Urbanization & Labor Productivity in Indonesia
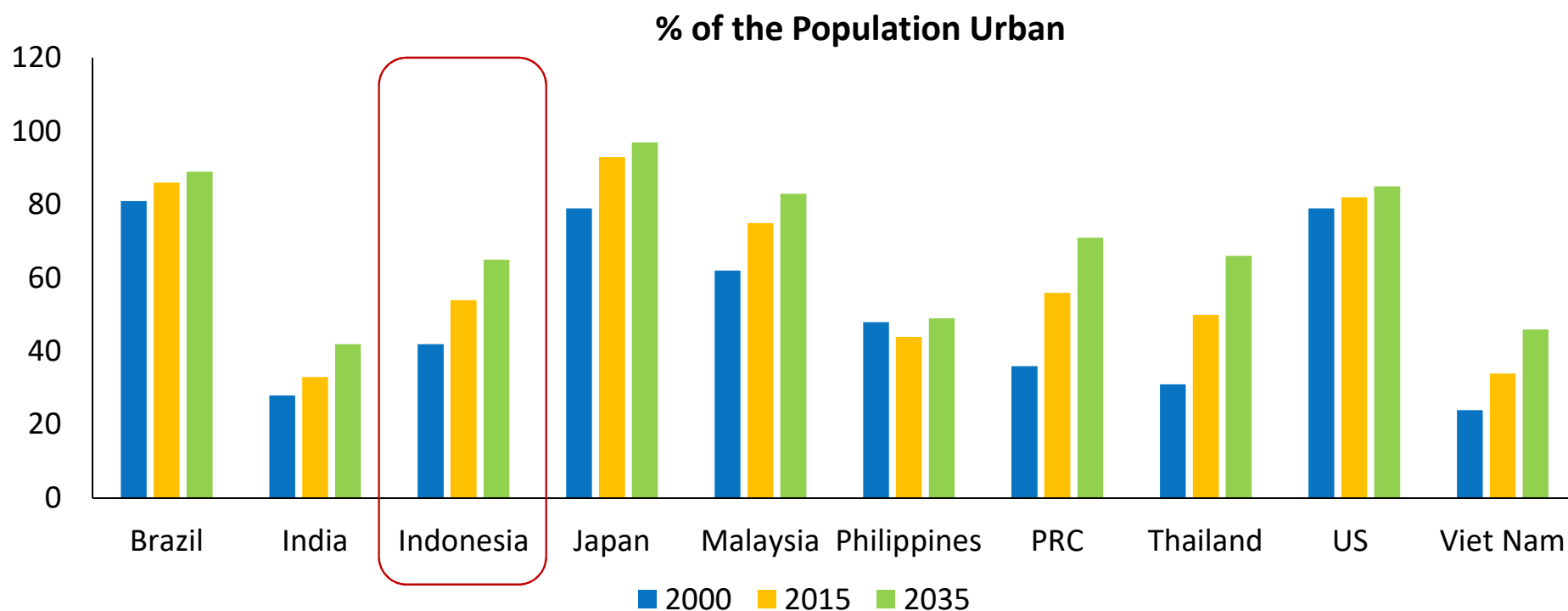
Zulfan Tadjoeddin (*Western Sydney University*)
Valerie Mercer-Blackman (*Asian Development Bank*)

Forum Kebijakan Ketenagakerjaan (FKK)
SMERU Research Institute, Jakarta, 24 July 2018

