Unlocking the Power of Human Capital: How SMEs Can Build Resilience

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HUMAN CAPITAL, RESILIENCE, Small and Medium size Enterprises

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Definitions

SMEs

are economic entities characterized by having fewer than **100 employees (small)** or up to **250 employees (medium)**, with annual sales totaling less than **800 million rubles** for small enterprises and up to **2 billion rubles** for medium-sized enterprises

Human capital

knowledge and skills that a single employee brings to value-adding processes **(InCaS, 2009)**

Resilience

Adaptability, responsiveness, sustainability and competitiveness in evolving markets. **(Gunasekaran A., Rai B.K. and Griffin M., 2011)**

Ability of an organisation **to not only survive but to thrive,** both in good times and in the face of adversity **(Vargo J. and Seville E., 2011)**

MOTIVATION

SMEs

Russia is still behind developed economies in terms of SME contribution to GDP
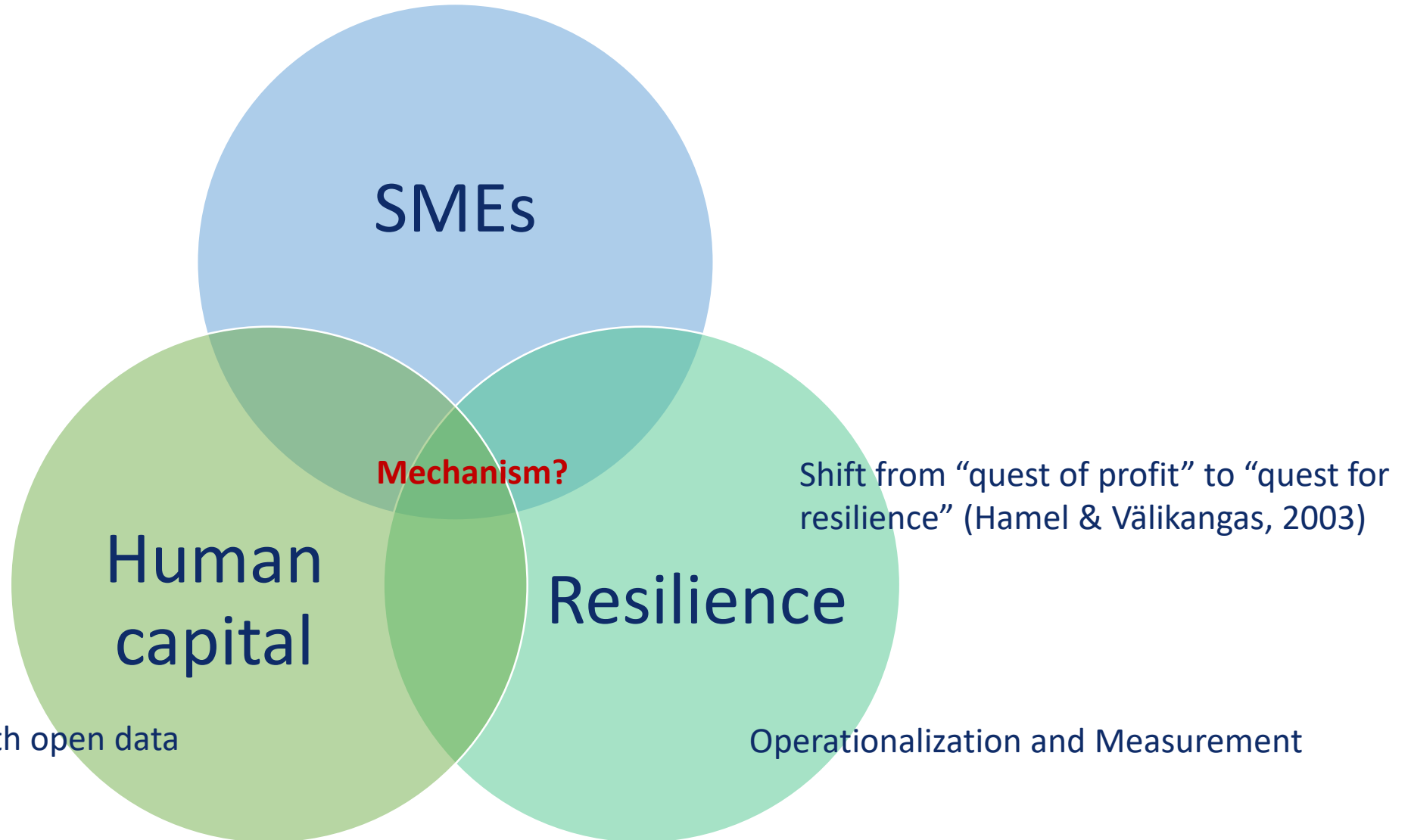
Human capital

