



MAGYAR TUDOMÁNYOS AKADÉMIA
KÖZGAZDASÁG- ÉS REGIONÁLIS
TUDOMÁNYI KUTATÓKÖZPONT



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Universitatea Babeş-Bolyai | Facultatea de Ştiinţe Economice şi Gestionarea Afacerilor



A comparative study of multinational subsidiaries and local companies in emerging economies

A manufacturing practice approach

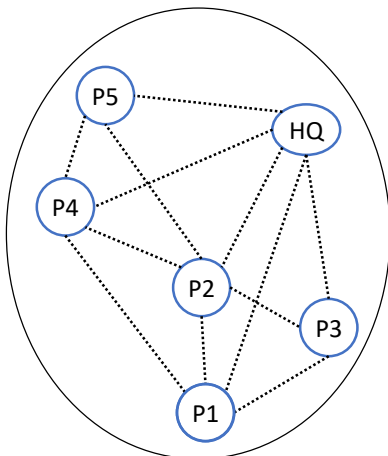
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Introduction

Multinational companies (MNC)

International manufacturing network (IMN)



- The **flow of knowledge** within the IMN is crucial for coordinating the network (*Chew et al, 1990; Ferdows, 2006; Vereecke et al, 2006*)
- **Benefits** of knowledge transfer – mixed results:
 - Beneficial for plants (*e.g. Tsai, 2001; Ding et al., 2013*)
 - Mixed results (*Szász et al., 2016*), curvilinear effects (*Erden et al., 2014*), not beneficial (*Ambos et al, 2006*)
- **Main research question:** are MNC subsidiaries located in emerging countries better in using manufacturing practices than local companies?
- **Open the „black box” of these companies:** investigate whether there is a potential of manufacturing knowledge spillover (*Mariotti et al., 2015*)

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Introduction

- Multinational companies (MNCs) operate networks of manufacturing plants generally located in both developed and emerging countries

Dual perception of MNC plants in emerging countries

Exploitation of low cost resources

- Emerging country plants are located in their regions mainly due to **low cost resources** (Szász & Demeter, 2015)
- They generally perform **repetitive manufacturing tasks** that **value added**, within the MNC (Murphy, 2005)
- The **number of plants** within the MNC is quite **unstable** and as the market conditions change, they **can easily be closed or relocated** (Birkinshaw, 1996)

Many empirical papers

Superior knowledge

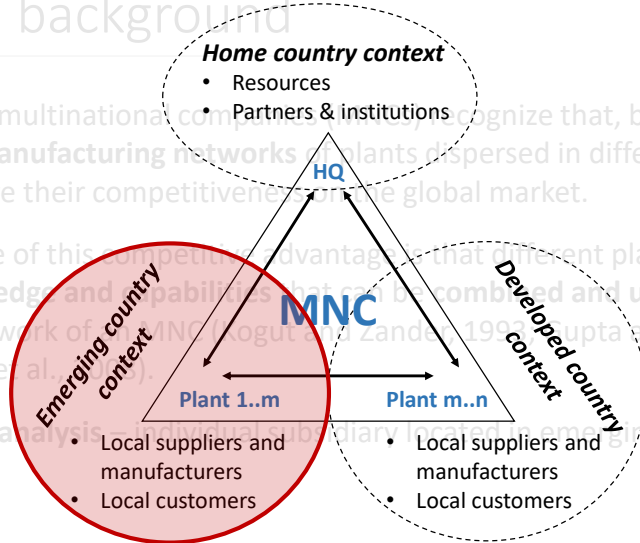
- Emerging country plants can **access knowledge** residing within the **internal network** and transfer it to their capabilities (Tsai, 2006)
- This **knowledge** can also contribute to the **development of local economy** by being shared with local partners (Sveiby, 2011)

Less empirical evidence

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Literature background

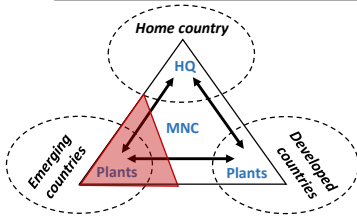
- The majority of multinational companies recognize that, by operating **international manufacturing networks** (plants dispersed in different countries), they can improve their competitiveness on the global market.
- The main source of this competitive advantage is that different plants possess different **knowledge and capabilities** that can be combined and used throughout the internal network of the MNC (Logut et al., Zander, 1998; Gupta and Govindarajan, 2000; Van Wijk et al., 2003).
- Primary unit of analysis is **subunitary local plants** in emerging countries.



