Interregional Migration Flows in Indonesia
Chapter 2

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Abstract - Population Census and Intercensal Population Survey data permit description of the origin–destination patterns that characterise interregional migration flows in Indonesia. Application of the framework of population redistribution proposed by Long (1985) results in indications of over-urbanisation, sub-urbanisation and metropolitan-to-non-metropolitan migration. However, indications of sub-urbanisation and metropolitan-to-non-metropolitan migration are weak, as migrants originate in diverse areas of the country but move mostly to particular areas of Java — mainly Jakarta and its surroundings.

Keywords: Indonesia, migration, population redistribution, urbanisation, sub-urbanisation, metropolitan and non-metropolitan areas.

2.1. Introduction

While it accounts for just 6.8 percent of Indonesia’s territory, Java accounts for 57.5 percent of the total population of the country. In comparison, that part of the island of New Guinea lying in Indonesia accounts for 21.8 percent of the country’s territory but only 1.5 percent of its population. And Sumatra, inhabited by 21.3 percent of the total population of Indonesia, represents 25.2 percent of its territory. In light of these patterns of population distribution, migration may represent an important mechanism of population redistribution.

Previous research has focused on migration flows to and from Java (Alatas, 1993; Firman, 1994), migration flows to and from Jakarta (Chotib, 1998), inter-island migration (Rogers et al., 2004) and inter-provincial migration flows (Darmawan & Chotib, 2007; Firman, 1994). Yet work on migration flows between metropolitan and non-metropolitan areas or between metropolitan areas, particularly work undertaken using a population redistribution framework, remains rare. This article aims to address interregional migration flows in Indonesia employing such a framework. It seeks to answer the following questions: Where do the main flows of migrants in Indonesia come from and what are their destinations? What phase of population redistribution is Indonesia currently in based on observed migration patterns? To what extent can patterns of regional concentration of migration flows be detected based on a set of origin-destination-regional flows? To answer these questions, we use three large data sets, the Population Censuses of 2000 and 2010 and the Intercensal Population Survey of 2005. We divide Indonesia into thirteen regions consisting of metropolitan and non-metropolitan areas and analyse these data using logistic regression and the migration Gini Index.

We argue that Java retains its position as the preferred destination for migration, though migration flows have gradually shifted in favour of destinations outside Java. Furthermore, findings of significant migration flows from large cities to their surroundings indicate that Indonesia is entering the sub-urbanisation phase of population redistribution, and findings showing metropolitan-to-non-metropolitan movement and decreasing preferences for metropolitan areas indicate that Indonesia is entering the sixth of Long’s phases of population redistribution.

2.2. Literature Review

As a demographic factor, migration plays an important role in altering population distribution and thus in affecting the growth of large cities in developing countries. It is responsible for a considerable part of demographic concentration and also for population redistribution in such countries (Hogan & Pinto da Cunha, 2001).
Chapter 2

At the same time, regional development is closely related to migration (De Haas, 2010; Fan, 2005; Zelinsky, 1971). Zelinsky (1971) proposed the mobility transition model to explain changes in spatial mobility linked to the theory of demographic transition and modernization. The model offers a generalisation of the transition occurring in both the rate and scale of migration as society changes over time. That is, it views migration in the context of the economic and social change that accompanies the modernization process (Boyle et al., 1998; Hagen-Zanker, 2008).

There are five stages of mobility transition — those characterising pre-modern traditional society, early transitional society, late transitional society, advanced society and future super-advanced society. Zelinsky argued that mobility transition is an ideal and flexible scheme for explaining movement in space and time and for describing or predicting the specific patterns of migration or circulation to an area or set of areas. However, the scheme lacked the ability to explain distance, time and rate of migration. Despite the importance of this theory as a comprehensive framework to explain human mobility, it ignores important characteristics of an advanced society, sub-urbanisation and counter-urbanisation (Bijak, 2006; Zelinsky, 1971).

Zelinsky’s theory does not explain the extent to which mobility acts as an agent of population redistribution. It explains only the migration phase, without addressing the impact of this phase on population distribution. Long’s theory of migration offers a more comprehensive approach to the relationship between the stage of development and the degree of population concentration in contexts in which migration is used as a major component of social engineering in the form of population redistribution. Long divides population redistribution trends into six phases: initial urbanisation, frontier settlement, traditional urbanisation, over-urbanisation, sub-urbanisation and metropolitan-to-non-metropolitan migration (Long, 1985).

In the phase of initial urbanisation, the establishment of the early administrative and commercial centres to support the transition from autonomous subsistence societies to an agrarian market economy leads to frontier settlement, during which the population of destination areas is relatively small compared to the number of migrants. This frontier settlement violates the so-called gravity approach, according to which migration between two places is proportional to the populations at origin and destination, and inversely proportional to distance (Long, 1985).

The next phase, traditional urbanisation, is characterised by massive rural–urban movement. This phase sees the concentration of large masses of population in central cities and the connection of rural and urban areas through migration and commercial relations. “Commercial relations between the urban centre and...
the hinterland” refers to rural areas’ transmission of agricultural products and of products emanating from cottage industry to urban areas and receipt of services and manufactured goods in return (Long, 1985). Urban areas provide commercial transactions and marketing services. Both urban and rural zones form a specific part of developing urban areas during this phase (Long, 1985). This traditional urbanisation phase has a parallel in economic geography, in Christaller’s central place theory (Christaller, 1933).

The next phase, over-urbanisation, is measured by the urban population as a percentage of the total population at a given level of economic development. This phase occurs when a society has good links to technology and participates in international trade but at the same time has limited transportation infrastructure and poorly developed networks of commercial organisation. As a result of these deficiencies, almost the entire modern industrial and commercial sector of a nation is located in urban areas. The limited regular exchange of goods leads to the physical movement of people to urban areas, where they can engage in face-to-face communication. As cities grow relative to the countryside, rural-to-urban movement becomes so large that the modern urban economy can no longer quickly absorb the total urban workforce (Long, 1985).

