Integration as a spatial institution: Implications for agglomeration and growth

Tim Deeken and Ingrid Ott

Karlsruhe Institute of Technology | Institute for Economics

evoREG Workshop at Fraunhofer ISI "Innovation, territories and policies: What we should know and ask about metropolitan evolutions", November 27-28, 2014

Motivation I

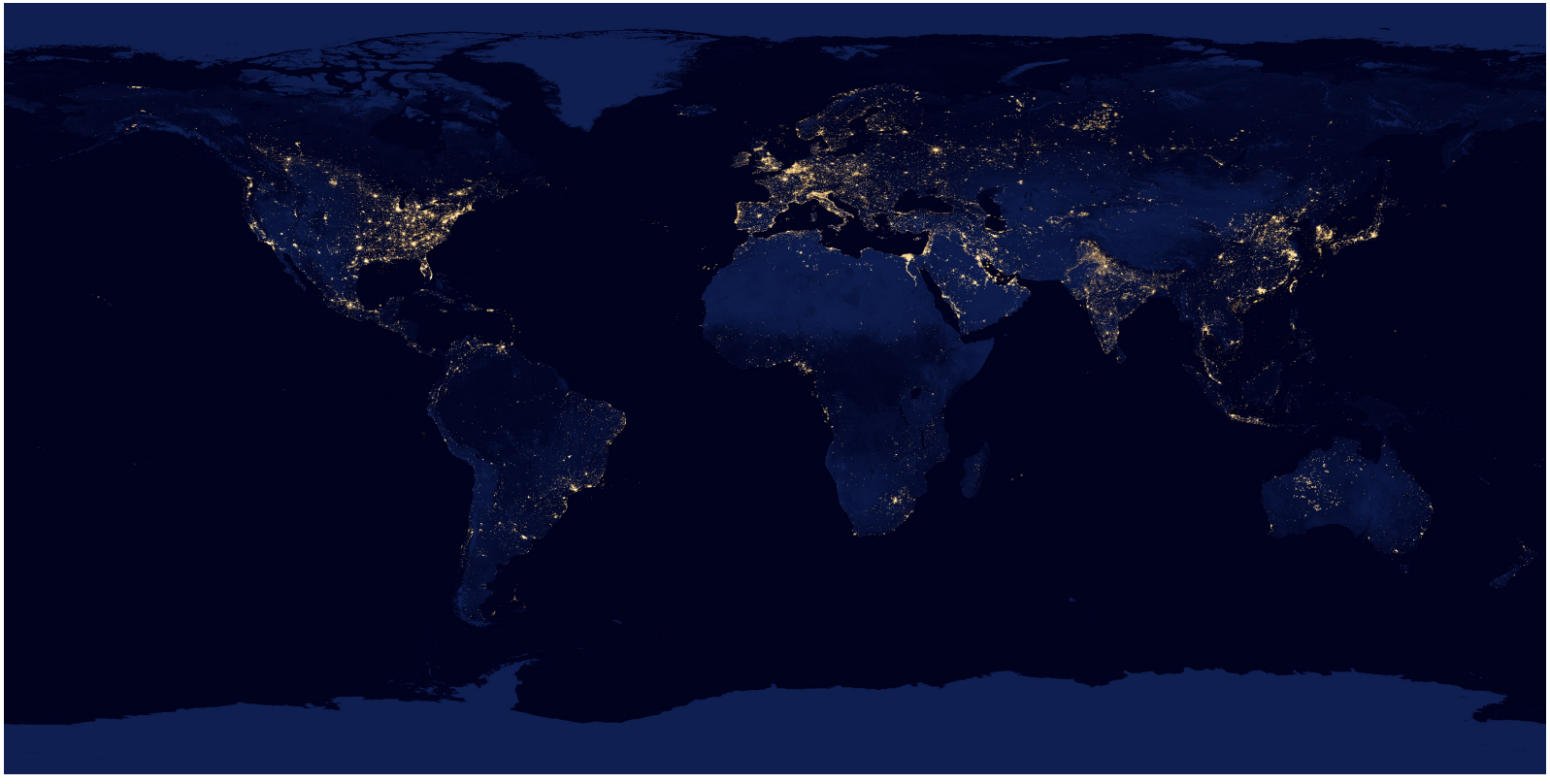

Figure 1: Earth at night.

Source: NASA (2012), http://earthobservatory.nasa.gov/NaturalHazards/view.php?id=79765.