Source: adapted from Meyer et al. 2011

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Literature background



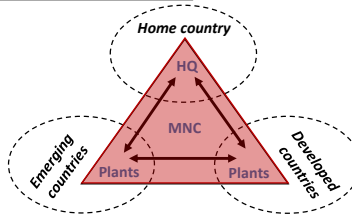
Plant perspective

Absorb knowledge residing within the network to increase plant **capabilities**...

(*Tsai, 2001; Lane et al., 2006*)

... thereby strengthening their **role** within the MNC.

(*Ferdows, 1997; Feldmann & Olhager, 2013; Blomqvist et al., 2014; Mudambi et al., 2014*)



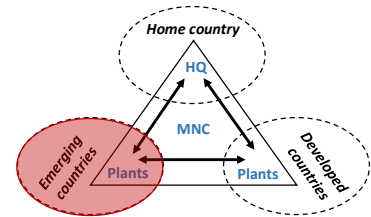
MNC perspective

Primarily **low cost** advantage

(*Szász & Demeter, 2015*)

Increasing capabilities via knowledge transfer - plants with a higher strategic role have **more value for the entire network**.

(*Fusco & Spring, 2003*)



Local economy perspective

The **knowledge** of the plant can contribute to the development of the local economy by being **shared** with **local suppliers, customers, and institutions**

(*Sveiby, 2001; Frost et al., 2002; Mudambi, 2008; Demeter et al., 2016*)

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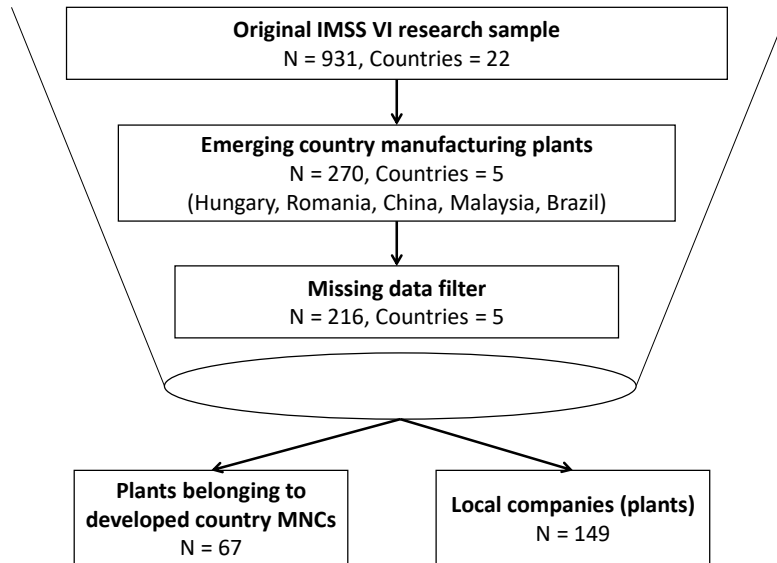
Best practices literature and RQ

- **Practice** refers to an organization's routine use of knowledge and often has a tacit component, embedded partly in individual skills and partly in social arrangements (*Szulanski, 1996*)
- The best **practice approach to manufacturing** strategy seriously entered the industrial and academic agenda with the recognition of the success of Japan Inc. in the late 1970s and early 1980s (*Voss, 1995, 2005*)
- The implementation of **best practices** will lead to **superior performance**, capability and **increased competitiveness** (e.g. *Davies and Kochhar, 2002*)
- According to *Mills et al. (1995)*, best practices "... can be considered as **bundles of actions**..., which tend to work well together"
- **Bundles** of practices, rather than single practices, **lead to high(er) performance improvement** (*Sun, 2000; Cua et al., 2001; Shah and Ward, 2003*)

RQ: Are MNC subsidiaries superior in respect of manufacturing practices compared to local companies in emerging countries?

