

European railways-an application of the life cycle theory

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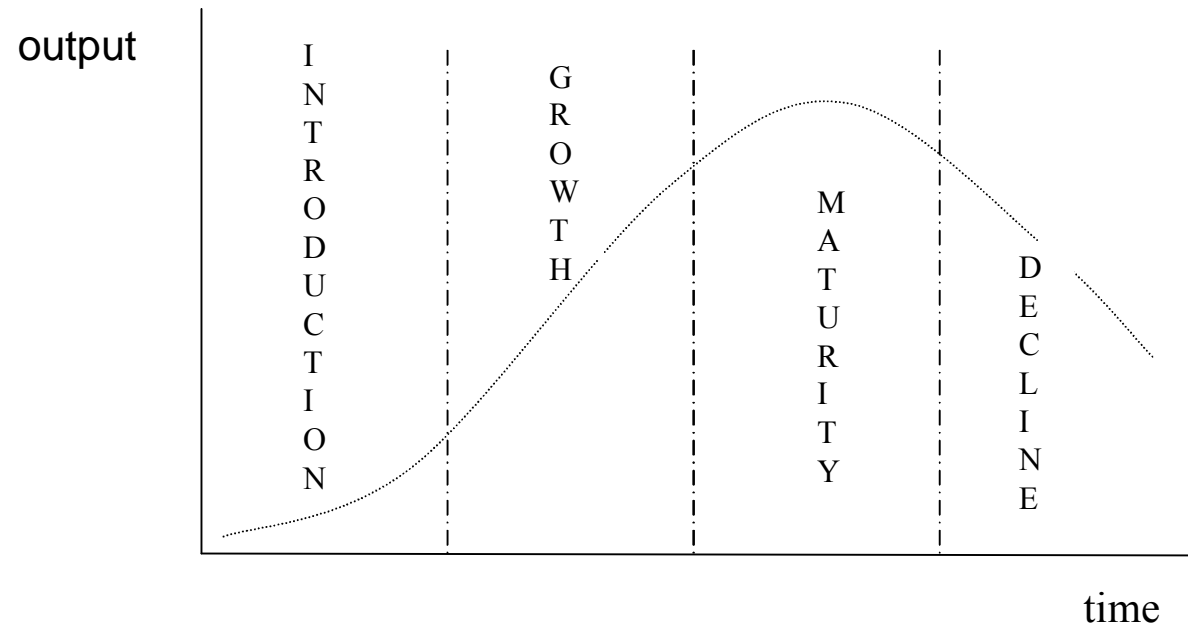
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Introduction

- Ø **Life cycle theory:** products on the market are undergoing the process of development
 - Ø **Aim:** an application of the life cycle theory to an analysis of economic history of railways in Europe.
 - Ø **Special attention:** differences between Eastern and Western Europe.
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Life cycle theory



Life cycle theory and application

Formal models:

Mueller (1972); Jovanovic-MacDonald (1994); Utterback-Suarez (1993); Klepper (1996)

Applications:

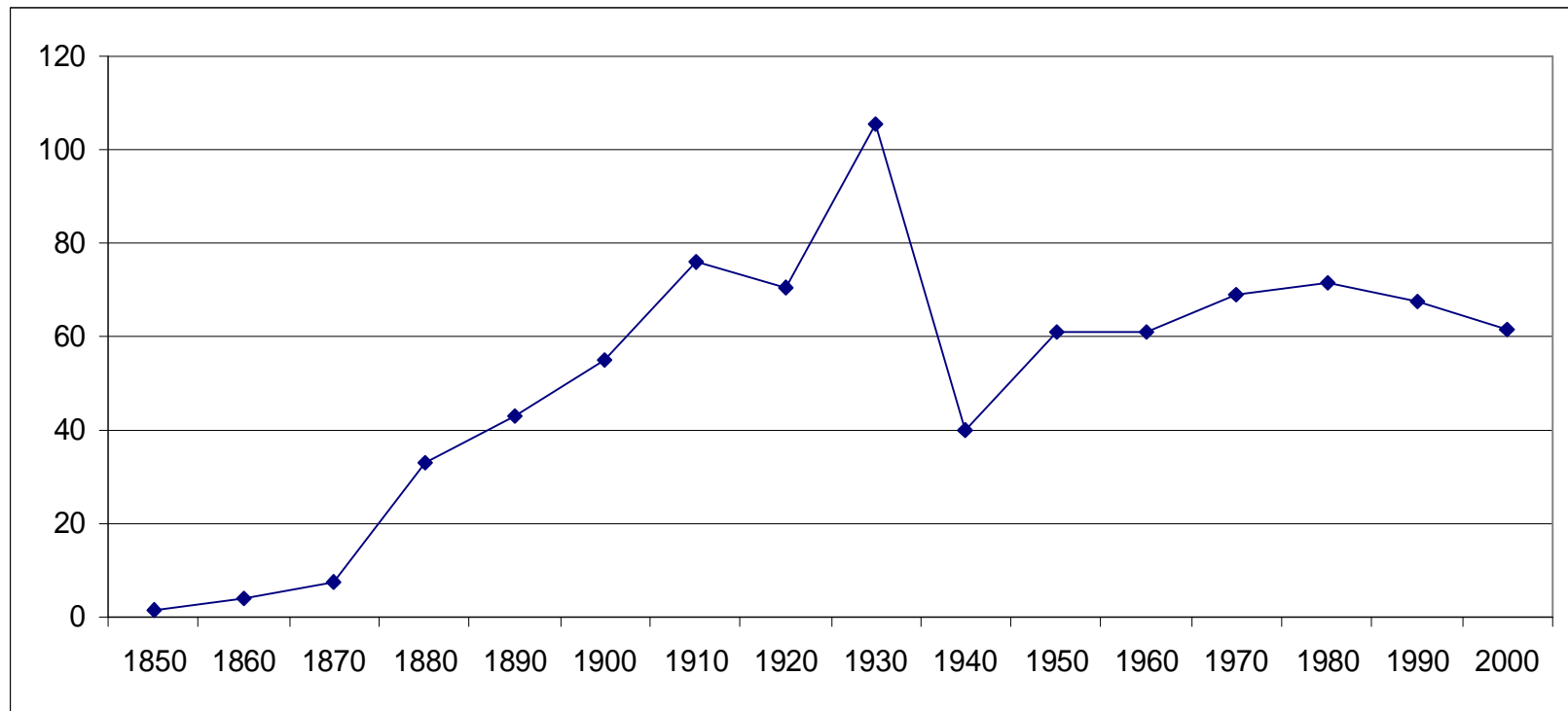
US agriculture.....Blank (2003)

US minivans.....Kwoka (1996)

Swedish manufacture.....Karlsson-Nystrom (2003)

The LC theory applied to railways

Graph: Life cycle curve – Belgium 1850-2000; railway freight; millions of metric tons