Motivation II

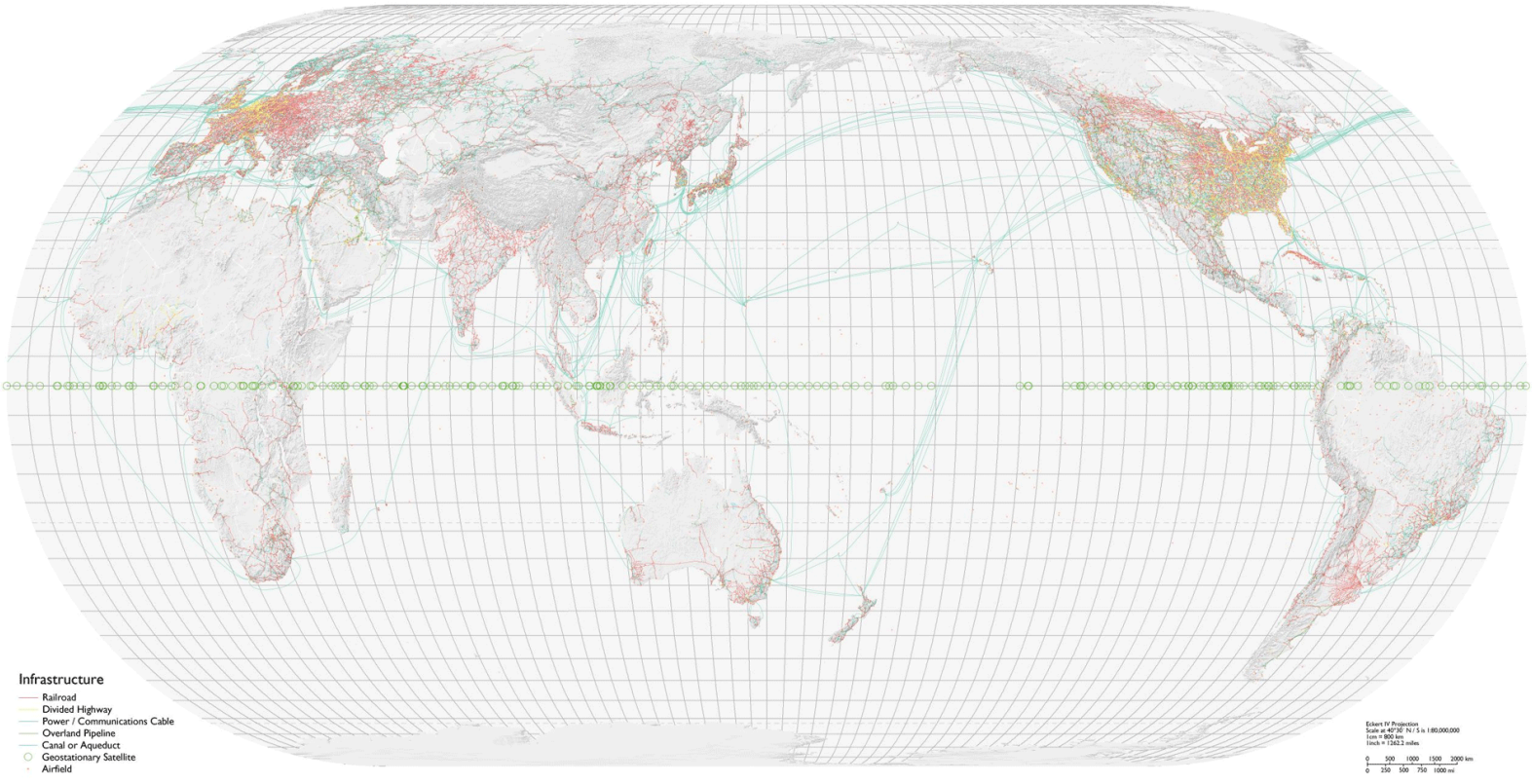

Figure 2: Integration via infrastructure.

Source: Max Roser (2014),
http://www.ourworldindata.org/data/technology-and-infrastructure/infrastructure/.