60% of Indonesia's population will be living in urban enclaves by 2035

% of the Population Urban

Legend: ■ 2000 ■ 2015 ■ 2035

Categories: Brazil, India, Indonesia, Japan, Malaysia, Philippines, PRC, Thailand, US, Viet Nam
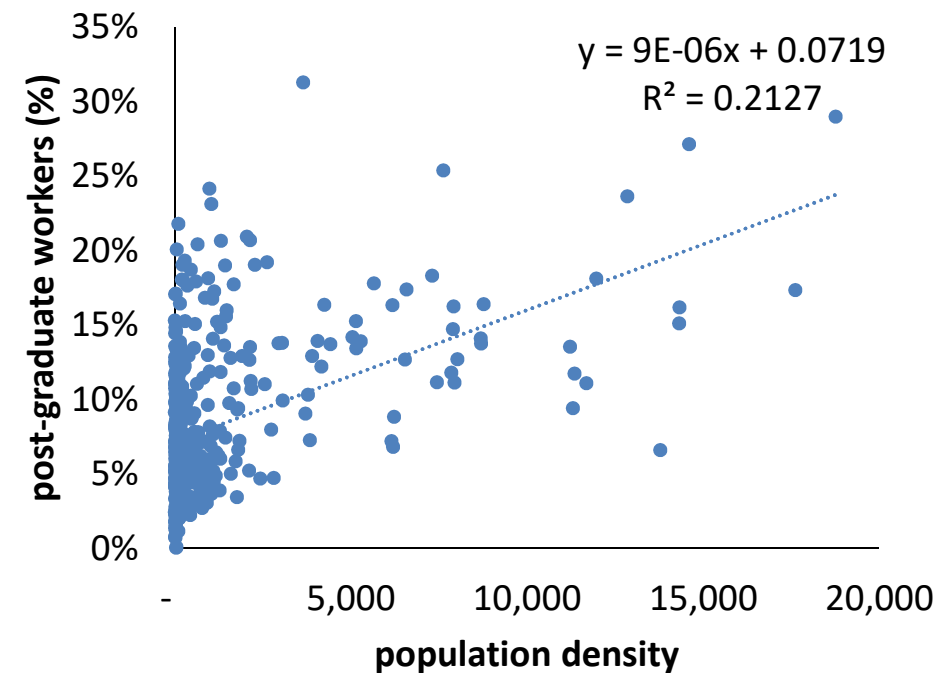
Sources: Indonesia: BPS (2014); all other countries: UN DESA (2015 and 2014)
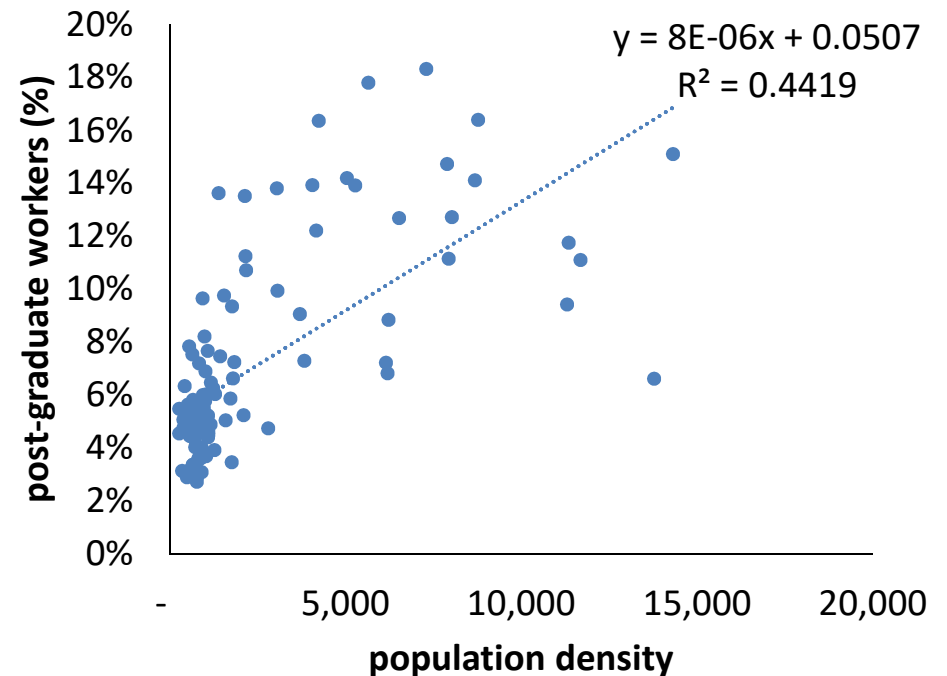
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Agglomeration is positively correlated with a higher share of well-educated workers

**Relationship Between Agglomeration and
High-Skilled Human Capital**

a. Indonesia

$y = 9E\text{-}06x + 0.0719$

$R^2 = 0.2127$

post-graduate workers (%)