Productivity gap, skill mismatch

Resilience

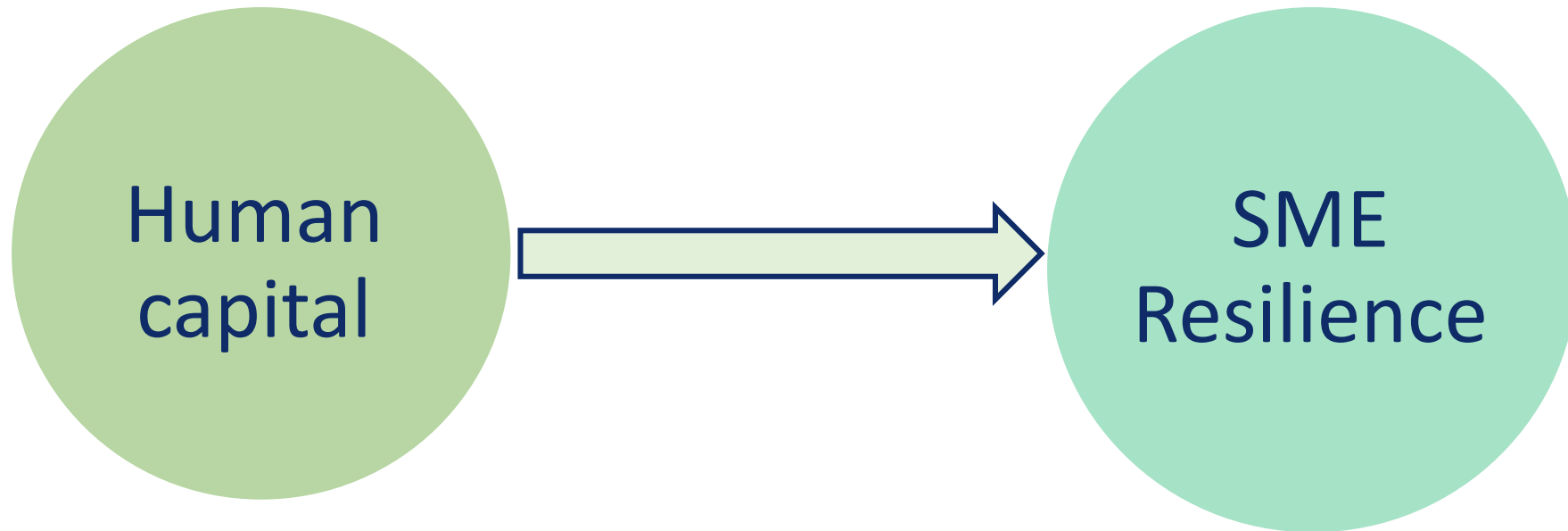**High uncertainty of Russian economy**

MOTIVATION

SMEs

Human capital

Resilience

Mechanism?

Shift from "quest of profit" to "quest for resilience" (Hamel & Välikangas, 2003)

Measurement with open data

Operationalization and Measurement

The scheme of the research (1st step – direct impact)

Human capital → SME Resilience

Hypothesis H1:

The effectiveness of human capital has a positive effect on the resilience of SMEs

METHODOLOGY

The human capital efficiency metric

is based on the value-based management concept and the principles of the resource-based view:

1. Human capital - is one of the **unique resources** that allow company to outperform it's rivals and create value (Barney, 1991).