After over-urbanisation has reached its peak, the processes of sub-urbanisation and metropolitan-to-non-metropolitan migration occur. Sub-urbanisation is the later stage of urbanisation in developed societies, during which commuting patterns permit the channelling of social interactions. It results in the increasing separation of workplace and residence. Metropolitan-to-non-metropolitan migration occurs as a result of strong preferences for low-density locations. It represents a reaction to congestion and therefore counterproductive social interactions in metropolitan areas. The improved communications and transportation of an advanced economy, which make many social and economic transactions possible at a distance, also help account for metropolitan-to-non-metropolitan movement (Long, 1985).

In the United States during the 1960s and 1970s, the population in non-metropolitan areas increased, and population decline in metropolitan counties followed. In developed countries more generally, the acceleration of the ageing of the population resulting from low fertility and other changes in family formation are becoming the principal demographic trends. The term “counter-urbanisation” describes both the population growth that occurs in non-metropolitan areas and the population decline in metropolitan areas. Regardless of the absolute flows, which are not usually large, the declining metropolitan population and increasing rural population are not necessarily directly linked (Boyle et al., 1998). Sub-urbanisation
and metropolitan-to-non-metropolitan movement are processes of de-concentration for urban areas (Mitchell, 2004). These de-concentrating processes are due not only to migration but also to natural increases in population and to the changing status of regions.

It is clear that Indonesia has passed Long’s initial urbanisation and frontier settlement phases of population redistribution. An example of these phases in the Indonesian context are the movement of people from Java to Lampung on Sumatera as a result of the Dutch resettlement programme known as colonisation (kolonisatie) starting in 1905. The architects of this programme assumed that Javanese would have enough skills as pioneers to clear the jungle and develop irrigated rice fields (Nitisastro, 1970).

Rogers et al. (2004) state that Indonesia has entered the fourth phase of Zelinsky’s mobility transition, characterised by massive rural–urban migration towards the largest cities. Their case is strengthened by evidence of widespread non-permanent mobility in Indonesia since the 1970s (Hugo, 1982). In addition, indications are thus that Indonesia has passed through the over-urbanisation phase and is entering the next phases of population redistribution.

Findings of significant migration flows from large cities to their surroundings would indicate Indonesia is entering the sub-urbanisation phase of population redistribution. Findings showing metropolitan-to-non-metropolitan movement and decreasing preferences for metropolitan areas would indicate that Indonesia is entering the sixth of Long’s phases of population redistribution. At the same time, regional variations in phases of population redistribution might see some regions in earlier phases even as more advanced regions are entering a new phase. These regional variations might be due to the unequal level of regional development. The development of Eastern Indonesia has changed migration patterns. Migration flows have gradually shifted from Java to outside of Java. A decreasing percentage of the country’s population — 68.7 percent in 1930 and 60 percent in 1990 — has lived on Java; an increasing percentage of the population has lived on Sumatera and in other parts of Indonesia (Firman, 1994; Tjiptoherijanto, 1995). Moreover, differing destinations of migration may reflect different motivations, as influenced by social ties, informal networks and responses to labour market fluctuations (Frey & Liaw, 1998). Because positive natural population increase in Indonesia (Rogers et al., 2004) and the changing status of a region from urban to rural are very rare, this de-concentrating process is most likely due to migration. When this process is attributed to movement rather than natural increase, the term “counter-urbanisation” is used (Mitchell, 2004).
Table 2.1. Summary of population redistribution phases, their characteristics and indicators

<table>
<thead>
<tr>
<th>Phase</th>
<th>Characteristic</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Initial urbanisation</td>
<td>Establishment of new administrative and commercial centres.</td>
<td>A small share of urban population.</td>
</tr>
<tr>
<td>II. Frontier settlement</td>
<td>The population at destination is quite small relative to the size of the migration movement.</td>
<td></td>
</tr>
<tr>
<td>III. Traditional urbanisation</td>
<td>Massive rural-urban shifts in population.</td>
<td>High out-flow to urban areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High ratio of rural-urban population.</td>
</tr>
<tr>
<td>IV. Over-urbanisation</td>
<td>Modern industrial and commercial sector is located in urban areas.</td>
<td>High migration volume to urban areas.</td>
</tr>
<tr>
<td></td>
<td>Large movement from rural to urban areas.</td>
<td>High preference for metropolitan areas.</td>
</tr>
<tr>
<td></td>
<td>Congestion problems.</td>
<td>High concentration of out-migration origins.</td>
</tr>
<tr>
<td>V. Suburbanisation</td>
<td>Increase in commuting.</td>
<td>High out-flow to surrounding areas of metropolises.</td>
</tr>
<tr>
<td></td>
<td>Congestion in central cities.</td>
<td>High preference for areas surrounding metropolises.</td>
</tr>
<tr>
<td>VI. Metropolitan-to-non-metropolitan migration</td>
<td>Increasing preference for low-density areas.</td>
<td>High out-flow to non-metropolitan areas.</td>
</tr>
<tr>
<td></td>
<td>Movement of industry from central city.</td>
<td>Decreasing preference for metropolitan areas.</td>
</tr>
</tbody>
</table>

Source: Adopted from Long (1985) and Authors’ elaboration
2.3. Data and Methodology

The data modelled in this paper are transition (status) data. Transition represents a change of residence, determined by comparing current and previous residence across an observation interval of five years. As used here, then, the term “migration” refers to a transition in place of residence during a five-year period. The data represent inter-regional migration streams based on the Indonesian censuses of 2000 and 2010 (Population Censuses 2000, 2010) and the Indonesian Intercensal Population Survey of 2005, also known as SUPAS 2005.

The use of SUPAS data along with data from the 2000 and 2010 censuses allows analysis of migration during the 2000–10 period in a more detailed way. SUPAS is designed to provide demographic data complementary to that in the censuses by filling the needs for demographic data between census dates. Its sample size is relatively small, but it is a national survey designed to permit estimation at the level of the 415 districts. Since we divide Indonesia into thirteen regions, the number of observations in the SUPAS data is, therefore, sufficient. We seek not to estimate exact numbers of migrants but rather to determine migration patterns in these thirteen regions.

The focus of analysis in this paper is on migration flows and on the spatial focusing of in-migration and out-migration. The thirteen regions used in the analysis consist of metropolitan and non-metropolitan areas. A metropolitan city is a city occupied by more than one million people, and metropolitan areas consist of several metropolitan cities, or of core cities and inner and outer cities adjacent to the core cities. Not all regions with more than one million inhabitants can be defined as metropolitan because the activities in these areas are not urban in character (Handiyatmo, 2009; Sahara, 2010).