population density

b. Java

$y = 8E\text{-}06x + 0.0507$

$R^2 = 0.4419$
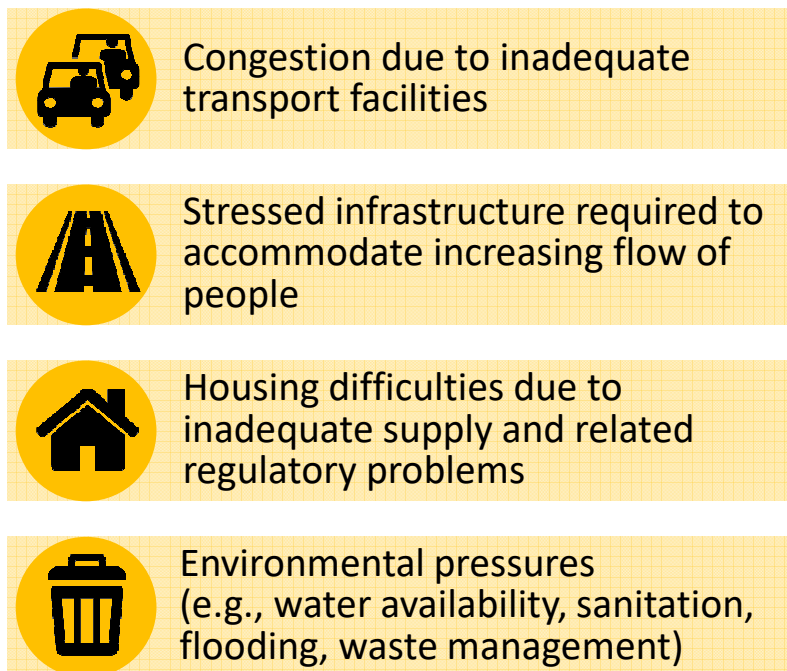
post-graduate workers (%)

population density

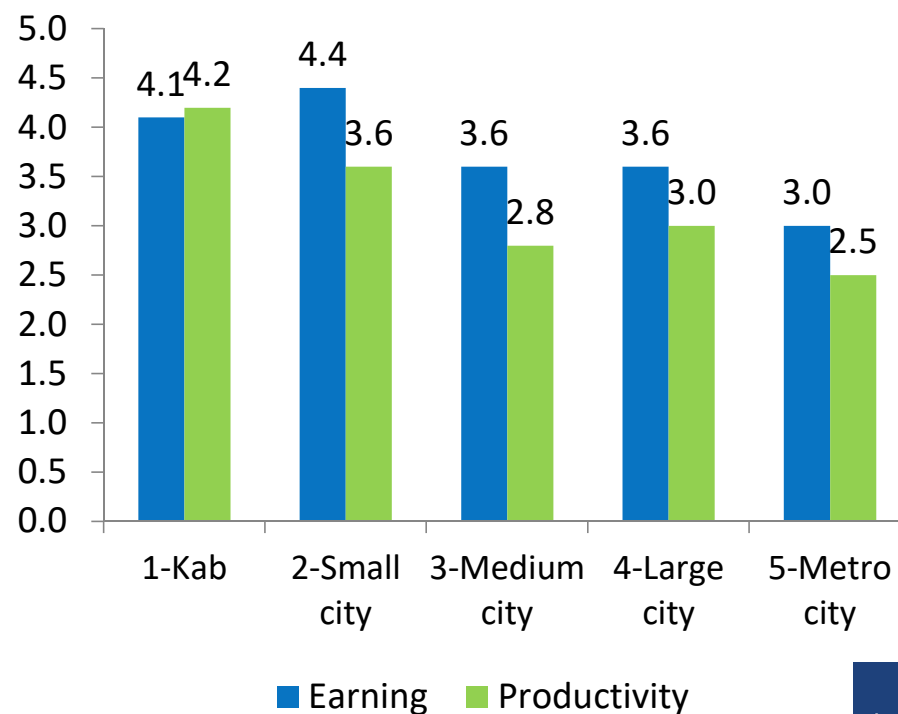Note: Java covers 108 districts
Source: Authors

But benefits of urbanization are overwhelmed by structural problems (left), thus contributing to lower productivity gains especially in large cities (right)

Structural Problems Associated with Urbanization

Congestion due to inadequate transport facilities

Stressed infrastructure required to accommodate increasing flow of people

Housing difficulties due to inadequate supply and related regulatory problems

Environmental pressures (e.g., water availability, sanitation, flooding, waste management)

Average Annual Growth of Productivity and Wage Earnings, 2007–2014 (%)

Category	Earning	Productivity
1-Kab	4.1	4.2
2-Small city	4.4	3.6
3-Medium city	3.6	2.8
4-Large city	3.6	3.0
5-Metro city	3.0	2.5

■ Earning ■ Productivity

Sources: Cervero (2014); Monkkonen (2013); Firman (2009); Jago-on et al (2009)

Kab = Kabupaten
Source: Calculations using BPS data.

