



Impact of Transport Infrastructure on International
Competitiveness of Europe



Impact of transport investments on spatial competitiveness

Some food for thought

Jan Kiel (Panteia)

ETC, Frankfurt

1 October 2013





Content

- The concept of spatial competitiveness
- The concept of accessibility
- Linking accessibility and competitiveness
- Contribution of models
- Conclusions and questions



Definition 'spatial' competitiveness

- Different definitions exist, such as:
 - *Competitiveness pertains the ability and performance of a firm, sub-sector or **country** to sell and supply goods and services in a given market, in relation to the ability and performance of other firms, sub-sectors or countries in the same market*
 - *Competitiveness is the set of institutions, policies, and factors that determine the level of productivity of a **country***
 - *The extent to which firms in a particular **region** can compete with those elsewhere*



Debate 'spatial' competitiveness I

- Krugman (1994):
 - Companies who perform badly, go out of business, countries do not.
 - Trade balance may give wrong impressions, trade surplus can be a sign of weakness
- Three dangers:
 1. Waste of government funds on competitiveness
 2. Protectionism
 3. Bad policy



Debate 'spatial' competitiveness II

- Dunn (1994):
 - *criticising measurement concepts does not imply that the subject of examination itself is meaningless. What methodological and empirical difficulties do call for is the development of better measurement concepts of competitiveness.*