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- The notion of integration as a spatial institution
- Policy implications concerning integration

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- Since 2007 the urban population exceeds the rural population
- Rural-urban shares are expected to roughly reverse over the century from 1950-2050
- Marked differences across regions exist though

Evolution of urban and rural population – global scale

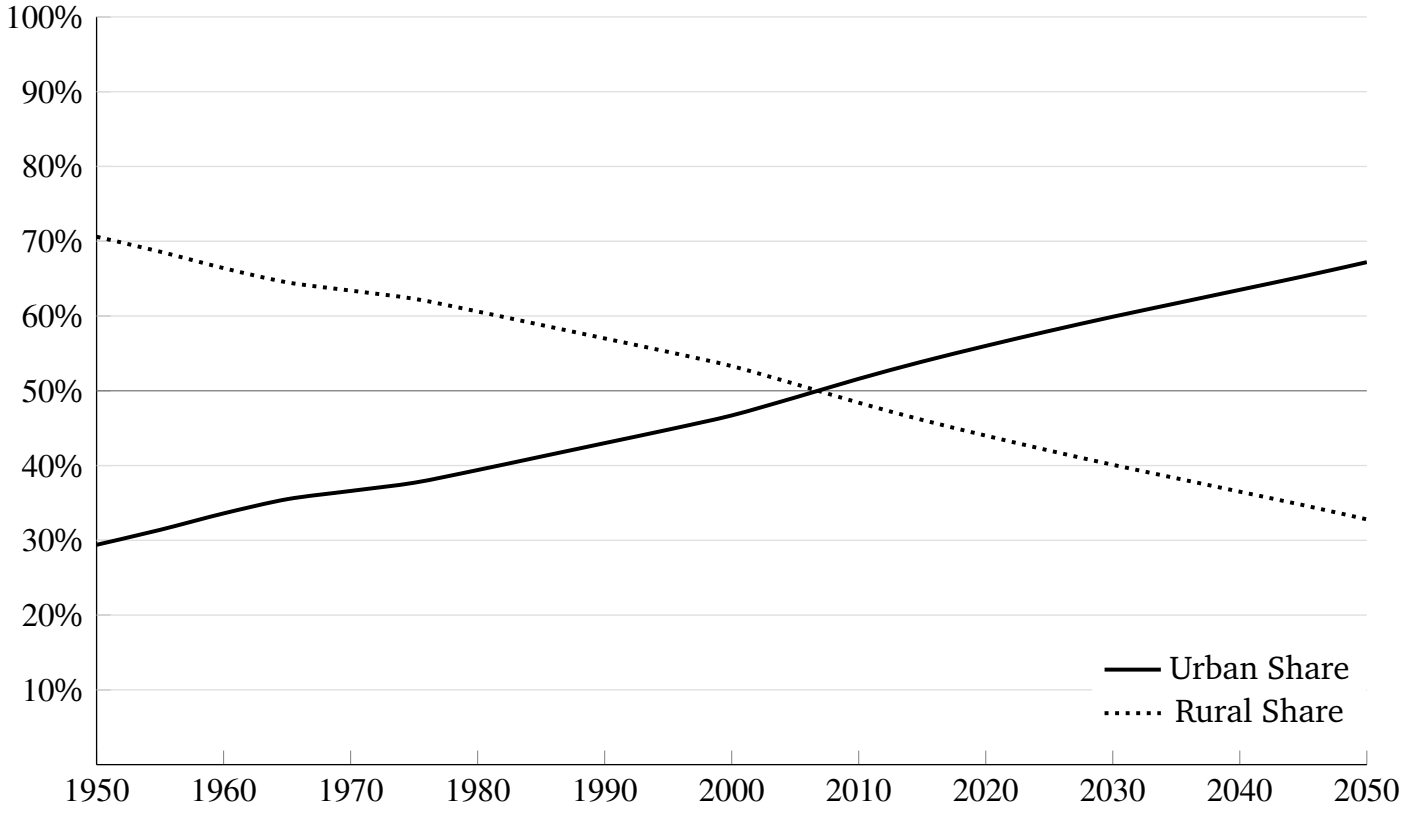

Figure 3: Global shares of urban and rural population.

Source: United Nations (2012).

