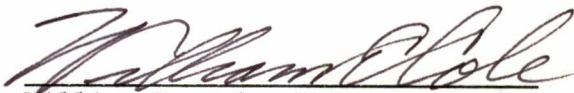
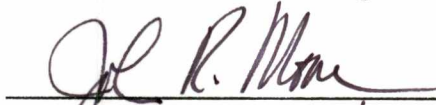
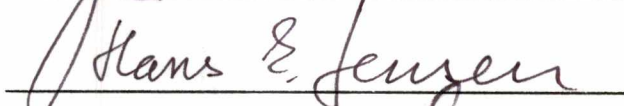
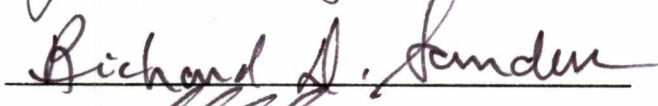
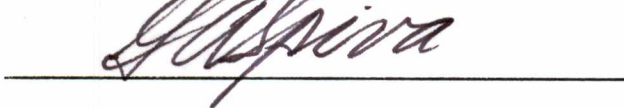


To the Graduate Council:

I am submitting herewith a dissertation written by Prasetyo Soepono entitled "Interprovincial Migration in Indonesia: An Economic Analysis". I have examined the final copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Economics.


William E. Cole, Major Professor

We have read this dissertation
and recommend its acceptance:

Accepted for the Council:


Vice Provost
and Dean of The Graduate School

INTERPROVINCIAL MIGRATION IN INDONESIA:
AN ECONOMIC ANALYSIS

A Dissertation
Presented for the
Doctor of Philosophy
Degree

The University of Tennessee, Knoxville

Prasetyo Soepono

March 1987

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ABSTRACT

There are two kinds of interprovincial migration in Indonesia: government-sponsored migration (transmigration) and voluntary / spontaneous migration. The purpose of this study is to examine how far each of the variables of the Todaro migration model and its extended version affected the voluntary migration in Indonesia in 1971. This study also takes into account the effects of those variables on both the male and the female migrations separately.

This study highlights the incorporation of two typical variables into the interprovincial migration models in addition to the seven economic, demographic/institutional, and educational variables. The two variables typical of migration in Indonesia are the entrepreneurship of migrants from a province and the number of transmigrants in a province. The importance of incorporating these two unique variables into the interprovincial migration models, lies in the empirical evidence that the effects of the variables under study could not be revealed without the inclusion of those two unique variables.

The empirical analysis of the study is represented by the analysis of the data mainly drawn from the 1971 Population Census of Indonesia, using the multiple regression models with the combined functional forms for the general migration rate, for the male migration rate, and for the female migration rate. The empirical results indicate that the transmigrants constituted a significant pull factor for the Indonesian migrants in general and for the male migrants as well as the female

migrants in particular, whereas the entrepreneurship of migrants served as a significant push factor only for the migrants in general and the male migrants in particular, but not for the female migrants. While the other significant pull factor was the degree of urbanization, especially for the female migrants, the other push factors were the population density, the education, the agricultural poverty (except for the female migrants), and the average annual expenditures in an urban subsistence sector (except for the female migrants).

In terms of policy implications, the findings suggest that the transmigration policy should be continued as one of the efforts to generate more voluntary migration. The other efforts are to train potential migrants to be entrepreneurs and to motivate them to get education as high as possible. All these efforts should be integrated with plans for regional development both in the short-run (cash crop cultivation) and in the long-run (urbanization).

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CHAPTER I

INTRODUCTION

More recent data show the increasing importance and urgency of redistribution of population in Indonesia by way of both government-sponsored migration (transmigration) and voluntary migration. In his Presidential Address to the general session of the People's Consultative Assembly (Indonesia's Congress) on March 1, 1983, President Soeharto reported that Indonesia had been successful in keeping the inflation rate down around 10 per cent per year in the last five years (1978-1983) (compared to 600% per year prior to his era) and its average growth rate had been around 7 percent per year (Sinar Harapan, March 2, 1983, p.2). He further said that one of the challenges facing the economic development of Indonesia was the population problem (about 158.1 million people in 1983 as compared to 119 million in 1971). The problem did not lie only in the magnitude and the unbalanced distribution of the population, but also in the resulting increased fragmentation of land holdings, especially in Java. According to him, a possible solution to the problem is to provide more employment opportunities and the successful implementation of both government sponsored and voluntary migration.

This study is concerned mainly with voluntary migration, a subject going unnoticed at the present time, but one on which will be important to the ultimate success of the Indonesian Government's population redistribution policy. The first priority at present is given to

government-sponsored migration (known as transmigration) and only secondarily to voluntary migration. In fact, however, transmigration and voluntary migration have been going on at the same time either through chain migration or independently. If official attention is given entirely to transmigration, then the potential of voluntary migration will not be realized. Efforts are likely to be more effective if voluntary migration is also induced by appropriate policies while transmigration is being implemented.

Little is known about what generates voluntary migration. This study therefore attempts to isolate and examine the factors that have generated voluntary migration, especially from rural to urban areas, from one province to another. To the extent that it is successful, it should aid in the design of appropriate policies. Thus, the objectives of this study are:

- 1) to describe and to analyze the roles of transmigration and voluntary migration in the economic development of Indonesia.
- 2) to identify the push and pull factors which have commonly explained interprovincial voluntary migration of both males and females.
- 3) to measure to what extent and in what direction each of these factors has generated net interprovincial migration, using a multiple regression model.
- 4) to identify certain new factors that influence interprovincial migration in Indonesia and to determine their direction and magnitude of influence by comparing the outcomes before and after those new variables are included in the estimated relationships between the explanatory variables and net migration.

5) to deduce policy implications from the empirical results of the research.

To reach these objectives, the study is organized in the following manner. Chapter II presents a background discussion of internal migration in Indonesia which is intended to help identify forces behind internal migration in general and interprovincial voluntary migration in particular. Chapter III reviews existing theoretical and empirical studies on the determinants of internal migration in developed and developing countries in general and in Indonesia in particular so that the role of this study can be put in perspective. It also provides the basis for designing an appropriate model for this study. Chapter III also presents the statement of the problems and the hypotheses that will be tested in this study. Chapter IV deals with the description of the basic Todaro migration model as the most appropriate theoretical model available to prove or disprove the hypotheses formulated in Chapter III. This chapter also discusses the data and the research method needed for the study.

Chapter V, which is the heart of the study, consists of two important parts: first, a section explaining the choice of the functional forms of the Todaro model and its extended models most appropriate for Indonesia and second, a section which deals with the application of those models for the analyses of the migration data so that its empirical results can be used to lend support to or raise questions about the hypotheses formulated in Chapter III.

Finally, Chapter VI presents the summary of the outcomes of the study, its conclusions and its policy implications. The benefits to be

be derived from the study are these:

- 1) an analysis of the determinants of interprovincial migration in Indonesia will contribute to the migration literature in general and to the Indonesian migration literature in particular;
- 2) the analysis will also provide the migration policy makers with information as a basis for decision making pertaining to voluntary rural to urban migration in general and male and female migration in particular. The results of this study will also be especially valuable when considering migration, regional development and national economic development.

CHAPTER II

STATEMENT OF THE PROBLEM

Background of the Problem

Regional differences in endowment of resources and in opportunities created through the process of economic development give rise to internal migration. For example, Java and Madura, with only 6.89 per cent of the land area of Indonesia had 63.83% of the country's population in 1971 and 62% in 1980. On the other hand, Sumatra with 24.67% of the land area had 19 per cent of the population in 1980 as compared to 17.5 per cent in 1971. Sulawesi (9.85% of the total land area) had 7.1 per cent of total population and Kalimantan (28.11% of the total land area) had 4.5 per cent of the country's population in 1982 (The Statistical Pocketbook of Indonesia, 1980, p.43) (These last three islands and other islands like, Irian Jaya (21.99%) will be called the Outer Islands for the sake of convenience). Regional differences in land endowment are reflected by the fact that lands in Java and Madura are more fertile than lands in the Outer Islands. However, the Outer Islands are richer in minerals, forestry and other natural resources than Java.

Regional differences in opportunities are reflected by differences in employment, wages and/incomes, and educational facilities available among provinces. People tend to move from provinces where there is slow employment growth to provinces that offer rapid employment growth; from provinces in which average wage rate or per capita income

is relatively low to provinces featuring relatively higher wage rates or per capita income and from provinces with relatively fewer educational facilities to provinces with more educational facilities. These regional differences in opportunities cause the kind of movement of people that occurs from the rural part of a province to the urban part of another province.

In Indonesia the two types of regional differences mentioned above have created two major types of internal migration. The first is migration from the densely settled islands of Java and Bali to the Outer Islands with lower population densities. The movement has been in response to the growth of population in the islands of origin beyond the capacity of the land to support the population through subsistence agriculture and to the opportunity of obtaining new land in the islands of destination. The second major movement of people is migration from rural areas to urban areas or from the rural sections of provinces to the urban sections of the same provinces or other provinces. Both of the above shifts in population comprise only a part of the total volume of migration (Suharso and Speare, 1981, p.289).

The type of migration with which the Government of Indonesia has been more concerned is the first type, migration from densely settled lands, which has been the focus of its land settlement program and since 1950s known as the transmigration program. In fact, it has been the focus since 1905, when Indonesia was under the Dutch Colonial rule at which time the term colonization was used (MacAndrews, 1978). Prior to the Indonesian Government's Second Five-Year Development Plan or REPELITA (April 1974-March 1978) the focus of transmigration was

largely the removal of people to other areas as a ready solution to the worst consequences of rural Java's high population density (such as the rural landless, unproductive land, the urban poor, flood victims, etc.). Since 1978 the focus has shifted somewhat toward the regional development of the Outer Islands.

The second type of migration, which is the focus of this study, refers to voluntary migration. Voluntary migrants were never registered with the government's transmigration program so that they were not included in government statistics. As a result, little is known about them. Voluntary migrants are those who move entirely at their initiative and their own cost, to some other area or to (or near) a government transmigration area where they obtain land independently. Transmigrants, on the other hand, are those who move with the sponsorship and the assistance of the government transmigration agency to a stipulated transmigration area, where each household gets two hectares of land, a house, tools, and food rations for a number of months.

Before the commencement of REPELITA I, transmigration and voluntary migration did not seem to be related to each other. During the period of REPELITA I the relationship is stated in Article 2 of the Basic Transmigration Act-Statute No. 3 of 1972 as follows:

" ... the fundamental aim in transmigration is to encourage an ever-increasing flow of voluntary or completely independent migrants who move with no assistance from overpopulated areas to places where employment opportunities are better."

After regional development became a principal justification for transmigration programs (REPELITA II and succeeding REPELITAS) (Bappenas, 1984, p. 47), transmigration and voluntary migration have been related to each other closer. In REPELITA II, it was stated that voluntary migration would be induced whenever development and economic activities were enhanced outside Java. Transmigration or government-sponsored migration and voluntary migration are thought to be related in the sense that the former acts as a catalyst for the latter. Therefore, the official transmigration of the land settlement type is expected to act as a catalyst for large-scale voluntary migration from Java to the Outer Islands. In other words, the success of voluntary migration to an area depends very much on the success of the preceding settlements in that area.

Although transmigration has been expected to provide for the development of prosperous growth centers that will attract voluntary migrants, the government attitude toward voluntary migration is, according to a foreign observer, not encouraging. According to her observation, policies to induce voluntary migration have never been formulated (J. Hardjono, 1982, p.173). Some efforts of the Directorate General of Transmigration to promote spontaneous or voluntary migration were less than successful. This social geographer mentioned three criticisms with regard to spontaneous migration. First, there was a lack of communication between the transmigration agency and migrants so that many of them did not know that they were classified as voluntary migrants until they arrived at a transmigration area. As a result, they were disappointed that they did not get the food rations, tools,

etc. that they had expected. Second, the Directorate General of Transmigration as the Transmigration Agency did not stick to the policy of transferring voluntary migrants only to some developed transmigration areas, where the pioneering stage of the development of those areas should have been done by the government-sponsored migrants. As a result, some voluntary migrants had to work as hard as the government-sponsored migrants/ transmigrants without receiving anything from the government. Moreover, the voluntary migrants were not allowed to settle in areas where they had relatives and/or friends (migrant stock). Third, there was no effort on the part of the agency to select who should be the right candidates for the voluntary migrants. This suggests that the agency did not have any idea as to the factors that motivate people to migrate voluntarily to an area outside Java. In conclusion, many people had the impression that the agency treated voluntary migrants as second-class citizens or as step children.

So little is known about voluntary migration compared to transmigration that it is widely viewed that the flow of voluntary migrants from Java to the Outer-Islands has been small and that there have been more of them moving from the Outer Islands to Java. Both the 1961 and the 1971 Censuses deny this view. According to the 1961 population census, there were 1.35 million Java-born in rural areas of the Outer Islands as compared to about 402,000 of migrants into Java. Thus, net life-time migration prior to 1961 appears to have moved substantially more people out of Java than into Java (McNicol, 1969, p. 79). According to the 1971 census, 1.96 million persons born in Java were resident in the Outer Islands, compared with 0.65 million

persons born in the Outer Islands resident in Java (Arndt and Sundrum, 1977, p.77). Again, this shows a balance of net lifetime migration from Java to the Outer Islands. This number of net voluntary migrants from Java to the Outer Islands far exceeds the number of official transmigrants (19,985 persons) (Oey and Astika, 1982, p.36). Moreover, those voluntary migrants appear to have gone to the transmigration areas. For example, the 1930 census indicated that 36.2 per cent of the total Lampung population of 361,000 consisted of people from different parts of Java. Based on the 1971 census, two-thirds of the population of 2,777,695 in that same province consisted of non-indigeneous people (Hardjono, 1977, p.46). Thus, migrants to the province of Lampung in Southern Sumatra, one of the transmigration areas, consisted of not only transmigrants but also voluntary migrants. The evidence seems to support the notion of transmigration as a catalyst for voluntary migration from Java to the Outer Islands like Lampung.

There was a net outflow of voluntary migration to each of the provinces of Sumatra (except West Sumatra and Aceh) up to 1966 (Arndt and Sundrum, 1977, p. 79). But after 1966 the net flow was reversed for most of Sumatra; so, after that year there was a net outflow of voluntary migrants from each of the provinces of Sumatra (except Lampung, Riau and Jambi). This reverse was due to a decline in the outflow from Java and an increase in migration to Java. Both the outward migration of people from Java to Sumatra and/or the rest of the Outer Islands and the reverse migration to Java show that Indonesian people have readily responded to economic incentives. This is

indicated by the fact that in 1930 the major stream of voluntary migration from Java to Sumatra was in response to job opportunities on North Sumatran plantations in 1930 and in 1971 to better employment opportunities in southern Sumatra, where oil drilling, mining activities and agricultural plantations were located (Hugo, 1979). However, the number of migrants in response to such economic factors was apparently small since the interprovincial migration in Indonesia was mostly short-range (Sundrum, 1976, p.76).

Census data on migration are presented in Table 1. From the figures in the table it is found that Sumatra was the largest recipient of migrants, because six out of its eight provinces had positive total migration and made up the greatest net number of migrants (more than 1.5 million). Other islands that also had positive net migration were Irian Jaya, Kalimantan, Maluku, and West Nusa-tenggara. On the other hand, Java was a province that lost its largest number of inhabitants (represented by the negative net migration of more than 1.3 million), followed by Sulawesi and Bali.

From that data in Table 1 rates of in-migration and out-migration expressed as percentages of the population enumerated in each province are derived. In terms of the net migration rate, the highest rate belonged to the capital city of Jakarta (a special region equivalent to a province), Lampung and Irian Jaya, to a lesser extent followed by provinces experiencing rapid development such as Jambi, Riau, North Sumatra, Central Kalimantan, South Sumatra, and East Kalimantan. So, there are three major streams: the movement to Jakarta, the movement to

TABLE 1. Lifetime Migration by Province: 1971

Province	Total Population	Total Migration			Migration Rate ^a		
		In	Out	Net	In	Out	Net
Aceh	2,008,341	60,982	65,835	-4,853	3.04	3.28	-0.24
Bali	2,120,091	22,010	57,072	-35,062	1.04	2.69	-1.65
Bengkulu	519,361	36,038	24,753	11,285	6.94	4.77	2.17
Central Java	21,865,263	153,477	1,798,001	-1,544,524	1.16	8.22	-7.06
Central Kalimantan	701,936	50,078	11,514	38,564	7.13	1.64	5.49
Central Sulawesi	913,662	50,937	34,274	16,663	5.58	3.75	1.82
East Java	25,508,387	273,228	749,858	-476,620	1.07	2.94	-1.87
East Kalimantan	731,606	39,548	23,723	15,825	5.40	3.24	2.16
East Nusatenggara	2,295,279	10,218	26,222	-16,004	0.45	1.14	-0.70
Irian Jaya	150,786	33,513	6,449	27,064	22.22	4.28	17.95
Jakarta	4,546,292	1,791,635	132,215	1,659,420	39.41	2.91	36.50
Jambi	1,005,658	155,924	27,487	128,437	15.50	2.73	12.77
Lampung	2,775,695	1,001,103	29,728	971,375	36.07	1.07	35.00
Maluku	1,089,511	42,228	36,613	5,615	3.88	3.36	0.52
North Sulawesi	1,717,671	48,668	60,837	-12,167	2.83	3.54	-0.71
North Sumatra	6,620,811	530,012	188,326	341,686	8.01	2.84	5.16
Riau	1,641,074	203,606	41,636	161,970	12.41	2.54	9.87
Southeast Sulawesi	714,120	25,906	30,771	-4,865	3.63	4.31	-0.68
South Sulawesi	5,179,911	66,984	241,726	-174,742	1.29	4.67	-3.37
South Kalimantan	1,699,105	66,119	84,257	-18,138	3.89	4.96	-1.07
South Sumatra	3,438,061	327,312	199,060	128,252	9.52	5.79	3.73
West Java	21,620,950	371,448	1,192,987	-821,539	1.72	5.52	-3.80
West Kalimantan	2,019,924	20,805	35,109	-14,304	1.03	1.74	-0.71
West Nusatenggara	2,203,435	33,575	12,764	20,811	1.51	0.58	0.94
West Sumatra	2,792,221	87,901	324,987	-236,996	3.15	11.64	-8.49
Yogyakarta	2,488,544	99,782	266,933	-167,151	4.01	10.73	-6.72
Total	118,367,850	5,703,037	5,703,037	0	4.82	4.82	0

Source: Central Bureau of Statistics, Republic of Indonesia, The 1971 Population Census: Series D, (March, 1975), pp. 101-102

^aThe denominator for determining the migration rates is the total 1971 population of the respective province.

Lampung and the movement to provinces with substantially high rate of economic growth.

Almost 1.8 million of people from other provinces that migrated into Jakarta made up almost 40 percent of Jakarta's 1971 population that was not born there. It shows how attractive Jakarta was as a place of ample opportunities for all classes of society, because it was a center of government, education, commerce, and industry. However, although Jakarta was 100 percent urban, it was not a place of destination with the highest regional income (RGDP per capita) and/or the highest growth rate of RGDP and yet it was the first or second destination from 23 out of the 25 other provinces and the first destination from eighteen provinces (Sundrum, 1976, p.73).

