



SGH

Channels and barriers of FDI technology transfers across the technology transfer-related activities. Case study of Poland

This publication/article is a result of statutory research of the Collegium of the World Economy at the Warsaw School of Economics, financed with funds from "Konkursu na zadania badawcze i prace rozwojowe służące rozwojowi młodych naukowców (wiek do 35 lat) oraz uczestników studiów doktoranckich na rok 2017".

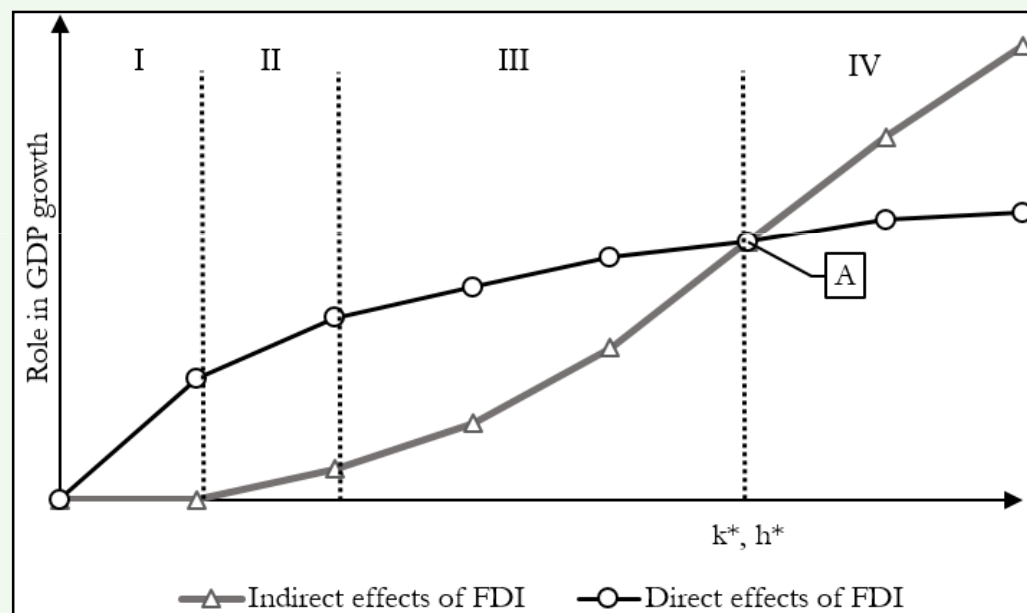
5 VI 2018 Dr. Tomasz M. Napiórkowski, Assistant Professor



Inspiration for the study

Napiórkowski, T.M. (2017) *The role of Foreign Direct Investment in economic growth. The production function perspective*, "Optimum. Studia ekonomiczne", No. 5(89).

Foreign Direct Investment Benefits Absorption Path





SGH

The aim of the study is to answer the following questions;

1. What are the key _____ of technology transfer?
 - Areas
 - Channels
 - Barriers
2. Do channels and barriers differ across the areas of technology transfer?



SGH

Data

1. Collected with the CATI method among foreign firms in Poland,
2. $N = 2,358$, $n = 205$ (at 95% confidence level gives a 6.54% margin of error),
3. Closed-ended multiple-choice and either single- only or multiple-answer possible questions,
4. To avoid the language barrier, each responded had a choice of a language, in which the interview was conducted; Polish or English.



SGH

Areas	Channels	Barriers
The manufacturing process	Demonstration	Lack of physical capital readiness
The product	Training	Lack of human capital readiness
Customer service	Collaboration with firms up the value chain	Technological gap
Marketing initiatives	Collaboration with firms down the value chain	Administrative
	Know-how	Legal
		Financial



SGH

The manufacturing process area

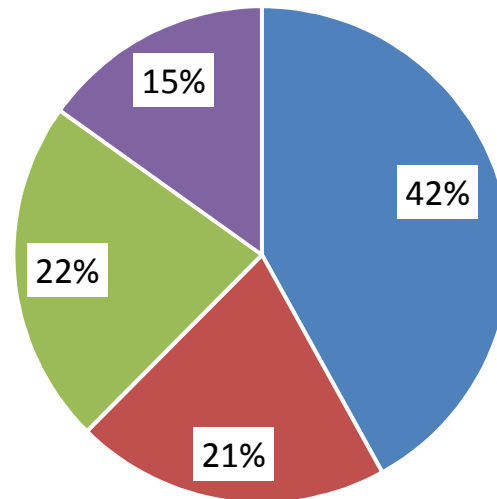
- The product / service produced is known to the Polish consumer market and the transfer is connected with the change in the production process or introduces the production process to the Polish market, i.e. the product / service was never produced in Poland before.

The product area

- The product is new to the Polish consumer market; therefore, it has never been manufactured in Poland before.



