45.38)	431.1 (12.69)	8,924.9 (36.63)
Urban	44.4 ( 4.27)	84.3 ( 3.52)	24.9 ( 0.14)	90.7 ( 2.67)	244.3 ( 1.00)
Rural	164.4 (15.80)	243.4 (10.17)	7,932.4 (45.24)	340.4 (10.02)	8,680.6 (35.63)
South	130.3 (12.52)	280.3 (11.71)	1,865.2 (10.64)	438.2 (12.90)	2,714.0 (11.14)
Urban	36.8 ( 3.54)	103.1 ( 4.31)	24.5 ( 0.14)	122.7 ( 3.61)	287.1 ( 1.18)
Rural	93.5 ( 8.98)	177.2 ( 7.40)	1,840.7 (10.50)	315.5 ( 9.29)	2,426.9 ( 9.96)
Whole Kingdom	1,040.4 (100.0)	2,393.7 (100.0)	17,533.4 (100.0)	3,396.8 (100.0)	24,364.3 (100.0)
Urban	504.2 (48.46)	1,142.8 (47.74)	126.8 ( 0.72)	1,321.4 (38.90)	3,095.2 (12.70)
Rural	536.2 (51.54)	1,250.9 (52.26)	17,406.6 (99.28)	2,075.4 (61.10)	21,269.1 (87.30)

Source: The Labor Force Surveys.

Note: In bracket are percent.

TABLE 7

THE COMPARISON OF EMPLOYED PERSONS AMONG OCCUPATIONS  
OF ROUND 1 AND ROUND 2  
(Round 1 - Round 2)

(Unit: thousand persons)

Occupation \ Region	Bangkok	Central	North	Northeast	South
Professional/ Management	-36.5	-10.1	-10.4	2.2	3.4
Clerical/Sales	-75.1	-25.7	33.0	90.4	-33.8
Agricultural	-60.8	-1,021.3	-2,126.7	-5,110.0	44.3
Blue Collars	-32.8	113.4	355.7	946.8	-27.7

Source: The Labor Force Survey, 1981.

TABLE 8  
 RATIO OF EMPLOYED PERSONS BY OCCUPATIONS  
 (ROUND 1/ROUND 2)

(Unit: percent)

Occupation	Region				
	Bangkok	Central	North	Northeast	South
Professional/ Management	89.1	95.2	93.3	101.1	102.6
Clerical/Sales	89.6	95.8	107.5	127.6	87.9
Agricultural	79.4	66.7	51.1	35.7	102.4
Blue Collars	96.9	111.3	176.8	319.6	93.7

Source: The Labor Force Survey 1981.

### Employment and Age Groups (pattern among two rounds)

In the projection study, three age groups are chosen for the study. However, the necessity of combining age into 3 groups might have excluded some of the interesting results. The section is aimed at breaking down age groups into 9 categories.

Here are some of the preliminary findings (Tables 9,10, 11, 12)

1. In general and for all regions, Thailand's labor force is relatively young. For the whole country more than 60% of our labor force is below 34 years old.
2. To a greater extent, the degree of youngness of labor force is extreme in the Northeast: reflecting the demographic factor of past and present high rate of population change.
3. Comparing the pattern of age structure and the employment among the two rounds, tables 11,12 indicate that there are significant decline in employment during the dry season for all age groups.

### Unemployment

In order to supplement the projection study, the objective is to discuss in details the types of unemployment problem in Thailand, utilizing the existing information in the labor force surveys. Three main types of unemployment in 1981 will be discussed here:

1. Open unemployment, using the new definition by adding those waiting for agricultural season into the definition to be consistent with the projection.

Table 9 Employed Workers Classified by age group, region and rural/urban areas in 1981....(round 1)

( Unit : ' 000 persons )

Age group Region	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60 +	Total
Bangkok	23.3 (1.05)	205.0 (9.26)	318.6 (14.39)	459.6 (20.76)	423.6 (19.13)	262.9 (11.88)	309.3 (13.97)	159.9 (7.22)	52.3 (2.36)	2,213.8 (100.00)
- Urban	15.2 (0.89)	140.2 (8.25)	232.8 (13.69)	363.3 (21.37)	334.3 (19.66)	209.1 (12.30)	243.7 (14.33)	125.4 (7.37)	37.3 (2.19)	1,700.4 (100.00)
- Rural	8.1 (1.58)	64.8 (12.62)	85.8 (16.71)	96.3 (18.76)	89.3 (17.39)	53.8 (10.48)	65.6 (12.78)	34.5 (6.72)	15.0 (2.92)	513.4 (100.00)
Central	38.4 (2.49)	598.4 (15.14)	649.7 (16.43)	570.0 (14.42)	468.1 (11.84)	377.2 (9.54)	605.8 (15.32)	405.8 (10.26)	179.9 (4.55)	3,953.3 (100.00)
- Urban	6.5 (1.66)	38.2 (0.82)	61.1 (15.65)	63.3 (16.21)	52.3 (13.40)	42.1 (10.78)	65.5 (16.78)	2.4 (10.86)	19.0 (4.87)	390.4 (100.00)
- Rural	91.9 (2.58)	560.2 (15.72)	588.6 (16.52)	506.7 (14.22)	415.8 (11.67)	335.1 (9.41)	540.3 (15.16)	363.4 (10.20)	160.9 (4.52)	3,562.9 (100.00)
North	100.5 (2.57)	580.0 (15.86)	633.4 (17.32)	557.4 (15.24)	425.4 (11.63)	343.1 (9.38)	521.3 (14.25)	360.0 (9.84)	136.1 (3.72)	3,657.7 (100.00)
- Urban	4.3 (1.44)	27.4 (9.15)	47.2 (15.76)	53.0 (17.70)	41.5 (13.86)	31.2 (10.42)	51.1 (17.06)	31.4 (10.48)	12.1 (4.04)	299.5 (100.00)
- Rural	96.2 (2.86)	552.6 (16.46)	586.2 (17.46)	504.4 (15.02)	383.9 (11.43)	311.9 (9.29)	470.2 (14.00)	328.6 (9.79)	124.0 (3.69)	3,358.2 (100.00)
Northeast	278.7 (5.74)	901.8 (18.57)	746.3 (15.37)	680.9 (14.00)	632.8 (13.03)	481.7 (9.92)	601.3 (12.36)	382.1 (7.87)	149.0 (3.07)	4,854.4 (100.00)
- Urban	3.6 (1.67)	19.0 (8.54)	27.7 (12.46)	38.9 (17.60)	35.5 (15.96)	28.6 (12.86)	37.3 (16.77)	22.8 (10.25)	8.2 (3.69)	221.6 (100.00)
- Rural	275.0 (5.94)	882.8 (19.06)	718.6 (15.51)	642.0 (13.86)	597.3 (12.89)	453.1 (9.78)	564.0 (12.17)	359.3 (7.76)	140.8 (3.04)	4,632.8 (100.00)
South	54.6 (2.02)	362.0 (13.40)	402.3 (14.90)	372.7 (13.80)	330.1 (12.20)	277.6 (10.28)	436.1 (16.15)	303.2 (11.23)	161.3 (5.97)	2,700.5 (100.00)
- Urban	3.0 (1.11)	24.4 (9.04)	38.5 (14.27)	42.2 (15.64)	36.7 (13.60)	32.3 (11.97)	47.7 (17.68)	31.2 (11.56)	13.7 (5.08)	269.8 (100.00)
- Rural	51.6 (2.12)	337.6 (13.89)	363.8 (14.97)	330.5 (13.60)	293.4 (12.07)	245.3 (10.09)	388.4 (15.98)	272.0 (11.19)	147.6 (5.07)	2,430.7 (100.00)
Whole Kingdom	555.3 (3.19)	2,647.4 (15.23)	2,750.6 (15.83)	2,640.6 (15.19)	2,280.4 (13.12)	1,742.9 (10.03)	2,473.6 (14.23)	1,611.4 (9.27)	678.7 (3.90)	17,381.0 (100.00)
- Urban	32.6 (1.13)	249.3 (8.65)	407.4 (14.13)	560.8 (19.45)	500.6 (17.36)	343.5 (11.92)	445.0 (15.44)	253.6 (8.80)	90.1 (3.13)	2,882.9 (100.00)
- Rural	522.7 (3.61)	2,398.1 (16.54)	2,343.2 (16.16)	2,079.8 (14.35)	1,779.8 (12.28)	1,399.4 (9.65)	2,028.6 (13.99)	1,357.8 (9.37)	588.6 (4.06)	14,498.1 (100.00)

Source : National Statistical Office , Report of the Labor Force Survey .. 1981

TABLE 10

EMPLOYED WORKERS CLASSIFIED BY AGE GROUPS , REGION AND RURAL/URBAN AREAS IN 1981  
(ROUND 2 )

( Unit : ' 000 persons )

Age Group Region	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60 +	Total
Bangkok	36.3 (1.50)	232.9 (9.63)	349.3 (14.44)	495.4 (20.48)	450.8 (18.63)	282.7 (11.68)	331.7 (13.71)	175.9 (7.27)	64.3 (2.66)	2,419.5 (100.00)
-Urban	21.6 (1.18)	155.7 (8.50)	253.0 (13.82)	388.4 (21.21)	351.6 (13.20)	222.2 (12.13)	260.0 (14.20)	134.4 (7.34)	44.3 (2.42)	1,831.3 (100.00)
-Rural	14.7 (2.50)	77.2 (13.12)	96.3 (16.37)	107.0 (18.19)	99.2 (16.87)	60.5 (10.29)	71.7 (12.19)	41.5 (7.06)	20.0 (3.40)	588.2 (100.00)
Central	172.2 (3.52)	731.5 (14.93)	793.9 (16.21)	689.9 (14.09)	568.7 (11.61)	459.3 (9.38)	723.6 (14.77)	506.1 (10.33)	252.5 (5.16)	4,897.9 (100.00)
-Urban	10.7 (2.56)	43.2 (10.33)	67.0 (16.02)	65.3 (15.61)	54.8 (13.10)	43.8 (10.47)	68.4 (16.35)	43.7 (10.45)	21.0 (5.02)	418.3 (100.00)
-Rural	161.5 (3.61)	688.3 (15.37)	726.9 (16.23)	624.6 (13.94)	513.9 (11.47)	415.5 (9.28)	655.2 (14.63)	462.4 (10.32)	231.5 (5.17)	4,479.6 (100.00)
North	214.7 (3.97)	892.7 (16.51)	919.7 (17.01)	791.7 (14.64)	596.9 (11.04)	470.4 (8.70)	770.8 (14.26)	538.8 (9.97)	210.7 (3.90)	5,406.9 (100.00)
-Urban	6.8 (2.17)	28.2 (9.00)	48.3 (15.42)	54.1 (17.27)	41.8 (13.34)	32.9 (10.50)	53.6 (17.11)	34.9 (11.14)	12.4 (3.96)	313.3 (100.00)
-Rural	207.9 (4.08)	864.5 (16.97)	871.4 (17.11)	737.6 (14.48)	555.1 (10.90)	437.5 (8.59)	717.2 (14.08)	503.9 (9.89)	198.3 (3.89)	5,093.6 (100.00)
Northeast	711.6 (7.97)	1,587.8 (17.79)	1,368.4 (15.33)	1,183.6 (13.26)	1,080.3 (12.10)	815.3 (9.13)	1,132.1 (12.68)	748.5 (8.39)	298.0 (3.34)	8,926.3 (100.00)
-Urban	6.1 (2.49)	22.1 (9.02)	31.7 (12.94)	41.4 (16.90)	38.6 (15.76)	28.4 (11.59)	40.3 (16.45)	26.3 (10.73)	9.6 (2.92)	245.0 (100.00)
-Rural	705.5 (8.13)	1,565.7 (18.04)	1,336.7 (15.40)	1,142.2 (13.16)	1,041.7 (12.00)	786.9 (9.06)	1,091.8 (12.58)	722.2 (8.32)	288.4 (3.32)	8,681.3 (100.00)
South	64.9 (2.39)	359.0 (13.22)	405.5 (14.93)	377.6 (13.90)	332.2 (12.23)	284.9 (10.49)	444.2 (16.36)	301.9 (11.12)	144.7 (5.33)	2,715.8 (100.00)
-Urban	6.1 (2.12)	27.8 (9.65)	41.2 (14.30)	44.1 (15.30)	38.2 (13.25)	32.7 (11.35)	51.0 (17.70)	33.3 (11.55)	13.7 (4.75)	288.2 (100.00)
-Rural	58.8 (2.42)	331.2 (13.64)	364.3 (15.01)	333.5 (13.74)	294.0 (12.11)	252.2 (10.39)	393.2 (16.20)	268.6 (11.06)	131.0 (5.40)	2,427.6 (100.00)
Whole Kingdom	1,200.0 (4.92)	3,803.9 (15.61)	3,837.0 (15.75)	3,538.5 (14.52)	3,029.0 (12.43)	2,312.7 (9.49)	3,402.6 (13.96)	2,271.5 (9.32)	971.0 (3.99)	24,366.2 (100.00)
-Urban	51.6 (1.67)	276.8 (8.94)	441.4 (14.26)	593.5 (19.17)	525.0 (16.96)	360.0 (11.63)	473.2 (15.28)	273.0 (8.82)	101.5 (3.28)	3,096.0 (100.00)
-Rural	1,148.4 (5.40)	3,527.1 (16.58)	3,395.6 (15.96)	2,945.0 (13.85)	2,504.0 (11.77)	1,952.7 (9.18)	2,929.4 (13.77)	1,998.5 (9.40)	869.5 (4.09)	21,270.2 (100.00)

Source : National Statistical Office , Office of the Prime Minister , Report of the Labor Force Survey

Note : In brackets are percentage .

TABLE 11  
 COMPARISON OF EMPLOYED PERSONS AMONG AGE GROUPS  
 BY ROUND 1 AND ROUND 2  
 (Round 1 - Round 2)

(Unit: thousand persons)

Age Group	Region				
	Bangkok	Central	North	Northeast	South
11 - 14	-13.0	- 73.8	-114.2	-432.9	-10.3
15 - 19	-27.9	-133.1	-312.7	-686.0	3.0
20 - 24	-30.7	-144.2	-286.3	-622.1	- 3.2
25 - 29	-35.8	-119.9	-234.3	-502.5	- 4.9
30 - 34	-27.2	-100.6	-171.5	-447.5	-32.1
35 - 39	-19.8	- 82.1	-127.3	-333.5	- 7.3
40 - 49	-22.4	-117.8	-249.5	-530.8	- 8.1
50 - 59	-16.0	-100.3	-178.8	-366.4	1.3
60 +	-12.0	- 72.6	- 74.6	-149.0	16.6

Source: The Labor Force Survey, 1981.

TABLE 12

RATIO OF EMPLOYED PERSONS BY AGE GROUPS  
(ROUND 1/ROUND 2)

(Unit: percent)

Age Groups	Region	Bangkok	Central	North	Northeast	South
11 - 14		64.2	57.1	46.8	39.2	84.1
15 - 19		88.0	81.8	65.0	56.8	100.8
20 - 24		91.2	81.3	68.9	54.5	99.2
25 - 29		92.8	82.6	70.4	57.5	98.7
30 - 34		93.9	82.3	71.2	58.6	90.3
35 - 39		93.0	82.1	73.0	59.1	97.4
40 - 49		93.2	83.7	67.6	53.1	98.2
50 - 59		90.9	80.2	66.8	51.0	100.4
60 +		81.3	71.2	64.6	50.0	111.5

Source: The Labor Force Survey, 1981.

2. Underemployment, although there is no projection on underemployment, a detailed discussion of underemployment is presented here utilizing the definitions in the existing labor force surveys.

3. Seasonal unemployment, using definition as explained in the projection study to subtract round 1 from round 2 figure but in this section, attempt is made to provide additional details.

### Open Unemployment

Tables 13, 14 reveal number and proportion of those open unemployed persons by age groups, rural/urban, regionally and comparing the two rounds.

With a new definition by adding the those who wait for agricultural season to start, the number of open unemployment shot up significantly to 5.9 million for the whole country in the first round. The critical region is the Northeast, where 3.4 million people are considered to be open-unemployed, followed by the North. Open unemployment is critical only during the dry season.

In terms of age groups for the whole country, 20-24 age group constitutes for 16.99% or 1 million people openly unemployed. The second most important age group following closely is 15-19 age group with 980,000 people openly unemployed for the whole country. Across the regions, two age groups 15-19 and 20-24 appear to indicate the alarming trends regarding open unemployment.

Table 13 Open Unemployment Classified by age groups, region and rural/urban areas in 1981... (round 1)

( Unit : ' 000 persons )

Age group Region	Age group									Total
	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60+	
Bangkok	2.3 (2.33)	17.6 (17.83)	20.2 (20.47)	19.7 (19.96)	9.6 (9.73)	7.0 (7.09)	7.2 (7.29)	5.8 (5.88)	4.9 (4.96)	98.7 (100.00)
- Urban	1.1 (0.21)	11.6 (2.18)	13.8 (2.60)	14.2 (2.67)	5.4 (1.02)	2.5 (0.47)	2.7 (0.51)	0.6 (0.11)	0.1 (0.02)	53.1 (100.00)
- Rural	1.2 (2.63)	6.0 (13.16)	6.4 (14.04)	5.5 (12.06)	4.2 (9.21)	4.5 (9.87)	6.5 (14.25)	5.2 (11.40)	4.8 (10.53)	45.6 (100.00)
Central	18.9 (2.31)	124.1 (15.18)	146.7 (17.95)	115.3 (14.21)	80.3 (9.83)	66.6 (8.15)	111.6 (13.65)	93.6 (11.45)	57.5 (7.04)	817.3 (100.00)
- Urban	0.5 (4.50)	2.6 (23.42)	3.5 (31.53)	1.1 (9.91)	0.5 (4.50)	0.3 (2.70)	0.4 (3.60)	0.2 (1.80)	0.5 (4.50)	11.1 (100.00)
- Rural	18.4 (2.28)	121.5 (15.07)	143.2 (17.76)	114.2 (14.17)	79.8 (9.90)	66.3 (8.22)	111.2 (13.79)	93.4 (11.59)	57.0 (7.07)	806.2 (100.00)
North	63.9 (4.09)	266.7 (17.08)	264.3 (16.92)	210.3 (13.47)	172.6 (11.05)	118.5 (7.59)	234.8 (14.98)	170.1 (10.89)	57.9 (3.71)	1,561.8 (100.00)
- Urban	0.2 (1.85)	0.8 (7.41)	2.4 (22.22)	2.1 (19.44)	0.6 (5.56)	0.8 (7.41)	0.7 (6.48)	1.6 (14.81)	0.5 (4.63)	10.8 (100.00)
- Rural	63.7 (4.11)	265.9 (17.14)	261.9 (16.89)	208.2 (13.42)	172.0 (11.09)	117.7 (7.59)	234.1 (15.09)	168.5 (10.86)	57.4 (3.70)	1,551.0 (100.00)
Northeast	141.7 (4.15)	569.2 (16.67)	569.4 (16.67)	456.6 (13.37)	388.1 (11.36)	292.1 (8.55)	487.9 (14.28)	352.8 (10.33)	155.3 (4.55)	3,413.1 (100.00)
- Urban	0.3 (2.3)	2.1 (16.15)	2.4 (19.23)	1.4 (10.77)	1.0 (7.69)	0.9 (6.90)	1.6 (12.30)	2.1 (16.10)	1.1 (8.50)	15.0 (100.00)
- Rural	141.4 (4.16)	567.6 (16.68)	567.0 (16.67)	455.1 (13.38)	387.1 (1.09)	291.2 (8.56)	486.3 (14.29)	350.7 (10.31)	154.2 (4.53)	3,402.0 (100.00)
South	1.5 (2.12)	11.0 (15.58)	11.4 (16.15)	14.2 (20.11)	8.7 (12.32)	7.2 (10.20)	8.5 (12.04)	6.2 (8.78)	0.4 (0.57)	70.6 (100.00)
- Urban	0.1 (1.45)	1.5 (21.74)	1.7 (24.64)	1.3 (18.84)	0.7 (10.14)	0.1 (1.45)	0.8 (11.59)	0.1 (1.45)	0.2 (2.90)	6.9 (100.00)
- Rural	1.4 (2.20)	9.5 (14.91)	9.7 (15.23)	12.9 (20.25)	8.0 (12.56)	7.1 (11.15)	7.7 (12.09)	6.1 (9.58)	0.2 (0.31)	63.7 (100.00)
Whole Kingdom	229.4 (3.84)	990.50 (16.60)	1,013.5 (16.99)	817.2 (13.70)	660.8 (11.08)	492.3 (8.25)	853.5 (14.31)	629.4 (10.55)	276.2 (4.63)	5,960.9 (100.00)
- Urban	2.5 (2.58)	19.4 (20.40)	24.6 (25.90)	20.4 (21.50)	8.8 (9.30)	4.8 (5.10)	6.9 (7.50)	4.9 (5.20)	2.7 (2.90)	95.0 (100.00)
- Rural	226.9 (3.87)	971.1 (16.55)	988.9 (16.85)	796.8 (13.58)	652.0 (11.11)	487.5 (8.31)	846.6 (14.42)	624.5 (10.64)	273.5 (4.66)	5,869.4 (100.00)

TABLE 14

## OPEN UNEMPLOYMENT CLASSIFIED BY AGE GROUPS , REGION AND RURAL/ URBAN AREAS IN 1981

(Round 2)

( Unit : ' 000 persons )

Region	Age Group									
	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60 +	Total
Bangkok	2.2 (2.7)	15.5 (19.72)	25.9 (32.90)	17.1 (21.80)	8.0 (10.20)	3.9 (4.90)	3.9 (4.90)	1.9 (2.30)	0.2 (0.25)	78.6 (100.0)
-Urban	1.3 (1.96)	12.3 (18.52)	23.2 (34.94)	15.3 (23.04)	6.4 (9.64)	3.1 (4.67)	2.7 (4.07)	1.4 (2.11)	0.1 (0.15)	66.4 (100.0)
-Rural	0.9 (7.75)	3.2 (24.80)	2.7 (20.90)	1.8 (13.90)	1.6 (12.40)	0.8 (6.20)	1.2 (9.50)	0.5 (3.90)	0.1 (0.77)	12.9 (100.0)
Central	6.9 (7.36)	24.4 (26.01)	28.3 (30.17)	9.7 (10.34)	2.9 (3.09)	3.2 (3.41)	9.1 (9.70)	3.6 (3.84)	3.7 (3.94)	93.8 (100.0)
-Urban	0.2 (1.90)	2.6 (24.76)	4.2 (40.00)	1.7 (16.19)	0.3 (2.86)	0.4 (3.81)	0.5 (4.76)	0.1 (0.95)	-	10.5 (100.0)
-Rural	6.7 (8.04)	21.8 (26.17)	24.1 (28.93)	8.0 (9.60)	2.6 (3.12)	2.8 (3.36)	8.6 (10.32)	3.5 (4.20)	3.7 (4.44)	83.3 (100.0)
North	1.2 (4.36)	6.9 (25.09)	7.9 (28.73)	3.5 (12.73)	3.2 (11.64)	1.8 (6.55)	4.1 (14.91)	2.0 (7.27)	0.4 (1.45)	27.5 (100.0)
-Urban	0.5 (6.17)	1.6 (19.75)	3.4 (41.98)	1.7 (20.99)	0.3 (3.70)	0.1 (1.23)	-	0.1 (1.23)	-	8.1 (100.0)
-Rural	0.7 (3.61)	5.3 (27.32)	4.5 (23.20)	1.8 (9.28)	2.9 (14.95)	1.7 (8.76)	4.1 (21.13)	1.9 (9.79)	0.4 (2.06)	19.4 (100.0)
Northeast	5.6 (5.41)	17.5 (16.89)	22.1 (21.33)	11.5 (11.10)	11.8 (11.39)	4.0 (3.86)	14.8 (14.29)	9.6 (9.27)	4.7 (4.54)	103.6 (100.0)
-Urban	0.3 (5.26)	0.9 (15.79)	2.1 (36.84)	0.8 (14.04)	0.3 (5.26)	0.4 (7.02)	0.2 (3.51)	-	-	5.7 (100.0)
-Rural	5.3 (5.41)	16.6 (16.96)	20.0 (20.43)	10.7 (10.93)	11.5 (11.75)	3.6 (3.68)	14.6 (14.91)	9.6 (9.81)	4.7 (4.80)	97.9 (100.0)
South	2.2 (2.44)	13.9 (15.44)	18.8 (20.89)	15.9 (17.67)	3.8 (4.22)	5.6 (6.22)	10.8 (12.00)	11.0 (12.22)	6.4 (7.11)	90.0 (100.0)
-Urban	-	1.9 (25.00)	2.8 (36.84)	1.1 (14.47)	0.3 (3.95)	0.2 (2.63)	0.3 (3.95)	0.1 (1.32)	-	7.6 (100.0)
-Rural	2.2 (2.67)	12.0 (14.56)	16.0 (19.42)	14.8 (17.96)	3.5 (4.25)	5.4 (6.55)	10.5 (12.74)	10.9 (13.23)	6.4 (7.77)	82.4 (100.0)
Whole Kingdom	19.1 (4.75)	79.4 (19.74)	104.0 (25.86)	58.6 (14.57)	30.6 (7.61)	19.3 (4.80)	43.8 (10.39)	28.8 (7.16)	15.7 (3.90)	402.2 (100.0)
-Urban	2.5 (2.52)	19.9 (20.08)	35.9 (36.23)	21.0 (21.19)	7.9 (7.97)	4.6 (4.64)	4.1 (4.14)	1.7 (1.72)	0.1 (0.10)	99.1 (100.0)
-Rural	16.6 (5.48)	59.5 (19.63)	68.1 (22.47)	37.6 (12.41)	22.7 (7.49)	14.7 (4.85)	39.7 (13.10)	27.1 (8.94)	15.6 (5.15)	303.1 (100.0)

Source : National Statistical Office , Report of the Labor Force Survey .

Open unemployment in round 2 figures drops sharply to 400,000 persons. However the two most important age groups are still 15-19, 20-24 groups. Among the old age group, 40-49 category is relatively significant and relative to others.

#### Underemployment. (Tables 15 - 20)

Here are some of the preliminary findings:

1. Underemployment is much lower for data from round 1 by 1.2 million persons.
2. Underemployment is generally very severe for primary sector employment.
3. For Bangkok and Central region, underemployment is relatively more severe for manufacturing and service sectors.
4. Younger age groups 15-19 and 20-24 categories, face a high degree of underemployment incidence, constituting around 40% of underemployment.
5. By occupation, Bangkok region has the highest number of underemployed persons among blue collar workers followed by clerical/sale category while the underemployment is highest for agricultural workers in the Northeast and the North

#### Seasonal Unemployment

The rationale of this concept is to use labor utilization concept (see Mehmet in the appendix for more details).

TABLE 15  
 UNDEREMPLOYED WORKERS CLASSIFIED BY INDUSTRIAL SECTORS, REGION  
 AND RURAL/URBAN AREAS IN 1981  
 (ROUND 1)

(Unit: thousand persons)

Region	Sectors		Secondary				Tertiary			Unknow	Total
	Primary		Mining	Manufacturing	Construction	Electricity	Commerce	Transport	Service		
Bangkok	136.6 ( 7.60)	0.1 ( 0.70)	284.0 (46.80)	43.9 (38.60)	3.6 (40.90)	140.5 (40.10)	17.8 (43.10)	200.0 (41.80)	0.1 ( 6.50)	827.8 (24.20)	
Urban	12.2 ( 0.70)	0.1 ( 0.70)	191.0 (31.50)	31.2 (27.50)	1.9 (21.60)	125.0 (35.70)	15.4 (37.30)	181.4 (37.90)	0.1 ( 6.50)	558.9 (16.30)	
Rural	124.4 ( 6.90)	- ( - )	93.0 (15.30)	12.7 (11.20)	1.7 (19.30)	15.5 ( 4.42)	2.4 ( 5.80)	18.6 ( 3.90)	- ( - )	268.9 ( 7.90)	
Central	485.2 (26.90)	8.4 (57.10)	145.1 (23.90)	24.4 (21.50)	2.8 (31.80)	91.5 (26.10)	9.5 (23.00)	93.8 (19.60)	1.2 (75.00)	862.4 (25.20)	
Urban	13.2 ( 0.70)	0.1 ( 0.70)	34.2 ( 5.60)	4.8 ( 4.20)	1.4 (15.90)	26.6 ( 7.60)	3.5 ( 8.50)	42.9 ( 8.90)	0.2 (12.50)	127.3 ( 3.70)	
Rural	472.0 (26.20)	8.3 (56.50)	110.9 (18.30)	19.6 (17.30)	1.4 (15.90)	64.9 (18.50)	6.0 (14.50)	50.9 (10.60)	1.0 (62.50)	735.4 (21.50)	
North	457.9 (24.30)	1.7 (11.60)	63.4 (10.40)	11.8 (10.40)	0.5 ( 5.70)	48.8 (13.90)	3.6 ( 8.70)	63.5 (13.30)	0.3 (18.80)	632.9 (18.50)	
Urban	7.4 ( 0.40)	0.1 ( 0.70)	20.1 ( 3.30)	5.3 ( 4.70)	0.5 ( 5.70)	20.5 ( 5.80)	2.2 ( 5.30)	29.9 ( 6.20)	0.3 (18.80)	87.1 ( 2.50)	
Rural	430.5 (23.90)	1.6 (10.90)	43.3 ( 7.10)	6.5 ( 5.70)	- ( - )	28.3 ( 8.10)	1.4 ( 3.90)	33.6 ( 7.00)	- ( - )	545.8 (16.00)	
Northeast	473.9 (26.30)	2.1 (14.30)	65.8 (10.80)	28.6 (25.20)	0.4 ( 4.50)	45.0 (12.80)	5.3 (12.80)	91.4 (19.10)	- ( - )	713.7 (20.90)	
Urban	6.3 ( 0.30)	- ( - )	12.7 ( 2.10)	3.3 ( 2.90)	0.3 ( 3.40)	15.0 ( 4.30)	3.3 ( 8.00)	23.9 ( 5.00)	- ( - )	65.4 ( 1.90)	
Rural	467.6 (25.90)	2.1 (14.30)	53.1 ( 8.80)	25.3 (22.30)	0.1 ( 1.10)	30.0 ( 8.60)	2.0 ( 4.80)	67.5 (14.10)	- ( - )	648.3 (19.00)	
South	268.9 (14.90)	2.1 (14.30)	47.4 ( 7.80)	4.2 ( 3.70)	1.5 (17.00)	27.8 ( 6.80)	4.4 (10.60)	28.8 ( 6.00)	- ( - )	382.2 (11.20)	
Urban	13.2 ( 0.70)	0.5 ( 3.40)	18.9 ( 3.10)	3.7 ( 3.30)	1.5 (17.00)	14.8 ( 4.20)	2.3 ( 5.60)	20.2 ( 4.20)	- ( - )	75.8 ( 2.20)	
Rural	255.7 (14.20)	1.6 (10.90)	28.5 ( 4.70)	0.5 ( 0.40)	- ( - )	9.0 ( 2.60)	2.1 ( 5.10)	8.6 ( 1.80)	- ( - )	306.4 ( 8.90)	
Whole Kingdom	1,803.4 (100.0)	14.7 (100.0)	606.7 (100.0)	113.6 (100.0)	8.8 (100.0)	350.5 (100.0)	41.3 (100.0)	478.6 (100.0)	1.6 (100.0)	3,420.3 (100.0)	
Urban	52.7 ( 2.90)	0.9 ( 6.10)	277.3 (45.70)	48.6 (42.80)	5.9 (67.00)	202.4 (57.70)	27.1 (65.60)	298.9 (62.50)	0.6 (37.50)	915.0 (26.80)	
Rural	1,750.7 (97.10)	13.8 (93.90)	329.4 (54.30)	65.0 (57.20)	2.9 (32.90)	148.1 (42.30)	14.2 (34.40)	179.7 (37.50)	1.0 (62.50)	2,505.3 (73.20)	

Source: Report of The Labor Force Surveys.

Note: In brackets are percentage.

TABLE 16  
UNDEREMPLOYED WORKERS CLASSIFIED BY INDUSTRIAL SECTORS, REGION  
AND RURAL/URBAN AREAS IN 1981  
(ROUND 2)

(Unit: thousand persons)

Region	Sectors		Secondary				Tertiary			Total
	Primary		Mining	Manufacturing	Construction	Electricity	Commerce	Transport	Service	
Bangkok	175.3 ( 5.60)	0.4 ( 6.60)	298.7 (54.20)	30.5 (48.77)	2.4 (40.70)	169.9 (43.90)	19.9 (48.80)	212.2 (50.30)	913.3 (19.70)	
Urban	16.4 ( 0.50)	0.4 ( 6.60)	197.3 (30.80)	26.1 (36.90)	1.1 (18.60)	140.0 (36.20)	17.0 (41.70)	194.9 (46.20)	593.2 (12.80)	
Rural	159.9 ( 5.10)	- ( - )	101.4 (18.40)	8.4 (11.90)	1.3 (22.00)	29.9 ( 7.70)	2.9 ( 7.10)	17.3 ( 4.10)	320.1 ( 6.90)	
Central	577.4 (18.50)	1.6 (26.20)	157.7 (28.60)	22.9 (32.40)	1.1 (18.60)	96.4 (24.90)	11.2 (27.20)	104.4 (24.80)	972.7 (21.00)	
Urban	15.3 ( 0.50)	0.1 ( 1.84)	30.5 ( 5.50)	6.2 ( 8.80)	1.1 (18.60)	35.5 ( 9.20)	3.9 ( 9.60)	42.9 (10.20)	155.5 ( 2.90)	
Rural	562.1 (17.80)	1.5 (24.60)	127.2 (23.10)	16.7 (23.60)	- ( - )	60.9 (15.70)	7.3 (17.90)	61.5 (14.60)	830.2 (18.10)	
North	695.0 (22.10)	- ( - )	36.1 ( 6.60)	4.1 ( 5.80)	1.0 (16.90)	49.7 (12.80)	3.2 ( 7.80)	57.2 ( 8.80)	826.2 (17.80)	
Urban	13.3 ( 0.40)	- ( - )	19.0 ( 3.40)	3.8 ( 5.40)	1.0 (16.90)	27.4 ( 7.10)	2.3 ( 5.60)	30.8 ( 7.30)	97.6 ( 2.10)	
Rural	681.7 (21.60)	- ( - )	17.1 ( 3.10)	0.3 ( 0.40)	- ( - )	22.3 ( 5.80)	0.9 ( 2.20)	6.4 ( 1.50)	728.6 (15.70)	
Northeast	1,369.2 (43.50)	- ( - )	25.6 ( 4.60)	3.4 ( 4.80)	0.2 ( 3.40)	44.3 (11.40)	3.5 ( 8.60)	34.6 ( 8.60)	1,480.8 (51.90)	
Urban	19.8 ( 0.60)	- ( - )	17.0 ( 3.10)	3.1 ( 4.40)	0.2 ( 3.40)	12.8 ( 3.30)	2.2 ( 5.40)	25.7 ( 6.10)	80.8 ( 1.70)	
Rural	1,349.4 (42.90)	- ( - )	8.6 ( 1.60)	0.3 ( 0.40)	- ( - )	31.5 ( 8.10)	1.3 ( 3.20)	8.9 ( 2.10)	1,400.0 (50.20)	
South	329.2 (10.50)	4.0 (65.60)	31.7 ( 5.80)	5.0 ( 7.10)	0.8 (13.60)	24.6 ( 6.40)	1.9 ( 4.70)	31.4 ( 7.40)	428.6 ( 9.20)	
Urban	10.3 ( 0.30)	0.7 (11.50)	20.6 ( 3.70)	4.1 ( 5.80)	0.7 (11.90)	17.3 ( 4.50)	1.7 ( 4.20)	24.8 ( 5.90)	80.2 ( 1.70)	
Rural	318.9 (10.10)	3.3 (54.10)	11.1 (20.10)	0.9 ( 1.30)	0.1 ( 1.70)	7.5 ( 1.90)	0.2 ( 0.50)	6.6 ( 1.60)	348.6 ( 7.50)	
Whole Kingdom	5,146.8 (100.0)	6.1 (100.0)	551.1 (100.0)	70.7 (100.0)	5.9 (100.0)	386.8 (100.0)	40.8 (100.0)	421.7 (100.0)	4,629.9 (100.0)	
Urban	75.5 ( 2.40)	1.3 (21.30)	285.1 (51.70)	43.8 (61.90)	4.4 (74.60)	233.7 (60.40)	27.9 (68.40)	320.0 (75.90)	992.0 (21.40)	
Rural	5,071.0 (97.60)	4.8 (78.70)	266.0 (48.30)	26.9 (38.10)	1.5 (25.40)	153.1 (39.60)	12.9 (31.60)	101.7 (24.10)	3,637.9 (78.60)	

Source: Report of The Labor Force Surveys.

Note: In brackets are percentage.