According to Indonesia’s Government Regulation no. 26 of 2008 (Peraturan Pemerintah Republik Indonesia 2008), there are nine metropolitan areas in Indonesia. However, these nine metropolitan regions exclude most of the country’s territory. Therefore, we specified regions on the basis both of Government Regulation no. 26 (2008) and data on metropolitan agglomeration size published by the World Bank (2012). The regions consist of administrative areas below the provincial level, namely districts (kabupaten) and municipalities (kota). The thirteen regions used in the analysis here are listed in Table 1.1. (Chapter 1, pp. 14-15), and their locations are shown in Figures 1.1. and 1.2. (Chapter 1, p. 16).

Following Jones and Mamas (1996), we distinguish Jakarta from the surrounding Bodetabek region because Jakarta is much more urbanised than that region. Moves from Jakarta to Bodetabek can, therefore, be seen as sub-urbanisation, typical of the fifth phase of population redistribution.
The first part of the analysis below is the presentation of flow maps (Figures 2.1.–2.3.) showing flows by means of lines connecting the flow sources and destinations. We utilise JFlowMap, a graphical tool offering various visualisation techniques for producing and analysing flow maps and developed by Boyandin et al. (2010). Straight lines on the maps represent the flows, and their shade indicates the directions of the flows. JFlowMap is also capable of node clustering and flow aggregation, which are useful in offering a summarised overview of data. After creating graphic representations of the flows, we applied two logit models to describe the level and the distribution of migration. In the models, \( n_i(x) \) is the number of persons of age \( x \) who live in region \( i \) at the beginning of the observation period and who live in region \( j \) at the end of the observation period. According to Rogers et al. (2001), this number can be broken down into three components: (1) the number of persons of age \( x \) who reside in region \( i \) at the beginning of the observation period, (2) the share of migrants of age \( x \) leaving region \( i \), and (3) the conditional probability that a migrant leaving \( i \) in the observation period resides in region \( j \) at the end of the observation period. Therefore, following Rogers et al. (2001), we use the framework of logit modelling to describe the level and the distribution of migration.

The first logit model describes the level of migration. The level of migration is expressed by the proportion of migrants, determined by distinguishing between movers and stayers. If \( m \) denotes migrant status, with \( m = 1 \) denoting migrants and \( m = 0 \) denoting stayers, \( n_{mi} \) stands for the number of persons living in region \( i \) at the beginning of the interval by migration status \( m \). The logit model, which predicts the odds of being a migrant as against being a stayer, incorporates two independent variables, namely, region of origin and time period (see Appendix 2.1.).

The \( mstatus \) effects (migrant status effects/ \( v_{ij}^{ott} \)) are odds ratios, equal to the ratio of two separate sets of odds: (1) the odds of being a migrant from region \( i \) as opposed to being a migrant from the region that we call Rest of Indonesia during the 2005–10 period to (2) the odds of being a stayer in region \( i \) as opposed to being a stayer in the Rest of Indonesia during the 2005–10 period. The three-way interaction parameters (migrant-status–region–time effect \( v_{ij}^{ott} \)) are ratios of two odds ratios. This migrant-status–region–time effect parameter is useful to analyse population mobility over time, which represents the change of migration propensities over time.

As suggested by Van Imhoff et al. (1997), a model of gross migration flows with a good fit requires origin–destination interaction. Therefore, to examine the spatial structure of migration destinations, a saturated multinomial logit model that includes origin–destination variables interaction is applied.
Chapter 2

The second logit model describes the distribution component; that is, the \( i \) to \( j \) linkages. This is a saturated multinomial logit model. The dependent variables in this model are the areas of destination, while the independent variables are the areas of origin and time (Appendix 2.2.).

The logit model for the distribution component for analysing the spatial structure of migration destinations with time variable included to produce the period-specific distribution can be specified as:

\[
\theta_{jt|i} = \frac{S_{jt|i}}{S_{kt|i}} = v_{ji}^{T}v_{t|i}
\]  

(2.1)

where \( v_{ji} \) is the intercept for destination \( j \), denoting the odds of choosing destination region \( j \) relative to reference destination region \( k \) given the origin region \( i \), and \( S \) is the period effect for the origin-destination pair \((i,j)\), while \( S \) denotes the number of migrants.

The interaction parameters are odds ratios, which are equal to the ratio of (1) odds of migrants from \( i \) to \( j \) at time \( t \) relative to (2) odds of migrants from \( i \) to \( j \) in the reference period. These odds ratios are measures of the change in preference for the origin-destination pair \((i,j)\) relative to the reference period. High odds ratios indicate high preference. Odds ratios significantly different from 1.0 indicate a significant change, and odds ratios equal to or close to 1.0 indicate relative stability (Rogers et al., 2001).

After describing the spatial structure of the migration system, we compare the degree to which the sources of in-migration and the destinations of out-migration are spatially focused using the Gini index. The use of the Gini index to measure spatial focusing is analogous to measuring equality in any distribution of numerical values. The spatial focusing is the inequality that exists in the relative volumes of a set of origin-destination-specific migration flows. A high degree of spatial focusing will occur when most in-migrants are moving selectively to only a few destinations while most out-migrants are leaving only a few regions; a situation in which migrants are moving among all the possible origins and destinations in relatively equal numbers will result in a low degree of spatial focusing (Plane & Mulligan, 1997).
2.4. Results

Migration pattern (the generation component logit model)

Table 2.2 presents the parameter values for the generation component logit model. The overall effect parameter ($\nu$), which corresponds to the odds of being a migrant as opposed to being a stayer from the Rest of Indonesia (RoI) in the 2005-2010 period, is 0.0104, meaning that the odds of being a migrant as against being a stayer in RoI during the 2005-2010 period are about 10 to 1000. The smallest odds of being a migrant as against being a stayer are the odds for RoI and the biggest odds are the odds for Jakarta (0.1240). In fact, in terms of total numbers, the population of RoI is twice times greater than the population of Jakarta (Appendix 2.3). The odds for another region, Rest of Sumatera (RoS), with a population ten times larger than that of Mebidangro, are 0.0107, while the odds for Mebidangro are 0.0631.