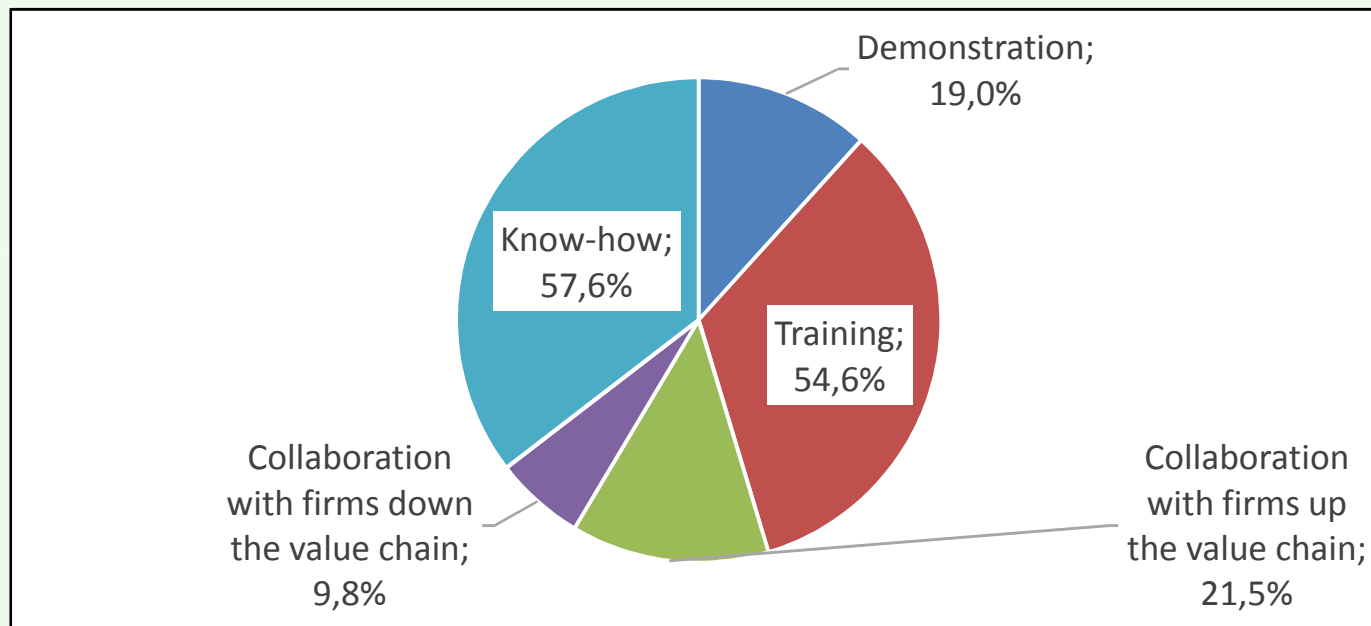
Areas of technology transfers



- Transfer is connected with the manufacturing process
- Transfer is connected with the product itself
- Transfer is connected with customer service after the sale
- Transfer is connected with marketing initiatives