Table 17 Underemployed Workers Classified by age groups, region and rural/urban areas in 1981... (round 1)

(Unit : ' 000 persons)

Age groups Region										
	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60 +	Total
Bangkok	19.6 (2.37)	166.6 (20.12)	177.6 (21.45)	155.9 (18.80)	109.1 (13.18)	60.7 (7.33)	77.3 (9.34)	39.8 (4.81)	19.3 (2.33)	828.0 (100.00)
- Urban	13.4 (2.40)	114.6 (20.30)	125.4 (22.43)	113.7 (20.30)	69.9 (12.50)	38.2 (38.2)	47.1 (8.43)	23.3 (4.17)	11.6 (2.08)	559.0 (100.00)
- Rural	6.2 (2.30)	52.0 (19.33)	52.2 (19.41)	42.2 (15.69)	39.2 (14.60)	22.5 (8.40)	30.2 (11.23)	16.5 (6.13)	7.7 (2.90)	268.7 (100.00)
Central	28.0 (3.24)	179.3 (20.78)	160.9 (18.64)	111.9 (12.97)	81.8 (9.48)	61.1 (7.08)	111.6 (12.93)	80.8 (9.36)	47.3 (5.48)	863.0 (100.00)
- Urban	4.3 (3.36)	25.8 (20.25)	31.5 (24.73)	18.9 (14.84)	11.8 (9.26)	6.3 (4.95)	14.6 (11.46)	7.6 (5.97)	6.4 (5.02)	127.4 (100.00)
- Rural	23.7 (3.22)	153.5 (20.87)	129.4 (17.59)	93.0 (12.64)	70.0 (9.52)	54.8 (7.45)	97.0 (13.19)	73.2 (9.95)	40.9 (5.56)	735.6 (100.00)
North	26.8 (4.77)	132.6 (20.94)	117.6 (18.58)	83.1 (13.13)	48.0 (7.58)	48.3 (7.63)	86.6 (13.68)	66.2 (10.46)	23.8 (3.76)	633.1 (100.00)
- Urban	2.9 (3.33)	20.1 (23.05)	20.4 (23.39)	13.1 (15.02)	7.4 (8.49)	5.0 (5.73)	9.1 (10.44)	5.9 (6.77)	3.1 (3.56)	87.2 (100.00)
- Rural	23.6 (4.38)	112.5 (20.61)	97.2 (17.81)	70.0 (12.82)	40.6 (7.44)	43.3 (7.93)	77.5 (14.20)	60.3 (11.05)	20.7 (3.79)	545.9 (100.00)
Northeast	63.4 (8.88)	172.4 (24.15)	94.7 (13.26)	74.9 (10.49)	94.0 (11.76)	55.4 (7.76)	84.4 (11.82)	63.6 (8.91)	21.1 (2.96)	714.0 (100.00)
- Urban	3.1 (4.73)	14.4 (21.95)	14.3 (21.80)	9.6 (14.63)	7.5 (11.43)	4.4 (6.71)	5.8 (8.84)	4.9 (7.47)	1.4 (2.13)	65.6 (100.00)
- Rural	60.3 (9.30)	158.0 (24.37)	80.4 (12.40)	65.3 (10.07)	76.5 (11.80)	51.0 (7.87)	78.6 (12.12)	58.7 (8.05)	19.7 (3.04)	648.4 (100.00)
South	12.3 (3.22)	72.3 (18.90)	64.3 (16.81)	49.9 (13.02)	39.1 (10.22)	36.8 (9.62)	40.1 (10.48)	42.5 (11.11)	24.5 (6.41)	382.5 (100.00)
- Urban	1.8 (2.37)	16.1 (21.18)	17.0 (22.37)	10.7 (14.08)	8.3 (10.92)	4.9 (6.45)	6.9 (9.08)	5.6 (7.37)	4.2 (5.53)	76.0 (100.00)
- Rural	10.5 (3.43)	56.2 (18.34)	47.3 (15.43)	39.1 (12.76)	30.8 (10.05)	31.9 (10.41)	33.2 (10.83)	36.9 (12.04)	20.3 (6.62)	306.5 (100.00)
Whole Kingdom	149.9 (4.38)	723.3 (21.15)	616.6 (18.03)	476.1 (13.92)	364.1 (10.64)	262.6 (7.68)	400.3 (11.70)	293.2 (8.57)	136.6 (3.99)	3,420.5 (100.00)
- Urban	25.5 (2.79)	191.0 (20.87)	210.0 (22.95)	166.4 (18.18)	107.0 (11.69)	59.0 (6.45)	83.6 (9.13)	47.7 (5.21)	27.0 (2.95)	915.2 (100.00)
- Rural	124.4 (4.97)	532.3 (21.25)	406.6 (16.23)	309.7 (12.36)	257.1 (10.26)	203.6 (8.13)	316.7 (12.64)	245.5 (9.80)	109.6 (4.37)	2,505.3 (100.00)

Source : National Statistical Office , Report of the Labor Force Survey ... 1981

Note : In brackets are percentage .

TABLE 18

UNEMPLOYED WORKERS CLASSIFIED BY AGE GROUPS, REGION AND RURAL/URBAN AREAS IN 1981 (Round 2)

Age Group Region	(Unit: '000 persons)									Total
	11-14	15-19	20-24	25-29	30-34	35-39	40-49	50-59	60 +	
Bangkok	27.5 (3.00)	185.8 (20.55)	195.4 (21.34)	166.1 (18.14)	115.4 (12.60)	64.2 (7.01)	80.9 (8.84)	50.6 (5.53)	26.4 (2.88)	915.7 (100.0)
-Urban	15.8 (2.66)	123.4 (20.81)	134.4 (22.60)	120.7 (20.30)	68.4 (11.50)	38.8 (6.52)	48.5 (8.18)	28.6 (4.81)	14.4 (2.42)	595.0 (100.0)
-Rural	11.7 (3.65)	62.4 (19.45)	61.0 (19.01)	45.4 (14.15)	47.0 (14.65)	25.4 (7.92)	32.4 (10.10)	22.0 (6.86)	12.0 (3.74)	320.9 (100.0)
Central	36.8 (3.77)	191.6 (19.65)	177.8 (18.23)	134.3 (13.77)	90.3 (9.26)	61.1 (6.27)	125.7 (12.89)	98.4 (10.09)	55.3 (5.67)	975.2 (100.0)
-Urban	6.5 (4.75)	28.3 (20.70)	29.2 (21.36)	19.4 (14.19)	12.0 (8.78)	8.1 (5.93)	14.6 (10.68)	9.4 (6.88)	7.1 (5.19)	136.7 (100.0)
-Rural	30.3 (3.61)	163.3 (19.48)	148.6 (17.72)	114.9 (13.70)	78.3 (9.34)	53.0 (6.32)	111.1 (13.25)	89.0 (10.61)	48.2 (5.75)	838.5 (100.0)
North	46.1 (5.54)	167.5 (20.12)	160.6 (19.30)	100.1 (12.03)	63.1 (7.58)	58.0 (6.97)	101.8 (12.23)	98.2 (11.80)	33.6 (4.04)	829.0 (100.0)
-Urban	3.8 (3.84)	21.2 (21.44)	21.5 (21.74)	13.8 (13.95)	8.1 (8.19)	6.4 (6.47)	9.9 (10.01)	9.0 (9.10)	3.4 (3.44)	97.1 (100.0)
-Rural	42.3 (5.77)	146.3 (19.95)	139.1 (18.97)	86.3 (11.77)	55.0 (7.50)	51.6 (7.04)	91.9 (12.53)	89.2 (12.16)	30.2 (4.12)	731.9 (100.0)
Northeast	151.0 (10.19)	298.3 (20.13)	227.0 (15.32)	159.6 (10.77)	143.8 (9.70)	134.7 (9.09)	199.5 (13.46)	114.8 (7.75)	50.3 (3.39)	1482.0 (100.0)
-Urban	5.2 (6.38)	17.2 (21.10)	15.3 (18.77)	10.4 (12.76)	8.1 (9.94)	5.3 (6.50)	8.7 (10.67)	6.9 (8.47)	3.1 (3.80)	81.5 (100.0)
-Rural	145.8 (10.41)	281.1 (20.07)	211.7 (15.12)	149.2 (10.65)	135.7 (9.69)	129.4 (9.24)	190.8 (13.62)	107.9 (7.70)	47.2 (3.37)	1400.5 (100.0)
South	17.1 (3.97)	73.2 (17.01)	69.4 (16.12)	58.8 (13.66)	43.6 (10.13)	41.5 (9.64)	56.4 (13.10)	40.9 (9.50)	25.8 (5.99)	430.4 (100.0)
-Urban	4.1 (5.06)	17.3 (21.33)	16.8 (20.72)	12.6 (15.54)	6.4 (7.89)	5.7 (7.03)	7.6 (9.37)	5.7 (7.03)	3.1 (3.82)	81.1 (100.0)
-Rural	13.0 (3.72)	55.9 (16.00)	52.6 (15.06)	46.2 (13.23)	37.2 (10.65)	35.8 (10.25)	48.8 (13.97)	35.2 (10.08)	22.7 (6.50)	349.3 (100.0)
Whole Kingdom	279.5 (6.03)	917.4 (19.80)	831.8 (17.95)	621.5 (13.41)	457.2 (9.87)	361.4 (7.80)	565.3 (12.20)	403.9 (8.72)	192.7 (4.16)	4634.2 (100.0)
-Urban	35.7 (3.59)	208.1 (20.94)	218.4 (21.97)	178.4 (17.95)	103.7 (10.43)	65.3 (6.57)	90.2 (9.07)	60.4 (6.08)	31.8 (3.20)	994.0 (100.0)
-Rural	243.8 (6.70)	709.3 (19.49)	613.4 (16.85)	443.1 (12.17)	353.5 (9.71)	296.1 (8.13)	475.1 (13.05)	343.5 (9.44)	160.9 (4.42)	3640.2 (100.0)

Source : National Statistical Office, Report of the Labor Force Survey.

Note : In brackets are percentage.

TABLE 19

UNDEREMPLOYED WORKERS CLASSIFIED BY OCCUPATION, REGION AND  
RURAL/URBAN AREAS IN 1981. (ROUND 1)

(Unit: thousand persons)

Region	Occupation	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Bangkok		17.2 (36.9)	157.5 (40.1)	138.3 (7.6)	513.3 (43.9)	826.3 (24.2)
	Urban	13.7 (29.5)	141.0 (35.9)	14.1 (0.8)	389.4 (33.3)	558.2 (16.3)
	Rural	3.5 (7.5)	16.5 (4.2)	124.2 (6.9)	123.9 (10.6)	268.1 (7.9)
Central		8.0 (17.2)	104.5 (26.6)	484.2 (26.8)	264.2 (22.6)	860.9 (25.2)
	Urban	3.9 (8.4)	37.6 (9.6)	14.0 (0.77)	71.3 (6.1)	126.8 (3.7)
	Rural	4.1 (8.8)	66.9 (17.0)	470.7 (26.1)	192.9 (16.5)	734.1 (21.5)
Northern		4.9 (10.5)	57.9 (14.7)	438.4 (24.3)	130.7 (11.1)	631.9 (18.5)
	Urban	1.9 (4.1)	25.8 (6.6)	7.7 (0.43)	51.1 (4.4)	86.5 (2.5)
	Rural	3.0 (6.5)	32.1 (8.2)	430.7 (23.8)	79.6 (6.8)	545.4 (16.0)
Northeastern		10.9 (23.4)	45.8 (11.7)	473.1 (26.2)	182.6 (15.6)	712.4 (20.9)
	Urban	1.3 (2.8)	14.2 (3.6)	6.2 (0.34)	43.2 (3.7)	64.9 (1.9)
	Rural	9.6 (20.6)	31.6 (8.0)	466.9 (25.8)	139.4 (11.9)	647.5 (18.9)

TABLE 19 (Continued)

(Unit: thousand persons)

Region	Occupation	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Southern		5.5	27.4	271.3	76.8	381.0
		(11.8)	(7.0)	(15.0)	(6.6)	(11.16)
	Urban	2.5	17.2	13.2	42.3	75.2
		(5.4)	(4.4)	(0.7)	(3.6)	(2.2)
Rural		3.0	10.1	258.1	34.5	305.8
		(6.5)	(2.6)	(14.3)	(2.9)	(8.9)
Whole Kingdom		46.5	393.1	1,805.3	1,167.6	3,412.5
		(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
	Urban	23.3	235.8	55.2	597.3	911.6
		(50.1)	(60.0)	(3.1)	(51.15)	(26.7)
Rural		23.2	157.3	1,750.1	570.3	2,500.9
		(49.9)	(40.0)	(97.0)	(48.84)	(73.29)

Source: Nation Statistical Office, Office of the Prime Minister,  
Report of the Labor Force Survey. (Round 1), 1981.

Note: In Brackets are Percentage.

TABLE 20  
 UNDEREMPLOYED WORKERS CLASSIFIED BY OCCUPATION, REGION AND  
 RURAL/URBAN AREAS IN 1981. (ROUND 2)

(Unit: thousand persons)

Region	Occupation	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Bangkok		16.1 (40.25)	194.2 (45.2)	177.2 (5.64)	526.8 (52.7)	914.3 (19.8)
	Urban	14.0 (35.0)	163.5 (36.3)	17.9 (0.6)	398.9 (39.9)	594.3 (12.8)
	Rural	2.1 (5.25)	30.7 (6.8)	159.3 (5.0)	127.9 (12.8)	320.0 (7.0)
Central		9.8 (24.5)	119.7 (26.6)	569.3 (18.1)	275.4 (27.5)	974.2 (21.0)
	Urban	4.2 (10.5)	45.7 (10.2)	15.2 (0.48)	71.2 (7.1)	136.3 (2.9)
	Rural	5.6 (14.0)	74.0 (16.5)	554.1 (17.6)	204.2 (20.4)	837.9 (18.1)
Northern		2.2 (5.5)	58.4 (12.9)	694.5 (22.1)	73.2 (7.3)	828.3 (17.9)
	Urban	2 (5.0)	32.6 (7.2)	13.7 (0.4)	50.0 (5.0)	98.3 (2.1)
	Rural	0.2 (0.5)	25.8 (5.7)	680.8 (21.7)	23.2 (2.3)	730.0 (15.8)
Northeastern		6.7 (16.75)	49.8 (11.1)	1,366.9 (43.5)	58.0 (5.8)	1,481.4 (32.0)
	Urban	0.8 (2.0)	17.6 (3.9)	19.8 (0.6)	43.0 (4.3)	81.2 (1.8)
	Rural	5.9 (14.75)	32.2 (7.2)	1,347.1 (42.9)	15.0 (1.5)	1,400.2 (30.3)

TABLE 20 (Continued)

Region \ Occupation	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
Southern	5.2 (13.0)	27.7 (6.2)	330.6 (10.5)	66.1 (6.61)	429.6 (9.3)
Urban	2.0 (5.0)	18.8 (4.18)	10.8 (0.34)	49.0 (4.9)	80.6 (1.7)
Rural	3.2 (8.0)	8.9 (2.0)	319.8 (10.2)	17.1 (1.7)	349.0 (7.5)
Whole Kingdom	40.0 (100.0)	449.8 (100.0)	3,138.5 (100.0)	999.5 (100.0)	4,627.8 (100.0)
Urban	23.0 (57.5)	278.2 (61.8)	77.4 (2.5)	612.1 (61.24)	990.7 (21.4)
Rural	17.0 (42.5)	171.6 (38.1)	3,061.1 (97.5)	387.4 (38.76)	3,637.1 (78.6)

Source: Report of the labor Force Survey. (Round 2), 1981.

Note: In bracket are percentage

Having the availability of labor force surveys of two rounds (dry and wet seasons) can point out the movement of labor between two seasons. By subtracting employment in round 1 from round 2 is the amount of seasonal Unemployment.

Table 21 indicates the number of seasonal unemployment by regions and economic subsectors. The positive number is the number of seasonal unemployment. The negative number appears mostly in non-agricultural sectors outside Bangkok. The negative number means that people are employed temporarily during the off-seasons and go back to agricultural activities during the farming season. One important finding is that seasonal unemployment is an agricultural problem. Only Bangkok, non-agricultural sectors do not display a negative number except construction sector which indicates that many construction workers in Bangkok come from rural areas and go back when agricultural seasons starts. Overall, the commercial sector among regions show a small negative number (in absolute terms) indicates that there is a little movement between farm and commercial activity. It is also true for transport sector in which movement of labor from farm to transport sector is negligible. However, one can not say the same thing for manufacturing and service sectors, where negative sign (absolute term) is large. In particular, the negative appears very large in Northeast followed by the North. Surprisingly, the South and the Central regions, the negative sign in the manufacturing sector disappear indicating the advanced stage of industrial development relatively to that of the other regions (see the earlier explanation)

TABLE 21

SEASONAL UNEMPLOYMENT CLASSIFIED BY INDUSTRIAL SECTORS, REGION  
AND RURAL/URBAN AREA...1981

( Unit : ' 000 persons )

Region	Agriculture		Secondary			Tertiary			Unknw	Total
			Mining	Manufacturing	Construction	Electricity	Commerce	Transport		
Bangkok	61.0	1.2	29.9	- 7.3	- 2.9	71.6	0.9	51.3	- 0.2	205.6
	( 0.74)	(-8.96)	(-8.63)	( 2.35)	(69.05)	(183.12)	(-1.51)	(-8.91)	(10.00)	( 2.94)
Unban	4.1	1.5	22.2	- 5.3	- 2.6	62.4	0.9	47.7	- 0.2	150.9
	( 0.05)	(-11.19)	(-6.41)	( 1.70)	(61.90)	(159.59)	(-1.81)	(-8.29)	(10.00)	( 1.87)
Rural	56.9	- 0.3	7.7	- 2.0	- 0.3	9.2	0.0	3.6	-	74.7
	( 0.69)	( 2.24)	(-2.22)	( 0.64)	( 7.14)	(23.53)	( 0.0)	(-0.63)	( - )	( 1.07)
Central	1,034.8	- 6.0	12.3	- 84.8	- 1.2	19.0	1.5	- 30.0	- 1.3	944.4
	(12.55)	(44.78)	(-3.55)	(27.24)	(28.57)	(48.59)	(-3.01)	( 5.21)	(65.00)	(13.52)
Unban	1.8	- 0.1	- 0.4	- 0.3	- 0.6	19.8	3.1	4.1	- 0.3	27.8
	( 0.02)	( 0.75)	( 0.12)	( 0.09)	(14.29)	(50.64)	(-6.22)	(-0.71)	(15.00)	( 0.40)
Rural	1,033.0	- 5.9	12.7	- 84.5	- 0.6	- 0.8	- 1.6	- 25.9	- 0.8	916.6
	(12.52)	(44.03)	(-3.67)	(27.14)	(14.29)	(-2.05)	( 3.21)	( 4.50)	(40.00)	(13.12)
Norht	2,121.8	- 5.2	- 162.7	- 68.2	0.4	- 14.4	- 14.2	- 108.5	- 0.5	1,749.2
	(25.72)	(38.81)	(46.98)	(21.91)	(-9.52)	(-36.83)	(28.51)	(18.85)	(25.00)	(25.04)
Unban	8.7	- 0.4	- 1.3	- 2.0	0.6	8.4	- 0.4	0.9	- 0.5	13.9
	( 0.11)	( 2.99)	( 0.38)	( 0.64)	(-14.29)	(21.48)	( 0.80)	(-0.12)	(25.00)	( 0.20)
Rural	2,113.1	- 4.8	- 161.4	- 66.2	- 0.2	- 22.8	- 13.8	- 109.4	-	1,735.3
	(25.62)	(35.82)	(46.61)	(21.27)	( 4.76)	(-58.31)	(27.71)	(19.00)	( - )	(24.84)
Northeast	5,069.6	- 10.1	- 251.4	- 169.0	1.9	- 72.8	- 40.0	- 456.0	-	4,071.3
	(61.46)	(75.37)	(72.60)	(54.29)	(-45.24)	(-186.19)	(80.52)	(79.21)	( - )	(58.28)
Unban	15.6	- 0.2	3.1	- 0.4	0.0	5.0	0.3	- 0.7	-	22.7
	( 0.19)	( 1.49)	(-0.90)	( 0.13)	( 0.0)	(12.79)	(-0.60)	( 0.12)	( - )	( 0.32)
Rural	5,054.0	- 9.9	- 254.5	- 168.6	1.9	- 67.8	- 40.3	- 455.3	-	4,048.6
	(61.27)	(73.88)	(73.49)	(54.16)	(-45.24)	(173.40)	(80.92)	(79.09)	( - )	(57.96)
South	- 38.4	6.9	25.4	17.9	- 2.4	35.9	1.8	- 32.6	-	14.6
	(-0.46)	(-51.49)	(-7.33)	(-5.75)	(57.14)	(91.82)	(-3.61)	( 5.66)	( - )	( 0.21)
Unban	- 3.1	0.5	5.1	1.6	- 0.5	9.3	- 1.0	5.9	-	17.8
	(-0.04)	(-3.73)	(-1.47)	(-0.51)	(11.90)	(23.79)	( 2.01)	(-1.02)	( - )	( 0.25)
Rural	- 35.3	6.4	20.3	16.3	- 2.9	45.2	2.8	- 38.5	-	- 3.2
	(-0.43)	(-47.76)	(-5.86)	(-5.23)	(69.05)	(115.60)	(-5.62)	( 6.69)	( - )	(-0.05)
Whole Kingdom	8,248.7	- 13.4	- 346.3	- 311.3	- 4.2	39.1	- 49.8	- 575.7	- 2.0	6,985.2
	(100.0)	(100.0)	( 70.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)
Unban	27.1	1.3	28.8	- 5.6	- 3.2	104.8	3.0	57.9	- 1.0	213.1
	(0.33)	(-9.70)	(-8.32)	( 1.80)	(76.19)	(268.03)	(-6.07)	(-10.06)	(50.00)	( 3.05)
Rural	8,221.6	- 14.7	- 375.1	- 305.7	- 1.0	- 65.7	- 52.8	- 633.6	- 1.0	6,772.1
	(99.67)	(109.70)	(108.52)	(98.20)	(23.81)	(-168.03)	(106.02)	(110.06)	(50.00)	(96.95)

Source: Report of the Labor Force Survey.

Note: In bracket are percentage.

Table 22 also confirms other finding regarding age groups which indicates that age groups of 15-19 and 20-24 pose serious problems in terms of seasonal unemployment. The point is that of all three types of unemployment, the young labor force appears to pose the most serious problems for the government. Finally in table 23, the most critical occupation in seasonal unemployment is the agricultural workers. In sum, the most critical region in terms of seasonal unemployment is the Northeast and the young labor force constituting the most pressing problem. Seasonal unemployment is purely a problem of agricultural sector.

Table 22 Seasonal Unemployed Workers Classified By age group, region and rural/urban areas in 1981.

( Unit : ' 000 persons )

Age group Region	11-14	15-19	20-24	25-29	30-34	35-39	40-43	50-59	60 +	Total
Bangkok	13.0 (6.32)	27.9 (13.56)	30.7 (15.43)	35.8 (19.17)	27.2 (13.22)	19.8 (10.01)	22.4 (12.45)	16.0 (6.88)	12.0 (5.35)	205.7 (100.00)
- Urban	6.4 (4.89)	15.5 (11.84)	20.2 (15.43)	25.1 (19.17)	17.3 (13.22)	13.1 (10.01)	16.3 (12.45)	9.0 (6.88)	7.0 (5.35)	130.9 (100.00)
- Rural	6.6 (8.82)	12.4 (16.58)	10.5 (14.04)	10.7 (14.30)	9.9 (13.24)	6.7 (8.96)	6.1 (8.16)	7.0 (9.36)	5.0 (6.68)	74.8 (100.00)
Central	73.8 (7.81)	133.1 (14.09)	144.2 (15.27)	119.9 (12.69)	100.6 (10.65)	82.1 (8.69)	117.8 (12.47)	100.3 (10.62)	72.6 (7.69)	944.6 (100.00)
- Urban	4.2 (15.05)	5.0 (17.92)	5.9 (21.15)	2.0 (7.17)	2.5 (8.96)	1.7 (6.09)	2.9 (10.39)	1.3 (4.66)	2.0 (7.17)	27.9 (100.00)
- Rural	69.6 (7.59)	128.1 (13.97)	138.3 (15.09)	117.9 (12.86)	98.1 (10.70)	80.4 (8.77)	114.9 (12.53)	99.0 (10.80)	70.6 (7.70)	916.7 (100.00)
North	114.2 (6.35)	312.7 (17.88)	286.3 (16.37)	234.3 (13.39)	171.5 (9.80)	127.3 (7.28)	249.5 (14.26)	178.8 (10.22)	74.6 (4.26)	1,749.2 (100.00)
- Urban	2.5 (18.12)	0.8 (5.80)	1.1 (7.97)	1.1 (7.97)	0.3 (2.17)	1.7 (12.32)	2.5 (18.12)	3.5 (25.36)	0.3 (2.17)	13.8 (100.00)
- Rural	111.7 (6.44)	311.9 (17.97)	285.2 (285.2)	233.2 (13.44)	171.2 (9.87)	125.6 (7.24)	247.0 (14.23)	175.3 (10.10)	74.3 (4.28)	1,735.4 (100.00)
Northeast	432.9 (10.63)	686.0 (16.85)	622.1 (15.28)	502.7 (12.30)	447.5 (10.99)	333.6 (8.19)	530.8 (13.04)	366.4 (9.00)	149.0 (3.66)	4,071.1 (100.00)
- Urban	2.4 (10.62)	3.1 (13.72)	4.0 (17.70)	2.5 (10.70)	3.1 (13.72)	-0.2 (-0.88)	3.0 (13.27)	3.5 (15.49)	1.4 (6.19)	22.6 (100.00)
- Rural	430.5 (10.63)	682.9 (16.87)	618.1 (15.27)	500.2 (12.36)	444.4 (10.98)	333.8 (8.25)	527.8 (13.04)	362.9 (8.96)	147.6 (3.65)	4,048.5 (100.00)
South	10.3 (67.32)	-3.0 (-19.61)	3.2 (20.92)	4.9 (32.3)	2.1 (13.70)	7.3 (47.71)	8.1 (52.94)	-1.3 (-8.50)	-16.6 (-108.50)	15.3 (100.00)
- Urban	3.1 (16.85)	3.4 (18.48)	2.7 (14.67)	1.9 (10.33)	1.5 (18.58)	0.4 (2.17)	3.3 (17.93)	2.1 (11.41)	0.0 (0.0)	18.4 (100.00)
- Rural	7.2 (-232.26)	-6.4 (206.45)	0.5 (-16.13)	3.0 (-96.47)	0.6 (-19.35)	6.9 (-222.58)	4.8 (-154.84)	-3.4 (109.68)	-16.6 (535.48)	-3.1 (100.00)
Whole Kingdom	644.7 (9.23)	1,156.5 (16.56)	1,086.4 (15.55)	897.9 (12.5)	748.6 (10.72)	569.8 (8.16)	929.0 (12.30)	660.1 (9.45)	292.3 (4.18)	6,985.2 (100.00)
- Urban	19.0 (0.89)	27.5 (1.29)	34.0 (1.60)	32.7 (1.53)	24.4 (1.14)	16.5 (0.77)	28.2 (1.32)	19.4 (0.91)	11.4 (0.53)	2,131.1 (100.00)
- Rural	625.7 (9.24)	1,129.0 (16.67)	1,052.4 (15.54)	865.2 (12.78)	724.2 (10.69)	553.3 (8.17)	900.8 (13.30)	640.7 (9.46)	280.9 (4.15)	6,772.1 (100.00)

Source : National Statistical Office , Report of the Labor Force Survey ..

Note : In brackets are percentage .

TABLE 23  
SEASONAL UNEMPLOYMENT CLASSIFIED BY OCCUPATION, REGION  
AND RURAL/URBAN AREA....1981

( Unit : ' 000 persons )

Region	Occupation				Total
	Professional/ Management	Clerical/Sales Workers	Agricultural Workers	Blue Collars	
Bangkok	36.5 (69.79)	75.1 (641.88)	60.8 ( 0.73)	32.8 (-2.42)	204.3 ( 2.93)
Urban	32.2 (61.57)	67.3 (575.21)	3.2 ( 0.04)	27.9 (-2.06)	130.2 ( 1.86)
Rural	4.3 ( 8.22)	7.8 (66.67)	57.6 ( 0.69)	4.9 (-0.36)	74.1 ( 1.06)
Central	10.1 (19.31)	25.7 (219.66)	1,021.3 (12.34)	- 113.4 ( 8.37)	942.9 (13.50)
Urban	2.3 ( 4.40)	23.5 (200.85)	0.8 ( 0.01)	0.9 (-0.07)	27.1 ( 0.39)
Rural	7.8 (14.91)	2.2 (18.80)	1,020.5 (12.33)	- 114.3 ( 8.44)	915.8 (13.11)
North	10.4 (19.89)	- 33.0 (-282.05)	2,126.7 (25.70)	- 355.7 (26.26)	1,747.8 (25.03)
Urban	7.9 (15.11)	3.2 (27.35)	9.0 ( 0.11)	- 6.4 ( 0.47)	13.3 ( 0.19)
Rural	2.5 ( 4.78)	- 36.2 (-309.40)	2,117.7 (25.59)	- 349.3 (25.79)	1,734.5 (24.84)
Northeast	- 2.2 (-4.21)	- 90.4 (-772.65)	5,110.0 (61.76)	- 946.8 (69.90)	4,070.0 (58.28)
Urban	2.1 ( 4.02)	5.4 (46.15)	15.8 ( 0.19)	- 0.9 ( 0.07)	22.1 ( 0.32)
Rural	- 4.3 (-8.22)	- 95.8 (-818.80)	5,094.2 (61.56)	- 945.9 (69.83)	4,047.9 (57.96)
South	- 3.4 (-6.50)	33.8 (288.89)	- 44.3 (-0.54)	27.7 (-2.05)	13.1 ( 0.19)
Urban	1.8 ( 3.44)	7.6 (64.96)	- 2.2 (-0.03)	10.0 (-0.74)	16.8 ( 0.24)
Rural	- 5.2 (-9.94)	26.2 (223.93)	- 42.1 (-0.51)	17.7 (-1.31)	- 3.7 (-0.05)
Whole Kingdom	52.3 (100.0)	11.7 (100.0)	8,274.6 (100.0)	-1,354.5 (100.0)	6,983.4 (100.0)
Urban	46.8 (89.48)	107.4 (917.95)	26.7 ( 0.32)	31.8 (-2.35)	212.3 ( 3.04)
Rural	5.5 (10.52)	- 95.7 (-817.95)	8,247.9 (99.68)	-1,386.3 (102.35)	6,771.1 (96.96)

Source: Report of the Labor Force Survey.

Note: In brackets are percentage .

The Trends and Changing Pattern of Unemployment 1977-1981

In Order to supplement the projection study, it is appropriate to add few more details on the changing pattern of unemployment overtime. Ideally, it will be logical to have the long history of changing pattern of unemployment in a longer time series information, however the limitation on LFS will not allow us to do. The consistent definition (for comparison over time) is only recent as 1977. In addition, the main concern of this section is the unemployment, the trends in employment will not be included.

Open-Unemployment

The study of Chira and Pradit,<sup>1</sup> utilized the existing definition of LFS<sup>2</sup> indicates that by this definition the severity of open unemployment does not exist. In the past open unemployment has never been higher than 3%, only in Bangkok, open unemployment is considered to be relatively higher and can pose some serious problems to the government (table 24)

However this study will attempt to adjust the definition of open unemployment. (see definition in the appendix).

From tables 25, 26, 27 here are the following preliminary results:

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<sup>1</sup>Chira Hongladarom and Pradit Charsoambut. Current Employment Situation with Specific Reference to Rural Employment. Paper prepared for a seminar on Employment Problems and Rural Credit in Thailand, at the Dusit Thani Hotel, March 31, 1984. pp.17 -19.

<sup>2</sup>Open unemployment refers to those persons, 11 years of age and over, who, during the survey week, did not work at all, but wanted to work and were able to do so.

TABLE 24

RATE OF OPEN UNEMPLOYMENT BY REGION, 1974-1981

(Unit: Percent)

Year	Bangkok	Central	North	Northeast	South
1974	1.36	0.44	0.12	0.38	0.43
1975	1.23	0.36	0.20	0.27	0.75
1976	1.73	0.77	0.47	0.96	0.61
1977	2.33	1.17	0.55	1.47	1.21
1978	2.67	1.37	0.49	0.52	1.70
1979	3.31	1.12	0.47	0.77	1.44
1980	3.51	1.26	0.56	0.61	1.70
1981	3.00	1.10	0.40	0.30	0.70

Source; National Statistical Office, Report of the Labour Force Survey,  
 Whole Kingdom 1974-1981 Round 2 (July-September), Bangkok.

TABLE 25

NUMBER AND ANNUAL RATE OF GROWTH OF OPEN UNEMPLOYMENT CLASSIFIED BY AGE GROUP  
IN 1977-1981.....WHOLE KINGDOM

(Unit: thousand persons)

Round	Year	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1	1977	405.1 ( 9.6 )	1,052.1 (25.00)	817.5 (19.40)	531.3 (12.60)	390.1 ( 9.30)	335.6 ( 8.00)	394.7 ( 9.40)	201.5 ( 4.80)	76.8 ( 1.8)	4,205.6 (100.0)
	1981	229.4 ( 3.84)	980.5 (16.60)	1,013.5 (16.99)	817.2 (13.70)	660.8 (11.08)	492.3 ( 8.25)	853.5 (14.31)	629.4 (10.55)	276.2 ( 4.63)	5,966.5 (100.0)
Growth Rate		-14.09	- 1.76	5.57	10.76	13.18	9.58	19.28	28.47	32.00	8.74
2	1977	76.6 ( 8.86)	210.4 (24.34)	194.6 (22.52)	106.9 (12.37)	75.8 ( 8.77)	74.8 ( 8.65)	80.1 ( 9.27)	36.6 ( 4.23)	20.7 ( 2.40)	864.5 (100.0)
	1981	19.1 ( 4.75)	79.4 (19.74)	104.0 (25.86)	58.6 (14.57)	30.6 ( 7.61)	19.3 ( 4.80)	43.8 (10.88)	28.8 ( 7.16)	15.7 ( 3.90)	402.2 (100.0)
Growth Rate		-34.72	-24.36	-15.66	-15.03	-22.68	-33.87	-15.09	- 5.99	- 6.91	-19.12

Source: Report of the Labor Force Survey, 1977 and 1981.

Note: in bracket are percent.

TABLE 26

NUMBER AND ANNUAL RATE OF GROWTH OF OPEN UNEMPLOYMENT CLASSIFIED BY AGE GROUP  
AND REGION IN 1977-1981 (ROUND 1)

(Unit: thousand persons)

Year	Region	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1977	Bangkok	0.4 ( 0.70)	9.0 (16.20)	17.6 (31.80)	15.6 (28.20)	5.8 ( 6.90)	2.1 ( 3.80)	4.2 ( 7.60)	1.2 ( 2.20)	0.5 ( 0.50)	55.4 (100.0)
	Central	46.5 ( 7.80)	135.4 (22.80)	114.9 (19.40)	75.0 (12.60)	60.8 (10.20)	48.4 ( 8.10)	62.9 (10.60)	35.2 ( 5.90)	12.8 ( 2.20)	595.0 (100.0)
	North	85.4 ( 7.80)	293.9 (27.00)	194.2 (17.80)	120.9 (11.10)	91.4 ( 8.40)	106.6 ( 9.80)	118.2 (10.90)	58.5 ( 5.40)	25.8 ( 2.40)	1,088.5 (100.0)
	Northeast	268.3 (11.30)	591.6 (24.90)	468.4 (19.70)	306.9 (12.90)	229.1 ( 9.60)	173.1 ( 7.30)	202.5 ( 8.50)	102.2 ( 4.30)	35.2 ( 1.50)	2,378.7 (100.0)
	South	2.5 ( 3.10)	20.7 (26.00)	20.9 (26.50)	12.1 (15.20)	4.1 ( 5.20)	4.8 ( 6.00)	6.0 ( 7.50)	5.6 ( 7.00)	2.3 ( 2.90)	79.6 (100.0)
1981	Bangkok	2.3 ( 2.33)	17.6 (17.83)	20.2 (20.47)	19.7 (19.96)	9.6 ( 9.73)	7.0 ( 7.09)	7.2 ( 7.29)	5.8 ( 5.83)	4.9 ( 4.96)	98.7 (100.0)
	Central	18.9 ( 2.31)	124.1 (15.18)	146.7 (17.95)	115.5 (14.11)	80.3 ( 9.83)	66.6 ( 8.15)	111.6 (13.65)	93.6 (11.45)	57.5 ( 7.04)	817.3 (100.0)
	North	63.9 ( 4.09)	266.7 (17.08)	264.3 (16.92)	210.3 (13.47)	172.6 (11.05)	118.5 ( 7.59)	234.8 (14.98)	170.1 (10.89)	57.9 ( 3.71)	1,561.8 (100.0)
	Northeast	141.7 ( 4.15)	569.2 (16.67)	569.4 (16.67)	456.6 (13.37)	388.1 (11.36)	292.1 ( 8.55)	487.9 (14.28)	352.8 (10.33)	155.3 ( 4.55)	3,413.1 (100.0)
	South	1.5 ( 2.12)	11.0 (15.58)	11.4 (16.15)	14.2 (20.11)	8.7 (12.32)	7.2 (10.20)	8.5 (12.04)	6.2 ( 8.78)	0.4 ( 0.57)	70.6 (100.0)
Growth Rate	Bangkok	43.75	16.77	3.44	5.83	23.17	30.10	13.47	39.39	69.83	14.44
	Central	-22.51	- 2.18	6.11	10.75	6.95	7.98	14.33	24.45	37.56	8.02
	North	- 7.25	- 2.45	7.70	13.84	15.89	2.65	17.16	26.68	20.21	9.03
	Northeast	-15.96	- 0.96	4.88	9.90	13.18	1.69	21.98	30.97	37.11	9.03
	South	-12.77	-15.81	-15.15	4.00	18.81	10.14	8.71	2.54	- 43.73	2.99

Source: Report of the Labor Force Survey.

Note: in bracket are percent.