2. **Idea of economic profit**: a company creates value when the return on invested capital **is higher than** the industry average return on invested capital (Ehrbar, 1998).

Human capital

Just to remind: the formula for calculating the economic profit of the company

$$EP_{it} = (Return\ on\ invested\ capital_{it} - Return\ on\ invested\ capital_{t\ ind}) \times Invested\ capital_{it},$$

where:

EP_{it} – economic profit of the company i for the period t

$Return\ on\ invested\ capital_{it}$ – return on invested capital of the company i for the period t

$Return\ on\ invested\ capital_{t\ ind}$ – average industry return on invested capital for the period t

$Invested\ capital_{it}$ – invested capital of the company i for the period t

Human capital efficiency metric:
Economic profit from Human Capital = EP_HC

$$EP\_HC_{it} = (Return\ on\ HC_{it} - Return\ on\ HC_{t\ ind}) \cdot Invested\ HC_{it}$$

$$Invested\ HC_{it} = \sum_{k=0}^{l-1} \frac{l-k}{l} Costs\ HC_{i(t-k)}$$

Invested HC$_{it}$ – capital invested in the human capital component by period *t*

Costs HC$_{i(t-k)}$ – the costs of the company *i* on human capital for the period *(t-k)*

l – the number of years during which *human capital* affects the company's profit *i*

Human capital

$$EP\_HC_{it} = (Return\ on\ HC_{it} - Return\ on\ HC_{t\ ind}) \cdot Invested\ HC_{it}$$

$$Return\ on\ HC_{it} = \frac{VA_{it}}{Invested\ HC_{it}} = \frac{TR_{it} - Costs_{it} + Costs\ HC_{it}}{Invested\ HC_{it}}$$

Return on HC$_{it}$ – return on invested human capital *i* for the period *t*

TR$_{it}$ – revenue of the company *i* for the period *t*

Costs$_{it}$ – the cost of the company *i* for the period *t*

Costs HC$_{it}$ – the company's *i* human capital costs for the period *t*

Invested HC$_{it}$ – invested human capital for the period *t*

VA$_{it}$ – the added value of the company *i*, created by HC for the period *t*

Human capital

In our study we use the normalized EP_HC:

$$EP\_HC_{it} = Return\ on\ HC_{it} - Return\ on\ HC_{t\ ind}$$

To measure **SMEs resilience**, we use two metrics based on financial statements:

1. *Sd(ROS)* – the standard deviation of return on sales over three years. The **higher** the Sd(ROS), the **lower** the resilience.

$$SD(ROS)_{it} = Standard\ deviation(ROS_{it}, ROS_{it-1}, ROS_{it-2}),$$

where i – company, t – year, ROS – return on sales

2. *Dif ROS from industry median* – the difference in return on sales form the industry median. Alternative measurement indicates the deviation from the industry performance.