The migrant status-region effect ($\nu_i \Omega$) implies that in 2005-2010 the relative chance of a person being an out-migrant from region $i$ rather than from RoI is $\nu_i \Omega$. Given the reference category RoI, the most mobile population was the population leaving Jakarta ($\nu_{1 \Omega} = 11.8683$), followed by the population from Mebidangro ($\nu_{9 \Omega} = 6.0437$) and the Rest of Central Java and Yogyakarta (RoCJY, $\nu_{6 \Omega} = 3.6708$). People leaving the Rest of Sumatera (RoS) and Kalimantan are almost as mobile as those leaving the Rest of Indonesia, with migrant status-region effects of $\nu_{10 \Omega} = 1.0268$ and $\nu_{11 \Omega} = 1.0159$, respectively.

These findings suggest that migration propensities are not related to size of population since migration is selective. The fact that migration is selective means that migrants are not a random sample of the population of the area of origin. People respond differently to push and pull factors. Moreover, each person has different abilities to overcome intervening obstacles to migration (Lee, 1966; Todaro, 1980).

In terms of volume of migration, Mebidangro and several regions on Java have larger out-flows of migrants than in-flows, as illustrated in Figures 3-5; they are thus shaded orange. The other regions are mostly shaded blue, meaning that they have larger in-flows of migrants than out-flows. This general pattern remains unchanged over time.

The high volume of migration from Mebidangro contradicts Lee’s theory (1966, p. 52) that the volume of migration varies with the diversity of people, where low diversity among people should result in a lower rate of migration compared to high diversity. In terms of diversity, most of Mebidangro is inhabited by Bataks. Some ethnic groups in Indonesia are known for their high mobility, such as the Bataks of Sumatera, the Bugis and the Makassar people of Sulawesi, the Banjar of Kalimantan and the Madurese (Rogers et al., 2004; Tirtosudarmo, 2009).
# Table 2.2: The odds, odds ratios and ratios of odds ratios of migrant status, origin and time

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jakarta</td>
<td>0.1345</td>
<td>0.0973</td>
<td>0.1240</td>
<td>7.3942</td>
<td>10.5079</td>
<td>11.8683</td>
<td>1.4211</td>
<td>1.6051</td>
<td></td>
</tr>
<tr>
<td>Bodetabek</td>
<td>0.0256</td>
<td>0.0162</td>
<td>0.0199</td>
<td>1.4099</td>
<td>1.7544</td>
<td>1.9090</td>
<td>1.2444</td>
<td>1.3540</td>
<td></td>
</tr>
<tr>
<td>Bandung Raya</td>
<td>0.0339</td>
<td>0.0283</td>
<td>0.0317</td>
<td>1.8623</td>
<td>3.0556</td>
<td>3.0323</td>
<td>1.6408</td>
<td>1.6283</td>
<td></td>
</tr>
<tr>
<td>RoWJB</td>
<td>0.0345</td>
<td>0.0176</td>
<td>0.0262</td>
<td>1.8987</td>
<td>1.9023</td>
<td>2.5083</td>
<td>1.0019</td>
<td>1.3210</td>
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<tr>
<td>Kedungsepur</td>
<td>0.0447</td>
<td>0.0253</td>
<td>0.0321</td>
<td>2.4587</td>
<td>2.7332</td>
<td>3.0722</td>
<td>1.1116</td>
<td>1.2495</td>
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</tr>
<tr>
<td>RoCJY</td>
<td>0.0435</td>
<td>0.0246</td>
<td>0.0383</td>
<td>2.3895</td>
<td>2.6560</td>
<td>3.6708</td>
<td>1.1115</td>
<td>1.5362</td>
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</tr>
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<td>Gerbangkertosila</td>
<td>0.0253</td>
<td>0.0229</td>
<td>0.0275</td>
<td>1.3884</td>
<td>2.4739</td>
<td>2.6299</td>
<td>1.7819</td>
<td>1.8942</td>
<td></td>
</tr>
<tr>
<td>RoEJ</td>
<td>0.0266</td>
<td>0.0179</td>
<td>0.0240</td>
<td>1.4624</td>
<td>1.9329</td>
<td>2.2936</td>
<td>1.3217</td>
<td>1.5683</td>
<td></td>
</tr>
<tr>
<td>Mebidangro</td>
<td>0.3010</td>
<td>0.0417</td>
<td>0.0631</td>
<td>16.5532</td>
<td>4.5057</td>
<td>6.0437</td>
<td>0.2722</td>
<td>0.3651</td>
<td></td>
</tr>
<tr>
<td>RoS</td>
<td>0.0148</td>
<td>0.0117</td>
<td>0.0107</td>
<td>0.8131</td>
<td>1.2631</td>
<td>1.9268</td>
<td>1.5533</td>
<td>1.2628</td>
<td></td>
</tr>
<tr>
<td>Kalimantan</td>
<td>0.0088</td>
<td>0.0101</td>
<td>0.0106</td>
<td>0.4814</td>
<td>1.0857</td>
<td>1.0159</td>
<td>2.2551</td>
<td>2.1102</td>
<td></td>
</tr>
<tr>
<td>Sulawesi</td>
<td>0.0121</td>
<td>0.0100</td>
<td>0.0138</td>
<td>0.6658</td>
<td>1.0783</td>
<td>1.3187</td>
<td>1.6196</td>
<td>1.9806</td>
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<tr>
<td>Rest of Indonesia</td>
<td>0.0182</td>
<td>0.0093</td>
<td>0.0104</td>
<td></td>
<td></td>
<td></td>
<td>Reference category</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Author's statistical results*
FIGURE 2.1. Inter-regional migration flows in Indonesia 1995-2000

FIGURE 2.2. Inter-regional migration flows in Indonesia 2000-2005

Source: Figure prepared by authors

Interregional Migration Flows
Chapter 2

The case of Mebidangro indicates the phase of sub-urbanisation because the largest flow is an out-flow to the nearby regions of RoS, which are less densely populated than Mebidangro. However, a high volume of out-migration from Mebidangro to other, more developed metropolitan areas must be taken into account in assigning a population redistribution phase. Movements from “less-developed metropolitan” to “more-developed metropolitan”—that is, metropolitan-to-metropolitan movement—are also found for Bandung Raya, Kedungsepur and Gerbangkertosusila.