Determinants of the railways' life cycle

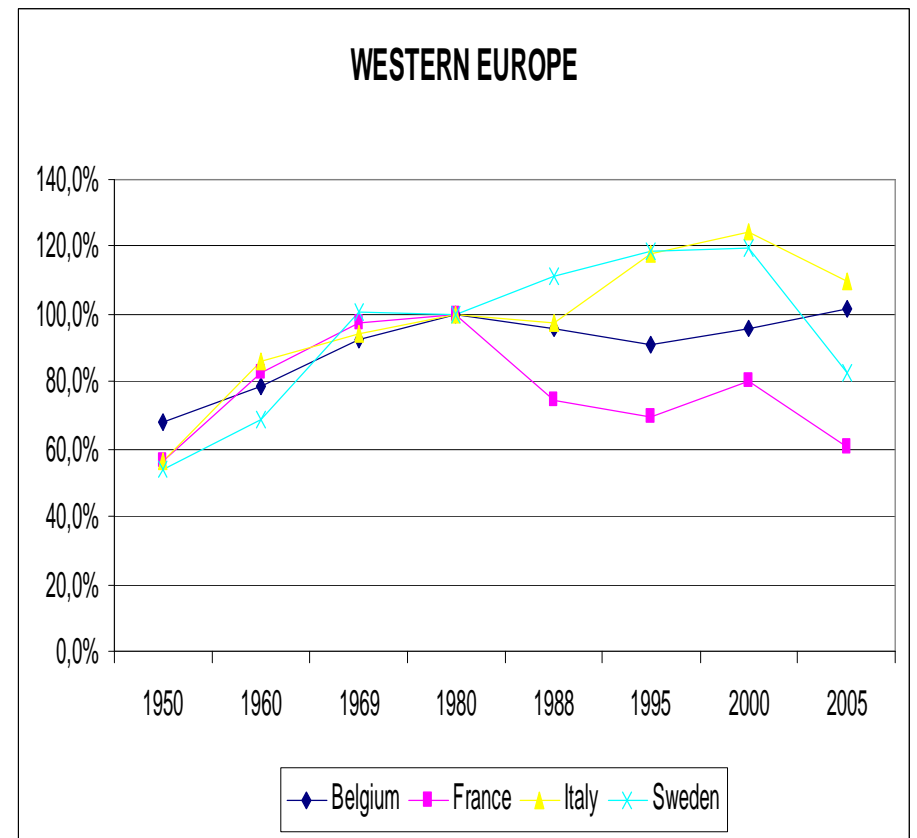
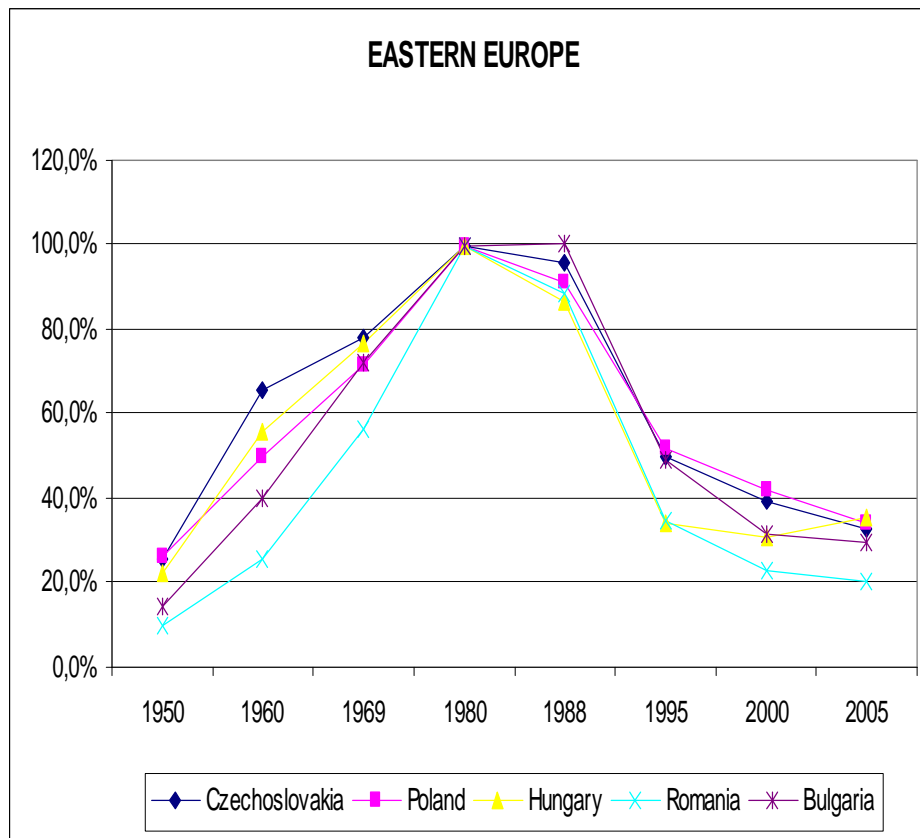
- ∅ Changing intensity of competition from other transport modes
 - ∅ Structural shift: agriculture → industry → services
 - ∅ Shocks to the economy (wars, depressions, abrupt changes of policies)
 - ∅ Other reasons (lack of innovations, fixed costs...)
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Western and Eastern Europe

How the life cycle theory can be applied to explain different developments of railways in Eastern and Western Europe?