$$Dif\ ROS\ from\ industry\ median_{it} = ROS_{it} - median(ROS_{jt}),$$

where i – company, t – year, j – industry, ROS – return on sales

The scheme of the research

Human capital

$\longrightarrow$

SME Resilience
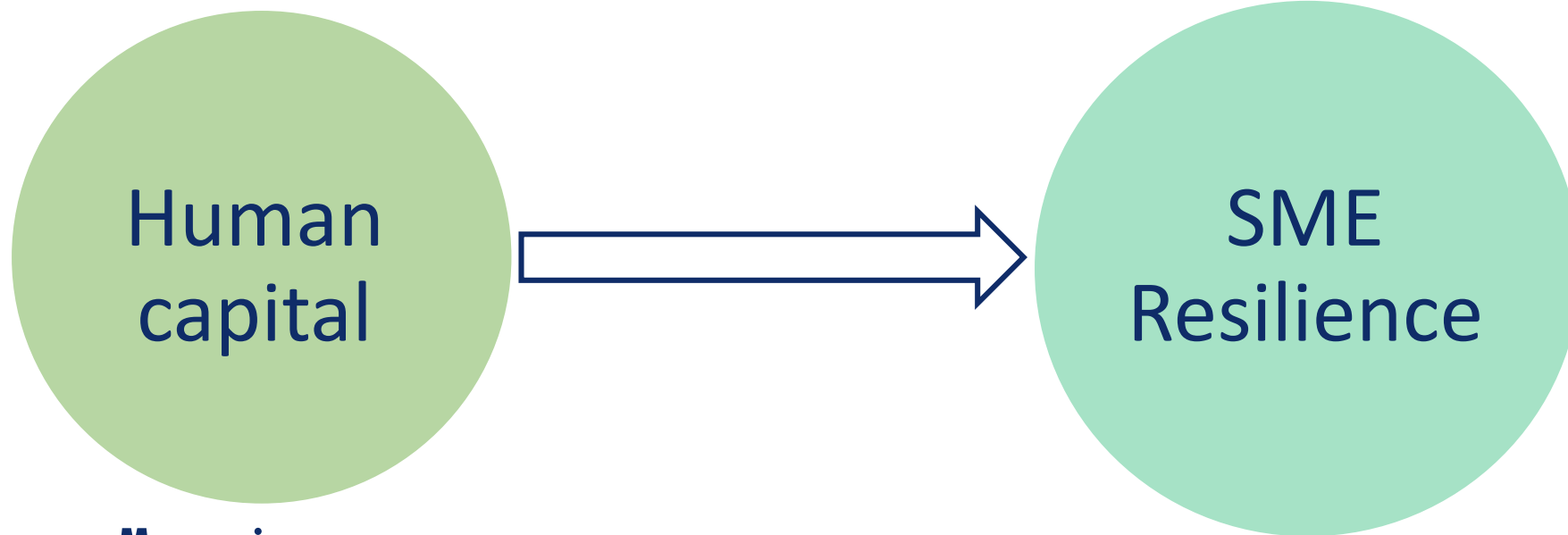
Measuring:

Economic profit from human capital

$$EP\_HC_{it} = (Return\ on\ HC_{it} - Return\ on\ HC_{t\ ind})$$

Measuring:

1. **SD(ROS)** – the standard deviation of return on sales
2. **Dif ROS from industry median** – the difference in return on sales from the industry median

Specifications:

Model 1:

$$SD(ROS)_{it} = \beta_1 \cdot EP_{HC_{it}} + \beta_2 \cdot EP^2_{HC_{it}} + CV \cdot \gamma + \varepsilon_{it} + \alpha_i$$

Model 2:

$$DifROS_{it} = \beta_1 \cdot EP_{HC_{it}} + \beta_2 \cdot EP^2_{HC_{it}} + CV \cdot \gamma + \varepsilon_{it} + \alpha_i$$

where $SD(ROS)_{it}$ - standard deviation of ROS over three year,

$EP_{HC_{it}}$ - economic profit from human capital,

CV – is a vector of control variables: Financial leverage (Debt to Equity), Tangibility of assets (Fixed Assets to Total Assets), Company size (Logarithm of Total Assets), The growth rate of the company's revenue

The database

The initial database used :

- **154 994 small and medium-sized companies**

- **Period from 2013 to 2022**

- **The data is collected using the SPARK-Interfax database.**

As a result of database filtering:

- **8 325 observations left**

- **2017-2022**

- **11 unique industries**

Variable	N	Mean	St. Dev.	Min	Pctl(25)	Median	Pctl(75)	Max
Return on sales	8 325	0.053	0.121	-2.485	0.017	0.052	0.116	2.753
The standard deviation of ROS	8 325	0.041	0.048	0.001	0.011	0.026	0.053	0.291
Dif ROS from industry median	8 325	0.007	0.094	-0.274	-0.040	-0.007	0.048	0.325
EP_HC	8 325	0.225	1.129	-4.546	-0.331	-0.047	0.412	11.782
Financial leverage	8 325	2.958	7.065	0.011	0.432	1.035	2.465	97.160
Tangibility (fa/assets)	8 325	0.284	0.214	0.00003	0.101	0.249	0.435	0.978
Company size (assets)	8 325	16.279	683.771	45.165	397.341	649.564	1 019.805	9 573.902
The growth rate of sales	8 325	0.156	0.861	-0.942	-0.027	0.074	0.216	51.555