Evolution of urban population – geographic regions

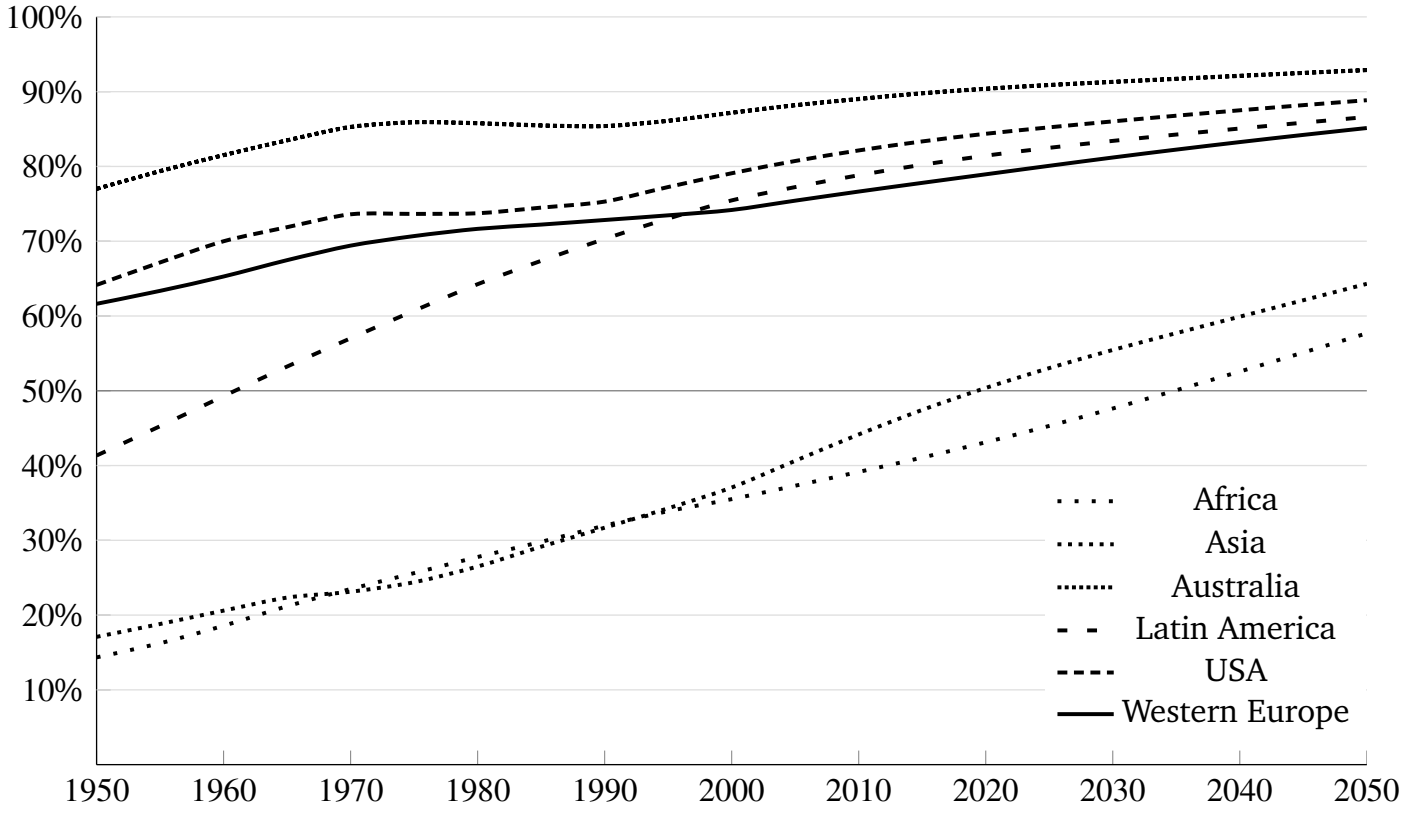

Figure 4: Urban population by major geographical area.

Source: Own calculation based on data from United Nations (2012).

Evolution of urban population – city-size classes

	<0.5m	0.5-1m	1-5m	5-10m	>10m
1970	833	128	244	109	39
1990	1333	206	456	142	145
2011	1849	365	776	283	359
2025	1966	516	1129	402	630

Table 1: Evolution and forecast of total population in millions according to city-size classes.

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- Number of cities with a population larger than 10m grows from 2 to 37 over the period

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  - – e.g. immobile factors, land rents or increased congestion, pollution and crime

Growth trends

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- As with urbanization rates, distinct experiences across global regions
- No fixed ranking ($\Longrightarrow$ 'leapfrogging')