TABLE 27

NUMBER AND ANNUAL RATE OF GROWTH OF OPEN UNEMPLOYMENT CLASSIFIED BY AGE GROUP AND REGION IN 1977-1981 (ROUND 2)

(Unit: thousand persons)

Year	Region	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total		
1977	Bangkok	1.0 (2.20)	6.4 (18.50)	19.8 (43.61)	8.7 (19.16)	3.0 (6.61)	1.6 (3.52)	0.7 (1.54)	0.9 (1.98)	0.1 (0.22)	45.4 (100.0)		
	Central	9.5 (8.25)	34.1 (29.65)	24.5 (21.11)	12.1 (10.51)	8.1 (7.04)	8.1 (7.04)	9.6 (8.34)	3.5 (2.87)	3.4 (2.95)	115.1 (100.0)		
	North	25.9 (12.00)	60.5 (28.02)	45.5 (21.07)	29.8 (13.80)	5.4 (2.50)	15.2 (7.04)	30.0 (13.90)	9.8 (4.54)	1.0 (0.46)	215.9 (100.0)		
	Northeast	34.9 (9.91)	81.2 (23.07)	67.8 (19.26)	38.9 (11.05)	41.6 (11.82)	33.5 (9.46)	34.6 (9.83)	11.6 (3.30)	6.3 (1.79)	332.0 (100.0)		
	South	4.6 (3.41)	24.6 (16.41)	20.9 (15.42)	16.5 (12.25)	16.5 (12.25)	16.3 (12.10)	13.6 (10.10)	10.4 (7.72)	9.5 (7.05)	134.7 (100.0)		
	1981	Bangkok	2.2 (2.79)	15.5 (19.70)	25.9 (32.90)	17.1 (21.80)	8.0 (10.20)	5.9 (4.90)	3.9 (4.90)	1.9 (2.50)	0.2 (0.25)	78.6 (100.0)	
		Central	6.9 (7.35)	24.4 (26.00)	26.3 (30.17)	9.7 (10.34)	2.9 (3.09)	5.2 (3.41)	9.1 (9.70)	3.6 (3.84)	3.7 (3.94)	93.8 (100.0)	
		North	1.2 (4.36)	6.9 (25.09)	7.9 (28.73)	3.5 (12.75)	3.2 (11.64)	1.8 (6.55)	4.1 (14.91)	2.0 (7.27)	0.4 (1.45)	27.5 (100.0)	
		Northeast	5.6 (5.41)	17.5 (16.89)	22.1 (21.35)	11.5 (11.10)	11.8 (11.39)	4.0 (3.86)	14.8 (14.29)	9.6 (9.27)	4.7 (4.54)	105.6 (100.0)	
		South	2.2 (2.44)	13.9 (15.44)	16.8 (20.89)	15.9 (17.67)	3.8 (4.22)	5.6 (6.22)	10.8 (12.00)	11.0 (12.20)	6.4 (7.11)	90.0 (100.0)	
		Growth Rate	Bangkok	19.71	13.82	6.71	16.89	24.52	22.27	42.94	18.66	17.33	13.72
			Central	-7.99	-6.37	3.81	-5.53	-25.66	-23.22	-1.33	2.18	2.11	-5.10
North			-76.8	-54.28	-45.77	-53.54	-13.06	-53.34	-45.76	-39.73	-22.91	-51.52	
Northeast			-45.74	-38.37	-28.02	-30.47	-31.50	-52.98	-21.23	-4.73	-7.32	-30.58	
South			-18.64	-14.47	-2.65	-0.93	-36.71	-26.71	-5.76	-1.40	-9.87	-10.08	

1. The change in definition and based on two rounds surveys the number of open-unemployed shot up significantly especially in round 2.
2. For the whole country (in round 1), the number of unemployed went up by average of 8.74 per annum, while the all age groups except 11-14 and to a lesser extent 15-19, the open unemployment rate has been increasing.
3. Regional pattern appears to follow the national pattern with respect to growth rate and age group pattern.

#### Underemployment

As the previous study (Chira and Pradit)<sup>1</sup> has concluded "Underemployment tended to decline during 1977-81". Since this study will not adjust any definition of underemployment, the additional aspect of this study to monitor such a decline carefully.

Here are some of the preliminary findings:

1. For both rounds, only Bangkok region indicates such an significant increase in underemployment.<sup>2</sup>
2. For both rounds, the decline has been very significant in primary sector employment and very severe in Northeast (tables 28-30).
3. Pattern of underemployment in modern sectors is fascinating. It appears that underemployment is more severe in manufacturing construc-

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<sup>1</sup> Ibid, pp.25

<sup>2</sup> Bangkok is unique since income used to measure underemployment is adjusted by change in minimum wage-while rural areas, 250 baht is used over time.

TABLE 26  
 NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
 BY SECTORS IN 1977-1981....WHOLE KINGDOM

(Unit: thousand persons)

Round	Year	Primary	Secondary			Tertiary				Total
			Mining	Manufacturing	Construction	Electricity	Commerce	Transportation	Service	
1	1977	3,827.7 (80.44)	7.6 ( 0.16)	405.2 ( 8.52)	29.0 ( 0.61)	1.1 ( 0.02)	206.6 ( 4.34)	24.3 ( 0.51)	256.9 ( 5.40)	4,758.4 (100.0)
	1981	1,803.4 (52.75)	14.7 ( 0.43)	606.7 (17.75)	113.6 ( 3.32)	8.8 ( 0.26)	350.5 (10.25)	41.3 ( 1.21)	478.6 (14.00)	3,418.7 (100.0)
Growth Rate		- 18.8	16.5	10.1	(34.1)	52.0	13.2	15.3	15.5	- 8.3
2	1977	6,528.2 (89.64)	5.8 ( 0.08)	296.4 ( 4.07)	18.2 ( 0.25)	0.6 ( 0.01)	179.9 ( 2.47)	16.9 ( 0.23)	236.7 ( 3.25)	7,282.7 (100.0)
	1981	3,148.1 (67.92)	6.1 ( 0.13)	551.1 (11.89)	70.9 ( 1.53)	6.0 ( 0.13)	387.2 ( 8.35)	41.1 ( 0.89)	422.1 ( 9.11)	4,634.7 (100.0)
Growth Rate		- 18.2	1.3	15.5	34.0	57.6	19.2	22.2	14.5	- 11.3

Source: The Labour Force Survey.

Note: in brackets are percent.

TABLE 29

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY SECTORS AND REGION IN 1977-1981... ROUND 1

(Unit: thousand persons)

Year	Region	Primary	Secondary			Tertiary				Total
			Mining	Manufacturing	Construction	Electricity	Commerce	Transportation	Services	
1977	Bangkok	160.5 (32.05)	0.5 ( 0.10)	147.0 (29.35)	10.6 ( 2.12)	0.1 ( 0.02)	60.6 (12.1)	6.2 ( 1.24)	115.3 (23.02)	500.6 (100.0)
	Central	624.1 (76.45)	0 (0)	79.5 ( 9.74)	8.9 ( 1.09)	0.2 ( 0.02)	49.9 ( 6.11)	7.6 ( 0.95)	46.1 ( 5.65)	816.3 (100.0)
	North	888.2 (90.86)	0.2 ( 0.02)	35.1 ( 3.59)	2.5 ( 0.26)	0.8 ( 0.08)	27.0 ( 2.76)	1.5 ( 0.15)	22.2 ( 2.27)	977.5 (100.0)
	Northeast	1,611.2 (86.60)	2.6 ( 0.14)	126.7 ( 6.81)	5.8 ( 0.31)	0 (0)	48.8 ( 2.62)	6.0 ( 0.32)	59.5 ( 3.20)	1,860.6 (100.0)
	South	543.2 (90.76)	4.2 ( 0.70)	16.1 ( 2.69)	0.6 ( 0.10)	0 (0)	19.4 ( 3.24)	2.0 ( 0.33)	13.0 ( 2.17)	598.5 (100.0)
1981	Bangkok	136.6 (16.50)	0.1 ( 0.01)	284.0 (34.31)	43.9 ( 5.30)	3.6 ( 0.43)	140.5 ( 16.97)	17.8 ( 2.15)	200.0 (24.16)	827.7 (100.0)
	Central	485.2 (56.34)	8.4 ( 0.98)	145.1 (16.85)	24.4 ( 2.83)	2.8 ( 0.33)	91.5 (10.62)	9.5 ( 1.10)	93.8 (10.89)	861.2 (100.0)
	North	437.9 (69.22)	1.7 ( 0.27)	63.4 (10.02)	11.8 ( 1.87)	0.5 ( 0.08)	48.8 ( 7.71)	3.6 ( 0.57)	63.5 (10.04)	632.6 (100.0)
	Northeast	473.9 (66.40)	2.1 ( 0.29)	65.8 ( 9.22)	28.6 ( 4.01)	0.4 ( 0.06)	45.0 ( 6.31)	5.5 ( 0.74)	91.4 (12.81)	713.7 (100.0)
	South	268.9 (70.36)	2.1 ( 0.55)	47.4 (12.40)	4.2 ( 1.10)	1.5 ( 0.39)	23.8 ( 6.23)	4.4 ( 1.15)	28.8 ( 7.54)	382.2 (100.0)
Growth Rate										
	Bangkok	- 4.0	- 40.2	16.5	35.5	89.6	21.0	26.4	13.8	12.5
	Central	- 6.3	-	15.0	25.2	66.0	15.2	5.6	17.8	1.3
	North	- 17.7	53.5	14.8	38.8	- 11.7	14.8	21.9	26.3	- 18.9
	Northeast	- 30.6	- 5.3	- 16.4	39.9	-	- 2.0	- 3.1	10.7	- 24.0
	South	- 17.6	- 17.3	27.0	48.7	-	5.1	19.7	20.0	- 11.3

TABLE 30

 NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
 BY SECTORS AND REGION IN 1977-1981....ROUND 2

(Unit: thousand persons)

Year	Region	Primary	Secondary			Tertiary				Total
			Mining	Manufacturing	Construction	Electricity	Commerce	Transportation	Services	
1977	Bangkok	195.9 (36.82)	0.5 (0.09)	142.9 (26.86)	7.7 (1.45)	0.4 (0.08)	54.6 (10.26)	4.9 (0.92)	125.2 (23.53)	532.1 (100.0)
	Central	828.2 (83.31)	0.9 (0.09)	67.8 (6.82)	4.6 (0.46)	0.2 (0.02)	48.6 (4.89)	4.0 (0.40)	38.9 (3.91)	994.1 (100.0)
	North	1,450.7 (96.23)	0.1 (0.01)	19.9 (1.31)	3.0 (0.20)	0 (0)	15.3 (1.01)	0.9 (0.06)	18.1 (1.19)	1,518.0 (100.0)
	Northeast	3,489.9 (96.67)	0.6 (0.02)	42.1 (1.17)	0.8 (0.02)	0 (0)	36.5 (1.01)	4.5 (0.12)	35.8 (0.99)	3,610.2 (100.0)
	South	552.7 (38.59)	3.7 (0.59)	22.8 (3.65)	1.6 (0.26)	0 (0)	23.2 (3.72)	1.5 (0.29)	18.1 (2.90)	623.9 (100.0)
1981	Bangkok	175.3 (19.19)	0.4 (0.04)	298.7 (32.71)	34.5 (3.78)	2.4 (0.26)	169.9 (18.60)	19.9 (2.18)	212.2 (23.23)	913.3 (100.0)
	Central	577.4 (59.36)	1.6 (0.16)	157.7 (16.21)	22.9 (2.35)	1.1 (0.11)	96.4 (9.91)	11.2 (1.15)	104.4 (10.73)	972.7 (100.0)
	North	695.2 (83.85)	0 (0)	36.4 (4.39)	4.3 (0.52)	1.0 (0.12)	50.3 (6.07)	3.4 (0.41)	37.7 (4.55)	829.1 (100.0)
	Northeast	1,569.2 (92.46)	0 (0)	25.6 (1.73)	3.4 (0.23)	0.2 (0.01)	44.3 (2.99)	3.5 (0.24)	34.6 (2.34)	1,480.8 (100.0)
	South	329.2 (76.81)	4.0 (0.93)	31.7 (7.40)	5.0 (1.17)	0.8 (0.19)	24.6 (5.74)	1.9 (0.44)	31.4 (7.33)	428.6 (100.0)
Growth Rate										
	Bangkok	- 2.8	- 5.6	18.4	37.5	44.8	28.4	35.0	13.2	13.5
	Central	- 9.0	24.4	21.1	40.1	42.6	17.1	25.7	24.7	- 0.5
	North	- 18.6	-	15.1	9.0	-	29.7	18.3	18.3	- 15.1
	Northeast	- 23.4	-	12.4	36.2	-	4.8	6.5	- 0.8	- 22.3
	South	- 12.9	1.9	8.2	28.5	-	6.7	1.4	13.8	- 9.4

tion, commerce and services in all regions. Only Northeast, underemployment in manufacturing sector is declining.

4. For the whole kingdom, by age groups, the underemployment has declined for all age groups (tables 31-33). However for the regions, the rate of change of underemployment by age groups manifests different and interesting pattern. Bangkok displays a significant growth rate for underemployment for all age groups except 11-14 category. For Central region, the growth of underemployment is higher in 1981 for 15-19, 20-24, 25-30, 30-34 age categories. The possible hypothesis is that the role of non-primary sector employment in Bangkok and Central regions play important role in increasing underemployment among younger age groups (especially in the Central region) to compensate for a reduction in underemployment in primary employment.

5. The pattern of occupation is so consistent with the hypothesis. This is a decline of agricultural workers, there is an increase especially Clerical/Sales and Blue Collars (tables 34-36). However the Northeast, the pattern is different because the decline is seen for all occupational groups.

#### Seasonal Unemployment

Because the figure of seasonal unemployment is calculated from subtraction round 1 from round 2 figure, growth rate will not be calculated, however tables 37, 38, 39 offer interesting pattern for comparison. The preliminary conclusions are as follow:

TABLE 31

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY AGE GROUPS IN 1977-1981.....WHOLE KINGDOM

(Unit: thousand persons)

Round	Year	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1	1977	280.9 ( 5.90)	795.9 (16.72)	611.1 (12.84)	544.2 (11.43)	466.9 ( 9.81)	455.0 ( 9.56)	805.4 (16.92)	507.8 (10.67)	293.9 ( 6.17)	4,760.0 (100.0)
	1981	149.9 ( 4.38)	723.3 (21.15)	616.6 (18.03)	476.1 (13.92)	364.1 (10.64)	262.6 ( 7.68)	400.3 (11.70)	293.2 ( 8.57)	136.6 ( 3.92)	3,420.5 (100.0)
Growth Rate		- 15.70	- 2.39	0.22	- 3.34	- 6.22	- 13.74	- 17.48	- 13.73	- 19.15	- 8.30
2	1977	639.8 ( 5.78)	1,455.5 (19.98)	1,046.0 (14.36)	810.7 (11.13)	690.5 ( 9.48)	652.6 ( 8.96)	1,056.6 (14.51)	620.7 ( 8.52)	311.3 ( 4.27)	7,283.9 (100.0)
	1981	279.5 ( 6.03)	917.4 (19.80)	831.8 (17.95)	621.5 (13.41)	457.2 ( 9.87)	361.4 ( 7.80)	565.3 (12.20)	403.9 ( 8.72)	192.7 ( 4.16)	4,634.2 (100.0)
Growth Rate		- 20.70	- 11.54	- 5.73	- 6.64	- 10.31	- 14.77	- 15.64	- 10.74	- 11.99	- 11.30

Source: The Labour Force Survey.

Note: in brackets are percent.

TABLE 32

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY AGE GROUPS AND REGION IN 1977-1981 (ROUND 1)

(Unit: thousand persons)

Year	Region	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1977	Bangkok	20.6 ( 4.11)	128.1 (25.53)	109.5 (21.83)	85.3 (17.00)	37.8 ( 7.53)	27.2 ( 5.42)	45.2 ( 9.01)	30.9 ( 6.16)	15.6 ( 3.11)	501.7 (100.0)
	Central	42.5 ( 5.17)	152.0 (18.59)	103.8 (12.70)	89.4 (10.94)	72.9 ( 8.92)	78.1 ( 9.55)	127.1 (13.55)	90.7 (11.09)	60.8 ( 7.44)	817.5 (100.0)
	North	55.1 ( 5.55)	161.9 (16.54)	113.0 (11.54)	100.8 (10.30)	118.3 (12.09)	98.7 (10.08)	136.6 (20.09)	101.4 (10.36)	34.2 ( 3.49)	973.8 (100.0)
	Northeast	153.9 ( 7.19)	259.0 (13.91)	213.6 (11.47)	189.4 (10.17)	175.6 ( 9.43)	192.1 (10.32)	355.1 (19.07)	221.1 (11.87)	122.7 ( 6.59)	1,862.1 (100.0)
	South	23.7 ( 4.73)	94.9 (15.82)	72.9 (12.15)	79.2 (13.20)	61.8 (10.30)	58.6 ( 9.77)	51.2 (13.54)	62.4 (10.40)	59.4 ( 9.90)	599.8 (100.0)
1981	Bangkok	19.6 ( 2.37)	166.6 (20.12)	177.6 (21.45)	155.9 (18.80)	109.1 (13.18)	60.7 ( 7.33)	77.3 ( 9.34)	39.8 ( 4.81)	19.3 ( 2.33)	828.0 (100.0)
	Central	23.0 ( 3.24)	179.3 (20.78)	160.9 (18.64)	111.9 (12.97)	81.8 ( 9.48)	61.1 ( 7.08)	111.6 (12.93)	50.8 ( 9.36)	47.3 ( 5.48)	863.0 (100.0)
	North	26.8 ( 4.23)	152.6 (20.94)	117.6 (18.58)	83.1 (13.13)	48.0 ( 7.58)	48.3 ( 7.63)	36.6 (13.68)	66.2 (10.46)	23.8 ( 3.76)	633.1 (100.0)
	Northeast	65.4 ( 8.58)	172.4 (24.15)	94.7 (13.26)	74.9 (10.49)	84.0 (11.76)	55.4 ( 7.76)	34.4 (11.82)	63.6 ( 8.91)	21.1 ( 2.96)	714.0 (100.0)
	South	12.3 ( 3.22)	72.3 (18.90)	64.3 (16.81)	49.8 (13.02)	39.1 (10.22)	36.8 ( 9.62)	40.1 (10.48)	42.5 (11.11)	24.5 ( 6.41)	382.5 (100.0)
Growth Rate	Bangkok	- 1.24	6.40	12.10	15.10	26.50	20.10	13.40	6.30	5.30	12.50
	Central	- 10.30	4.10	11.00	5.60	2.90	- 6.10	- 3.20	- 3.00	- 6.30	1.30
	North	- 13.20	- 5.00	1.00	2.60	- 9.20	- 12.00	- 14.20	- 5.70	- 8.10	- 10.90
	Northeast	- 13.70	- 10.20	- 20.30	- 23.20	- 18.48	- 31.10	- 35.90	- 31.20	- 44.00	- 23.90
	South	- 21.20	- 6.08	- 3.10	- 11.60	- 11.40	- 11.60	- 17.68	- 9.60	- 22.14	- 11.20

TABLE 33

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY AGE GROUPS AND REGION IN 1977-1981 (ROUND 2)

(Unit: thousand persons)

Year	Region	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1977	Bangkok	28.2 ( 5.29)	136.3 (25.58)	107.3 (20.14)	88.6 (16.63)	58.8 ( 7.28)	32.6 ( 6.12)	50.9 ( 9.55)	32.5 ( 6.10)	17.7 ( 3.32)	532.9 (100.0)
	Central	73.0 ( 7.34)	190.3 (19.14)	131.6 (13.23)	164.2 (10.48)	102.5 (10.31)	88.4 ( 8.09)	140.1 (14.09)	104.0 (10.46)	67.9 ( 6.83)	994.4 (100.0)
	North	124.4 ( 8.19)	332.4 (21.88)	193.5 (12.74)	135.3 ( 8.91)	145.0 ( 9.55)	141.9 ( 9.34)	256.2 (16.87)	135.3 ( 8.91)	52.2 ( 3.44)	1,519.0 (100.0)
	Northeast	358.0 (10.74)	695.2 (19.24)	529.8 (14.67)	416.6 (11.53)	331.1 ( 9.17)	329.9 ( 9.13)	510.7 (14.14)	284.7 ( 7.88)	125.6 ( 3.48)	3,612.5 (100.0)
	South	25.9 ( 4.14)	101.1 (16.17)	81.77 (13.08)	66.0 (10.56)	73.2 (11.71)	65.0 (10.40)	98.2 (15.71)	64.0 (10.24)	47.4 ( 7.58)	625.2 (100.0)
1981	Bangkok	27.5 ( 3.00)	185.8 (20.84)	195.4 (21.34)	166.1 (18.14)	115.4 (12.60)	64.2 ( 7.01)	80.9 ( 8.84)	50.6 ( 5.53)	26.4 ( 2.88)	913.3 (100.0)
	Central	36.8 ( 3.77)	191.6 (19.65)	177.8 (18.23)	134.3 (13.77)	90.3 ( 9.26)	61.1 ( 6.27)	125.7 (12.89)	98.4 (10.09)	55.3 ( 5.67)	975.2 (100.0)
	North	46.4 ( 5.60)	167.4 (20.19)	160.7 (19.38)	100.7 (12.15)	62.9 ( 7.59)	58.4 ( 7.04)	101.4 (12.23)	97.9 (11.81)	33.4 ( 4.03)	829.1 (100.0)
	Northeast	151.0 (10.19)	298.3 (20.13)	227.0 (15.32)	159.6 (10.77)	143.8 ( 9.70)	134.7 ( 9.09)	199.5 (13.46)	114.8 ( 7.75)	50.3 ( 3.39)	1,482.0 (100.0)
	South	17.1 ( 3.97)	73.2 (17.01)	69.4 (16.12)	58.8 (13.66)	43.6 (10.13)	41.5 ( 9.64)	56.4 (13.10)	40.9 ( 9.50)	25.8 ( 5.99)	430.4 (100.0)
Growth Rate	Bangkok	- 0.63	7.70	14.99	15.70	27.25	16.94	11.58	11.07	9.99	13.58
	Central	- 17.12	0.17	7.52	6.34	- 3.17	- 6.86	- 2.71	- 1.38	- 5.13	- 0.49
	North	- 24.65	- 17.15	- 4.90	- 7.38	- 20.88	- 22.20	- 23.17	- 8.09	- 11.16	- 15.14
	Northeast	- 23.59	- 21.15	- 21.19	- 23.99	- 20.85	- 22.39	- 23.50	- 22.71	- 22.88	- 22.30
	South	- 10.38	- 8.07	- 4.08	- 2.89	- 12.95	- 11.22	- 13.86	- 11.19	- 15.21	- 9.33

TABLE 34

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY OCCUPATION IN 1977-1981....WHOLE KINGDOM

(Unit: thousand persons)

Round	Year	Professional/ Management Workers	Clerical/Sales Workers	Agricultural Workers	Blue Collars	Total
1	1977	34.3 ( 0.72)	225.0 ( 4.73)	3,819.3 (80.27)	679.7 (14.28)	4,758.3 (100.0)
	1981	47.8 ( 1.40)	394.8 (11.54)	1,806.6 (52.82)	1,169.9 (34.20)	3,420.3 (100.0)
	Growth Rate	8.5	14.1	- 18.7	13.6	- 8.3
2	1977	27.5 ( 0.38)	204.3 ( 2.81)	6,528.3 (89.65)	522.2 ( 7.17)	7,282.3 (100.0)
	1981	40.0 ( 1.02)	451.2 ( 9.74)	3,139.3 (67.73)	1,001.5 (21.61)	4,632.0 (100.0)
	Growth Rate	9.4	19.8	- 18.3	16.3	- 11.3

Source: The Labour Force Survey

Note: in brackets are percent.

TABLE 35

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY OCCUPATION AND REGION IN 1977-1981.... ROUND 1

(Unit: thousand persons)

Year	Region	Professional/ Management	Clerical/Sales	Agricultural Workers	Blue Collars	Total
1977	Bangkok	5.3 ( 0.66)	65.6 (13.11)	161.4 (32.25)	270.1 (53.98)	500.4 (100.0)
	Central	8.5 ( 1.04)	55.0 ( 6.74)	623.8 (76.43)	128.9 (15.79)	816.2 (100.0)
	North	1.1 ( 0.11)	27.8 ( 2.85)	882.0 (90.33)	65.5 ( 6.71)	976.4 (100.0)
	Northeast	18.2 ( 0.98)	55.7 ( 2.99)	1,603.3 (86.14)	184.1 ( 9.89)	1,861.3 (100.0)
	South	1.2 ( 0.20)	20.0 ( 3.35)	547.2 (91.57)	29.2 ( 4.89)	597.6 (100.0)
1981	Bangkok	17.2 ( 0.11)	157.5 (19.06)	138.3 (16.74)	513.3 (62.12)	826.3 (100.0)
	Central	8.0 ( 0.93)	104.5 (12.11)	484.7 (56.21)	264.2 (30.62)	862.7 (100.0)
	North	4.9 ( 0.78)	57.9 ( 9.16)	432.4 (68.43)	130.7 (20.68)	631.9 (100.0)
	Northeast	10.9 ( 1.52)	45.8 ( 6.38)	479.1 (66.69)	182.6 (25.42)	718.4 (100.0)
	South	5.5 ( 1.44)	27.4 ( 7.19)	271.3 (71.21)	76.8 (20.16)	381.0 (100.0)
Growth Rate	Bangkok	41.3	21.9	- 3.8	16.1	12.5
	Central	- 1.5	16.0	- 6.3	17.9	1.4
	North	37.4	17.8	- 17.8	17.3	- 10.9
	Northeast	- 12.8	- 4.9	- 30.2	- 0.2	- 23.9
	South	22.9	7.9	- 75.1	64.2	- 11.25

Source: The Labour Force Survey.

TABLE 36

NUMBER AND ANNUAL RATE OF GROWTH OF UNDEREMPLOYED WORKERS CLASSIFIED  
BY OCCUPATION AND REGION IN 1977-1981....ROUND 2

(Unit: thousand persons)

Year	Region	Professional/ Management	Clerical/Sales	Agricultural Workers	Blue Collars	Total
1977	Bangkok	3.5 ( 0.66)	59.7 (11.22)	196.1 (36.87)	272.6 (51.25)	531.9 (100.0)
	Central	6.1 ( 0.61)	54.7 ( 5.51)	828.7 (83.45)	103.5 (10.42)	993.0 (100.0)
	North	1.3 ( 0.09)	17.2 ( 1.15)	1,460.7 (96.23)	38.7 ( 2.55)	1,517.9 (100.0)
	Northeast	11.7 ( 0.32)	42.0 ( 1.16)	3,488.5 (96.61)	68.7 ( 1.90)	3,610.9 (100.0)
	South	4.0 ( 4.73)	29.5 ( 4.73)	553.4 (88.67)	57.2 ( 5.96)	624.1 (100.0)
1981	Bangkok	16.7 ( 0.09)	194.2 (21.23)	177.2 (19.37)	526.8 (57.58)	914.9 (100.0)
	Central	9.8 ( 1.01)	119.7 (12.29)	569.5 (58.44)	275.4 (28.27)	974.2 (100.0)
	North	2.2 ( 0.27)	57.9 ( 6.98)	694.5 (83.77)	73.2 ( 8.83)	829.1 (100.0)
	Northeast	6.7 ( 0.32)	49.8 ( 3.36)	1,366.9 (92.27)	58.0 ( 3.92)	1,481.4 (100.0)
	South	5.2 ( 1.21)	27.7 ( 6.45)	330.6 (76.96)	66.1 (15.39)	429.6 (100.0)
Growth Rate	Bangkok	39.1	29.5	- 2.5	16.5	13.6
	Central	11.8	19.6	- 9.4	24.5	- 0.5
	North	13.1	30.3	- 18.6	15.9	- 15.1
	Northeast	- 13.9	4.3	- 25.7	- 4.2	- 22.3
	South	6.5	- 1.6	- 12.9	14.4	- 9.3

Source: The Labour Force Survey.

TABLE 37

## SEASONAL UNEMPLOYMENT CLASSIFIED BY INDUSTRIAL SECTORS, REGION IN 1977-1981

Year	Region	Primary	Secondary			Tertiary			Total	
			Mining	Manufacturing	Construction	Electricity	Commerce	Transportation		Service
1977	Bangkok	55.7 (31.26)	- 0.3 (-0.28)	10.4 ( 9.65)	0.4 ( 0.37)	1.9 ( 1.76)	27.1 (25.14)	3.5 ( 3.25)	31.1 (28.85)	107.8 (100.0)
	Central	858.0 (122.76)	0.3 ( 0.04)	- 63.7 (-9.11)	- 20.6 (-2.95)	1.2 ( 0.17)	- 7.8 (-1.12)	- 12.3 (-1.76)	- 56.2 (-8.04)	698.9 (100.0)
	North	1,353.0 (122.11)	- 1.5 (-0.14)	- 123.8 (-11.34)	- 24.9 (-2.28)	- 2.5 (-0.23)	- 60.8 (-5.57)	- 5.6 (-0.51)	- 22.3 (-2.04)	1,091.6 (100.0)
	Northeast	3,010.4 (123.1)	- 6.6 (-0.27)	- 377.4 (-15.43)	- 56.8 (-2.32)	- 0.6 (-0.02)	- 25.0 (-1.02)	- 23.1 (-0.94)	- 75.4 (-3.08)	2,445.5 (100.0)
	South	- 31.5 (656.25)	- 6.5 (135.42)	4.7 (-97.92)	- 1.1 (22.92)	0.6 (-12.50)	24.5 (-510.42)	2.8 (-58.33)	1.7 (-35.42)	- 4.8 (100.0)
	Whole Kingdom	5,203.7 (119.91)	- 14.5 (-0.33)	- 549.8 (-12.67)	-103.00 (-2.37)	0.6 ( 0.01)	- 42.1 (-0.97)	34.6 (-0.80)	-120.8 (-2.78)	4,339.7 (100.0)
1981	Bangkok	61.0 (29.65)	1.2 ( 0.58)	29.9 (14.54)	- 7.3 (-3.55)	- 2.9 (-1.41)	71.6 (34.81)	0.9 ( 0.44)	51.3 (24.94)	205.7 (100.0)
	Central	1,034.8 (109.43)	- 6.0 (-0.63)	12.3 ( 1.30)	- 84.8 (-8.97)	- 1.2 (-0.13)	19.0 ( 2.01)	1.5 ( 0.16)	- 30.0 (-3.17)	945.6 (100.0)
	North	2,121.8 (121.32)	- 5.2 (-0.38)	- 162.7 (-9.50)	- 68.2 (-3.90)	9.4 ( 0.02)	- 14.4 (-0.82)	- 14.2 (-0.81)	- 108.5 (-6.20)	1,749.0 (100.0)
	Northeast	5,069.6 (124.49)	- 10.1 (-0.25)	- 251.4 (-6.17)	- 169.0 (-4.15)	1.9 ( 0.05)	- 72.8 (-1.79)	- 40.0 (-0.98)	- 456.0 (-11.20)	4,072.2 (100.0)
	South	- 38.4 (-264.83)	6.9 (47.59)	25.4 (175.17)	17.9 (123.45)	- 2.4 (-16.55)	35.9 (247.59)	1.8 (12.41)	- 32.6 (-224.83)	14.5 (100.0)
	Whole Kingdom	8,248.7 (118.06)	- 13.4 (-0.19)	- 346.3 (-4.96)	- 311.3 (-4.46)	- 4.2 (-0.06)	39.1 ( 0.56)	- 49.8 (-0.71)	- 575.7 (-8.24)	6,987.1 (100.0)

Source: The Labour Force Survey.

Note: in brackets are percent.

TABLE 38  
SEASONAL UNEMPLOYMENT BY AGE GROUP AND REGION IN 1977-1981

Year	Region	11 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 49	50 - 59	60+	Total
1977	Bangkok	8.1 ( 7.44)	11.7 (10.75)	5.5 ( 5.06)	27.7 (25.46)	29.2 (26.84)	8.5 ( 8.73)	12.2 (11.21)	4.9 ( 4.50)	0 ( 0 )	108.8 (100.0)
	Central	105.1 (14.74)	147.7 (21.12)	110.8 (15.78)	68.8 ( 9.84)	73.3 (10.48)	54.2 ( 7.75)	67.2 ( 9.61)	52.6 ( 7.52)	22.2 ( 3.17)	699.5 (100.0)
	North	141.9 (13.00)	291.0 (26.66)	173.3 (15.88)	100.4 ( 9.20)	95.2 ( 8.72)	104.9 ( 9.61)	104.5 ( 9.57)	58.3 ( 5.34)	21.9 ( 2.01)	1,091.4 (100.0)
	Northeast	400.9 (16.39)	583.6 (23.86)	444.2 (18.16)	309.5 (12.65)	208.7 ( 8.53)	162.2 ( 6.63)	209.8 ( 8.58)	100.3 ( 4.10)	26.5 ( 1.08)	2,445.7 (100.0)
	South	- 0.3 ( 6.67)	14.3 (-317.78)	4.6 (102.22)	- 3.6 (80.00)	- 13.7 (304.44)	- 0.3 ( 6.67)	0.8 (-17.78)	1.3 (-28.89)	- 7.6 (168.89)	- 4.5 (100.0)
	Whole Kingdom	653.9 (15.06)	1,048.9 (24.16)	739.3 (17.03)	502.6 (11.57)	392.4 ( 9.04)	330.9 ( 7.62)	394.6 ( 9.09)	216.9 ( 5.00)	62.8 ( 1.45)	4,542.3 (100.0)
1981	Bangkok	15.0 ( 6.35)	27.9 (13.62)	30.7 (14.99)	35.8 (17.48)	27.2 (13.28)	19.8 ( 9.67)	22.4 (10.94)	16.0 ( 7.81)	12.0 ( 5.86)	204.8 (100.0)
	Central	73.8 ( 7.81)	133.1 (14.09)	144.2 (15.27)	119.9 (12.70)	100.6 (10.65)	82.1 ( 8.69)	117.8 (12.47)	100.3 (10.62)	72.6 ( 7.69)	944.4 (100.0)
	North	114.2 ( 6.53)	312.7 (17.88)	286.3 (16.37)	234.3 (13.39)	171.5 ( 9.80)	127.3 ( 7.28)	249.3 (14.26)	178.8 (10.22)	74.6 ( 4.26)	1,749.2 (100.0)
	Northeast	432.9 (10.65)	686.0 (16.84)	622.1 (15.27)	502.7 (12.38)	447.5 (10.99)	333.6 ( 8.19)	530.8 (13.03)	366.4 ( 9.00)	149.0 ( 3.66)	4,072.7 (100.0)
	South	10.3 (69.13)	- 3.0 (-20.13)	3.2 (21.48)	4.9 (32.89)	2.0 (13.42)	7.3 (48.99)	8.1 (54.36)	- 1.3 (-8.72)	- 16.6 (-111.41)	14.9 (100.0)
	Whole Kingdom	644.7 ( 9.23)	1,156.5 (16.56)	1,086.4 (15.55)	897.9 (12.85)	748.6 (10.72)	569.8 ( 8.16)	929.0 (13.30)	660.1 ( 9.45)	292.3 ( 4.18)	6,985.3 (100.0)

Source: The Labour Force Survey.

Note: in bracket are percent.

TABLE 39

## SEASONAL UNEMPLOYMENT CLASSIFIED BY OCCUPATION AND REGION IN 1977-1981

Year	Region	Professional	Clerical/Sales	Agriculture	Blue Collars	Total
1977	Bangkok	9.2 ( 8.51)	29.0 (26.83)	31.2 (28.86)	38.7 (35.80)	108.1 (100.0)
	Central	- 1.6 (-0.23)	- 15.6 (-2.23)	856.7 (122.37)	- 139.4 (-19.91)	700.1 (100.0)
	North	- 11.7 (-1.07)	- 58.2 (-5.33)	1,340.5 (122.7)	- 178.1 (-16.30)	1,092.5 (100.0)
	Northeast	- 22.8 (-0.93)	- 31.4 (-1.28)	3,051.4 (124.73)	- 550.8 (-22.51)	2,446.4 (100.0)
	South	- 5.1 (102.00)	22.2 (-444.00)	- 35.5 (710.00)	13.4 (-268.00)	- 5.0 (100.0)
	Whole Kingdom	- 33.2 (-0.76)	- 53.6 (-1.25)	5,244.4 (120.52)	- 816.9 (-18.82)	4,340.7 (100.0)
1981	Bangkok	36.5 (17.79)	75.1 (36.60)	60.8 (29.63)	32.8 (15.98)	205.2 (100.0)
	Central	10.1 ( 1.07)	25.7 ( 2.72)	1,021.3 (108.22)	- 113.4 (-12.02)	943.7 (100.0)
	North	10.4 ( 0.59)	- 33.0 (-1.89)	2,126.7 (121.64)	- 355.7 (-20.34)	1,748.4 (100.0)
	Northeast	- 2.2 (-0.05)	- 90.4 (-2.22)	5,110.0 (125.53)	- 946.8 (-23.26)	4,070.6 (100.0)
	South	- 3.4 (-24.64)	33.8 (244.95)	- 44.3 (321.01)	27.7 (200.72)	13.8 (100.0)
	Whole Kingdom	52.3 ( 0.75)	11.7 ( 0.17)	8,274.6 (118.48)	- 1,354.5 (-19.39)	6,984.1 (100.0)

Source: The Labour Force Survey

Note: in bracket are percent.

1. Seasonal unemployment is a phenomenon in primary employment and the trend during the last five years is increasing unlike the figure on underemployment. In 1977, only 4.3 million is considered to be seasonal unemployed shot up to 6.9 million. For agricultural sector alone the figure shot up from 5.2 million in 1977 to 8.2 million in 1981.

2. By age groups, the distribution of seasonal unemployment is heavily in favor of all age groups except 11-14 and 15-19 categories.

3. The occupational breakdown clearly confirms the fact that seasonal unemployment is agricultural in nature. As expected the negative sign is observed for blue collar workers.

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## Appendix

### The Definition:

1. Employment refers to persons, 11 years of age and over, who, during the survey week,

- worked for wages, salaries, profits, dividends or any other kind of payment, or
- did not work at all but had jobs or businesses from which they were temporarily absent because of reasons, or persons who did not work at all because they were waiting to be called in for new job assignment, or
- worked without pay in enterprises or on farms owned or operated by household heads or members, to whom they were related by kinship or marriage or through adoption, and worked at least 20 hours, or worked less than 20 hours but wanted to work more.

2. Open unemployment refers to persons, 11 years of age and over, who, during the survey week,

- did not work at all but wanted to work and were able to do so, or
- did not work at all but were looking for work, or
- did not work and were not looking for work because of illness, or belief that no work was available, or

- were waiting for agricultural season : persons who usually worked without pay on farms owned or operated by the household head or a member of the same household but did not work during the survey week because it was not the agricultural season.

3. Underemployment refers to persons underutilized by the number of hours worked per week, or by income, or by a mismatch of occupation and education.

4. Seasonal unemployment = Employed workers in round 2 minus  
Employed workers in round 1

5. Industrial Sectors are classified as follows:

- Primary sector refers to agriculture, forestry and hunting
- Secondary sector refers to
  1. Mining and Quarrying
  2. Manufacturing
  3. Construction, Repair and Demolition.
- Tertiary sector refers to
  1. Electricity, Gas, Water and Sanitary Service.
  2. Commerce
  3. Transport, Storage and Communication
  4. Services

6. Occupations are classified as follows:

- Professional/Management Workers refer to Professional, Technical and Related Workers, Administrative, Executive and Managerial Workers.
- Clerical-Sales Workers refer to Clerical Workers and Sales Workers
- Agricultural Workers refer to Farmers, Fishermen, Hunters, Loggers and Related Workers, Miners, Quarrymen and Related Workers
- Blue Collars refer to Workers in Transport and Communication Occupations, Craftsmen, Production-Process Workers and laborers, Service, Sports and Recreation Workers.