Jakarta had larger out-flows than the corresponding in-flows to Bodetabek, RoS, Kalimantan, Sulawesi and RoI during the 1995–2010 period. The larger out-flow than in-flow to Bodetabek might result from the fact that Bodetabek enjoys spillover effects due to its proximity to Jakarta. This type of movement can be regarded as the sub-urbanisation phase of population redistribution. The other flows from Jakarta, for which Jakarta has bigger out-flows to regions outside Java — that is, RoS, Kalimantan, Sulawesi and RoI — than the corresponding in-flow, indicate metropolitan to non-metropolitan movement or the sixth phase of population redistribution. This movement might be due to high preferences for low-density locations as a result of the congestion of counterproductive social interactions in the metropolitan areas (Long, 1985). On the other hand, the larger in-flows to Jakarta are the flows from regions on Java and from Mebidangro.

Source: Figure prepared by authors

FIGURE 2.3. Inter-regional migration flows in Indonesia 2005-2010
Bodetabek, the areas surrounding Jakarta, had an unchanged pattern of migration during the 1995-2000 to 2005-2010 period. Bodetabek was a “net importer” of migrants. The largest flows of in-migrants entering Bodetabek came from Jakarta, followed by migrants from RoWJB and RoCJY.

Between 1995-2000 and 2005-2010, RoWJB—surrounding Jakarta, Bodetabek and Bandung Raya—became predominantly migrant out-flow regions. Most out-migrants from RoWJB migrated to Bodetabek, Jakarta and Bandung Raya, and most in-migrants to RoWJB came from RoCJY and RoEJ. This finding might due to migrants’ tendency to migrate to regions surrounding metropolitan areas before migrating to the metropolitan areas. A study by De Jong and Sell (1977) shows that, although many people want to live in a small town or a rural environment, they also want to be near a metropolitan centre.

Migration flows from RoCJY and RoEJ can also be seen as traditional urbanisation because RoWJB is more developed than RoCJY and RoEJ. Other flows exemplifying traditional urbanisation are the migration flows from RoEJ, from which the flow to Gerbangkertosusila is bigger than the flows to other regions.

The above descriptions offer strong indications that distance is the dominant factor affecting the migration flows (Ravenstein, 1885; Lee, 1966). The origin–destination matrix (Appendices 2.7.–2.9.) also shows that intra-island migration on Java and inter-island migration to Java are relatively high. Java contains the most attractive destination regions for migrants. Almost one-third of the total migrants migrate to Java. The latest census data show that 87.5 percent of migrants from Sumatera migrated to Java. Appendices 2.10.–2.12. show that 62.3 percent of migrants to Java came from Sumatera, 15.6 percent from RoI, 14.5 percent from Kalimantan and 7.6 percent from Sulawesi.

To borrow terms used by Firman (1994), the general pattern of migration flows in Indonesia closely resembles a “Java-centric” pattern because most migrants come from and migrate to areas on Java. Java still holds dominance as both a receiver and sender of migrants.

The three-way interaction parameters migrant status–origin–time ($v_{OT}$) show that nine out of twelve regions have consistently increasing out-migration propensities over all three periods from 1995 to 2010. The regions that consistently show an increase are Jakarta, Bodetabek, Bandung Raya, RoWJB, Kedungsepur, RoCJY, Gerbangkertosusila, RoEJ and Sulawesi. This result suggests that the rate of migration tends to increase over time, while the regional differences in the volume and rate of migration are due to the differential progress of regional development (Lee, 1966).
Chapter 2

When viewed by the level of development, there is a positive relationship between migrant propensities and levels of development. Metropolitan areas—Jakarta, Mebidangro, Kedungsepur, Bandung Raya and Gerbangkertosusila—tend to have higher migration propensities than the surrounding areas and non-metropolitan areas. This difference supports the previous findings of Rogers et al. (2004) that several metropolitan cities in Indonesia have entered the fourth phase of Zelinsky’s mobility transitions, characterised by vigorous inter-urban movements.

Migration structure (the distribution component logit model)

To explore the Java-centric pattern of migration in Indonesia further, we examine the spatial structure of migration destinations by applying a saturated multinomial logit model. The multiplicative regression coefficients for this model are shown in Tables 2.3–2.5. The intercept is the odds that a migrant who leaves region $i$ during the reference period (2005–2010) selects region $j$ as the destination rather than the reference region $k$.

The first explanation for the Java-centric pattern of migration in Indonesia is the fact that Jakarta is the favoured migration destination. Migrants from about three-quarters of migration origin areas prefer Jakarta as their destination, as is indicated by 98 of 132 intercept values of less than 1.0. The second most favoured destination is Bodetabek; ten out of twelve intercepts in Bodetabek’s model are above 1.0. This result suggests that migrants from outside Bodetabek, with the exception of those from Kalimantan and Sulawesi, prefer to migrate to Bodetabek rather than to Jakarta. Migrants from Kalimantan and Sulawesi are more likely to choose Jakarta than Bodetabek, with parameter values of 0.9408 for Kalimantan and 0.8615 for Sulawesi, respectively; see Table 2.3.

What emerges from these results is that the preference for developed metropolitan regions in Indonesia remains high. For instance, Table 2.3 shows that migrants from RoWJB prefer Jakarta rather to Bandung Raya ($u^R_{3/4} = 0.8104$) and that migrants from RoCJY choose Jakarta as their destination rather than Kedungsepur ($u^R_{5/6} = 0.3964$). That migrants from Bandung Raya prefer RoWJB to Jakarta but migrants from RoWJB prefer Jakarta to Bandung Raya and that migrants from Kedungsepur prefer RoCJY to Jakarta but migrants from RoCJY choose Jakarta as their destination rather than Kedungsepur imply that the preference for developed metropolitan areas remains high despite the long distance often involved in migration. The negative effect of distance on migration is not applicable here, in all likelihood because of relatively large differences in incomes earned between region of origin and destination (Lucas, 1997; Todaro, 1980). Such movement of
people to more developed metropolitan areas suggests that the overurbanisation phase is ongoing; the degree of population concentration in metropolitan regions is still increasing in Indonesia.