Lampung was the other province which received net lifetime migration from most provinces, although Lampung was only 9.9 per cent urban in 1971 (Table 2). The non-indigenous people that constituted two-thirds of the population in Lampung in 1971 seems to be related to the theory that the existence of a migration stream creates contacts between origin and destination, and the acquisition of new attributes at destination, such as skills or wealth, often makes it possible to attract more friends or relative to migrate to the place of destination. Thus, migrants knew much about their place of destination from their friends and/or relatives (migrant stock) before they decided to move there. Lampung was an area where most of the Dutch settlements had been made since 1905 and after the Independence of Indonesia (between 1951-1973/1974) received 251,847 transmigrants from Java, or 42.1 % of total transmigrants (Jones, 1979, p.215). The second largest

TABLE 2. Population of Indonesia by Province, Percentages of Population, and Percentages in Urban Areas: 1971

Province/ Island	Population (000's)	% of Popu- lation	% of Popu- lation in Urban Areas
Aceh	2,008	1.7	9.8
Bali	2,120	1.8	9.8
Bengkulu	519	0.4	11.7
Central Java	21,865	18.4	10.7
Central Kalimantan	702	0.6	15.7
Central Sulawesi	914	0.8	8.0
East Java	25,508	21.5	14.5
East Kalimantan	732	0.6	41.1
East Nusatenggara	2,295	1.9	5.6
Irian Jaya	150	0.2	16.3
Jakarta	4,546	3.8	100.0
Jambi	1,006	0.8	29.1
Lampung	2,776	2.3	9.9
Maluku	1,090	1.7	13.3
North Sulawesi	1,718	1.4	19.5
North Sumatera	6,623	5.6	17.7
Riau	1,642	1.4	13.3
Southeast Sulawesi	714	0.6	7.3
South Sulawesi	5,180	4.4	18.1
South Kalimantan	1,699	1.4	26.7
South Sumatera	3,438	2.9	29.0
West Java	21,620	18.3	12.4
West Kalimantan	2,019	1.7	12.8
West Nusatenggara	2,203	1.8	8.1
West Sumatera	2,792	2.3	17.2
Yogyakarta	2,489	2.1	16.4
Total	118,368	100.0	17.4
Sumatra	20,801	17.4	17.8
Java	76,029	63.8	18.0
Kalimantan	5,153	4.3	21.8
Sulawesi	8,526	7.2	16.4
Other Islands	7,859	7.2	9.4

Sources: Sukanto Reksohadiprodjo, "Regional Development As A Strategy For Economic Development of Indonesia", Masyarakat Indonesia, VII, No. 1-2, 1980 and the 1971 Population Census.

recipient of transmigrants during the same period was the province of South Sumatra (25.5%), which could not attract as many voluntary migrants as Lampung did, because the former is relatively farther from Java than is Lampung; so, it was less convenient for people settling in South Sumatra to visit relatives in their provinces of origin in Java. Besides, the land, sea and air transportation network between Lampung and Java was much better. Migration from Java to Lampung is a good example of short-range mobility in Indonesia. The other provinces in the Outer Islands received between 4.3% at the highest and 0.1% at the lowest of total transmigrants (598,885) during the 1951-1973/4 period.

Perhaps the reason Irian Jaya had the third highest rate of net in-migration has anything to do with the development efforts concentrated in that province since that former Dutch colony was integrated with the Republic of Indonesia in 1969.

The relatively high rates of net in-migration in the provinces experiencing rapid economic development like Jambi, Riau, and South Sumatra, represents another element in the southward shift of destinations for Java-born migrants to Sumatra. Most of this migration could have been associated with the expansion of oil drilling and mining activities in those provinces. The high rate of net in-migration in North Sumatra may have been associated with post-independence plantation activities which has attracted labor from Java.

The highest rate of net in-migration in Kalimantan was recorded for Central Kalimantan which, however, did not have the highest per capita RGDP (6.2%) in Kalimantan or even in Indonesia like East Kalimantan (25%), although both have been engaged in large-scale

exploitation of natural resources, especially timber, just like any other province in Kalimantan (Table 3). On the other hand, East Kalimantan did not experience the highest rate of net in-migration. The reason was that net lifetime migration to provinces other than Jakarta, Lampung, and Irian Jaya was mostly short-range. Thirty-nine percent of net migration to East Kalimantan and 65 per cent of net migration to Central Kalimantan were from South Kalimantan (Sundrum, 1976). Therefore, even the drastic increase in economic opportunities in East Kalimantan has not yet attracted migration from more distant provinces, not even from those with intense population pressure. A brief description of regional differences in terms of population density might give some idea as to why migration to the Outer-Islands has flowed from regions in Java where ecological pressures and poverty were greatest similar to the migration that happened in colonial times. According to the population census of 1971, Central Java, the Special Region of Yogyakarta, and East Java, where most of both transmigrants and voluntary migrants had moved to the Outer Islands, had a density of more than 500 to the square km, whereas all of the Outer Islands provinces of destination like Lampung, North Sumatra, South Sumatra, West Sumatra, South Kalimantan, had a density of less than 100 to the square km (Table 4).

Although many village people have moved to urban areas, overall population growth is such that pressure on the land in cultivated areas is still high. The 1963 Agriculture Census showed that in Central Java the average size of holdings was 0.69 hectares, while in East Java it was 0.76 hectares and in the Special Region of Yogyakarta 0.58

TABLE 3. Population, Regional Gross Domestic Product and Growth Rate of RGDP: 1972

Province	Population (000's)	% of total popu- lation	RGDP (Rp. bill.)	% of RGDP	RGDP per capita		Growth of RGDP 1968-72
					Money Terms	Real Terms	
Aceh	2,051	1.7	77,707	1.9	37,887	40,092	8.1
Bali	2,158	1.8	64,015	1.6	29,664	35,314	9.1
Bengkulu	532	0.4	17,447	0.4	32,795	31,686	2.3
Central Java	22,271	18.3	565,448	13.8	25,389	27,900	5.3
C. Kalimantan	724	0.6	45,896	1.1	63,393	47,772	6.2
C. Sulawesi	945	0.8	23,385	0.6	24,746	25,328	5.9
East Java	25,935	21.3	944,703	23.1	36,426	38,343	5.9
E. Kalimantan	775	0.6	167,268	4.1	221,546	142,993	25.0
E. Nusatenggara	2,332	1.9	45,612	1.1	19,559	14,194	3.1
Irian Jaya	941	0.8	34,837	0.9	37,021	28,089	16.2
Jakarta	4,791	3.9	261,437	6.4	54,568	54,568	9.2
Jambi	1,037	0.9	44,930	1.1	43,327	39,069	3.6
Lampung	2,921	2.4	90,476	2.2	30,974	30,308	4.3
Maluku	1,124	0.9	46,228	1.1	41,128	31,205	15.2
North Sulawesi	1,759	1.4	43,890	1.1	24,952	22,459	-1.4
North Sumatra	6,815	5.6	297,601	7.3	43,669	48,901	7.8
Riau	1,690	1.4	148,519	3.6	87,881	81,500	9.7
S.E. Sulawesi	732	0.6	20,316	0.5	27,754	27,183	8.4
South Sulawesi	5,262	4.3	125,251	3.1	23,803	22,866	3.5
S. Kalimantan	1,723	1.4	62,057	1.5	36,017	31,677	1.8
S. Sumatra	3,520	2.9	155,826	3.8	44,269	42,772	4.3
West Java	22,086	18.1	586,212	14.3	26,542	27,167	5.3
W. Kalimantan	2,070	1.7	48,357	1.2	23,361	22,143	2.4
W. Nusatenggara	2,246	1.8	40,382	1.0	17,980	22,702	2.6
W. Sumatra	2,846	2.3	80,651	2.0	28,338	28,799	6.5
Yogyakarta	2,517	2.1	59,224	1.4	23,530	27,139	3.7
Indonesia	121,783	100.0	4,097.676	100.0	33,647	38,160	

Source: Hendra Esmara, "Regional Income Disparities", Bulletin of Indonesian Economic Studies, XI, No. 1, March 1975, pp. 41-57.

TABLE 4. Population of Indonesia by Province and Density: 1971

Province	Population		Area		Density (Persons per sq km)
	(000)	%	(sq km)	%	
Aceh	2,008	1.7	59,814	3.0	34
Bali	2,120	1.8	5,623	0.3	377
Bengkulu	519	0.4	21,082	1.0	25
Central Java	21,865	18.4	34,503	1.7	634
Central Kalimantan	702	0.6	156,552	7.7	4
Central Sulawesi	914	0.8	88,561	4.4	10
East Java	25,508	21.5	47,366	2.3	539
East Kalimantan	732	0.6	202,619	10.0	4
East Nusatenggara	2,295	1.9	48,889	2.4	47
Irian Jaya	150	0.2	412,718	20.4	2
Jakarta	4,546	3.8	576	0.02	7.944
Jambi	1,006	0.8	62,150	3.1	16
Lampung	2,776	2.3	33,892	1.7	82
Maluku	1,090	1.7	496,393	24.5	4
North Sulawesi	1,718	1.4	24,289	1.1	71
North Sumatra	6,623	5.6	70,804	3.5	94
Riau	1,642	1.4	124,084	6.1	13
Southeast Sulawesi	714	0.6	32,036	1.6	22
South Sulawesi	5,180	4.4	82,768	4.1	63
South Kalimantan	1,699	1.4	34,611	1.7	49
South Sumatra	3,438	2.9	103,268	5.1	33
West Java	21,620	18.3	34,503	1.7	634
West Kalimantan	2,019	1.7	157,066	7.7	13
West Nusatenggara	2,203	1.8	21,740	1.1	101
West Sumatra	2,792	2.3	66,080	3.3	42
Yogyakarta	2,489	2.1	3,140	0.2	793
Total	118,368	100.0	2,027,087	100.0	59

Sources: Sukanto Reksohadiprodjo, "Regional Development As A Strategy For Economic Development of Indonesia", Masyarakat Indonesia, VII, No. 1-2, 1980 and the 1971 Population Census.

hectares. The arable land used for agriculture in Java and Madura was 0.12 hectares per capita in 1964 as compared with 0.155 hectares in 1955. As a result, the available means of livelihood can no longer provide for the subsistence of the existing number of people. There is a great number of landless agricultural laborers in most rural areas. Farm incomes are low largely because of population pressure. Population pressure means unemployment or underemployment. The 1980 population census indicates that more than 11 million farm households cultivated land less than 0.5 hectares per household and almost 6 million out of which cultivated less than 0.25 hectares. Many farmers are kept busy for only part of the year, that is, only during the wet season.

So far, some facts about voluntary migration from Java to the Outer Islands have been revealed. Now some observations about voluntary migration from the Outer Islands or Outer Indonesia to Java or Inner Indonesia are as follows. That which is unique about the interprovincial voluntary migration in Indonesia in general and the migration from Outer Indonesia to Inner Indonesia in particular is the high mobility of migrants (male migrants in particular) which is related to their entrepreneurship, which, in turn, is associated with being members of certain ethnic groups. Therefore, membership in those particular ethnic groups becomes one of the predictors of propensity to migrate.

Members of those ethnic groups who have exhibited many characteristics of entrepreneurship view 'merantau' or voluntary migration as their norm or tradition. Merantau means leaving one's

cultural territory voluntarily, whether for a short or long time, with the aim of earning a living or seeking further knowledge or experience, normally with the intention of coming back home (Naim, 1976, p.150).

It is not merantau if one moves to a town or a place which is still within the cultural boundary of his native land, where language, lores, and tradition are still the same. Those certain ethnic groups, the (male) members of which possess entrepreneurial qualities, are in this study called entrepreneurial ethnic groups. They are, among others, Minangkabau (West Sumatra), Batak (North Sumatra), Menadonese (North Sulawesi), Ambonese (Maluku), Banjarese (South Kalimantan), and Buginese (South Sulawesi) (Booth and McCawley, 1981, p.16). The (male) members of those ethnic groups have the merantau tradition and, therefore, a high intensity of migration. Entrepreneurial migrants were mainly males, who wanted to abandon their matriarchal society (such as Minangkabau males) or who gained work as fishermen, dock workers, and sailors (such as Buginese males) (Hugo, 1979). The Javanese (Central Java, Yogyakarta and East Java) and Sundanese (West Java) had no entrepreneurship although they constituted the largest absolute number who migrated to outside Java.

The share in lifetime out-migration to Java from all Outer Island provinces that was contributed by Sumatra grew from 46 percent in 1930 to 59 percent in 1971 (Hugo, 1979). The largest share of the increase was contributed by the entrepreneurial ethnic groups with traditionally high mobility, that is, the Minangkabau and the Batak. The out-migration of Minangkabau people from West Sumatra was of considerable volume. The number of those who merantau is more or less equal to the

number remaining at home in West Sumatra. They merantau because of the inability of West Sumatra's agricultural economy to sustain its population and psycho-social traits of the Minangkabau people. The Bataks, who are also highly mobile, migrate not because there is a scarcity of economic opportunities, but because they want a variety of alternate occupations, the greater possibilities for wealth and the excitement of life elsewhere (Hugo, 1979). The somewhat important movement was from South Kalimantan to East Java by Banjarese people.

Similar to migration from Java to the Outer Islands, migration within Java is due to population pressure on agricultural resources, especially in the provinces of Central Java and Yogyakarta. By 1971 there was heavy movement from West Java to Jakarta, but in 1971, West Java had a net migration gain from all Java provinces except Jakarta. Central Javanese migrants in East and West Java in the 1930 census were mainly people who moved in 1920s to settle land for wet rice cultivation. But, in post-Independence years, Central Javanese have been more likely to move to urban rather than rural areas. The result is not only heavy migration to Jakarta but also to the main urban centers in West and East Java.

As for migration within the Outer Islands the proportion settling in Sumatra has increased. Like migrants from Java, migrants from the Outer Islands to Sumatra shifted their province of destination from North Sumatra to Lampung. In 1971 one-third of all migrants in Lampung were from other Outer Islands provinces, and hence not transmigrants. Migration from Sumatra provinces were mainly to other provinces of the island. In inter-island migration, West Sumatra was the main province

of out-migration (probably due to merantau tradition). Therefore, it is not surprising to find that a lot of Minangkabaus have settled in North Sumatra, Riau, Jambi, South Sumatra and Lampung. Minangkabau migration, like that to other parts of Indonesia was to urban centers where they worked as hawkers, merchants or semi-skilled workers and unskilled workers. In contrast to Sumatra mentioned above, most inter-provincial migration from Kalimantan and Sulawesi to other Island provinces was inter-island in nature; most of it was to Sumatra. Most migrants were from South Sulawesi, where the two mobile ethnic groups: the Buginese (one of the highly mobile ethnics) and the Makassarese, originate. Both were famous for being seafarers; they have their own sailing route along which they migrate. The destination of the Buginese has been to the west of the province: East and South Kalimantan, whereas that of the Makassarese has been to the east and south: Maluku and the islands of East Nusatenggara. The Banjarese of South Kalimantan, another entrepreneurial ethnic group, has shown a preference for settling in Riau and Jambi, but their largest number has been to the province of East Kalimantan, which is a still sparsely populated and developing area. In Sulawesi such intra-island migration is to Central and Southeast Sulawesi.

Table 5, which presents the census data on the principal destination of out-migrants from each of the 26 provinces, indicates that the voluntary migration of most of the entrepreneurial ethnic groups was long-range. Most members of the enterprising ethnic groups in Sumatra (except the Bengkulu and the Palembangese) migrated to another province on another island. In other words, around 65 thousand

TABLE 5. Principal Destinations of Voluntary Migration: 1971

Province of Origin	Total Out- migration from (1)	Principal Destination of (2)	No. of Migrants from (1) who settled in (3)	(4) as a % of (2)
(1)	(2)	(3)	(4)	(5)
Aceh	65,835	North Sumatra	39,508	60.01
Bali	57,072	Lampung	19,908	34.88
Bengkulu	24,753	South Sumatra	11,880	47.99
Central Java	1,798,001	Jakarta	500,689	27.85
C. Kalimantan	11,514	S. Kalimantan	5,785	50.24
C. Sulawesi	34,274	S. Sulawesi	7,322	21.36
East Java	749,848	Lampung	218,586	29.15
E. Kalimantan	23,723	East Java	5,544	23.37
E. Nusatenggara	26,222	Jakarta	6,354	24.23
Irian Jaya	6,449	Jakarta	1,487	23.06
Jakarta	132,215	West Java	55,200	41.75
Jambi	27,487	W. Sumatra	5,388	19.60
Lampung	29,728	S. Sumatra	9,394	31.60
Maluku	36,613	Jakarta	9,142	24.97
North Sulawesi	60,837	Jakarta	18,590	30.56
North Sumatra	188,326	Jakarta	64,968	34.50
Riau	41,636	W. Sumatra	12,912	31.01
S.E. Sulawesi	30,771	Maluku	10,754	34.95
South Sulawesi	241,726	Jambi	37,497	15.51
S. Kalimantan	84,257	C. Kalimantan	31,813	37.76
S. Sumatra	199,060	Lampung	78,798	39.59
West Java	1,192,987	Jakarta	767,413	64.33
W. Kalimantan	35,109	Jakarta	21,496	61.23
W. Nusatenggara	12,764	Jakarta	3,127	24.50
W. Sumatra	324,897	Jakarta	80,612	24.81
Yogyakarta	266,933	Lampung	87,386	32.74

Sources: The World Bank Report No. 4776-IND and the 1971 Population Census, Series D, Table 23, pp. 101-102.

West Sumatra-born persons and about 81 thousand North Sumatra-born persons resided in Jakarta at the time of the 1971 census enumeration. Most members of two out of three enterprising ethnic groups in Kalimantan migrated to other provinces on another island. The principal destinations of the entrepreneurial Menadonese migrants and Buginese migrants were Jakarta and Jambi, respectively. Jakarta was the principal destination for the enterprising Ambonese migrants originating in Maluku.

On the other hand, Table 5 shows that the voluntary migration of most of the non-enterprising ethnic groups was short-range. For instance, members of all the non-enterprising ethnic groups in Sumatra (Aceh, Riau, Jambi, and Lampung) moved to other provinces on the same island. Specifically, the principal destinations of migrants from Aceh and Lampung were North Sumatra and South Sumatra, respectively and the principal destination of migrants from Riau and Jambi was South Sumatra.

As to whether people migrated from the Outer Islands to urban Java or rural Java and from Java to an urban Outer Island or a rural Outer Island, Sundrum (1976) indicated that the urban destinations in Sumatra, Java including Jakarta and Java excluding Jakarta was 36.6 percent, 55.4 per cent and 27.6 per cent, respectively, each of which being much higher than the percentage of population in urban areas, which was 17.8 per cent for Sumatra, 18.0 per cent for Java including Jakarta and 13.5 percent for Java excluding Jakarta (See the last column of Table 2). In other words, the urban share in the destination of total migration was in all cases higher than the urban share of total population. Therefore, it appears that inter-provincial

migration is very heavily weighted with migrants to urban areas. The percentage of migrants from Java living in urban Sumatra was lower than that of migrants from Java living in other parts of Java. This was also the case with migrants from other islands.

There is a survey for 1973 (by Suharso and Speare) that shows why people migrated to cities in Java. For male migrants, most (51.8%) moved to Javanese urban areas to get a job, whereas for female migrants most of them (50.8%) moved there to join their husband / family. The second greatest number of male migrants (27.3%) moved to cities in Java to get some education, while the second greatest number of female migrants (28.2%) became Javanese city dwellers to get a job.

In 1971 the labor force participation rate (which Gavin W. Jones calls the crude activity rate) in Indonesia ranged between 27.25% in South Sulawesi and 42.73% in East Nusatenggara (Jones, 1981)(Table 6). As seen in Table 1 and Table 3, the highest net migration rate and the highest regional income (RGDP) were not in the province with the highest labor force participation rate. This was also the case for the province with the lowest LFPR. While the lowest female labor force participation rate was also in South Sulawesi and the highest was also in East Nusatenggara, the lowest male labor force participation rate was not, however, in South Sulawesi, but in East Kalimantan, the highest-income province, and the highest was still in East Nusatenggara.

