

Measuring outsourcing of services

Cross-cutting topic

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Plan of presentation

- Introduction
- Data sources on outsourcing in the Statistics Poland
- Outsourcing of services in Poland
- Services outsourcing vs. productivity of enterprises in Poland
 - The Ist stage of procedure
 - The IInd stage of procedure
 - Conclusions
- Challenges for future

Introduction

- Objective – presenting the experiences of the Statistics Poland in measuring the services outsourcing&establishing the relationship between the services outsourcing and productivity of enterprises;
- Outstanding development of services sector as a result of growing demand for services;
- What motivates enterprises to outsource services instead of producing them in-house;
- Definition by Greaver (1999):

„Outsourcing involves the transfer of an organization's recurring internal tasks to external service providers, in accordance with the provisions of an agreement (contract), as well as the related personnel, machinery, equipment, facilities, technology, and other resources, along with the decision-making authority regarding their use.”

Data sources on services outsourcing

□ *Annual business survey of enterprises:*

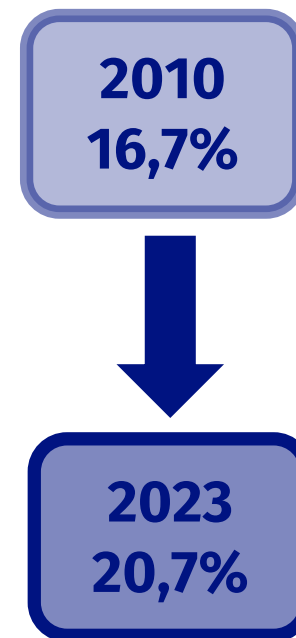
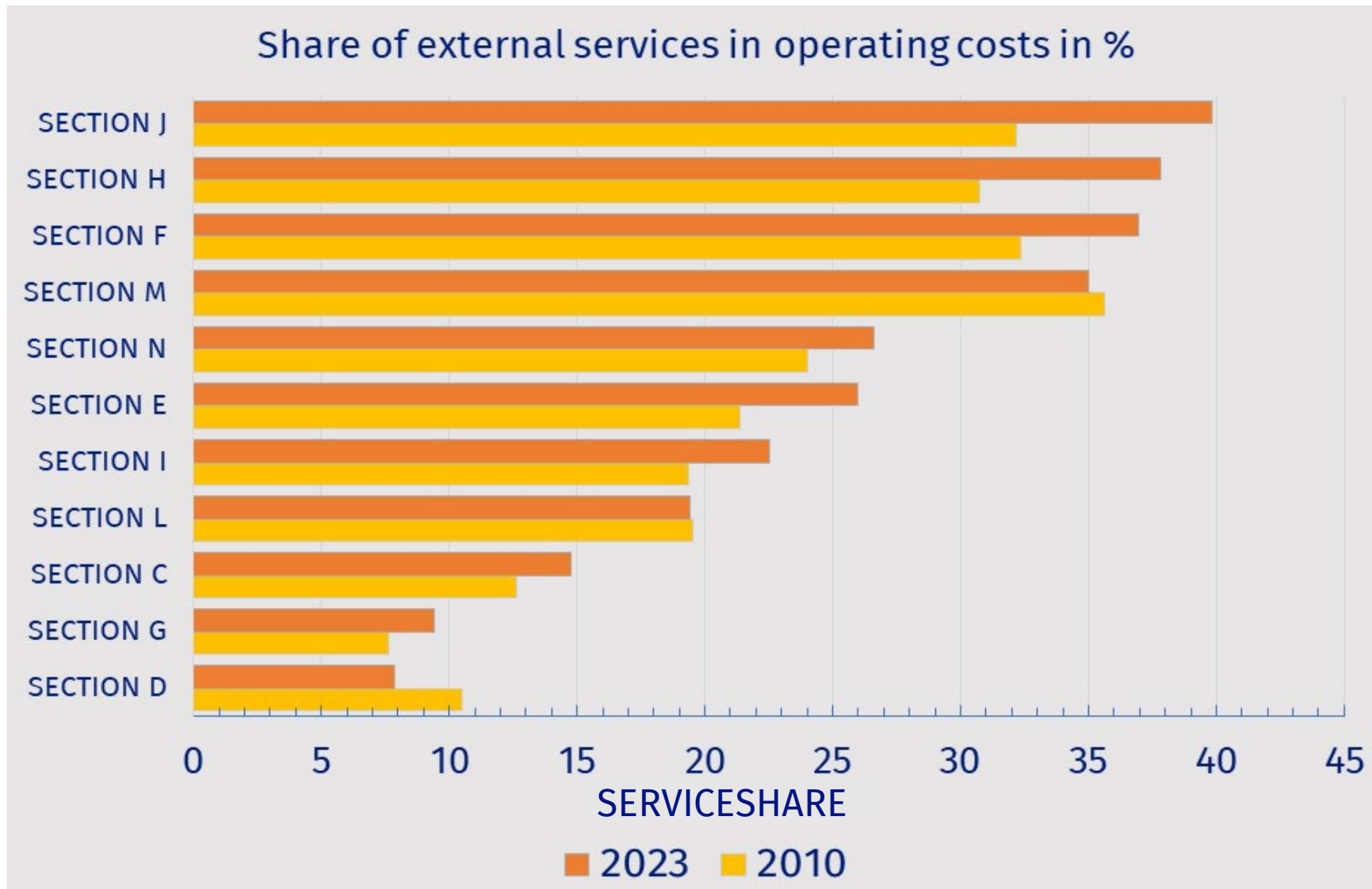
- data from the financial statements: profit and loss account as well as data from the balance sheet collected, including the value of services purchased from the third parties;
- information collected from all companies with the number of persons employed 10 and more and the approx. 3% sample of enterprises with the number of persons employed 9 and less running the business activities classified according to the NACE sections: A – N;