Some patterns indicating a de-concentration process — sub-urbanisation and metropolitan-to-non-metropolitan movement — are also evident. Migrants from Bandung Raya are more likely to choose RoWJB than Jakarta as their destination, migrants from Kedungsepur are more likely to choose RoCJY than the capital, and migrants from Gerbangkertosusila are more likely to choose RoEJ than Jakarta.

Another case is that of migration from Mebidangro to RoS and from RoS to Mebidangro, in which the preference for the non-metropolitan area is higher than the preference for the metropolitan region. The intercept of Mebidangro to RoS ($v_{10|9}$ = 13.5294) is higher than the intercept of migration flow from RoS to Mebidangro ($v_{9|10}$ = 1.7311).

Another pattern is observable in cases in which population redistribution does not accompany migration. Rather, in those cases, large gross flows of in- and out-migration are associated with relatively small net migration. These turnover migration cases include those of migrants from Gerbangkertosusila who prefer RoEJ to Jakarta as a destination ($v_{8|7}$ = 4.6189) and also those from RoEJ who prefer Gerbangkertosusila to Jakarta ($v_{7|8}$ = 5.5233). However, since the odds of migration from RoEJ to Gerbangkertosusilo are larger than the odds of migration from Gerbangkertosusilo to RoEJ, the preference for migration from RoEJ to Gerbangkertosusilo is larger than that for migration from Gerbangkertosusilo to RoEJ.

The intercepts from our model (Table 2.3.) show there are six intercepts for migration from Jakarta with values of less than 1.0 — migration to Kedungsepur, Gerbangkertosusila, RoEJ, Mebidangro, Kalimantan and Sulawesi. These results mean that the migrants’ preference to leave Jakarta for these regions is smaller than their preference to migrate to the Rest of Indonesia. The “favourite” destinations for migrants from Jakarta are Bodetabek, Sumatera other than Mebidangro, Central Java other than Kedungsepur, RoWJB and Bandung Raya. Migrants from Jakarta are more likely to choose nonmetropolitan areas, with the exception of Bodetabek. This preference suggests the phase of metropolitan-to-non-metropolitan migration. The high preference for migration from Jakarta to Bodetabek is the expression of a preference for smaller towns within commuting distance, which can be seen as an indication of the sub-urbanisation phase.
<table>
<thead>
<tr>
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<th>1</th>
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*: reference category

Source: Author's statistical results
TABLE 2.4. Regression coefficient of saturated multinomial logit Origin, Destination and Time ([O][D][T=1]), 2000-2005

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*: reference category

Source: Author’s statistical results
### TABLE 2.5. Regression coefficient of saturated multinomial logit Origin, Destination and Time ([O][D][T=2]), 2005-2010

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<td>1.3343</td>
<td>1.1325</td>
<td>1.2631</td>
<td>1.4563</td>
<td>2.0452</td>
<td>3.8859</td>
<td>-</td>
<td>0.3943</td>
<td>2.3849</td>
<td>2.1539</td>
<td>2.7360</td>
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<td>10. RoE6</td>
<td>*</td>
<td>1.2404</td>
<td>0.9889</td>
<td>1.0101</td>
<td>1.0728</td>
<td>1.0006</td>
<td>1.6876</td>
<td>2.1588</td>
<td>1.0567</td>
<td>-</td>
<td>1.1580</td>
<td>0.6312</td>
<td>1.2637</td>
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<tr>
<td>11. Kalimantan</td>
<td>*</td>
<td>1.3872</td>
<td>1.1590</td>
<td>0.8727</td>
<td>1.1132</td>
<td>1.0879</td>
<td>1.0996</td>
<td>2.7275</td>
<td>0.8486</td>
<td>1.6966</td>
<td>-</td>
<td>2.5268</td>
<td>0.8685</td>
</tr>
<tr>
<td>12. Sulawesi</td>
<td>*</td>
<td>2.1284</td>
<td>1.6223</td>
<td>0.7352</td>
<td>0.5096</td>
<td>0.5263</td>
<td>2.1302</td>
<td>2.5982</td>
<td>1.0153</td>
<td>1.4350</td>
<td>2.2382</td>
<td>-</td>
<td>4.1787</td>
</tr>
<tr>
<td>13. Rest of Indonesia</td>
<td>*</td>
<td>1.1321</td>
<td>0.7942</td>
<td>0.3835</td>
<td>1.2712</td>
<td>0.8827</td>
<td>1.9699</td>
<td>3.0497</td>
<td>1.3261</td>
<td>1.7524</td>
<td>1.0427</td>
<td>0.5768</td>
<td>-</td>
</tr>
</tbody>
</table>

*: reference category

*Source: Author's statistical results*
From the perspective of population redistribution in Indonesia, this movement has no effect; such metropolitan-to-non-metropolitan migration occurs entirely within Java. However, the preference of migrants from Jakarta for Bodetabek relative to the Rest of Indonesia during the past ten years has decreased ($v_{21}^R = 0.9664$ and $v_{22}^R = 0.8151$). A similar pattern also occurred for the flows from Jakarta to Bandung Raya and Kedungsepur, which manifested a decreasing preference of migrants from Jakarta for Bodetabek, Bandung Raya and Kedungsepur relative to the Rest of Indonesia. However, the odds ratio is relatively high, indicating that the preference for the area surrounding Jakarta remains high.

There is an increase in the preference for choosing Jakarta instead of other regions as a destination for migration during 1995–2010. Migrants from Bodetabek show an increase in the preference for choosing Jakarta relative to Bandung Raya, RoWJB and RoI; migrants from Bandung Raya show an increase in the preference for choosing Jakarta relative to Bodetabek; migrants from RoCJY show an increase in the preference for choosing Jakarta relative to Gerbangkertosulisila; migrants from RoEJ show an increase in the preference for choosing Jakarta relative to RoWJB; migrants from Mebidangro show an increase in the preference for choosing Jakarta relative to RoS; migrants from Kalimantan show an increase in the preference for choosing Jakarta relative to RoS; migrants from Sulawesi show an increase in the preference for choosing Jakarta relative to RoCJY; and migrants from RoI show an increase in preference for choosing Jakarta relative to RoWJB.