The 1971 data concerning the education of migrants show that those going to Jakarta and other provinces of Java had higher educational levels (from primary to university) than native-born residents in those

TABLE 6. Labor Force Participation Rates, Male Labor Force Participation Rates, And Female Labor Force Participation Rates By Province: 1971

Province	LFPR	MLFPR	FLFPR
Aceh	32.08	23.11	9.32
Bali	34.56	23.90	10.72
Bengkulu	36.96	23.71	15.79
Central Java	37.12	23.96	12.92
Central Kalimantan	29.81	21.23	9.65
Central Sulawesi	35.56	23.31	12.70
East Java	38.24	23.89	12.59
East Kalimantan	31.06	20.63	8.66
East Nusatenggara	42.73	24.84	21.95
Irian Jaya	35.76	23.86	12.57
Jakarta	29.72	21.13	7.08
Jambi	36.09	24.22	12.27
Lampung	33.10	23.70	10.88
Maluku	30.47	21.03	10.35
North Sulawesi	30.05	23.09	7.61
North Sumatra	35.67	23.38	15.28
Riau	33.50	24.25	9.53
Southeast Sulawesi	35.17	24.15	14.42
South Sulawesi	27.25	23.15	5.05
South Kalimantan	34.64	23.54	11.01
South Sumatra	35.66	23.47	13.39
West Java	30.94	22.20	9.37
West Kalimantan	41.28	24.37	16.22
West Nusatenggara	32.28	24.27	8.99
West Sumatra	32.50	22.02	11.47
Yogyakarta	41.02	22.40	16.96

Source: Gavin W. Jones, "Labor Force Developments Since 1961" in Ann Booth and Peter McCawley, The Indonesian Economy During the Suharto Era, (Kuala Lumpur: Oxford University Press, 1981), pp. 224-225.

provinces. In contrast, migrants to Sumatra had lower educational levels (especially primary and general junior high) than native-born residents in Sumatra (Sundrum, 1976). This may reflect the fact that the more educated migrated to Java, whereas the unskilled workers migrated to Sumatra, especially in earlier times. Most migrants to Jakarta and other provinces of Java completed primary education, whereas many migrants to Sumatra (40.1%) did not have formal education. Other evidence shows that migrants into urban areas had a higher level of education than migrants into rural areas. All migrant groups, except female migrants from Sumatra to rural areas of Java, had a higher level of education than non-migrants. On average, migrants from Sumatra had a much higher education level than migrants from Java.

The Problems

The background of internal migration in Indonesia mentioned above has been disclosed in order to give some background for identifying and examining the factors that have generated migration from one province to another and from rural areas to urban areas throughout Indonesia and for measuring the extent to which each of those factors has affected voluntary migration. For academic and policy reasons, knowledge about factors that precipitate or draw the migrants would be useful.

The problem is finding the most appropriate variable or variables to represent the economic incentives that have affected voluntary migration from one province to another. Among the various reasons as to migration, is the economic incentive a factor that has generated voluntary migration?

There is also some evidence that interprovincial voluntary migration in Indonesia is mostly rural to urban migration : migration within Inner Indonesia, within Outer Indonesia, from Outer Indonesia to Inner Indonesia and from Inner Indonesia to Outer Indonesia. Thus, the next question or problem is selection of the theory and/or model that is the most suitable for explaining and analyzing the rural to urban migration in Indonesia?

Also, is it true that among the factors that have influenced inter-provincial migration, the 'merantau' norm of the enterprising ethnic groups plays an important role?

Is it also true that transmigrants outside Java have attracted their relatives and friends to migrate voluntarily from Java to outside Java. If it is, to what degree? In other words, how much has information affected the decision to migrate in Indonesia?

CHAPTER III

A REVIEW OF LITERATURE ON MIGRATION

This chapter consists of two main parts: first, the theoretical foundation of the study and, second, the previous studies of internal migration in the advanced countries and in the developing countries in general and in Indonesia in particular.

The Theoretical Foundation for Migration

A theoretical basis must be laid out before any commitment to the solution of the problems is to be made. Interest in migration can be traced back to the works of Ravenstein (1885, 1889) and Redford (1926) that were influenced by the massive migration from rural to urban areas during the industrial revolution in Great Britain. E.G. Ravenstein developed the widely quoted generalization or "laws" of migration which may be summarized in the form of six basic propositions: (1) migration and distance between two points were inversely related, (2) the migration proceeded by stages, one person filling the gap left by another who had moved earlier (the stages of migration), (3) each main current of migration produced a compensating counter current (Ravenstein, 1885, p. 199), (4) rural people were more migratory than urban people, (5) changes in technology and communication were prone to increase migration and (6) the economic motive was dominant in the decision to migrate. These laws were the forces that determined migration and became known as the push and pull theory of migration.

The push factors were the attributes of the place of origin and the pull factors were those of the place of destination. People were pushed from rural areas by factors such as natural disaster (volcano eruption), wars, rural poverty etc. and were "pulled" by the "bright lights" of the towns as their general desire for a better life at the place of destination. This general desire included, but went beyond, employment, education and other economic opportunities (Lee, pp.47-48). Push-pull theories considered the interaction of factors that attracted migrants to their destinations with factors that repelled them from their origin. Thus, according to this push and pull theory, migrants were not necessarily influenced solely by economic (cost-and-return) calculations. Their decision to migrate resulted mostly from a combination of push and pull factors.

Arthur Redford found Ravenstein's laws of migration valuable when he was studying the human movement during the first half of the 19th century in Great Britain some forty years later (Herrick, 1965). Then, Everett S. Lee, a sociologist, developed a convenient framework for the study of the determinants of migration and for analyzing the internal migration process. By first defining migration as a permanent or semi-permanent change of residence, he pointed out that "every act of migration involves an origin, a destination, and an intervening set of obstacles" (Lee, 1966, p.49). Lee classified the important factors that entered directly into the decision-making process of a potential migrant as: (1) factors associated with the area of origin, (2) factors associated with the area of destination, (3) intervening obstacles and (4) personal factors. The factors at origin and destination could be

either positive or negative, in that they either attracted a person to the place or repelled him from it. The intervening obstacles could be physical or legal barriers to migration or the cost and burden of moving. According to Lee, individuals differed in the perception and assessment of the first three sets that became of the existence of a fourth set: personal factor. Personal factors included personal sensitiveness, intelligence, and awareness of conditions elsewhere that entered into the evaluation of the situation at the origin. Thus, there were personalities which were resistant to change and those which welcome change (Sahota, 1968).

The next theory was not directly concerned with internal migration, but implicitly considered it. This theory is the model of economic development that was proposed by W. Arthur Lewis (1954). It is a dual model which assumes that the economy consists of a traditional, rural subsistence sector (characterized by zero or low productivity of surplus labor) and a highly productive modern urban industrial sector into which labor from the subsistence sector migrates or is transferred. In this model, internal migration was deemed socially beneficial since human resources were shifted from locations where their social marginal products were zero to places where the marginal product was positive or from a sector where labor was abundant to a sector where labor was needed. The Lewis model was later formalized and extended by John Fei and Gustav Ranis using graphs depicting the process of labor transfer and its effect on both the agricultural and the industrial sectors (Fei and Ranis, 1961). They showed that continued out-migration from agriculture caused a decline

in agricultural output; consequently, the terms of trade for the urban industrial sector worsened. If no attempt was made to increase productivity through innovations in agriculture, high food prices caused wages to rise, profits and investment to fall and unemployment in urban areas to fall.

In short, the Lewis model and its extension, the Ranis-Fei model, viewed labor migration not only as an instrument of economic growth and development, but also as a possible solution to a resource imbalance in a dual economy. But, such a concept failed to recognize the limit of the labor absorptive capacity of the urban sector and the consequential growth of urban unemployment and underemployment which tended to lead to slow economic development and inequitable distribution of income.

A substantial migration of the rural populations into urban areas followed by rising levels of urban unemployment and under-employment in many developing nations in the 1960s has raised the question of the validity of those traditional models of labor transfer and economic development. To fill this gap in migration theory, Todaro developed a model of rural-urban migration which attempted to explain the paradoxical relationship of accelerated rural-urban migration in the context of rising urban unemployment (Todaro, 1969). The Todaro model postulated that migration proceeded in response to urban-rural differences in expected rather than actual earnings. In this model, migrants as decision-makers were assumed to consider the various labor market opportunities between the rural and urban sectors, and chose the one which maximized their expected gains from migration by measuring the difference in real incomes between rural and urban job

opportunities and the probability of a new migrant obtaining an urban job. Cole and Sanders (1983) found a significant relationship between labor force participation rate (as a proxy for the probability of employment in the modern sector) and net migration. As long as the present value of the net stream of expected urban income over the migrant's planning period exceeded that of the expected rural income, the decision to migrate was economically justified.

The basic Todaro migration model has experienced a number of modifications. Todaro and Harris utilized and extended the basic Todaro framework to construct a two-sector internal trade model of migration and unemployment so that it was possible to give explicit attention to the impact of migration on rural incomes, urban and rural output and total social welfare (Harris and Todaro, 1970). Johnson (1971) was one of the first to modify theoretically the basic Todaro/Harris-Todaro model by explicitly introducing variables for the rate of labor turnover and the possibility of the urban employed sharing their income with the unemployed through some form of extended family network. In his theoretical exploration of the dynamics of the basic Todaro model, Porter (1973) attempted to demonstrate that urban unemployment could not be in equilibrium if employment in the urban sector was growing at a more rapid rate than the population as a whole while other factors were unchanging. Bhagawati and Srinivasan (1974) criticized the Harris-Todaro model, identified some of its theoretical weaknesses and modified some of its major policy conclusions, especially those relating to the migration and employment impact of various wage and production subsidy programs in both rural and urban

areas. Fields (1975) used the Harris-Todaro framework to consider four additional factors in the determination of equilibrium levels of urban unemployment in developing countries: (1) a more generalized description of the urban job-search process in which a rural resident might have some positive probability of finding an urban job without first migrating to the city; (2) the existence of underemployment in the urban traditional or "informal" sector in which workers were not barred from searching for a modern sector job although their probability of success was lower than for an unemployed worker who engaged in full-time job search; (3) the likelihood that educated workers would be given preferential treatment in modern sector job hiring; and (4) the likelihood of differential attitudes toward risk aversion among different migrants. The most recent critique of the Todaro model has come from Cole and Sanders (1985). They have demonstrated that the Todaro approach was limited to explaining the movement of persons possessed of sufficient human capital to qualify them for modern sector employment. They said that the structures of Todaran theory could not explain a subsistence world in which masses of relatively uneducated migrants worked. They utilized the perspective of the urban subsistence sector to develop a model that served as a useful complement to that of Todaro.

Todaro's migration model mentioned above can be classified into what is called the human capital approach. This approach, which has appeared in the work of the Chicago School, in particular Schulz (1961, 1962) and Sjaastad (1962), viewed migration as a form of investment in human capital. This means that, just like an investment in machines,

migration took place if the locational difference in returns or the long-term benefits or the present values of comparative future income streams of destination and origin was greater or less than the costs of migration. A change in the present value of a migrant's expected returns or income stream might come from a change in the demand for his present skill or his upgraded skill in the labor market. Returns and costs associated with migration could be both monetary and non-monetary. Monetary returns could be higher wages associated with improved job opportunities between destination and origin, whereas nonmonetary benefits might include better school systems, lower pollution levels, superior climate, better recreational and medical facilities, lower crime rates etc. As for the cost side, while the money costs of migration are those out-of-pocket expenses for the move, such as food, lodging and transportation, the non-monetary cost of migration covers both opportunity costs (income foregone during the period spent on traveling searching for, and learning a new job) and psychic costs (disutility attached to leaving home, friends, and familiar environment: homesickness, acclimazation strains, etc.) that make distance and migration inversely related. However, the psychic cost of moving to a cosmopolitan capital from a backwoods hamlet may be negative. The strength of the attraction of the city's bright lights or the desire to escape from an unpleasant family situation in the village may be much stronger than the more frequently considered joys of home (Herrick, p.20). All these considerations reinforced the of point that large flows of migration in the underdeveloped countries might well be economically justified without the presence of particularly

significant wage differentials between geographic regions. Once a tradition for migration was started, its effect was likely to be cumulative, since the probability would be even higher that any given person living outside the city knew someone who had moved. Since friends and relatives were sources of information and shelter, a snowball effect was likely to result once the number of migrants had grown to any substantial number.

In the human capital approach the decision to migrate is in fact a function of three variables: the differential returns (before and after migration), the costs of migration, and the length of time over which the returns are received. According to this approach, investment in migration, like other investments in human beings (education), has a high payoff and stimulates growth.

An alternative approach to migration is related to Kuznets' (1958) so-called "selectivity" theory. It delineated between internal migration and economic development in terms of the selectivity of people. Migrants came from select groups. They were the dynamic risk-taking human beings who had high capacity to detach themselves from the traditional environment and adapted themselves to the unfamiliar environment. They were stimulated to move to the growth centers that offered better economic opportunities. The resulting redistribution of population promoted subsequent growth and induced further migration of the select individuals. The jobward-migrating components of the population and the indicated interaction, according to Kuznets, might be among the most productive from the standpoint of economic growth.

"Their [migrants'] very rootlessness may promote adjustment to new opportunities." (Kuznets, 1957, p.3).

So, again as mentioned above, these are the relations between the processes of internal migration and economic development. As implied above, how internal migration stimulates economic development lies in its demographic selectivity. On the other hand, the presence of economic opportunity follows the distribution of population. The distribution of a country's population at any given time may be viewed as an adjustment to the distribution of economic opportunities. For the United States, that population distribution has been responsive to economic opportunities is reflected by the notable convergence over time in per capita incomes and economic structure among the states and regions.

Previous Studies of Internal Migration

Michael J. Greenwood (1975) pointed out that demographers, sociologists, geographers as well as economists had made numerous contributions to the migration literature since 1960. Economists had classified such literature into two broad categories: (1) studies dealing with the determinants of migration and (2) studies dealing with the consequences of migration. L.A. Sjaastad (1962) clearly made the point that migration research had dealt mainly with the forces which affected migration and how strongly they had affected migration.

On the question of geographic mobility J.R. Hicks (1932) stated that differences in economic advantages, chiefly differences in wages were the main causes of migration. A number of studies have tested

Hicks' hypothesis by examining the factors affecting inter-regional migration in the United States. These studies can be grouped into two categories: those dealing with gross migration as a dependent variable and those dealing with net migration as a dependent variable. Gross migration (GM) consists of a single flow (migration from origin i to destination j or GM_{ij}) or the sum of unidirectional flows, over either destinations or origins (like total outmigration from i or $GOM_i = \sum G M_{ij}$), whereas net migration is the difference between two gross flows (e.g.: $NM_{ij} = GM_{ij} - GM_{ji}$). While the theoretical implications of gross and net migration models are somewhat different, the theoretical foundations are similar.

Distance is one of the factors that affect migration. In some cases, distance can be the single most important deterrent to migration. Thus, migration decreases substantially with increased distance. Distance serves as a proxy for both the transportation and psychic costs of movement as well as for the availability of information. Direct transportation expenses need not be great to discourage migration. The psychic costs involved in migration are substantial and are closely related to distance. Information declines with distance and hence uncertainty increases with distance (Schwartz, 1973).

Another determinant is income. As far as income is concerned, the application of the notion of investment in human capital to the decision to migrate requires the comparison between the present value of the income stream in location j less that in i or $\sum (E_{jt} - E_{it}) / (1+r)^t$ and the present value of net costs of migration or

$\Sigma(C_{jt} - C_{it})/(1+r)^t$. The present value of investment in migration from i to j , PV_{ij} , is the difference between those two terms. If $PV_{ij} > 0$, an individual residing in i will decide to migrate to j (Sjaastad, 1962).

The influence of income on migration can be considered from two different perspectives: one consistent with aggregate income measures and the other consistent with migrant specific income measures. The first perspective involves the determination of whether migration occurs from low-to-high income or wage areas. The second perspective is the determination of whether and to what extent migrants themselves benefit by moving.

Personal demographic characteristics such as age and education are also likely to affect the decision to migrate. Since older persons have a shorter expected working life over which they can enjoy the advantages of migration, the probability to migrate will decrease with age. Employment information and job opportunities are both expected to increase with higher education. S. Saben, (1964) concluded that most migrants who were professional and technical workers had a job in view when they moved, either going to take a new job or being transferred. Moreover, education might also reduce the importance of tradition and family ties and increase the awareness of other localities. Schwartz (1973) found that the deterring effects of distance declined substantially with education within a given age group. E.M. Suval and C.H. Hamilton showed that the correlation between education and migration became stronger as the distance of migration increased. The well-educated were much more likely to be involved in a long-distance move.

Another determinant of migration is information. The availability of information concerning alternative places of destination plays a prominent role in the potential migrants' decision to move to a destination. Persons are more likely to move to places about which they have at least some information rather than to places about which they know little or nothing. The reason why migration decreases with distance is that information decreases, and hence uncertainty increases as the distance from a person's home increases. Nelson (1959) found out that family and friends who had previously migrated from one place to another might provide persons in their former place of origin with an important source of information about their present location. This information might in turn increase the propensity of persons in i to move to j rather than to some other place. The more persons who had migrated from i to j in the past, the greater would be the amount of information sent from j back to i and hence the greater the current flow of migrants from i to j tended to be (chain migration). Relatives and friends might supply the recent migrants with food and shelter until they could find a job, and they might also make the social transition easier for the migrants. In his analysis of the factors that influenced interstate migration in the United States over the period 1955-1960, Greenwood (1969) found that the "migrant stock", i.e., the number of persons born in state i as the origin state and living in state j (the destination state) was the most unique explanatory variable so that the failure to include that variable in the estimated relationship in his econometric model caused the true direct effect of most other variables to be obscured. Greenwood found that when the

migrant stock was taken into account, the true direct effects of distance were not nearly so great as they otherwise seemed.

In the developing countries. The econometric studies of interstate migration dealt with the United States. Studies of migration in some developing countries have used the same econometric techniques that have been employed in studying internal migration in the United States. The first of these studies was done by Beals, Levy and Moses in 1967. In it they developed a model to explain differences in the rates of adult male migration between regions in Ghana. They found that lifetime migration between regions was negatively related to distance, average labor income in the origin region, and education level in the origin and destination regions, and positively related to average labor income level in the destination region, population in the origin and destination regions, and the level of urbanization in the origin and destination regions. In this study there were two unexpected results: (1) out-migration rates were lower in provinces where the population had a higher level of education, and (2) the positive relationship between out-migration and the level of urbanization in the origin region.

A study of internal migration in Brazil by Gian Sahota utilizing the same techniques used in the Ghana study reported that the best single-equation model explaining interstate flows of migrants showed migration significantly influenced by the following variables: (1) population density in the destination region (+), (i) wage rate per production worker in the origin region (-), (3) wage rate per

production worker in the destination region (+), (4) percentage of educated population in the origin region (-), (5) percentage of educated population in the destination origin (+), (6) rate of growth of per capita income in the origin region (-), (7) distance of migration (-), and (8) level of urbanization in origin region. The relationship between urbanization in the origin region and migration here as in the Ghana study was positive instead of negative. A negative relationship would have suggested that all urban areas attracted migrants, not just those urban areas outside the origin region. This positive relationship might, however, be due to multicollinearity affecting the urbanization variable in both origin and destination regions.

Internal migration in Egypt and in India has been analyzed by Michael Greenwood (1969b, 1971). Greenwood's Egyptian study explained male migration among 25 regions in terms of distance and origin and destination values for industrial wages, urbanization, education, and male population. All coefficients were significant and their signs were as expected except urbanization in the origin region, which was again, positive. Greenwood's Indian study analyzed variations in interregional rural-urban and urban-urban lifetime male migration in India. Explanatory variables included distance between regions and an income measure and an urbanization measure in origin and destination regions. In the rural-urban regression model all coefficients were significant and their signs were what was expected, whereas in the urban-urban regression model the coefficient of urbanization in the origin is not significant.

Internal migration in Colombia has been studied by Paul Schultz (1971). Schultz chose as his dependent variable periodic migration specified by age and sex. The model included origin-region agricultural wage levels, school enrollments, population growth, distance, and the incidence of political violence (particularly significant for Colombia). Interprovincial migration in Turkey has been analyzed by Munro (1974). He found that while all the models (except Schultz's model) mentioned above represented a blending of the human-capital and push models and thus could be criticized for lack of a consistent theoretical foundation, he argued, using the Turkish case, that push models of internal migration should be preferred to models based on human-capital theory, because push models had sounder conceptional foundations, and were less demanding in their data needs. He also thought that in some of the studies above little effort was made to place either the model or the results in the development context of the country concerned or to discuss the policy significance of the conclusions.

A study of interstate migration in Venezuela has been done by Levy and Wadycki (1974). The results of this study showed that the educated members of the labor force in Venezuela were more mobile and that there were significant differences in the responses of educated and uneducated migrants to variables which reflected the costs and benefits of alternative locations.