□ *Demand for services survey:*

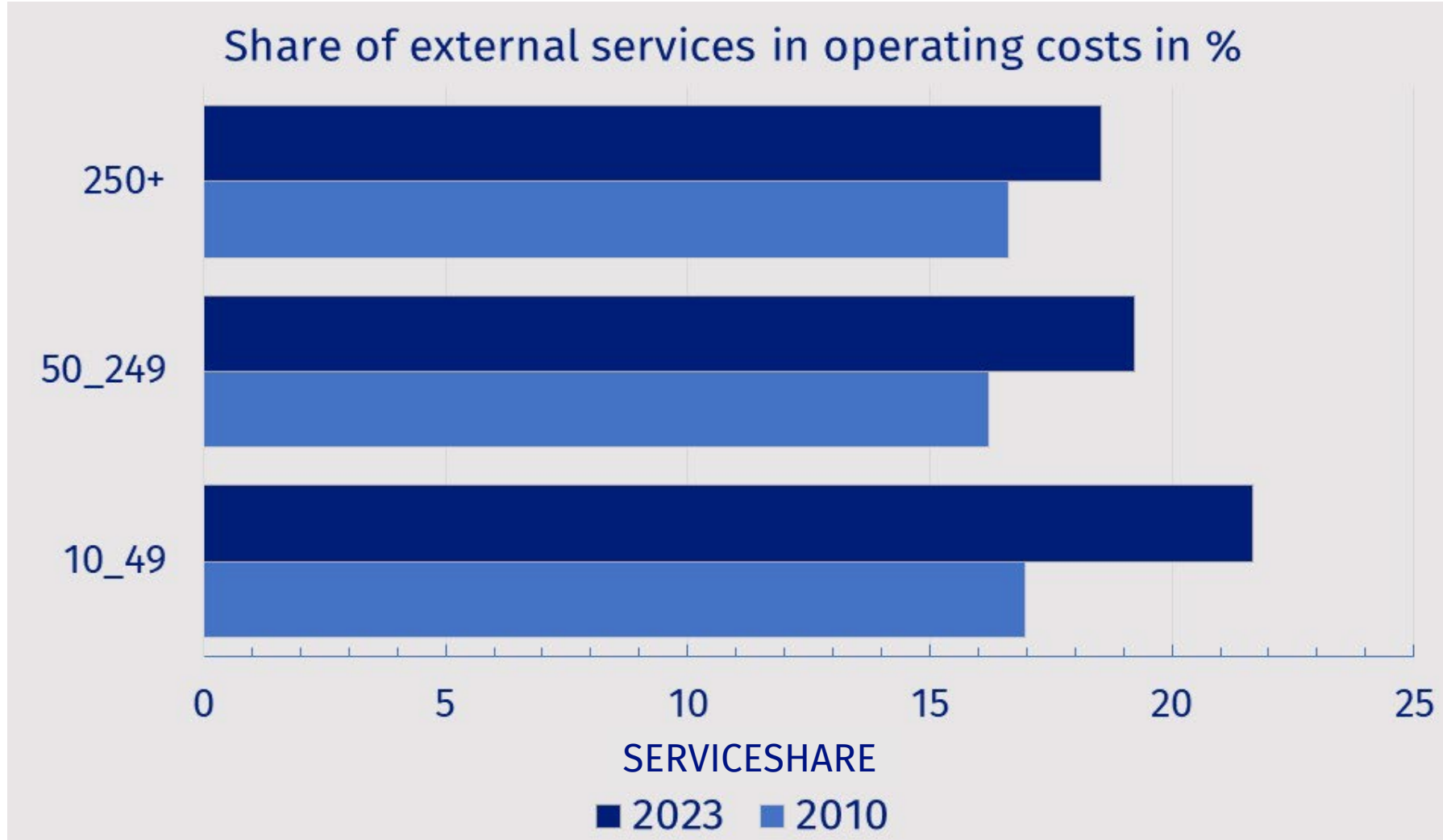
- ✓ information on: value of services purchased from the third parties by services category, direction of service purchases (domestic/foreign), barriers to purchase of services and enterprises plans in the scope of external service acquiring.
- ✓ conducted every 5 years;
- ✓ information collected from all companies with the number of persons employed 50 and more which carry out activities classified, according to NACE, to sections: C *Manufacturing*, F *Construction*, G *Wholesale and retail trade; repair of motor vehicle and motorcycles*, H *Transportation and storage*, I *Accommodation and food service activities*, J *Information and communication* (excluding division 59), K *Financial and insurance activities*, L *Real estate activities*, M *Professional, scientific and technical activities*, N *Administrative and support service activities*.



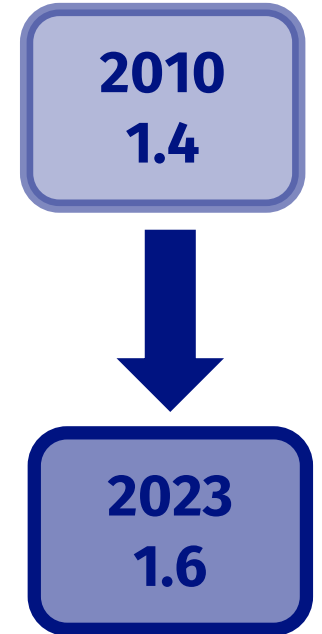
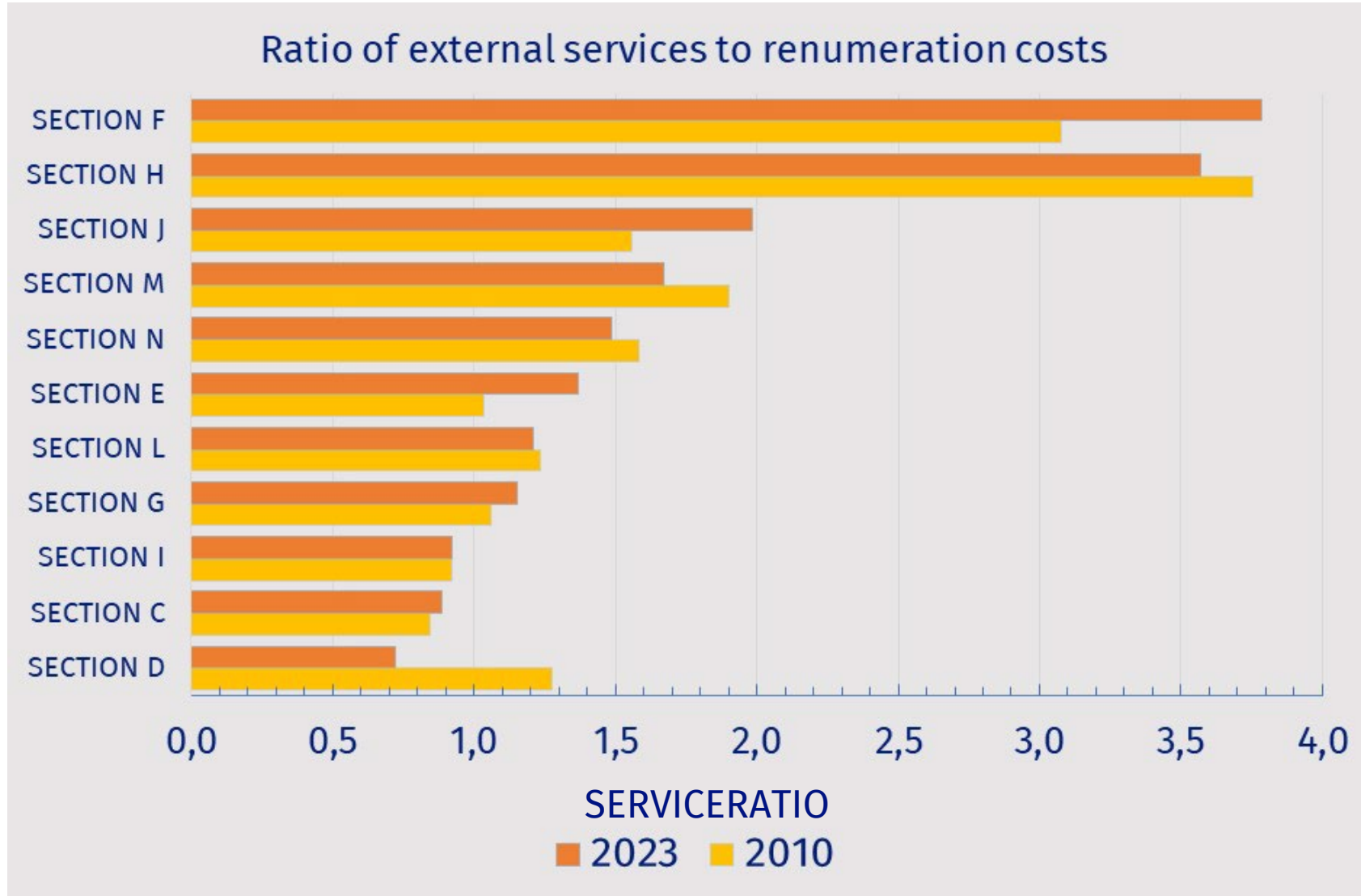
Outsourcing of services in Poland