ADB

Medium-sized cities show the largest productivity gains from more schooling…

Productivity Modeled as a Function of Wages, Education, and Population

Variable	CLASSIFCATION OF DISTRICTS BASED ON % OF VILLAGES URBAN, AND ALL URBAN DISTRICTS (KOTA)						DIFFERENT GROUPS OF KOTA		
	Kabupaten				Kota	ALL	Provincial Capital	Kota - medium	Kota – others
	Kab1	Kab2	Kab3	Total Kab					
	(urban <25%)	(25%≤urban <50%)	(urban≥50%)	(All districts)	(All muni)			(100K ≤ pop < 500K)	(small, large, metro)
log real wages	.117***	.33***	.423***	.17***	.367***	.191***	.456***	.395***	.351***
log schooling	.18***	.532***	-0.143	.199***	.658***	.204***	.867**	1.2***	0.241
log pop. density	.397***	.426***	0.148	.42***	0.083	.413***	-0.202	-0.135	.223*
constant	1.32***	-0.261	2.2**	.93***	1.1*	.745***	2.61**	1.33	1.09
No. of obs	1984	936	272	3192	784	3976	256	448	336
No. of groups	248	117	34	399	98	497	32	56	42
F	58.29	100.19	19.15	126.61	79.69	176.52	23.22	48.23	34.33
prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.0917	0.2692	0.1965	0.1198	0.2593	0.1322	0.2397	0.2711	0.2614

Kab1 = kabupaten with less than 25% urban population, kab 2 = kabupaten with urban population of 25%–50%), kab3 = kabupaten with urban population higher than 50%, kabupaten = predominantly rural district, obs = observation(s) Note: ***, **, and * indicate 1%, 5%, and 10% levels of significance, respectively

...As well as the largest positive effect of population density on wages
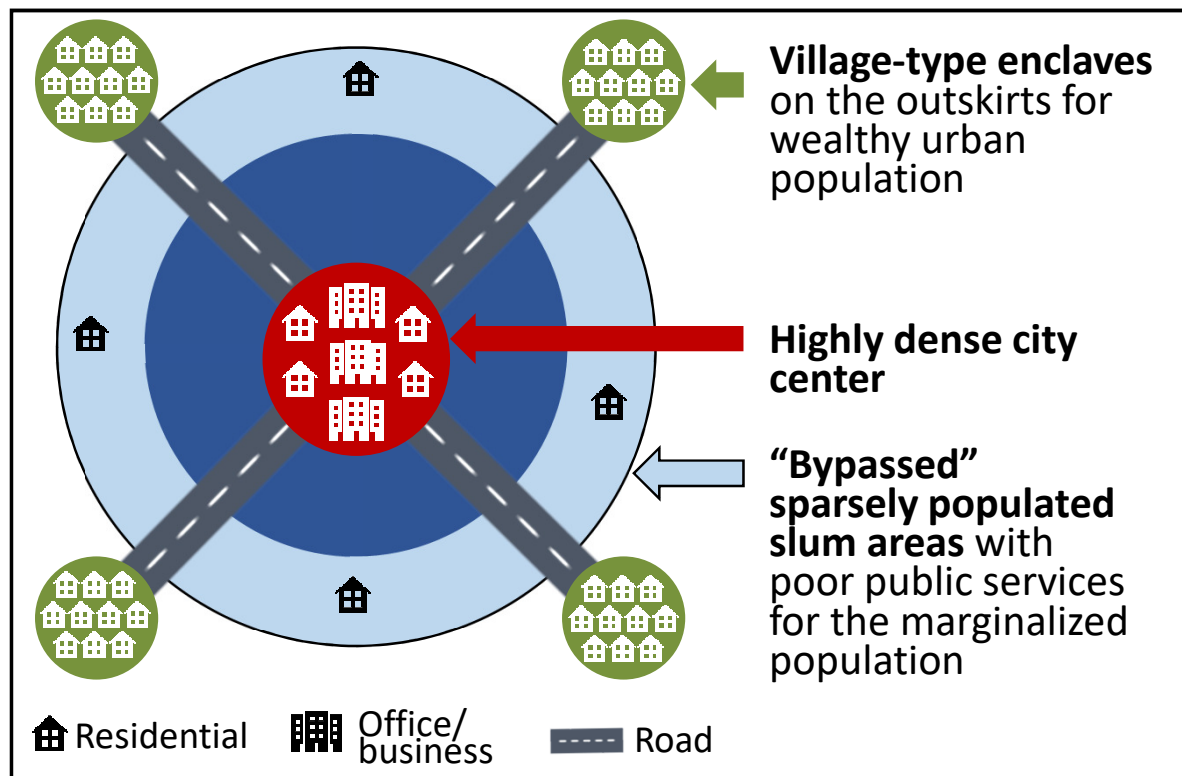
Wages Modeled as Function of Productivity, Education, Unemployment Rate, and Population Density