# EMPLOYMENT AND UNEMPLOYMENT IN THAILAND :

## A PROJECTION INTO THE FUTURE

### 1. INTRODUCTION

In the past few years, there have been increasing interest paid to the problem of unemployment in Thailand. This was despite the fact that open unemployment in Thailand as estimated in the Labor Force Survey <sup>1/</sup> has consistently shown a low rate of only slightly over 1 percent in the labor force. The general feeling, however, is that unemployment in Thailand is a more serious problem than what the official statistics say.

One line of argument against the low unemployment rate concerns the definition of open unemployed as used in the Labor Force Survey. Attempts have been made to come up with alternative definitions or to modify the data employed in estimations.

Another line of argument, however, accepted the low open unemployed rate<sup>2</sup> in Thailand but pointed out that unemployment problems in Thailand are rather different from the Western industrialized countries and thus different concepts of unemployment should be utilized. This was especially the cases of seasonal unemployed and underemployed.

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<sup>1/</sup> National Statistical Office, Report of the Labor Force Survey.

The above preoccupation with data and conceptual problems have thus made the systematic projection of future unemployment problems in Thailand in the longer term received less attention. It is also more difficult to make projections when there is as yet no general agreement on existing unemployment problems in the country. However, there is at present a clearer understanding of the existing unemployment problems together with the availability of more and better published data. It thus seems timely for an attempt to be made on future employment and unemployment problems on a more disaggregated level. <sup>1/</sup> USAID's support of this present study is thus deemed highly appropriate. However, due to the limited resources available especially in terms of time, the attempt at projecting employment and unemployment problems in the future would not be an ambitious one.

### 1.1 Objectives and Scope of the Study

The main objective of this study is to project employment or unemployment problems according to sex, age and education on a regional basis. <sup>2/</sup> Projections would be made for the years 1990 and 1995. In making the projections, two scenarios would be utilized as follows:

1. High Growth Scenario: The income growth assumption of this scenario would be one percentage point below the growth

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<sup>1/</sup> Projections thus far have been made at the aggregate employment levels.

<sup>2/</sup> Classifications of regions, age groups and educational groups are given in Appendix A.

rate during 1971-1982. Since average gross domestic product growth in this period was about 7 percent per year, this scenario involved an average future growth assumption of 6 percent per year.

2. Low Growth Scenario: The future income growth assumption of this scenario would be two percentage points below the growth rate during 1971-1982 or about 5 percent per year.

Projection experiments would be carried out on both the demand and supply sides of labor. However, it should be pointed out that no attempt would be made to obtain future unemployment rates which would take into account market adjustments (or expost), since this would require labor market and migration models which are beyond the scope of this study. Not only would more theoretical work be required in such circumstances, but much more data would be required especially time series data of wage rates among various labor groups which are still almost nonexistent at present.

## 1.2 Sources of Labor Force and Employment Data

There are 3 main sources of data as follows:

1. The Population Census (PC)
2. The Labor Force Census (LFC)
3. The Labor Force Survey (LFS)

In this study, labor force and employment statistics were base entirely on the LFS. Not only does the LFS provide more time series data, they are also more detailed and more suitable to the objective of the study. Both the PC and LFC were designed more for the purpose of estimating economically active population than actual employment or unemployment. PC and LFC are also only available once in every ten years while the LFS statistics are available for the period 1971-1982.<sup>1/</sup>

Nevertheless, there are certain problems in using LFS statistics for time series analysis. Adjustments of these statistics were thus made before they were actually employed in the study. The methodology in adjusting the labor force and employment data together with the adjusted data are presented in Appendix C.

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<sup>1/</sup> However, LFS statistics of Round 2 for 1982 have not yet been published at the time of this study the present study therefore utilized data only during 1971-1981.

### 1.3 Definitions of Labor Force, Employment and Unemployment

#### 1. Labor force

According to the LFS, all persons under 11 years of age are not classified in the labor force. For those over 11 years of age, there are four main groups which are not included in the labor force. They are those who 'worked around house'; those who are 'students'; those who are 'waiting for agricultural season', and those classified as 'others'. Together they accounted for about 32.8 percent (Round 1) and 18.7 percent (Round 2) of the population of the LFS in 1981.

In this study, those who were waiting for agricultural season were reclassified to be included in the labor force. It seemed reasonable to think that those who were waiting for agricultural season would like to work and were waiting for work which came with the agricultural season. They were not voluntarily unemployed but were unemployed more by circumstances. It seemed more justifiable to include them in the labor force. By not including them in the labor force would only underestimate the open unemployment problem in Thailand for there is no guarantee that these people who were waiting for agricultural season would all be able to actually get a job during the agricultural season.

In short, labor force in this study could be broken down, based on the LFS, to encompass the following groups of people :

1. Adequately utilized
2. Inadequately utilized by unemployed<sup>1/</sup>
3. Inadequately utilized by hours of work
4. Inadequately utilized by income
5. Inadequately utilized by mismatch
6. Waiting for agricultural season.

## 2. Employment

Those classified as employed in this study include the following:

1. Adequately utilized
2. Inadequately utilized by hours of work
3. Inadequately utilized by income
4. Inadequately utilized by mismatch

Those inadequately utilized by income and mismatch were included in those employed because they are people who work more or less fully in terms of hours. The reason that they earned a low income or were mismatched in their jobs are related to social problems such as poverty and the educational policy of the government. It does not mean that they were actually unemployed without anything to do. Since the objective of the projection is confined mainly to a narrow one of studying labor absorption capacity and less of other related social problems, unless otherwise stated, these two categories of inadequately utilized labor force were included as those employed.

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<sup>1/</sup> This actually means those openly unemployed.

As for those inadequately utilized by hours of work, they were also included in those classified as employed since it was not possible to separate them out in the earlier years (1971-1976). All those who were inadequately utilized were included in the employment statistics of the LFS and it was not until 1977 before they could be separated out. However, considering that those inadequately utilized by hours of work was only a small proportion of the labor force, the error may not be too significant in such a case. In 1981, they were 2.6 percent (Round 1) and 1.8 percent (Round 2) of the labor force.

### 3. Unemployment

The concentration of this study was on two types of unemployment : open unemployed and seasonal unemployed. This does not mean that underemployment is not a problem which should not be studied. It is more because of the inability to project this type of unemployment due to present data limitations. Time series data are available only since 1977. Furthermore, there have been frequent changes in the definition of those inadequately utilized by income which make up the majority of those inadequately utilized. The definition changes were based on the minimum wage rates which were politically determined and thus not too useful a concept to deal with the problem of underemployment. Nevertheless, those underemployed in this study are meant to include the following:

1. Inadequately utilized by hours of work.
2. Inadequately utilized by income.
3. Inadequately utilized by mismatch.

In the case of open unemployment, two concepts would be employed. Unemployed I include only those classified as inadequately utilized by unemployed in the LFS. Unemployed II include both those classified as inadequately utilized by unemployed and those waiting for agricultural season. It should be pointed out that, in the latter case, people who were waiting for agricultural season were actually openly unemployed during the period that they were waiting for the agricultural season and thus should be classified as openly unemployed during that period. Furthermore, there is no guarantee that these people would all be able to find jobs when the agricultural season arrived.

For those who are seasonally unemployed, the present study uses a different concept to that in the LFS. The LFS concept is based on the survey period. (Round 1 covers January to March while Round 2 covers July to September). The concept here is instead based on a longer period and more dynamic in nature. It aims to study the difference between employment levels in Round 1 and Round 2. This difference would provide the minimum level of seasonal unemployed in a given year since it would show the inability of the economy to sustain the same level of employment between two different seasons in a given year. (See Appendix F).

#### 1.4 Organization of the Study

After this introductory Part 1, there are 4 more parts as follows:

Part 2 deals with the supply side of labor. The method in projecting future labor force levels together with the results would be presented here. A comparison would be made with the past. There would also be a linking of population growth to labor force growth.

Part 3 deals with projecting the demand for labor or employment. The projection methodology and results are given here. A comparison would also be made with past employment levels to identify the absorptive capacity of the economy for each group of labor.

Part 4 is an integration of results from Part 2 and Part 3 to identify the unemployment problems of various labor groups among various regions. The projected unemployment rates are ex ante results which must be interpreted with care.

Part 5 ends the study with a summary of some of the main conclusions and findings. A set of policy recommendations would also be made based on the results of the study. The weaknesses of the study together with suggestions for future studies would also be given here.

## 2. LABOR SUPPLY IN THAILAND

In this study, the supply of labor would be synonymous with the available labor force. However, the definition of labor force is somewhat different from that of the Labor Force Survey. Those waiting for agricultural season were included in the labor force instead of classifying them as outside the labor force. (See Part 1 Section 1.2)

The first section of this part would discuss the methodology in projecting labor force by region, sex and age in 1990 and 1995 together with the results. The second section deals with the methodology in projecting labor force by educational groups in each region together with the results. The last section would be a comparison of the past and future growth rates of labor force and the impact of population growth on labor force growth.

## 2.1 Labor Force Projection

In this study, a simple method was utilized to estimate the potential labor force by regions in 1990 and 1995. This was done by assuming certain labor force participation rates for population above 11 years. By multiplying these rates with projected population figures, labor force estimations were thus obtained.

Fortunately, projected population figures by region, sex and age were available from the National Economic and Social Development Board (NESDB) up until 1995 and thus formed the basis of labor force estimations in this study. These statistics are shown in Tables 2.1 - 2.2. As can be seen, only population 11 years upwards were employed and classified into age groups with five-year intervals.

The projected population figures of the NESDB utilized here are based on the low fertility assumption, since they seem to approximate reality more as verified by the Population Census in 1980. In short, the population growth rate under this assumption for the whole kingdom is 1.77 percent per year during 1980-1990 and 1.48 percent per year during 1990-1995. Population growth rates by regions are also shown in Table 2.3.

To convert the population figures in Tables 2.1-2.2 into labor force figures, labor force participation rates would have to be estimated.<sup>1/</sup> To do this, time series data during 1977-1981 from the Labor Force Survey were utilized. Labor force participation rates thus obtained for these years were examined to see whether there were any obvious increasing or decreasing trend. In the case

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<sup>1/</sup> labor force participation rate =  $\frac{\text{labor force}}{\text{population}}$

of no observed trend, the average labor force participation rate during this period would be utilized to estimate the labor force. For cases of observed increasing trend, the maximum labor force participation rate for the period would be utilized for estimating the labor force. Fortunately, there do not seem to be cases of decreasing trend in labor force participation rates and thus no assumptions were required. (see Appendix G)

To summarize, the labor force participation rates assumed in this study are given in Table 2.4. Due to time constraints, these rates were estimated only for Round 2 (July-September). Thus, it should be pointed out that the estimated labor force figures in this study are only for Round 2. To the extent that there is a stable relationship between labor force in Round 1 (January-March) and Round 2, the estimated labor force figures may also be utilized to study employment conditions in Round 1. The projection results on labor force for 1990 and 1995 are shown in Tables 2.5-2.6.

TABLE 2.1  
 PROJECTED POPULATION BY REGION, SEX AND AGE, 1990  
 (thousand persons)

AGE GROUP (years)	BANGKOK		CENTRAL		NORTHERN		NORTHEASTERN		SOUTHERN	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
11 - 14	296.56	292.56	489.04	457.85	475.74	458.86	961.07	925.38	326.56	313.04
15 - 19	344.00	356.00	620.00	548.00	593.00	576.00	1,148.00	1,114.00	372.00	360.00
20 - 24	303.00	319.00	653.00	580.00	613.00	602.00	1,151.00	1,132.00	352.00	340.00
25 - 29	323.00	353.00	590.00	505.00	566.00	563.00	845.00	861.00	294.00	285.00
30 - 34	319.00	352.00	494.00	410.00	482.00	477.00	653.00	673.00	239.00	228.00
35 - 39	301.00	329.00	406.00	338.00	393.00	385.00	548.00	579.00	219.00	200.00
40 - 49	404.00	436.00	558.00	508.00	529.00	511.00	875.00	908.00	345.00	300.00
50 - 59	176.00	209.00	353.00	363.00	352.00	378.00	485.00	561.00	218.00	215.00
60 upwards	155.00	212.00	338.00	404.00	337.00	401.00	457.00	564.00	210.00	226.00
TOTAL	2,621.56	2,858.56	4,501.04	4,113.85	4,340.74	4,351.86	7,123.07	7,317.38	2,575.56	2,467.04

SOURCE : NESDB

TABLE 2.2  
 PROJECTED POPULATION BY REGION, SEX AND AGE, 1995  
 (thousand persons)

AGE GROUP (years)	BANGKOK		CENTRAL		NORTHERN		NORTHEASTERN		SOUTHERN	
	Male	Female								
11 - 14	311.75	308.54	474.59	443.33	458.21	443.09	955.98	920.80	329.47	316.69
15 - 19	406.00	416.00	612.00	558.00	587.00	569.00	1,166.00	1,127.00	390.00	375.00
20 - 24	383.00	408.00	631.00	549.00	582.00	571.00	1,095.00	1,082.00	352.00	343.00
25 - 29	342.00	371.00	673.00	558.00	596.00	594.00	1,088.00	1,099.00	335.00	325.00
30 - 34	340.00	384.00	613.00	490.00	545.00	553.00	794.00	833.00	289.00	281.00
35 - 39	316.00	361.00	509.00	404.00	463.00	467.00	620.00	656.00	242.00	224.00
40 - 49	540.00	604.00	733.00	608.00	667.00	655.00	997.00	1,158.00	405.00	359.00
50 - 59	241.00	285.00	421.00	404.00	385.00	397.00	587.00	658.00	260.00	241.00
60 upwards	189.00	263.00	392.00	472.00	395.00	474.00	530.00	655.00	247.00	266.00
<b>TOTAL</b>	<b>3,068.75</b>	<b>3,400.54</b>	<b>5,058.59</b>	<b>4,486.33</b>	<b>4,678.21</b>	<b>4,723.09</b>	<b>7,832.98</b>	<b>8,188.80</b>	<b>2,849.47</b>	<b>3,730.69</b>

SOURCE: NESDB

TABLE 2.3  
POPULATION AND LABOR FORCE GROWTH RATES

BY REGION

(percent per year)

Region	1960-1970	1971-1981	1981-1990	1990-1995
<u>1. Bangkok</u>				
- total population	3.7	4.1	3.0	2.6
- population under 11	-	3.8	0.5	-0.4
- labor force	-	5.7	3.7	3.7
<u>2. Central</u>				
- total population	2.5	1.9	1.5	1.5
- population under 11	-	-0.2	-1.0	-0.3
- labor force	-	3.6	2.8	2.3
<u>3. Northern</u>				
- total population	2.7	2.0	1.3	1.1
- population under 11	-	-0.3	-1.3	-0.8
- labor force	-	3.6	2.5	1.7
<u>4. Northeastern</u>				
- total population	3.0	2.5	1.6	1.3
- population under 11	-	0.7	-0.7	-0.6
- labor force	-	4.2	2.8	3.1
<u>5. Southern</u>				
- total population	2.7	2.4	1.6	1.0
- population under 11	-	1.0	-0.4	-1.0
- labor force	-	0.6	5.1	2.6
<u>6. Whole kingdom</u>				
- total population	2.7	2.5	1.7	1.5
- population under 11	-	0.6	-0.7	-0.6
- labor force	-	4.0	2.9	2.7

TABLE 2.4

## LABOR FORCE PARTICIPATION RATES USED IN PROJECTION

(percent of population)

AGE GROUP (years)	BANGKOK		CENTRAL		NORTHERN		NORTHEASTERN		SOUTHERN	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
11 - 14	7.33	10.23	19.09	22.37	24.13	29.27	35.80	38.38	11.09	11.64
15 - 19	46.18	44.94	65.87	66.29	74.94	77.85	81.96	84.20	58.56	59.44
20 - 24	71.18	58.94	88.80	79.12	93.32	86.65	95.46	90.26	88.97	78.94
25 - 29	94.51	74.12	97.52	82.12	98.56	87.85	98.92	90.53	97.37	85.86
30 - 34	98.16	72.89	98.55	83.75	98.87	89.55	98.75	90.14	99.10	91.28
35 - 39	98.59	72.55	99.48	87.93	99.16	91.23	99.23	92.36	98.98	91.15 <sup>6</sup>
40 - 49	96.76	66.02	97.97	86.30	98.67	88.98	98.47	90.90	98.59	89.63
50 - 59	88.07	50.07	94.04	78.96	95.15	77.81	96.75	77.79	95.33	84.03
60 upwards	40.20	15.53	55.83	35.69	54.87	27.55	61.93	29.25	60.48	36.83

TABLE 2.5

## PROJECTED LABOR FORCE BY REGION, SEX AND AGE, 1990

(thousand persons)

AGE GROUP (years)	BANGKOK		CENTRAL		NORTHERN		NORTHEASTERN		SOUTHERN	
	Male	Female								
11 - 14	21.74	29.93	93.36	102.42	114.80	134.31	344.06	355.16	36.21	36.44
15 - 19	158.86	159.99	408.39	363.27	444.39	448.42	940.90	937.99	217.84	213.98
20 - 24	215.68	138.02	579.86	458.90	572.05	521.63	1,098.74	1,021.74	313.17	268.40
25 - 29	305.28	261.64	581.27	414.71	557.85	494.60	835.37	779.46	236.27	244.70
30 - 34	313.13	256.57	486.84	343.38	476.55	427.15	644.84	606.64	236.85	208.12
35 - 39	296.76	238.69	403.89	297.20	389.70	351.24	543.78	534.76	216.77	182.30
40 - 49	390.91	287.85	546.67	438.40	525.91	454.89	861.61	834.46	340.10	272.48
50 - 59	155.00	104.65	331.96	286.62	334.93	294.12	469.24	436.40	207.82	180.66
60 upwards	62.31	32.92	188.71	144.19	184.91	110.48	283.02	164.97	127.00	83.24
<b>TOTAL</b>	<b>1,519.67</b>	<b>1,510.26</b>	<b>3,620.95</b>	<b>2,849.09</b>	<b>3,601.09</b>	<b>3,236.84</b>	<b>6,021.56</b>	<b>5,671.58</b>	<b>1,932.03</b>	<b>1,690.32</b>

TABLE 2.6

## PROJECTED LABOR FORCE BY REGION, SEX AND AGE, 1990

(thousand persons)

AGE GROUP (years)	BANGKOK		CENTRAL		NORTHERN		NORTHEASTERN		SOUTHERN	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
11 - 14	22.85	31.56	90.50	99.17	110.57	129.69	342.24	353.40	36.54	36.86
15 - 19	187.49	186.95	403.12	369.90	439.80	442.97	1,027.01	948.93	228.38	222.90
20 - 24	272.62	240.48	560.33	434.37	543.12	494.77	1,045.29	976.61	313.17	270.76
25 - 29	323.22	274.98	656.31	458.23	587.42	521.83	1,076.25	994.92	326.19	279.05
30 - 34	333.74	279.90	604.11	410.38	539.83	495.21	784.08	750.87	286.40	256.50
35 - 39	311.54	261.91	506.35	355.24	459.11	426.04	615.23	650.95	239.53	204.18
40 - 49	522.50	398.76	718.12	524.70	658.13	582.82	981.75	1,140.28	399.29	321.77
50 - 59	212.25	142.70	395.91	319.00	366.33	308.91	567.92	636.62	247.86	202.51
60 upwards	75.98	40.84	218.85	132.77	216.74	130.59	328.23	405.64	149.39	97.97
TOTAL	2,262.19	1,808.08	4,153.6	3,103.76	3,921.05	3,532.83	6,767.77	6,858.22	2,226.75	1,892.50

## 2.2 Projected Labor Force by Educational Level

It is rather difficult to make labor force projections by educational levels since it depends on a lot of factors. Furthermore, in order to avoid making excessive subjective assumptions, the present study therefore relied on past trends during 1977-1981 to make the projections. A longer time series was not available and, as such, the projection may be somewhat biased due to the short period.

The available labor force statistics by regions and educational levels were adjusted (See Appendix B) before they were regressed with a time variable based on the following semi-log equation:

$$\ln(LF_{it}) = a_{0i} + a_{1i} t$$

where  $LF_i$  = labor force with educational level  $i$

$t$  = year (1977, ....., 1981)

$a_{0i}$  and  $a_{1i}$  are the estimated coefficients. The regression results are shown in Appendix B. From the above estimated equations, labor force levels for each educational group in every region were estimated for 1990 and 1995. However, these estimated figures were not utilized directly. They were instead used to estimate the proportion of labor force in each educational group in each region. These estimated proportions are shown in Table 2.7.

The obtained proportion of each educational group in each region were then multiplied with the corresponding regional labor

force projected in section 2.1. The results thus obtained were then assumed to be the labor force by education of each region in 1990 and 1995 as shown in Table 2.8. The figures for the whole kingdom are but the summation of regional estimates.

TABLE 2.7  
 PAST AND PROJECTED PROPORTION OF LABOR FORCE  
 BY REGION AND EDUCATION : ROUND 2  
 (percent)

Education/Region	Bangkok	Central	Northern	Northeastern	Southern
<u>1. Below elementary</u>					
1977	10.8	14.0	24.1	10.8	27.9
1981	8.0	11.8	18.7	8.3	19.2
1990	4.7	7.9	9.3	4.0	8.6
1995	3.2	6.1	5.4	2.7	4.7
<u>2. Elementary</u>					
1977	59.7	78.2	72.1	85.5	65.7
1981	58.9	78.4	74.5	87.3	69.6
1990	51.4	78.1	70.2	88.0	62.2
1995	46.3	76.4	59.3	86.1	49.9
<u>3. Secondary</u>					
1977	14.8	4.2	2.4	2.2	3.6
1981	15.3	4.8	3.6	2.3	6.0
1990	16.2	5.4	7.5	2.9	10.4
1995	16.3	5.6	10.0	3.1	12.5
<u>4. Above secondary</u>					
1977	14.7	3.6	1.4	1.5	2.7
1981	17.8	5.0	3.2	2.1	5.1
1990	27.7	8.6	13.0	5.1	18.8
1995	34.2	11.9	25.3	8.1	32.9

TABLE 2.8  
 PAST AND PROJECTED LABOR FORCE  
 BY REGION AND EDUCATION : ROUND 2  
 (1,000 persons)

Education/Region	Bangkok	Central	Northern	Northeastern	Southern	Whole kingdom
<u>1. Below elementary</u>						
1977	208.0	633.2	1,161.0	859.2	698.8	3,560.2
1981	200.7	590.1	1,022.4	750.0	539.8	3,103.0
1990	162.6	511.1	635.9	467.7	311.5	2,088.9
1995	132.8	442.7	402.5	367.9	193.6	1,539.6
<u>2. Elementary</u>						
1977	1,154.3	3,537.4	3,480.2	6,791.9	1,645.7	16,609.5
1981	1,470.6	3,927.4	4,070.0	7,931.0	1,957.4	19,356.4
1990	1,778.1	5,053.1	4,800.2	10,290.0	2,253.1	24,174.5
1995	1,922.0	5,544.6	4,420.2	11,732.2	2,055.5	25,674.5
<u>3. Secondary</u>						
1977	286.6	192.1	117.0	173.3	90.2	859.2
1981	380.6	241.6	197.1	212.8	168.6	1,200.7
1990	560.4	349.4	512.8	339.1	376.7	2,138.5
1995	676.7	406.4	745.4	422.4	514.9	2,765.8
<u>4. Above secondary</u>						
1977	283.4	160.9	66.4	115.5	68.8	695.0
1981	443.3	251.7	173.0	189.6	144.7	1,202.3
1990	958.3	556.4	888.9	596.3	681.0	3,681.0
1995	1,419.7	863.6	1,885.8	1,103.7	1,355.2	6,628.1
<u>5. Total</u>						
1977	1,932.3	4,523.6	4,824.6	7,940.0	2,503.5	21,724.0
1981	2,495.2	5,010.8	5,462.6	9,083.3	2,810.5	24,862.4
1990	3,459.4	6,470.0	6,837.9	11,693.1	3,622.4	32,082.9
1995	4,151.3	7,257.4	7,453.9	13,626.2	4,119.3	36,608.0

### 2.3 Population and Labor Force Growth

It can be seen from Table 2.3 that, in general, both population and labour force growth rates declined over the years. For population growth rate, the decline was consistently steady throughout the projected period i.e. from 2.5 percent per year between 1971-1981 to 1.7 percent per year between 1981-1990 and to 1.5 percent per year between 1990-1995. For labour force growth rate, however, the decline was rather sharp from 4.0 percent per year between 1971-1981 to 2.9 percent per year between 1981-1990 but slowed down to 2.7 percent per year between 1990-1995. This reflected the sharp decline in the population growth rate of the past.

At the regional level, Bangkok still exhibited the highest growth rate of both population and labour force, with labour force growth rate remaining constant from 1981-1990 and 1990-1995. This is probably because of migration of people from other regions. Both population and labour force growth rates declined throughout the period for Bangkok, Central, and the Northern regions. The declining trend of labour force growth rate, nevertheless, could not be readily seen in the Northeastern and the Southern regions. This may be due to data problems which show an unusually low labour force growth rate for the Southern region during 1971-1981 and an unusually high labour force growth rate for the Northeastern region in the same period. Another reason may be due to migration patterns during 1971-1981 which may have affected labor force growth in this period. However, the study at present could not include a migration factor into the analysis.

### 3. EMPLOYMENT DEMAND IN THAILAND

While future labor supply growth was assumed to be mainly determined by population growth, the future demand for labor was assumed to be determined by economic growth. Market behavior and substitution among various labor groups could not be considered in this study. This was not only because of scanty data especially on wage rates, but it was also because of the lack of a firm theoretical foundation in specifying how the Thai labor market actually operates. As such, substitution of labor among various labor groups could not be considered. In short, the projection of employment demand would be based on existing conditions in 1981 especially the relative wage rates among various labor groups.

The projection of future labor demand was thus undertaken through a set of assumptions concerning the income elasticities of employment and economic growth without any regard to the actual adjustment in the labor market. Due to such a limitation, it should be pointed out here that the projected aggregate demand for employment are much more accurate than the demand for labor of various smaller groups.

Similar to labor force statistics, employment data from the LFS were first corrected and adjusted for the projection purpose. (See Appendix C). Gross regional product by sectors were also revised to make them consistent. (See Appendix D).

### 3.1 Income Elasticities of Employment.

After income and employment data have been adjusted, they were employed to estimate the income elasticities of employment in each sector and region. The three sectors are the primary, secondary and service sectors. There were thus 3 equations estimated for each region. The equation form utilized in the estimations is as follows:

$$\ln E_j = a_0 + a_1 \ln Y_j$$

where  $E_j$  = employment level in sector j.

$Y_j$  = income level in sector j.

The value of  $a_1$  is but the income elasticity of employment.

The equations were estimated with the ordinary least squares method and the results can be found in Appendix E. The value of the elasticities obtained are summarized here in Table 3.1.

The elasticities ranged from a negative value of  $-0.5818$  to a positive value of  $1.1938$ . The income elasticity of employment for the whole kingdom was approximately  $0.5$ . It was also found that on average labor absorption capacity was greater during the wet season than the dry season especially in the primary sector and to a lesser extent the secondary sector.

In general, it was found that the income elasticities of employment were larger in the primary sector while they were not much different in the secondary and service sectors. However, a look at regional elasticities in the primary sector revealed that there were large differences. They were rather high in the Northeastern ( $0.77/0.87$ ) and Southern ( $1.19/0.83$ ) regions and lowest in Bangkok ( $0.39/0.43$ ). For the Central ( $0.38/0.79$ ) and Northern ( $0.55/0.63$ ) regions, even though elasticities in the wet season were not low, the elasticities in the dry season were relatively low. The results seem to be reasonable considering that the Northeastern and Southern regions rely relatively more on nature or rain-fed agriculture. Agricultural technology tended to be more labor-intensive. A given economic growth rate could thus absorb a greater employment increase. The other three regions are generally more developed in agriculture especially in terms of irrigation facilities and tend to use more advanced technology which are less labor-intensive, e.g. farm tractors and power tillers. They are thus less able to absorb labor with a given economic growth rate.

TABLE 3.1  
 INCOME ELASTICITY OF EMPLOYMENT  
 BY REGION AND ECONOMIC SECTOR, 1971-1981

Region/Sector	Primary	Secondary	Service	Total
<u>1. Bangkok</u>				
Round 1	0.3887	0.7146	0.6530	0.6025
Round 2	0.4256	0.7270	0.6471	0.6303
<u>2. Central</u>				
Round 1	0.3774	0.5555	0.4383	0.3483
Round 2	0.7882	0.6763	0.5316	0.5137
<u>3. Northern</u>				
Round 1	0.5534	0.8645	0.7577	0.5904
Round 2	0.6298	0.8517	0.6949	0.5643
<u>4. Northeastern</u>				
Round 1	0.7673	0.0296	0.2505	0.4829
Round 2	0.8679	-0.5818	0.1288	0.5367
<u>5. Southern</u>				
Round 1	1.1938	0.7011	0.4876	0.6942
Round 2	0.8298	0.8431	0.6590	0.6097
<u>6. Whole kingdom</u>				
Round 1	0.6804	0.5125	0.5367	0.4864
Round 2	0.8445	0.6082	0.5821	0.5330

Note: Income elasticity of employment were obtained from estimating the following equation:

$$\ln(\text{employment})_t = a_0 + a_1 \ln(\text{GRP})_t$$

Except for the Northeastern region, the secondary sector possessed a greater ability to absorb labor than the service sector. The Northern region showed the greatest ability in absorbing labor both in the secondary (0.86/0.85) and service sectors (0.76/0.69). This was followed by Bangkok and the Southern region. The Central region surprisingly did not have a high absorptive capacity of labor in these sectors.

The most significant results found, however, were the rather low labor absorptive capacities of both the secondary and service sectors in the Northeast. In fact, a negative elasticity value was found in the secondary sector in the wet season.

Employment statistics in the Northeast seem to show a wide fluctuation in the secondary and service sectors. This can probably be explained by the dominance of the agricultural sector. The available supplies of labor in the secondary and service sectors are likely to be residuals left after the demand for labor in agriculture has been met. Since rainfed agriculture in the Northeast fluctuates a lot depending on weather, it affects significantly available supplies of labor in the secondary and service sectors. Furthermore, the secondary and service industries in the Northeastern region are probably highly dependent on agricultural production through the supply of inputs and the purchase of outputs. As such, employment levels in these two sectors may fluctuate a lot.

Another explanation could well be the relatively easy and low cost of migrating to work in other regions. With manufacturing industries in the Northeast not being well developed, it may be easier for labor to find jobs in other regions especially in Bangkok and the Central

region. In fact, employers and job agencies are known to be involved in the transporting of workers from villages in the Northeast directly to their factories in other regions. The irony is that the easy and low cost of migration of workers to other regions may well be one reason obstructing industrial development in the Northeast, since an assured steady supply of labor is not readily available for the secondary and service sectors in the region.

Although the income elasticity of employment in the primary sector of Bangkok during 1971-1981 may be the lowest, the income growth rate of this sector was highest at about 7 percent per year as shown in Table 3.2. This helped to maintain a reasonable employment growth rate of 2 percent in the primary sector during 1971-1981. (See Table 3.3).

On the contrary, the Southern region, which had the highest income elasticity of employment in the primary sector, had a relatively low economic growth rate in the primary sector of 3.5 percent per year. Nevertheless, the South remained the region with the highest employment growth during 1971-1981.

The economic growth rates in the secondary sector were highest in Bangkok and the Central region at 9.7 percent per year and 9.5 percent per year, respectively. With a relatively high absorptive capacity, the high growth rate of Bangkok resulted in the highest growth rate of employment in the secondary sector at 7.3 percent per year during 1971-1981.

The lowest growth rates of employment in the secondary and service sectors are to be found, not surprisingly, in the Northeastern region which tended to have very low income elasticities of employment as has been mentioned.

TABLE 3.2  
 GROWTH RATE OF GROSS REGIONAL  
 PRODUCT BY ECONOMIC SECTOR, 1971-1982  
 (percent per year)

Region/Sector	Primary	Secondary	Service	Total
1. Bangkok	7.3	9.7	7.7	8.5
2. Central	3.3	9.5	7.6	6.7
3. Northern	4.0	6.6	7.3	5.7
4. Northeastern	4.5	7.4	7.9	6.2
5. Southern	3.5	7.2	7.4	5.6
6. Whole kingdom	3.8	9.1	7.6	6.9

Note: Growth rates were estimated by fitting an exponential equation as follows:

$$\ln(\text{GDP})_t = a_0 + a_1 t$$

where  $t$  = time period.

Regional income growth rates in the service sector are not greatly different. As such, relative employment growth in this sector across regions depended more on the income elasticities of employment.

TABLE 3.3.  
GROWTH RATE OF EMPLOYMENT BY REGION AND ECONOMIC SECTOR,  
1971 - 1981  
(percent per year)

Region/Sector	Primary	Secondary	Service	Total
1. Bangkok	2.0	7.3	5.0	5.2
2. Central	1.2	5.8	3.2	2.4
3. Northern	2.2	6.6	6.0	3.4
4. Northeastern	3.9	0.6	1.7	3.0
5. Southern	4.0	6.2	4.0	4.0
6. Whole kingdom	2.7	5.1	4.1	3.4

Note: Growth rates were estimated by fitting an exponential equation as follows:

$$\ln E_t = a_0 + a_1 t$$

where  $E_t$  = employment

$t$  = time

### 3.2 Employment Projection by Region and Economic Sector

In projecting future employment levels, the regional income elasticities of employment by sectors as estimated in the previous section were utilized except for elasticities in the secondary sector of the Northeastern region. It does not seem reasonable to think that employment levels in the secondary sector of the Northeast would actually decline in the future. However, it is highly likely that employment absorptive capacity would remain very low. As such, income elasticities of employment in the secondary sector of the Northeastern region were assumed to be 0.1 for Round 1 and 0.05 for Round 2.

Given the income elasticities of employment, two economic scenarios of high growth and low growth as mentioned in Part 1 were experimented. It was assumed that growth rates of all sectors and all regions would decline by one percentage point from corresponding growth rates estimated between 1971-1982 under the high growth scenario. (See Table 3.1) Under the low growth scenario, the reduction would be two percentage points reduction in the growth rates estimated from 1971-1982 data of every sector and every region.

From the above growth assumptions and the income elasticities of employment, employment growth rates in each sector of every region were estimated. This is presented in Table 3.4. The growth rates were then used to project employment levels in 1990 and 1995 with employment levels in 1981 providing the base figures for estimation. The resulting employment levels or labor demand in 1990 and 1995 are shown in Tables 3.5-3.6. The figures for the whole kingdom are but the summation of regional totals.

TABLE 3.4

GROWTH RATE OF EMPLOYMENT BY REGION AND SECTOR  
(percent per year)

Region/Sector	Round 1			Round 2		
	1971-1981 Actual	1981-1995 High Low		1971-1981 Actual	1981-1995 High Low	
<u>1. Bangkok</u>						
- primary	2.0	2.4	2.1	2.5	2.7	2.3
- secondary	7.3	6.1	5.4	7.5	6.3	5.5
- service	5.0	4.4	3.7	5.0	4.3	3.7
- total	5.2	4.8	4.1	5.5	4.8	4.1
<u>2. Central</u>						
- primary	1.2	0.9	0.5	2.7	1.8	1.0
- secondary	5.8	4.7	4.2	6.9	5.7	5.1
- service	3.2	2.9	2.5	4.0	3.5	3.0
- total	2.4	2.4	1.9	3.4	2.9	2.2
<u>3. Northern</u>						
- primary	2.2	1.7	1.1	3.1	1.9	1.3
- secondary	6.6	4.8	4.0	6.4	4.8	3.9
- service	6.0	4.8	4.0	5.3	4.4	3.7
- total	3.4	3.1	2.4	3.4	2.5	1.8
<u>4. Northeastern</u>						
- primary	3.9	2.7	1.9	4.5	3.0	2.2
- secondary	0.6	0.6	0.5	-3.3	0.3	0.3
- service	1.7	1.7	1.5	-0.5	0.9	0.8
- total	3.0	2.2	1.6	3.5	2.8	2.0
<u>5. Southern</u>						
- primary	4.0	3.0	1.8	3.1	2.1	1.2
- secondary	6.2	4.3	3.6	7.9	5.2	4.4
- service	4.0	3.1	2.6	5.1	4.2	3.6
- total	4.0	3.2	2.2	3.6	3.0	2.2
<u>6. Whole kingdom</u>						
- primary	2.7	2.2	1.4	3.4	2.4	1.7
- secondary	5.1	4.3	3.7	6.0	5.3	4.6
- service	4.1	3.4	2.9	4.5	3.7	3.1
- total	3.4	2.9	2.3	3.8	3.0	2.3

Note: High means high growth scenario (6% per year)  
Low means low growth scenario (5% per year)

TABLE 3.5

## PROJECTED EMPLOYMENT BY REGION AND SECTOR

SCENARIO : High Growth (6%)

(1,000 persons)

Region/Sector	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>1. Bangkok</u>						
- primary	233.0	288.4	324.8	293.9	373.5	426.8
- secondary	708.7	1,207.5	1,623.6	732.3	1,269.1	1,722.5
- service	1,270.8	1,872.3	2,322.1	1,391.5	2,032.6	2,508.8
- total	2,212.5	3,368.2	4,270.5	2,417.7	3,675.2	4,658.1
<u>2. Central</u>						
- primary	2,048.4	2,220.4	2,322.2	3,094.5	3,633.5	3,972.5
- secondary	786.1	1,188.5	1,495.3	709.9	1,169.2	1,542.6
- service	1,120.9	1,449.8	1,672.6	1,113.8	1,518.0	1,802.9
- total	3,955.4	4,858.7	5,490.1	4,918.2	6,320.7	7,318.0
<u>3. Northern</u>						
- primary	2,223.0	2,587.2	2,814.7	4,362.5	5,167.8	5,677.7
- secondary	523.6	798.5	1,009.4	289.1	440.9	557.3
- service	914.8	1,395.0	1,763.5	780.5	1,149.9	1,426.2
- total	3,661.4	4,780.7	5,587.6	5,432.1	6,758.6	7,661.2
<u>4. Northeastern</u>						
- primary	2,896.8	3,681.7	4,206.3	8,011.4	10,453.0	12,118.0
- secondary	671.4	708.5	730.1	240.3	246.9	250.6
- service	1,294.1	1,506.1	1,638.6	729.5	790.8	827.0
- total	4,862.3	5,896.3	6,575.0	8,981.2	11,490.7	13,195.6
<u>5. Southern</u>						
- primary	1,887.9	2,463.3	2,855.6	1,854.3	2,235.7	2,480.5
- secondary	253.2	369.8	456.5	304.2	480.1	618.6
- service	559.1	735.9	857.3	563.3	815.7	1,002.0
- total	2,700.2	3,569.0	4,169.4	2,721.8	3,531.5	4,101.1
<u>6. Whole kingdom</u>						
- primary	9,289.1	11,241.0	12,523.6	17,616.6	21,863.5	24,675.5
- secondary	2,943.0	4,272.8	5,314.9	2,275.8	3,606.2	4,691.6
- service	5,159.7	6,959.1	8,254.1	4,578.6	6,307.0	7,566.9
- total	17,391.8	22,472.9	26,092.6	24,471.0	31,776.7	36,934.0

## PROJECTED EMPLOYMENT BY REGION AND SECTOR

SCENARIO : Low Growth (5%)

(1,000 persons)

Region/Sector	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>1. Bangkok</u>						
- primary	233.0	280.9	311.7	293.9	360.6	404.1
- secondary	708.7	1,137.7	1,479.9	732.3	1,185.7	1,549.6
- service	1,270.8	1,762.3	2,113.4	1,391.5	1,929.7	2,314.1
- total	2,212.5	3,180.9	3,905.0	2,417.7	3,476.0	4,267.8
<u>2. Central</u>						
- primary	2,048.4	2,142.4	2,196.5	3,094.5	3,384.4	3,557.0
- secondary	786.1	1,138.4	1,398.4	709.9	1,110.8	1,424.4
- service	1,120.9	1,399.9	1,583.8	1,113.8	1,453.3	1,684.7
- total	3,955.4	4,680.7	5,178.7	4,918.2	5,948.5	6,666.1
<u>3. Northern</u>						
- primary	2,223.0	2,453.0	2,590.9	4,362.5	4,900.3	5,227.2
- secondary	523.6	745.2	906.7	289.1	407.9	493.9
- service	914.8	1,302.0	1,584.1	780.5	1,082.4	1,298.0
- total	3,661.4	4,500.2	5,081.7	5,432.1	6,390.6	7,019.1
<u>4. Northeastern</u>						
- primary	2,896.8	3,431.5	3,770.1	8,011.4	9,744.7	10,864.8
- secondary	671.4	702.2	720.0	240.3	246.9	250.6
- service	1,294.1	1,479.7	1,594.0	729.5	783.7	815.6
- total	4,862.3	5,613.4	6,084.1	8,981.2	10,775.3	11,931.0
<u>5. Southern</u>						
- primary	1,887.9	2,216.7	2,423.5	1,854.3	2,064.5	2,191.3
- secondary	253.2	348.1	415.4	304.2	448.2	555.9
- service	559.1	704.4	800.9	563.3	774.4	924.2
- total	2,700.2	3,269.2	3,639.8	2,721.8	3,287.1	3,671.4
<u>6. Whole kingdom</u>						
- primary	9,289.1	10,524.5	11,292.7	17,616.6	20,454.5	22,244.4
- secondary	2,943.0	4,071.6	4,920.4	2,275.8	3,399.5	4,274.4
- service	5,159.7	6,648.3	7,676.2	4,578.6	6,023.5	7,036.6
- total	17,391.8	21,244.4	23,889.3	24,471.0	29,877.5	33,555.4

Since economic growth have been assumed to be lower than in the past, both the high growth and low growth scenarios showed lower growth rates of employment demand. (See Table 3.4) At the regional level, employment growth in the Northeast became lower than the Central region which used to have the lowest growth rate during 1971-1981.