Growth

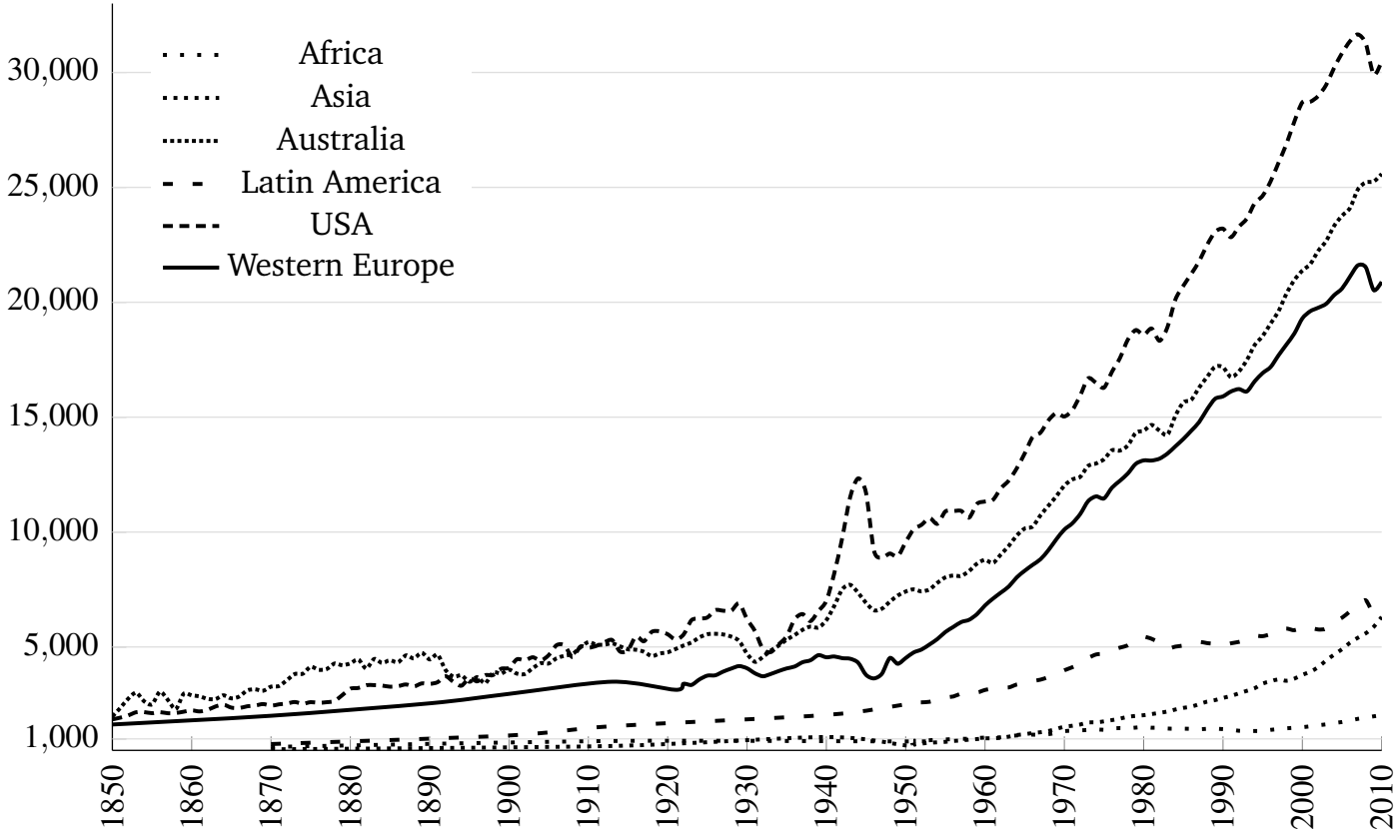

Figure 5: GDP per capita in 1990 international dollars.

Source: New Maddison Project Database (Bolt and van Zanden, 2013).

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- Increase in the mobility of goods ('trade') and capital ('FDI')