Variable	CLASSIFCATION OF DISTRICTS BASED ON % OF VILLAGES URBAN, AND ALL URBAN DISTRICTS (KOTA)						DIFFERENT GROUPS OF KOTA		
	Kabupaten				Kota	ALL	Provincial Capital	Kota - medium	Kota – others
	Kab1	Kab2	Kab3	Total Kab					
	(urban <25%)	(25%≤urban <50%)	(urban≥50%)	(All districts)	(All muni)			(100K ≤ pop < 500K)	(small, large, metro)
log prod.	.159***	.39***	.305***	.22***	.365***	.241***	.273***	.369***	.374***
log school	9.30E-03	0.075	.927***	0.024	.508***	0.031	0.377	-0.246	1.06***
log unemployment rate	-.061***	-.073***	3.80E-03	-.064***	-.047***	-.068***	-0.024	-0.035	-.065**
log pop. density	0.044	.211**	.699***	.112**	.553***	.169***	.813***	.928***	.242*
constant	1.9***	-0.055	-5.27***	1.29***	-4***	.878***	-5.42***	-4.98***	-2.97***
no of obs	1984	936	272	3192	784	3976	256	448	336
no of groups	248	117	34	399	98	497	32	56	42
F	24.15	63.49	42.85	66.28	98.57	107.92	47.6	58.21	46.73
prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
R^2	0.0528	0.2376	0.4228	0.0868	0.3663	0.1105	0.4639	0.375	0.3919

Kab1 = kabupaten with less than 25% urban population, kab 2 = kabupaten with urban population of 25%–50%), kab3 = kabupaten with urban population higher than 50%, kabupaten = predominantly rural district, obs = observation(s) Note: ***, **, and * indicate 1%, 5%, and 10% levels of significance, respectively

Indonesia's cities: manifestations of urban sprawl

Urban Sprawl in Megacities

Village-type enclaves on the outskirts for wealthy urban population

Highly dense city center

"Bypassed" sparsely populated slum areas with poor public services for the marginalized population

🏠 Residential   🏢 Office/business   - - - - Road

Manifestations:

High-income earners live either in Central Jakarta or in outskirts and commute long distances to city center

High-skilled services are concentrated in dense city centers while basic services are in the areas immediately surrounding them

Note: Blue and lighter denotes less population density. Red denotes high population density including high-rise buildings, Green is mostly residential.
Source: authors representation based on Brueckner (2011)

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Manifestation 1: High-income earners live either in Central Jakarta or in outskirts and commute long distances to city center