Kedungsepur in Central Java demonstrates a pattern marked by a decreasing preference for choosing RoCJY — areas surrounding Kedungsepur — to choosing Jakarta during 1995–2010. But the preference of migrants from Kedungsepur for Mebidangro, RoS and Sulawesi relative to Jakarta has increased. Most migrants from Kedungsepur preferred long-distance moves during the past ten years, meaning that the negative effect of distance on migration is not applicable in this case. This pattern also characterised migration from RoCJY, which shows a decreasing preference for choosing Gerbangkertosulisila to choosing Jakarta as a destination and an increasing preference for choosing RoS and Sulawesi to choosing Jakarta. A second example of long-distance migration is migration from RoEJ, the area surrounding Gerbangkertosulisilo, which shows an increasing preference for choosing Mebidangro and RoS relative to choosing Jakarta. A last example of long-distance migration is that of migrants from Mebidangro, who show an increasing preference for choosing Bandung Raya, Kedungsepur, RoEJ and Kalimantan relative to Jakarta, while their preference for choosing RoS relative to Jakarta has decreased.
Chapter 2

The foregoing discussion indicates that migrants who reside in a metropolitan city — in this case, Jakarta — tend to move to the areas close by, in a pattern of sub-urbanisation. But migrants who live far from the central metropolitan areas of Jakarta and Bodetabek tend to move long distances, in a pattern of urbanisation. Another conclusion that can be drawn from the analysis concerns an increasing preference among migrants from the areas surrounding Jakarta — Bodetabek and Bandung Raya — for choosing Jakarta (urbanisation) rather than choosing the adjacent areas of Jakarta and an increasing preference among migrants from the same surrounding areas for choosing regions outside Java rather than choosing Jakarta (metropolitan-to-non-metropolitan migration). The data thus suggest that, in terms of population redistribution phases in Indonesia, three types of migration are in progress: urbanisation, sub-urbanisation and metropolitan to non-metropolitan migration.

Spatial focusing of migration

To explore the extent to which migration in Indonesia is spatially focused, Gini index values are used to analyse the interregional migration system in Indonesia. Table 2.6. shows both the raw and the standardised coefficients for the components of the total flows index for the 1995–2000, 2000–05 and 2005–10 periods.

Despite the fact that unequal migration distribution occurred in all three periods, interregional migration flows in Indonesia became less spatially focused over time; that is, migration selectivity has decreased, with migrants increasingly moving among all possible origins and destinations. Lee’s argument (Lee, 1966) that the volume of migration tends to increase over time, among other reasons because of increasing diversity among different areas, the fact that migration in Indonesia has become more dispersed over time, and the findings of Rogers et al. (2004) that Indonesia has entered the fourth phase of Zelinsky’s mobility transition all indicate that migration as a part of economic and social change is in line with the modernization process. It thus confirms the principal idea of the mobility transition.

Table 2.6. shows that, except for the 1995–2000 period, the Gini indices in the rows are greater than the Gini indices in the columns. This means that out-migration is more spatially concentrated than in-migration. The pattern seems continuous; the standardised values of the Gini index for the rows, reflecting the distributions of places of origin, increase while those for the columns, reflecting the distributions of destinations, decrease. These figures indicate that, over time, migrants are expected increasingly to come from a range of regions but to migrate to particular destination regions. They imply that some regions retain a strong attraction for migrants. This finding is in line with that of Plane and Mulligan for the case of the
Interregional Migration Flows

American migration system in the 1980s. They argued that although their finding was at odds with Ravenstein’s theory (Ravenstein 1885) that each migrant stream tends to generate a counter stream, the relatively small differences in the indices could be due to the differences in the volumes of migration between large and small regions (Plane & Mulligan, 1997). Therefore, it is necessary to explore the regional concentration of in- and out-migration for each specific region.

The Gini indices in Table 2.6. do not reveal the regional concentration of in- and out-migration for each specific region; Gini field indices for each region are calculated and shown in Appendix 2.13. If metropolitan regions show increasingly dispersed out-migration, then metropolitan-to- non-metropolitan migration is occurring. This type of movement could lead to a dispersed metropolitan society characterised by a higher level of social and economic interaction but a lower degree of population concentration relative to those of advanced metropolitan societies (Long, 1985). For more interpretable results, we follow Plane and Mulligan (1997) and present these indices in z-score standardised indices in Figure 2.4.

Following Plane and Mulligan (1997), the figure is divided into quadrants through which a line at a forty-five-degree angle is drawn. This line is used to distinguish outward redistributors from inward redistributors. Regions plotted above this line are called outward redistributors because these regions have larger in-migration than out-migration field indices; out-migration from them is relatively dispersed among destinations, while the origins of in-migration to them are relatively concentrated. Regions plotted below this line are called inward redistributors, meaning in-migration to them is relatively uniform across all origins, whereas out-migration from them is more highly focused on selective destinations.


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Raw index value</td>
<td>Standardized value (%)</td>
<td>Raw index value</td>
</tr>
<tr>
<td>Rows (Out-migration)</td>
<td>0.0462</td>
<td>6.51</td>
<td>0.0453</td>
</tr>
<tr>
<td>Columns (In-migration)</td>
<td>0.0473</td>
<td>6.67</td>
<td>0.0452</td>
</tr>
<tr>
<td>Exchanges</td>
<td>0.0033</td>
<td>0.46</td>
<td>0.0021</td>
</tr>
<tr>
<td>Other flows</td>
<td>0.6126</td>
<td>86.36</td>
<td>0.5883</td>
</tr>
<tr>
<td>Overall total flows</td>
<td>0.7090</td>
<td>86.69</td>
<td>0.6809</td>
</tr>
</tbody>
</table>

*Source: Author’s statistical results*
Chapter 2

**FIGURE 2.4.** Migration Field Gini Index Values, 1995-2000, 2000-2005 and 2005-2010

Figure 2.4 makes possible classification of the regions into consistent outward, consistent inward, inward-to-outward and outward-to-inward redistributor regions. Regions classified as consistent inward redistributors during the whole period under study are Jakarta, Bodetabek, RoWJB, RoCJY and Mebidangro. This is further evidence that Java is the main destination of migration. The fact that Jakarta and Bodetabek remain as major destinations for migrants indicates Jakarta and its surrounding area are still attractive for migrants. However, migrants from Jakarta, Bodetabek, RoWJB, RoCJY and Mebidangro show a high selectivity of destinations; the result is a higher concentration of population in those destination regions.
Migrants from RoCJY, RoWJB and Mebidangro have a high preference for migrating to Jakarta, while migrants from Jakarta have a high preference for migrating to Bodetabek.

