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Analysis of Urbanization in Indonesia using village census

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Background of objectives:

The main purpose of this project is to construct our original Indonesian urban area dataset, and investigate the impact of urbanization on welfare level of Indonesian people and productivity of companies.

Indonesia has experienced ongoing urbanization, and it is estimated that over half of its population now lives in urban areas. The number of Indonesian urban population is estimated by Indonesian statistical office (BPS). BPS collects village/town level census data every three year, and calculates urban index for each community using population density, share of non-agricultural households, and amenity such as number of hotels, hospitals, schools and the like). Then, if villages have the index of 10 and over, those villages are defined as "urban" (see Figure 1).

This index give us a useful and important information, though it has problems too. One of the largest problem is that the index lacks information about the degree of agglomeration. For developed countries, we have urban area data such as Standard Metropolitan Statistical Area (SMSA) of United States, which take into consideration the connectivity of cities in an area. If we see the literature of urbanization, almost all quantitative analysis use this kind of more informative urban area dataset to estimate the effect of urbanization on productivity, welfare of residents and so on, though we have almost no data of this kind for developing countries. For example, if we turn our eyes to those analysis on urbanization in Indonesia, they usually only use the BPS defined urban/rural dichotomous variable, which makes it difficult to do an insightful research because of little information of the degree of agglomeration.

Brief summary of the project:

This project consists of two parts. First, we construct our original Indonesian urban area dataset from population census data of 2000 and 2010 (*Sensus Penduduk*), as well as village level map data of 2012 (*Peta Digital*). We follow the definition of OECD (2012) to construct the urban area dataset. We calculate the population density of each community, and then, identify contiguous highly-dense areas with total population of more than 100 thousand people. According to our estimate, Indonesia had 76 urban areas in 2000, and the number grew to 86 in 2010 (see Figure 2).

Second, we have two papers after constructing the urban area dataset. A paper titled "Human Capital Externalities in Indonesia" (IDE Discussion Paper No.XXXX) investigates the urbanization effects of human capital agglomeration on plant level productivity. After we merge the urban area dataset with Indonesian manufacturing plant-level panel data (*Industri Besar dan Sedang*: IBS) for 1996 and 2006 by village level information, we estimate the external benefits of human capital agglomeration. The external benefits are identified through the relationship between wage per worker of plants in cities and the city-level agglomeration of human capital, after controlling for worker's skill level, plant fixed effects, and time-varying industry fixed effects.

Our preliminary findings suggest that the degree of human capital externalities depends on urban population size, and the externalities do not occur in too large or too small cities. In the case of Indonesian manufacturing industry, the evidence of human capital externalities is observed in cities with a population of 500 thousand or more and less than 1500 thousand (Metropolitan Area), though our instrumental variable (IV) approach failed to show the causal relation because of a weak correlation between the share of highly educated workers and the instrument we used.

Another paper titled "The Causal Effect of Urbanization on Rural Poverty Reduction: Quasi-Experimental Evidence using Indonesian Urban Area Data" (IDE Discussion Paper No.XXXX) analyzes the effects of population urbanization on poverty reduction. We utilize earthquakes in 2006, which hit one of the largest urban areas in Indonesia, as natural experimental events in order to estimate the causal relation between the urbanization and the change in welfare level of rural village households. After we merge our original Indonesian urban area dataset with a longitudinal household panel dataset (IFLS) covering the period of 2000 to 2007/2008, as well as a village level census data (Podes) of 2008 which collected the earthquake information of 2005/2006, we estimate by the instrumental variable approach.