Other studies of interstate migration using the econometric technique have been done for Taiwan (Speare, 1971), Ceylon (Dutta, 1972), Costa Rica (Carvajal and Geithman, 1974), the Dominican Republic

(Carvajal and Geithman, 1976), Peru (Falaris, 1979), Tunisia (Hay, 1980) and Mexico (Greenwood, 1978a), (Greenwood and Ladman, 1978b), (King, 1978c), and (Cole and Sanders, 1983).

The survey of literature leads to the conclusion that no apparent attempt has been made to utilize the economic approach to the study of interstate/interprovincial migration in Southeast Asia in general and in Indonesia in particular. For that reason, it is hoped that this study will make a significant contribution.

Previous studies of interprovincial migration in Indonesia. So far the studies of interprovincial migration in Indonesia were based on surveys of migrants and/or subjective evaluation of the impact of various social and economic conditions on migratory flows. The first approach provides useful elaboration and detail but is not sufficiently comprehensive to be an accurate basis for conclusions about the underlying causes of interprovincial migration. The second approach is based solely on the researcher's skill at interpreting statistical series. Both of these two approaches have been utilized by a number of non-economists (demographers, anthropologists, geographers, sociologists) and a few economists to study the internal migration in Indonesia.

McNicol (1968), a demographer, gave a complete analysis of internal migration in Indonesia on the basis of the 1961 Population Census and the 1964-65 National Sample Survey. To him, the major reason for the little attention hitherto given to the study of internal migration in Indonesia was the inadequacy of the relevant statistics.

His complete analysis covered outmigration from Java, including transmigration, migration in the Outer Islands and urban migration. One of his important observations, which is one of the reasons why this study will be conducted, was that transmigrants as the sponsored migrants generated a substantial voluntary flow of settlers from Java to Lampung (the first place of destination for sponsored migrants since 1905). The 1930 census recorded 120,641 Javanese and Sundanese (West Javanese) in Lampung, compared to 180,160 Lampungese. While some of the Javanese and Sundanese outside the settlements might have come originally as sponsored migrants or contract workers or had been descendents of such persons, most of them were likely to have been voluntary/spontaneous migrants. About urban migration, he found that the number of urban migrants in Java who came from the Outer Islands were hardly significant beside the local migrants. Similarly, migrants from Java to urban areas in the Outer Islands made up only a small part of the total number of urban migrants to these areas.

Sundrum (1976), an economist, analyzed some of the information from the 1971 Population Census of Indonesia, which, he thought, provided some of the most detailed data on migration available so far for any Asian country although there had been a lack of policy-oriented data on migration. He found that the most important stream of migration was that flowing into Jakarta, (the capital city in Java) from all other provinces, whereas the second largest stream of migration was that flowing into Lampung (Sumatra). He also found that the rest of inter-provincial migration was mostly short-range and a great part of inter-provincial migration went to urban destinations.

His analysis showed that the average age of migrants was quite low, being about 19 years to Jakarta, a little over 20 to other urban areas of Java and to the rural areas of Sumatra and about 26 to the rural areas of Java. It probably consisted mainly of first-time job seekers.

Hugo (1979), a demographer, also studied the interprovincial migration in Indonesia and described the major migration stream within Java, from Java to Outside Java and from Outside Java to Java in 1930 and 1971. He thought that tabulations from the 1971 Indonesian census provided the first comprehensive set of migration statistics for Indonesia since the volumes of the 1930 'Volkstelling' (Population Census) were published. He found that a small amount of population redistribution from non-metropolitan Javanese provinces to Jakarta and parts of Sumatra had occurred due to migration; however, much important migration, especially between rural and urban areas, occurred within provinces. He confirmed that the availability of employment opportunities and hence the degree of economic development were important determinants of the degree of net in-migration or out-migration by provinces.

Suharso and Speare (1981), a demographer and a sociologist, respectively, provided an overview of migration in Indonesia by looking at interprovincial migration based on the 1971 population census and rural-to-urban migration based on the results of the 1973 migration survey for Java. They found that migration between provinces of Indonesia had not been particularly large by international standard. During the sixties and early seventies, Indonesia did not experience a great deal of internal migration. Their findings showed that with the

exception of Jakarta, which attracted migrants from all parts of Indonesia, most migrants to cities in Java came from nearby towns and villages. Rural to urban migration was greater from the more densely settled districts of Java and also from those areas with poor soil fertility. Those who moved were not necessarily the poorer members of the villages. By and large, migration from rural areas was highly selective of those who were best able to succeed in the city. Migrants had the tendency to be young, were more likely to be unmarried, and were much more likely to have completed primary and secondary school than village residents in general.

A study by Naim (1976) is concerned with the discussion of 'merantau' (voluntary migration) among major ethnic groups in Indonesia. He categorized those ethnic groups into two groups: those with the high intensity of mobility and those with the low intensity of mobility. The first category included those, the male members of which exhibited many qualities of entrepreneurship and/or innovativeness such as Minangkabau (West Sumatra), Batak (North Sumatra), Banjarese (South Kalimantan), Menadonese (North Sulawesi), Buginese (South Sulawesi), Ambonese (Maluku), and Bengkulu (Bengkulu). Their (male) members' innovativeness was identified when he discussed the causative factors for their voluntary migration: the ecological factor, the locational factor, the economic factor, the demographic factor, the educational factor, the urban attraction factor, the matriarchal system and so on. For example, Minangkabau society with a population density of 68 persons per square km (the 1971 census) was considered 'over-populated' and therefore caused their members, especially the male ones, to

migrate to another province, where they tried to get something other than a continuation of their old subsistence farming in the village of origin such as trade and intellectual occupations. The second category included those which lacked entrepreneurial skills such as Lampungese (Lampung), Jambier (Jambi), Sundanese (West Java), Javanese (Central and East Java). Thus the high population pressure for Java did not cause most of the Javanese people to migrate nor did the low population for Jambi did not refrain most of the Jambier from migrating.

Unlike the previous studies mentioned above, this study attempts to identify factors that explain the interprovincial migration in Indonesia and measure to what extent each of the identified factors has generated the mobility of people from one province to another and from a rural area to an urban area. Therefore, this study on the determinants of voluntary interprovincial (rural to urban) migration makes a contribution to the study of Indonesian migration literature, which in turn may serve as a basis for the formulation of migration policies by the Indonesian policy makers. The previous studies are still useful to serve as complements to the proposed study because they have provided relevant data for use in the proposed study.

Based on the objectives of the study, the background information, the theoretical foundations and the previous studies on internal migration, the problems that require solutions are:

1. Did the regional gross domestic product (RGDP) per capita (as a proxy for economic incentives) affect interprovincial net migration, male net migration and female net migration in Indonesia in 1971?
2. Did the labor force participation force (LFPR), the male labor

force participation force (MLFPR), and the female labor force participation rate (FLFPR) also influence net migration, male net migration, and female net migration, respectively ?

3. Did the urbanization generate rural-to-urban, male and female migration ?
4. Did the population density cause the interprovincial male and female migration in Indonesia ?
5. Did the agricultural poverty exert an influence on the interprovincial voluntary migration, male and female voluntary migration?
6. Was the level of education of migrants associated with the variability of net migration in general and male and female net migration in particular ?
7. Did the cost of migration act as impediments to the combined male and female migration in general and the male and female migration in particular ?
8. Did the entrepreneurship of a number of provinces' ethnic groups as a new factor generate the high mobility of the Indonesian people, male and female ?
9. How far did the transmigrants attract their relatives and friends to settle within or near their transmigration areas as voluntary migrants ?

In this regard, the hypotheses to the problems cited above are formulated as follows:

1. Variables that explained the interprovincial net migration rate in 1971 were: a proxy for economic incentives, the labor force participation rate, the urbanization rate, the population density, a

proxy for the agricultural poverty, the education level, and a proxy for the cost of migrating to the urban subsistence sector,

2. Variables that influenced the interprovincial male net migration rate in Indonesia were: a proxy for income differentials, MLFPR, the urbanization rate, the population density, the agricultural poverty, education, and a proxy for the cost of migrating to the urban subsistence sector,

3. Variables that generated rural to urban female net migration rate were: a proxy for income differentials, FLFPR, the urbanization rate, the population density, the agricultural poverty, the education level, and a proxy for the cost of migrating to the urban subsistence sector.

The relationship between those explanatory variables and the net migration rate can be considered as the sub-hypotheses as follows:

a) there was a positive relationship between a proxy for income differentials and the net in-migration in Indonesia, male or female,

b) the labor force participation rate (LFPR), the male LFPR and the female LFPR were positively associated with the net in-migration, the male net in-migration, and female net in-migration, respectively;

c) the urbanization rate was positively related to the net in-migration, the male net in-migration or the female net in-migration, respectively,

d) the population density was inversely related to the net in-migration, the male net in-migration or the female net in-migration;

e) the agricultural poverty was also inversely related to the migration rate in general and the male and/or the female migration rate in particular,

f) the education level was inversely associated with the net in-migration, the male net in-migration or the female net in-migration;

g) a proxy for the cost of migrating to the urban subsistence sector and the net in-migration, the male or female in-migration had a positive relationship.

4. The failure to include the provinces' existence or non-existence of the 'merantau'-generating entrepreneurship in the estimated relationship would cause the direct effects of most other explanatory variables to be obscured.

5. The inclusion of the transmigrants as a migrant stock into the estimated relationship between those explanatory variables and the net in-migration would cause the direct effects of the independent variables to increase.

CHAPTER IV

RESEARCH METHOD

In trying to find solutions to the problems stated previously, a model will be designed and data to be utilized in that model will be described.

The Model

This study utilizes the basic Todaro model (1969) of labor migration in order to explain what has generated interprovincial migration in Indonesia during 1971. The theory deals with the push and pull factors which are demographic and institutional in nature in addition to the conventional economic variables such as wage or income differential and employment probability. As mentioned before, the model postulates that migration occurs mainly in response to the urban-rural differences in expected rather than actual earnings. This means that migrants evaluate the various labor market opportunities between, say, the rural and urban sector, and choose the one which maximizes their expected gains. Expected gains from migration are determined by two factors: (1) the difference in real incomes between the rural and urban sectors and (2) the probability that a new migrant gets a job in the modern sector. Todaro states those expected gains in mathematical terms as follows:

$$V(0) = \int_{t=0}^n [P(t)Y_u(t) - Y_r(t)]e^{it} dt - C(0) \quad \dots \dots \dots (1)$$

where :

- $V(0)$ = the discounted present value of the expected net rural-urban income stream over the migrant's life time;
- $Y_u(t)$ = the average real incomes of individuals employed in the urban sector;
- $Y_r(t)$ = the average real income of individuals employed in the rural sector;
- n = the number of years in the migrant's life time;
- i = the discount rate reflecting the migrant's time preference for consumption;
- $P(t)$ = the probability that a new migrant get a job in the modern sector, where $0 < P(t) < 1$;
- $C(0)$ = the direct pecuniary costs of moving and cost of living differentials between rural and urban regions.

According to Todaro, the decision to migrate is economically justified as long as the present value of the net stream of expected urban income over the migrant's life time exceeds that of the expected rural income.

The Todaro approach to migration, which is called the Expected Income Differential (EID) theory to distinguish it from the human investment theory of migration, can be expressed as:

$$NMR = f(EID, \text{other variables}) \dots \dots \dots (2)$$

where:

NMR = the net in-migration of people from province i to province j as a percentage of the total population in province i. This is a probabilistic dependent variable;

EID = the expected income differential obtained by discounting the present value of a future streams of interprovince income differential by the probability that a migrant gets a job in the modern sector at the province of destination.

In this study the Todaro model or the EID theory is employed since it is also a theory of labor migration in developing countries. It also permits an inclusion of the institutional factors (such as rural poverty), which may influence the decision to migrate in addition to the conventional economic variables in the human investment theory of migration. It emphasizes that the migration decision depends especially on the expected or probabilistic income differential instead of the actual income implied by the neoclassical theory of human investment in migration.

Other variables include distance between origin i and destination j, urbanization rate (URB), labor force participation rate (LFPR), agricultural poverty (AGP) measured in terms of the average agricultural income, demographic factors, such as age, education, marital status, sex, and area characteristics such as, wages, employment growth, climate, crime rate.

An extended version of the basic Todaro model or the EID theory can be specified as follows:

$$\text{NMR} = f(\text{RGDP}, \text{LFPR}, \text{URB}, \text{DENS}, \text{AGP}, \text{PEDUC}, \text{FERT}, \text{USC}, \text{MRT}, \text{MS}, e_1) \dots \dots \dots (3)$$

where :

NMR = the net in-migration or out-migration rate as a percent of the total population of each of 26 Indonesian provinces;

RGDP = the Regional Gross Domestic Product per capita in real terms for each province used as a proxy to the economic incentives of each province;

LFPR = the percent of economically active population aged 10 years or more who worked during the census period of 1971 including those who were unemployed but looking for a job. This variable is used as a proxy for the probability of finding urban jobs (Cole and Sanders, 1983);

URB = the degree of urbanization in a province measured by the number of people living in cities with 20,000 inhabitants or more as percent of the total population in respective provinces;

DENS = the province's number of people per square kilometer;

AGP = the rural poverty variable measured by the average agricultural income or per capita agricultural productivity;

PEDUC = the percent of the province's total population which completed primary education;

FERT = the number of births per 1000 persons which can be treated as a crude measure of the rate of population growth in a province;

USC = the province's annual average living expenditures of various occupations in the urban subsistence sector;

MRT = a dummy variable to represent the high intensity or the low intensity of migration of an ethnic group in a province, which indicates the existence or non-existence of a sizable ethnic group in the province, which possesses some characteristics of entrepreneurship leading to the norm or tradition of leaving home to indulge in entrepreneurial undertakings in another province (merantau). MRT is one for a province which is inhabited mainly by an entrepreneurial ethnic group that has a high intensity of migration and MRT is zero for a province which is inhabited mainly by an ethnic group with lack of merantau-generating entrepreneurial skills;

MS = the migrant stock variable defined as the number of previous migrants from province i to province j prior to one year before the census divided by the population in province i . The larger the number of persons born in state i and living in state j , the more the employment and other information that is likely to be communicated from j to i . The more information channeled from j to i and the more the number of migrants from j to i , the higher the probability that their relatives and friends will migrate from j to i (Greenwood, 1969a). In this study the transmigration rate (TRANS), which is the ratio of the province's number of transmigrants (up to 1970) to the province's total population of the year under study (1971), is expected to exert an influence on the migration as the migrant stock does, that is, generating chain migration mentioned above;

e_i = the disturbance term designed to capture errors due to measurement, specification and aggregation.

On the basis of the theoretical model outlined in equation (3), a linear multiple regression model (4) is constructed to:

- (1) measure statistically the extent to which the included factors affected interprovincial (possibly female and male) migration in Indonesia during 1971,
- (2) evaluate the effects of changes in those factors (economic, demographic, and educational) and
- (3) deduce the policy implications of the interprovincial (voluntary) migration in Indonesia from the empirical results for the Indonesian economic development:

$$M_i = b_0 + b_1 \text{RGDP}_i + b_2 \text{LFPR}_i + b_3 \text{URB}_i + b_4 \text{DENS}_i + b_5 \text{AGP}_i + b_6 \text{PEDUC}_i + b_7 \text{FERT}_i + b_8 \text{USC}_i + \text{MRT}_i + \text{MS/TRANS}_i + e_i \dots \dots \dots (4)$$

where M_i represents the gross in-migration rate, and/or the gross out-migration rate, or the net migration rate of province i , e_i is the disturbance term, $i = 1, \dots, 26$, and the independent or explanatory variables are:

RGDP_i is the province i 's real regional gross domestic product, which can be assumed to represent the economic incentives, to which migrants are supposed to respond positively;

$LFPR_i$ is the percent of province i 's population aged 10 years and over who actively participated in the labor force at some time during the 1971, which includes those who were unemployed but looking for employment and this variable is divided into male and female (where possible) with notations: $MLFPR$ and $FLFPR$, respectively;

URB_i is the province i 's urbanization rate or the percent of province i 's population residing in urban areas in 1971 and functions as a pull factor. What constitutes an urban area is the special capital district of Jakarta, all 'kotamadya' (municipal) and 'kabupaten' (regency) capitals and other centers which has more than 20,000 inhabitants, a hospital or clinic, a high school or higher education building, and electricity and in which the majority of the the workforce are not in the agricultural sector (Milone, 1966);

$DENS_i$ is the province i 's number of people per square kilometer, which is expected to serve as a pull or a push factor (Sahota, 1968). It is the pull effect because the densely populated areas may provide better information about job opportunities, whereas the push effect may be due to population pressure. But in this study this variable is expected to serve mainly as the push factor;

AGP_i is the province i 's index of rural poverty measured by the average agricultural income or per capita agricultural productivity. This will serve as a push factor;

$PEDUC_i$ is the percent of province i 's total population which completed primary education. This percentage is derived by calculating the ratio of those who completed primary schools to the province's total population and then multiplying by 100;

$FERT_i$ is the province's fertility rate, which is obtained by counting births per 1000 persons or is the crude birth rate and which is expected to be inversely related to migration;

USC_i is the annual average household expenditures of various occupations in the urban subsistence sector in a province which act as impediments to migration to urban areas. This variable is derived from the daily expenditures of various occupations such as peddlers, shoe shiners, cigarette collectors, etc., in the urban subsistence sector of a province and data on the cost of living per province. While USC is not the cost of migration, it can be viewed as one of its components. Thus, like the cost of migration, it is expected to act as impediments to migration;

MRT_i is a dummy variable for the high intensity or low intensity of an ethnic group in province i . In this case $MRT = 1$ if province i has an entrepreneurial dominant ethnic group that has a high intensity of migration and $MRT = 0$ if it has no such ethnic group. MRT is included in the models as a dummy variable for the purpose of trying to highlight and justify the role and the importance of the migration-generating

entrepreneurial and adventure-seeking select ethnic groups, which are typical of voluntary migration in Indonesia;

MS_i is the migrant stock variable which is defined earlier as the number of previous migrants from state i to state j prior to one year before the census divided by the population in state i . In this study, the migrant stock (MS) will be represented by the transmigration rate (TRANS). These transmigrants are expected to attract their friends and relatives as voluntary migrants from Java to the Outer Islands. The inclusion of MS_i into the model is to examine how far information has affected interprovincial migration, like from Java to Lampung, through a network (Cole and Sanders, 1985, p. 482).

A linear multiple regression model will also be utilized to analyze the male and female net migration in Indonesia, using the same independent variables as found in equation (4), except that fertility rate per province (FERT) will be added to the equation for female net migration:

$$MM_i = f(RGDP_i, LFPR_i, URB_i, DENS_i, AGP_i, PEDUC_i, USC_i, MRT_i, MS_i, e_i) \dots \dots \dots (5)$$

$$FM_i = f(RGDP_i, LFPR_i, URB_i, DENS_i, AGP_i, PEDUC_i, FERT_i, USC_i, MRT_i, MS_i, e_i) \dots \dots \dots (6)$$

where all the dependent and independent variables have been defined before, except FERT. FERT is province i 's fertility rate computed from the number of live births per 1000 persons and e_i 's are the error terms. The multiple regression models mentioned above will be estimated by ordinary least squares (OLS).

Data

The data used in this study were derived from the 1971 population census of Indonesia and from journal articles and books referring to that census. The 1971 census data provides two conventional types of migration estimates. These are lifetime migration and recent migration. The 1971 census data recorded only 5.7 million persons living outside their province of birth, or only 4.8 percent of the population, which was a relatively small volume of migration compared to 20 percent of the Americans living outside their state of birth (Speare, 1975). According to Speare, the main advantage of lifetime migration as a measure is that it is more accurate than measures which depend on the place of previous residence only, from which migration of the Indonesian males and females was recorded. Another advantage is to see the cumulative effect of migration over time on the population of a sending or receiving area. Its major disadvantage is that it provides little indication of when the migration occurred. However, this study employed the lifetime migration data rather than the recent migration data (migration for five years preceding the 1971 census) since the latter gave only data on interregional migration instead of inter-provincial migration.

Besides, recent migration data for the period of study (1971) was not available.