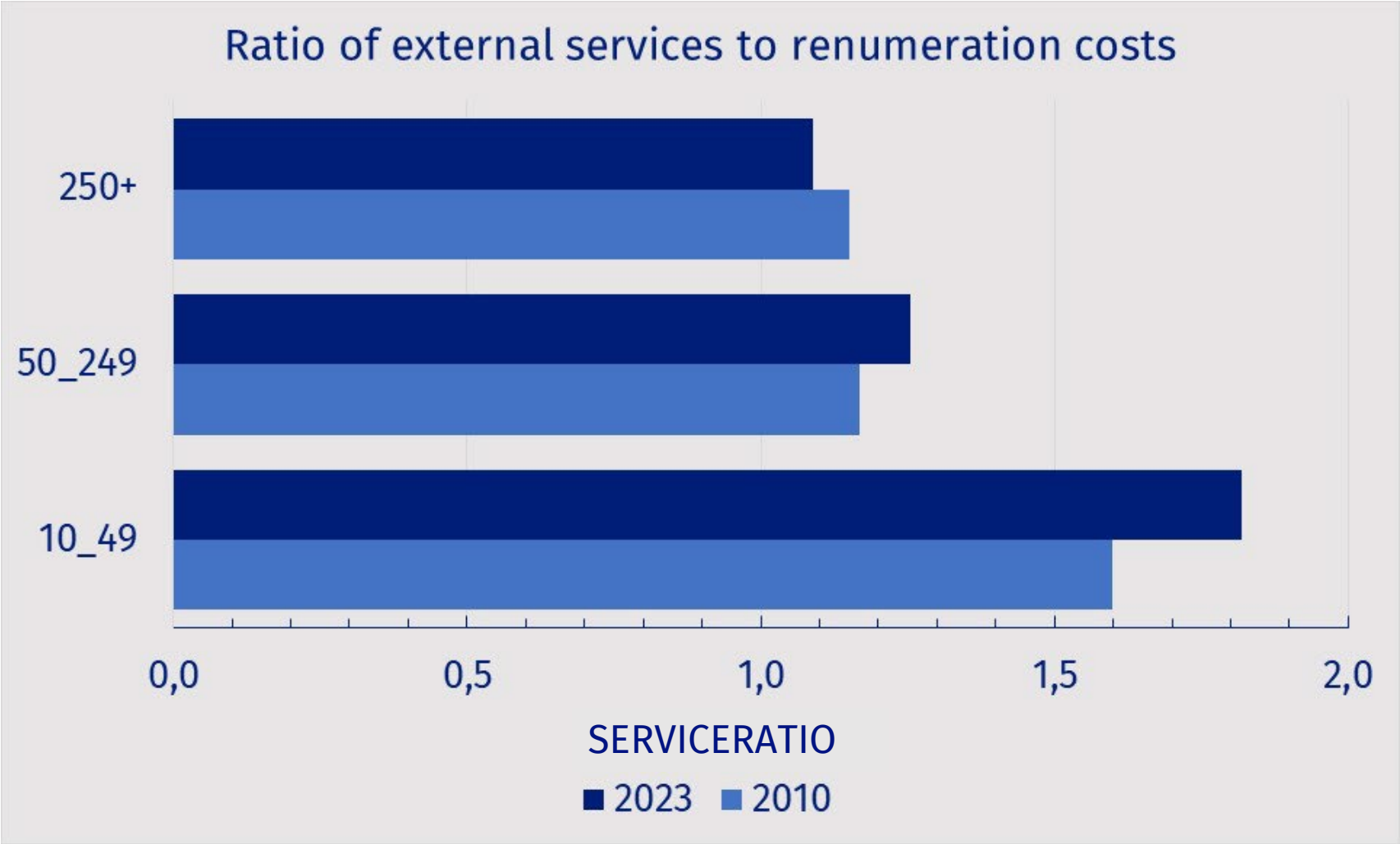
Outsourcing of services in Poland



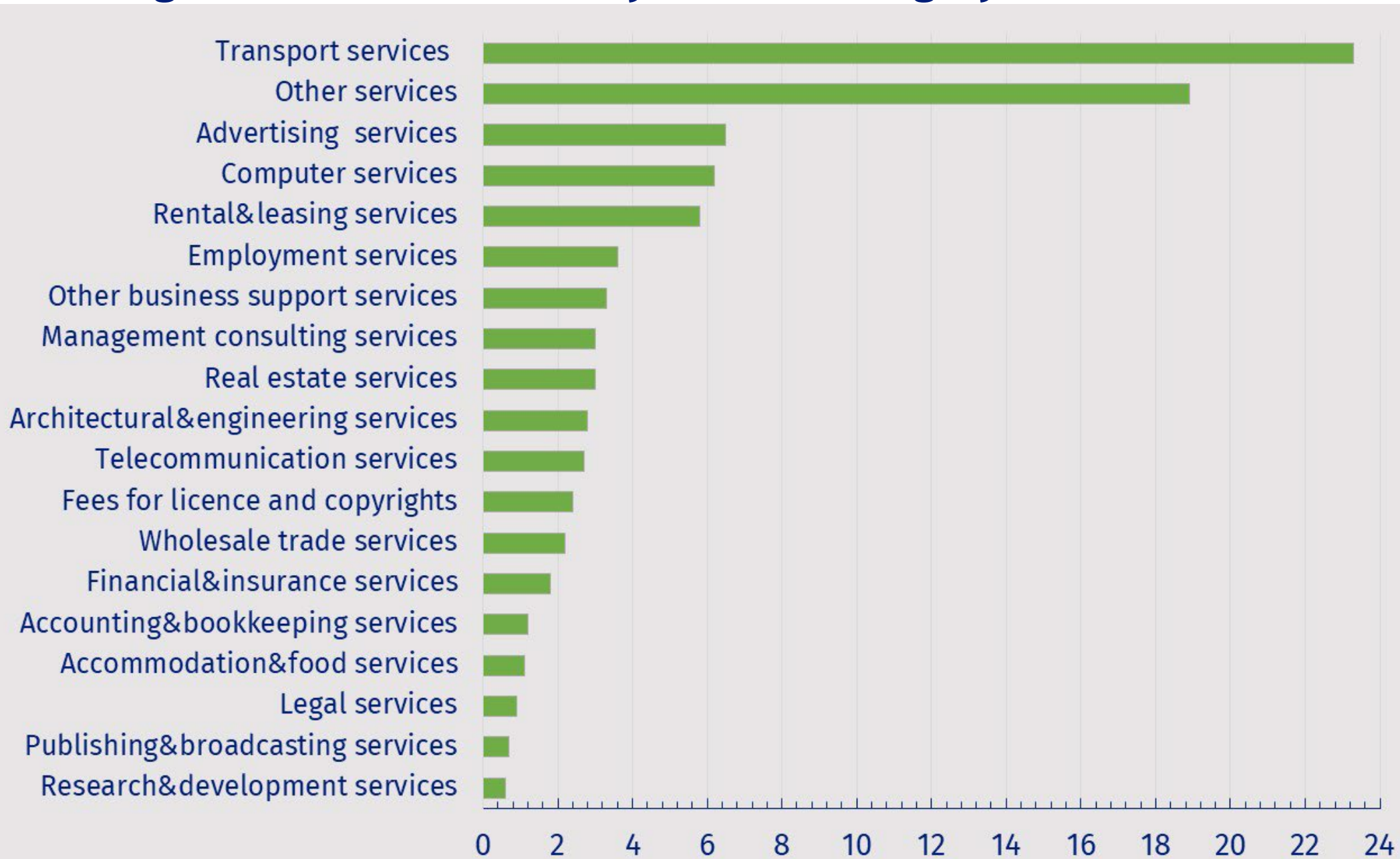
Outsourcing of services in Poland – ratio of external services to remuneration costs



