

# Varieties of Capitalism and technological inventive capacity in Central Europe: The case of Hungary

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Various evidence for no technological catch-up in CEE since 1990 in spite of FDI and operating market economy

## *Why?*

Hypothesis 1: the subsidiaries of multinational firms in Hungary do not invest in technologically inventive activities because they have no mandate in terms of basic research and applied development;

The correlative Hypothesis 2 is that inventive R&D is a strategic asset which remains located in the home country of the multinational firm;

Hypothesis 3: the Hungarian firms' inventiveness is too weak to incite the headquarters of multinational firms to transform the local subsidiaries' mandate in terms of technology;

The correlative Hypothesis 4 is that transfer of technology through FDI towards indigenous firms remain poor.

# Introduction and Hypotheses

- Varieties of Capitalism (VoC): institutionalist approach, elaborated first for developed countries (two main types of national political economies with different coordination mechanisms for firm activities: LME – CME)
- Less developed/developing economies: further versions: Latin-America: Schneider (2009): Hierarchical Market Economies
- CEE/Visegrad4: Lane and Myant (2007); Nölke and Vliegenthart (2009): a distinctive VoC: Dependent Market Economies (DME)

## Theoretical background

	HME in Latin America	DME in Central Europe
<b>Countries concerned</b>	Most of the Latin American countries	Czech Republic, Hungary, Poland, Slovak Republic
<b>Distinctive coordination mechanisms</b>	Family-owned groups and multinational firms	Business-led Multinational firms
<b>Corporate governance</b>	Familial management and headquarters of multinational firms	Headquarters of multinational firms
<b>Industrial relations</b>	Plant-level and company-level coordination over wages and working conditions	
<b>Vocational training and education</b>	No vocational training at the work place Low education level	Few vocational training at the work place Relatively high education level
<b>Inter-firm relations</b>	Standard market relationships of the subsidiaries of multinational firms with indigenous firms	
<b>Employees</b>	Few general skills Few specific skills High turnover	Firm-specific skills Long-term tenures

Source: Rugraff, 2006; Nölke and Vliegenthart, 2009; Schneider, 2009

## Strategic interactions in the Dependent Market Economies (DME) and Hierarchical Market Economies (HME) type of Capitalism

### Choice of Hungary:

- 1 first to open to FDI
- 2 companies with foreign ownership dominant (employment, export, VA)
- 3 companies with foreign ownership dominant in BERD, especially in manufacturing

### Data sources:

- **OECD** database used for data on R&D in four industries (dominant from the point of view of FDI and R&D):
  - manufacture of *computer, electronics and optical products* (ISIC Revision 4, Division 26),
  - manufacture of *electrical equipment* (Division 27),
  - manufacture of *machinery and equipment* (Division 28)
  - manufacture of *motor vehicles, trailers and semi-trailers* (Division 29)
- **AMADEUS** database used for patent data (separately for foreign-owned and domestic-owned companies)

# Methodology

	<b>Foreign subsidiaries</b>	<b>Indigenous firms</b>	<b>Total</b>
<b>Number of firms</b>	<b>237</b>	<b>75</b>	<b>312</b>
<b>Total number of employees</b>	<b>177,421</b>	<b>27,141</b>	<b>204,562</b>
<b>Average number of employees</b>	<b>749</b>	<b>361</b>	<b>656</b>
<b>Standard deviation</b>	<b>1420,9</b>	<b>493,5</b>	<b>1267,7</b>

## **Characteristics of the sample**

- Hypothesis 1: the subsidiaries of multinational firms in Hungary do not invest in technologically inventive activities because they have no mandate in terms of basic research and applied development
- Hypothesis 2: that inventive R&D is a strategic asset which remains located in the home country of the multinational firm

### R&D activities of subsidiaries of multinational firms in Hungary and West European companies\* in their home country, 2009, %