Ave. District per Capita Income and Population Density in the Three-Province Area Surrounding Central Jakarta
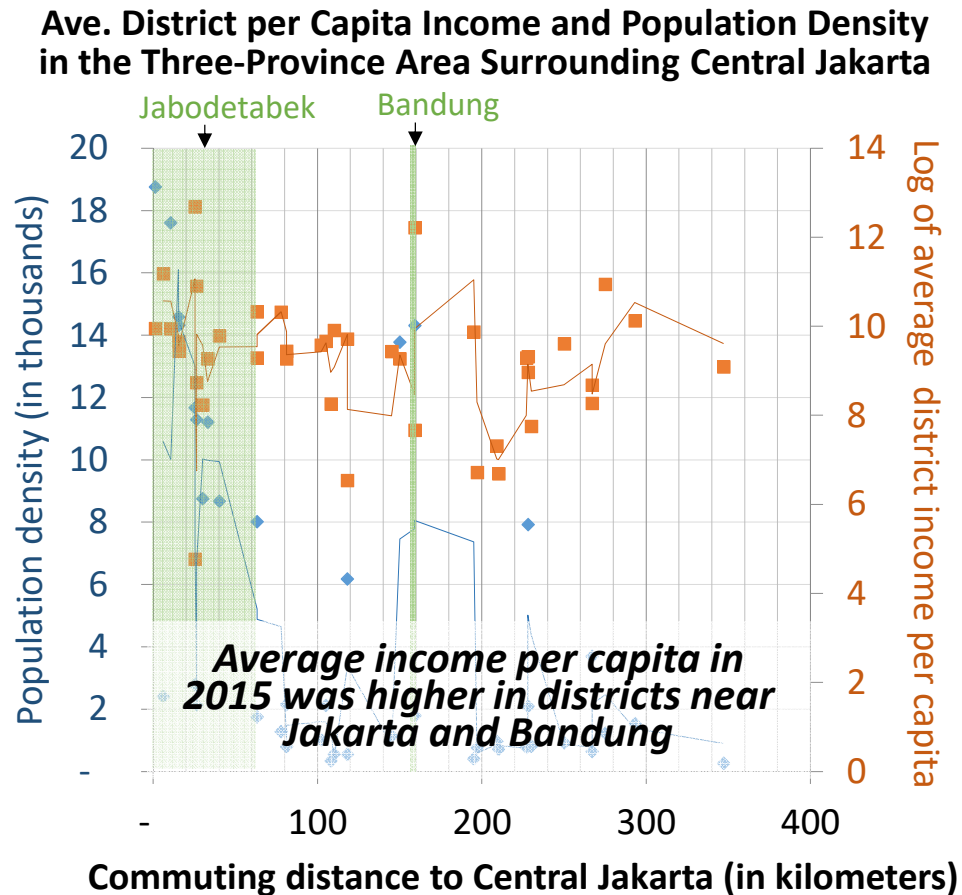
Wage Income in Relation to Distance for Districts Contiguous to Central Jakarta
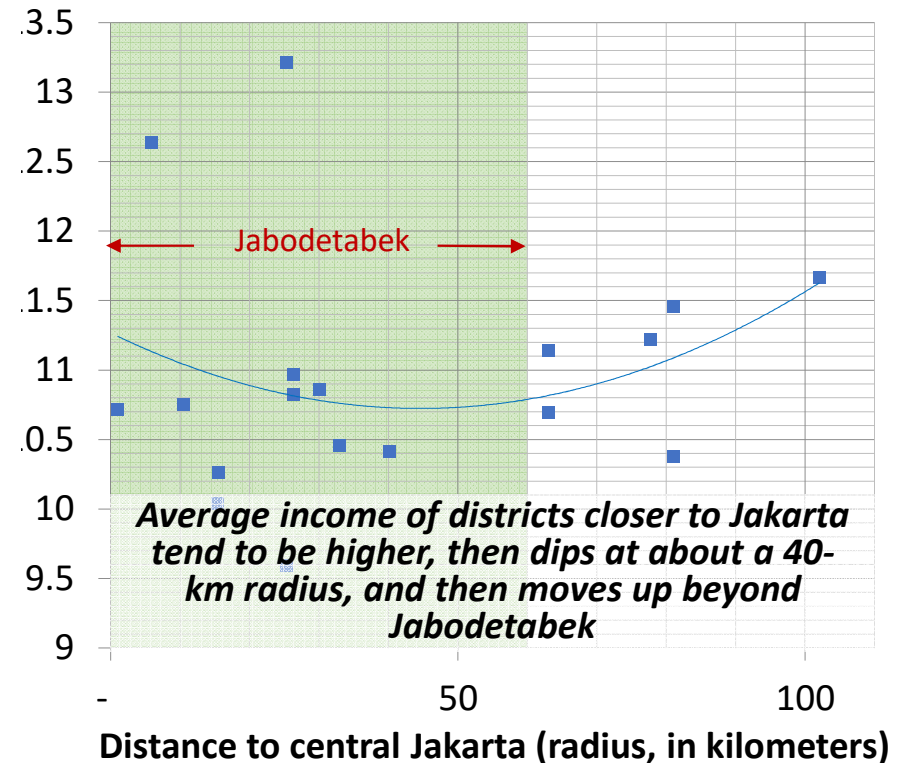
GDP = gross domestic product, Jabodetabek = Greater Jakarta, km = kilometer.. Note Horizontal axis shows driving distance from Jakarta's epicenter to district center.
Sources: BPS (various years) and authors' calculations.

Manifestation 2: Concentration of high-skilled services in city centers

Shares of Services Sector Employment in Total, Jakarta, and Selected Regions (%), Complexity-augmented Augmented by the SCI

| Services sectors ranked by services complexity index (SCI)	Jakarta	Java excluding Jakarta	Jakarta and Contiguous Provinces	Java excluding Jakarta and Contiguous Provinces	Indonesia
Financial intermediation	16.7	3.5	6.5	3.5	4.1
Business activities	5.1	1.1	2.3	0.9	1.2
Storage & comm.	3.9	0.9	1.6	0.9	1.1
Transportation	4.9	3.8	5.3	2.8	3.9
Trade	27.6	22.7	26.0	21.0	21.3
Real estate activities	0.7	0.1	0.3	0.1	0.1
Hotels and resto.	0.8	0.4	0.6	0.4	0.4
Construction	0.3	0.3	0.3	0.3	0.3
Weighted manu. share	*16.9*	*39.8*	*36.3*	*38.1*	*36.2*
Weighted services share	*60.0*	*32.8*	*43.0*	*29.8*	*32.4*

● *High-skilled service in city centers*

● *Low-skilled activities in and around large cities cater to wealthy individuals and provide support to high-end services*