Outsourcing of services in Poland



Outsourcing of services in Poland by services category in 2020 – structure in %



Types of services outsourcing

❑ **Outsourcing of core activity services:**

- transport and storage services - the biggest share of external services in Section H *Transporting and storage* (66,6%);
- computer services and telecommunication services - suitably 30,8% and 25,1% of external services in Section J *Information and communication*;
- advertising services - 23,5% of external services in Section M *Professional, scientific and technical activities*;

❑ **Outsourcing of services supporting the core activity:**

- architectural and engineering services - almost 9% of services purchased from the third companies in Section F *Construction*;
- advertising, market research and public opinion pooling services - almost 15% of external services in Section G *Wholesale and retail trade; repair of motor vehicles and motorcycles*;
- other business support services (i.e cleaning services, security and investigation services, tourist services) & advertising services - over 24% and 10% of external services in Section I *Accommodation and food service activities*;

- ❑ **Outsourcing of services supporting the running business activity** (i.e. computer and telecommunication services, accounting, book-keeping and auditing services, legal services);

Services outsourcing vs. productivity of enterprises in Poland

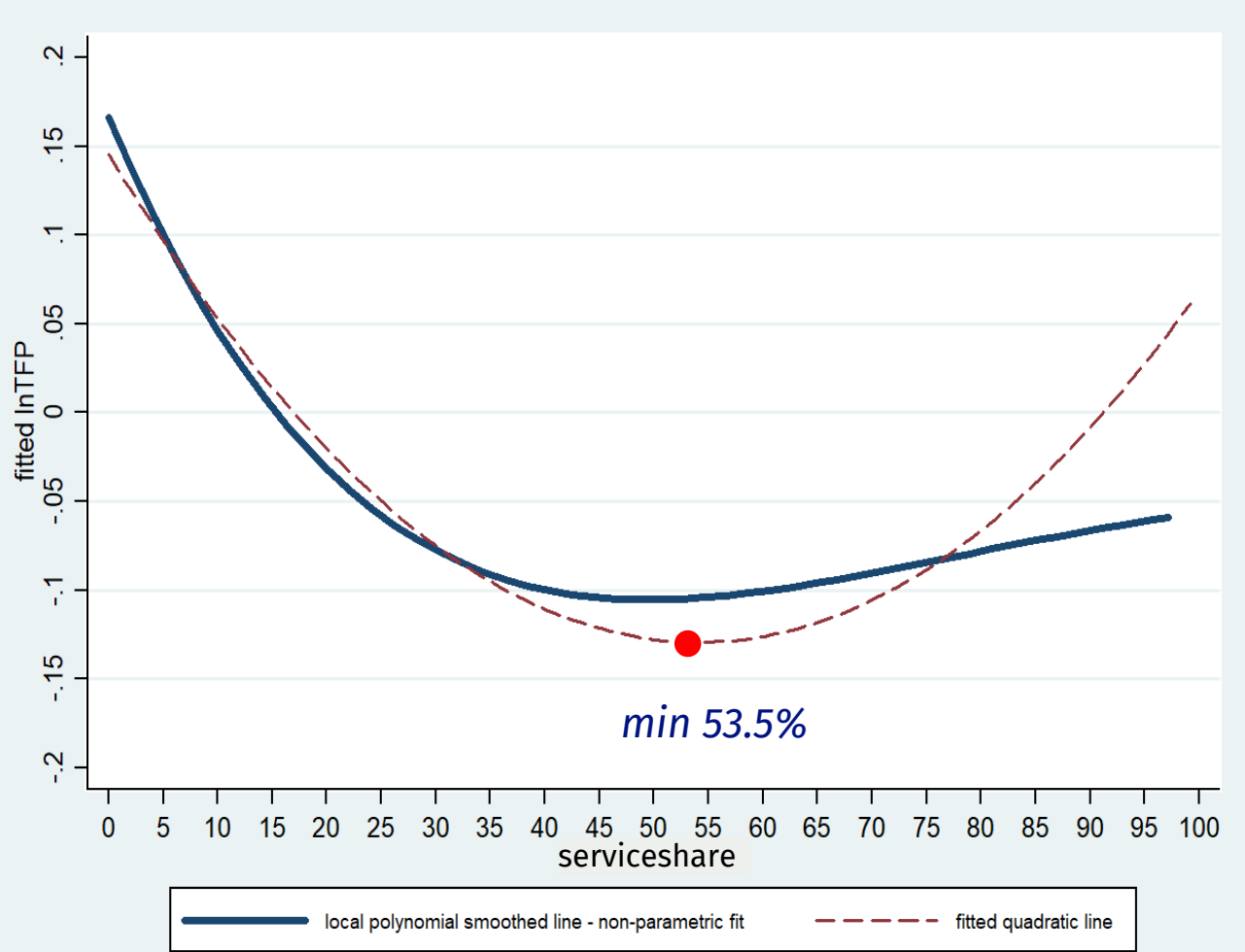
- ❑ Methodological work covered legal units with the number of persons being employed 10 and more which run activities classified according to the PKD/NACE from C to N;
- ❑ Period: 2010-2023;
- ❑ Two stages procedure:
 - 1st stage - TFP estimation – method developed by Akerberg, Cavesa i Frazera (2015) based on the translogarithmic production function
 - 2nd stage - estimating the correlation between outsourcing of services and TFP:
 - ✓ regression model using the order least square method (OLS);
 - ✓ panel data model with fixed effects (FE);
 - ✓ generalized additive model (GAM);

① share of external services in operating costs (size of outsourcing)

② ratio of external services to remuneration costs (intensity of outsourcing)

① Share of external services in operating costs vs. total factor productivity (TFP)