During the 1995–2010 period, three regions were consistently outward redistributor regions — namely Kedungsepur, Gerbangkertosusila and Kalimantan. These three regions have larger in-migration than out-migration field indices, meaning that the origins of in-migration to these regions are relatively more highly focused, whereas out-migration from them is relatively uniform across all destinations.

Bandung Raya and RoI are the regions which changed from inward redistributor to outward distributor regions between 1995–2000 and 2005–10. In fact, Bandung Raya and RoI are more likely to be outward redistributors over time, meaning that migrants who migrated to Bandung Raya and RoI mainly came from selected regions, while out-migration from these regions disperse to various destinations. RoEJ and Sulawesi, on the other hand, changed from outward redistributor to inward redistributor status over time. Migrants from RoEJ and Sulawesi became more selective in choosing their destinations over time, while in-migrants to these regions came from a range of places of origin.

Following Plane and Mulligan (1997), we also classified the regions plotted outside the small boxes in the centre of the three graphs in Figure 2.4. into regions with focused fields, regions with broad fields and pure outward redistributor regions. The regions plotted outside the box are the regions with index values — Gini indices in z-score standardised indices — greater than one standard deviation above or below the mean.

Regions with focused fields characterised by two positive indices are Mebidangro and Bodetabek, meaning that these regions have spatially focused destinations for their out-migrants and spatially focused source regions for their in-migrants. As shown in the previous section, migrants from Bodetabek mostly migrate to Jakarta, and migrants from Jakarta mostly migrate to Bodetabek. Migrants from Mebidangro mostly migrate to RoS and migrants from RoS mostly migrate to Mebidangro.

Regions with broad fields characterised by two negative indices are RoCJY, Kalimantan and RoI. They show substantially below-average spatial focusing. One region with positive index of in-migration and negative index of out-migration is Gerbangkertosusila. Gerbangkertosusila has strongly focused sources of in-migrants but a moderately broad out-migration field. Thus it can be called a “pure” outward redistributor of population.
Chapter 2

The fact that some regions outside Java — that is, RoS, Kalimantan and RoI — are outward redistributor regions sending migrants to almost all possible destinations and receiving migrants only from selected regions, and that Jakarta, Bodetabek, RoWJB, RoCJY and RoEJ, all located on Java, are inward redistributor regions, shows that Java is still the main migration destination. That migrants from Java only migrated to a number of particular destinations, as indicated by out-migrant Gini indices that are high relative to in-migrant Gini indices, results in an increasing concentration of population on Java. This effect is compounded by the migration from RoWJB and RoCJY, which tends to be directed towards Jakarta, and by migration from Jakarta, which is more likely to be directed towards Bodetabek.

2.5. Conclusion

This study investigates interregional migration in Indonesia in terms of metropolitan and non-metropolitan migration in a population redistribution context. We found indications of a Java-centric pattern of interregional migration in Indonesia, in which Java remains the main destination of migration. This pattern is due to a high preference for metropolitan areas on Java, especially Jakarta. Despite some new metropolitan area formation, the gravitational pull of Jakarta, its surroundings and other metropolitan areas on Java in attracting migrants remains high. The attraction of metropolitan areas on Java is such that distance is not a significant obstacle to migration to Java.

Analysis of the three-way interaction parameters (migrant status-origin-time, \(v_{\text{OT}}\)) confirmed our idea that migration propensities increase consistently over time. They are also in line with Lee’s theory that the rate of migration tends to increase over time, as do regional differences in the volume and rate of migration because of different trajectories of regional development (Lee 1966, p. 53). The regions that consistently show an increase in migration propensities are Jakarta, Bodetabek, Bandung Raya, RoWJB, Kedungsepur, RoCJY, Gerbangkertosusila, RoEJ and Sulawesi. When levels of development are taken into account, there is a positive relationship between the propensities for migration and the level of development. Metropolitan areas—Jakarta, Mebidangro, Kedungsepur, Bandung Raya, Gerbangkertosusila—generally have higher migration propensities than the surrounding areas and non-metropolitan areas. This finding supports the notion that several metropolitan cities in Indonesia have entered the fourth phase in Zelinsky’s mobility transition, characterised by vigorous inter-urban movement. Three types of migration related to population redistribution are under way in Indonesia, reflecting the phases of urbanisation, sub-urbanisation and metropolitan-to-non-
metropolitan migration. Examples of the urbanisation phase are migration from RoCJY and RoEJ to RoWJB and migration from RoEJ to Gerbangkertosusila. Migration from Mebidangro to RoS and from Jakarta to Bodetabek are examples of sub-urbanisation, while migration from Jakarta to RoI can be labelled as a metropolitan-to-non-metropolitan movement.

In general, we may conclude that Indonesia is currently in a phase of over-urbanisation. Indications of sub-urbanisation and metropolitan-to-non-metropolitan migration are still weak; the country shows a high preference for metropolitan regions and a high out-migration Gini index for metropolitan areas, which will cause population density on Java to increase. Although the percentage of the population living on Java has declined since the 1930s, population density there has actually increased (Wajdi 2010).

The population redistribution framework proposed by Long (1985) does not seem sufficient for explaining migrant movement patterns. The fourth phase in this framework is said to occur when a society has good links to technology and international trade but at the same time has a limited infrastructure of transportation networks and commercial organisation. In fact, in terms of infrastructure, Jakarta has several alternative forms of public transport allowing for commuting. In addition, migration from large metropolitan areas to small metropolitan areas and vice versa are not incorporated in Long’s framework. But this type of migration flow has been typical of Indonesia in the past decade — migration from, for example, Mebidangro to Jakarta, from Bandung to Bodetabek and from Gerbangkertosusila to Jakarta.

This article has not incorporated socio-demographic factors such as age, sex or education level in its exploration of migration propensities to particular areas. It is also necessary to consider the places of birth of migrants to see if they migrate directly from those places to given destination areas or to other places first. These matters await further research.
Chapter 2

2.6. References


Interregional Migration Flows


Chapter 2


Interregional Migration Flows