● *Manufacturing production is more evenly spread out geographically*

Comm. = communication; manu. = manufacturing; resto. = restaurants; trade = wholesale & retail
Notes: The SCI averages 1 if each worker in each sector is equally skilled. If a sector requires more skills (a higher SCI), the weight will be greater than 1. For manufacturing it is multiplied by the PCI. Contiguous provinces" relates to Banten and West Java. All three provinces have districts located within a 150-km radius of the Jakarta city center. It is not possible to disaggregate at the more detailed district level the economic activities in those provinces. *Source: Authors' calculations based on BPS (various years), National Labor Force Survey (SAKERNAS)*

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Policy Recommendations: Create incentives for economic activity to move out of the metropolis and settle in more livable urban areas
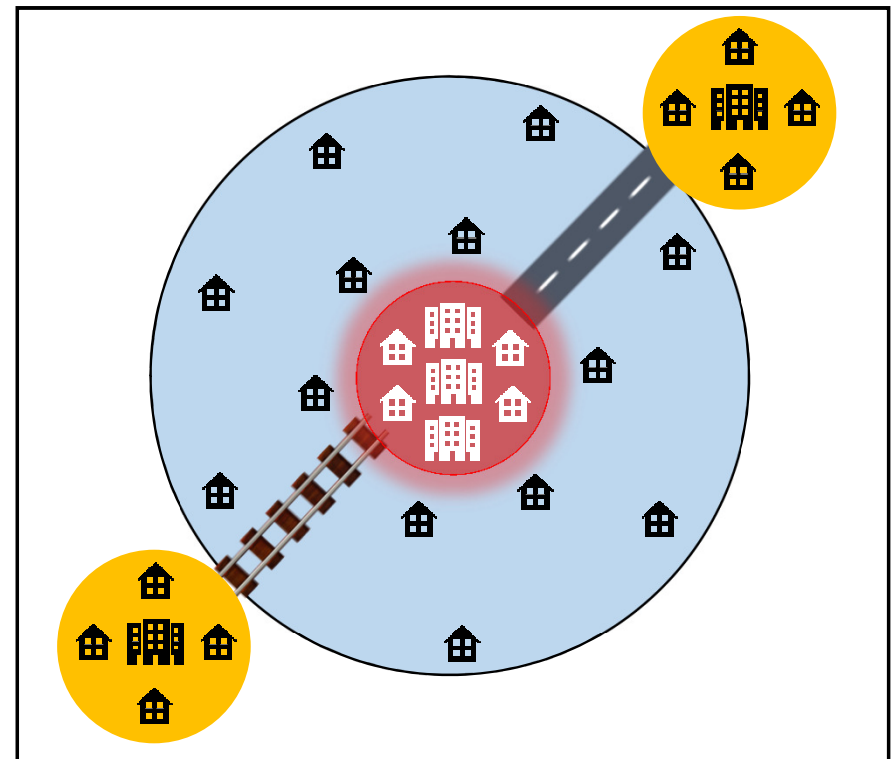
Urban Sprawl
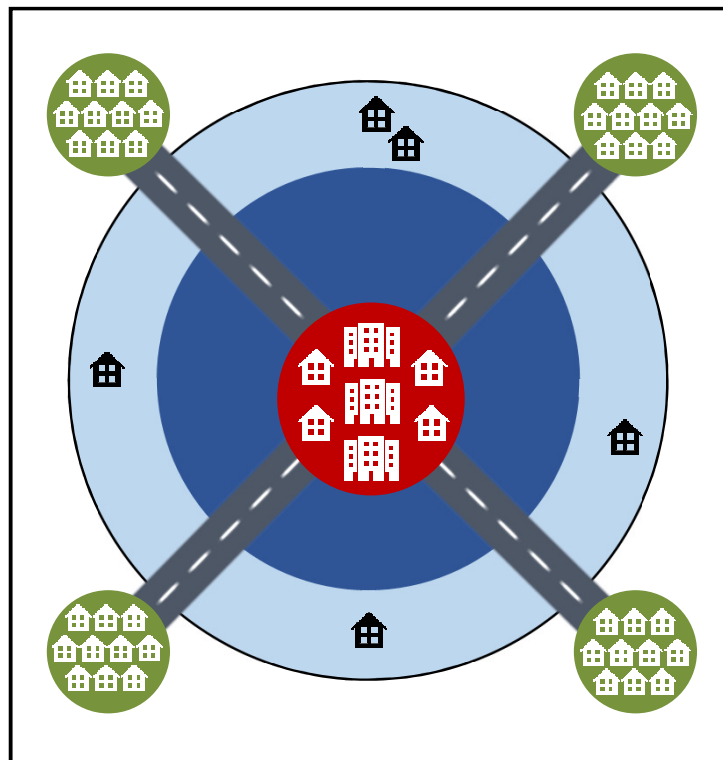
Partial Solution