LnTFP	(1)	(2)	(3)
	OLS	FE	FE
Intfp	Intfp	Intfp	Intfp
serviceshare	0,00195*** (0,00007)	-0,00056*** (0,0001)	-0,00581*** (0,00023)
serviceshare2	x	x	0,00007*** (2.92e-06)
...
Constans	5,14071*** (0,003)	5,25957*** (0,00597)	5,29853*** 0,00616
No of observations	638 826	638 826	638 826
No of groups		95 128	95 128
R ²	23.34		
R ² within		0.0152	0.0164
R ² between		0.1548	0.1440
R ² overall		0.1754	0.1620



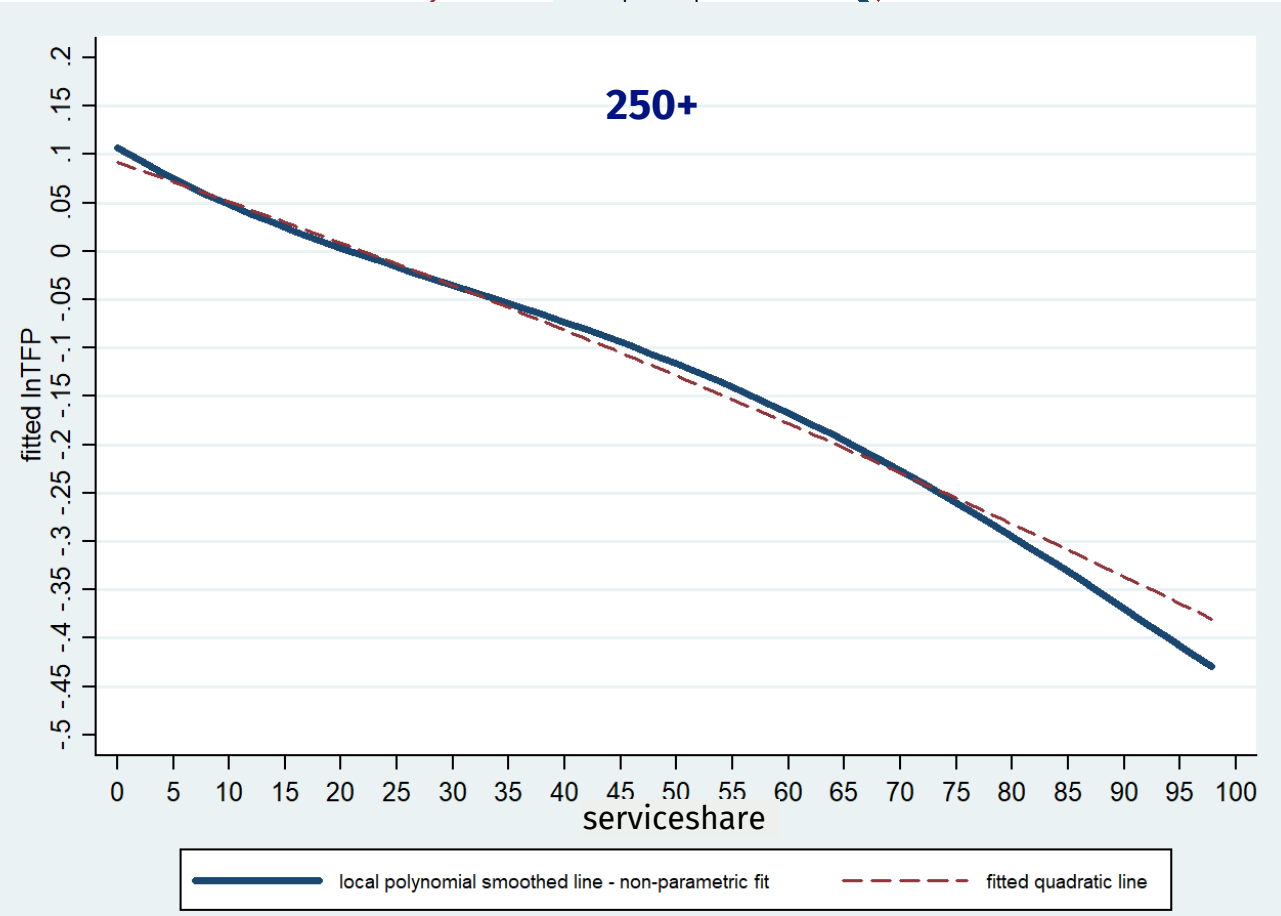
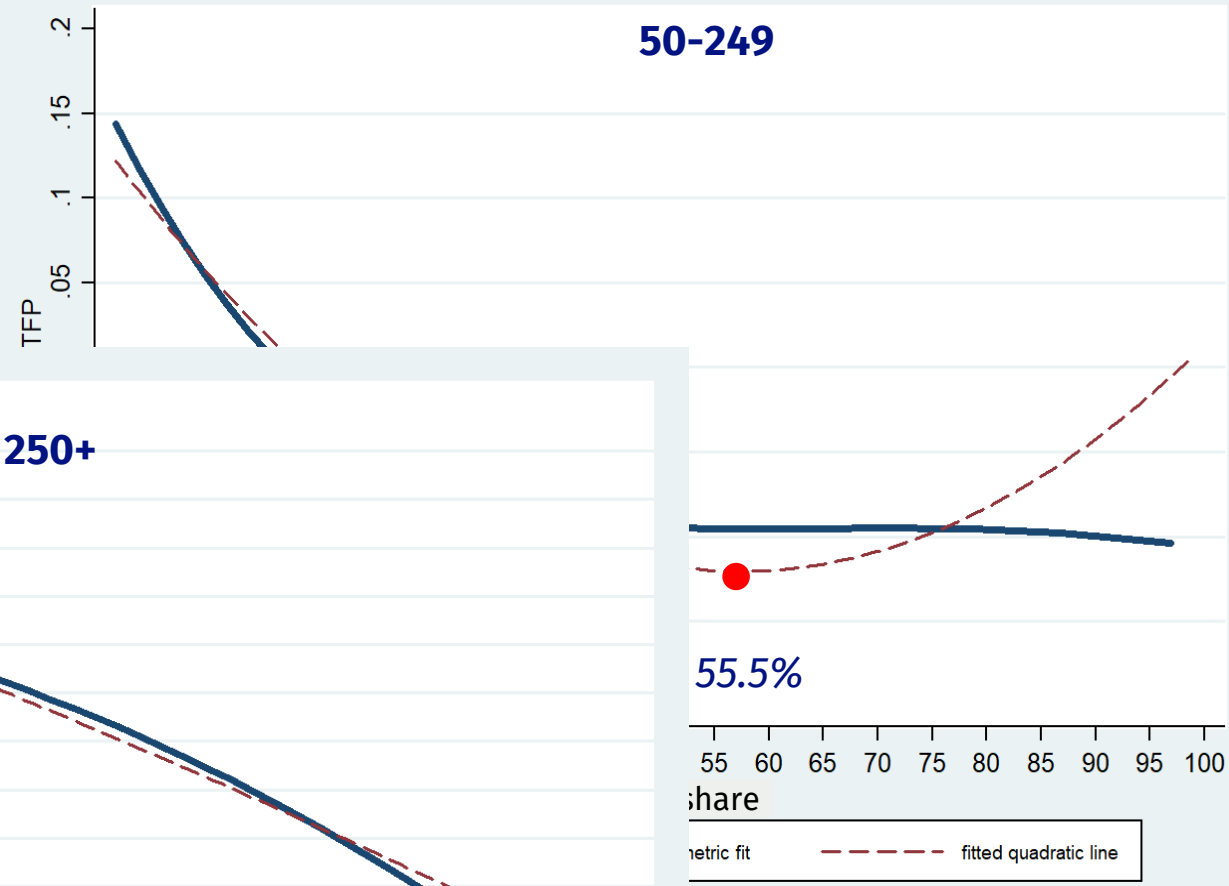
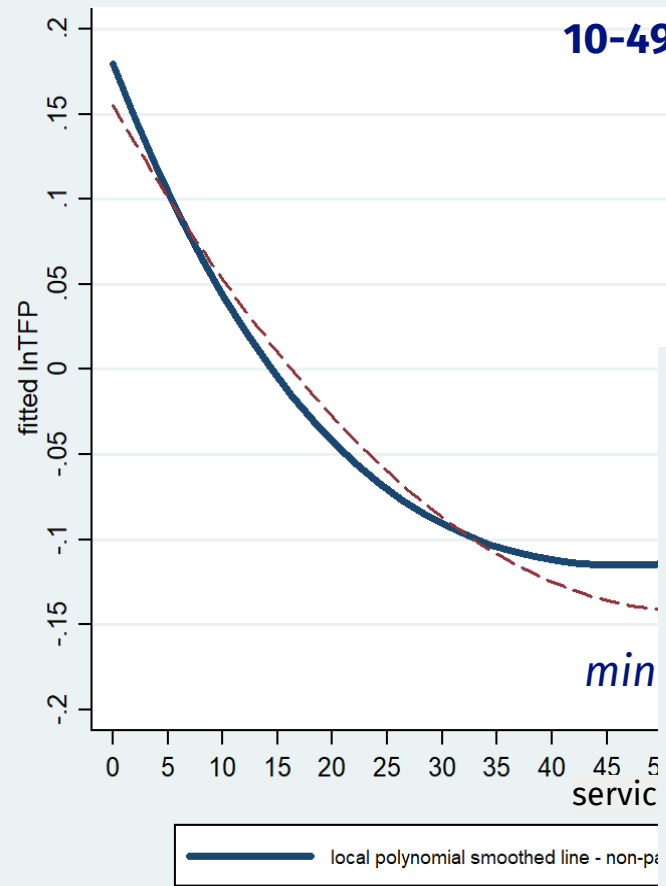
Standard error in brackets *** p<0.01, ** p<0.05, * p<0.1