### 3.3 Employment Projection by Region and Sex Group.

As has been mentioned, it is not possible at present to project labor demand taking into account market behavior and relationships. However, it is possible to capture the change in the demand for labor from the structural change among economic sectors from economic growth.

In this case, it can be seen from Tables 3.7-3.8 that the secondary and service sectors tended to employ more male workers relative to female workers. The increasing importance of the secondary and service sectors could thus be biased in favor of male employment.

In projecting future employment demand by sex, the employment structure by sex in each sector of every region in 1981 were utilized. From this, data in Tables 3.5-3.6 and Tables 3.7-3.8 could be utilized to estimate employment demand by region and sex. The results are shown in Tables 3.9-3.10.

TABLE 3.7  
 EMPLOYMENT SHARES OF MALE AND FEMALE  
 IN EACH SECTOR BY REGION, 1981 (ROUND 1)

Region/Sector	Primary	Secondary	Service	All Sectors
<u>1. Bangkok</u>				
Male	51.739	62.795	55.076	57.266
Female	48.261	37.205	44.924	42.734
Total	100.000	100.000	100.000	100.000
<u>2. Central</u>				
Male	52.793	60.209	53.553	54.477
Female	47.207	39.791	46.447	45.523
Total	100.000	100.000	100.000	100.000
<u>3. Northern</u>				
Male	54.502	60.658	55.399	55.602
Female	45.498	39.342	44.601	44.398
Total	100.000	100.000	100.000	100.000
<u>4. Northeastern</u>				
Male	55.579	69.443	60.790	58.881
Female	44.421	30.557	39.210	41.119
Total	100.000	100.000	100.000	100.000
<u>5. Southern</u>				
Male	51.536	68.144	55.882	53.982
Female	48.464	31.856	44.118	46.018
Total	100.000	100.000	100.000	100.000
<u>6. Whole kingdom</u>				
Male	53.787	63.694	56.340	56.222
Female	46.213	36.306	43.660	43.778
Total	100.000	100.000	100.000	100.000

SOURCE: National Statistical Office, Report of the Labor Force Survey,  
 January-March 1981.

TABLE 3.8  
 EMPLOYMENT SHARES OF MALE AND  
 FEMALE IN EACH SECTOR BY REGION, 1981 (ROUND 2)  
 (percent)

Region/Sector	Primary	Secondary	Service	All Sectors
<u>1. Bangkok</u>				
Male	49.030	63.229	52.904	55.562
Female	50.970	36.771	47.096	44.438
Total	100.000	100.000	100.000	100.000
<u>2. Central</u>				
Male	52.571	57.337	52.544	53.258
Female	47.429	42.663	47.456	46.742
Total	100.000	100.000	100.000	100.000
<u>3. Northern</u>				
Male	51.505	64.360	54.147	52.563
Female	48.495	35.640	45.853	47.437
Total	100.000	100.000	100.000	100.000
<u>4. Northeastern</u>				
Male	50.433	65.842	57.306	51.403
Female	49.567	34.158	42.694	48.597
Total	100.000	100.000	100.000	100.000
<u>5. Southern</u>				
Male	52.160	68.074	54.133	54.340
Female	47.840	31.926	45.867	45.660
Total	100.000	100.000	100.000	100.000
<u>6. Whole kingdom</u>				
Male	51.232	62.449	53.880	52.774
Female	48.768	37.551	46.120	47.226
Total	100.000	100.000	100.000	100.000

SOURCE: National Statistical Office, Report of the Labor Force Survey,  
 July-September, 1981.

TABLE 3.9

PROJECTED EMPLOYMENT BY REGION AND SEX :  
 HIGH GROWTH SCENARIO  
 (1,000 persons)

Region/Sex	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
1. <u>Bangkok</u>						
- male	1,267.6	1,938.6	2,466.4	1,344.0	2,060.8	2,625.7
- female	946.0	1,429.6	1,804.1	1,075.0	1,614.4	2,032.4
- total	2,213.5	3,368.2	4,270.5	2,419.0	3,675.2	4,658.1
2. <u>Central</u>						
- male	2,155.9	2,664.2	3,022.0	2,619.4	3,378.2	3,920.2
- female	1,801.5	2,194.5	2,468.1	2,299.8	2,942.5	3,397.8
- total	3,957.4	4,858.7	5,490.0	4,919.2	6,320.7	7,318.0
3. <u>Northern</u>						
- male	2,036.6	2,667.3	3,123.4	2,855.9	3,568.1	4,055.2
- female	1,626.1	2,113.4	2,464.2	2,576.9	3,190.5	3,606.0
- total	3,662.7	4,780.7	5,587.6	5,432.8	6,758.6	7,661.2
4. <u>Northeastern</u>						
- male	2,863.4	3,453.9	3,840.9	4,617.1	5,887.6	6,750.4
- female	1,999.6	2,442.4	2,734.1	4,364.9	5,603.1	6,445.2
- total	4,862.9	5,896.2	6,574.8	8,982.0	11,490.7	13,195.6
5. <u>Southern</u>						
- male	1,458.1	1,932.7	2,261.9	1,479.7	1,934.5	2,257.3
- female	1,242.9	1,636.3	1,907.5	1,243.0	1,597.0	1,843.8
- total	2,701.0	3,569.1	4,169.4	2,722.7	3,531.5	4,101.1
6. <u>Whole kingdom</u>						
- male	9,781.6	12,656.7	14,714.6	12,916.1	16,829.9	19,608.8
- female	7,616.1	9,816.2	11,378.0	11,559.6	14,947.5	17,325.2
- total	17,397.5	22,472.9	26,092.6	24,475.7	31,776.7	36,934.0

TABLE 3.10  
 PROJECTED EMPLOYMENT BY REGION AND SEX:  
 LOW GROWTH SCENARIO  
 (1,000 persons)

Region/Sex	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>1. Bangkok</u>						
- male	1,267.6	1,830.3	2,254.6	1,344.0	1,947.4	2,402.2
- female	946.0	1,350.6	1,650.4	1,075.0	1,528.6	1,865.6
- total	2,213.5	3,180.9	3,905.0	2,419.0	3,476.0	4,267.8
<u>2. Central</u>						
- male	2,155.9	2,566.1	2,849.8	2,619.4	3,179.7	3,571.9
- female	1,801.5	2,114.6	2,328.9	2,299.8	2,768.8	3,094.2
- total	3,957.4	4,680.7	5,178.8	4,919.2	5,948.4	6,666.0
<u>3. Northern</u>						
- male	2,036.6	2,510.2	2,839.7	2,855.9	3,372.5	3,713.0
- female	1,626.1	1,990.0	2,242.0	2,576.9	3,018.1	3,306.1
- total	3,662.7	4,500.2	5,081.7	5,432.8	6,390.5	7,019.0
<u>4. Northeastern</u>						
- male	2,863.4	3,294.3	3,564.4	4,617.1	5,526.2	6,111.8
- female	1,999.6	2,319.1	2,519.7	4,364.9	5,249.1	5,819.2
- total	4,862.9	5,613.2	6,084.0	8,982.0	10,775.3	11,931.0
<u>5. Southern</u>						
- male	1,458.1	1,773.2	1,979.7	1,479.7	1,801.1	2,021.7
- female	1,242.9	1,496.0	1,660.1	1,243.0	1,486.0	1,649.7
- total	2,701.0	3,269.1	3,639.8	2,722.7	3,287.1	3,671.4
<u>6. Whole kingdom</u>						
- male	9,781.6	11,974.1	13,488.2	12,916.1	15,826.9	17,820.6
- female	7,616.1	9,270.3	10,401.1	11,559.6	14,050.6	15,734.8
- total	17,397.5	21,244.4	23,889.3	24,475.7	29,877.5	33,555.4

### 3.4 Employment Projection by Region and Educational Group

It can also be seen in Tables 3.11-3.12 that economic sectors in different regions demand workers with different levels of education in varying proportions. To take account of changes in employment demand among various educational groups, a similar exercise as those in the previous section was carried out, that is, projected employment in each sector were broken down into employment categories by educational levels utilizing the existing shares of the corresponding sector in 1981. The estimated employed persons by region and education in 1990 and 1995 were thus obtained and are presented in Tables 3.13-3.14.

### 3.5 Employment Projection by Region and Age Group.

Since sectoral employment figures by age groups were not available, it was not possible to take into account the effect of changing economic structure on the demand for employment of different age groups. As such, it was assumed that the growth rate of total employment in each region as shown in Table 3.4 applies equally to all age groups. In short, the employment demand estimated in 1990 and 1995 in Tables 3.5-3.6 were distributed among different age groups according to the shares of each group in 1981. Employment shares of different age groups in 1981 are shown in Tables 3.15-3.16.

TABLE 3.11  
 EMPLOYMENT SHARES OF EDUCATIONAL GROUPS  
 IN EACH SECTOR BY REGION, 1981 (Round 1)  
 (percent)

Region/Sector	Primary	Secondary	Services	All Sectors
<u>1. Bangkok</u>				
- Below Elementary	7.55	6.15	9.26	8.08
- Elementary	89.13	73.21	47.17	59.93
- Secondary	3.02	12.58	18.27	14.84
- Above Secondary	0.30	8.06	25.30	17.15
- Total	100.00	100.00	100.00	100.00
<u>2. Central</u>				
- Below Elementary	15.52	8.09	9.43	12.32
- Elementary	81.67	85.84	65.02	77.79
- Secondary	1.84	4.44	10.79	4.89
- Above Secondary	0.97	1.63	14.76	5.00
- Total	100.00	100.00	100.00	100.00
<u>3. Northern</u>				
- Below Elementary	23.53	14.99	12.06	19.45
- Elementary	74.64	80.85	61.44	72.25
- Secondary	1.42	3.44	12.03	4.35
- Above Secondary	0.41	0.71	14.47	3.95
- Total	100.00	100.00	100.00	100.00

TABLE 3.11 (CONTINUED)

Region/Sector	Primary	Secondary	Services	All Sectors
<u>4. Northeastern</u>				
- Below Elementary	9.38	8.23	4.82	8.01
- Elementary	89.45	87.83	75.77	85.59
- Secondary	1.13	3.49	8.33	3.37
- Above Secondary	0.04	0.45	11.08	3.03
- All Sector	100.00	100.00	100.00	100.00
<u>5. Southern</u>				
- Below Elementary	24.85	16.05	14.89	20.39
- Elementary	71.97	75.09	51.21	63.06
- Secondary	2.56	5.39	14.75	8.23
- Above Secondary	0.62	3.47	19.15	8.32
- All Sectors	100.00	100.00	100.00	100.00
<u>6. Whole kingdom</u>				
- Below Elementary	67.66	11.98	20.36	16.58
- Elementary	57.49	18.35	31.42	69.40
- Secondary	15.96	18.15	65.89	6.97
- Above Secondary	4.32	8.68	87.0	7.05
- All Sectors	100.00	100.00	100.00	100.00

TABLE 3.12  
 EMPLOYMENT SHARES OF EDUCATIONAL GROUPS  
 IN EACH SECTOR BY REGION, 1981 (ROUND 2)  
 (percent)

Region/Sector	Primary	Secondary	Service	All Sectors
<u>1. Bangkok</u>				
- Below elementary	8.818	6.789	8.660	8.167
- Elementary	85.543	73.296	46.389	59.257
- Secondary	4.443	11.974	18.986	15.159
- Above secondary	1.196	7.941	25.965	17.417
- Total	100.000	100.000	100.000	100.000
<u>2. Central</u>				
- Below elementary	13.749	7.424	9.220	11.841
- Elementary	83.250	83.473	63.321	78.651
- Secondary	1.724	6.159	11.797	4.660
- Above secondary	1.277	2.944	15.662	4.848
- Total	100.000	100.000	100.000	100.000
<u>3. Northern</u>				
- Below elementary	20.362	13.759	11.728	18.784
- Elementary	77.854	78.273	55.371	74.560
- Secondary	1.339	6.353	14.725	3.552
- Above secondary	0.445	1.615	18.176	3.104
- Total	100.000	100.000	100.000	100.000

TABLE 3.12 (CONTINUED)

Region/Sector	Primary	Secondary	Service	All Sectors
<u>4. Northeastern</u>				
- Below elementary	8.250	10.495	6.183	8.156
- Elementary	90.332	82.141	59.699	87.582
- Secondary	1.218	5.967	11.837	2.221
- Above secondary	0.200	1.397	22.281	2.041
- Total	100.000	100.000	100.000	100.000
<u>5. Southern</u>				
- Below elementary	21.766	15.995	12.392	19.207
- Elementary	73.953	76.708	52.892	69.767
- Secondary	3.577	5.298	14.296	6.031
- Above secondary	0.704	1.999	20.420	4.995
- Total	100.000	100.000	100.000	100.000
<u>6. Whole Kingdom</u>				
- Below elementary	13.654	9.539	9.500	12.488
- Elementary	84.170	78.238	54.799	78.088
- Secondary	1.647	8.006	14.843	4.718
- Above secondary	0.529	4.217	20.858	4.706
- Total	100.000	100.000	100.000	100.000

TABLE 3.13  
PROJECTED EMPLOYMENT BY REGION AND EDUCATION :

## HIGH GROWTH SCENARIO

(1,000 persons)

Region/Education	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>1. Bangkok</u>						
- Below Elementary	177.9	269.5	339.4	195.8	295.1	371.8
- Elementary	1,318.8	2,024.1	2,573.4	1,429.8	2,192.6	2,791.4
- Secondary	326.6	502.7	638.3	364.4	554.5	701.6
- Above Secondary	377.4	571.9	719.4	422.6	633.1	793.3
- Total	2,200.7	3,368.2	4,270.5	2,412.6	3,675.3	4,658.1
<u>2. Central</u>						
- Below Elementary	485.9	577.4	639.0	579.7	295.4	826.9
- Elementary	3,067.4	3,776.3	4,267.7	3,865.1	4,962.1	5,736.4
- Secondary	192.7	250.1	289.6	227.4	313.7	376.2
- Above Secondary	197.2	254.9	293.8	233.6	318.5	378.5
- Total	3,943.2	4,858.7	5,490.1	4,905.8	5,889.7	7,318.0
<u>3. Northern</u>						
- Below Elementary	710.6	896.7	1,026.3	1,018.2	1,247.9	1,400.1
- Elementary	2,381.8	3,433.9	4,000.6	4,057.9	5,005.1	5,646.2
- Secondary	158.2	231.9	286.8	190.6	266.5	321.4
- Above Secondary	143.4	218.2	273.9	164.8	239.1	293.5
- Total	3,394.0	4,780.7	5,587.6	5,431.4	6,758.6	7,661.2

TABLE 3.13 (CONTINUED)

Region/Education	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>4. Northeastern</u>						
- Below Elementary	388.7	476.2	533.7	1,019.6	937.2	1,077.1
- Elementary	4,153.1	5,056.8	5,645.3	4,063.7	10,117.2	11,645.9
- Secondary	163.5	191.7	209.5	190.9	235.6	260.5
- Above Secondary	147.8	171.6	186.5	165.0	200.6	212.0
- Total	4,853.1	5,896.3	6,575.0	5,439.2	11,490.6	13,195.5
<u>5. Southern</u>						
- Below Elementary	591.4	781.1	910.6	520.5	664.5	763.1
- Elementary	1,628.1	2,427.4	2,837.0	1,895.9	2,453.1	2,838.9
- Secondary	143.5	191.5	224.1	162.0	222.0	264.7
- Above Secondary	126.5	169.0	197.7	133.0	191.9	234.5
- Total	2,489.5	3,569.0	4,169.4	2,711.5	3,531.4	4,101.5
<u>6. Whole kingdom</u>						
- Below Elementary	2,354.5	3,000.9	3,449.0	3,333.8	3,440.1	4,439.0
- Elementary	12,549.2	16,718.9	19,324.0	15,312.4	24,730.1	28,658.8
- Secondary	984.5	1,367.9	1,648.3	1,135.3	1,592.3	1,924.4
- Above Secondary	992.3	1,385.6	1,671.3	1,119.0	1,583.2	1,911.8
- Total	16,880.5	22,472.9	26,092.6	20,900.5	31,345.7	36,934.0

TABLE 3.14

## PROJECTED EMPLOYMENT BY REGION AND EDUCATION :

## LOW GROWTH SCENARIO

(1,000 persons)

Region/Education	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>1. Bangkok</u>						
- Below Elementary	177.9	254.37	310.24	195.8	277.10	341.23
- Elementary	1,318.8	1,914.56	2,358.14	1,429.8	2,072.71	2,554.96
- Secondary	326.6	473.58	581.70	364.4	524.37	642.86
- Above Secondary	377.4	538.39	654.91	422.6	599.52	728.75
- Total	2,200.7	3,180.90	3,904.99	2,412.6	3,473.70	4,267.80
<u>2. Central</u>						
- Below Elementary	485.9	556.61	603.38	579.7	681.79	750.13
- Elementary	3,067.4	3,637.12	4,024.06	3,865.1	4,664.97	5,216.96
- Secondary	192.7	241.02	273.40	227.4	298.21	347.79
- Above Secondary	197.2	245.97	277.87	233.6	303.54	351.21
- Total	3,943.2	4,680.71	5,178.70	4,905.8	5,948.51	6,666.09
<u>3. Northern</u>						
- Below Elementary	710.6	450.98	489.73	1,018.2	1,180.86	1,284.55
- Elementary	2,381.8	4,807.38	5,212.50	4,057.9	4,733.70	5,174.89
- Secondary	158.2	186.54	200.51	190.6	250.91	292.90
- Above Secondary	143.4	168.48	181.37	164.8	225.14	267.16
- Total	3,394.0	5,613.38	6,084.11	5,431.4	6,390.61	7,019.10

TABLE 3.14 (CONTINUED)

Region/Education	Round 1			Round 2		
	1981	1990	1995	1981	1990	1995
<u>4. Northeastern</u>						
- Below Elementary	388.7	450.98	489.73	11,019.6	1878.31	973.10
- Elementary	4,153.1	4,807.38	5,212.50	4,063.7	9,473.25	10,507.32
- Secondary	163.5	186.54	200.51	190.9	226.19	243.86
- Above Secondary	147.8	168.48	181.37	165.0	197.56	207.02
- All Sector	4,853.1	5,613.38	6,084.11	5,439.2	10,775.31	11,931.30
<u>5. Southern</u>						
- Below Elementary	591.4	711.61	788.16	520.5	617.01	680.41
- Elementary	1,628.1	2,217.47	2,466.25	1,895.9	2,280.17	2,535.77
- Secondary	143.5	179.41	202.56	162.0	208.31	239.95
- Above Secondary	126.5	160.71	182.81	133.0	181.62	215.26
- All Sector	2,489.5	3,269.02	3,639.79	2,711.5	3,287.11	3,671.39
<u>6. Whole kingdom</u>						
- Below Elementary	2,354.5	2,819.49	3,128.10	3,333.8	3,635.07	4,029.42
- Elementary	12,549.2	15,809.97	17,701.23	15,312.4	23,224.80	25,989.90
- Secondary	984.5	1,297.65	1,516.71	1,135.3	1,507.99	1,766.96
- Above Secondary	992.3	1,317.31	1,543.23	1,119.0	1,507.38	1,769.40
- All Sector	16,880.5	21,244.40	23,889.29	20,900.5	29,875.24	33,555.68

TABLE 3.15

EMPLOYMENT SHARE OF AGE GROUPS  
IN EACH REGION, 1981 (Round 1)

Region/Age Group	11-19	20-34 (years)	35 upwards	Total
1. Bangkok	10.290	54.255	35.455	100.000
2. Central	24.519	42.688	32.793	100.000
3. Northern	18.592	44.178	37.230	100.000
4. Northeastern	24.312	42.419	33.267	100.000
5. Southern	15.421	40.535	44.045	100.000
6. Whole kingdom	18.424	44.134	37.442	100.000

SOURCE: National Statistical Office, Report of the Labor Force Survey, January-March 1981.

TABLE 3.16  
 EMPLOYMENT SHARE OF AGE GROUPS  
 IN EACH REGION, 1981 (Round 2)

Region/Age Group	11-19	20-34 (years)	35 upwards	Total
1. Bangkok	11.102	53.540	35.357	100.000
2. Central	18.439	41.899	39.661	100.000
3. Northern	20.476	42.682	36.841	100.000
4. Northeastern	25.757	40.689	33.554	100.000
5. Southern	15.607	41.053	43.340	100.000
6. Whole kingdom	20.534	42.697	36.768	100.000

SOURCE: National Statistical Office, Report of the Labor Force Survey, July-September 1981.

### 3.6 Employment Generation by Sector and Region

The employment projection results show that the number of additional jobs created for the whole country between 1981-1990 would be 7.3 million persons under the high growth scenario and 5.4 million persons under the low growth scenario. Similar figures of employment generation between 1990-1995 would be 5.2 million persons and 3.7 million persons, respectively. (See Tables 3.17-3.18)

The region which generated the highest share of new employment remained the Northeast. Nevertheless, the share of additional employment created by the region declined under both the high and low growth scenarios with the decline being more pronounced under the low growth scenario. (see Table 3.19-3.20). Besides the Northeast, the Central and Northern regions also showed reductions in the share of additional employment generated under both growth scenarios. The region with the most significant increase in terms of contribution towards employment generation is Bangkok with the increase being more pronounced under the low growth scenario. The South also contributed towards more employment generation in share terms although the increase was not too significant under the low growth scenario.

In sectoral terms, the structure of employment generation of the future would not change much under the high growth scenario. (See Table 3.21) However, under the low growth scenario, the share of new jobs in the primary sector declined relative to the secondary and service sectors. (See Table 3.22) The regions which would generate lower new employment shares in the primary sector under both growth scenarios are Bangkok and the Central region while the regions which would generate higher new employment shares in the primary sector under both growth scenarios are the Northeastern and Southern regions. The greater

reliance on the primary sector in the latter case, however, is due more to the inability of the secondary and service sectors of these regions to generate as many new jobs as in the past.

TABLE 3.17

## ADDITIONAL EMPLOYMENT CREATED BY REGION AND SECTOR :

## HIGH GROWTH SCENARIO (ROUND 2)

(1,000 persons)

Region/Sector	1971-1981	1981-1990	1990-1995
<u>1. Bangkok</u>			
- primary	76.4	79.6	53.3
- secondary	423.2	536.8	453.4
- service	475.4	641.1	476.2
- total	975.0	1,257.5	982.9
<u>2. Central</u>			
- primary	636.6	539.0	339.0
- secondary	409.1	459.3	373.4
- service	350.8	404.2	284.9
- total	1,396.5	1,402.5	997.3
<u>3. Northern</u>			
- primary	728.3	805.3	509.9
- secondary	166.3	151.8	116.4
- service	385.4	369.4	276.3
- total	1,280.0	1,326.5	902.6
<u>4. Northeastern</u>			
- primary	2,118.8	2,441.6	1,665.0
- secondary	109.7	6.6	3.7
- service	235.8	61.3	36.2
- total	2,464.3	2,509.5	1,704.9
<u>5. Southern</u>			
- primary	175.5	381.4	244.8
- secondary	230.8	175.9	138.5
- service	189.3	252.4	186.3
- total	695.6	809.7	569.6
<u>6. Whole Kingdom</u>			
- primary	3,735.8	4,246.9	2,812.0
- secondary	1,339.2	1,330.4	1,085.4
- service	1,736.8	1,728.4	1,259.9
- total	6,811.8	7,305.7	5,157.3

TABLE 3-18

## ADDITIONAL EMPLOYMENT CREATED BY REGION AND SECTOR:

## LOW GROWTH SCENARIO (ROUND 2)

(1,000 persons)

Region/Sector	1971-1981	1981-1990	1990-1995
<u>1. Bangkok</u>			
- primary	76.4	66.7	43.5
- secondary	423.2	453.4	363.9
- service	475.4	538.2	384.4
- total	975.0	1,058.3	791.8
<u>2. Central</u>			
- primary	636.6	289.9	172.6
- secondary	409.1	400.9	313.6
- service	350.8	339.5	231.4
- total	1,396.5	1,030.3	717.6
<u>3. Northern</u>			
- primary	728.3	537.8	326.9
- secondary	166.3	118.8	86.0
- service	385.4	301.9	215.6
- total	1,280.0	958.5	628.5
<u>4. Northeastern</u>			
- primary	2,118.8	1,733.3	1,120.1
- secondary	109.7	6.6	3.7
- service	235.8	54.2	31.9
- total	2,464.3	1,794.1	1,155.7
<u>5. Southern</u>			
- primary	175.5	210.2	126.8
- secondary	230.8	144.0	107.7
- service	289.3	211.1	149.8
- total	695.6	565.3	384.3
<u>6. Whole Kingdom</u>			
- primary	3,735.8	2,837.9	1,789.9
- secondary	1,339.2	1,123.7	874.9
- service	1,736.8	1,444.9	1,013.1
- total	6,811.8	5,406.5	3,677.9

TABLE 3-19

## REGIONAL SHARE OF ADDITIONAL EMPLOYMENT CREATED :

## HIGH GROWTH SCENARIO (ROUND 2)

(percent)

Region	1971-1981	1981-1990	1990-1995
1. Bangkok	14.3	17.2	19.1
2. Central	20.5	19.2	19.3
3. Northern	18.8	18.2	17.5
4. Northeastern	36.2	34.3	33.1
5. Southern	10.2	11.1	11.0
6. Whole kingdom	100.0	100.0	100.0

TABLE 3-20

## REGIONAL SHARE OF ADDITIONAL EMPLOYMENT CREATED :

LOW GROWTH SCENARIO (ROUND 2)

(percent)

Region	1971-1981	1981-1990	1990-1995
1. Bangkok	14.3	19.6	21.5
2. Central	20.5	19.1	19.5
3. Northern	18.8	17.7	17.1
4. Northeastern	36.2	33.2	31.4
5. Southern	10.2	10.4	10.5
6. Whole kingdom	100.0	100.0	100.0

TABLE 3-21

SECTORAL SHARE OF ADDITIONAL EMPLOYMENT CREATED IN EACH  
REGION HIGH GROWTH SCENARIO (ROUND 2)  
(percent)

Region/Sector	1971-1981	1981-1990	1990-1995
<u>1. Bangkok</u>			
- primary	7.8	6.3	5.4
- secondary	43.4	42.7	46.1
- service	48.8	51.0	48.5
- total	100.0	100.0	100.0
<u>2. Central</u>			
- primary	45.6	38.4	34.0
- secondary	29.3	32.8	37.4
- service	25.1	28.8	28.6
- total	100.0	100.0	100.0
<u>3. Northern</u>			
- primary	56.9	60.7	56.5
- secondary	13.0	11.5	12.9
- service	30.1	27.8	30.6
- total	100.0	100.0	100.0
<u>4. Northeastern</u>			
- primary	86.0	97.3	97.7
- secondary	4.5	0.3	0.2
- service	9.6	2.4	2.1
- total	100.0	100.0	100.0
<u>5. Southern</u>			
- primary	25.2	47.1	43.0
- secondary	33.2	21.7	24.3
- service	41.6	31.2	32.7
- total	100.0	100.0	100.0
<u>6. Whole kingdom</u>			
- primary	54.8	58.1	54.5
- secondary	19.7	18.2	21.1
- service	25.5	23.7	24.4
- total	100.0	100.0	100.0

TABLE 3-22

## SECTORAL SHARE OF ADDITIONAL EMPLOYMENT CREATED IN EACH

REGION : LOW GROWTH SCENARIO (ROUND 2)

(percent)

Region/Sector	1971-1981	1981-1990	1990-1995
<u>1. Bangkok</u>			
- primary	7.8	6.3	5.5
- secondary	43.4	42.6	46.0
- service	48.8	50.9	48.5
- total	100.0	100.0	100.0
<u>2. Central</u>			
- primary	45.6	28.1	24.1
- secondary	29.3	38.9	43.7
- service	25.1	33.0	32.2
- total	100.0	100.0	100.0
<u>3. Northern</u>			
- primary	56.9	56.1	52.0
- secondary	13.0	12.4	13.7
- service	30.1	31.5	34.3
- total	100.0	100.0	100.0
<u>4. Northeastern</u>			
- primary	86.0	96.6	97.0
- secondary	4.5	0.4	0.3
- service	9.6	3.0	2.7
- total	100.0	100.0	100.0
<u>5. Southern</u>			
- primary	25.2	37.2	33.0
- secondary	33.2	25.5	28.0
- service	41.6	37.3	39.7
- total	100.0	100.0	100.0
<u>6. Whole kingdom</u>			
- primary	54.8	52.5	48.7
- secondary	19.7	20.8	23.8
- service	25.5	26.7	27.5
- total	100.0	100.0	100.0

## 4. PROJECTED UNEMPLOYED IN 1990 AND 1995

This part of the study utilized the projection results of Part 2 and Part 3 to investigate possible future unemployment problems. The projection of unemployment in this part would be based on the two economic growth scenarios of Part 3.

It should be pointed out here that there were many instances where the results show negative unemployed figures. This in no way indicates that there would be no one unemployed in the future, since market adjustment and behavior could not be included in the projection.

What could be said, however, is that given relative wage rates and other factors similar to those which existed in 1981, population growth, labor force participation rates, income growth, and income elasticities of employment as assumed in this study, there would be excess demand in those categories of labor groups which show negative unemployed figures. In reality, market adjustments especially relative wage rates would most probably take place leading finally to different levels of positive unemployed figures from the projection results. In such cases, it would nevertheless mean that relative wage rates of the labor groups found to have negative unemployed here in this study would increase relative to those with positive unemployed. By how much relative wage rates would have to adjust depends on the wage elasticities of demand and supply among various groups which unfortunately could not be taken into account in this study.

In estimating the number of seasonal unemployed, the projected employment figures in Round 1 and Round 2 were first compared with the projected labor force in Round 2. If the projected employment figure in Round 1 was found to be larger than or equal to the corresponding projected labor force figure, this would be taken to mean that no significant seasonal unemployment exists for that particular labor category. However, if the projected employment figure in Round 1 was found to be lower than the corresponding projected labor force figure, seasonal unemployment would be estimated by subtracting the employment figure in Round 1 from either the corresponding employment figure in Round 2 or the corresponding labor force figure in Round 2 depending on which figure has a lower value.

A positive sign means that employed persons in the wet season is larger than employed persons in the dry season while a negative sign means the opposite. The rate of seasonal unemployment here was estimated as a percentage of the labor force in the wet season.

Since market adjustments and migration could not be taken into account, the above estimation does not yield consistent figures of seasonal unemployed for different classifications of employment. Nevertheless, there are some similar patterns which emerged from the estimations. These would be discussed in the following pages.

#### 4.1 Results of Open Unemployment Projection

In the high growth scenario, it was found that the open unemployment problem would not in general be a serious problem. The rate of unemployment in 1990 would be only 1 percent of the labor force as compared to 1.6 percent in 1981. (see Table 4.1) In 1995, there would, in fact, be a negative unemployment rate of 0.9 percent. Evidently, the growth of employment demand was able to outstrip the growth of labor supply. This is not surprising considering that the population growth rate has been declining substantially in the past two decades and is expected to further continue such a trend. (See Part 2 Table 2.3) It can thus be expected under such a growth scenario that real wage rates in the economy would increase.

At the regional level, Bangkok showed the most rapid decline in open unemployment rates. In fact, it exhibited the largest excess demand for labor in 1990 and 1995 despite the fact that population and labor force growth rates were higher than the other regions. This is due both to the region's ability in absorbing labor and the higher economic growth rates. Similar to Bangkok, the Southern region also showed a consistently declining unemployment rate although the rates remained positive. It declined from 3.2 percent in 1981 to 0.4 percent in 1995.

The Central and Northern regions, however, showed increased in unemployment rates in 1990 over those of 1981 but these rates declined to show negative rates in 1995. This again could be explained by the declining population growth rate and its effect on the growth of labor force.

TABLE 4.1

## OPEN: UNEMPLOYED BY REGION

Region	HIGH GROWTH SCENARIO		LOW GROWTH SCENARIO	
	Number (1,000 persons)	Rate (%)	Number (1,000 persons)	Rate (%)
<u>1. Bangkok</u>				
1981	80.9	3.2	80.9	3.2
1990	-215.8	-6.2	-16.6	-0.4
1995	-506.8	-12.2	-116.5	-2.8
<u>2. Central</u>				
1981	94.0	1.9	94.0	1.9
1990	149.3	2.3	521.5	8.0
1995	-60.6	-0.6	591.3	8.1
<u>3. Northern</u>				
1981	32.6	0.6	32.6	0.6
1990	79.3	1.2	447.3	6.5
1995	-207.3	-2.8	434.8	5.8
<u>4. Northeastern</u>				
1981	104.0	1.2	104.0	1.2
1990	202.4	1.7	917.8	7.8
1995	430.6	3.2	1,695.2	12.4
<u>5. Southern</u>				
1981	90.6	3.2	90.6	3.2
1990	90.9	2.5	335.2	9.2
1995	18.2	0.4	447.9	10.8
<u>6. Whole kingdom</u>				
1981	402.6	1.6	402.6	1.6
1990	306.2	1.0	2,205.4	6.8
1995	-326.0	-0.9	3,052.6	8.3

As usual, the region which showed a significant difference to the other regions is the Northeast. In this region, there was no decline in the unemployment problem. The rate of unemployment increased from 1.2 percent in 1981 to 1.7 percent in 1990 and 3.2 percent in 1995. Probably, this is mainly due to the low labor absorptive capacity in the secondary and service sectors. Although the primary sector possessed a high absorptive capacity, the growth rate of this sector is expected to be much lower than the other sectors.

Unlike the high growth scenario, unemployment problem in the low growth scenario was generally found to be serious. The rate of unemployment in 1990 and 1995 would be 6.8 and 8.3 percent of the labour force. This, therefore, indicated that growth of employment demand was not sufficient to absorb the growth of labor supply. Under such a scenario, it is difficult for an increase in real wage rates to take place.

At the regional level, Bangkok was the only region which exhibited excess demand for labor both in 1990 and 1995 with increasing magnitude and rate as time goes by. The reason is again due to the region's higher ability to absorb labor and the higher economic growth rate.

The Central, Northeastern and Southern regions showed consistently increasing unemployment rates, with the Northeastern region's unemployment rate being highest, followed by the Southern and the Central regions, respectively. The Northern region, however, illustrated no such trend. The rate increased from 0.6 percent in 1981 to 6.5 percent in 1990 and dropped slightly to 5.8 percent in 1995.

(a) Open Unemployed by Sex

In both the high growth and low growth scenarios, the open unemployed problems by sex were not significantly different at the country level. (see Table 4.2-4.3) Differences in the rate of unemployment between male and female workers were unimportant since it was the result of very slight differences in the growth rate of the labor force. Under the high growth scenario, both unemployment problems for males and females declined. However, unemployment problems increased in both sex groups under the low growth scenario.

Regionally, male unemployment would become more serious in the Central region while female unemployment would become more serious in the Southern region. The future rates of unemployment increased for male workers in the Central region and female workers in the Southern region. This can again be traced to the growth rate pattern of the labor force. Furthermore, the labor force participation rate for male workers was much greater than the female rate in the Central region while it was less significant in the Southern region.