As mentioned above, data on male and female migration are available only from the 1971 census volumes containing tabulations of male and female migrants by place of previous residence. Since for almost all the provinces the figures are higher than those for lifetime migrants, it cannot be expected that the net (in/out) migration rate of a province equal to the sum of the net (in/out) migration rate for males and that for females of the same province. Table 7 and Table 8 provide the number of in-migrants, the number of out-migrants, the net (in/out) migration rate for the males and the females, respectively, from the tabulations of male population and female population by place of previous residence.

Although estimates of RGDP per capita in Indonesia might give a misleading picture of inter-regional differences and although they would not really be the economic incentives to which migrants respond when they have to travel a long distance to move to a province, it is likely that wage is closely associated with per capita RGDP. Since the data on RGDP is only available for 1972, a downward adjustment will be made by using the inflation rate of 1971 (7.09%).

Data on total labor force participation rate (LFPR) in each of the 26 provinces, as presented in Table 6, was obtained for this study from Jones' article (Jones, 1981). So are data on the female and male labor force participation rates (MLFPR and FLFPR). He calls LFPR the crude activity rate (CAR) and defines it as the percentage of the total population (aged 10 and over) which is economically active. In his

TABLE 7. Lifetime Male Migration by Province: 1971

Province	Total Population	Total Migration			Migration Rates ^a		
		In	Out	Net	In	Out	Net
Aceh	2,008,341	51,233	68,150	-16,917	2.55	3.39	-0.84
Bali	2,120,091	26,632	40,153	-13,521	1.26	1.89	-0.63
Bengkulu	519,361	24,516	23,826	690	4.72	4.59	0.13
Central Java	21,865,263	341,603	939,394	-597,263	1.56	4.30	-2.74
C. Kalimantan	701,936	32,760	15,322	17,438	4.67	2.18	2.49
C. Sulawesi	913,662	39,593	41,171	-1,578	4.33	4.51	-0.18
East Java	25,508,387	237,937	438,783	-200,846	0.93	1.72	-0.79
E. Kalimantan	731,606	25,047	37,876	-12,829	3.42	5.18	-1.76
E. Nusatenggara	2,295,279	16,212	21,228	-5,016	0.71	0.92	-0.22
Irian Jaya	150,786	23,405	22,836	569	15.52	15.15	0.38
Jakarta	4,546,492	939,372	278,468	660,904	20.66	6.13	14.53
Jambi	1,005,658	96,062	201,085	-105,023	9.55	20.00	-10.45
Lampung	2,775,695	531,394	72,045	459,349	19.15	2.60	16.55
Maluku	1,089,511	31,705	40,494	-8,789	2.91	3.72	-0.81
North Sulawesi	1,717,671	69,626	42,943	26,683	4.05	2.5	1.55
N. Sumatra	6,620,811	316,561	179,556	137,005	4.78	2.71	2.07
Riau	1,641,074	128,334	88,583	39,751	7.82	5.40	2.42
Southeast Sulawesi	714,120	24,275	24,032	243	3.40	3.37	-0.03
South Sulawesi	5,179,911	88,909	167,766	-78,857	1.72	3.24	-1.52
S. Kalimantan	1,699,105	52,576	62,873	-10,297	3.09	3.7	-0.61
S. Sumatra	3,438,061	205,389	201,085	4,304	5.97	5.85	0.12
West Java	21,620,950	391,089	695,314	-304,225	1.81	3.22	-1.41
W. Kalimantan	2,019,924	16,656	34,741	-18,085	0.83	1.72	-0.89
W. Nusatenggara	2,203,435	25,384	14,390	10,994	1.15	0.65	0.50
W. Sumatra	2,792,221	150,179	192,126	-41,947	5.38	6.88	-1.50
Yogyakarta	2,488,544	83,177	155,406	-72,229	3.34	6.25	-2.91

Source: Central Bureau of Statistics, Republic of Indonesia, The 1971 Population Census: Volume D, (March, 1975), pp.103-104.

TABLE 8. Lifetime Female Migration by Province: 1971

Province	Total Population	Total Migration			Migration Rates ^a		
		In	Out	Net	In	Out	Net
Aceh	2,008,341	38,586	50,627	-12,041	1.92	2.52	-0.60
Bali	2,120,091	18,539	33,179	-14,640	0.87	1.57	-0.70
Bengkulu	519,361	19,736	18,315	1,421	3.80	3.53	3.53
Central Java	21,865,263	253,297	838,596	-585,299	1.16	3.84	-3.84
C. Kalimantan	701,936	25,624	11,638	13,986	3.65	1.66	1.99
C. Sulawesi	913,662	23,332	26,836	-3,503	2.55	2.94	-0.39
East Java	25,508,387	168,571	373,026	-204,455	0.66	1.46	-0.80
E. Kalimantan	731,606	17,473	22,791	-5,318	2.39	3.12	-0.73
E. Nusatenggara	2,295,279	8,911	9,877	-966	0.39	0.43	-0.04
Irian Jaya	150,786	13,263	7,121	6,142	8.80	4.72	4.08
Jakarta Raya	4,546,492	898,315	221,711	676,544	19.76	4.88	14.88
Jambi	1,005,658	69,033	38,857	30,176	6.80	3.86	3.00
Lampung	2,775,695	487,451	43,866	443,585	17.56	1.58	15.98
Maluku	1,089,511	23,527	23,864	-337	2.16	2.19	-0.03
North Sulawesi	1,717,671	49,767	29,863	19,904	2.90	1.74	1.16
N. Sumatra	6,620,811	270,329	133,853	136,476	4.08	2.02	2.06
Riau	1,641,074	92,562	56,255	36,307	5.64	3.43	2.21
Southeast Sulawesi	714,120	14,325	15,032	-707	2.01	2.11	-0.10
South Sulawesi	5,179,911	54,123	112,702	-58,579	1.05	2.18	-1.13
S. Kalimantan	1,699,105	42,799	48,813	6,014	2.52	2.87	-0.35
S. Sumatra	3,438,061	168,432	147,289	21,143	4.90	4.28	0.62
West Java	21,620,950	289,474	659,916	-370,442	1.34	3.05	-1.71
W. Kalimantan	2,019,924	9,975	23,431	-13,456	0.49	1.16	-0.67
W. Nusatenggara	2,203,435	19,185	10,209	8,976	0.87	0.46	0.41
W. Sumatra	2,792,221	112,282	150,744	-38,462	4.02	5.40	-1.38
Yogyakarta	2,488,544	61,022	140,805	-79,783	2.45	5.66	-3.21

Source: Central Bureau of Statistics, Republic of Indonesia, The 1971 Population Census: Volume D, (March, 1975), pp. 105-106.

view, this rate depends on two things: the age structure of the population and the percentages working in each age and sex group. Thus, the number of economically active males and females were calculated if the provincial age-specific activity rates for each sex are applied to the numbers in each age-sex group in Indonesia as a whole. The number of active males calculated in this way, divided by the total population (denoted by $stand'm$), yield the standardized male contribution to the crude activity rate (LFPR). This is also the case for females. The rate is denoted by $stand'f$. The sum of $stand'm$ or MLFPR and $stand'f$ or FLFPR is the standardized activity rate of both sexes in the total population, which can be the same as or differ from the CAR (or LFPR). When that sum and the CAR differ, it is due to the effect of differences between the age-sex structure of each province's population and that of Indonesia as a whole. This is ASI (the age-sex index).

The urbanization rate for each province is available in the 1971 Population Census of Indonesia. As mentioned before, this variable is expected to capture the "bright lights" or the effects of the availability of amenities in urban areas and reflects the availability of a wide range of occupations and the psychic costs & benefits of urban surroundings.

Data on population density for each province are available in the 1971 Population Census. The population density (DENS) is chosen as an independent variable, which reflects not only the population pressure, but also means low agricultural income, or low agricultural productivity per worker due to fragmented and uneconomical small

holdings, that is expected to function as a push factor of voluntary migration (Hendra Esmara, 1975).

Data on agricultural poverty (AGP) are available for each province from the World Bank Report (No. GPTY/DC-248). Data on the poverty line per province in rupiah is also available from the same source, but was not chosen for this study. AGP as a push factor will be represented by the poverty incidence, which is the percentage number of people in poverty and which reflects differences among regions in the poverty levels. Even data on USC to represent one of the elements that make up the cost of migration (C) is hard to find. Consequently, an indirect estimation of one of its components, USC, was made by using data on the cost of living per province in 1971 and data on the average daily expenditures of persons with various occupations in the urban informal sector of a city (Jakarta) (Hendra Esmara, 1975; Papanek, 1975). It is assumed that cost of migration varies with cost of living.

Data on primary education are readily available from the 1971 Population Census (Series D). Unfortunately, data for such an important variable as the fertility rate (FERT) are available only by islands instead of by province. Therefore, this variable is not included in the migration models.

As for MRT, a province is assigned $MRT = 1$ if it has an ethnic group with the high intensity of migration, which means that that ethnic group displays the 'merantau'-generating entrepreneurial qualities and $MRT = 0$ if it has an ethnic group with the low intensity of migration, which means that the ethnic group lacks entrepreneurial

skills. In this study provinces that have $MRT = 1$ are Bengkulu, North Sumatra (the Batak), West Sumatra (the Minangkabau), South Sumatra, East Kalimantan, West Kalimantan, South Kalimantan (the Banjarese), North Sulawesi (the Menadonese), Central Sulawesi, South Sulawesi (the Buginese), East Nusatenggara and Maluku (the Ambonese). This is based on the 1930 Population Census, Naim's study (1976), Hugo's study (1976) and the judgment and observation used in this study. The other ethnic groups such as the Javanese (Central Java, Yogyakarta, East Java) and the Sundanese (West Java), the members of which constitute the majority of the total population, were rated by Naim as having the low intensity of voluntary migration. This high or low intensity was, as Naim pointed out, derived by taking the ratio of the number of the members of an ethnic group enumerated outside their territorial-cultural boundary to those inside their territorial-cultural boundary. Because these ratios are not available for 1971, in this study one or zero for the value of MRT for each province is used.

As mentioned before, the migrant stock (MS) will be represented by the transmigration rate (TRANS), which is the ratio of the number of transmigrants resettled in a province up to 1970 to the total population of that province in 1971. Data on the number of transmigrants resettled in each stipulated province comes from some publications by Hardjono (1982) and by Hugo (1979). Provinces that were designated to receive transmigrants are Aceh, North Sumatra, West Sumatra, Riau, Jambi, South Sumatra, Lampung, West Java (Banten), West Kalimantan, Central Kalimantan, South Kalimantan, East Kalimantan, North Sulawesi, Central Sulawesi, South Sulawesi, Maluku, and Irian

Jaya. In this study an observation will be made by examining the difference between the effects of the other explanatory variables when TRANS is not included in the migration models and their effects when it is included in the estimated relationship.

CHAPTER V

EMPIRICAL RESULTS

Two crucial problems stand in the way of progress with this study: One problem concerns the nature of the data; the other concerns the appropriate functional form of the model. The available data are far from ideal, but there are sufficient sources to allow the quantification in some fashion of all of the generally recognized variables. A major part of the data problem stems from the fact that the province as an administrative unit does not fit ideally with the geographic discontinuities of this nation of many islands. Whereas migration data for both 1971 and 1980 are available by province, which is the basic unit of the study, data for many of the key variables for 1980 are not elaborated by province. Furthermore, the migration data for both 1971 and 1980 are expressed in lifetime forms. This suggests that if we are to continue with the study, it will be appropriate to experiment with various reasonable possibilities for a dependent variable to see if any of them produces significant results when used in a model that includes the independent variables that have been identified as important for explaining migration in Indonesia.

Problems with the data makes the selection of an appropriate functional form for the model far from a straight forward proposition. At the outset one would expect to encounter problems with a linear form. The independent variables suggested by theory often do not act in a direct or straight-forward fashion upon the dependent variable; often the products of factors, or ratios among them are relevant.

Further, economic variables tend to have variances that are not constant over time or across sets of socio-economic units on which observations are collected. Methods or procedures for overcoming these types of difficulties are varied and often of uncertain validity. Because the utilization of logarithmic form tends to stabilize variances and aid in interpretation, it is not unreasonable to suggest that log forms be tried even when no compelling apriori reasons are apparent. Indeed, some preliminary experimentation will undoubtedly be required before an adequate functional form is settled upon.

While not ideal, the necessity of experimenting with data and functional form should not cause significant unease. If the variables in the estimation model are clearly in accord with economic theory and with other related works on Indonesia, significant results from any functional form should be welcomed. At the very least they can serve to point the way for future data collection so that future investigators can avoid time consuming iterations with a multitude of forms and data mutations.

Data on lifetime migration by province in 1971 is available for both 1971 and 1980 (Table 1 and Table 9). However, it is recognized that these data are not ideal proxies for one-year observations. They, in fact, denote the accumulation of migrants over a wide span of years. To mitigate this problem, an attempt was made to focus on the migration occurring between 1971 and 1980. However, a consistent series of data for 1980 was not available for the independent variables. Therefore, we chose to go with the second best alternative which was the only feasible course left available to us. Consequently,

TABLE 9. Lifetime Migration by Province: 1980

Province	Total Population	Total Migration			Migration Rates ^a		
		In	Out	Net	In	Out	Net
Aceh	2,607,569	143,348	116,010	27,338	5.5	4.4	1.0
Bali	2,467,725	63,272	117,828	-54,556	2.6	4.8	-2.2
Bengkulu	766,477	121,274	39,019	82,255	15.8	5.1	10.7
Central Java	25,353,028	336,408	3,227,892	-2,891,484	1.3	12.7	-11.4
C. Kalimantan	951,888	139,969	25,086	114,883	14.7	2.6	12.1
C. Sulawesi	1,281,969	184,465	33,912	150,553	14.4	2.6	11.7
East Java	29,133,676	430,621	1,597,851	-1,167,230	1.5	5.5	4.0
E. Kalimantan	1,209,225	291,586	34,059	257,527	24.1	2.8	21.3
E. Nusatenggara	2,729,381	35,007	47,534	-12,527	1.3	1.7	-0.5
Irian Jaya	1,104,210	92,998	15,559	77,439	8.4	1.4	4.3
Jakarta	6,445,777	2,564,490	400,767	2,163,723	39.8	6.2	33.6
Jambi	1,439,047	292,937	47,151	245,786	20.4	3.3	17.1
Lampung	4,613,806	1,782,621	57,664	1,724,957	38.6	1.2	37.4
Maluku	1,402,888	124,546	64,725	59,821	8.9	4.6	4.3
North Sulawesi	2,111,550	88,188	121,231	-33,043	4.2	5.7	-1.6
N. Sumatra	8,327,662	547,575	417,659	129,916	6.6	5.0	1.6
Riau	2,150,583	342,959	86,540	256,419	15.9	4.0	11.9
Southeast Sulawesi	940,259	104,652	89,957	14,695	11.1	9.6	1.6
South Sulawesi	6,048,361	107,781	511,725	-403,944	1.8	8.5	-6.7
S. Kalimantan	2,060,386	142,576	169,561	-26,985	6.9	8.2	-1.3
S. Sumatra	4,617,921	607,947	333,024	274,923	13.2	7.2	10.7
West Java	27,409,454	963,372	1,487,935	-524,563	3.5	5.4	-1.9
W. Kalimantan	2,477,395	104,748	72,358	32,390	4.2	2.9	1.3
W. Nusatenggara	2,719,050	51,453	44,487	6,966	1.9	1.6	0.3
W. Sumatra	3,402,796	131,376	558,804	-427,428	3.9	16.4	-12.6
Yogyakarta	2,745,377	175,616	253,447	-77,831	6.4	9.2	2.8
Total	146,517,460	9,971,785	9,971,785	0	6.8	6.8	0

Source: The World Bank Report No. 4776-IND, Nov. 1, 1984 and 1980 Population Census Series No. 2. Table 6.3 page 25, 26 and 27. Excludes persons born abroad, in East Timor and those whose place of birth was not stated.

^aThe denominator used in calculating the migration rates is the 1980 population of the respective province.

we use as a dependent variable lifetime migration as it shows in the 1971 Population Census.

Selection of An Appropriate Functional Form

A number of attempts at estimation show that the most appropriate model for estimating migration in Indonesia is probably a combined functional form in which the dependent variable is expressed in logarithms and the independent variables in several forms, including linear, log and hyperbolic (quadratic). The description of the attempts is found in the appendix.

The combined forms seem to be appropriate for the 1971 data as well as the 1980 data. This combined form has produced the highest and significant overall regression (F-value), the highest R^2 , the correct sign of the adjusted R^2 and the significance of most, if not all, of the regression coefficients of the explanatory variables. This combined form is also appropriate to explain the male migration as well as the female migration.

This section attempts to demonstrate how far the variables that are commonly related to migration in developing countries, that is, regional income (RGDP), the labor force participation rate (LFPR), the urbanization rate (URB), the density (DENS), agricultural poverty (AGP), (primary) education (PEDUC), the fertility rate (FERT), and the urban cost of living (USC), or the 8 core "V"s, can also explain the variation in interprovincial migration in Indonesia in 1971. Then an attempt is made to include a variable which is typical of migration in Indonesia, that is, the entrepreneurship or the 'merantau' tradition

of certain ethnic groups throughout Indonesia (MRT) to see if there will be an increase in the significance of some, if not all, of the core variables. Finally, TRANS (the transmigration rate) will be added to the core variables and MRT in order to look for its contribution to explaining interprovincial migration in Indonesia. The dependent variables in the natural log form are GIMLN for the migration model, MGIMLN for the male migration model, and FGIMLN for the female migration model. The most appropriate form that RGDP takes as one of the common explanatory or independent variables is RGDPLN, the natural log form of RGDP. LFPRLN is also the natural log form of LFPR; MLFPRLN and FLFPRLN are the natural log forms of LFPR for the male migration model and the female migration model, respectively. Unlike the previous two common variables, the appropriate form of the urbanization rate (URB) is linear. However, the population density will be stated its natural log form, DENSLN. Unlike all the previous common independent variables, both AGP and PEDUC take the reciprocal forms, which are written as A and P, respectively. Finally, the last common variable in this study is the urban subsistence sector cost of living (USC), which takes the natural log form.

These various forms of the independent variables are also good for the male migration model as well as the female migration model for the 1971 data. The particular functional form was chosen after each variable was evaluated on a scatter diagram showing a number of dots representing the values of the dependent variable for given values of its explanatory variable.

In this study the fertility rate (FERT) is not included either in the migration model or the female migration model since the 1971 data on the crude birth rate by province is not available and what is available is only the 1971 data on the crude birth rate by islands. The crude birth rate by province is available in the 1980 data, which is, however, not the focus of this study. The reason is that the 1980 data did not have values for all of the explanatory variables.

MRT as the dummy variable for the enterprising quality of an ethnic group takes the linear form and, therefore, its notation remains MRT. This variable is included in the migration model and the male migration model and not in the female migration model. TRANS as the second unique variable for Indonesia's migration model is linear, too.

In conclusion, the proposed migration models typical of Indonesia can be written as:

$$\text{GIOM 1: } \text{GIMLN} = f(\text{RGDPLN}, \text{LFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, e_i) \quad (7)$$

$$\text{GIOM 2: } \text{GIMLN} = f(\text{RGDPLN}, \text{LFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, e_i) \quad (8)$$

$$\text{GIOM 3: } \text{GIMLN} = f(\text{RGDPLN}, \text{LFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{TRANS}, e_i) \quad (9)$$

$$\text{GIOM 4: } \text{GIMLN} = f(\text{RGDPLN}, \text{LFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, \text{TRANS}, e_i) \quad (10)$$

where model GIOM 1 is without MRT and TRANS, model GIOM 2 without TRANS, model GIOM 3 without MRT, and model GIOM 4 with both MRT and TRANS.