① Share of external services in operating costs vs. total factor productivity (TFP) by size classes

Specification	FE model (5)			FE model (6)		
	Entities with the no of persons employed:			Entities with the no of persons employed:		
	from 10 to 49 persons	from 50 to 249 persons	250 persons and more	from 10 to 49 persons	from 50 to 249 persons	250 persons and more
	ln_tfp	ln_tfp		Model GAM (7)		
			Specification	Entities with the no of persons employed:		
serviceshare	-0.00109*** (0.00012)	0.00045** (0.00019)		from 10 to 49 persons	from 50 to 249 persons	250 persons and more
serviceshare2	X	X		ln_tfp	ln_tfp	ln_tfp
...			remunshare	-0,01071*** (0,00017)	-0,00609*** (0,00022)	-0,00242*** (0,00046)
Constans	5.15394*** (0.00791)	5.44769*** (0.0103)	exportshare	0,00053*** (0,00006)	0,00059*** (0,00007)	0,00031** (0,00014)
			...			
No of observations	406 618	186 910				
No of groups	77 189	28 910	No of observations	319 713	163 828	41 256
R² within	0.0092	0.0056	R²	0.018	0.009	0.004
R² between	0.0524	0.0333	<i>Standard error in brackets *** p<0.01, ** p<0.05, * p<0.1</i>			
R² overall	0.0644	0.0309				

Standard error in brackets *** p<0.01, ** p<0.05, * p<0.1

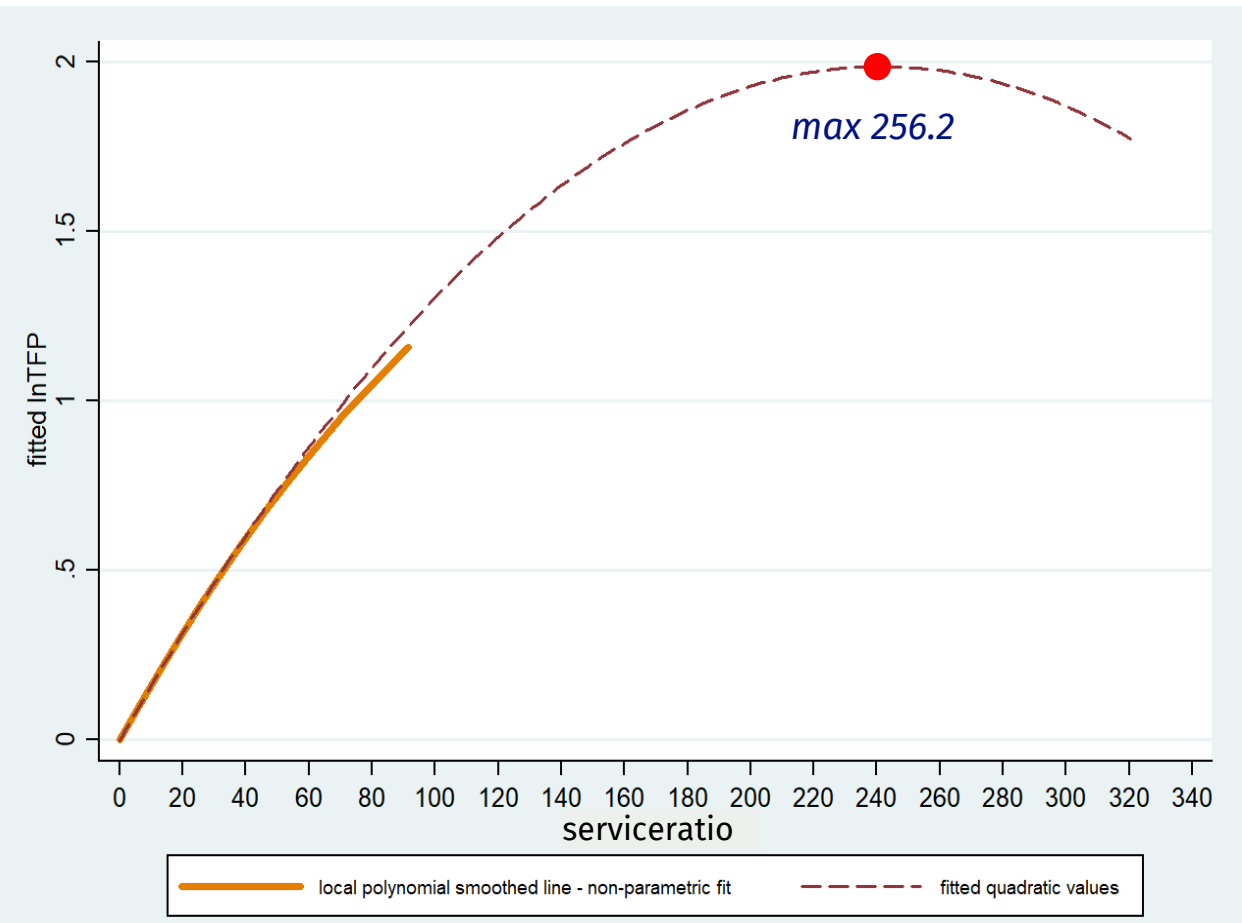
① Share of external services in operating costs vs. total factor productivity (TFP) by size classes