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Research sample definition



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Research sample composition

- 2014-2015 International Manufacturing Strategy Survey data set (www.manufacturingstrategy.net)
- 5 emerging countries (China, Malaysia, Hungary, Romania, Brazil), 216 manufacturing plants

Region	Country	No. of plants	%
Eastern Europe	Hungary	48	22.2%
	Romania	35	16.2%
Asia	China	98	45.4%
	Malaysia	9	4.2%
South-America	Brazil	26	12.0%
TOTAL		216	100.0%

ISIC code	Freq.	%	Size	Freq.	%
25	69	31.9	<250	100	46.3
26	30	13.9	250-500	39	18.1
27	40	18.5	>500	77	35.6
28	42	19.4	TOTAL	216	100.0
29	27	12.5			
30	8	3.7			
TOTAL	216	100.0			

ISIC Code: 25: Manufacture of fabricated metal products, except machinery and equipment;
 26: Manufacture of computer, electronic and optical products;
 27: Manufacture of electrical equipment;
 28: Manufacture of machinery and equipment not elsewhere classified;
 29: Manufacture of motor vehicles, trailers and semi-trailers;
 30: Manufacture of other transport equipment

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Measures - CFA

- **Internal manufacturing practices (four constructs)**

- **Human resource development (HR)**
 - Delegation and knowledge of workers
 - Autonomous teams
 - Workers' flexibility
- **Lean process improvement (LeanProc)**
 - Restructuring for process focus
 - Pull production
- **Advanced manufacturing technology (Tech)**
 - Advanced processes
 - Factory of the future (smart/digital)
 - Process automation
- **Quality management (Qual)**
 - Quality improvement and control
 - Improving equipment availability
 - Benchmarking/self-assessment

- **Operational performance (two constructs)**

- **Cost performance (CostPerf)**
- **Differentiation performance (DiffPerf)**
 - Flexibility (mix, volume)
 - Delivery (speed, reliability)
 - Quality (conformance, reliability)

Good fit of the measurement model (*absolute fit indices: $\chi^2=261.908$, $p=.000$, $df=152$, $\chi^2/df=1.723$, $GFI=.894$, $RMSEA=.058$, $SRMR=.0385$; incremental fit indices: $IFI=.948$, $CFI=.947$, $TLI=.934$)*

Reliability, discriminant and convergent validity (*AVE, CR measures, factor correlation*)

Common method bias

- Harman's single factor: 5 factors (*eigen. >1*), first factor 30.2% of TVE
- CFA marker approach: χ^2 difference=62.26, $df=20$, $p=.000$ between the models with and without a CLF

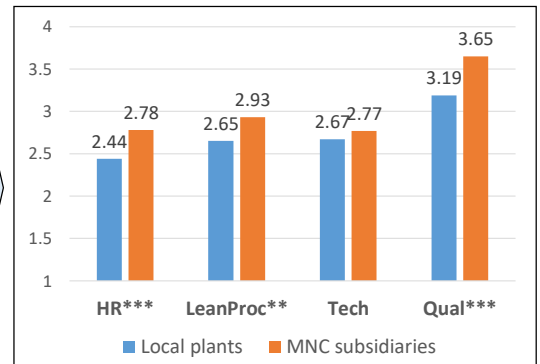
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The effort invested in manufacturing practices

The intensity of use of different manufacturing practices – a comparison

Practice bundles	Local plants N=149	MNC plants N=67	F-value	p-value
	Mean (st. dev.)	Mean (st. dev.)		
HR	2.44 (.588)	2.78 (.629)	F(1, 214) = 14.010	.000***
LeanProc	2.65 (.723)	2.93 (.701)	F(1, 214) = 7.016	.009**
Tech	2.67 (.906)	2.77 (.970)	F(1, 214) = 0.642	.424
Qual	3.19 (.905)	3.65 (.992)	F(1, 214) = 11.203	.001***

