The Regional Concentration and Connectedness of Indonesia's Inter-Provincial Migration Flows, 1971-2010

Background

Internal migration has become a prominent element in shaping population redistribution and capturing potential economic corridor in Indonesia. It is evident that some provinces have been attributed as the main donor of migrants while other provinces are popular as destinations for many migrants over decades. In addition, flows of migrants from specific origin destination can be a robust indicator to measure regional connectedness. To date, studies on the regional concentration and connectedness mostly rely on the presence of natural resources in the areas and put little attention to the population movements. This study likes to fill that gap.

Various studies on inter-provincial migration in Indonesia focused extensively on the characteristics of migrants (Firman, 1999; Hamid, 1999; Hugo, 2000; McDonald et al., 2010; Muhidin, 2003) and exposed boldly that Java used to be the pot for educated people who look for jobs and provide friendly atmosphere for female migrants. However, all studies do not provide comprehensive information on the connectedness across provinces which actually the most factor on facilitating people to migrate. The objective of this study is to observe flows of people across provinces over 1971-2010, specifically to measure the level of provincial concentration and structural patterns of inter-provincial migration in Indonesia. It is important to conduct this study because it can help us to understand the key driver of migration behaviour and identify unique patterns.

Data

This study uses five consecutive Indonesian population censuses, from 1971 to 2010. Unit of analysis is individual age five years above. An individual is classified as a migrant if his place of residence five year prior to the census is different from his place of residence during the census is conducted. Next, it is important to highlight that since 2000, there are several new provinces were born. In 1971, there were 26 provinces found in Indonesia, but then the number or provinces increases to 33 provinces in 2010. Therefore, for the sake of analysis, the new provinces will be grouped to their old provinces so in total there will be 26 provinces in the analysis.

Method

Rogers and Sweeney (1998) proposed that concept of spatial concentration of inter-regional migration flows can provide a picture of geographical concentration. Related to this study, spatial

concentration of inter-provincial migrations can be articulated on how migrant population which are originated from different provinces distribute themselves across destination provinces. This study will use Coefficient of Variation (CV) in its analysis. The CV measures the variability of a series of number independently of the unit of measurement used for these numbers. Statistically, CV is defined as the ratio of the standard deviation associated with each region's outflows (inflows) by the corresponding average flow value. It can be expressed in the following equation:

$$CV_i = \sqrt{\frac{\sum(x_{ij} - \bar{x})^2}{n-1}} \Big/ \bar{x}$$

Where CV_i is the coefficient of variation index for province i, x_{ij} is the number of migrants from province i to province j, $\bar{x}$ is the mean of the total number of migrants, and n is the number of provinces involved for calculation. An aggregate system-wide index (ACV) may be found by a weighted summation of regional outflow CVs (or inflow CVs) in which the weights reflect the relative sizes of the total regional flows that are being summed (Rogers & Sweeney, 1998).

In relation to the inter-provincial connectedness, the multiplicative components are useful to identify the structures in the migration pattern (Raymer, Bonaguidi, & Valentini, 2006). Adopted mostly from Raymer's work (Raymer, Abel, Disney, & Wisniowski, 2011; Raymer, et al., 2006; Salzmann, Edmonston, & Raymer, 2010), the multiplicative component model for an origin-destination specific table of migration flows is as follows:

$$n_{ij} = (T)(O_i)(D_j)(OD_{ij}), i \neq j$$

Where n_{ij} is an observed flow of migration from region i to j. The above model consists of four components. T is the total number of migrants (n_{++}) and is noted as an overall components. There are two main effect components, namely the origin components O_i and the destination component D_j which represent the proportion of migrants from each origin and to each destination. These two main effects representing the push and pull factor from each regions. The last component is a two way interaction between a specific origin and destination, OD_{ij} which represents the ratio of observed to expected migration. If the ratio is greater than one, there is a strong of connectedness between two specific regions, and or otherwise.

Inter-provincial concentration

Table 1 exhibits the weighted CV field indices for both in- and out-migration over five time periods. It is seen that the overall inter-provincial migration flows is increasing from 1971 to 2000, translating into a greater spatial concentration of migration flows. An increase of system-wide solely caused by an increase of the in-migration CV field indices, while the out-migration field indices remain. Thus, it

can be said that in the beginning of the time period, migrants were potentially coming from a larger number of origins than that in the 2000. The provincial concentration of migration flows for the whole migration system decreased slightly in 2010. Such decreased solely as the caused by the reduction of the In-migration CV field indices, while out-migration CV field indices at the same time experienced a moderate increase. This situation pointed out that in-migrants were drawing from a greater number of origins while out-migrants had lesser diverse destinations choice.

Table 1 ACV field indices of Inter-provincial migration

Year	Out-migration ACV	In-migration ACV	System-wide ACV
1971	2.02	2.09	4.11
1980	2.15	1.95	4.10
1990	2.02	2.14	4.16
2000	2.09	2.20	4.30
2010	2.15	2.12	4.27

In 2010, the CV value of Sulawesi Selatan was constant at the level of 1.63, slightly lower than the total average. There are seven provinces that have CV value for out-migration far above the average, namely DI Aceh (2.02); Sumatera Utara (2.65); DKI Jakarta (3.55); Jawa Barat (2.05); Jawa Tengah (2.00); Kalimantan Tengah (2.63); and Kalimantan Timur (2.16). In terms of CV values for in-migration, Sulawesi Tenggara, Jawa Timur and Bali stood out as the top three of the highest CV values, accounted for 2.83; 2.69; and 2.62 respectively in 1995-2000. In contrast, the lowest CV value for in-migration is found to be Sulawesi Selatan, with the value was less than one point.

Inter-provincial connectedness

The origin main effect component of inter-provincial migrations over five periods has shown that Jawa Tengah has high contribution in out-migration over the years. The share of it out-migration rocketed from 19 per cent in 1971 to 26 per cent in 1980, slightly decreased 23 per cent in the next period and remained stable at 20 per cent over the last two periods. With regards to destination main effect component, DKI Jakarta and Jawa Barat dominated the patterns. In 1971 DKI Jakarta experienced a great percentage on the number of in-migrants coming to this province, the figure was 28 per cent. Then the figure substantially decreased and reached 13 per cent in 2010. A reversed patterns however shown by Jawa Barat, in which the number of in-migrants drawing by this province increased considerably from 10 per cent in 1971 to 28 per cent in 2000 and then slightly reduced to 27 per cent in 2010.

Later, It is observed that provinces in java absorbed migrants from Jawa Tengah. Thus, it can be said that their strong connectedness between Jawa Tengah and provinces in Java, perhaps due to close

distance between provinces. In the beginning of the periods, there were number of out-migrants from Jawa Tengah found in several provinces in Sumatera and Kalimantan, reflecting the impact of transmigration on the connectedness across provinces. In the contrary, there was weak connectedness between Jawa Tengah with provinces in Sulawesi, Maluku and Papua

Conclusion

The weighted CV values for in-migration are bigger than that of out-migration, accounting for a lesser number of origins of migrants in 1971. The opposite situation is found in 2010, reflecting that destination choices of migrants are getting concentrated. The structural patterns of inter-provincial migrations flows can provide knowledge on the level of connectedness across provinces. The overall findings suggest that distance does matter in inter-provincial migration flows in Indonesia. But, it seems that other factor such as historical setting could contribute to the connectedness across provinces.

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