TABLE 4.2  
OPEN UNEMPLOYED BY REGION AND SEX

(1,000 persons)

Region/Sex	High Growth Scenario		Low Growth Scenario	
	Male	Female	Male	Female
1. <u>Bangkok</u>				
1981	43.8	36.9	43.8	36.9
1990	-111.8	-104.1	1.8	-18.3
1995	-332.5	-174.3	-109.0	7.5
2. <u>Central</u>				
1981	56.4	36.4	57.4	36.4
1990	242.8	-93.4	441.3	80.3
1995	233.4	-294.0	581.7	9.6
3. <u>Northern</u>				
1981	17.8	14.7	17.8	14.7
1990	33.0	46.3	228.6	218.7
1995	-134.2	-73.2	208.1	226.7
4. <u>Northeastern</u>				
1981	53.2	50.4	53.2	50.4
1990	134.0	68.5	495.4	422.5
1995	17.6	413.0	656.2	1,039.0
5. <u>Southern</u>				
1981	41.7	48.3	41.7	48.3
1990	-2.5	93.3	130.9	204.3
1995	-30.6	48.7	205.1	242.8
6. <u>Whole Kingdom</u>				
1981	218.8	183.4	218.8	183.4
1990	295.6	10.6	1,297.9	907.5
1995	-246.2	-79.8	1,542.0	1,510.6

TABLE 4.3  
 RATE OF OPEN UNEMPLOYMENT BY REGION AND SEX  
 (% of labor force)

Region/Sex	High Growth Scenario		Low Growth Scenario	
	Male	Female	Male	Female
<u>1. Bangkok</u>				
1981	3.2	3.3	3.2	3.3
1990	-5.7	-6.9	0.1	-1.2
1995	-14.5	-9.4	-4.8	-0.4
<u>2. Central</u>				
1981	2.2	1.6	2.2	1.6
1990	6.7	43.3	12.1	2.8
1995	5.6	-9.5	14.0	0.3
<u>3. Northern</u>				
1981	0.6	0.6	0.6	0.6
1990	0.9	1.4	6.3	6.7
1995	-3.4	-2.1	5.3	6.4
<u>4. Northeastern</u>				
1981	1.1	1.1	1.1	1.1
1990	2.2	1.2	8.2	7.4
1995	0.3	6.0	9.6	15.1
<u>5. Southern</u>				
1981	2.7	3.7	2.7	3.7
1990	-0.1	5.5	6.7	12.1
1995	-1.4	2.6	9.2	12.8
<u>6. Whole Kingdom</u>				
1981	1.7	1.6	1.7	1.6
1990	1.7	0.1	7.5	6.1
1995	-1.3	-0.5	7.9	8.7

(b) Open Unemployed by Educational Group

Projections of unemployed problems by education revealed substantial problems for those with a higher education. This was true irrespective of economic growth scenarios and regions. The overriding factor for such results was due to the projection assumption of labor supply by educational groups which was based on past patterns of change during 1977-1981. However, even if the growth rate assumptions were revised downwards for the more educated, it seems rather certain that the main conclusion would remain the same. (See Tables 4.4-4.7)

Although the magnitudes of the unemployment rates are so substantially different among different educational groups and seem exceptionally high for those with education above the secondary school level, it is, as has been mentioned, due to the lack of a model to take into account the adjustment process among different classes of labor. Nevertheless, since the magnitudes estimated were so much different across educational groups, it is highly likely that the relative wage rates of workers with lower education especially those with less or equal to elementary schooling would increase relatively to those with education above secondary schooling.

The projection results show that unemployment rates would increase substantially for those with secondary schooling and above.

TABLE 4.4

## UNEMPLOYED BY REGION AND EDUCATION : HIGH GROWTH SCENARIO

(1,000 persons)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	3.1	37.6	14.0	24.1	80.7
1990	-132.5	-414.5	5.9	325.2	-215.9
1995	-239.0	-869.4	-24.9	626.4	-506.8
<u>2. Central</u>					
1981	7.7	58.9	12.3	12.9	93.8
1990	215.9	91.0	35.7	237.9	580.3
1995	-384.2	-191.8	30.2	485.1	-60.6
<u>3. Northern</u>					
1981	2.4	19.8	4.1	4.7	32.5
1990	-612.0	-204.9	246.3	649.8	79.3
1995	997.6	-1,226.0	424.0	1,592.3	-207.3
<u>4. Northeastern</u>					
1981	17.2	65.1	13.1	6.4	103.6
1990	-469.5	172.8	103.5	395.8	202.5
1995	-709.2	86.3	161.9	891.7	430.7
<u>5. Southern</u>					
1981	16.9	58.0	4.3	8.9	90.0
1990	-353.0	-200.0	154.7	489.1	90.9
1995	-569.5	-783.4	250.2	1,120.7	18.0
<u>6. Whole kingdom</u>					
1981	48.9	241.9	49.7	59.5	402.2
1990	-1,351.2	-555.6	546.2	2,097.8	737.2
1995	-2,899.5	-2,984.3	841.4	4,716.3	326.1

TABLE 4.5

## RATE OF UNEMPLOYMENT BY REGION AND EDUCATION :

## HIGH GROWTH SCENARIO

(% of labor force)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	1.5	2.6	3.7	5.4	3.2
1990	-81.5	-23.3	1.1	33.9	-6.2
1995	-179.9	-45.2	-3.7	44.1	-12.2
<u>2. Central</u>					
1981	1.3	1.5	5.1	5.1	1.9
1990	42.2	1.8	10.2	42.8	9.0
1995	-86.8	-3.5	7.4	56.2	-0.8
<u>3. Northern</u>					
1981	0.2	0.5	2.1	2.7	0.6
1990	-96.2	-4.3	48.0	73.1	1.2
1995	-247.9	-27.7	56.9	84.4	-2.8
<u>4. Northeastern</u>					
1981	2.3	0.8	6.2	3.4	1.1
1990	-100.4	1.7	30.5	66.4	17.7
1995	-192.8	0.7	38.3	80.8	3.2
<u>5. Southern</u>					
1981	3.1	3.0	2.6	6.2	3.2
1990	-113.3	-8.9	41.1	71.8	2.5
1995	-294.2	-38.1	48.6	82.7	0.4
<u>6. Whole kingdom</u>					
1981	1.6	1.3	4.1	4.9	1.6
1990	-64.7	-2.3	25.5	57.0	2.3
1995	-188.3	-11.6	30.4	71.2	0.9

TABLE 4.6  
 UNEMPLOYED BY REGION AND EDUCATION : LOW GROWTH SCENARIO  
 (1,000 persons)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	3.1	37.6	14.0	24.1	80.7
1990	-114.5	-294.6	33.4	258.7	-17.3
1995	-208.4	-632.9	33.8	691.0	-116.5
<u>2. Central</u>					
1981	7.7	58.9	12.3	12.9	93.8
1990	-170.7	388.1	46.2	252.9	521.5
1995	-307.4	327.7	58.6	512.4	591.3
<u>3. Northern</u>					
1981	2.4	19.8	4.1	4.7	32.5
1990	-504.9	66.5	261.9	663.8	447.3
1995	-882.0	-574.7	452.9	1,618.7	434.8
<u>4. Northeastern</u>					
1981	17.2	65.1	13.1	6.4	103.6
1990	-410.6	816.7	112.9	398.8	917.8
1995	-605.2	1,224.9	178.6	896.7	1,694.2
<u>5. Southern</u>					
1981	16.9	58.0	4.3	8.9	90.0
1990	-305.5	-27.1	168.4	499.4	335.2
1995	-486.8	-480.3	275.0	114.0	447.9
<u>6. Whole kingdom</u>					
1981	48.9	241.9	49.7	59.5	402.2
1990	-1,547.2	949.7	630.5	2,173.6	2,207.6
1995	-2,489.9	-315.4	998.8	4,858.7	3,052.3

TABLE 4.7  
 RATE OF UNEMPLOYMENT BY REGION AND EDUCATION :  
 LOW GROWTH SCENARIO  
 (% of labor force)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	1.5	2.6	3.7	5.4	3.2
1990	-70.4	-16.6	6.5	37.4	10.5
1995	-156.9	-32.9	5.0	48.8	-2.8
<u>2. Central</u>					
1981	1.3	1.5	5.1	5.1	1.9
1990	-33.4	7.7	13.2	45.5	8.1
1995	-69.4	5.9	14.4	59.3	8.2
<u>3. Northern</u>					
1981	0.2	0.5	2.1	2.7	0.6
1990	-79.4	1.4	51.1	74.7	6.5
1995	-219.1	-13.0	60.8	85.8	5.8
<u>4. Northeastern</u>					
1981	2.3	0.8	6.2	3.4	1.1
1990	-87.8	7.9	33.3	66.9	7.8
1995	-164.5	10.4	42.3	81.2	12.4
<u>5. Southern</u>					
1981	3.1	3.0	2.6	6.2	3.2
1990	-98.1	-1.2	44.7	73.3	9.3
1995	-251.5	-23.4	53.4	84.1	10.9
<u>6. Whole kingdom</u>					
1981	1.6	1.3	4.1	4.9	1.6
1990	-74.1	3.9	29.5	59.1	6.9
1995	-161.7	-1.2	36.1	73.3	8.3

(c) Open Unemployed by Age Group

Since the rate of increase in employment demand across different age groups of labor was assumed to be the same, the unemployment problem here would be determined wholly by changes in the labor force growth pattern which in turn is influenced by population changes.

At the country level, the projected rates of unemployment in 1990 and 1995 were found to be highest for the age group of over 35 years. (See Tables 4.8-4.9). The rates of unemployment were also high for the age group of 20-34 years under the low growth scenario.

For the lowest age group of 11-19 years, the projection consistently show that the growth of employment outstrips the growth of labor force in all regions under both growth scenarios. It thus seems that unemployment problems of young workers would not be a serious problem in the future. This result, however, should be accepted with care. If those in this lower age group are regarded as those in the secondary market, it would mean that unemployment in this group would be determined by market conditions in the primary labor market. As such, unemployment in this age group would be the residual to the other groups. At this stage, modelling along this line is not yet possible without sufficient knowledge concerning labor markets in Thailand.

TABLE 4.8  
 OPEN UNEMPLOYED BY REGION AND AGE GROUP  
 (1,000 persons)

Region/Age Group	High Growth Scenario			Low Growth Scenario		
	11-19	20-34	35 upwards	11-19	20-34	35 upwards
	(year)			(year)		
<u>1. Bangkok</u>						
1981	17.8	51.0	10.3	17.8	51.0	10.3
1990	-8.0	-477.4	269.7	14.1	-370.8	340.1
1995	-57.3	-769.0	319.5	-14.0	-560.1	457.5
<u>2. Central</u>						
1981	31.3	41.1	19.6	31.3	41.1	19.6
1990	-198.1	216.7	130.7	-129.4	372.6	278.4
1995	-386.7	57.5	268.5	-266.5	330.7	527.1
<u>3. Northern</u>						
1981	8.1	14.6	8.3	8.1	14.6	8.3
1990	-242.0	165.1	156.3	-166.6	322.2	291.8
1995	-445.7	-87.8	326.2	-314.2	186.3	562.8
<u>4. Northeastern</u>						
1981	23.1	45.4	33.1	23.1	45.4	33.1
1990	-381.6	311.3	272.6	-197.3	602.4	512.7
1995	-727.2	258.8	898.9	-401.5	773.4	1,323.3
<u>5. Southern</u>						
1981	15.9	38.5	33.8	15.9	38.5	33.8
1990	-46.7	7.8	79.8	-8.5	158.0	185.8
1995	-115.3	48.5	85.1	-48.5	224.9	271.3
<u>6. Whole Kingdom</u>						
1981	98.5	193.2	107.6	98.5	193.2	107.6
1990	-876.4	273.5	909.1	-487.7	1,084.4	1,608.8
1995	-1,732.2	-492.0	1,898.2	-1,044.5	955.2	3,142.0

TABLE 4.9

RATE OF OPEN UNEMPLOYMENT BY REGION AND AGE GROUP  
(% of labor force)

Region/Age Group	High Growth Scenario			Low Growth Scenario		
	11-19	20-34	35 upwards	11-19	20-34	35 upwards
	(year)			(year)		
<u>1. Bangkok</u>						
1981	6.2	3.8	1.2	6.2	3.8	1.2
1990	-2.0	-32.0	17.2	3.5	-24.8	21.6
1995	-12.5	-44.6	16.2	-3.0	-32.4	23.2
<u>2. Central</u>						
1981	3.3	1.9	1.0	3.3	1.9	1.0
1990	-20.5	7.6	5.0	-13.3	13.0	10.5
1995	-40.2	1.8	8.5	-27.6	10.5	16.6
<u>3. Northern</u>						
1981	0.8	0.6	0.4	0.8	0.6	0.4
1990	-21.2	5.4	5.9	-14.5	10.5	11.0
1995	-39.7	2.8	10.4	-27.9	5.8	17.8
<u>4. Northeastern</u>						
1981	1.0	1.2	0.4	1.0	1.2	0.4
1990	-14.8	6.2	5.2	7.6	12.0	12.4
1995	-27.2	4.6	16.9	-15.0	13.7	24.8
<u>5. Southern</u>						
1981	3.6	3.3	1.2	3.6	3.3	1.2
1990	-9.3	0.5	5.0	-1.6	10.4	11.5
1995	-22.0	2.8	4.6	-9.2	12.9	14.5
<u>6. Whole Kingdom</u>						
1981	1.9	1.8	1.2	1.9	1.8	1.2
1990	-15.7	1.6	7.2	-8.7	7.8	12.7
1995	-30.2	-3.2	12.3	-18.1	6.2	20.3

For mature workers of 20-34 years of age, the unemployment rates under the high growth scenario show that they would increase in 1990 for 3 regions. They are the Central, Northern and Northeastern regions. However, there was a reversal of such a trend in all regions during 1990-1995 with the rates declining rapidly for the Central and Northern regions and less rapidly for the Northeastern region.

The above pattern in age group between 20-34 years also held under the low growth scenario for the Central and Northern regions. The Northeastern region, however, showed a consistently increasing unemployment rate in this age group.

In other regions, Bangkok was found to have much higher growth in employment demand than supply growth in the age group of 20-34 years under both growth scenarios. Excess demand from the projection was found to be greatest in this group. In the Southern region, unemployment rate in this age group declined under the high growth scenario but increased in the low growth scenario.

The projected unemployment rates for those 35 years upwards show that they were generally highest in the Bangkok region to be followed by the Northeastern region. They were lowest in the Southern region.

#### 4.2 Results of Seasonal Unemployment Projection

Since there was a limitation in disaggregating employment and labor force data from published labor force surveys, projections of employment in this study were carried out separately for each type of classification (sex, education and age). This has resulted in differences in the aggregate level of seasonal unemployed estimated under each classification. (See Table 4.10) Nevertheless, there emerged some similar patterns from the different projections which may help to indicate future trends of seasonal unemployment.

The projections for all classifications, under both the high and low growth scenarios, found that the rate of seasonal unemployment in 1990 and 1995 would not be much higher than those of the past. In fact, projections made according to educational groups and age groups showed a clear reduction in the seasonal unemployment rate in the future. (See Table 4.11). Nevertheless, the sheer magnitude of those seasonally unemployed in 1990 and 1995 still make it a serious problem to contend with. (See Table 4.10)

At the regional level, the most serious problem of seasonal unemployment remained in the Northeast which accounted for more than half of those seasonally unemployed in the country. Although the number of seasonally unemployed increased, the seasonal unemployment rate in the region seems to show a decline except for the projection based on sex groups under the high growth scenario. The serious seasonal unemployment problem remaining in the Northeast could be

TABLE 4-10  
 PROJECTED SEASONAL UNEMPLOYED BY REGION  
 (1,000 persons)

	High Growth Scenario			Low Growth Scenario		
	Sex	Education	Age	Sex	Education	Age
<u>1. Bangkok</u>						
1981	205.3	205.3	205.3	205.3	205.3	205.3
1990	91.2	113.0	158.6	276.8	111.9	159.8
1995	54.0	112.3	182.0	246.3	134.9	182.5
<u>2. Central</u>						
1981	961.7	961.6	961.8	961.7	961.7	961.8
1990	1,462.0	1,313.0	1,487.8	1,267.8	1,142.6	1,318.6
1995	1,533.9	1,448.2	1,824.6	1,487.4	1,340.6	1,527.8
<u>3. Northern</u>						
1981	1,770.1	1,769.8	1,770.0	1,770.1	1,769.8	1,770.0
1990	1,977.9	1,421.8	1,735.8	1,890.4	1,555.5	1,723.7
1995	1,866.3	473.8	1,540.1	1,937.4	834.8	1,623.1
<u>4. Northeastern</u>						
1981	4,119.0	4,118.8	4,118.9	4,119.0	4,118.8	4,118.9
1990	5,594.4	5,133.3	5,213.0	5,161.9	4,751.3	4,964.8
1995	6,620.6	6,077.1	5,893.7	5,846.9	5,363.9	5,445.5
<u>5. Southern</u>						
1981	21.6	21.6	21.6	21.6	21.6	21.6
1990	-39.3	53.4	11.6	17.9	85.4	9.5
1995	-	77.1	-65.4	31.6	69.9	19.9
<u>6. Whole Kingdom</u>						
1981	7,072.7	7,072.7	7,072.7	7,072.7	7,072.7	7,072.7
1990	9,086.2	8,034.5	8,606.8	8,614.8	7,646.7	8,176.4
1995	10,074.8	8,188.5	9,375.0	9,549.6	7,744.1	8,798.7

TABLE 4.11  
 PROJECTED RATE OF SEASONAL UNEMPLOYMENT BY REGION  
 (% of Labor force)

	High Growth Scenario			Low Growth Scenario		
	Sex	Education	Age	Sex	Education	Age
<u>1. Bangkok</u>						
1981	8.2	8.2	8.2	8.2	8.2	8.2
1990	2.6	3.3	4.6	8.0	3.2	4.6
1995	1.3	2.7	4.4	5.9	3.2	4.4
<u>2. Central</u>						
1981	19.2	19.2	19.2	19.2	19.2	19.2
1990	22.6	20.3	23.0	19.6	17.6	20.4
1995	21.1	19.9	25.1	20.5	18.5	21.1
<u>3. Northern</u>						
1981	32.4	32.4	33.7	32.4	32.4	33.7
1990	28.9	20.8	25.4	27.6	22.4	25.2
1995	25.0	6.4	20.7	26.0	11.2	21.8
<u>4. Northeastern</u>						
1981	45.3	45.3	45.3	45.3	45.3	45.3
1990	47.8	43.9	44.6	44.1	40.6	42.5
1995	48.6	44.6	43.3	42.9	39.4	40.0
<u>5. Southern</u>						
1981	0.8	0.8	0.8	0.8	0.8	0.8
1990	-1.0	0.3	0.3	0.5	2.4	0.3
1995	-	0.3	-1.6	0.8	1.7	0.5
<u>6. Whole kingdom</u>						
1981	28.4	28.4	28.4	28.4	28.4	28.4
1990	28.3	25.0	26.8	26.9	23.8	25.5
1995	27.5	22.4	25.6	26.1	21.2	24.0

traced to a large extent to the underdevelopment of the non-agricultural sector in this region. Furthermore, reliance on rain-fed agriculture and the lack of adequate irrigation facilities also make it difficult for the agricultural sector to absorb labor during the dry season.

The other regions with serious seasonal unemployment problems are the Central and Northern regions. Whereas the Northern region showed a clear decline in the seasonal unemployment rate in 1990 and 1995 over 1981, the seasonal unemployment rate in the Central region does not seem to show any decline. In fact, results seem to indicate a slight increase in the seasonal unemployment rate. Although irrigation facilities in the Central region are much better than the Northeast, the increasing use of modern techniques of production, such as farm tractors and water pumps, may be a factor limiting the labor absorptive capacity in the dry season. This is borne out by the relatively large differences in the income elasticity of employment between the wet and the dry seasons in the Central region.

In contrast to the Northeastern and the Central regions, the Southern region does not have any serious seasonal unemployment problems. There is rain all year round in the Southern region which makes agriculture exhibit much less seasonality. Furthermore, agriculture in the South has a high proportion of economic activity coming from tree crops such as rubber and coconut plantations.

The two regions which showed significant reductions in both the seasonal unemployment rate and the number of seasonal unemployed

are Bangkok and the North. In spite of the decline, seasonal unemployment still remains an important problem in the North with the rate most likely being above 10 percent in 1995. On the other hand, the rate of seasonal unemployment in Bangkok in 1981 could be cut by half in 1995. This could be explained by the declining significance of the agricultural sector in Bangkok.

(a) Seasonal Unemployed by Sex (see Table 4.12-4.13)\*

Projections of seasonal unemployed confirmed that the problem would remain more serious for female workers than for male workers. However, there would not be a worsening of the seasonal unemployment rate for both male and female workers in the future.

As usual, seasonal unemployment is not and would not be a problem in the Southern region. This is true for both male and female workers.

In Bangkok and the North, the rate of seasonal unemployment declined over time. The problem of seasonal unemployment for male workers in Bangkok disappeared completely in 1995 and would be insignificant in 1990 under the high growth scenario. Under the low growth scenario, the rate of seasonal unemployment increases in 1990 before it declines to an insignificant level in 1995. For female workers, the seasonal unemployment rate also declined significantly under the high growth scenario, but it did not decline under the low growth scenario.

In the case of the Northern region, although the rate of seasonal unemployment would drop over time under both growth scenarios, the rate would remain high in 1990 and 1995. The seasonal unemployment rate for female workers would also remain much higher than that for male workers.

In the Central region, it seems that the rate of seasonal unemployment would not get better for both male and female workers. This is also the case for the Northeastern region except for female workers under the low growth scenario. Despite the decline in the seasonal unemployment rate for female workers in the Northeast under the low growth

scenario, this in no way should be taken to be a positive phenomenon. The lower seasonal unemployment rate is due more to the slower growth in employment in the wet season rather than the higher growth in employment in the dry season. This can be seen by the much higher rate of open unemployed in the Northeast under the low growth scenario as compared to the high growth scenario.

TABLE 4.12  
SEASONAL UNEMPLOYED  
BY REGION AND SEX

(1,000 persons)

Region/Sex	High Growth Scenario		Low Growth Scenario	
	Male	Female	Male	Female
1. <u>Bangkok</u>				
1981	76.3	128.9	76.3	128.9
1990	10.6	80.7	117.1	159.7
1995	-	54.0	38.6	207.7
2. <u>Central</u>				
1981	463.4	498.1	463.4	498.1
1990	714.0	748.0	613.6	654.2
1995	898.2	635.7	722.1	765.3
3. <u>Northern</u>				
1981	819.2	950.7	819.2	950.7
1990	900.8	1,077.1	862.3	1,028.1
1995	797.7	1,068.6	873.3	1,064.1
4. <u>Northeastern</u>				
1981	1,753.6	2,365.3	1,753.6	2,365.3
1990	2,433.7	3,160.7	2,231.9	2,930.0
1995	2,909.5	3,711.1	2,547.4	3,299.5
5. <u>Southern</u>				
1981	21.5	0.1	21.5	0.1
1990	-	-39.3	27.9	-10.0
1995	-	-	42.0	-10.4
6. <u>Whole kingdom</u>				
1981	3,132.6	3,940.3	3,132.6	3,940.3
1990	4,059.1	5,027.2	3,852.8	4,762.0
1995	4,605.4	5,469.4	4,223.4	5,326.2

TABLE 4.13  
 RATE OF SEASONAL UNEMPLOYMENT  
 BY REGION AND SEX  
 (% of labor force)

Region/Sex	High Growth Scenario		Low Growth Scenario	
	Male	Female	Male	Female
1. <u>Bangkok</u>				
1981	5.5	11.6	5.5	11.6
1990	0.5	5.3	6.0	10.6
1995	-	2.9	1.7	11.2
2. <u>Central</u>				
1981	17.3	21.4	17.3	21.4
1990	19.7	26.3	16.9	23.0
1995	21.6	20.5	17.4	24.7
3. <u>Northern</u>				
1981	28.5	36.7	28.5	36.7
1990	25.0	33.3	23.9	31.8
1995	20.3	30.2	22.3	30.1
4. <u>Northeastern</u>				
1981	37.5	53.6	37.5	53.6
1990	40.4	55.7	37.1	51.7
1995	43.0	54.1	37.6	48.1
5. <u>Southern</u>				
1981	1.4	-	1.4	-
1990	-	-2.3	1.4	-0.6
1995	-	-	1.9	-0.5
6. <u>Whole Kingdom</u>				
1981	23.5	33.6	23.5	33.6
1990	23.7	33.6	22.5	31.8
1995	23.8	31.7	21.8	30.9

(b) Seasonal Unemployed by Educational Group (see Table 4.14-4.17)

The projection showed that there would be a general reduction in the rate of seasonal unemployment for all educational groups. However, the reduction for those classified under elementary education was very moderate especially under the high growth scenario. Within this group, seasonal unemployment rates in 1990 and 1995 for the Central and Northeastern regions either increased or remained stable. The rate remained highest in the Northeastern region. Once again, the decline in seasonal unemployment would take place in Bangkok and the Northeast. In the South, seasonal unemployment would be insignificant.

As for those with below elementary education, the projection results showed that seasonal unemployment would eventually disappear in the future. This is likely because of public policy in eradicating illiteracy which would finally lead to further reduction in the supply of labor under this group. Given that demand for this unskilled category of labor continue to increase, the result would be a disappearance of open and seasonal unemployment in this category.

For those who completed up to secondary school level education, seasonal unemployment was found to be most serious in the Central region. In fact, the projection results show an increasing seasonal unemployment rate under both the high and low growth scenarios in this region. Although the seasonal unemployment rate in the Northeast remained high at above 10 percent, there would be a gradual decline in the future. This, however, is substituted by the higher open unemployment rate in this region.

The South which does not seem to show any serious seasonal unemployment in almost all projections undertaken was found to have the highest seasonal unemployment rate in the secondary education category. Furthermore, such rates are also high by Southern standards for those with above secondary school education. The results thus seem to show that seasonal unemployment in the South is mainly concentrated among those with higher education. Nevertheless, the rate of seasonal unemployment in the South remained low as compared to other regions. Furthermore, such rates would be reduced further in the future.

For other regions, projected seasonal unemployment rates for those with higher than secondary schooling in 1990 and 1995 were found to have gone down significantly. However, this can again be traced to the higher open unemployment rates of this group in 1990 and 1995.

TABLE 4.14

## SEASONAL UNEMPLOYED BY REGION AND EDUCATION : HIGH GROWTH SCENARIO

(1,000 persons)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	17.3	110.8	37.9	38.6	205.3
1990	-	-	51.8	61.2	113.0
1995	-	-	38.4	73.9	112.3
<u>2. Central</u>					
1981	93.7	797.6	33.0	36.6	961.6
1990	-	1,185.8	63.6	63.6	1,313.0
1995	-	1,276.9	86.6	84.7	1,448.2
<u>3. Northern</u>					
1981	307.4	1,408.0	33.2	20.9	1,769.8
1990	-	1,366.3	34.6	20.9	1,421.8
1995	-	419.6	34.6	19.6	473.8
<u>4. Northeastern</u>					
1981	341.1	3,709.1	33.7	34.0	4,118.8
1990	-	5,060.4	43.9	29.0	5,133.3
1995	-	6,000.6	51.0	25.5	6,077.1
<u>5. Southern</u>					
1981	-71.2	67.0	18.3	7.2	21.6
1990	-	-	30.5	22.9	53.4
1995	-	-	40.3	36.8	77.1
<u>6. Whole kingdom</u>					
1981	687.9	6,086.5	158.1	139.5	7,072.7
1990	-	7,612.5	224.4	197.6	8,034.5
1995	-	7,697.1	250.9	240.5	8,188.5

TABLE 4.15  
RATE OF SEASONAL UNEMPLOYMENT BY REGION AND EDUCATION : HIGH GROWTH SCENARIO

(% of Labor force)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
1. <u>Bangkok</u>					
1981	8.6	7.5	10.0	8.7	8.2
1990	-	-	9.2	6.4	3.3
1995	-	-	5.7	5.2	2.7
2. <u>Central</u>					
1981	15.9	20.3	13.6	14.5	19.2
1990	-	23.5	18.2	11.4	20.3
1995	-	23.0	21.3	9.8	19.9
3. <u>Northern</u>					
1981	30.1	34.6	16.8	12.1	32.4
1990	-	28.5	6.8	2.4	20.8
1995	-	9.5	4.6	1.0	6.4
4. <u>Northeastern</u>					
1981	45.5	46.8	15.8	17.9	45.3
1990	-	49.2	13.0	4.9	43.9
1995	-	51.2	12.1	2.3	44.6
5. <u>Southern</u>					
1981	-13.2	3.4	10.8	5.0	0.8
1990	-	-	8.1	3.4	0.3
1995	-	-	7.9	2.7	0.3
6. <u>Whole kingdom</u>					
1981	22.2	31.4	13.1	11.5	28.4
1990	-	31.5	10.5	5.4	25.0
1995	-	30.0	9.1	3.6	22.4

TABLE 4.16  
SEASONAL UNEMPLOYED BY REGION AND EDUCATION : LOW GROWTH SCENARIO

(1,000 persons)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
<u>1. Bangkok</u>					
1981	17.3	110.8	37.9	38.6	205.3
1990	-	-	50.8	61.1	111.9
1995	-	-	61.2	73.8	134.9
<u>2. Central</u>					
1981	93.7	797.6	33.0	36.6	961.6
1990	-	1,027.9	57.2	57.6	1,142.6
1995	-	1,192.9	74.4	73.3	1,340.6
<u>3. Northern</u>					
1981	307.4	1,408.0	33.2	20.9	1,769.8
1990	-	1,500.3	33.8	21.4	1,555.5
1995	-	779.9	34.0	20.9	834.8
<u>4. Northeastern</u>					
1981	341.1	3,709.1	33.7	34.0	4,118.8
1990	16.7	4,665.9	40.0	29.1	4,751.3
1995	-	5,294.8	43.4	25.7	5,363.9
<u>5. Southern</u>					
1981	-71.2	67.0	18.3	7.2	21.6
1990	-	35.6	28.9	20.9	85.4
1995	-	-	37.4	32.5	69.9
<u>6. Whole kingdom</u>					
1981	687.9	6,086.5	158.1	139.5	7,072.0
1990	16.7	7,229.6	210.3	190.1	7,646.7
1995	-	7,267.6	250.3	226.2	7,744.1

TABLE 4.17

## RATE OF SEASONAL UNEMPLOYMENT BY REGION AND EDUCATION: LOW GROWTH SCENARIO

(% of labor force)

Region/Education	Below elementary	Elementary	Secondary	Above secondary	Total
1. <u>Bangkok</u>					
1981	8.6	7.5	10.0	8.7	8.2
1990	-	-	9.1	6.4	3.2
1995	-	-	9.0	5.2	3.2
2. <u>Central</u>					
1981	15.9	20.3	13.6	14.5	19.2
1990	-	20.3	16.4	10.4	17.6
1995	-	21.5	18.3	8.5	18.5
3. <u>Northern</u>					
1981	30.1	34.6	16.8	12.1	32.4
1990	-	31.3	6.6	2.4	22.4
1995	-	17.6	4.6	1.1	11.2
4. <u>Northeastern</u>					
1981	45.5	46.8	15.8	17.9	45.3
1990	3.6	45.3	11.7	4.9	40.6
1995	-	45.1	10.3	2.3	39.4
5. <u>Southern</u>					
1981	-13.2	3.4	10.8	5.0	0.8
1990	-	1.6	7.7	3.1	2.4
1995	-	-	7.3	2.4	1.7
6. <u>Whole kingdom</u>					
1981	22.2	31.4	13.1	11.5	28.4
1990	0.8	29.9	9.8	5.2	23.8
1995	-	28.3	9.1	3.4	21.2

(c) Seasonal Unemployed by Age Group (see Table 4.18-4.19)

Under the low growth scenario, the rate of seasonal unemployment declined for all age groups. However, such a rate did not decline much under the high growth scenario except for those in the age group 11-19 years. The decline in seasonal unemployment of the low growth scenario, however, is the result of higher open unemployment rates.

The decline in seasonal unemployment rates for age group 11-19 years under both growth scenarios is not due to any significant increase in demand for this group, but it is more the result of a rapid decline in the growth rate of labor force resulting from the rapid decline in population growth rates of the past. The rate of seasonal unemployment in this age group declined significantly for all regions with the possible exception of the Northeastern region which showed only a modest decline.

For age group 20-34 years under both growth scenarios, seasonal unemployed disappeared from Bangkok in 1990 and 1995 while the seasonal unemployment rate declined significantly in the Northern region. The seasonal unemployment rate in the North, however, remained at a high level. The seasonal unemployment rates for the Central and Northeastern regions in general showed increases in 1990 and 1995.

Regional changes in seasonal unemployment rates for age group 35 years upwards follow the pattern of age group 20-34 years, that is, they decrease in Bangkok and the North and increase in the Central region. The decrease in Bangkok, however, is less pronounced while the increase in the Central region is more pronounced. In the case of the Northeastern region, the seasonal unemployment rate showed some reduction. This, however, is the result of much higher open unemployment rates.

The South, as usual, remained the region with no seasonal unemployment problems for all groups of employment.

TABLE 4.18  
SEASONAL UNEMPLOYED  
BY REGION AND AGE GROUP  
(1,000 persons)

Region/Age Group	High Growth Scenario			Low Growth Scenario		
	11-19	20-34	35 upwards	11-19	20-34	35 upwards
	(years)			(years)		
<u>1. Bangkok</u>						
1981	41.3	93.5	70.5	41.3	93.5	70.5
1990	53.4	-	105.2	58.6	-	101.2
1995	49.1	-	132.9	58.0	-	124.5
<u>2. Central</u>						
1981	210.1	371.8	379.6	210.1	371.8	379.6
1990	-	574.2	913.6	-	494.3	824.3
1995	-	722.6	1,102.0	-	582.3	945.5
<u>3. Northern</u>						
1981	431.2	700.9	638.1	431.2	700.9	638.1
1990	253.1	772.7	710.0	305.2	739.5	679.0
1995	84.2	713.7	742.2	178.2	750.9	694.0
<u>4. Northeastern</u>						
1981	1,131.4	1,591.4	1,395.9	1,131.4	1,591.4	1,395.9
1990	1,144.6	2,174.3	1,894.1	1,213.4	2,003.3	1,748.1
1995	1,073.1	2,580.2	2,240.4	1,192.4	2,273.8	1,979.3
<u>5. Southern</u>						
1981	8.4	12.9	0.6	8.4	12.9	0.6
1990	-	53.0	-41.4	0.5	24.3	-15.3
1995	-	-6.4	-59.0	-	31.8	-11.9
<u>6. Whole Kingdom</u>						
1981	1,819.5	2,770.0	2,483.3	1,819.5	2,770.0	2,483.3
1990	1,451.1	3,574.2	3,581.5	1,577.7	3,261.4	3,337.3
1995	1,206.4	4,010.1	4,158.5	1,428.6	3,638.8	3,731.4

TABLE 4.19  
 RATE OF SEASONAL UNEMPLOYMENT  
 BY REGION AND AGE GROUP  
 (% of labor force)

Region/Age Group	High Growth Scenario			Low Growth Scenario		
	11-19 (years)	20-34 (years)	35 upwards	11-19 (years)	20-34 (years)	35 upwards
<u>1. Bangkok</u>						
1981	14.4	6.9	8.2	14.4	6.9	8.2
1990	13.4	-	6.7	14.7	-	6.4
1995	10.7	-	6.8	12.6	-	6.3
<u>2. Central</u>						
1981	23.2	17.7	19.3	23.2	17.7	19.3
1990	-	20.0	34.6	-	17.3	31.3
1995	-	23.1	34.8	-	18.6	29.8
<u>3. Northern</u>						
1981	42.4	30.9	32.7	42.4	30.9	32.7
1990	22.2	25.	26.8	26.7	24.2	25.7
1995	7.5	22.4	23.6	15.9	23.6	22.0
<u>4. Northeastern</u>						
1981	48.4	43.0	45.8	48.4	43.0	45.8
1990	44.4	43.6	45.9	47.1	40.2	42.3
1995	40.2	45.8	42.1	44.6	40.4	37.2
<u>5. Southern</u>						
1981	1.9	1.1	0.05	1.9	1.1	0.05
1990	-	3.5	-2.6	0.1	1.6	-1.0
1995	-	-0.4	-3.2	-	1.8	-0.6
<u>6. Whole Kingdom</u>						
1981	35.5	26.0	27.3	35.5	26.0	27.3
1990	25.9	25.7	28.4	28.2	23.5	26.5
1995	21.0	26.1	26.9	24.9	23.6	24.1

## 5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

### 5.1 Summary and Conclusion

The present study attempted to project future unemployment and seasonal unemployment problems by region, sex, age and education. On the supply side, labor force was estimated from NESDB's low fertility assumption of population growth and labor force participation rates of the Labor Force Survey. On the demand side, employment was estimated from income elasticities of employment and two sets of economic growth assumptions. Some of the main results from the study are:

1. The growth rate of labor force would be lower than that of the past. It would be 2.9 percent per year between 1981-1990 and 2.7 percent per year between 1990-1995 as compared to the 4 percent per year between 1971-1981. The declining growth rate of labor force is attributed to the rapidly declining population growth rate of the past. The growth rate of labor force in the NESDB projection for 1981-1991 would be 2.7 percent per year which is quite close to the growth rate utilized in this study. <sup>1/</sup>

2. The growth rate of employment for the whole country during 1981-1995 would be 3 percent per year under the high growth scenario and 2.3 percent under the low growth scenario. Employment growth would be most rapid in Bangkok at above 4 percent per year

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<sup>1/</sup> National Economic and Social Development Board, "Trends in the Thai Economy under the Sixth Development Plan and Recommendations on Aggregate Targets for the Economy", September 1984. (mimeograph)

under both growth scenarios. The growth rate of employment in this study which is for the period 1981-1995 is much higher than the 1.9 percent per year projected by the NESDB.<sup>1/</sup>

3. Open unemployment rates are quite sensitive to economic growth rates. Under the high growth scenario of about 6 percent growth per year, unemployment problems could be reduced significantly in the future. However, if general economic growth were only 5 percent per year, the rate of unemployment would increase in all regions except Bangkok. Although the methodology, of this study is different from the NESDB's projection of employment in the Fifth Plan, the results are quite similar. Under the high growth scenario in this study which is close to the NESDB's economic growth assumption of 6.4 percent per annum, open unemployment would not in general be a serious problem although seasonal unemployment would remain a problem to contend with. Other than this general statement, not much comparison can be made between this study and the projections made by the NESDB. The scantily available projection results of the NESDB runs up to only 1986 which is the last year of the Fifth Plan while the projections in this study is for 1990 and 1995.