	$SD(ROS)_{it}$		$DifROS_{it}$	
	(1)	(2)	(3)	(4)
$EP_{HC_{it}}$	0.052**	**0.103***	0.039***	**0.076***
	(0.021)	**(0.035)**	(0.003)	**(0.005)**
$EP^2_{HC_{it}}$		**-0.009**		**-0.006***
		(0.004)		**(0.001)**
Control variables		Included		
Observations	8,325	8,325	8,325	8,325
R^2	0.023	0.024	0.207	0.281
F Statistic	31.956*** (df = 5; 6751)	27.713*** (df = 6; 6750)	352.356*** (df = 5; 6751)	440.185*** (df = 6; 6750)

Note: OLS with fixed effects, clustered standard errors   *$p<0.1$; **$p<0.05$; ***$p<0.01$
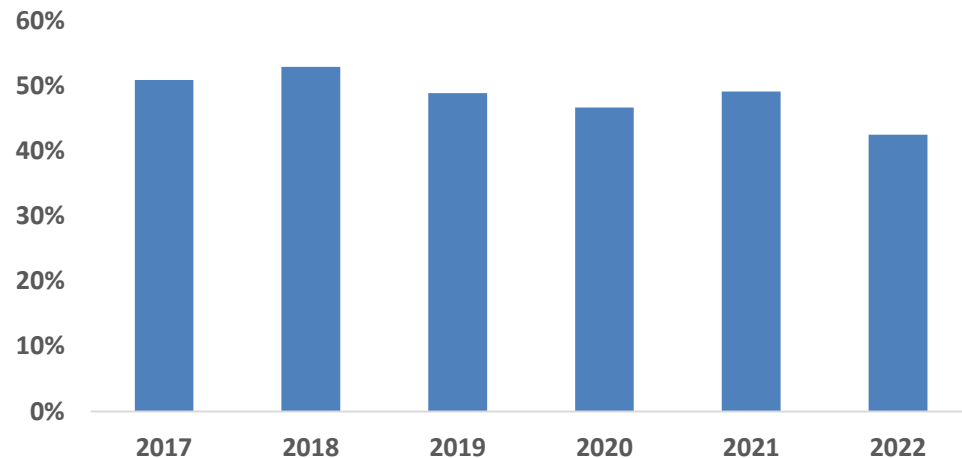
First results

- **The greater the efficiency of human capital, the lower the resilience of SMEs.**

- **Does decline in company performance matter for company resilience? $ROS_{t-1} > ROS_t$**

- **Does it moderate the link between efficiency of HC and resilience of SMEs?**

Share of companies with negative changes in ROS

Almost half of the observed companies experienced a decline in ROS.

Additional specifications:

Model 3:

$$SD(ROS)_{it}$$
$$= \beta_1 \cdot EP_{HC_{it}} + \beta_2 \cdot EP^2_{HC_{it}} + \beta_3 \cdot NegChange + \beta_4 \cdot EP_{HC_{it}} \cdot NegChange + \beta_4 \cdot EP^2_{HC_{it}}$$
$$\cdot NegChange + CV \cdot \gamma + \varepsilon_{it} + \alpha_i$$

Model 4:

$$DifROS_{it}$$
$$= \beta_1 \cdot EP_{HC_{it}} + \beta_2 \cdot EP^2_{HC_{it}} + \beta_3 \cdot NegChange + \beta_4 \cdot EP_{HC_{it}} \cdot NegChange + \beta_4 \cdot EP^2_{HC_{it}} + CV \cdot \gamma$$
$$+ \varepsilon_{it} + \alpha_i$$

where $SD(ROS)_{it}$ - standard deviation of ROS over three year,

$EP_{HC_{it}}$ - economic profit from human capital,

$NegChange$ – a dummy variable that takes the value 1 if the company's ROS decreases compared to the previous period