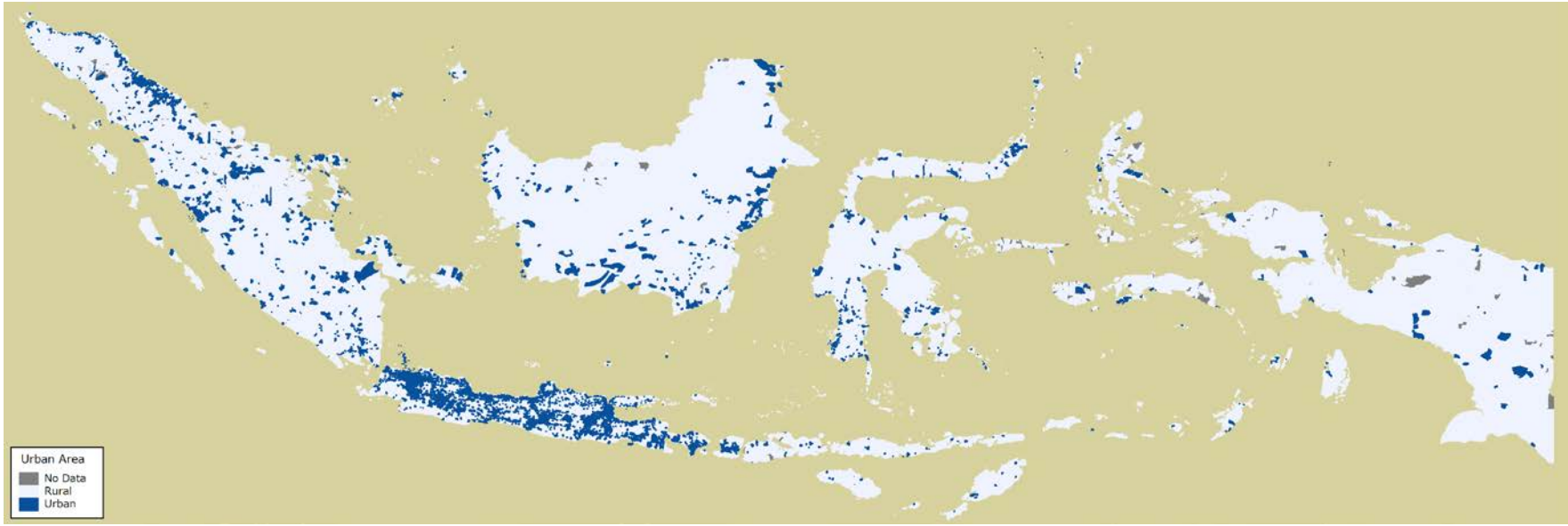
We find that an effective market size growth as an index of population urbanization leads to increase in per capita expenditure of households in rural villages, especially that of the poor. In addition, our analysis shows that the increase in welfare

of rural village households is mainly brought about by the rise in farm business profit, on the other hand, we indicate that the increase of per capita total income for the poor households came mainly from the non-farm business profit.

Reference

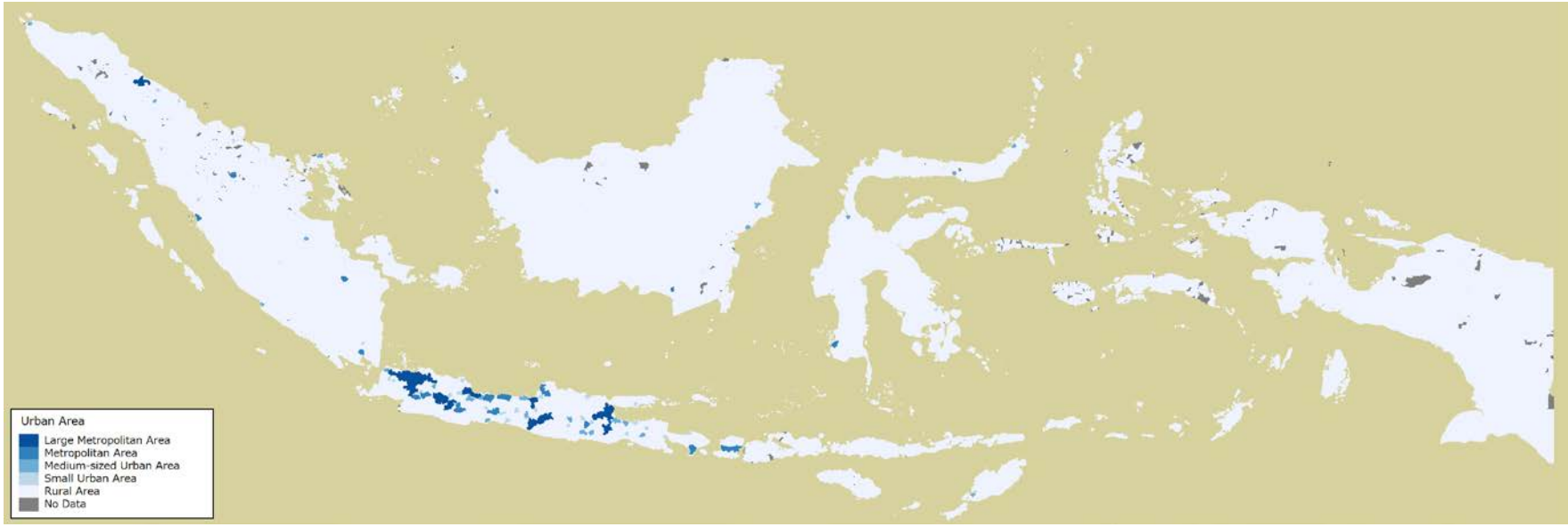
OECD 2012. Redefining ”Urban”: A New Way to Measure Metropolitan Areas. OECD Publishing, Paris.

Figure 1: Urban Communities in Indonesia (2010)



Notes: In 2010, Indonesia had around 77.5 thousand communities, 20.7% of which was "urban" if we employ the dichotomous definition of the BPS.

Figure 2: Urban Areas in Indonesia (2010)



Notes: Indonesia had nine Large Metropolitan Areas (total population above 1.5 million), 17 Metropolitan Areas (500,000-1.5 million), 25 Medium-sized Urban Areas (200,000-500,000), and 35 Small Urban Areas (100,000-200,000) in 2010.