4. At the regional level, open unemployment rates in the Northeastern region show an increasing trend while they show declining trends in Bangkok irrespective of economic growth scenarios. Under the high growth scenario, open unemployment rates would decline in all regions except for the Northeast. Under the low growth scenario, unemployment rates would increase in all regions except Bangkok.

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<sup>1/</sup> National Economic and Social Development Board and World Bank, "Medium Term Outlook of the Thai Economy", the Siam Project on Macro Economic Management of the Thai Economy, June 1983.

5. Projected unemployment by sex do not in general show significant differences. Although the rate of unemployment in the Central region became relatively more serious for male workers as compared to female workers while in the Southern region it became relatively more serious for female workers as compared to male workers, general movements in unemployment rates of the other regions for both male and female workers are more or less in the same direction. This can be explained by the larger differences between the male and female labor force growth rates in these two regions.

6. Projected open unemployment by educational groups under both growth scenarios show that the problem would be serious for those with secondary and above secondary schooling in all regions except for those with secondary education in Bangkok.

7. In terms of age group, open unemployment would not be serious for those between 11-19 years of age in all regions under both economic growth scenarios. In age group 20-34 years, the open unemployment rate was not serious under the high growth scenario, but it was more serious under the low growth scenario especially in the Northeastern and Southern regions which have sustained increasing trends. Unemployment problems was found to be serious in all regions under both growth scenarios for those in the age group of 35 years upwards.

8. Under both the high and low growth scenarios, the projection results show that the rate of seasonal unemployment would be reduced slightly. However, the sheer numbers of those seasonally unemployed make this a serious problem to contend with in the future.

Seasonal unemployment rates under the low growth scenario were not higher than those found under the high growth scenario. The low growth scenario affected mainly the open unemployment rates rather than seasonal unemployment rates.

9. At the regional level, seasonal unemployment would not be a problem in the Southern region while it would remain problematic in the Central, Northern and Northeastern regions irrespective of economic growth scenarios. This is especially true of the Northeastern region which would continue to contribute more than half of all those seasonally unemployed in the country. The Northern region and Bangkok, on the other hand, would witness significant reductions in the seasonal unemployment rates.

10. Projected seasonal unemployment rates show that they were higher for female workers than for male workers similar to past. Nevertheless, seasonal unemployment rates would not increase for both groups.

11. The rate of seasonal unemployment would decline for all educational groups. This would be most significant for those with below elementary education and above secondary schooling.

12.. The most significant reduction in seasonal unemployment rates would be among those 11-19 years of age. Nevertheless, the seasonal unemployment rate would remain significant and not much different for all the three age groups.

## 5.2 Policy Implications and Recommendations

As has been stated, it was found in the study that unemployment problems are quite sensitive to the economy's growth rate. Under

a 6 percent per year growth, open unemployment was found not to be a serious problem. However, seasonal unemployment would remain a serious problem to contend with despite the decline in such rates. Under such a scenario, the strategy and effort should then be placed on solving this latter type of unemployment.

On the other hand, a low growth of 5 percent per year would result in serious open unemployment problems. Seasonal unemployment also would remain a major problem to be tackled under such a case. The problem of underemployment is also quite likely to get more serious as those openly unemployed would be forced to compete for a living somehow. The conditions faced under the low growth scenario would thus be much more complex and difficult to solve considering the greater variety and seriousness of unemployment problems.

Since it is widely believed that a low growth scenario is more likely in the future, the government should be prepared to solve most types of unemployment problems. A comprehensive strategy package should thus be drawn up.

One of the major findings of the investigation is that both open unemployment and seasonal unemployment are most serious in the Northeastern region. Since this is also the region with the largest share of the labor force in the country, it may not be too bold to state that, if unemployment problems in the Northeastern region could be solved, about half of all unemployment problems in Thailand could eventually disappear.

The recommendation here is therefore to formulate a strategy which would aim at reducing unemployment in this region. A greater absorptive capacity of labor in the Northeast could also lead to less unemployment problems in other regions through the reduction of migrant workers to those regions.

Since the primary sector in the Northeastern region could not be expected to grow as fast as in the past due to the land constraint and it is difficult to promote more labor-intensive technology than those existing at present (especially during peak labor demand periods), the secondary and service sectors would have to be able to absorb a large proportion of the labor force. Past absorptive capacity in these two sectors has, however, been found to be lacking.

If unemployment problems in the Northeast were to be solved, there may have to be a greater effort at promoting industrialization in the region. Nevertheless, the strategy should not be towards the promotion of large modern industrial enterprises which are capital-intensive since this would not help to absorb labor sufficiently. Furthermore, large-scale industries would not help spread employment opportunities over a wider area.

An ideal strategy would be to promote small-scale rural industries which interact with or could be linked up with the local economy. A greater effort should be placed on identifying such industries. These could be rural industries linked to the primary sector or they could be industries producing products for the local population. Industries which require little capital outlay could provide for the flexibility of producing only during the slack

period in the agricultural sector. This would help reduce the problem of seasonal unemployment.

Another result from the study is the increasingly serious problem of unemployment of those with higher education. It is quite likely that, as the country become more developed, there would be a much greater demand for skilled labor. However, education alone, without any consideration given to the type of skill demand in the labor market, would only lead to excess supply of those highly educated in certain fields and excess demand which could not be met in others.

It is thus increasingly imperative for the government to seriously consider manpower planning. The postponement of unemployment problems in the past through the provision of higher education has now provided a flood of highly educated people who, however, do not have the necessary skills required in the labor market. The projection shows that, if past supply patterns were not reversed, there would be increasingly serious unemployment problems for those with higher education. These people tend to have rising expectations from their education which, if not met, could lead to serious social and political problems. A redesign of the educational system may seem to be in order.

Among the three age groups included in this study, government policies to solve open unemployment problems should be directed at those 35 years upwards, since this is where the problem is most serious. In view of the fact that labor skill requirements in the economy change through development, job retraining programs may be required for the unemployed in this age group so as to help facilitate adjustments in the labor market.

### 5.3 Limitations of the Study and Suggestions for Future Research

It has been mentioned many times in this study that the projection results are only indicative of possible unemployment problems in the future. The projections were based on only a few simple but basic assumptions. Many potential future changes and adjustments in the labor market could not be identified and studied in this research due to the limited scope of the work. This is not to mention the lack of sufficient data and theoretical work on Thailand in this field.

In more specific terms, the following are only some of the main limitations of the study:

1. The assumption of labor force participation rates were based mainly on past rates which may not hold in the future. An attempt to study in more detail some of the factors determining labor force participation rates could lead to a better projection of the labor force. However, the short time series data presently available (1971-1981) is a major obstacle here.

2. Although it has been mentioned that relative wage rate changes could not be taken into account in the study, they could not be entirely separated out. The long term changes in relative wage rates are likely to be partly captured by the estimated income elasticities of employment. The projection results thus assumed implicitly continuations of such trends to some degree which would lead to difficulties in interpreting these results.

However, little can be done without reliable and consistent time series data on wage rates among different groups of labor.

3. The projection of regional labor force did not take into consideration the possible change in migration patterns both within the country and internationally. To do this, considerable data which are now unavailable would be required together with more theoretical work on Thailand.

4. The study did not include for possible technological changes in production which may affect the employment absorption capacity of the economy. The assumption of the same ability to absorb labor as in the past for projections may not hold considering that there may be increasing movements towards the use of more capital-intensive technology. This could reduce the income elasticities of employment significantly.

5. Although open unemployment problems in some cases were found to be not serious (especially in Bangkok), it may not be true in reality if labor markets become less efficient in absorbing labor. This is not to say that the available jobs are insufficient to meet the supply of workers. It is more a problem of matching available jobs with workers through an efficient information system. For a large and complex market, frictional unemployment problems could exist side by side with an excess demand in the labor market. More microeconomic study of labor markets would be required here.

6. The projection of employment demand did not take into account possible structural changes in demand patterns for different groups of labor. For example, future industrialization could lead to a much higher demand growth for skilled labor than those in the past. This would help alleviate to some extent the unemployment problems found in the groups with higher education.

7. The projection of labor force by education in this study was based on past patterns which may not hold in the future. A greater amount of effort could be made to study in greater detail the country's educational policy and its impact on the composition of the labor force and unemployment problems.

8. The present statistics of underemployment makes it difficult to study such a problem. Not only is the time series data rather short, the definitions utilized may not be appropriate for the study of unemployment. For example, underemployed by income and mismatch are more suitable for studies on poverty and educational policy than for direct studies of underemployment. Furthermore, the frequent change in the definition of income levels in estimating underemployment by income, based on the legal minimum wage rate which is determined by political rather than economic factors, is highly inappropriate.

## APPENDIX A

## CLASSIFICATIONS UTILIZED IN THIS STUDY

1. Region

GDP, labor force and employed persons are classified by regions according to the classification of the Labor Force Survey as follows:

1. Bangkok
2. Central
3. North
4. Northeast
5. South
6. Whole kingdom

2. Economic Sector

Both GDP and employed persons are classified by economic sectors into primary, secondary, and service. Components which adds up to sectoral GDP and sectoral labor force (and employed persons) are given below:

Economic Sector in this Study	GDP (NESDB)	Labor Force and Employed Persons (NSO)
1. Primary	-Agriculture	-Agriculture
2. Secondary	-Mining	-Mining
	-Manufacturing	-Manufacturing
	-Construction	-Construction
3. Service	-Electricity & water supply	-Electricity
	-Transportation & communication	-Transport communication
	-Wholesale & retail trade	-Commerce

Economic Sector	GDP	Employed Persons
	-Banking, insurance & real estate	- Services
		-Unknown
	-Ownership of dwellings	
	-Public administration & defence	
	-Services.	

### 3. Educational Group

The Labor Force Survey's (LFS) classification of educational groups were regrouped as follows:

Present Study	LFS
1. Below elementary	- none - less than pratom 4
2. Elementary	- lower elementary - upper elementary
3. Secondary	- lower secondary - upper secondary
4. Above secondary	- vocational - academic - technical vocational - teacher training - short-course vocational - other

#### 4. Age Group

The LFS's age group classification were regrouped as follows:

Present Study	LFS
1. 11-19 years	- 11-14 years - 15-19 years
2. 20-34 years	- 20-24 years - 25-29 years - 30-34 years
3. 35 years upwards	- 35-39 years - 40-49 years - 50-59 years - 60 & over years

## APPENDIX B

## EQUATIONS USED IN FORECASTING SHARES OF LABOR FORCE

## BY REGION AND EDUCATION

(Round 2)

LIST OF VARIABLES

E = employed persons (1,000 persons)

t = year (1977,.....,1981)

1. BANGKOK1.1 Below Elementary

$$\ln E = 15.6815 - 0.0052t$$

(0.332) (0.218)

$$R^2 = 0.3126 \quad DW = 1.4434 \quad SE = 0.0755 \quad F = 0.0475 \quad N = 1977-1981$$

1.2 Elementary

$$\ln E = -93.5158 + 0.0509t$$

(3.932) (4.233)

$$R^2 = 0.8088 \quad DW = 2.6912 \quad SE = 0.0380 \quad F = 17.9184 \quad N = 1977-1981$$

1.3 Secondary

$$\ln E = -137.562 + 0.0724t$$

(6.671) (6.951)

$$R^2 = 0.9221 \quad DW = 2.2070 \quad SE = 0.0330 \quad F = 48.3203 \quad N = 1977-1981$$

1.4 Above Secondary

$$\ln F = -219.8602 + 0.1141 t$$

(18.505) (18.998)

$$R^2 = 0.9890 \quad DW = 3.1238 \quad SE = 0.0190 \quad F = 360.924 \quad N = 1977-1981$$

2. CENTRAL2.1 Below Elementary

$$\ln E = -35.2179 + 0.0221 t$$

$$(-2.0175) \quad (2.5018)$$

$$R^2 = 0.38385 \quad DW = 2.7222 \quad SE = 0.0395 \quad F = 3.4920 \quad N = 1977-1981$$

2.2 Elementary

$$\ln E = -41.2179 + 0.0250 t$$

$$(1.9799) \quad (2.3740)$$

$$R^2 = 0.5368 \quad DW = 1.8905 \quad SE = 0.0333 \quad F = 5.6361 \quad N = 1977-1981$$

2.3 Secondary

$$\ln E = -64.8467 + 0.0355 t$$

$$(-1.1038) \quad (1.1960)$$

$$R^2 = 0.0972 \quad DW = 2.2657 \quad SE = 0.0939 \quad F = 1.4305 \quad N = 2977-2981$$

2.4 Above Secondary

$$\ln E = -184.4192 + 0.0958 t$$

$$(-2.5992) \quad (0.0958)$$

$$R^2 = 0.6057 \quad DW = 2.3648 \quad SE = 0.1134 \quad F = 7.1437 \quad N = 1977-1981$$

3. NORTHERN3.1 Below Elementary

$$\ln E = 80.0598 - 0.0369 t$$

$$(2.8298) \quad (-2.5813)$$

$$R^2 = 0.5861 \quad DW = 1.6188 \quad SE = 0.0452 \quad F = 6.6634 \quad N = 1977-1981$$

3.2 Elementary

$$\ln E = -67.91097 + 0.03847 t$$

$$(-26.8221) \quad (30.0729)$$

$$R^2 = 0.9956 \quad DW = 1.8914 \quad SE = 0.0040 \quad F = 904.378 \quad N = 1977-1981$$

3.3 Secondary

$$\ln E = -252.8060 + 0.1303 t$$

$$(-9.4674) (9.6541)$$

$$R^2 = 0.9584 \quad DW = 2.4809 \quad SE = 0.0427 \quad F = 93.2024 \quad N = 1977-1981$$

3.4 Above Secondary

$$\ln E = -401.7072 + 0.2054 t$$

$$(-4.9522) (5.0102)$$

$$R^2 = 0.8577 \quad DW = 2.5814 \quad SE = 0.1296 \quad F = 25.1021 \quad N = 1977-1981$$

4. NORTHEASTERN4.1 Below Elementary

$$\ln E = 107.7791 - 0.0510 t$$

$$(2.0977) (-1.9666)$$

$$R^2 = 0.4176 \quad DW = 2.5589 \quad SE = 0.08210 \quad F = 3.8676 \quad N = 1977-1981$$

4.2 Elementary

$$\ln E = -51.1920 - 0.0304 t$$

$$(-2.1150) (2.4834)$$

$$R^2 = 0.5637 \quad DW = 2.8829 \quad SE = 0.0387 \quad F = 6.1673 \quad N = 1977-1981$$

4.3 Secondary

$$\ln E = -93.5520 + 0.0499 t$$

$$(-2.8325) (2.9925)$$

$$R^2 = 0.6654 \quad DW = 3.2987 \quad SE = 0.0528 \quad F = 8.9552 \quad N = 1977-1981$$

4.4 Above Secondary

$$\ln E = -250.8714 + 0.1293 t$$

$$(-9.2709) (9.4547)$$

$$R^2 = 0.9567 \quad DW = 3.1631 \quad SE = 0.0432 \quad F = 89.3917 \quad N = 1977-1981$$

5. SOUTHERN5.1 Below Elementary

$$\ln E = 81.9726 - 0.0382 t$$

$$(1.1964) \quad (-1.1034)$$

$$R^2 = 0.0516 \quad DW = 2.4557 \quad SE = 0.1095 \quad F = 1.2175 \quad N = 1977-1981$$

5.2 Elementary

$$\ln E = -65.3767 + 0.0368 t$$

$$(-2.0370) \quad (2.2716)$$

$$R^2 = 0.5098 \quad DW = 2.6721 \quad SE = 0.0513 \quad F = 5.1603 \quad N = 1977-1981$$

5.3 Secondary

$$\ln E = -226.0036 + 0.1167 t$$

$$(-1.9836) \quad (2.0263)$$

$$R^2 = 0.4371 \quad DW = 2.9495 \quad SE = 0.1821 \quad F = 4.1058 \quad N = 1977-1981$$

5.4 Above Secondary

$$\ln E = -376.5851 + 0.1926 t$$

$$(-10.3384) \quad (10.4652)$$

$$R^2 = 0.96445 \quad DW = 2.6377 \quad SE = 0.0582 \quad F = 109.521 \quad N = 1977-1981$$

Note : Figures in parenthesis are t-values.

## APPENDIX C

## ADJUSTMENT OF LABOR FORCE AND EMPLOYMENT DATA

There are numerous problems in utilizing the Labor Force Survey (LFS) statistics for time series analysis. This is mainly because statistics obtained from each LFS were based on past population levels many years back in different geographical areas as reported by the Local Administration Department. The population growth rate in the LFS may thus be different from what actually took place.

Furthermore, in order to make the study's demand projections of future employment consistent with the projection of the future labor force, the same set of assumptions regarding population growth and changes must be assumed.

Since projected population figures of the NESDB under the low fertility assumption seem to approximate well population changes which have taken place and they are also widely accepted, they were utilized in projecting the future labor force in this study as have been discussed in Part 2.

As such, the LFS statistics must thus be adjusted so that past labor force and employment statistics would be based on a growth pattern which is similar to the projected population growth of the NESDB. Adjustments of data were carried out only on the main variables which would be required in time series analysis, e.g. employment and labor force.

No attempt to completely restructure the LFS statistics was made since this would be too great a task. The rate of unemployment and share of employment among various groups were thus maintained.

The following is a step by step explanation on how factors of adjustment were obtained for each region in order to correct for time series data of the LFS.

Step 1 Fixing population levels for Round 1 and Round 2

The projected population figures of the NESDB were based on mid-year estimations. Since this is closer to the Round 2 LFS, it was assumed that this set of figures are the population levels for Round 2. In estimating the population figures for Round 1 in a given year, the population of the previous year was averaged with the population of the given year. The results thus obtained were assumed to be the population figures for Round 1.

Step 2 Adjusting the share of population under 11 years of age.

The share of population under 11 years of age influences the level of economically active population and thus the labor force and employment levels. Since population statistics of the LFS and the NESDB projection are based on different growth rates over time, there would be a difference in the share of population under 11 years of age from the two sources. This can be seen in Tables C.1-C.2 which shows an increasing divergence of such shares from the two sources during 1971-1982. The figures for 1981-1982 from the two sources were similar since the LFS figures in these two years have probably been corrected

TABLE C.J

SHARE OF POPULATION UNDER 11 YEARS OF AGE BY REGION AND SOURCE OF DATA : ROUND 1

Year	Eangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB
1971	28.18	28.00	34.48	34.12	33.56	33.79	37.76	37.71	34.92	35.29	34.92	34.87
1972	28.17	27.57	34.52	33.64	33.53	33.13	37.77	37.64	34.47	35.00	34.93	34.52
1973	28.20	27.23	34.47	33.11	33.56	32.46	37.75	37.43	34.97	34.67	34.92	34.11
1974	28.18	27.00	33.76	32.55	33.70	31.78	37.34	37.09	35.04	34.30	34.66	33.65
1975	28.19	26.84	33.81	31.93	33.71	31.10	37.34	36.63	35.04	33.90	34.67	33.14
1976	28.19	26.91	33.63	31.21	33.71	30.37	37.34	35.92	35.04	33.41	34.63	32.52
1977	24.92	27.11	31.55	30.41	33.71	29.62	37.34	35.05	35.04	32.88	34.24	31.84
1978	24.47	27.21	33.66	29.66	33.71	28.90	37.34	34.22	35.04	32.36	34.19	31.19
1979	24.07	27.20	33.66	28.95	33.71	28.22	37.34	23.44	35.04	31.86	34.13	30.55
1980	n.a.	27.11	n.a.	28.26	n.a.	27.57	n.a.	32.69	n.a.	31.37	n.a.	29.94
1981	27.05	26.99	27.91	27.67	27.25	26.98	32.33	32.03	31.12	30.93	29.64	29.38
1982	26.94	26.82	27.33	27.01	26.70	26.44	31.73	31.42	30.73	30.54	29.13	28.87

n.a. = not available

SOURCE: National Statistical Office, Report of the Labor Force Survey, various issues, and National Economic and Social Development Board.

TABLE C.2

SHARE OF POPULATION UNDER 11 YEARS OF AGE BY REGION AND SOURCE OF DATA : ROUND 2

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB	LFS	NESDB
1971	28.10	27.76	34.52	33.89	33.64	33.46	37.53	37.71	34.87	35.16	34.85	34.71
1972	28.16	27.38	34.53	33.39	33.56	32.79	37.78	37.57	34.95	34.85	34.94	34.32
1973	28.18	27.09	34.46	32.84	33.48	32.12	37.77	37.29	34.93	34.50	34.90	33.89
1974	28.19	26.90	33.81	32.26	33.71	31.44	37.34	36.89	35.01	34.11	34.67	33.41
1975	28.19	26.78	33.81	31.61	33.71	30.76	37.34	36.37	35.04	33.68	34.67	32.87
1976	28.18	27.04	33.63	30.81	33.71	29.98	37.34	35.47	35.04	33.14	34.63	32.18
1977	24.80	27.19	33.66	30.02	33.71	29.25	37.34	34.62	35.04	32.61	34.23	31.51
1978	24.31	27.23	33.66	29.30	33.71	28.55	37.34	33.82	35.04	32.10	34.16	30.87
1979	23.86	27.18	33.66	28.60	33.71	27.89	37.34	33.05	35.04	31.61	34.05	30.24
1980	23.66	27.05	33.44	27.92	33.71	27.25	37.28	32.33	35.04	31.12	33.98	29.64
1981	27.05	26.93	27.90	27.31	27.25	26.71	32.33	31.73	31.12	30.75	29.64	29.13
1982	n.a.	26.70	n.a.	26.71	n.a.	26.17	n.a.	31.11	n.a.	30.33	n.a.	28.60

n.a. : not available

SOURCE: National Statistical Office, Report of the Labor Force Survey, Various issues, and National Economic and Social Development Board.

for the more appropriate population changes in light of new information from the 1980 Population Census which showed a much slower population growth rate than was originally envisaged.

The LFS shares of population under 11 years of age declined very little during 1971-1980 while those of the NESDB projection declined much more rapidly. This was because the population growth rate assumption of the LFS was much higher than that of the population growth rate based on the low fertility assumption of the NESDB projection. The growth rate of the LFS population (Round 2) during 1971-1980 was 3.5 percent per year while that of the NESDB was 2.5 percent per year.

To correct for the appropriate structural change from a rapidly declining population growth rate so that labor force and employment data may be made more suitable for time series analysis, the LFS statistics were readjusted to have similar shares as those of the NESDB projection.

For convenience, the population under 11 years of age of the LFS were adjusted downwards until they have the same shares as those of the NESDB projection. Population 11 years upwards of the LFS remained unchanged at this stage.

In short, the following formula was employed:

$$\frac{P(< 11)}{P(< 11) + P(\geq 11)} = s$$

where  $P(< 11)$  = population under 11 years of age to be estimated.

$P(\geq 11)$  = population 11 years upwards from the LFS.

$s$  = share of population under 11 years of age obtained from the NESDB projection.

To estimate  $P(\langle 11)$ , rearrange as follows:

$$P(\langle 11) = s.P(\langle 11) + s.P(\rangle 11)$$

$$(1-s) . P(\langle 11) = s.P(\rangle 11)$$

$$P(\langle 11) = \frac{s}{1 - s} .P(\rangle 11)$$

Given the value of  $s$  and  $P(\rangle 11)$  for each year and each region,  $P(\langle 11)$  can be estimated for every region during the period 1971-1981. From this, revised time series figures of total population for each region were obtained as follows;

$$PR = P(\langle 11) + P(\rangle 11)$$

where  $PR$  = preliminary population level

Step 3 Estimating the factor of adjustment to be utilized in adjusting LFS statistics.

In order to adjust the population levels of the LFS to make them similar to those of the NESDB projection under the low fertility assumption, the following factors of adjustment were estimated for each year in each region:

$$f = \frac{PN}{PR}$$

where  $f$  = adjustment factor for labor force and employment statistics of the LFS.

$PN$  = population level from NESDB projection.

$PR$  = preliminary population level from Step 2.

The estimated adjustment factors are shown in Tables C.3-C.4.

TABLE C.3  
 ADJUSTMENT FACTOR FOR LABOR FORCE  
 AND EMPLOYMENT BY REGION : ROUND 1

Year	Bangkok	Central	Northern	Northeastern	Southern	Whole kingdom
1971	1.1133	1.0591	1.0375	1.0463	1.0372	1.0526
1972	1.1270	1.0703	1.0433	1.0469	1.0216	1.0586
1973	1.0980	1.0360	1.0107	1.0102	1.0098	1.0246
1974	1.1140	1.0348	1.0222	1.0115	1.0204	1.0303
1975	1.1213	1.0418	1.0261	1.0152	1.0249	1.0353
1976	1.1252	1.0464	1.0303	1.0227	1.0298	1.0408
1977	0.9796	0.9318	1.0374	1.0194	1.0202	1.0198
1978	0.9720	1.0349	1.0463	1.0318	1.0290	1.0280
1979	0.9646	1.0449	1.0549	1.0441	1.0383	1.0362
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	0.9999	1.0010	1.0014	1.0016	1.0000	1.0011

TABLE C.4  
 ADJUSTMENT FACTOR FOR LABOR FORCE  
 AND EMPLOYMENT BY REGION : ROUND 2

Year	Bangkok	Central	Northern	Northeastern	Southern	Whole kingdom
1971	1.1264	1.0685	1.0482	1.0537	1.0460	1.0620
1972	1.1436	1.0833	1.0534	1.0553	1.0526	1.0694
1973	1.1125	1.0467	1.0190	1.0191	1.0190	1.0344
1974	1.1174	1.0383	1.0239	1.0127	1.0212	1.0323
1975	1.1242	1.0450	1.0278	1.0174	1.0270	1.0377
1976	1.1247	1.0515	1.0327	1.0278	1.0325	1.0446
1977	0.9772	1.0316	1.0429	1.0269	1.0251	1.0252
1978	0.9693	1.0395	1.0509	1.0382	1.0339	1.0323
1979	0.9594	1.0501	1.0592	1.0500	1.0429	1.0392
1980	0.9547	1.0586	1.0671	1.0605	1.0521	1.0472
1981	0.9998	1.0043	1.0048	1.0062	1.0026	1.0043

Step 4 Estimating labor force and employment statistics.

After having obtained the adjustment factors (f) for each region during 1971-1981, they were multiplied with the relevant labor force and employment statistics of the LFS in each region to obtain the labor force and employment data utilized for time series analysis in this study. The statistics for the whole kingdom are but the summation of adjusted regional totals. Some of the adjusted labor force and employment statistics are shown in Tables C.5-C.9.

The above adjustment of data were done for both Round 1 and Round 2. In the case of employment data, however, the statistics must first be corrected for major definitional changes before they can be adjusted. This was because employment statistics of the LFS during 1971-1973 included those waiting for agricultural season while those during 1974-1981 do not include them.

An attempt was thus made to separate out those waiting for agricultural season from the employment statistics during Round 1 of 1971-1973. The correction was not made for Round 2 since those waiting for agricultural season during the wet season were usually insignificant and tend to fluctuate without any visible pattern.

In correcting for employment statistics for Round 1, the following steps were undertaken :

Step 1 Estimate the share of those waiting for agricultural season in the labor force.

The shares in the labor force of those waiting for agricultural season during 1975-1981 were estimated to see if there were any increasing or decreasing patterns. The results are shown in Table C.10. In general, there do not seem to be any increasing or declining trend.

TABLE C.5

## UNADJUSTED AND ADJUSTED LABOR FORCE BY REGION : ROUND 1

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	1,200.0	1,336.0	3,395.5	3,596.2	3,903.8	4,050.1	6,082.2	6,363.7	2,037.5	2,113.2	16,619.0	17,493.1
1972	1,345.1	1,516.0	3,468.2	3,712.0	3,621.6	3,778.3	5,702.6	5,970.1	1,929.8	1,971.5	16,067.2	17,008.2
1973	1,341.7	1,473.1	3,470.2	3,595.1	3,810.3	3,851.2	5,861.8	5,921.9	2,051.5	2,071.6	16,535.4	16,942.8
1974	1,388.7	1,547.1	3,286.9	3,401.4	2,953.7	3,019.2	4,388.8	4,439.1	1,737.4	1,772.8	16,681.3	17,187.1
1975	1,380.2	1,547.6	3,368.7	3,509.4	3,284.2	3,369.8	6,302.1	6,398.0	1,818.3	1,863.6	17,376.3	17,989.7
1976	1,442.3	1,622.8	3,384.1	3,541.1	3,001.4	3,092.4	6,646.2	6,797.0	1,962.6	2,021.1	18,110.6	18,850.4
1977	1,881.9	1,843.4	4,166.1	3,882.1	4,419.5	4,584.7	7,312.8	7,454.4	1,738.9	1,774.1	20,173.6	20,572.8
1978	2,083.6	2,025.4	4,286.9	4,436.5	4,034.9	4,222.0	7,518.2	7,757.2	1,765.0	1,816.2	20,926.5	21,513.2
1979	2,114.9	2,040.1	4,244.2	4,435.0	4,725.4	4,985.1	7,721.8	8,062.5	1,913.2	1,986.4	21,404.3	22,178.6
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	2,312.9	2,312.6	4,771.0	4,776.0	5,219.7	5,227.1	8,271.4	8,284.9	2,340.4	2,340.4	23,347.4	23,372.0

SOURCE : National Statistical Office, Report of the Labor Force Survey (Round 1), various issues.

TABLE C.6

## UNADJUSTED AND ADJUSTED LABOR FORCE BY REGION : ROUND 2

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	1,242.5	1,399.5	3,313.1	3,539.8	3,971.5	4,163.1	6,187.9	6,520.2	1,939.0	2,028.2	16,653.9	17,685.7
1972	1,364.4	1,560.4	3,427.0	3,712.5	3,739.0	3,938.7	5,771.1	6,090.2	1,913.5	2,014.1	16,215.3	17,340.1
1973	1,383.6	1,539.3	3,507.7	3,671.6	3,927.9	4,002.5	6,273.9	6,393.7	2,023.5	2,062.0	17,116.6	17,705.1
1974	1,415.4	1,581.6	3,574.4	3,711.2	3,795.9	3,886.8	6,459.6	6,541.4	1,986.4	2,028.6	17,231.6	17,789.0
1975	1,387.6	1,560.0	3,710.7	3,877.6	4,093.4	4,207.2	6,969.2	7,090.2	2,094.4	2,150.8	18,255.2	18,943.2
1976	1,474.8	1,658.7	3,923.4	4,125.5	4,089.5	4,223.1	6,968.3	7,162.2	2,109.6	2,178.2	18,565.5	19,393.5
1977	1,980.0	1,934.8	4,387.1	4,525.8	4,629.9	4,828.5	7,732.2	7,940.2	1,700.3	1,743.0	21,172.7	21,706.7
1978	2,196.9	2,129.4	4,501.8	4,679.7	4,813.9	5,059.1	8,122.7	8,433.1	1,773.0	1,833.1	22,227.2	22,945.9
1979	2,268.8	2,176.7	4,328.2	4,545.2	4,895.4	5,185.0	8,109.3	8,515.0	1,848.9	1,928.4	22,149.8	23,019.0
1980	2,414.1	2,304.8	4,491.6	4,754.9	4,919.8	5,249.8	8,256.4	8,756.2	2,242.5	2,359.4	22,770.4	23,844.4
1981	2,500.4	2,499.8	4,991.9	5,013.6	5,439.5	5,465.6	9,030.0	9,086.4	2,305.5	2,311.5	24,768.7	24,876.2

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.7

## UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN PRIMARY SECTOR BY REGION : ROUND 2

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	193.1	217.5	2,300.4	2,457.9	3,467.0	3,634.2	5,592.3	5,822.6	1,604.9	1,678.8	13,157.7	13,880.9
1972	218.2	249.5	2,379.5	2,577.7	3,042.3	3,204.8	4,661.4	4,919.1	1,340.7	1,411.2	11,642.1	12,362.4
1973	156.3	173.9	2,342.2	2,451.6	3,274.4	3,336.6	5,085.4	5,182.5	1,412.2	1,439.1	12,270.5	12,583.7
1974	77.2	86.3	1,757.8	1,825.1	2,739.5	2,856.3	5,290.1	5,357.1	1,311.6	1,339.5	11,226.2	11,464.2
1975	132.8	149.3	2,448.6	2,558.7	3,248.9	3,339.2	5,967.1	6,070.7	1,472.4	1,512.1	13,269.8	13,630.1
1976	158.3	178.0	2,735.5	2,876.4	3,336.2	3,445.2	6,126.3	6,296.8	1,592.2	1,644.0	13,948.5	14,440.4
1977	230.7	225.4	2,828.1	2,917.5	3,692.4	3,850.8	6,496.5	6,671.3	1,573.9	1,715.9	14,921.6	15,381.0
1978	239.6	232.2	2,936.1	3,052.1	3,827.5	4,022.5	7,184.6	7,459.1	1,829.7	1,891.7	16,017.5	16,657.7
1979	198.9	190.8	2,519.4	2,645.7	3,869.1	4,098.0	6,733.8	7,070.7	1,697.2	1,770.0	15,018.4	15,775.2
1980	184.5	176.1	2,724.3	2,884.0	3,888.2	4,149.0	7,230.2	7,667.9	1,915.0	2,014.8	15,942.2	16,891.9
1981	294.0	293.9	3,081.1	3,094.5	4,341.7	4,362.5	7,961.7	8,011.4	1,849.5	1,854.3	17,528.0	17,616.7

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.8

UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN SECONDARY SECTOR BY REGION : ROUND 2

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole Kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	274.4	309.1	281.5	300.8	117.1	122.7	123.9	130.6	70.2	73.4	867.1	936.6
1972	367.9	420.7	352.1	381.4	211.8	223.1	432.4	456.3	250.3	263.5	1,614.5	1,745.1
1973	398.5	443.3	444.0	464.7	197.0	200.7	555.2	565.8	240.5	245.1	1,835.1	1,919.6
1974	471.9	527.3	736.2	764.4	256.0	262.1	406.2	411.3	150.2	153.4	2,020.5	2,118.5
1975	418.2	470.1	444.9	464.9	185.0	190.1	387.4	394.1	154.1	158.3	1,589.6	1,677.6
1976	3,602.8	399.0	379.6	399.1	234.2	241.8	238.9	245.5	141.0	145.6	4,596.5	1,431.2
1977	545.0	532.6	507.3	523.3	199.1	207.6	252.7	259.5	205.9	211.1	1,710.0	1,734.1
1978	680.7	659.8	514.4	534.7	280.5	194.8	155.7	161.6	188.8	195.2	1,820.1	1,845.1
1979	697.6	669.3	690.3	724.9	294.9	312.3	215.5	226.3	273.8	285.5	2,172.1	2,218.4
1980	741.3	707.7	684.6	724.7	276.1	294.6	285.7	303.0	272.8	287.0	2,260.5	2,317.1
1981	732.5	732.3	706.8	709.9	287.7	289.0	238.8	240.3	303.4	304.2	2,269.2	2,275.8

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.9

## UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN SERVICE SECTOR BY REGION : ROUND 2

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole Kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	813.3	916.1	714.1	763.0	377.0	395.1	468.5	493.7	261.9	274.0	2,634.8	2,841.8
1972	750.1	857.8	679.3	735.9	475.3	500.7	649.5	685.4	316.3	332.9	2,870.5	3,112.7
1973	810.7	901.9	716.5	750.0	447.0	455.5	879.2	896.0	362.1	369.0	3,215.5	3,372.3
1974	847.3	946.8	1,063.8	1,104.5	746.1	764.0	738.8	1,648.1	516.0	527.0	4,800.7	4,990.4
1975	819.6	921.4	827.9	865.1	814.6	837.3	595.6	605.9	452.0	464.2	3,509.7	3,693.9
1976	865.0	972.9	776.9	816.9	499.5	515.8	536.5	551.4	363.5	375.3	3,041.4	3,232.3
1977	1,157.7	1,131.3	935.5	965.1	521.1	543.5	629.9	646.8	427.4	438.1	3,671.6	3,724.8
1978	1,217.6	1,180.2	962.7	1,000.7	671.1	705.3	599.8	622.7	441.1	456.1	3,892.3	3,965.0
1979	1,301.5	1,248.7	996.1	1,046.0	662.8	702.0	612.0	642.6	466.4	486.4	4,038.8	4,125.8
1980	1,403.9	1,340.3	1,023.6	1,083.6	713.6	761.4	709.5	752.5	466.4	490.7	4,316.9	4,428.5
1981	1,391.8	1,391.5	1,109.0	1,113.8	776.8	780.5	725.0	729.5	561.8	563.3	4,504.4	4,578.6

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.10

PERCENTAGE OF WAITING FOR AGRICULTURAL SEASON IN THE LABOR FORCE : ROUND 2

(percent)

Year	Bangkok	Central	Northern	Northeastern	Southern	Whole kingdom
1974	n.a.	n.a.	n.a.	n.a.	n.a.	17.54
1975	0.12	8.71	21.02	30.57	12.83	18.10
1976	0.12	11.26	37.97	37.49	7.73	23.00
1977	0.80	13.01	24.18	31.63	3.11	19.80
1978	0.62	10.43	21.47	35.61	2.22	19.32
1979	0.24	10.22	20.93	36.62	6.72	20.48
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	1.64	15.76	28.77	39.95	2.10	24.18
1982	0.50	9.39	23.35	45.08	4.23	22.56
1975-1982 Average	0.50	11.26	25.38	36.71	5.56	21.06

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

It was thus fixed that the share in the labor force of those waiting for agricultural season during Round 1 of 1971-1973 equals the average share estimated during 1975-1981.

Step 2 Estimate employment levels.

Given the fixed share in the labor force of those waiting for agricultural season during 1971-1973 from Step 1, the number of people waiting for agricultural season during 1971-1973 were thus estimated from the level of labor force of the LFS in these years. They are shown in Table C.11.

To obtain corrected employment levels, the estimated waiting for agricultural season were subtracted from employment statistics in the agricultural sector and total employment during 1971-1973. Employment in the other non-agricultural sectors were not corrected, since it is probably reasonable to think that almost all of those waiting for agricultural season are in the agricultural sector.

After correcting for those waiting for agricultural season during 1971-1973, the employment statistics of Round 1 were then adjusted with the estimated adjustment factors 'f' to obtain the employment statistics utilized for time series analysis in this study. (see Tables C.12-C.14 ).