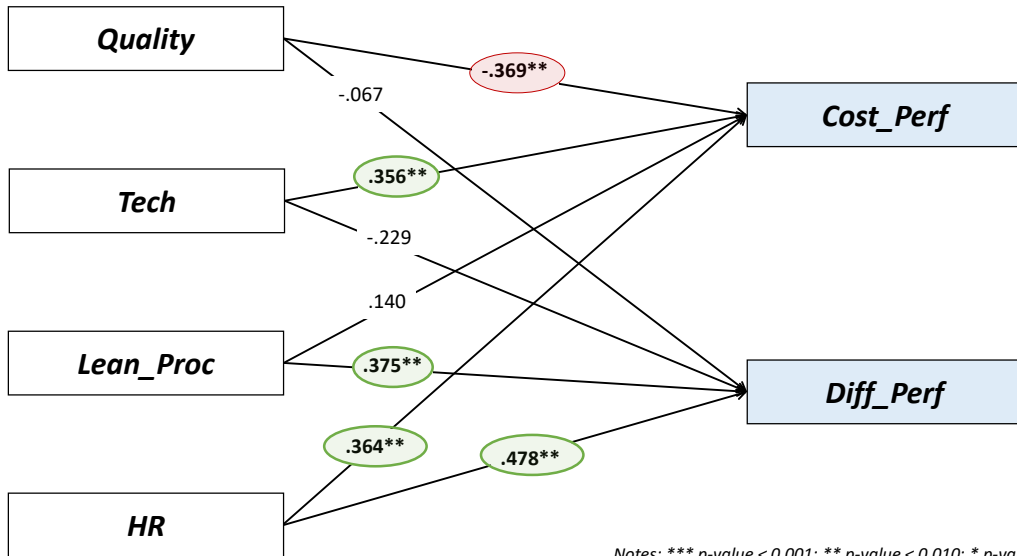
One-way ANOVA tests



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Impact on performance – SEM results (1)

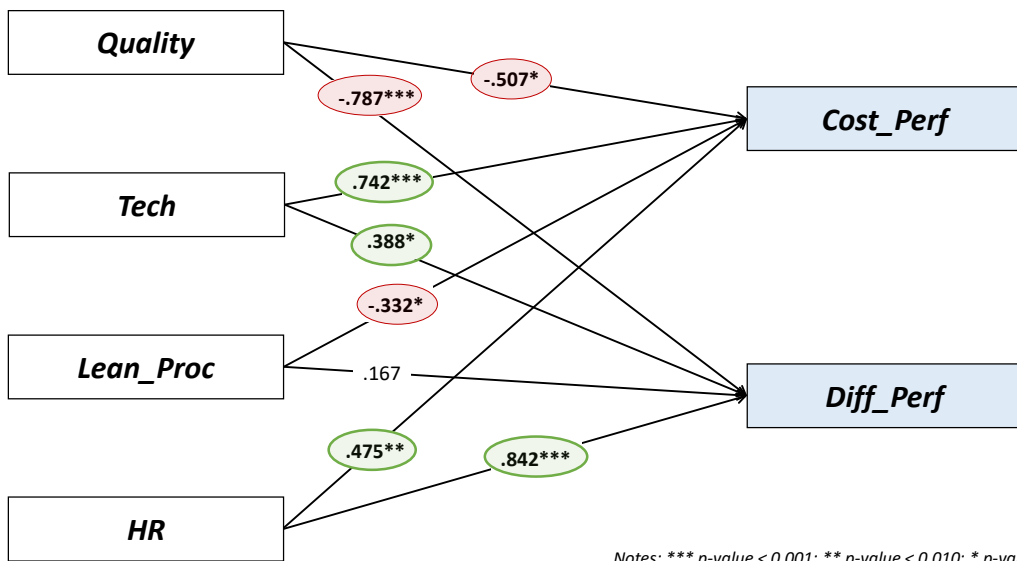
Best practice analysis for **local** manufacturing plants (standardized coefficients)



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Impact on performance – SEM results (2)