Globalization II

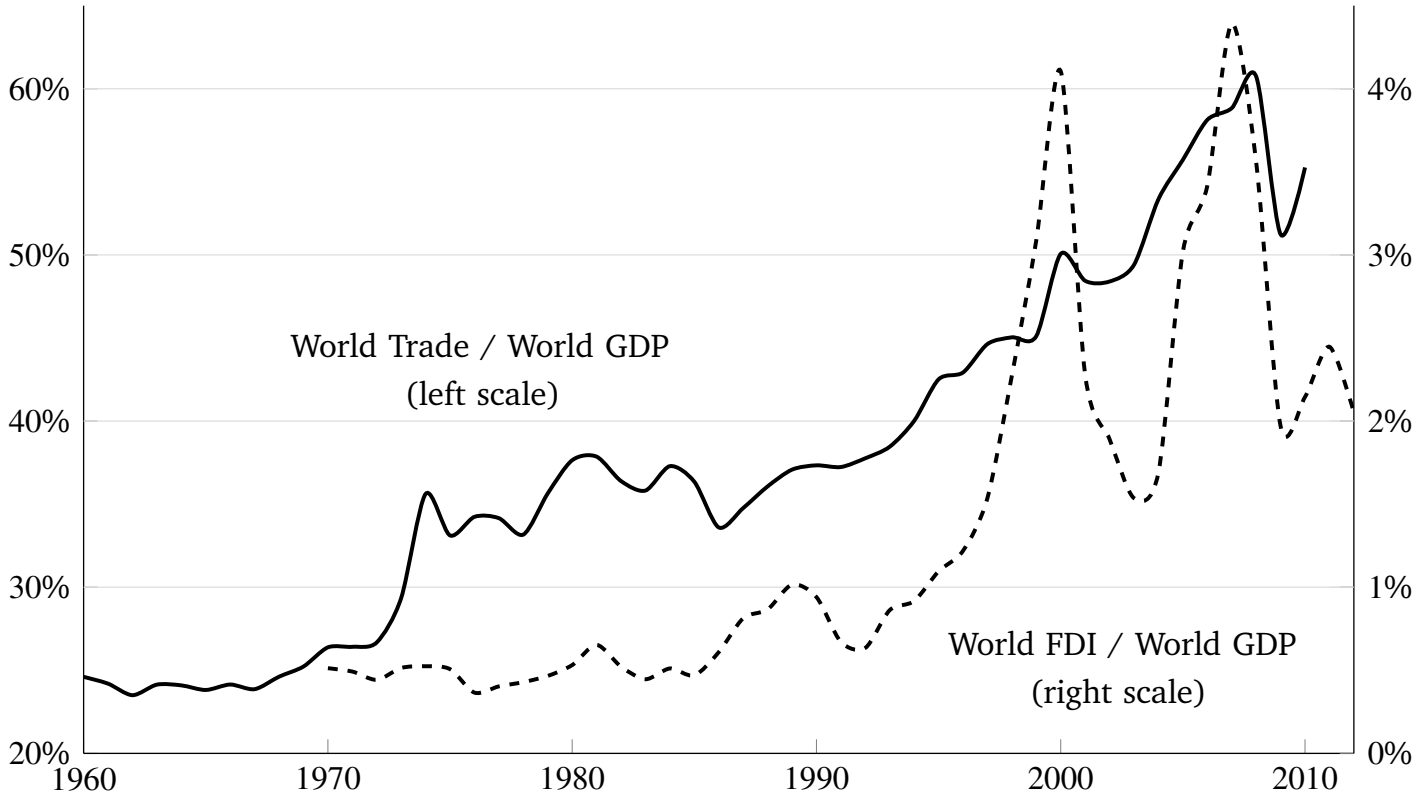

Figure 6: Globalization for the dimension goods and capital.

Source: Own calculation based on data from *World Development Indicators* (World Bank, 2013) and Heston et al. (2012).

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  - $\Longrightarrow$ Chain of cumulative causation is set in motion

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- Both goods are traded — the agricultural good Z can be traded costlessly, but trade in the X good incurs iceberg trade costs ($\tau \geq 1$ units need to be shipped so that one unit arrives).

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- Production function:

$$Q_K = \frac{L_I}{a_I} \tag{1}$$

with Q_K the flow of new capital,
L_I employment in the I-sector,
a_I unit labour requirement in the I-sector

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- Empirical evidence: Rapping (1965) and Eaton and Kortum (1996).