TABLE C.11  
 WAITING FOR AGRICULTURAL SEASON BY REGION : ROUND 1  
 (1,000 persons)

Year	Bangkok	Central	Northern	Northeastern	Southern	Whole kingdom
1971	(6.9)	(382.2)	(990.9)	(2,232.7)	(113.3)	(3,500.4)
1972	(7.8)	(390.4)	(919.2)	(2,093.3)	(107.3)	(3,358.5)
1973	(7.8)	(390.6)	(967.1)	(2,151.8)	(114.1)	(3,482.8)
1974	(8.3)	(381.8)	(773.6)	(1,662.4)	(99.7)	2,925.8
1975	1.7	293.5	690.2	1,926.7	233.3	3,145.5
1976	1.7	380.9	1,139.6	2,491.4	151.7	4,165.4
1977	15.0	542.0	1,068.8	2,313.4	54.0	3,993.4
1978	12.9	447.1	866.1	2,677.5	39.1	4,042.9
1979	5.1	433.9	988.8	2,827.8	128.6	4,384.4
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	38.0	752.1	1,501.7	3,304.6	49.2	5,645.7
1982	17.0	463.0	1,484.4	3,434.0	72.4	4,471.0

Note: Figures in parenthesis are estimates.

SOURCE: National Statistical Office, Report of the Labor Force Survey  
 (Round 1), various issues.

TABLE C.12  
UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN PRIMARY SECTOR BY REGION : ROUND 1  
(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	199.3	214.2	2,186.0	1,910.5	3,274.2	2,368.9	5,014.3	2,910.4	1,647.8	1,591.5	12,321.6	8,995.5
1972	216.9	235.7	2,292.1	2,005.3	2,703.0	1,860.9	4,089.4	2,089.7	1,350.5	1,270.1	10,651.8	7,491.7
1973	148.4	154.4	2,287.4	1,965.1	2,962.2	2,016.5	4,279.4	2,149.4	1,395.5	1,294.0	11,072.9	7,579.4
1974	65.6	73.1	1,518.7	1,571.6	1,741.4	1,780.0	2,725.1	2,756.3	1,004.8	1,025.3	7,055.6	7,206.1
1975	131.7	147.7	2,055.4	2,141.3	2,254.9	2,313.7	2,626.8	2,666.8	1,212.8	1,242.9	8,281.6	8,512.1
1976	152.8	171.9	2,181.8	2,283.0	2,812.5	2,897.8	2,119.4	2,167.5	1,378.4	1,419.5	8,644.9	8,939.8
1977	197.0	193.0	1,970.1	1,835.8	2,359.4	2,447.6	3,486.1	3,553.6	1,705.4	1,739.9	9,718.0	9,769.9
1978	190.8	185.5	2,304.5	2,384.9	2,459.1	2,573.0	3,643.7	3,759.5	1,877.0	1,931.5	10,475.1	10,834.4
1979	190.5	183.8	1,945.5	2,032.9	2,478.9	2,615.1	3,504.6	3,659.2	1,563.0	1,622.8	9,682.5	10,113.8
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	233.0	233.0	2,046.3	2,048.4	2,219.9	2,223.0	2,892.1	2,896.8	1,887.9	1,887.9	9,279.2	9,289.2

SOURCE : National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.13

## UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN SECONDARY SECTOR BY REGION : ROUND 1

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	266.6	296.8	404.3	428.2	232.4	241.1	373.1	390.4	90.7	94.0	1,367.0	1,450.5
1972	379.5	427.7	389.3	416.7	319.9	333.7	702.5	735.5	242.3	247.5	2,033.5	2,161.1
1973	395.2	433.9	431.2	446.7	318.7	322.1	533.8	539.3	256.6	259.1	1,935.5	2,001.1
1974	482.0	537.0	713.9	738.7	419.1	428.4	731.4	739.7	153.6	156.7	2,499.9	2,600.5
1975	417.7	468.4	476.0	495.9	317.9	326.2	896.1	909.7	146.0	149.6	2,253.7	2,349.8
1976	424.5	477.6	421.2	440.7	604.4	622.7	288.5	295.0	184.1	189.6	1,922.7	2,025.7
1977	534.5	523.6	591.3	551.0	349.4	362.5	693.5	706.9	208.8	213.0	2,377.5	2,357.0
1978	662.1	643.6	503.5	521.1	437.8	459.1	412.5	425.6	179.7	184.9	2,195.6	2,233.3
1979	694.2	669.7	787.8	823.2	462.2	487.6	556.3	580.8	340.5	353.5	2,841.0	2,914.8
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	708.7	708.6	785.3	786.1	522.9	523.6	670.3	671.4	253.2	253.2	2,940.4	2,943.0

SOURCE : National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

TABLE C.14

## UNADJUSTED AND ADJUSTED EMPLOYED PERSONS IN SERVICE SECTOR BY REGION : ROUND 1

(1,000 persons)

Year	Bangkok		Central		Northern		Northeastern		Southern		Whole kingdom	
	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted	LFS	Adjusted
1971	717.8	799.1	800.3	847.6	396.1	410.9	686.3	718.1	294.8	305.8	2,895.3	3,081.5
1972	729.9	822.6	769.9	824.0	576.4	601.3	860.1	900.4	326.9	334.0	3,263.2	3,482.4
1973	784.0	860.8	738.4	765.0	514.9	520.4	1,017.9	1,028.3	396.0	399.9	3,451.2	3,574.5
1974	822.7	916.5	1,011.5	1,046.7	784.3	801.7	897.8	908.1	571.5	583.1	4,087.8	4,256.1
1975	812.6	911.2	828.8	863.4	712.0	730.6	830.1	842.7	451.2	462.5	3,634.7	3,810.3
1976	840.6	945.8	759.2	794.4	693.4	714.4	579.1	592.2	376.2	387.4	3,248.5	3,434.3
1977	1,094.1	1,071.7	1,010.6	941.7	612.3	635.2	753.6	768.2	397.8	405.8	3,868.4	3,822.7
1978	1,164.4	1,131.8	991.6	1,026.2	731.0	764.9	732.8	756.1	398.6	410.2	4,018.4	4,089.2
1979	1,240.8	1,196.9	1,032.1	1,078.5	765.6	807.7	780.2	814.6	467.3	485.2	4,286.0	4,382.9
1980	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1981	1,270.9	1,270.8	1,119.7	1,120.9	913.5	914.8	1,292.0	1,294.1	559.1	559.1	5,155.2	5,159.6

SOURCE: National Statistical Office, Report of the Labor Force Survey (Round 2), various issues.

## APPENDIX D

ADJUSTMENT OF GROSS REGIONAL PRODUCT  
(GRP) DATA(1) Gross Regional Product (GRP)

The NESDB divided GRP into 4 period series-1970-1976, 1973-1977, 1976-1978, and 1978-1982-which are not consistent to each other because of differences in some factors such as tax rates. Therefore, GRP by industrial sectors of each region were adjusted according to the following steps:

Step 1: Fix GRP of 1978-1982 as the base period

GRP during 1978-1982 were used in this study without any adjustment.

Step 2: Deriving GRP by industrial sectors during 1971-1977.

1. Calculate annual growth rates of GRP by industrial sectors from each period series.

2. In cases where there were more than one growth rate for some years due to the many series such as 1976 (growth rates of GRP by industrial sectors in 1976 can be computed from period series 1970-1976, 1973-1977 and 1976-1978), the growth rates chosen were the ones obtained from the most recent series.

3. Given the growth rates of GRP by industrial sectors, GRP by industrial sectors during 1971-1977 were computed using 1978 as the base year together with the following formula:

$$GRP_t = \frac{GRP_{t+1}}{1 + g_{t+1}}$$

where  $GRP_t$  = computed GRP by industrial sector in year t

$GRP_{t+1}$  = GRP by industrial sector in year t+1 (Except for the value of 1978, all the others were generated from the above (formula)).

$g_{t+1}$  = growth rate of GRP by industrial sector in year t+1 over year t.

Step 3: Finding GRP of each region.

GRP of each region can be computed by summing the GRP of all industrial sectors in each region.

Step 4: Finding GDP.

GDP of the whole kingdom were derived from the sum of GRP of each region.

APPENDIX E  
EQUATIONS USED IN ESTIMATING INCOME ELASTICITY  
OF EMPLOYMENT

LIST OF VARIABLES

E = employed persons (1,000 persons)

GDP = gross domestic product (million 1972 baht)

ROUND 1

1. BANGKOK

1.1 Primary

$$\ln E = 2.7698 + 0.3887 \ln \text{GDP}$$

(0.9181) (0.78.79)

$$R^2 = -0.0439, \text{ SE} = 0.3456 \quad F = 0.6208 \quad N = 10 \text{ (1971-1979, 1981)}$$

1.2 Secondary

$$\ln E = -1.0228 + 0.7146 \ln \text{GDP}$$

(-0.8296) (5.8798)

$$R^2 = 0.7886, \text{ SE} = 0.1187 \quad F = 34.5726 \quad N = 10 \text{ (1971-1979, 1981)}$$

1.3 Services

$$\ln E = -0.0038 + 0.6530 \ln \text{GDP}$$

(-0.0106) (18.9289)

$$R^2 = 0.9754 \quad \text{SE} = 0.0254 \quad F = 358.3020 \quad N = 10 \text{ (1971-1979, 1981)}$$

1.4 Total

$$\ln E = 0.7502 + 0.6025 \ln \text{GDP}$$

(1.4020) (12.4688)

$$R^2 = 0.9449 \quad \text{SE} = 0.0401 \quad F = 155.4700 \quad N = 10 \text{ (1971-1979, 1981)}$$

2. CENTRAL2.1 Primary

$$\ln E = 3.8279 + 0.3774 \ln \text{GDP}$$

$$(1.3199) (1.3026)$$

$$R^2 = 0.0719, \text{ SE} = 0.1122 \quad F = 1.6969 \quad N = 10(1971-1979, 1981)$$

2.2 Secondary

$$\ln E = 0.8836 + 0.5555 \ln \text{GDP}$$

$$(0.4095) (2.5129)$$

$$R^2 = 0.3713 \quad \text{SE} = 0.2085 \quad F = 6.3149 \quad N = 10(1971-1979, 1981)$$

2.3 Services

$$\ln E = 2.4163 + 0.4383 \ln \text{GDP}$$

$$(1.8492) (3.3768)$$

$$R^2 = 0.5361 \quad \text{SE} = 0.0941 \quad F = 11.4026 \quad N = 10(1971-1979, 1981)$$

2.4 Total

$$\ln E = 4.3121 + 0.3483 \ln \text{GDP}$$

$$(5.7493) (5.1338)$$

$$R^2 = 0.73803, \quad \text{SE} = 0.0448 \quad F = 26.3563$$

3. NORTHERN3.1 Primary

$$\ln E = 2.4297 + 0.5534 \ln \text{GDP}$$

$$(0.8195) (1.7892)$$

$$R^2 = 0.1965 \quad \text{SE} = 0.1388 \quad F = 3.2014 \quad N = 10(1971-1979, 1981)$$

3.2 Secondary

$$\ln E = -1.0840 + 0.8645 \ln \text{GDP}$$

$$(-0.4436) (0.8929)$$

$$R^2 = 0.4502 \quad \text{SE} = 0.02093 \quad F = 8.3689 \quad N = 10(1971-1979, 1981)$$

### 3.3 Services

$$\ln F = -0.6926 + 0.7577 \ln \text{GDP}$$

$$(-0.3465) \quad (3.6057)$$

$$R^2 = 0.5714 \quad SE = 0.1559 \quad F = 13.0011 \quad N = 10(1971-1979, 1981)$$

### 3.4 Total

$$\ln E = 2.0086 + 0.5904 \ln \text{GDP}$$

$$(1.3710) \quad (4.1765)$$

$$R^2 = 0.64627 \quad SE = 0.0840 \quad F = 17.4432 \quad N = 10(1971-1979, 1981)$$

## 4. NORTHEASTERN

### 4.1 Primary

$$\ln E = 0.5722 + 0.7672 \ln \text{GDP}$$

$$(0.1700) \quad (2.1975)$$

$$R^2 = 0.2985 \quad SE = 0.1696 \quad F = 4.8289 \quad N = 10(1971-1979, 1981)$$

### 4.2 Secondary

$$\ln F = 6.1741 + 0.0296 \ln \text{GDP}$$

$$(2.0427) \quad (0.0811)$$

$$R^2 = -0.1241 \quad SE = 0.2758 \quad F = 0.0066 \quad N = 10(1971-1979, 1981)$$

### 4.3 Services

$$\ln E = 4.3902 + 0.2505 \ln \text{GDP}$$

$$(1.9087) \quad (1.0292)$$

$$R^2 = 0.0066 \quad SE = 0.1839 \quad F = 1.0593 \quad N = 10(1971-1979, 1981)$$

### 4.4 Total

$$\ln E = 3.3822 + 0.4829 \ln \text{GDP}$$

$$(2.9232) \quad (4.3304)$$

$$R^2 = 0.6636 \quad SE = 0.0689 \quad F = 18.7521 \quad N = 10(1971-1979, 1981)$$

5. SOUTHERN5.1 Primary

$$\ln E = -3.7685 + 1.1938 \ln GDP$$

$$(-1.0137) \quad (2.9766)$$

$$R^2 = 0.4662 \quad SE = 0.1498 \quad F = 8.8599 \quad N = 10(1971-1979, 1981)$$

5.2 Secondary

$$\ln E = -0.4056 + 0.7011 \ln GDP$$

$$(-0.1234) \quad (1.7336)$$

$$R^2 = 0.1822 \quad SE = 0.3327 \quad F = 3.0054 \quad N = 10(1971-1979, 1981)$$

5.3 Services

$$\ln E = 1.5599 + 0.4876 \ln GDP$$

$$(0.7493) \quad (2.1587)$$

$$R^2 = 0.2891 \quad SE = 0.1737 \quad F = 4.6600 \quad N = 10(1971-1979, 1981)$$

5.4 Total

$$\ln E = 0.6576 + 0.6942 \ln GDP$$

$$(0.5536) \quad (5.8969)$$

$$R^2 = 0.7896 \quad SE = 0.0696 \quad F = 34.7734 \quad N = 10(1971-1979, 1981)$$

6. WHOLE KINGDOM6.1 Primary

$$\ln E = 1.5657 + 0.6804 \ln GDP$$

$$(0.5744) \quad (2.7592)$$

$$R^2 = 0.4236 \quad SE = 0.1004 \quad F = 7.6134 \quad N = 10(1971-1979, 1981)$$

6.2 Secondary

$$\ln E = 2.1435 + 0.5125 \ln GDP$$

$$(1.1985) \quad (3.1216)$$

$$R^2 = 0.4928 \quad SE = 0.1504 \quad F = 9.7442 \quad N = 10(1971-1979, 1981)$$

6.3 Services

$$\ln E = 2.0915 + 0.5367 \ln \text{GDP}$$

$$(1.6194) (4.7771)$$

$$R^2 = 0.70798 \quad SE = 0.0828 \quad F = 22.8207 \quad N = 10(1971-1979, 1981)$$

6.4 Total

$$\ln E = 3.7162 + 0.4806 \ln \text{GDP}$$

$$(5.3342) (8.4729)$$

$$R^2 = 0.8872 \quad SE 0.0387 \quad F = 71.7905 \quad N = 10(1971-1979, 1981)$$

ROUND 21. BANGKOK1.1 Primary

$$\ln E = 2.6294 + 0.4256 \ln \text{GDP}$$

$$(1.0226) \quad (1.0174)$$

$$R^2 = 0.0035 \quad \text{SE } 0.3237 \quad \text{DW} = 1.4773 \quad \text{F} = 1.0350 \quad \text{N} = 11(1971-1981)$$

1.2 Secondary

$$\ln E = -1.1540 + 0.7270 \ln \text{GDP}$$

$$(-0.9354) \quad (6.0017)$$

$$R^2 = 0.7779 \quad \text{SE} = 0.1294 \quad \text{DW} = 1.7407 \quad \text{F} = 36.0200 \quad \text{N} = 11(1971-1981)$$

1.3 Services

$$\ln E = 0.1133 + 0.6471 \ln \text{GDP}$$

$$(0.1735) \quad (10.4982)$$

$$R^2 = 0.9161 \quad \text{SE} = 0.0505 \quad \text{DW} = 1.1651 \quad \text{F} = 110.2120 \quad \text{N} = 11(1971-1981)$$

1.4 Total

$$\ln E = 0.4833 + 0.6303 \ln \text{GDP}$$

$$(0.7952) \quad (11.5211)$$

$$R^2 = 0.9294 \quad \text{SE} = 0.0501 \quad \text{DW} = 1.2869 \quad \text{F} = 132.735 \quad \text{N} = 11(1971-1981)$$

2. CENTRAL2.1 Primary

$$\ln E = -0.0152 + 0.7882 \ln \text{GDP}$$

$$(-0.0051) \quad (2.6612)$$

$$R^2 = 0.3782 \quad \text{SE} = 0.1169 \quad \text{DW} = 1.7016 \quad \text{F} = 7.0822 \quad \text{N} = 11(1971-1981)$$

2.2 Secondary

$$\ln E = -0.3667 + 0.6763 \ln \text{GDP}$$

$$(-0.1658) \quad (2.9974)$$

$$R^2 = 0.4440 \quad SE = 0.2307 \quad DW = 1.5639 \quad F = 8.9842 \quad N = 11(1971-1981)$$

2.3 Services

$$\ln E = 1.4591 + 0.5316 \ln \text{GDP}$$

$$(1.1248) \quad (4.1373)$$

$$R^2 = 0.6171 \quad SE = 0.1011 \quad DW = 2.3433 \quad F = 17.1170 \quad N = 11(1971-1981)$$

2.4 Total

$$\ln E = 2.6318 + 0.5137 \ln \text{GDP}$$

$$(8.0799) \quad (17.4747)$$

$$R^2 = 0.9682 \quad SE = 0.0208 \quad DW = 1.6949 \quad F = 305.3630 \quad N = 11(1971-1981)$$

3. NORTHERN3.1 Primary

$$\ln E = 2.1540 + 0.6298 \ln \text{GDP}$$

$$(1.0909) \quad (3.0616)$$

$$R^2 = 0.4557 \quad SE = 0.0962 \quad DW = 1.1908 \quad F = 9.3733 \quad N = 11(1971-1981)$$

3.2 Secondary

$$\ln E = -1.5364 + 0.8517 \ln \text{GDP}$$

$$(-0.7506) \quad (3.4144)$$

$$R^2 = 0.5159 \quad SE = 0.1902 \quad DW = 1.9576 \quad F = 11.6583 \quad N = 11(1971-1981)$$

3.3 Services

$$\ln E = -0.2056 + 0.6949 \ln \text{GDP}$$

$$(-0.0866) \quad (2.7908)$$

$$R^2 = 0.4044 \quad SE = 0.1976 \quad DW = 1.8129 \quad F = 7.7885 \quad N = 11(1971-1981)$$

3.4 Total

$$\ln E = 2.5544 + 0.5643 \ln \text{GDP}$$

(2.9826) (6.8416)

$$R^2 = 0.8208 \quad SE = 0.0522 \quad DW = 1.3067 \quad F = 46.8077 \quad N = 11(1971-1981)$$

4. NORTHEASTERN4.1 Primary

$$\ln E = 0.3727 + 0.8679 \ln \text{GDP}$$

(0.2597) (5.8416)

$$R^2 = 0.7681 \quad SE = 0.0795 \quad DW = 1.1582 \quad F = 34.1237 \quad N = 11(1971-1981)$$

4.2 Secondary

$$\ln E = 10.4903 - 0.5818 \ln \text{GDP}$$

(2.4461) (-1.1304)

$$R^2 = 0.0270 \quad SE = 0.4388 \quad DW = 1.3861 \quad F = 1.2777 \quad N = 11(1971-1981)$$

4.3 Services

$$\ln E = 5.2747 + 0.1288 \ln \text{GDP}$$

(2.7699) (0.6415)

$$R^2 = -0.0625 \quad SE = 0.1681 \quad DW = 1.2297 \quad F = 0.4115 \quad N = 11(1971-1981)$$

4.4 Total

$$\ln E = 3.3296 + 0.5367 \ln \text{GDP}$$

(5.0446) (8.4608)

$$R^2 = 0.8759 \quad SE = 0.0436 \quad DW = 2.3951 \quad F = 71.5848 \quad N = 11(1971-1981)$$

5. SOUTHERN5.1. Primary

$$\ln E = -0.2929 + 0.8298 \ln \text{GDP}$$

$$(-0.1421) (3.7364)$$

$$R^2 = 0.5645 \quad SE = 0.0869 \quad DW = 1.8512 \quad F = 13.9605 \quad N = 11(1971-1981)$$

5.2 Secondary

$$\ln E = -1.5987 + 0.8431 \ln \text{GDP}$$

$$(-0.4892) (2.1069)$$

$$R^2 = 0.2559 \quad SE = 0.3641 \quad DW = 1.7619 \quad F = 4.4390 \quad N = 11(1971-1981)$$

5.3 Services

$$\ln E = -0.0344 + 0.6590 \ln \text{GDP}$$

$$(-0.0216) (3.8139)$$

$$R^2 = 0.5753 \quad SE = 0.1407 \quad DW = 1.3286 \quad F = 14.5455 \quad N = 11(1971-1981)$$

5.4 Total

$$\ln E = 1.5724 + 0.6097 \ln \text{GDP}$$

$$(2.6388) (10.3456)$$

$$R^2 = 0.9138 \quad SE = 0.0372 \quad DW = 1.4485 \quad F = 107.0300 \quad N = 11(1971-1981)$$

6. WHOLE KINGDOM6.1 Primary

$$\ln E = 0.2358 + 0.8445 \ln \text{GDP}$$

$$(0.1261) (4.9988)$$

$$R^2 = 0.7058 \quad SE = 0.0724 \quad DW = 0.9569 \quad F = 24.9881 \quad N = 11(1971-1981)$$

6.2 Secondary

$$\ln E = 0.8316 + 0.6082 \ln \text{GDP}$$

$$(0.3909) \quad (3.1252)$$

$$R^2 = 0.5204 \quad SE = 0.1949 \quad DW = 1.6464 \quad F = 9.7671 \quad N = 11(1971-1981)$$

6.3 Services

$$\ln E = 1.5003 + 0.5821 \ln \text{GDP}$$

$$(1.2912) \quad (5.7739)$$

$$R^2 = 0.7874 \quad SE = 0.0813 \quad DW = 1.7081 \quad F = 33.3387 \quad N = 11(1971-1981)$$

6.4 Total

$$\ln E = 3.3444 + 0.5329 \ln \text{GDP}$$

$$(6.5757) \quad (12.8991)$$

$$R^2 = 0.9487 \quad SE = 0.0307 \quad DW = 1.2123 \quad F = 166.388 \quad N = 11(1971-1981)$$

Note : Figures in parenthesis are t-values.

## Appendix F

## Measurement of Rural Under-employment : A Conceptual Framework

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## I INTRODUCTION

In a traditional rural economy in which seasonal farming is the dominant activity, measurement of employment, unemployment and under-employment is a highly complex problem because of certain dynamic and seasonal factors. In particular, there are :

- (i) inter - seasonal variations in the size of the labour force, which usually increases during the wet season and declines during the dry season.
- (ii) difference between the labour force, which is influenced by a host of socio-economic variables, and labour supply which is strictly determined by the wage-rate, and
- (iii) inter-sectoral labour migration from the traditional rural economy into the higher-wage modern sector.

This note provides a conceptual framework in an attempt to identify and isolate these various factors as a basis for measuring employment, unemployment and under-employment in the rural economy. Given the inherent difficulties of the task, it is inevitable that such a measurement will be only a "best attempt", to be refined after

considerable empirical work to build a sufficient data base. The justification for such a "best attempt" is that measurement of rural labour utilisation is essential to undertake plans and policies to alleviate rural poverty and under-utilisation of labour.

## II A MODEL OF UNDER-EMPLOYMENT

In Figure I, we present a two-sector economy, featuring a rural labour market in the left-hand quadrant, and an urban labour market in the right quadrant, where wages are significantly higher, thereby generating rational, inter-sectoral migration a la Todaro.

Our primary interest lies in the functioning of the rural labour market over the dry-wet season cycle. The labour force in the low-activity dry-season is  $LF^{DS}$ , but expands to  $LF^{WS}$  during the active wet season.  $LF^{WS}$  is the maximum potential work-force, demographically determined. The difference between  $LF^{WS}$  and  $LF^{DS}$  reflects the seasonal "discouraged worker" effect along with (in the case of female workers) alternative house and family obligations.

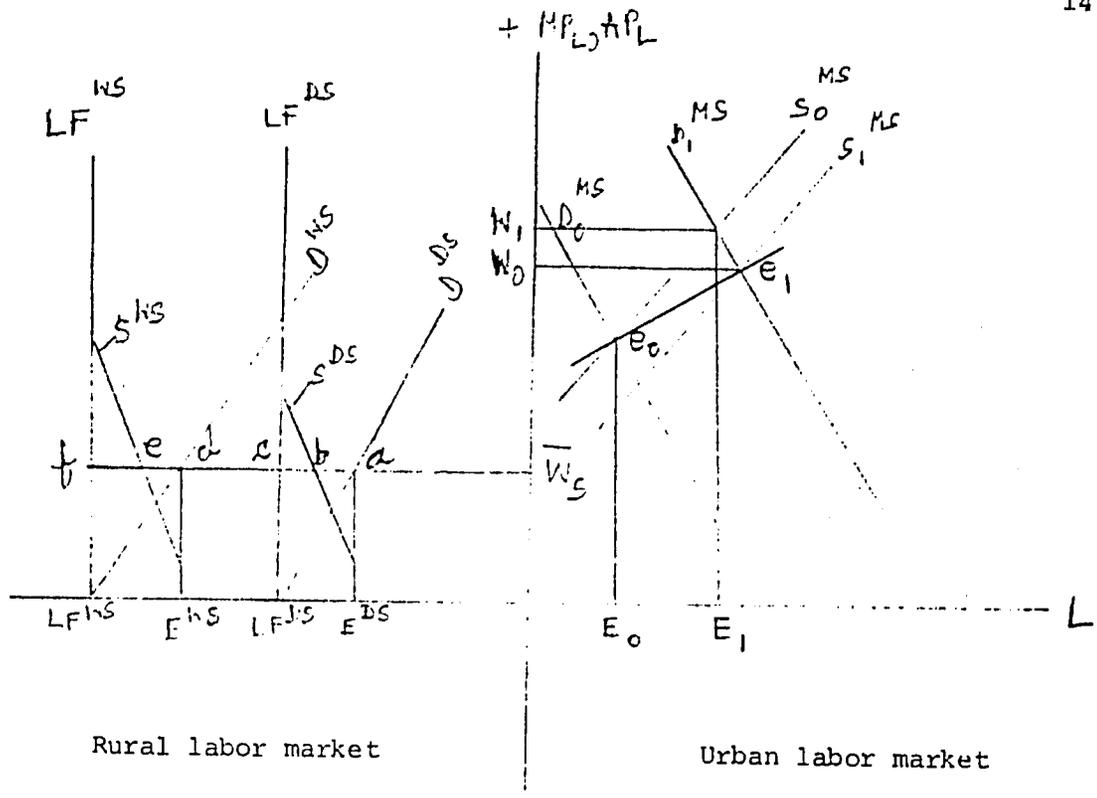


Figure I

These seasonal participants in  $LF^{WS}$  (but not in  $LF^{DS}$ ) can be considered as "secondary labour supply" in distinction with the "primary" supply shown in Fig. I by the supply schedules  $S^{DS}$  and  $S^{WS}$ :

$$S^{DS} = S^{DS} (W)$$

$$S^{WS} = S^{WS} (W)$$

At a sufficiently, high wage-rate,  $W$ , the labour supply schedule merges with the vertical labour force line.

In the dry-season, demand for labour in the rural economy is relatively low,  $D^{DS}$ , and at the given subsistence-level wage,  $\bar{w}_S$ , the level of employment is  $E^{DS}$ . Since, the corresponding supply of labour is "b", there is "open unemployment" equalling "ab". The volume of under-employment in the dry-season is "cb". Thus, "open unemployment" is excess labour supply at the prevailing  $\bar{w}_S$ . It is made up of job-seekers willing to work, but only at this rate of pay. Since there is inadequate labour demand to absorb them at this wage, at least for the time being, they remain full-time job-seekers, i.e. open unemployed.

On the other hand under-employment refers to labour which is in the labour force but outside the labour supply. Therefore, the under-employed, unlike the open unemployed, are willing to accept lower wages than  $\bar{w}_S$ , on a casual or temporary basis. Their opportunity costs are lower than the open unemployed. In practice, however, the distinction between the two groups may be difficult to establish since individuals may re-evaluate their opportunity costs over time.

When the wet season begins, there is significant increase in labour demand - from  $D^{DS}$  to  $D^{WS}$ . As a result, labour force expands from  $LF^{DS}$  to  $LF^{WS}$  and employment rises to  $E^{WS}$ . All the open unemployment, ab, under-employment, cb are now eliminated, and in addition extra job opportunities are created, equalling dc, which attracts new entrants into  $LF^{WS}$  at the prevailing subsistence wage-rate. These are "seasonally employed" which logically is equivalent to "seasonally unemployed"

But the size of  $LF^{WS}$  is larger still than  $D^{WS}$ . There is open unemployment, ed., and under-employment, fe., even during the wet season. These represent a "reserve" of labour in the rural economy in the sense that if and when there is an unusually busy wet season so that labour demand increases to  $D_1^{WS}$ , then the labour reserve in  $LF^{WS}$  is fully (but seasonally) employed at  $\bar{w}_S$ . Indeed, it is not inconceivable that  $D^{WS}$  may rise to an even higher level than  $D_1^{WS}$  creating temporary labour shortage and attracting extra labour inputs from neighbouring areas.

On the other hand, in times of poor farming, coupled with an expanding modern sector, there will be net out-migration from the rural into the urban sector. Thus, in Fig I, labour demand may be continuously shifting upwards from  $D_0^{WS}$  to  $D_1^{MS}$  tending to raise wage, which in turn, will attract new entrants into the urban labour market. Therefore, the labour supply will also shift rightwards as the demand schedule moves upwards, to a certain degree, moderating the rise in wages and limiting it to the trend line  $e_0e_1'$ .

### III DEFINITIONS AND MEASUREMENTS

From the above analysis, we derive the following definitions for measuring rural labour utilisation. However, as mentioned above, attempts to measure the various forms of rural labour utilisation may be expected to be less than perfect, at least in a first attempt where serious data limitations may be encountered :

Total under-employment (over 12-months):  $LF^{WS} - E^{DS} = fa$

$$fa = ab + cb + dc + ed + fe$$

where  $ab$  = open unemployment in Dry Season

$cb$  = under-employment in Dry Season

$ab + cb + dc$  = seasonally employed in WS

$ed$  = open unemployment in Wet Season

$fe$  = under-employed in Wet Season

$N_1 - N_2$  = net migration from rural to urban Labour Market.

TABLE G.1  
LABOUR FORCE PARTICIPATION RATE 1977-1981

BANGKOK

(percent of population)

Age	Sex	Year					Average 1977-1981
		1977	1978	1979	1980	1981	
11-14	M	6.82	9.89	6.57	7.45	7.91	7.33
	F	9.82	12.20	9.04	8.29	11.80	10.23
15-19	M	39.35	45.87	43.14	44.24	46.18	43.76
	F	38.27	43.50	41.62	42.06	44.94	42.08
20-24	M	68.70	74.61	71.56	70.64	70.40	71.18
	F	54.50	60.89	57.20	57.00	65.10	58.94
25-29	M	94.13	94.93	93.89	94.82	94.77	94.51
	F	65.78	69.96	69.08	70.59	74.12	69.91
30-34	M	98.76	98.23	97.92	97.82	98.09	98.16
	F	64.07	67.51	65.30	69.59	72.89	67.87
35-39	M	98.56	98.61	98.70	98.55	98.55	98.59
	F	64.34	64.24	65.65	62.28	72.55	65.81
40-49	M	96.55	96.90	96.78	96.49	97.09	96.76
	F	60.57	60.52	61.24	65.32	66.02	62.73
50-59	M	87.63	88.32	87.80	88.52	88.09	88.07
	F	45.98	45.97	48.87	52.20	57.33	50.07
60+	M	41.10	37.82	39.90	41.39	40.80	40.20
	F	13.93	15.52	16.04	16.70	15.45	15.53

Source: National Statistical Office, Report of the Labor Force Survey.

Labour Force Participation Rate 1977-1981  
Central  
(percent of population)

Age	Sex	Year					Average 1977-1981
		1977	1978	1979	1980	1981	
11-14	M	21.63	22.07	17.52	18.36	15.66	19.09
	F	24.07	27.89	20.75	19.86	19.28	22.37
15-19	M	65.79	68.96	62.72	66.81	65.06	65.87
	F	67.37	68.19	65.23	66.13	64.55	66.29
20-24	M	92.01	92.04	84.97	84.51	90.47	88.80
	F	81.91	82.64	75.52	74.59	80.93	79.12
25-29	M	96.61	98.33	97.65	97.87	97.15	97.52
	F	80.89	82.63	84.93	80.08	82.09	82.12
30-34	M	98.94	98.80	98.19	98.14	98.68	98.55
	F	85.66	83.77	81.73	81.75	85.86	83.75
35-39	M	99.02	98.23	97.70	98.93	99.48	98.67
	F	87.34	90.56	86.27	87.36	88.13	87.93
40-49	M	98.37	98.64	96.51	98.19	98.15	97.97
	F	86.29	86.05	85.35	87.30	86.49	86.30
50-59	M	93.88	94.31	95.41	94.15	92.46	94.04
	F	78.36	80.20	78.27	78.00	79.98	78.96
60+	M	55.00	56.81	53.99	58.83	54.53	55.83
	F	38.19	35.60	34.88	33.80	35.98	35.69

Source: National Statistical Office, Report of the labor Force Survey.

TABLE G.3

## Labour Force Participation Rate 1977-1981

## Northern

(percent of population)

Age	Sex	Year					Average 1977-1981
		1977	1978	1979	1980	1981	
11-14	M	25.13	29.72	27.15	20.06	18.58	24.13
	F	30.83	35.20	30.59	25.50	24.23	29.27
15-19	M	79.84	65.40	78.37	78.30	72.81	74.94
	F	81.35	75.00	77.68	77.08	78.13	77.85
20-24	M	95.04	91.11	94.82	92.54	93.09	92.91
	F	86.28	83.39	87.72	87.00	88.85	86.65
25-29	M	99.23	98.10	98.30	97.67	99.49	98.56
	F	84.25	88.33	88.01	90.08	88.51	87.85
30-34	M	98.62	98.76	99.44	99.39	98.12	98.87
	F	88.81	89.04	92.87	89.39	87.64	89.55
35-39	M	99.75	99.38	98.62	98.68	99.37	99.16
	F	85.38	94.34	94.10	91.11	91.24	91.23
40-49	M	98.39	98.97	98.59	99.12	98.30	98.67
	F	85.49	90.51	89.21	90.89	88.81	88.98
50-59	M	95.14	93.91	95.59	95.85	95.26	95.15
	F	72.48	78.87	76.20	80.93	80.55	77.81
60+	M	49.07	60.08	53.55	55.42	56.24	54.84
	F	24.86	28.50	27.48	29.75	27.18	27.55

Source: National Statistical Office, Report of the Labor Force Survey.

TABLE G.4

## LABOUR FORCE PARTICIPATION RATE 1977-1981

## NORTHEASTERN

(percent of population)

Age	Sex	Year					Average 1977-1981
		1977	1978	1979	1980	1981	
11-14	M	43.52	39.86	31.33	28.38	35.93	35.80
	F	45.65	45.86	33.52	30.28	36.56	38.38
15-19	M	81.15	82.97	81.45	81.28	82.96	81.67
	F	84.10	85.04	84.54	82.27	85.04	84.42
20-24	M	94.41	96.28	96.17	94.51	95.95	95.46
	F	87.51	91.89	90.59	91.10	90.22	90.26
25-39	M	98.06	99.43	98.81	99.27	99.01	98.92
	F	90.05	91.55	91.08	88.88	91.08	90.53
30-34	M	97.89	99.67	98.31	98.41	99.49	98.75
	F	87.1	91.83	91.07	90.48	90.22	90.14
35-39	M	99.36	98.71	99.45	99.52	99.10	99.05
	F	87.51	94.29	93.64	94.15	92.23	92.36
40-49	M	98.10	98.62	97.99	99.03	98.62	98.47
	F	85.12	92.21	90.91	93.28	92.96	90.90
50-59	M	96.99	96.73	97.16	96.70	96.16	96.80
	F	72.98	79.08	77.79	82.05	77.05	77.79
60+	M	65.00	60.38	65.15	60.43	58.67	61.93
	F	27.59	27.48	28.86	32.92	29.41	29.25

Source: National Statistical Office, Report of the Labor Force Survey.

TABLE G.5

## LABOUR FORCE PARTICIPATION RATE 1977-1981

## SOUTHERN

(percent of population)

Age	Sex	Year					Average 1977-1981
		1977	1978	1979	1980	1981	
11-14	M	12.50	10.57	10.25	10.64	11.49	11.09
	F	10.99	13.65	10.71	11.89	10.95	11.64
15-19	M	55.55	60.50	58.50	62.65	55.62	58.56
	F	58.03	57.88	57.32	66.22	57.74	59.44
20-24	M	86.53	91.60	93.32	88.05	85.35	88.97
	F	75.51	85.45	77.15	80.57	76.03	78.35
25-29	M	98.46	97.88	96.07	95.67	98.75	97.37
	F	87.98	88.27	85.92	85.86	81.28	85.86
30-34	M	98.96	99.27	99.48	99.73	98.04	99.10
	F	90.89	92.17	91.24	91.48	90.64	91.28
35-39	M	98.72	99.25	94.24	98.80	98.89	98.98
	F	91.52	93.42	90.08	91.03	89.71	91.15
40-49	M	98.57	98.98	98.51	98.58	98.30	98.59
	F	89.22	90.25	89.62	89.13	89.93	89.63
50-59	M	96.33	94.36	95.58	98.90	91.49	95.33
	F	84.92	84.45	82.56	85.77	82.47	84.03
60+	M	60.14	61.31	60.85	58.80	61.32	60.48
	F	35.10	36.63	37.94	38.90	35.60	36.83

Source: National Statistical Office, Report of the Labor Force Survey.