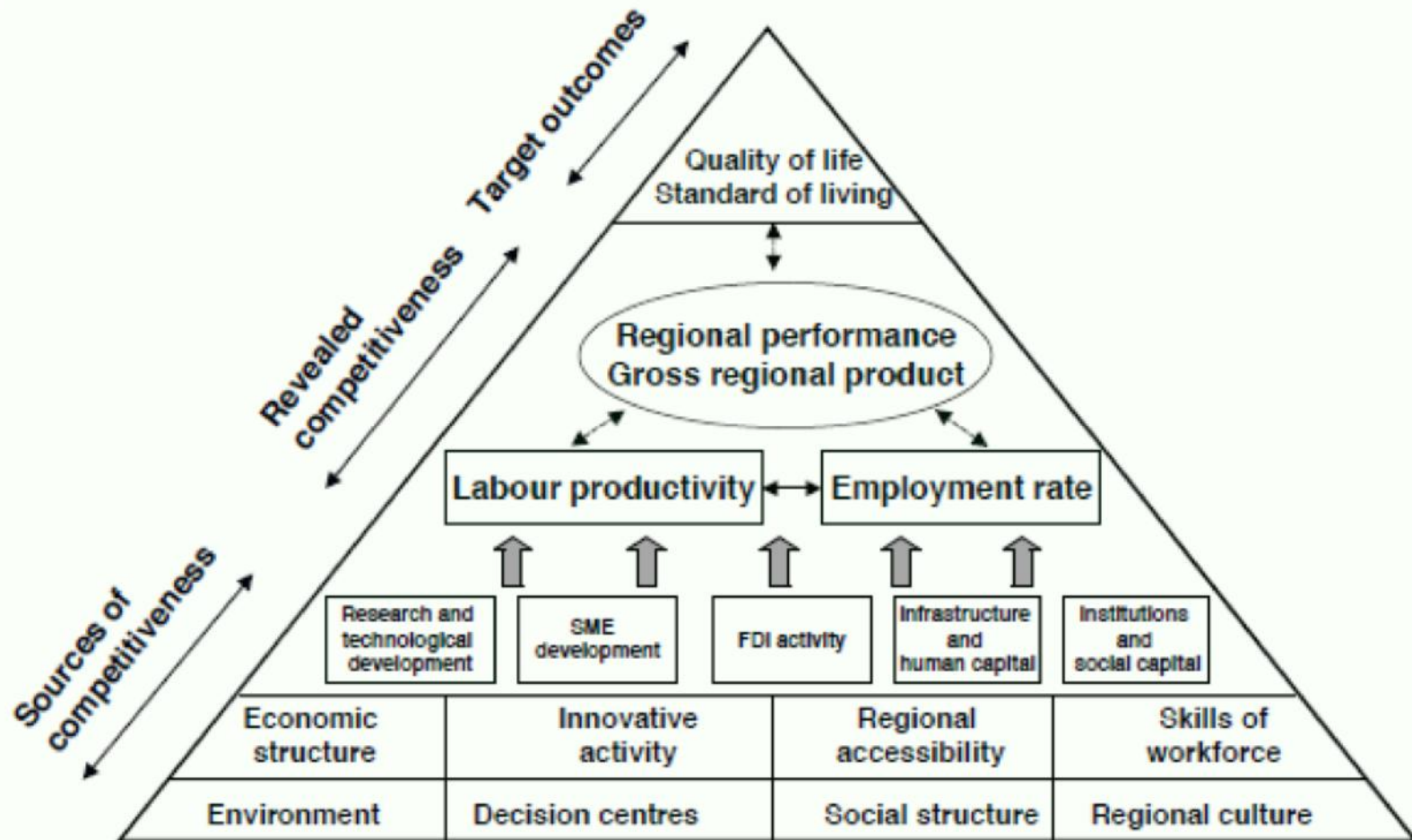


Measurement of competitiveness

- Lengyell (2004) constructed a Pyramid Model, enhanced by Gardiner et al (2004)
- Three levels:
 - Target output
 - Revealed competitiveness
 - Source of competitiveness