The male migration models can be written as follows:

$$\text{MGIOM 1: } \text{MGIMLN} = f(\text{RGDPLN}, \text{MLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, e_i) \dots \dots \dots (11)$$

$$\text{MGIOM 2: } \text{MGIMLN} = f(\text{RGDPLN}, \text{MLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, e_i) \dots \dots \dots (12)$$

$$\text{MGIOM 3: } \text{MGIMLN} = f(\text{RGDPLN}, \text{MLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{TRANS}, e_i) \dots \dots \dots (13)$$

$$\text{MGIOM 4: } \text{MGIMLN} = f(\text{RGDPLN}, \text{MLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, \text{TRANS}, e_i) \dots \dots \dots (14)$$

The female migration models can be specified as:

$$\text{FGIOM 1: } \text{FGIMLN} = f(\text{RGDPLN}, \text{FLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, e_i) \dots \dots \dots (15)$$

$$\text{FGIOM 2: } \text{FGIMLN} = f(\text{RGDPLN}, \text{FLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, e_i) \dots \dots \dots (16)$$

$$\text{FGIOM 3: } \text{FGIMLN} = f(\text{RGDPLN}, \text{FLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{TRANS}, e_i) \dots \dots \dots (17)$$

$$\text{FGIOM 4: } \text{FGIMLN} = f(\text{RGDPLN}, \text{FLFPRLN}, \text{URB}, \text{DENSLN}, \text{A}, \text{P}, \text{USCLN}, \text{MRT}, \text{TRANS}, e_i) \dots \dots \dots (18)$$

The Interpretations of The Empirical Results

This section describes the use of the chosen migration models mentioned above to make OLS estimates of migration in Indonesia, using

1971 data. The interpretations of the results should lead to the rejection or the acceptance of the hypotheses formulated in Chapter II.

The unit being the object of analysis in this study is a province, a geographical area constituting an entity necessary for administration and for the formulation and implementation of plans and public policies. The number of provinces in Indonesia, which makes up the number of observations (n) in the 1971 study, was 26. Since the integration of East Timor, the former Portuguese colony, into the Republic of Indonesia in 1976, the number has turned 27. Thus, in this case when the number of the explanatory variables (k) is seven, the degree of freedom is eighteen ($n-k-1$). When $k = 8$ and $k = 9$, the degree of freedom is 17 and 16, respectively.

The Explained Interprovincial Migration Rate

As mentioned before, the interprovincial migration rate as the dependent variable is represented by the natural log of the gross in-migration rate or GIMLN, (which is called the migration rate for short) and covers both males and females. In this section the estimated relationship between the migration rate and the common and uncommon/unique explanatory variables will be examined and the results will be used to test the hypotheses.

The common explanatory variables. In this study the common explanatory variables refer to the economic variable(s), the demographic variables, the institutional variable(s), and the educational variable(s) that are commonly found to affect migration in

developing countries when the Todaro migration models and/or other conventional models are utilized. In this study there are seven of those common explanatory variables combined. It is found that the seven common variables included in estimating their relationship with the interprovincial migration rate, as a whole, were significant. In this case Indonesia was, to a certain degree, similar to any other developing country. However, individually, not all of the common variables were significant. In fact, only four out of seven were significant. They were the urbanization (URB), the population density (DENS), the (primary) education (PEDUC) and the urban cost of living (USC). Among those four significant variables, PEDUC was the least, being significant only at the 10 % level (Table 10). Population density (DENS) being one of the four significant factors affecting the decision to migrate supports the widely held view that the population density brought about such adverse consequences as hunger, unemployment and underemployment, smaller and fragmented land holdings, deteriorating health. The negative sign associated with the significant parameter estimate of DENS led to the acceptance of the hypothesis that the population density is inversely related to the migration rate. This is confirmed by the fact that the most densely populated provinces such as Yogyakarta, Central Java, East Java, and West Java had the net out-migration rate of 6.72 percent, 7.06 percent, 1.87 percent, and 3.80 percent, respectively (Table 11). In this case it seems that DENS as a push factor was stronger than DENS as a pull factor in those provinces since it is associated more with migration outflow than migration inflow. This finding is not surprising given

TABLE 10. Interprovincial (Net In-)Migration:
Estimated Regression Coefficients

Explanatory Variables	Model GIOM 1	Model GIOM 2	Model GIOM 3	Model GIOM 4
Constant	12.574 (1.073)	17.270 (1.740)	13.693 (1.428)	17.717 (2.309)
URB	0.041 ^b (2.707)	0.046 ^a (3.660)	0.039 ^a (3.179)	0.044 ^a (4.513)
DENS	-0.444 ^b (-2.589)	-0.589 ^a (-3.888)	-0.378 ^b (-2.663)	-0.513 ^a (-4.306)
AGP	-1.111 (-0.963)	-2.131 ^c (-2.081)	-0.642 (-0.672)	-1.591 ^a (-1.974)
PEDUC	-31.535 ^c (-2.055)	-40.671 ^a (-3.082)	-31.375 ^b (-2.500)	-39.453 ^a (-3.866)
USC	-4.082 ^b (-2.208)	-4.278 ^b (-2.765)	-3.974 ^b (-2.628)	-4.158 ^a (-3.476)
MRT	—	-1.025 ^a (-2.960)	—	-0.904 ^a (-3.351)
TRANS	—	—	0.305 ^a (3.149)	0.272 ^a (3.529)
F-VALUE	3.408 ^b	5.363 ^a	5.699 ^a	9.363 ^a
R ²	0.57	0.72	0.73	0.84
ADJ R ²	0.40	0.58	0.60	0.75

^asignificant at $\alpha = 0.01$

^bsignificant at $\alpha = 0.05$

^csignificant at $\alpha = 0.10$

TABLE 11. Migration Rate And Values For Its Explanatory Variables: 1971

Province	Variables										
	GIM ^a (%)	GOM ^b (%)	RGDP (Rp.)	LFPR (%)	URB (%)	DENS (km ²)	AGP (%)	PEDUC (%)	USC ^c (000)	MRT	TRANS (%)
Aceh	3.04	3.28	37088	32.08	9.8	34	1.1	26.7	42.5	0	0.04
Bali	1.04	2.69	32368	34.56	9.8	377	26.3	15.7	37.8	0	0.00
Bengkulu	6.94	4.77	30974	3696	11.7	25	12.7	18.8	46.6	1	0.00
Central Java	1.16	8.22	26496	37.12	10.7	634	41.1	14.9	41.0	0	0.00
C. Kalimantan	7.13	4.96	44983	29.81	15.7	4	4.7	27.8	59.7	0	0.81
C. Sulawesi	5.58	3.75	23917	35.56	8.0	10	13.7	28.6	43.9	1	0.70
East Java	1.07	2.94	36207	38.24	14.5	539	37.7	17.4	42.8	0	0.00
E. Kalimantan	5.40	3.24	114394	31.06	41.1	4	11.3	21.7	69.8	1	2.27
East Nusatenggara	0.45	1.14	13767	42.73	5.6	47	23.1	23.0	62.0	1	0.00
Irian Jaya	22.22	4.28	24173	35.76	16.3	2	3.8	30.9	59.3	0	0.67
Jakarta	39.41	2.91	49971	29.72	100.0	7944	16.9	26.0	45.0	0	0.00
Jambi	15.50	2.73	37771	36.09	29.1	16	5.6	21.0	49.9	0	2.29
Lampung	36.07	1.07	29058	33.10	9.9	82	32.5	18.8	46.0	0	7.16
Maluku	3.88	3.36	27088	30.47	13.3	13	11.7	30.5	59.3	1	0.10
North Sulawesi	2.83	3.54	26115	30.05	19.5	71	17.4	27.9	50.0	1	0.34
N. Sumatera	8.01	2.84	45363	35.67	17.7	94	17.7	25.7	40.2	1	0.16
Riau	12.41	2.54	74294	33.50	13.3	13	8.8	17.0	49.9	0	0.07
Southeast Sulawesi	3.63	4.31	25077	35.17	7.3	22	12.6	15.6	45.9	0	0.00
South Sulawesi	1.29	4.67	22093	27.25	18.1	63	23.7	17.8	46.8	1	0.09
S. Kalimantan	3.89	4.96	31117	34.64	26.7	49	8.8	21.9	51.2	1	0.67
S. Sumatera	9.52	5.79	41009	35.66	29.0	33	15.1	20.9	46.6	1	3.58
West Java	1.72	5.52	25799	30.94	12.4	440	26.4	22.2	44.0	0	0.03
W. Kalimantan	1.03	1.74	21624	41.28	12.8	13	4.6	13.7	47.4	1	0.53
W. Nusatenggara	1.52	0.58	22127	32.28	8.1	101	34.2	11.4	35.6	0	0.05
W. Sumatera	3.15	11.64	27041	32.5	17.2	42	9.1	27.2	44.3	1	0.46
Yogyakarta	4.01	10.73	26171	41.02	16.4	793	28.2	25.5	39.0	0	0.00

^aGIM = Gross In-Migration Rate^cUSC in rupiah^bGOM = Gross Out-Migration Rate

that the part focus of transmigration programs has been the alleviation of overcrowding.

USC as a proxy for the cost of migration had the expected negative sign, indicating that the higher the cost of migration, the lower the number of people who moved. Jakarta, which had the highest net in-migration rate, ranked 18 as far as its USC was concerned. As migrants from various provinces throughout the country moved to Jakarta, they may have thought that the cost of migrating to Jakarta was still lower compared to the rapidly developing but less urbanized provinces like North Sumatra, Riau, and East Kalimantan. The province of South Sumatra, which had the net in-migration of 3.73 percent, ranked 14 on the basis of the magnitude of its USC.

The above findings indicate that the higher the USC, the less the tendency for people to in-migrate. However, this does not seem to be always the case. For example, Jambi had the higher net in-migration (12.77 percent) than South Sumatra although their urbanization rates were equal and the cost of moving (as represented by USC) to the former was higher than the cost of moving to the latter. So, there probably should be another factor or factors to explain the in-migration to Jambi.

The significance of urbanization (URB) shows that there was a tendency for the Indonesian people to move from the predominantly rural provinces to the predominantly urban provinces or from the rural portion of a province in Java or in the Outer Islands to the urban areas of a province in the Outer Islands or in Java. For example, based on the urbanization rate used in this study, the completely

urbanized Jakarta had the highest net in-migration rate of 36.50 percent, whereas the least urbanized province of East Nusatenggara had a net out-migration rate of 0.70 percent.

The distinction between money income (RGDP) and psychic income (URB) has been very useful in explaining migration, because the latter can be considered to capture some psychic benefits of living in an urban area although some migrants are underemployed in the city (Cole and Sanders, 1983). This also seems to be the case for Indonesia. To explain migration in Indonesia, the separation between RGDP and URB was considered so that a distinction could be made as to which one was more significant and/or more important than the other or, in this case, which one was significant and which was not. If URB were not included as a separate variable in the model, the psychic income would not have been captured and RGDP would probably have been farther from being significant and thus the variation in migration would have been poorly explained.

Although the other three common variables were not significant in and of themselves, they were needed to contribute to the attainment of the significance level of those four variables. In other words, they should be included in the model to explain variability in migration; otherwise, the F-value and R^2 would have been lower and URB, DENS, PEDUC and USC might have become insignificant. RGDP and LFPR were not significant, possibly because there was another variable or two that should have been included in explaining migration in Indonesia in addition to those used.

The addition of MRT to the common variables. As mentioned previously, MRT is a dummy variable which serves as a proxy for the entrepreneurship of an ethnic group in a province that leads to the tendency for the members of the group, especially the males, to leave their province of origin to move to another province, frequently regardless of distance, in search of better life, wealth and/or better education. Provinces with enterprising ethnic groups generally tend to experience out-migration more than in-migration such as West Sumatra, South Sulawesi, South Kalimantan, North Sulawesi and so on. In other words, the higher their intensity of merantau (voluntary migration), the higher their out-migration and consequently the lower the net in-migration of those provinces, assuming other things being equal. Thus, MRT is inversely related to (net) in-migration. This is supported by the regression result in Model GIOM 2 (Table 10). MRT has the expected negative sign and is significant.

When MRT is included in the model mentioned above, the model's performance is improved. This is indicated by the higher overall regression (F-value), the higher proportion of variation in the migration explained by the independent variables (higher R^2 : from 0.57 to 0.72), and the higher adjusted R^2 (from 0.40 to 0.58) (Table 10).

The model improvement due to the introduction of the unique variable in explaining the migration in Indonesia also lies in the fact that the parameter estimates of most, if not all, of the previous variables become more significant. The variables that became more significant were URB, DENS, and PEDUC. Moreover, the magnitudes of their parameter estimates increased to a certain degree. The

importance of including MRT in the migration model for Indonesia is justified and confirmed by the regression results that MRT itself was statistically significant (at all levels of confidence).

The expected result of the introduction of MRT to the model is improvement in the performance of the other variables. Indeed, as expected, after MRT was included, another variable became significant. That variable was the agricultural poverty (AGP).

After the influence of the MRT variable was recognized, a new combination of the five common explanatory variables: URB, DENS, PEDUC, USC, and AGP emerged and the significance of their parameter estimates was, respectively, confirmed. AGP was negative and significant. In a equation where the response variable is migration, a negative and statistically significant coefficient for AGB indicates that, given other policy and environmental variables, the greater is agricultural poverty, the larger is net out-migration.

As mentioned previously, the other independent variables that were declared statistically insignificant, such as RGDP and LFPR, were still necessary as a matter of completeness. It is in this sense that, as in the other developing countries such as Mexico, Venezuela, and Egypt, the economic variable (RGDP), and the demographic and/or the institutional variables (LFPR, URB, DENS, AGP, USC), and the educational level (PEDUC) also influenced migration in Indonesia.

The introduction of TRANS to the economic, demographic, institutional, educational and MRT variables. As pointed out previously, a number of studies revealed that transmigrants had

attracted voluntary migrants to settle within or around transmigration area. In other words, the transmigrants had caused chain migration to occur. The Government of Indonesia has formally recognized this phenomena by stating in its transmigration law that the long-run goal of transmigration is to create voluntary or spontaneous migration because it believes that transmigration is a catalyst for voluntary migration. The province of Lampung, which was more rural than urban but had the second largest net in-migration rate (35.0%), is a clear example of land settlement which has proved an effective catalyst for voluntary migration through the chain migration effect (Hardjono, 1982). The other examples of land settlement areas, which have induced voluntary settlers to move to those areas, are Parigi in Central Sulawesi, Belitang and Baturaja in South Sumatra.

When the TRANS variable was included, the estimated relationship between the explanatory variables and migration improved considerably in the sense that the F-values of the regressions grew considerably, that is, from 3.408 (without MRT and TRANS) to 5.363 (with MRT only) to 5.699 (with TRANS only) to 9.363 (with both MRT and TRANS), and the proportion of explained variance (R^2) also became higher, that is, from 0.57 (model GIOM 1) to 0.72 (model GIOM 2) to 0.73 (model GIOM 3) to 0.84 (model GIOM 4). Although no other variables became significant, except TRANS itself, the coefficients of URB, DENS, PEDUC, USC, MRT, and TRANS were significant at the 5% level of confidence.

Model GIOM 4 indicates that there was a significant and positive association between the transmigration rate (TRANS) and the migration rate (GIMLN) in Indonesia. The estimated regression coefficient of the

TRANS variable was 0.272, which can be interpreted as: a one-unit change in TRANS gave rise to a change in the migration rate by 0.272 (Table 10). This suggests that TRANS was one of the main pulls of migration for a province and should always be taken into account. The regression results of including MRT or TRANS in the migration models (model GIOM 2 or model GIOM 3) suggest that both were absolutely necessary in the migration models because they made significant but different contributions to the explanation of migration in Indonesia.

URB ranged between 5.6 percent in East Nusatenggara and 100 percent in Jakarta in 1971 with a mean of 18.37 percent. Model GIOM 4 indicates that the urbanization rate (URB) was positively related to the migration rate (GIMLN) at the 5 percent level like in the other GIOM models. The parameter estimate of URB in model GIOM 4 was 0.044, which can be interpreted as : *ceteris paribus*, a one-point increase (decrease) in URB led to an increase (decrease) in the interprovincial migration rate by 0.04. This suggests that urbanization really served as a significant pull factor in the interprovincial migration in Indonesia.

Population density (DENS) measured by dividing the total population of a province by the province's area in square kilometers, also had significant but negative impact on the migration rate when TRANS was involved. Based on model GIOM 4, the regression coefficient of DENS is -0.513, which suggests that other things being equal, an increase in population density by one unit was associated with a decrease in the (net in-)migration rate by 0.51. This clearly

indicates that any province suffering population pressure experienced more out-migration migration than in-migration, *ceteris paribus*.

The change of AGP from being insignificant to being significant gives a clear example of how important it is to think about the possibility of including uncommon or unconventional or unique variables in the migration models.

After MRT was included, the contribution of AGP became more apparent in a statistical sense. However, suppose TRANS instead of MRT as another unique variable was first included in the model, the result was that AGP was still not significant. This finding shows the importance of searching for all possible relevant explanatory variables. This finding implies that it was MRT, not TRANS, that increased the AGP elasticity of migration. This carries the possible implication that some migrate not only because their qualities of entrepreneurship induce them to do so in search of a better life, more wealth or better education, but also because they find that the soil where they subsist on is no longer capable of producing enough food for them.

The inclusion of the TRANS variable really made the parameter estimate of the education variable (PEDUC) significant at the 1 percent level. Moreover, the parameter estimate of PEDUC still had the expected negative sign. Based on model GIOM 4, the estimated coefficient of PEDUC was -39.45, which can be interpreted as follows: Other things being equal, a unit increase (decrease) in the percent of a province's population which completed primary education resulted in a decrease (increase) in the migration rate by 39.45.

It is likely that the educated people were relatively broad-minded and better informed of opportunities beyond the boundary of their province; in search of better life they were not reluctant to leave their home province. Thus the educated people had the greater propensity to migrate than the uneducated ones. The well-known example, as mentioned before, was the net out-migration of 8.49 percent in West Sumatra in 1971 was due to the 'merantau' spirit of the Minangkabau people to leave their province of origin in search of better education and wealth. The more educated had been involved in migration to Jakarta and other provinces of Java (Sundrum, 1971). The finding of the present study is also in agreement with Levy and Wadycki's migration study in Venezuela (1974), which found that the higher the level of origin education, the greater the propensity to out-migrate.

USC was a significant factor, even without the influence of either MRT or TRANS or both. Like in studies of other developing countries, USC was both a push factor and a pull factor that affected migration in Indonesia. But it is more realistic to call it a "pull" factor since migrants are attracted to low USC. The lower was USC in the urban areas of a province, the more USC acted as an attraction to migration into those areas. Part of the reason for Jakarta's attractiveness to migrants from all over the country was that the cost of living in the informal sector was not the highest, while Jakarta was the most urbanized region, which offered the attractiveness of the city.

The degree to which USC was a proxy for the cost of migration is suggested by the value of the coefficient of USC, which was -4.082

(model GIOM 1), -4.278 (model GIOM 2), -3.974 (model GIOM 3) and -4.158 (model GIOM 4). Since model GIOM 4 was the best and most improved model where both MRT and TRANS were combined with the conventional ones, the final outcome chosen in this study to measure how far USC exerted an influence on migration in Indonesia was reflected in the value for the coefficient of that variable, that is, -4.16. Thus, it can be stated that a one-unit decrease in USC was associated with an increase in the (net in-)migration rate by 4.16.

The last major determinant of interprovincial migration in Indonesia was a province's 'merantau' spirit of an ethnic group (the MRT variable). This could be considered a unique variable for Indonesia's migration model. It is unique in the sense that it was not one of the seven or eight economic, demographic and educational variables that are commonly found in studies of migration in developing countries. This is apparently the first to include a behavior attribute such as 'merantau' spirit as one of the determinants of migration.

It is also unique in the sense that most people with the high 'merantau' spirit were willing to migrate to distant provinces, whereas most of the interprovincial migration in Indonesia was short-range (Sundrum, 1976). This is indicated by the fact that in 1971 the principal destination of 'merantau'-spirited migrants from West Sumatra, North Sumatra, West Kalimantan, North Sulawesi, and Maluku, was Jakarta, whereas the principal destinations of those enterprising migrants from East Kalimantan and South Sulawesi, were East Java and

Jambi, respectively, instead of the nearby provinces on the the islands (World Bank Report, 1984, and the 1971 census of population).