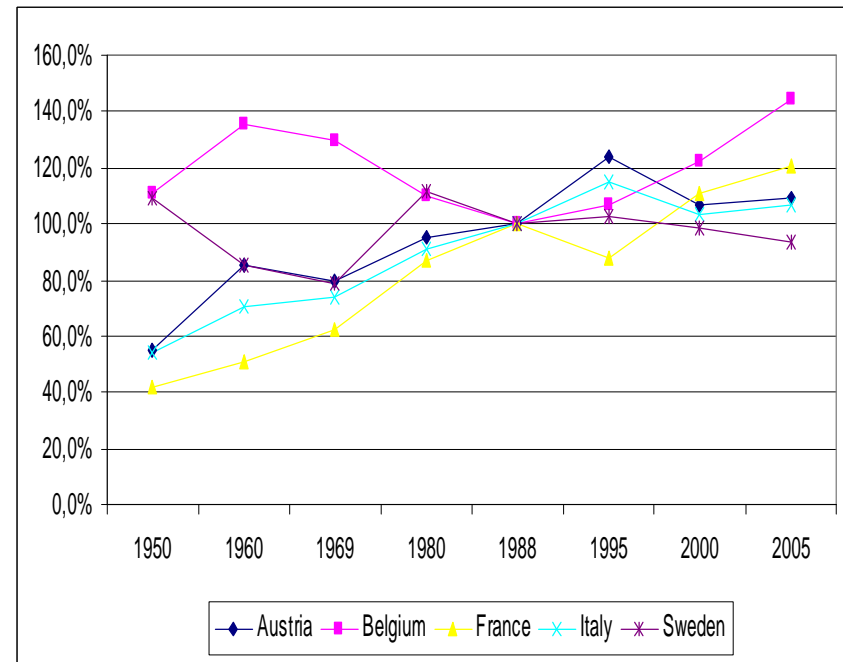
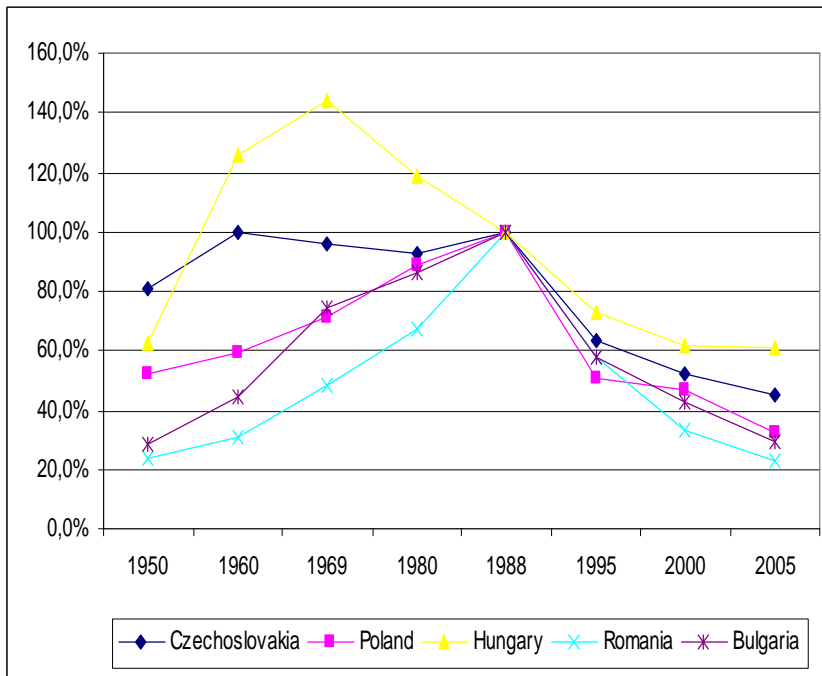
- 1) Eastern Europe has been economically backward in comparison with the Western Europe
 - 2) Eastern Europe was under socialism in the second part of the 20th century.
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Indexes of railway freight transport (tnkm; 1980=100)



Indexes of railway passenger transport

(milkm; 1988=100)



Problems

- ∅ Growing GDP → growing transport market → dynamic economy x static analysis
 - ∅ Disruptive effects of wars, economic shocks and policy changes on the „natural“ life-cycle
 - ∅ Volume indicators, not monetary indicators → an assumption of constant real prices
 - ∅ Long time span, unavailable data, heterogeneity of countries
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Solution?

Hypothesis: There is a life cycle in railways

Model: OLS. Cross-country (Europe) regression on contemporary data → we suppose that all of these countries have already passed the peak of their life-cycle

Dependent variable:

∅ Freight tnkm OR Passenger milkm

Independent variable:

∅ GDP (expected negative)

∅ Former central planning

∅ Number of motor vehicles

∅ $(A+I)/GDP$

∅ G/GDP

∅ Other control variables