	Intra-mural R&D expenditure as a % of turnover	
	In Hungary	In Western Europe*
<b>Manufacturing</b>	<b>0.4</b>	<b>2.0</b>
<b>Of which:</b>		
<b>Electronics</b>	<b>0.2</b>	<b>9.2</b>
<b>Electrical equipment</b>	<b>0.7</b>	<b>2.0</b>
<b>Machinery and equipment</b>	<b>0.2</b>	<b>2.0</b>
<b>Automobile</b>	<b>0.4</b>	<b>4.6</b>

Note: \*Average of seven Western European countries for which statistics was available: Austria, France, Finland, Germany, Italy, Netherlands, Spain.

Source: Authors' calculations based on the OECD statistics database (2016).

### R&D activities of [foreign-owned] subsidiaries of multinational firms in Hungary and Germany, 2009, %

	Intra-mural R&D expenditure as a % of turnover		R&D personnel as a % of total personnel	
	Hungary	Germany	Hungary	Germany
<b>Manufacturing</b>	<b>0.4</b>	<b>2.6</b>	<b>1.3</b>	<b>7.0</b>
<b>Of which:</b>				
<b>Electronics</b>	<b>0.2</b>	<b>10.8</b>	<b>1.8</b>	<b>21.7</b>
<b>Electrical equipment</b>	<b>0.7</b>	<b>2.4</b>	<b>1.2</b>	<b>5.1</b>
<b>Machinery and equipment</b>	<b>0.2</b>	<b>2.9</b>	<b>1.4</b>	<b>5.5</b>
<b>Transport equipment</b>	<b>0.4</b>	<b>6.0</b>	<b>1.6</b>	<b>9.1</b>

# Analysis 1 / Hypotheses 1 and 2

- Hypothesis 3: the Hungarian firms' inventiveness is too weak to incite the headquarters of multinational firms to transform the local subsidiaries' mandate in terms of technology;
- Hypothesis 4: transfer of technology through FDI towards indigenous firms remain poor.

	Foreign subsidiaries	Indigenous firms	Indigenous firms
<b>Industries</b>	<b>Electronics</b> <b>Electrical</b> <b>Mechanical</b> <b>Automobile</b>	<b>Electronics</b> <b>Electrical</b> <b>Mechanical</b> <b>Automobile</b>	<b>Upstream and downstream industries</b>
<b>NACE Rev. 2</b>	<b>26 to 29 and 70 to 74</b>	<b>26 to 29 and 70 to 74</b>	<b>20, 22 to 30 and 69 to 74</b>
<b>Number of firms</b>	<b>237</b>	<b>75</b>	<b>347</b>
<b>Number of patents 2010-2015</b>	<b>58</b>	<b>2</b>	<b>8</b>
<b>Share of firms with patents</b>	<b>4.2 %</b>	<b>1.3%</b>	<b>4.5%</b>
<b>Number of firms with more than 10 patents</b>	<b>3</b>	<b>0</b>	<b>0</b>
<b>Number of firms with more than 20 patents</b>	<b>0</b>	<b>0</b>	<b>0</b>

Patent holders in the Hungarian electronics-electrical-mechanical-automobile industries, 2010-2015

*Furthermore, data on patent policies of main investor companies reinforce this finding.*

## Analysis2/Hypotheses 3 and 4

- The **institutional framework**: unfavourable to the emergence/(survival) of technology-intensive companies in Hungary (legacy, turbulent transition times, privatisation)
- Best performing companies privatised to foreigners + greenfield, assembly-type foreign-owned subsidiaries
- **Few** large local multinationals and local medium-sized firms – few local linkages (suppliers) of foreign-owned subsidiaries
- In these circumstances: foreign-owned subsidiaries do not invest in technologically inventive activities (it is still located in the home country), furthermore, Hungarian firms are also weak in these activities
- ***Transfer of technology through FDI to local firms remains negligible***

## Conclusion

**Thank you for your attention!**