What is interesting about the interprovincial migration in Indonesia is that MRT was a push factor for migration from the Outer Islands, whereas TRANS served as a pull factor for migration from Java (and Bali) to the Outer Islands. The regression results (under model GIOM 4) indicates that the parameter estimate of the MRT variable was significant at the one percent level.

As indicated previously, the existence of the estimated coefficients of the other explanatory variables, which were not significant, also as seen in model GIOM 4, does not mean that they should be eliminated from the estimated relationship between the explanatory variables and the migration rate.

RGDP, which was one of the insignificant variables, was necessary but not sufficient enough to be significant, perhaps because migration in Indonesia was short-range so that mobility of people occurred mostly among neighboring provinces. For instance, although the RGDP of East Kalimantan was the highest, its net in-migration rate was not the highest (only 2.16 percent). This might be due to the fact that most, if not all, of the migrants in East Kalimantan came from South Kalimantan, the population of which was only 1.4 percent (Pryor, 1979; the Population Census, 1971). Most in-migrants in Riau, the other rapidly developing province with the second highest RGDP, originated in North Sumatra, the less densely populated and the closest province. As a matter of fact, even though migrants came from nearby provinces, the regional income would have exerted its significant influence on the in-

migration into a province if they moved in large numbers. Or, the insignificance of RGDP might be attributed to the inaccuracy of data since the estimation of RGDP by province in 1971 was still in the preliminary stage. Because RGDP was necessary, it still can be assumed that migration was responsive to the economic incentives.

The other insignificant variable in explaining the variation in interprovincial migration in Indonesia in 1971 was the labor force participation rate (LFPR), which was the percentage of the province's population that is economically active and served as a proxy for the employment probability. Again, this variable was necessary but not sufficient to influence migration. Data on LFPR by province seems to indicate the reason. For example, the province of East Nusatenggara which had the highest LFPR, did not have the high(est) net in-migration rate; it even had the negative net in-migration rate of 0.70; conversely, the province which had the lowest LFPR (South Sulawesi), did not necessarily have the lowest regional income. Therefore, the data did not give a clear indication that as LFPR went up and, hence, as the employment probability increased, the net in-migration rate also rose.

As to the two remaining insignificant variables above, the present study considered another possibility that those variables might become significant when the migrating population was divided into groups, that is, the male migrants and the female migrants. The following section will examine this possibility.

In a nutshell, the Todaro's major variables, wage and employment probability did not perform well. However, other variables found prominently in the literature did perform well.

The Explained Male Migration Rate

This section presents an attempt to reveal whether or not the migration models improve by breaking down total migrants into two groups: the male migrants and the female migrants. In this attempt the same procedure is followed as before. That procedure involves observing how the male and/or female migration models improved by first including only the common variables (the economic, demographic, institutional and educational variables), then involving the MRT variable in addition to the common ones and finally considering the TRANS variable in addition to the common variables and MRT.

The male migration rate and the seven common variables. The estimated relationship between the common variables and the male migration rate (MGIMLN) indicates that the overall regression was significant and higher (Table 10). This seems to demonstrate that the decision to break down the total migrants was on the right track and its results began to materialize, although it was found that, among the four significant variables, USC was the only one which became less significant.

How far each of those significant variables affected the variation in the male migration rate will be examined as follows. Under model MGIOM 1 the regression coefficient value of URB was significant at the

1 percent level and is 0.033. This can be interpreted as: a one-unit increase (decrease) in the urbanization rate led to an increase (decrease) in the male migration rate by 0.03, other things being equal (Table 12). Thus, the larger the degree of urbanization in a province was, the greater the number of male in-migrants was, assuming that other things did not change. That was the case, because for the male migrants especially, the larger degree of urbanization reflected more opportunities for education, employment, and better life. In a nutshell, how far and in what direction URB affected the male migration rate in Indonesia was similar to the degree and the way URB affected the migration rate in general. Finally, like in the general migration model (GIOM 4), urbanization was also a very important variable as a pull factor that generated migration among the Indonesian males.

Population density (DENS) was significant at the 5 percent level. The magnitude of its parameter estimate was -0.313, which, like in model GIOM 1, can be interpreted to mean that a one-unit increase (decrease) in population density resulted in a decrease (increase) in the male migration rate by 0.31, *ceteris paribus*. Thus, as mentioned previously, in Indonesia DENS was a push factor not only for male migration from Java (except Jakarta), but also for male migration from the densely populated parts of some provinces in the Outer Islands such as West Sumatra, North Sumatra, North Sulawesi, and South Sulawesi (Naim, 1976). Because the population density which reflected over-population both in Java as well as in the Outer Islands or elsewhere implies that the available means of livelihood could no longer provide

TABLE 12. Interprovincial Male (Net In-)Migration:
Estimated Regression Coefficients

Explanatory Variables	Model MGIOM 1	Model MGIOM 2	Model MGIOM 3	Model MGIOM 4
Constant	-5.828 (-0.362)	0.100 (0.007)	-0.513 (-0.037)	4.215 (0.378)
URB	0.033 ^a (2.902)	0.037 ^a (3.833)	0.032 ^a (3.253)	0.036 ^a (4.474)
DENS	-0.313 ^b (-2.348)	-0.425 ^a (-3.591)	-0.271 ^b (-2.374)	-0.375 ^a (-3.856)
AGP	-1.145 (-1.276)	-1.915 ^a (-2.403)	-0.774 (-1.005)	-1.504 ^b (-2.281)
PEDUC	-40.026 ^a (-3.000)	-45.989 ^a (-4.042)	-37.916 ^a (-3.351)	-43.485 ^a (-4.656)
USC	-2.965 ^c (-2.061)	-3.107 ^b (-2.572)	-2.951 ^b (-2.423)	-3.079 ^a (-3.143)
MRT	—	-0.789 ^a (-2.929)	—	-0.707 ^a (-3.211)
TRANS	—	—	0.224 ^b (2.852)	0.199 ^a (3.138)
F-VALUE	3.782 ^c	5.775 ^a	5.638 ^a	8.901 ^a
R ²	0.595	0.73	0.73	0.83
ADJ R ²	0.438	0.60	0.60	0.74

^asignificant at $\alpha = 0.01$

^bsignificant at $\alpha = 0.05$

^csignificant at $\alpha = 0.10$

for the subsistence for the existing number of people. This explanation is not only for the male migration but also for migration in general (both male and female) in Indonesia in 1971.

It appears that the education (PEDUC) status of the male migrants should affect their decisions to migrate. It is likely that the higher the education of the male migrants, the better informed they were of opportunities (employment, education, higher salary, etc.) in other provinces than their province of origin. The better informed they were, the greater their propensity to migrate was. In other words, the higher the education, the higher the outmigration rate, but other things being equal, the lower the net in-migration rate for the male migrants. It is in this sense that PEDUC is inversely related to the male migration rate. How far did a change in PEDUC lead to a change in the male migration rate in the opposite direction? In this case, the result of model MGIOM 1 shows that the regression coefficient of PEDUC was -40.03, which gives the answer to the question above as follows: *ceteris paribus*, a one-point change in PEDUC resulted in a change in the male migration rate by -40.03 percent. Thus, the education elasticity of the male migration in 1971 after the breakdown was higher than it was before the breakdown (-31.54) under the same model. However, before the breakdown, education was not for the potential male migrants the most important factor to consider. It certainly has some interesting implications to ponder. Those implications will be pointed out in the later section of this study.

The last significant variable under model MGIOM 1 was the urban informal sector cost of living (USC), which is a proxy for the cost of

migration. The original data on USC by province for 1971 or for any year before then through the period of the present study were, in fact, not available; however, they could be derived indirectly by combining data on the average daily expenditures of occupations in the urban informal sector (Jakarta) and data on the cost-of-living index by province (Papanek, 1975; Esmara, 1975). The average daily expenditures of the urban informal occupations (such as: peddlers, construction laborers, pedicab drivers, shoe shiners, cigarette collectors, and so on) were converted into an average annual per capita expenditure in Jakarta. Based on the cost-of-living index by province and the average annual per capita expenditure in Jakarta, the average annual per capita expenditure (USC) per province can be estimated to serve as a proxy for the cost of migration.

Model MGIOM 1 demonstrates that the parameter estimate of USC was -2.965 and significant at the ten percent level. This magnitude with the negative sign can, therefore, be interpreted as: a one-unit increase (decrease) in USC led to a decrease (increase) in the male net in-migration rate by more than one unit, that is 2.97. Thus, the USC elasticity of migration for the male migrants, like for the migrants in general, is more than one. As in the general migration, USC was inversely related to the male net in-migration rate.

Like in model GIOM 1, the insignificant variables in model MGIOM 1 were still RGDP, MLFPR (the labor force participation rate of the male migrants), and the agricultural poverty (AGP). In the provincial migration among the Indonesian males, RGDP was not significant perhaps for the same reasons as mentioned previously. First, the

interprovincial migration in Indonesia was mainly the short-range one. Potential migrants had easier access to information on opportunities about neighboring provinces and thus knew more about them rather than about distant provinces with even the highest RGDP. If this reason is found to be untrue, the other reason might be that figures on RGDP by province were not accurate to reflect the responsiveness of RGDP to that variation in the male net in-migration in particular and in the net in-migration in general in Indonesia. So, it might be a matter of the availability of the accurate data, because 1971 was the year around which the estimation of RGDP by province was still in the experimental phase. The other reason might be that another variable should be considered so that the male migration rate would be explained better.

Like LFPR, MLFPR was not a significant variable in model MGIOM 1, but what is important is that it was still necessary and therefore should not be neglected to be included in the model. The availability and accuracy of data on LFPR, MLFPR as well as FLFPR by province is not a problem for Indonesia, because these data have been collected every time the population census is conducted since data on labor force is the integral part of the outcome of the population census. The conclusion that LFPR, MLFPR and/or FLFPR are not the important determinants but the necessary variables of migration in Indonesia, will not be drawn until the other possible variables uniquely found in migration in Indonesia are included.

The last insignificant variable is the agricultural poverty (AGP). As seen in model MGIOM 1, this variable was still not significant even after the total migrants were divided. This should not be due to the

data problem since studies on the agricultural poverty in Indonesia are thought to be ample. In this case the inclusion of the other important explanatory variables was hoped to help enhance the influence of the AGP on the male migration rate.

The male migration rate and the introduction of MRT. When MRT was included in the male migration model (model MGIOM 2), the overall regression went up from 3.782 to 5.775 and R^2 from 0.595 to 0.73 (Table 12). Thus, the model improved. In other words, the male (net in-)migration rate was better explained when MRT was also on the scene. In addition, MRT contributed to the higher F-value in model MGIOM 2 than in model GIOM 2, which reflects the benefit of segmenting the total migrants. This suggests that the male (net in-)migration was better explained than was the (male and female) (net in-)migration rate when MRT was included. In other words, model MGIOM 2 improved more than model GIOM 2 did when MRT was involved. This is where the importance of segmenting the total migrants lies since the direct effect of MRT could hit the right target, that is, the male migrants. Besides, it was more evident that after MRT was considered, the most important determinant changed from PEDUC to DENS.

The MGIOM model also improves better than the GIOM models in the sense that the agricultural poverty (AGP) became significant not only at the ten percent level but also at the 5 percent level after MRT appeared. In the GIOM model (model 2) AGP was significant only at the ten percent level. The estimated coefficient of AGP in the MGIOM model was -1.92, which can be interpreted that the AGP elasticity of male

migration in the MGIOM model was somewhat lower than that in the GIOM model (-2.13) (Table 10). But what is more important is that the former was more significant than the latter.

A comparison between the significant variables of the MGIOM model and those of the GIOM model indicates that the former was an improvement over the latter. The parameter estimate of URB recorded a rise from 0.033 in the GIOM model to 0.037 in the MGIOM model. The parameter estimate of DENS was from -0.31 to -0.42. That of AGP was from -1.14 to -1.92. A rather drastic change was from -40.03 to -45.99 for PEDUC. Finally, due to the inclusion of MRT, the parameter estimate of USC changed from -2.97 to -3.11 (Table 12).

The findings described above suggest that the inclusion of MRT was also justified and was also very important in explaining the variability in the male (net in-) migration rate. Once again, MRT could not make RGDP and MLFPR significant at any level. But the signs associated with RGDP and MLFPR were both positive as anticipated.

The male (net in-)migration rate and the introduction of TRANS.
Like in the analysis of the (male and female) (net in-)migration, the addition of TRANS to the combination between the economic, demographic and educational variables (the common variables) and MRT raised the F-value and R^2 of the MGIOM model from 5.775 to 8.901 and from 0.73 to 0.83, respectively (Table 12). In this case, like the GIOM model, the MGIOM did improve when TRANS appeared. However, both models differed in that in the former it was the TRANS that gave more contribution to the higher F-value and R^2 , whereas in the latter it was the MRT. This

can be interpreted to imply that the information obtained from transmigrants could be the concern of both the male and female migrants, whereas the enterprising tradition/norm belonged to especially the male migrants, not to the female migrants.

In this MGIOM 4, where TRANS was included, the overall regression (F-value) remained significant at an alpha of 0.01 and its R^2 also remained statistically significant at an alpha of 0.01 [because $t > t(16, 0.995)$]. Furthermore, the most important thing with regard to the outcome of MGIOM 3 is that TRANS did contribute to the improvement of the male migration model, because it was statistically significant given URB, DENS, AGP, PEDUC, USC, and MRT. Thus it is confirmed that the number of transmigrants was associated with interprovincial mobility, particularly for males. It is thus strongly suggested that the transmigrants were the catalysts for male voluntary migration, which is part of the ultimate goal of the Republic of Indonesia's transmigration program. The results show that *ceteris paribus*, a one-point change in TRANS was associated with a change in the male (net in-)migration rate by 0.20. Like MRT, the impact of the inclusion of TRANS was not only on the higher overall regression and the higher coefficient of determination of MGIOM 4, but also on the higher and significant coefficient values of all the other explanatory variables, except RGDP and MLFPR. The inclusion of TRANS in the MGIOM model obviously did not make RGDP and MLFPR significant.

The transmigration rate is apparently one of the important determinants of voluntary migration among the provinces. At least through 1971 transmigrants were probably the most reliable and most

important sources of information for potential male migrants in particular as well as potential migrants in general. So, like potential migrants with the 'merantau' spirit, those who decided to move on the basis of information from transmigrants tended to discount the distance of the province. These two groups therefore constitute exceptions since most migrants moved to nearby provinces. TRANS is therefore the second unique variable after MRT for explaining the male migration in particular and the interprovincial migration in general.

According to model MGIOM 4, a one-percent change in URB would result in a change in the male (net in-)migration by 0.036 instead of 0.033. Thus, the faster the growth of urbanization in a province, the lower the number of the male out-migrants from that province and/or the higher the number of the male in-migrants into that province. This finding supports the previous studies relating urbanization and migration in Indonesia (Papanek, 1975; Suharso, 1978; Hugo, 1980). In addition, this result also has very important policy implications.

The outcome of model MGIOM 4 has confirmed the inverse relationship between the population density (DENS) and the male migration in particular and the migration in general, instead of the usual positive relationship. Based on that outcome, one-unit decrease (increase) in the population density would lead to an increase (decrease) in the male migration rate by 0.38.

Based on model MGIOM 4, it seems obvious that the male migrants were sensitive to the agricultural poverty of the area/ province, where they lived. Specifically, a one-point rise (decline) in AGP was associated with a decline (rise) in the male migration rate

by more than one (i.e., by $1\frac{1}{2}$) when MRT and TRANS were included, *ceteris paribus*. As unemployment increases and average size of rural holdings declines, rural males tend to consider moving to another area/province with better living conditions and opportunities after they get enough information from their relatives and/or friends in the area/province of destination.

The unexpected finding is that the education (PEDUC) variable was highly significant and highly elastic especially among the male migrants and all the migrants. The elasticity of PEDUC in model MGIOM 4 is indicated by the facts that the parameter estimate of PEDUC was -43.49. Thus, it means that an decrease (increase) in the male (net in-) migration rate by 43.49 point resulted from a one-point increase (decrease) in the percentage of those males who completed primary education (PEDUC). It can be imagined how tremendous the education elasticity of (male) migration was in Indonesia. This finding only came from the (male) migrants who completed elementary education. It can be imagined how much more responsive the migrants with higher education are to their decision to move beyond the boundaries of the provinces of origin, because they are more aware and better informed of opportunities in other provinces. This group with higher education might become responsive to a more economically developed province as indicated by the level of its RGDP. Therefore, when the size of the group increases significantly, the RGDP variable can become statistically significant.

The education variable has important policy implications, which will be discussed in the following chapter.

The finding of the last significant variable under model MGIOM 4, the urban (informal) sector cost of living (USC), is a proxy for the cost of migration. Potential migrants consider it especially when they decide to move to the urban section of a province. The lower the cost of living in a city, the more likely people are to move to that city. As to how much lower and how many more men would move, model MGIOM 4 indicates that *ceteris paribus*, a one-unit decrease (increase) in USC was associated with an increase (decrease) in the male migration rate by 3.08 (compared to 4.16 under model GIOM 4). In this case the USC elasticity of (male) migration was such that a one-unit increase in the urban cost of living would bring a response to more than a one-unit decrease in the inflow of male migrants into a city.

In summary, the segmentation of the total migrants into the male and the female migrants and the inclusion of the unique variables (MRT and TRANS) did yield the regression results that provided some insights into the reasons why members of each sex migrated. Unexpectedly, what the segmentation could not do was to obtain the significance of the remaining variables (RGDP and MLFPR).

The Explained Female (Net In-)Migration Rate.

This section reports on the importance of the common variables in explaining the variation in the female (net in-)migration rate, and on the degree of improvement when either MRT or TRANS and both were included in the models.

The link between the seven common variables and the female migration rate. It was found that unexpectedly the seven common variables (the economic, demographic and/or institutional, and the educational variables): RGDP, FLFPR, URB, DENS, AGP, PEDUC and USC, as a whole failed to explain the variability in the female migration rate. This outcome might suggest that it was most probably due to excluding a very important variable, that is, the fertility rate (FERT). As mentioned previously, the reason FERT was not included was that the data on the fertility rate by province in 1971 was not available.

The addition of MRT and/or TRANS to the seven common variables in explaining the female migration. When MRT was included in the female migration model in addition to the seven common variables, it was found that the parameter estimate of MRT was not significant at all, although the overall regression was significant and the estimated coefficients of some predictor variables: URB, DENS, and PEDUC, became significant. This supports the opinion that those who have the spirit of leaving home beyond the boundaries of the provinces of origin were mainly men.

When TRANS instead of MRT was included in model FGIOM, the model improved significantly in the sense that not only the overall regression, and the parameter estimates of URB, DENS, and PEDUC became significant, but also the coefficient of TRANS itself was significant. This result seems to justify what has been pointed out in the above paragraph; that because the number of the female migrants, who were the decision makers, was small and because most of the female migrants recorded in the census might be the wives and/or family members, the

inclusion of another relevant variable like TRANS did improve the model. Moreover, after TRANS appeared in both MGIOM and FGIOM models, a variable that had become significant in the former, USC, remained insignificant. Again, this outcome could be used to support the above interpretation.

Under model FGIOM, *ceteris paribus*, a one-point change in the urbanization rate (URB) was associated with a change in the female (net in-)migration rate (FGIMLN) by 0.034. The rate of urbanization had a significant influence on both the male migrants and the female migrants. This might suggest that most females moved to urban areas, not to transmigration areas and/or their surrounding areas (Table 13).

The population density (DENS) also had a significant influence on both the female migrants and the male migrants. The significant regression coefficients of DENS were about that same, that is, -0.27 for both of them. However, for the former the population pressure was not felt as the most important factor in considering moving as the males did. It seems that for women, the 'bright lights' of a city as a pull factor was stronger than the population pressure as a push factor.