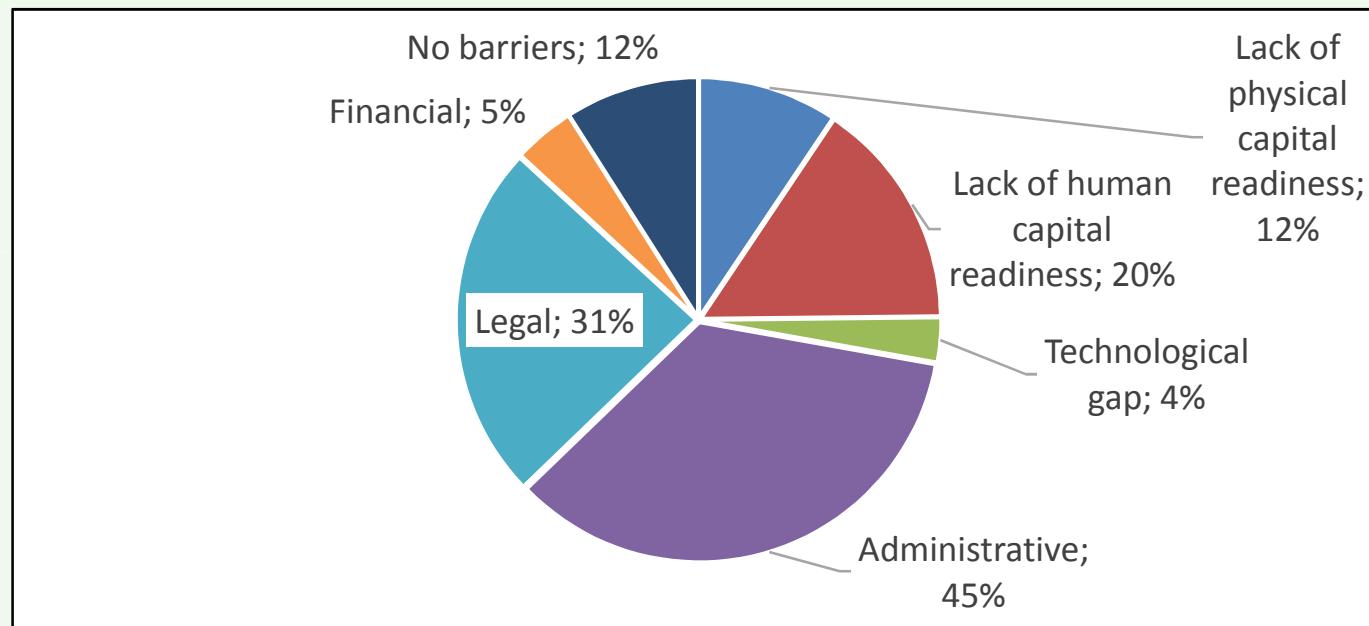


Channels of technology transfers





Barriers of technology transfers





SGH

	Area of technology transfer			
Technology transfer channel	Manufacturing process	The product	Customer service after the sale	Marketing initiatives
Demonstration	20.90%	11.90%	26.10%	12.90%
Training	50.00%	52.40%	69.60%	48.40%
Collaboration with firms up the value chain	36.00%	14.30%	15.20%	0.00%
Collaboration with firms down the value chain	15.10%	9.50%	4.30%	3.20%
Know-how	67.40%	81.00%	28.30%	41.90%



Test for homogeneity of Technology transfer

H_0 : No statistically significant difference in channels of technology transfers across areas of transfers

		Statistic	df1	df2	Sig.
Demonstration	Welch	1.348	3	91.306	0.264
Training	Welch	1.968	3	88.149	0.125
Collaboration with firms up the value chain	K-W	21.565	3		0.000
Collaboration with firms down the value chain	Welch	2.235	3	98.178	0.089
Know-how	Welch	13.178	3	88.361	0.000



SGH

Post hoc (Games-Howell) results for technology transfer channels

Collaboration with firms up the value chain	Know-how
Manufacturing > other areas	Manufacturing > customer service
Customer service > marketing	Product > customer service
	Product > marketing



Key barrier in the technology transfer process	Area of technology transfer			
	The manufacturing process	The product	Customer service after the sale	Marketing initiatives
Lack of physical capital readiness	14.0%	28.6%	2.2%	0.0%
Lack of human capital readiness	23.3%	38.1%	8.7%	3.2%
Technological gap	2.3%	7.1%	6.5%	0.0%
Administrative	34.9%	42.9%	47.8%	74.2%
Legal	24.4%	38.1%	30.4%	41.9%
Financial	7.0%	4.8%	6.5%	0.0%



Homogeneity test for barriers of the technology transfer

H_0 : No statistically significant difference in barriers of technology transfers across areas of transfers

		Statistic	df1	df2	Sig.
Lack of physical capital readiness	K-W	19.292	3		0.000
Lack of human capital readiness	Welch	8.513	3	99.204	0.000
Technological gap	K-W	3.828	3		0.281
Administrative	Welch	5.682	3	88.652	0.001
Legal	Welch	1.417	3	85.274	0.243
No barriers	Welch	2.380	3	99.040	0.074
Financial	K-W	2.337	3		0.505



SGH

Post hoc (Games-Howell) results for technology transfer barriers

Lack of physical capital readiness	Lack of human capital readiness	Administrative
Manufacturing > customer service	Manufacturing > marketing	Manufacturing < marketing
Manufacturing > marketing	Product > customer service	Product < marketing
Product > customer service	Product > marketing	
Product > marketing		



SGH

Conclusions

1. What are the key _____ of technology transfer?
 - Areas: Manufacturing
 - Channels: Know-how & Training
 - Barriers: Administrative
2. Homogeneity between:
 - Manufacturing process and product areas
 - I.e., it does not matter if the product is new to the market or not
 - Customer service and marketing
3. Heterogeneity between:
 - Good-related (Manufacturing, product) vs. Service-related (Customer service, marketing)



SGH

Additional findings

4. Highlight the role of human capital as an element of and of absorptive capacity
 - Same as Foreign Direct Investment Benefits Absorption Path
5. It is very interesting that the barrier to a successful technology transfer most often listed in the examined literature, i.e. technological gap, is a minor hindrance to foreign firms operating in Poland.



SGH

Thank you

Dr Tomasz M. Napiórkowski
Warsaw School of Economics
ul. Rakowiecka 24
02-521 Warsaw, Poland
tnapio@sgh.waw.pl