② Ratio of external services to remuneration costs vs. total factor productivity (TFP)

lnTFP	(1)	(2)	(3)	G ln
	OLS	FE	FE	
serviceratio	0.02166*** (0.00027)	0.01412*** (0.00033)	0.01926*** (0.00044)	
serviceratio2	X	X	0.00005*** (0)	
...	
Constans	5.11983*** (0.00279)	5.19673*** (0.00544)	5.18115*** (0.00551)	
No of observations	638 806	638 806	638 806	5
No of groups		95 118	95 118	
R ²	24.04			
R ² within		0.0185	0.0191	0.0126
R ² between		0.1511	0.0909	
R ² overall		0.1876	0.1721	

Standard error in brackets *** p<0.01, ** p<0.05, * p<0.1

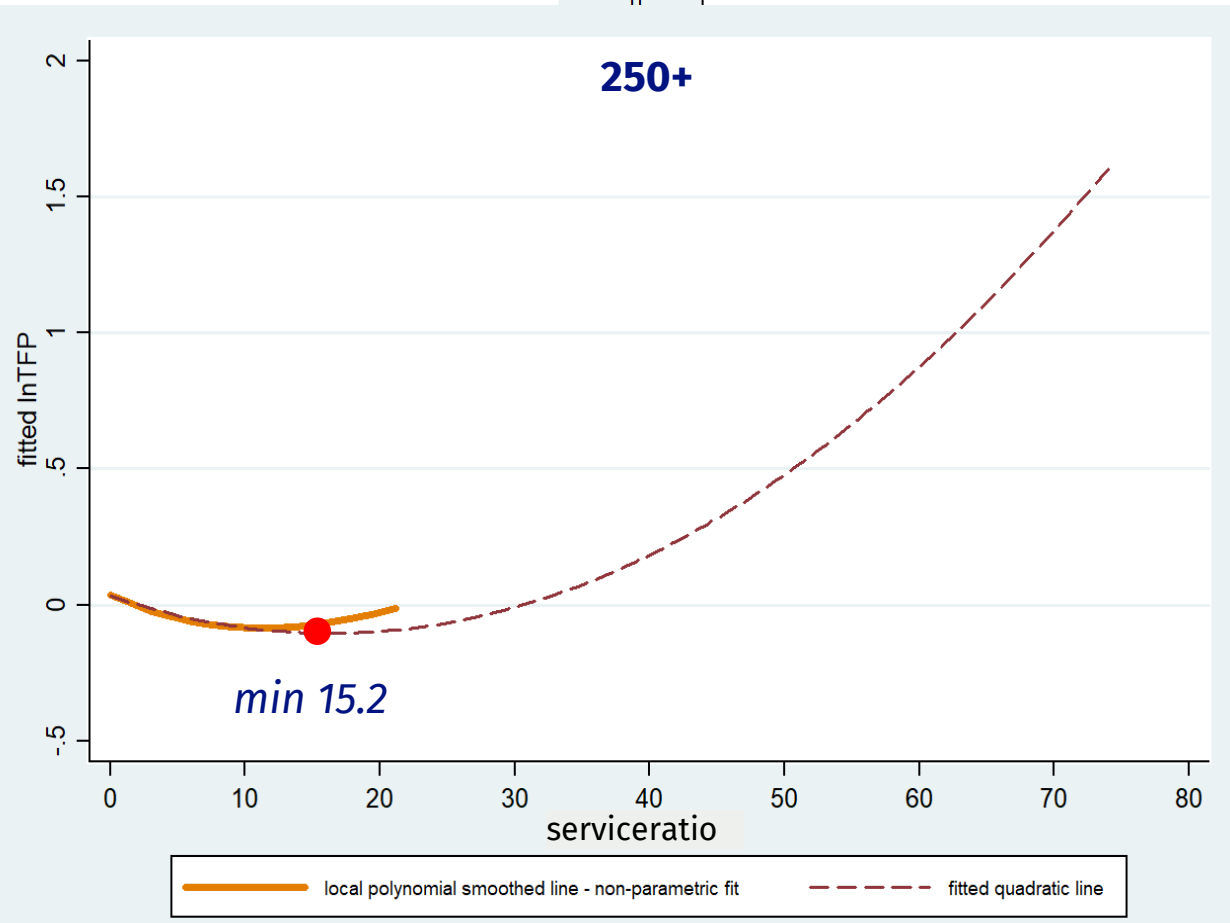
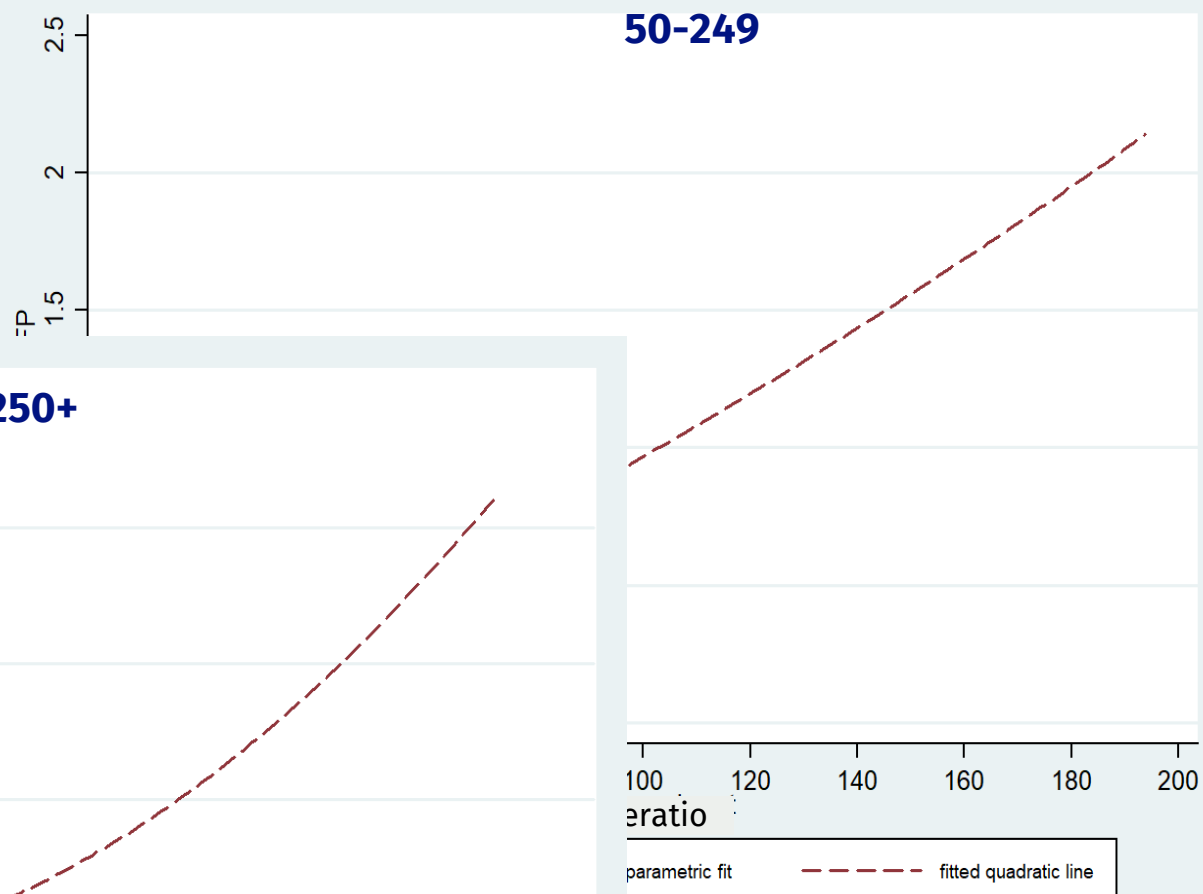
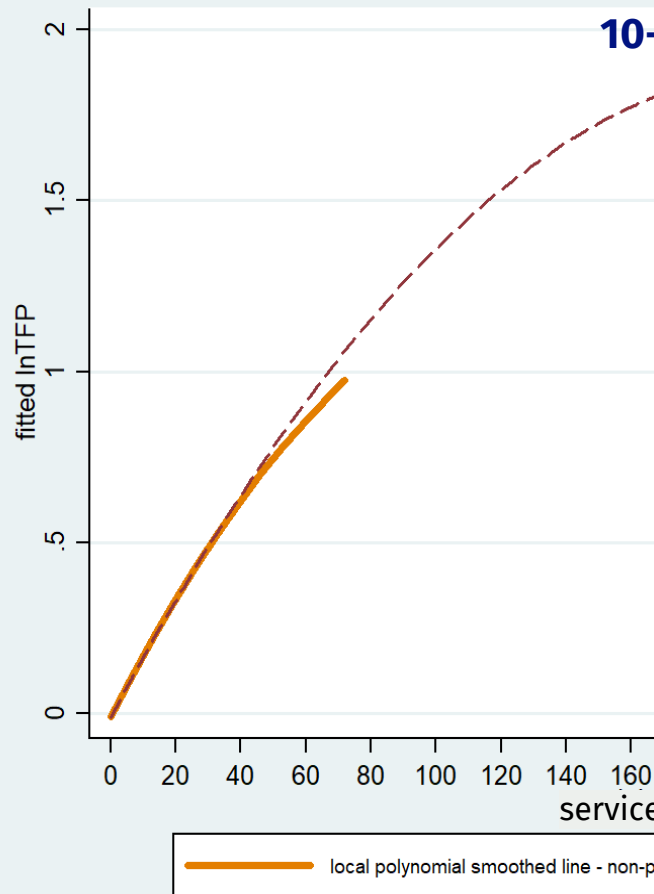