Best practice analysis for **MNC** manufacturing plants (standardized coefficients)



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Multi-group comparison of SEM results

Comparison of the performance impacts of manufacturing practices

	Local plants		MNC subsidiaries		z-score
	Unstand. coeff.	p-value	Unstand. coeff.	p-value	
Quality -> CostPerf	-0.311	0.013	-0.385	0.017	-0.365
Tech -> CostPerf	0.300	0.009	0.577	0.000	1.580
LeanProc -> CostPerf	0.148	0.302	-0.357	0.036	-2.268**
HR -> CostPerf	0.473	0.000	0.569	0.004	0.411
Quality -> DiffPerf	-0.044	0.615	-0.469	0.000	-2.943***
Tech -> DiffPerf	-0.150	0.063	0.237	0.013	3.107***
LeanProc -> DiffPerf	0.307	0.002	0.141	0.247	-1.050
HR -> DiffPerf	0.490	0.000	0.791	0.000	1.798*

Notes: *** p-value < 0.01; ** p-value < 0.05; * p-value < 0.10

MNC plants' advantage over local plants:

- Use advanced manufacturing **technology** to increase **differentiation** performance
- Stronger **differentiation** impact by using **HR development** practices

MNC plants' disadvantage compared to local plants:

- **Lean** has a negative impact on **cost** performance – costs of implementation in emerging countries?
- **Quality** has a negative impact on **differentiation** (delivery) – strict quality assurance/control takes more time?

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Discussion and conclusion

- Are MNC subsidiaries superior in respect of manufacturing practices compared to local companies in emerging countries?
- Opening up the „black-box“ of plants: best practices used by MNC plants and local plants in emerging countries

MNC plants operate differently:

- more investments in general in manufacturing practices
- More effective implementation of advanced technology and HR development
- Lean process improvement is, however, a best practice at local companies – Additional costs? MNC maturity? MNC plants still invest significantly more in lean

• Limitations and further research:

- **Methodology:** small sample of emerging country MNC plants, low number of countries, inhomogeneous sample with different regions
- Number and type of **manufacturing practices** considered, aggregate bundles
- Future research: whether and how MNC **knowledge „leaks“** to the actors of the local economy

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Thank you for your attention!

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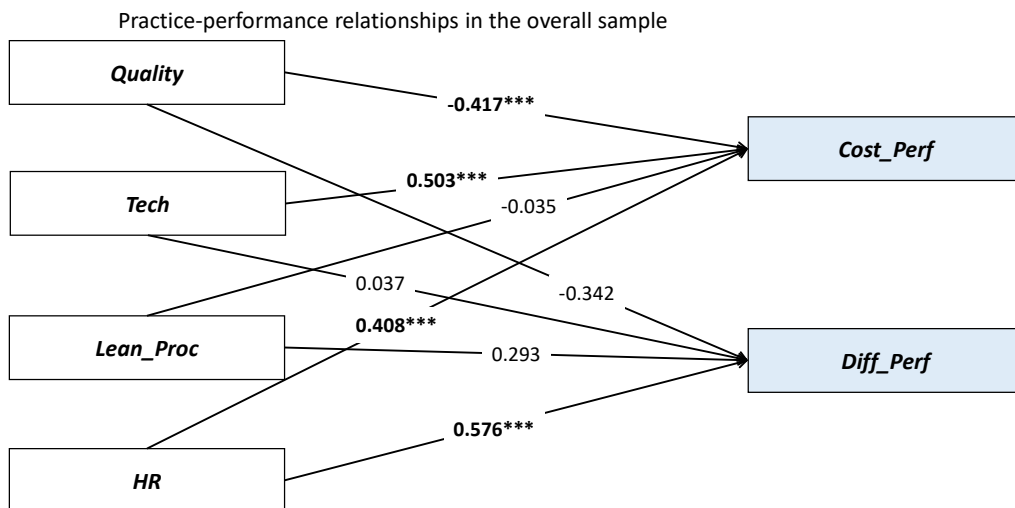
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Appendix 1 | Practice-performance relationships in the overall sample



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