As far as the education was concerned, the female migrants' primary education made them less responsive to the decision to migrate than the male migrants' primary education did. This is indicated by model FGIOM, where the regression coefficient of PEDUC was -18.40 and by model MGIOM 3, where the coefficient of that variable was more than twice as much (-37.92). Moreover, the coefficient of PEDUC in the former was less significant than that of PEDUC in the latter since the parameter estimate of PEDUC in the female migration model was significant only at

TABLE 13. Interprovincial Female (Net In-)Migration:
Estimated Regression Coefficients

Explanatory Variables	Model FGIOM
Constant	10.300 (1.283)
URB	0.034 ^b (2.757)
DENS	-0.273 ^b (-1.895)
AGP	-0.436 (-0.455)
PEDUC	-18.397 ^b (-1.814)
USC	-2.415 ^b (-1.680)
TRANS	0.259 ^b (2.670)
F-VALUE	3.672 ^a
R ²	0.63
ADJ R ²	0.46

^asignificant at $\alpha = 0.01$

^bsignificant at $\alpha = 0.05$

the alpha of 0.1. These findings support the outcome of the studies stating that most Indonesian females moved to cities to join their families, not to get some education or a job.

While the urban informal sector cost of living (USC) was insignificant in the explanation of the female migration, it was statistically important in the explanation of male migration in 1971. It seems that in this case the female migrants were less rational than the male migrants in their decision-making process of migration. Apparently when women were already attracted to the 'bright lights' of a city, they just decided to move there regardless of the high cost of living.

One last significant variable in the female migration model that also has important policy implications, is the TRANS variable. Here it is confirmed that the Indonesian women, like their male counterparts decide to migrate on the basis of information about their future settlement land and its opportunities from their transmigrant friends and relatives. However, their number seemed to be smaller than the number of those women who migrated to urban areas to join their families, to work or to get some education.

The value for the estimated coefficient of TRANS under model FGIOM was 0.259, (compared to 0.224 under MGIOM 3), which can be interpreted as: a one-unit change in the transmigration rate (TRANS) was associated with a change in the female (net in-) migration by 0.259. Thus, the larger was the number of transmigrants in a province of destination, the greater (though less proportionately) was the number of female migrants moving to that province. The TRANS variable

apparently played an important role in generating the interprovincial migration among the Indonesian women. This finding is supported by a comparison of the regression results obtained before TRANS was included with those obtained after it was included. As indicated above, after TRANS was included, the formerly insignificant variables: URB, DENS, and PEDUC, became significant. In other words, the female interprovincial migration in Indonesia in 1971 would have remained unexplained without TRANS.

Under model FGIOM the insignificant variables were USC, AGP, the female labor force participation rate (FLFPR), and RGDP. Like what happened to USC and AGP in the general migration model (GIOM 4) and in the male migration model (MGIOM 4), those two variables might possibly have become significant if another relevant variable or two (such as FERT) would have been included in the female migration model. Unexpectedly, besides being insignificant, the coefficient of FLFPR had the wrong sign (i.e., negative instead of positive) in all of the female migration models. The estimate of FLFPR still had the negative sign, leading us to have some doubt as to the reliability of the data.¹

Finally, as to the insignificance of RGDP, the same reason as indicated previously can be directed to the female migrants, too. So

¹This study has come to the following conclusions as to the coefficient of FLFPR with the negative sign: When the values of FLFPR by province were plotted against the values of their respective dependent variables, the pattern of association was unclear and was a description of scattered points running from northwest to southeast when both the dependent variable and the independent variable were in the natural log form, i.e., FGIMLN and FLFPRLN, respectively. The pattern of association was like a pyramid when FGIM and FLFPR were in the linear form.

like the male migrants, the female migrants moved mainly to nearby provinces. Their migration was especially short-range. The Indonesian women would most probably first consider the psychic benefits of urban life in a nearby province rather than the higher RGDP in a distant province before they decided to migrate. They were probably willing to move to a distant province only after they had been convinced by their transmigrant relatives and friends in that province.

The inclusion of both MRT and TRANS in the female migration model as in the general and male migration models, does not require further elaboration in this part of the study because it did not improve the female migration model. The insignificance of MRT again indicated that the spirit of 'merantau' with its entrepreneurship implications did not belong to the Indonesian women, but it was a unique factor in the explanation of the male migration in Indonesia. However, the Government of Indonesia believes that entreprising people are not born, but can be made through education and training, including those who tend to leave their home beyond the boundaries of the provinces of origin for the purpose of indulging in entrepreneurial undertakings.

In conclusion, the segmentation of the total migrants and the inclusion of MRT and TRANS did not give the same regression results to the female migration model, as it did to the male migration models because MRT was not relevant to the female migrants. The importance of TRANS with regard to the segmentation for the female migration model lies in the finding that the significance of all of the variables of the Todaro migration models and its extended ones could not be revealed in the migration of the Indonesian females until TRANS was included in

the female model. The finding shows that what appeared to be the most important variable for women was the attractiveness of cities (URB), as compared to the population pressure (DENS) for men.

CHAPTER VI

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

The interprovincial migration in Indonesia was mainly from Java to the Outer Islands and from the Outer Islands to Java. It also covered movements of people within Java and within the Outer Islands. The interprovincial migration under study is voluntary in the sense that migrants make their own decisions as to where, when and how to move, take their own risks of moving and pay their own costs after, presumably, considering a number of factors rationally and economically. This is contrary to the so-called involuntary migration or transmigration, which is the government-sponsored migration mainly from the densely populated provinces (West Java, Central Java, Yogyakarta, and East Java) to the sparsely populated provinces (the Outer Islands provinces). In this study transmigration is given, but, as expected, has been able to help explain and influence the interprovincial voluntary migration, which is the focus of the study.

The data available on the interprovincial migration in 1971 were gross out-migration, gross in-migration, and net in/out-migration, all from the 1971 Population Census of Indonesia.

The data on the explanatory variables did not come entirely from the census. Only population density (DENS), urbanization (URB), and primary education (PEDUC) can be obtained from the census. The data on the other variables came from the research/survey results published by national and international scholars.

This study has examined and measured quantitatively the impact of all and each of the selected economic, demographic and/or institutional, and educational variables (as suggested by the Todaro approach and its variations) and other (unique) variables on the interprovincial migration in Indonesia in 1971. In this case multiple regression models were employed to examine and measure the impact of those variables. Unlike the previous migration studies in other countries, linear or nonlinear multiple regression models have failed to estimate the relationship between the explanatory variables and the interprovincial migration in Indonesia. After various possible functional forms of the models have been experimented with, our search for the most appropriate migration models for Indonesia has come to an end when it was found that the most improved models were those with the combined functional forms, where the dependent variable should be in the natural log form. Consequently, the migration rate should be in the log form; however, instead of the log form of the net-in migration rate, the log form of the gross in-migration rate and that of the gross out-migration rate were considered as the dependent variables.

Before the 1971 original migration data were finally employed to run the best models, the supposedly more reasonable migration data such as the 1971-1980 data, the yearly 1980 data, and the yearly 1971 data, were also utilized to run the various models but failed to produce the better regression results.

Thus, in this study the multiple regression models with their combined functional forms have been utilized to measure the effects of

the explanatory variables not only on the migration in general, but also on the male migration and the female migration in particular.

The empirical results of the migration models demonstrated that most, but not all, of the explanatory variables as suggested by the general literature on migration significantly influenced the migration decision of both the Indonesian males and females. The very important variable among those significant variables was the population density (DENS as the push factor), followed by the urban informal sector cost of living (USC), the urbanization (URB) and the (primary) education (PEDUC). The regional gross domestic product per capita (RGDP), the labor force participation rate (LFPR), and the agricultural poverty (AGP) were possibly of some importance but not significant for all the Indonesian migrants. The same variables mentioned above (URB, DENS, PEDUC, and USC) also significantly affected the migration behaviour of the Indonesian males in particular. For the male migrants, RGDP, LFPR, and AGP were not significant, either. Unexpectedly, when only such economic, demographic/institutional, and educational variables (as suggested by the Todaro migration model and its modified models) were considered to explain the decision making process of migration of the Indonesian females, none was significant. This might indicate that most of the migration decision-makers were men, while most of the women (recorded in the census as female migrants) were their family members and/or wives, who could only influence but did not make any decision to migrate.

Further empirical results revealed that when those with the 'merantau' spirit were distinguished from those without, and when they used transmigrants as a source of information, the above findings were not valid any more. In this regard, for all the migrants in general as well as for the male migrants in particular the agricultural poverty (AGP) as one of the economic, demographic, institutional, and the educational variables and the unique variables: the 'merantau' spirit (MRT) and the transmigration rate (TRANS) themselves, became statistically significant in addition to the variables mentioned above. Then, for the male migrants, both education and population density were still as important as they were for migrants in general (for both males and females). Furthermore, for the migrants in general and the male migrants in particular, the other important variables were USC, URB, PEDUC, MRT, TRANS and AGP. For the female migrants, the inclusion of only TRANS revealed the significance of the other variables such as URB, DENS, and PEDUC. Interestingly enough, in contrast to the male migrants, AGP was not an important variable that affected their migration decision. Obviously MRT was not an important factor for females, either.

It is evident that MRT and TRANS played very important roles in generating the interprovincial migration in Indonesia. While both made the major contribution to the explanation of the male migration, only TRANS made the major contribution to the explanation of the female migration.

The uniqueness of interprovincial migration in Indonesia lies in the importance of MRT or TRANS or both being included in order to help

reveal what other determinants and to what degree each explained and predicted the variation in the general, male, and female migration. It is strongly suggested that the transmigration was indeed a catalyst for voluntary migration in Indonesia.

Although RGDP was not significant, it does not mean that migrants were in no way responsive to economic incentive or money income. Their response to economic incentive was implied and indirect, because the influence of other factors was stronger and more dominant. RGDP was still necessary to be accounted for; otherwise the models would have worsened. Other variables that were not significant in spite of the inclusion of MRT and /or TRANS was LFPR in the general migration model, MLFPR in the male migration model, LFPR in the female migration model. It was most likely that these variables would have been significant if another variable like the fertility rate (FERT) would have been included in the appropriate models like the general migration model and the female migration model.

The policy implications to be derived from the empirical findings are as follows:

The results of this study support the transmigration policy designed to alleviate the population pressure not only on Java but also in any province on any island that is suffering from the population pressure (e.g. crowded areas of Lampung). Regardless of how transmigration should be implemented, the study suggests that transmigration should be continued and even be enhanced since the transmigration itself has been, and will be, paving the way for both

men's and women's voluntary migration by way of information exchange and chain migration.

People with the 'merantau' spirit are entrepreneurial people who are willing to move to any province regardless of distance as long as their province of destination provides them with opportunities to seek wealth and education. Programs of educating and training people who are expected to become entrepreneurial migrants like them should be intensified and extensified. By offering them with opportunities to get as much education as possible, this majority of people are expected to become more responsive to better opportunities outside their provinces of origin. To accommodate large-scale transmigration as well as large-scale voluntary migration as a result of the above efforts, regional development in the expected provinces of destination should be planned both in the short-run and in the long-run. By regional development in the short-run is meant land settlements followed by opening up upland and swamp land for cultivation for food and cash crops, by improving transport networks, by establishing communities, and by attracting voluntary migrants to provide a supply of labor for non-agricultural employment in the settlement provinces (Hardjono, 1978). By regional development in the long-run is meant the promotion of industry and trade, the exploitation and processing of the Outer Islands' mineral, forest and other natural resources, the improvement of transport and communications (Arndt, 1980) for market access, and the development of urbanization.

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APPENDIX

TOWARD THE IDENTIFICATION OF AN APPROPRIATE FUNCTIONAL FORM BASED ON THE 1971 MIGRATION DATA

When the original data on migration in 1971 is used to run models of varying functional forms, the results can be described as follows: When only the eight independent variables: RGDP, LFPR, URB, DENS, AGP, PEDUC, FERT, and USC, were included in estimating the migration model, using the lifetime net in/out-migration as the dependent variable, and when the linear form was used, the regression results show that, unlike most migration studies at the macro level, the overall regression was not significant at 5% or even 1% level of confidence and FERT was the only variable with the significant regression coefficient but with the positive sign instead of the expected negative sign.

Since the net migration rate was negative for a number of provinces in 1971 like Bali, East Nusatenggara, Central Java, East Java, West Java, Yogyakarta, North Sulawesi, Southeast Sulawesi, South Sulawesi, South Kalimantan, West Kalimantan, West Sumatera, and Aceh, as the dependent variable it must remain in the linear form, whereas all the explanatory variables could be expressed in the log form and thus the semi-log form of this model was derived. However, this functional form did not seem to be the appropriate model, either. Its F-value was not significant at any level of confidence and even much lower than it was under the linear form. Furthermore, none of the explanatory variables were significant and the adjusted R-square was negative indicating that the model fitted poorly with the data.

When the hyperbolic form was applied to the 1971 original data, the results were even worse than those obtained from the functional

forms mentioned above, the overall regression being lower than that under the semilog form. Like in the semilog form, none of the independent variables were significant and its adjusted R-square was negative.

When MRT and/or MS/TRANS were added to the eight variables mentioned above, the fit of the models improved somewhat. Thus, when the linear form was used and MRT was included, the 1971 data used to estimate the models show that the overall regression was significant at both 5% and 1% levels of confidence, but, among the nine variables, only two were significant. The two were FERT and MRT. FERT was significant, but it had the wrong sign. The sign should be negative, not positive. MRT was the variable, the regression coefficient of which was significant and had the expected negative sign.

When the linear form was utilized and TRANS was added to the eight determinants, the significant F-value was even higher than it was when MRT was added and more variables were significant. In this case there were three significant variables: URB, DENS, and TRANS, among which TRANS was the only one with the expected positive sign. The other two apparently had the wrong signs. That is, URB had the negative sign instead of the positive sign, whereas DENS had the positive sign, not the negative sign. When variables show unanticipated signs, it suggests that some other functional form may be more appropriate.

When both MRT and TRANS were added to the eight explanatory variables, the linear model improved a little in the sense that its overall regression was higher than it was when MRT and TRANS were included separately in the model. Now only two out of ten variables

were significant and between the two only TRANS was the variable, which was both significant and had the expected positive sign. Here MRT had the correct negative sign, but was not significant at any level. Again, this indicates the possibility that for the Indonesia data some variables (the net migration rate as well as the explanatory variables) should be stated in nonlinear form.

The next step was to try the semi-log form for the explanatory variables, while MRT and /or MS/TRANS were added. First, when only MRT was added to the the model, the results were that the overall regression was not significant at any level of confidence and it means that MRT did not contribute anything in explaining variation in migration, although as a single factor its coefficient was significant enough to explain variation in migration. The other factor, which was significant, was variation in urbanization rate (URBLN). In this case the fertility rate (FERTLN) was significant; but it had the wrong positive sign, which indicates that the log form for that factor may not appropriate. The other factors: RGDP LN, DENS LN, LFP RLN, AGP LN, PEDU CLN, and US CLN, were absolutely insignificant. Among these six factors three had unanticipated signs, that is, RGDP had the negative sign, AGP had the positive sign, and PEDUC had the positive sign. To obtain the correct sign, it seems that one or two, if not all, of those three factors needed to have some other kind of functional form.

When only the migrant stock was added to the eight factors in the semilog form of the model, MS, a dummy variable, not TRANS, was utilized. Because many values of TRANS among provinces could not take the log form, whereas MS as a dummy variable just remained MS when it

took the form of natural log. Because the natural log of e from $e^{b_9 MS_9}$ was one. The regression results show the insignificant F-value, low R^2 , the negative adjusted R^2 , and all of the insignificant regression coefficients.

When both MRT and MS were included, the F-value of the semilog model was no higher than that of the model when only MRT was included. The other regression results were that the coefficient of determination (R^2) is low, the adjusted R^2 was even lower, and the only factors that were significant were URB and MRT. Thus, in this case the more the variables were added, the worse the model became. Therefore, the choice of the semi-log form of the model was less likely to be recommended.

Now when the hyperbolic/reciprocal form of the model was taken into account in connection with the addition of MRT and/or MS/TRANS to the eight other factors, it was found that MRT was the only variable, which was significant and had the correct sign. The regression coefficients of the other eight variables were insignificant. The adjusted R^2 was negative. When MS alone was added, the results were worse. None of the coefficients of the nine variables were significant and the F-value was insignificant. When both MRT and MS were included, almost all of the ten variables, could be considered insignificant, although MRT was significant at least at 1% level. Again, these results seem to show that the reciprocal form was not appropriate for the migration models in Indonesia.

Finally, when the quadratic form of the model was considered. It appears that the regression results were no better than those obtained

from the use of the reciprocal form, except that there was no negative adjusted R^2 . It also seems clear that this functional form was not the appropriate one, either, to estimate the migration model in Indonesia, using the 1971 original data.

Since the linear, semi-log, reciprocal, and quadratic forms of the models cannot be expected to estimate the true migration models, the double-log form should be considered. The need for this functional form can be justified when each of the independent variables is plotted against the dependent variable. In order to be able to make it workable, the values of the dependent variables should be those which can be of log form. In this case the gross in-and/out-migration rates, not the net in-and/or out-migration rates, that should be used as the dependent variable in the proposed models to explain the migration in Indonesia on the basis of the 1971 original data. In this way the net in-and/or out-migration as the dependent variable is derived indirectly. In other words, it requires two estimating models to arrive at the net in-and/or out-migration.

The first estimating model shows that the gross in-migration (GIM) is a function of RGDP, LFPR, URB, DENS, AGP, PEDUC, FERT, USC, MRT and/or MS/TRANS.. The second estimating model indicates that the gross out-migration is the function of the same explanatory variables. The net in-and/or out-migration equation is derived by subtracting the gross out-migration equation from the gross in-migration equation (Greenwood, 1975, p.408). When one of the the regression coefficients of the gross out-migration model equation is not statistically significant, while the corresponding coefficient of the gross in-

migration model equation is significant, then the former should not necessarily be subtracted from the latter. The reverse is also true.

Before both GIM and GOM are used as the dependent variables in the log form, this study attempts to find out the outcomes of the regressions when GIM and GOM are utilized as the dependent variables in the linear form for the linear, semi-log, reciprocal, and/or quadratic form(s) of the migration models in Indonesia. It is found that in general the outcomes are not so good as those when the net in-and/or out-migration is used as the dependent variable. Thus in any of those functional forms of the models only a few of the explanatory variables are significant and most of their overall regressions are not significant. That is so when the dependent variable is either GIM or GOM.

An attempt has been made to use the combination of the functional forms of the explanatory variables, keeping GIM and GOM in the linear form. Thus, for example, the estimating model is:

$$\begin{aligned} \text{GIM} = & b_0 + b_1\text{RGDPLN} + b_2\text{LFPRLN} + b_3\text{DENSLN} + b_4\text{AGP} \\ & + b_5\text{P} + b_6\text{F} + b_7\text{USC} + b_8\text{C1} + b_9\text{URB} + e_1 \end{aligned}$$

This example shows that in the model here is a combination of the functional forms of the variables in the sense that RGDP, LFPR, and DENS are assumed to have the natural log form, URB and AGP have the linear form, PEDUC and FERT the reciprocal form and USC the quadratic form in order to estimate the model of migration. This model appears to have produced poor estimates (insignificant F-values, most insignificant regression coefficients, negative adjusted R-squares, low

R^2 , and so on). Therefore, another combination should be attempted. There are a lot of the possibilities/probabilities of the combinations that can be thought of, since each variable can take the linear, the log, the quadratic, or the reciprocal form. However, it seems that data on migration in Indonesia, especially the 1971 original data, has not enabled any model containing any of those combinations to estimate the true model of migration in Indonesia as long as the dependent variable has the linear form. Therefore, this study does not utilize GIM and GOM as the dependent variables in the linear form.

In search of the most appropriate estimating model for migration in Indonesia, the focus is then on the regression results when GIM and GOM are the dependent variables in the natural log form and written as GIMLN and GOMLN, respectively. It is found that although the dependent variable is GIMLN and/or GOMLN, the regression of that variable on the eight variables: RGDP, LFPR, URB, DENS, AGP, PEDUC, FERT, and USC, does not yield higher t-ratios and higher R^2 . It was after MRT and MS/TRANS were included and after the various combinations of the available functional forms were observed that the most appropriate models were finally identified. It appears that the most appropriate functional form of the migration model for Indonesia requires that its dependent variable be in the log form, GIMLN and/or GOMLN.

VITA

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