Stability of the equilibria I

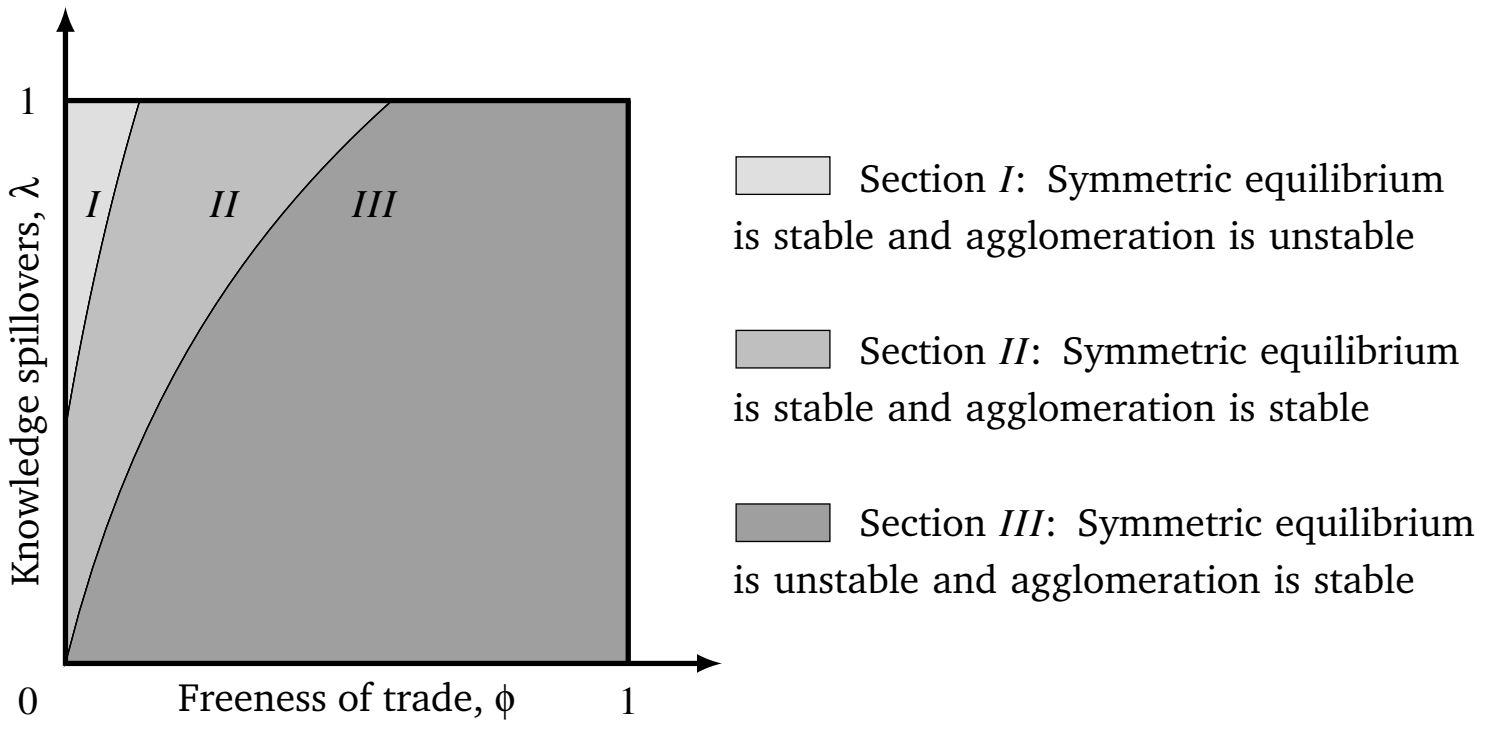
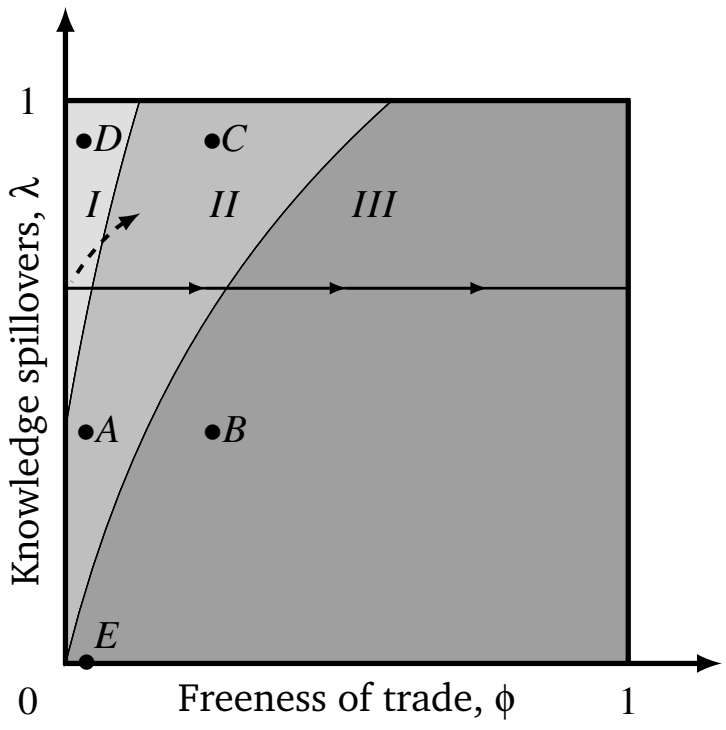


Figure 7: Core-Periphery and Symmetric Equilibrium Stability Map.

Stability of the equilibria II



Section *I*: Symmetric equilibrium is stable and agglomeration is unstable

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Figure 8: Equilibrium Stability Map.

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- Policies fostering integration depend, in general, on the institutional foundation
- Integration affects
  1. the size of the relevant market and
  2. the effectiveness of local agglomeration economies as regions possibly become more dense
- Through changing the rules of the game, integration then has an impact on the spatial structure of economic activity

Policy implications

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- In highly urbanized areas benefiting from urbanization economies (Jacobs, 1969) should be encouraged

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- Integration as a concept comprises more than merely a change in transportation costs and affects both size and density
- The concept of integration as a spatial institution is important as many analyses look only at the connection of institutions and growth, but lack an explicit spatial focus
- Future research needs to address the issue of how to endogenize integration.