Pyramid Model



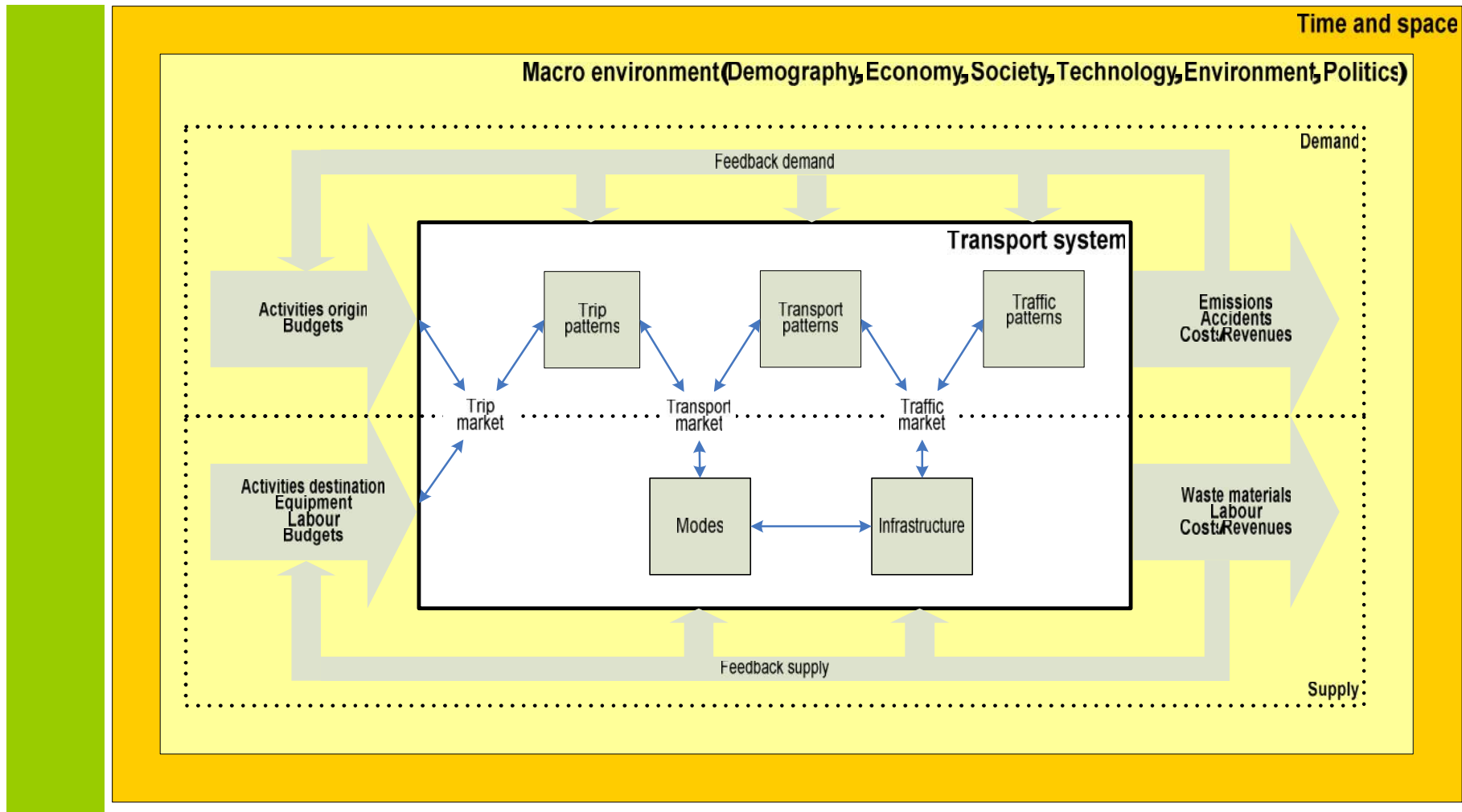


Accessibility as a source?

- Infrastructure as determinant for accessibility is regarded as important in many studies:
 - *Infrastructure quality determines the ease with which goods can be moved and the efficiency of delivering services remotely.*
 - *The quality of a country's infrastructure also affects the mobility of labour and quality of life.*
 - *Finally, the stock and quality of infrastructure can affect the **attractiveness** of the country in the eyes of investors and potential high skilled migrants*



Framework of the transport system





Concept of accessibility (I)

- Peter Gould (1969):
 - *Accessibility is a slippery notion... one of those common terms that everyone uses until faced with the problem of defining and measuring it.*
- Litman (2012) and Geurs & van Wee (2013) provide reviews on the concept of accessibility



Concept of accessibility (II)

- Geurs & van Wee (2013) distinguish two perspectives, from origin and from destination
- Different characteristics play a role such as income, car ownership, type of industry, modes or geographical scale



Measurement of accessibility

- Four types of accessibility indicators distinguished:
 - Infrastructure based indicators (e.g. length of network, congestion or speed)
 - Location based indicators (accessibility of locations)
 - Person-based indicators (accessibility at individual level)
 - Utility-based indicators (benefit people derive from access to spatially distributed activities)



Criteria for accessibility indicator

- Measure
 - Needs to include spatial level (region, country)
 - Needs to include both supply and demand side of a location
 - Should be able to include freight and passenger transport
 - Should be able to transfer in the monetary values to ease the link to other economic variables
 - Should be fit for use in forecasts



Accessibility measure

- Snelder et al (2012) for Dutch Ministry of Transport:
- Measure for freight transport, can be used for passenger transport as well, contains generalised costs

$$I_{iv} = \frac{\sum_g \sum_j (T_{jivg} * V_{jivg} + T_{ijvg} * V_{ijvg})}{\sum_g \sum_j (d_{ji}^{XY} * T_{jivg} + d_{ij}^{XY} * T_{ijvg})} \quad \forall i, v$$



Transport investments and economy

- Large quantity of literature on this subject.
- No consensus among economists as how assessment of large infrastructure projects should be performed
- Focus often on magnitude of indirect or strategic effects (long term development of a regional economy)
- Analysis often with models such as CGE. These include aspects such as transport, labour market and housing market.



Relation transport and economy

- Investments in the transport system (modes and infrastructure) have an initial impact on key variables distance, time, costs and perception (comfort, reliability, etc), and thus on volume
- Changes in the key variables lead to changes in the output of the transport system such as (generalised) costs and revenues, emissions, and safety



Modelling aspects

- Impact of transport investments can be modelled with transport models, land-use models and economic models
- For direct impacts on the key variables a transport model can do the work
- For indirect impacts other types of models can be used



Contribution transport models

- Transport models provide partial information
- Accessibility measures can be derived
- For overall accessibility additional information is needed (combining freight and passenger models)
- Assignment models are essential for accessibility measure
- It is usually not possible to assess wider economic impacts or indirect impacts (except TRANSTOOLS vs 1)



Contribution economic models

- It is possible to derive an accessibility indicator, though not at full detail
- Network and assignment models are (usually) missing, a link to a transport model is needed
- Economic models are able to predict changes in GDP and employment (if we use these as an indicator for competitiveness)
- Higher level of aggregation



Overall conclusions

- Both types of models have their pro's and con's for use in impact studies for competitiveness
- A combination of models seems to be a solution
- No revealed evidence to show the link between accessibility and competitiveness



Questions/Discussion

- Do we need to link accessibility and competitiveness in detail (and thus define the concepts and indicators) or is it OK to just use indicators without further debate?