② Ratio of external services to remuneration costs vs. total factor productivity (TFP) by size classes

Specification	FE model (5)			FE model (6)			
	Entities with the no of persons employed:			Entities with the no of persons employed:			
	from 10 to 49 persons	from 50 to 249 persons	250 persons and more	from 10 to 49 persons	from 50 to 249 persons	250 persons and more	
	ln t _{it} f _{it}	ln t _{it} f _{it}	ln t _{it} f _{it}		Model GAM (7)		
					Entities with the no of persons employed:		
					from 10 to 49 persons	from 50 to 249 persons	250 persons and more
serviceratio	0,01304*** (0,00039)	0,0101*** (0,00083)	0,0111 (0,00047)		ln t _{it} f _{it}	ln t _{it} f _{it}	ln t _{it} f _{it}
serviceratio2				remunshare	-0,00848*** (0,00017)	-0,00465*** (0,00023)	-0,00115** (0,00047)
...				exportshare	0,00053*** (0,00006)	0,00075*** (0,00007)	0,00068*** (0,00014)
Constans	5,0793*** (0,00729)	5,43166*** (0,00922)	6,0599 (0,0101)	...			
No of observations	406 599	186 909	45 298	No of observations	319 709	163 810	41 252
No of groups	77 179	28 910	6 071	R²	0.016	0.006	0.001
R² within	0.0123	0.0065	0.0049	<i>Standard error in brackets *** p<0.01, ** p<0.05, * p<0.1</i>			
R² between	0.0663	0.0428	0.0236	0.0371	0.0432	0.0236	
R² overall	0.0847	0.0379	0.0228	0.0738	0.0383	0.0226	

Standard error in brackets *** p<0.01 ** p<0.05 * p<0.1

② Ratio of external services to remuneration costs vs. total factor productivity (TFP) by size classes



Summing up:

1) The steady development of services sector observed for few decades together with the simultaneous changes in the structure of services provided on the market as a result of growing demand for services from businesses.

2) *What motivates the enterprises to take a decision to outsource services?*

One of reasons - > the desire to improve the efficiency of their operation - > increase in the productivity of one's own factors of production (measured i.e. by the total factor productivity (TFP))

3) *What do numbers say about the correlation between the services outsourcing and the productivity of enterprises in Poland?*

The relation between the outsourcing of services and the productivity of enterprises differentiated and dependent on the variable reflecting the phenomenon (the share of services purchased from the third parties in the operating costs vs. the ratio of services purchased from the third parties to the remuneration costs) & the size class.

Summing up:

- 4) Generally, there is negative correlation between share of external services in the operating costs and TFP, however, without a linear form. According to the graph of fitted quadratic function (GAM model) the TFP decreases together with the increase in the share of outsourced services and gets its minimum at the level of outsourced services - 53,5%. After exceeding that value the TFP starts slow increasing, but the positive correlation concerns only approx. 8% of records in panel as total. Simultaneously, together with the increase in the ratio of purchased service to remuneration costs the TFP is rising (on average 1 p.p increase corresponds to 1.4% rise in the TFP).
- 5) When looking into the sub-populations of enterprises regarding the number of persons employed the bigger enterprise the less benefits from the outsourcing of services.
- 6) The rise in the purchase of services is not enough in order to boost the productivity of enterprise. It has to be related with the simultaneous resigning from producing services inside the company.

Challenges for future:

- Searching for further variables that could provide a proxy for services outsourcing (including the necessary data sources);
- Establishing the relations between the outsourcing of services and TFP regarding the type of business activities (at the NACE section level);
- Establishing the relations between the outsourcing of services and TFP regarding the category of outsourced services;
- Widening the analyses for the population of micro-enterprises with the number of persons employed 9 and less;

Thank you for your attention

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