References I

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Evolution of urban population

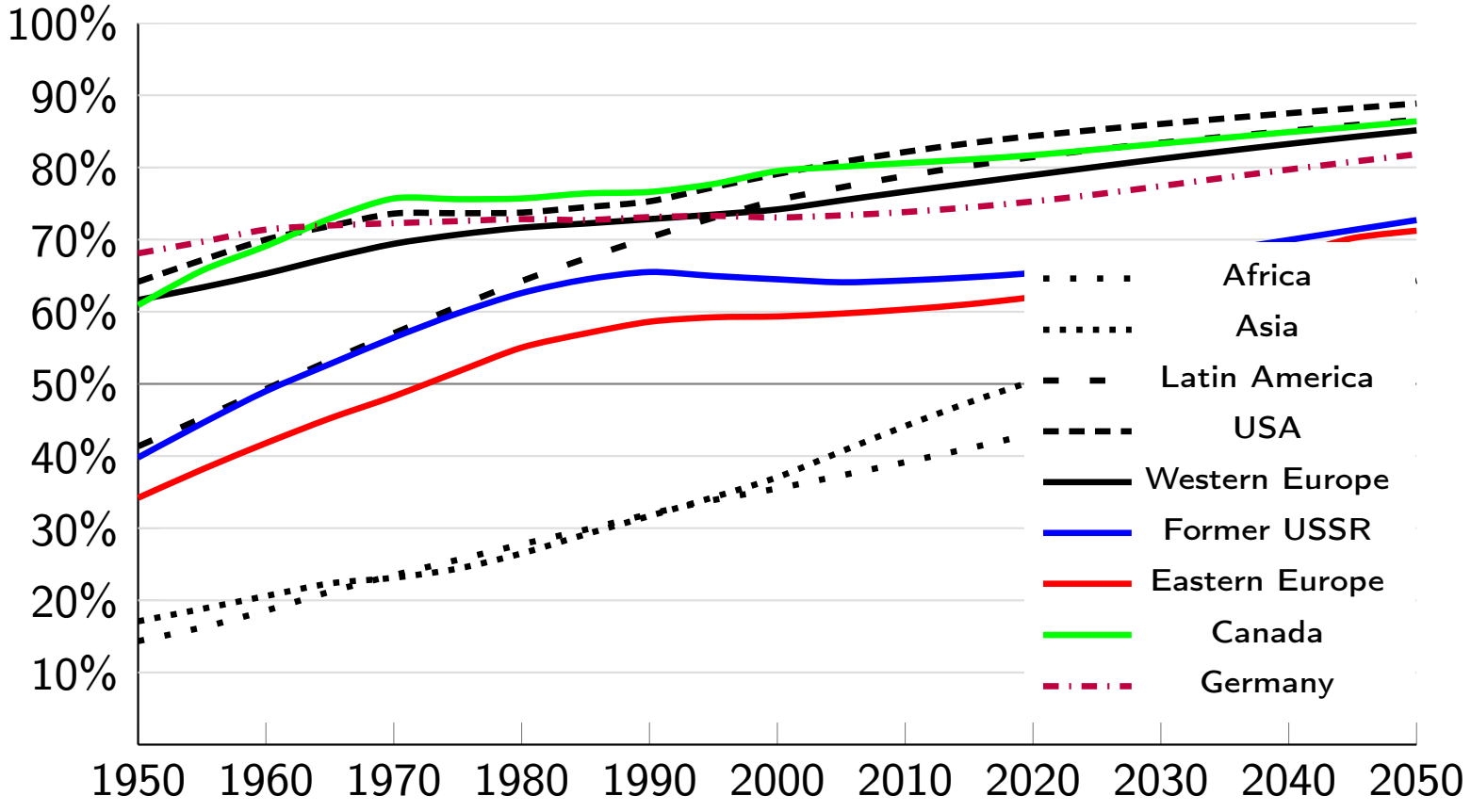

Figure 9: GDP per capita in 1990 international dollars.

Source: Own calculation based on data from United Nations (2012).

Evolution of urban population – number of cities

	<0.5m	0.5-1m	1-5m	5-10m	>10m
1970	NA	186	128	15	2
1990	NA	299	237	19	10
2011	NA	513	388	38	23
2025	NA	750	572	59	37

Table 2: Evolution and forecast of the number of cities according to city-size classes.

Source: United Nations (2012).