Land expansion grows faster than commuting costs, population, income, and agricultural rent—creating a "**donut shape**" of low population density
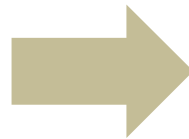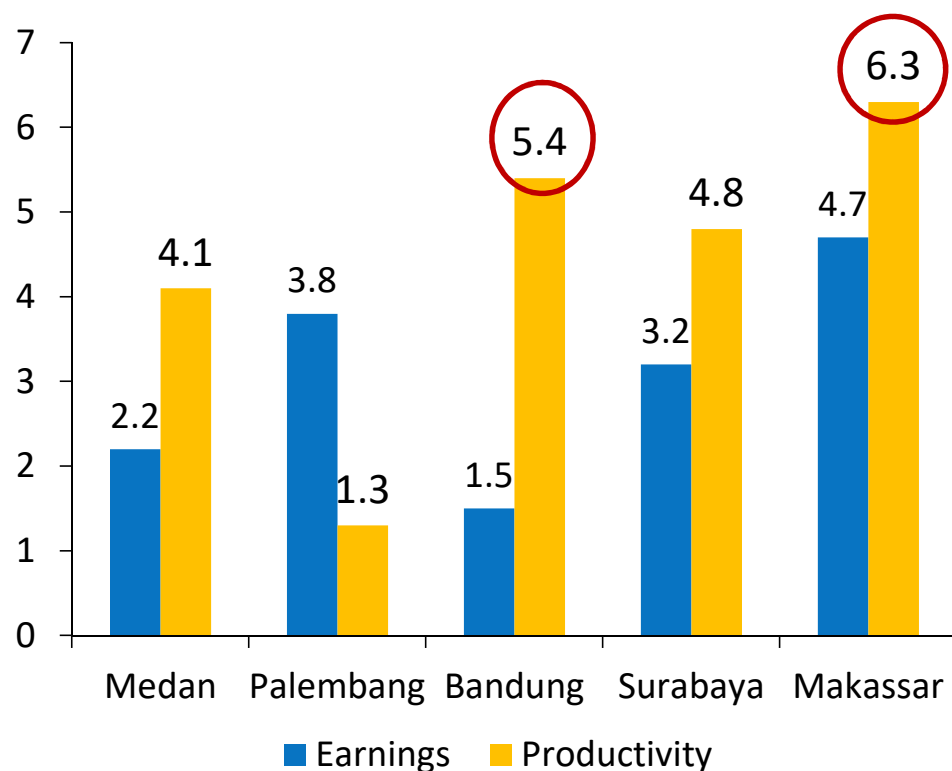
Create new urban centers with just as good or better amenities, and reinforce with congestion pricing, good inner city transport, and property taxes

Policy recommendations: Learn from Bandung & Makassar

Average Annual Growth of Productivity and Earnings in Selected Cities 2007–2014 (%)

	Medan	Palembang	Bandung	Surabaya	Makassar
Earnings	2.2	3.8	1.5	3.2	4.7
Productivity	4.1	1.3	5.4	4.8	6.3

■ Earnings ■ Productivity

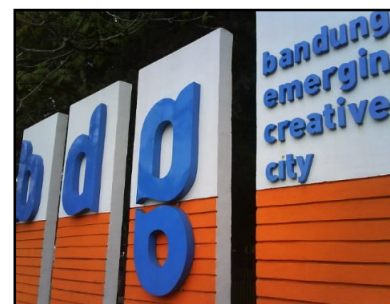*Source: BPS Statistics Indonesia.*

Similarities:

- Relatively innovative and energetic mayors
- Positive economic geography

Bandung Emerging Creative City

Makassar University

Photos from:
http://bdgeuy.com/bandung-emerging-creative-city/
https://photorator.com/photo/29610/makassar-university-phinisi-building-

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Key Messages

1. Urbanization is related to strong gains in productivity that are passed on in the form of higher wages.

2. Medium-sized cities seem to outperform other cities and rural districts (*kabupaten*) in terms of productivity gains from greater average educational attainment.

   - *Indonesia should look for nurturing vibrant and dynamic medium size cities spread across the country that will lower pressure to the currently large and metro cities.*

3. Need for more 'anticipative' urban management, rather than the largely 'reactive' one currently adopted.

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