CV – is a vector of control variables: Financial leverage (Debt to Equity), Tangibility of assets (Fixed Assets to Total Assets), Company size (Logarithm of Total Assets), The growth rate of the company's revenue

|	$SD(ROS)_{it}$		$DifROS_{it}$	
	(1)	(2)	(3)	(4)
$EP_{HC_{it}}$	0.064***	0.133***	0.033***	0.067***
	(0.023)	(0.039)	(0.003)	(0.004)
$EP^2_{HC_{it}}$		-0.013**		-0.006***
		(0.006)		(0.001)
$EP_{HC_{it}} \cdot NegChange$	-0.041*	-0.083***	0.001	-0.001
	(0.019)	(0.025)	(0.002)	(0.002)
$EP^2_{HC_{it}} \cdot NegChange$		0.009*		0.001
		(0.005)		(0.001)
$NegChange$	-0.018	-0.016	-0.040***	-0.036***
	(0.018)	(0.018)	(0.001)	(0.001)
Control variables		Inc	luded	
Observations	8,325	8,325	8,325	8,325
R^2	0.024	0.026	0.312	0.367
F Statistic	23.970*** (df = 7; 6749)	19.741*** (df = 9; 6747)	436.302*** (df = 7; 6749)	433.864*** (df = 9; 6747)

Preliminary conclusions

- There is a shift "quest for profit" to "quest for resilience"

- Proposition: Efficiency of HC measured by economic profit from HC may be a good predictor of SME resilience
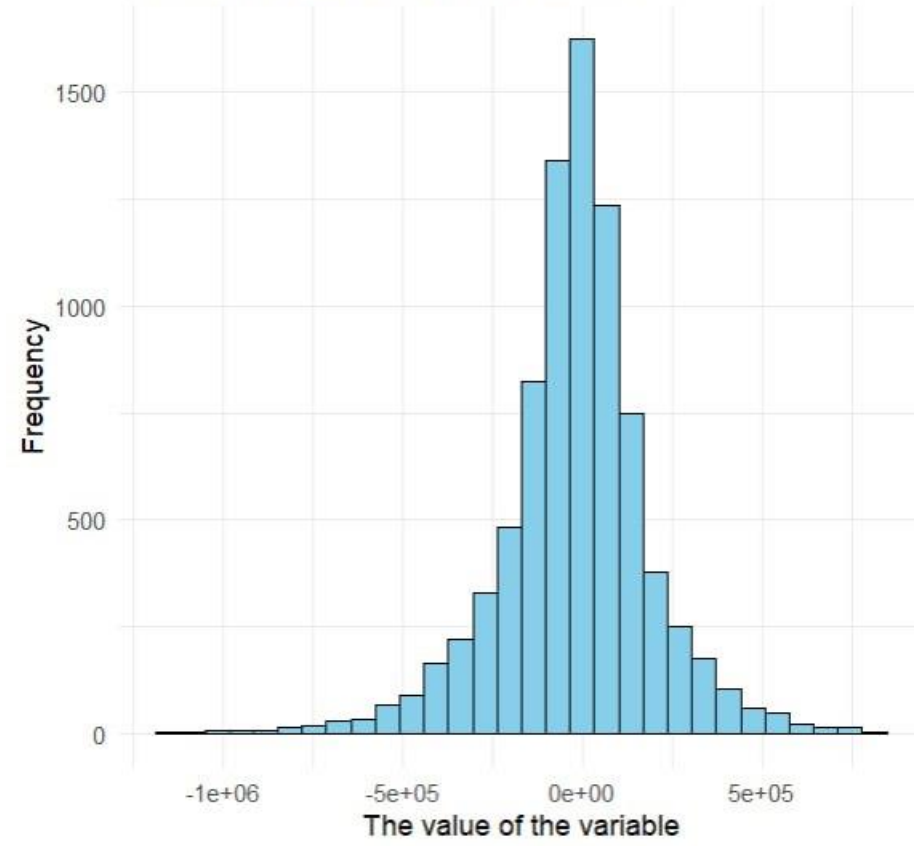
Empirical evidence:

- The greater the efficiency of human capital, the lower the resilience of SMEs

(with decreasing marginal effect)

- This effect is lower if SME experiences decline in performance

Distribution of the variable EP_HC normalized

Distribution of the variable EP_HC

Высшая школа экономики
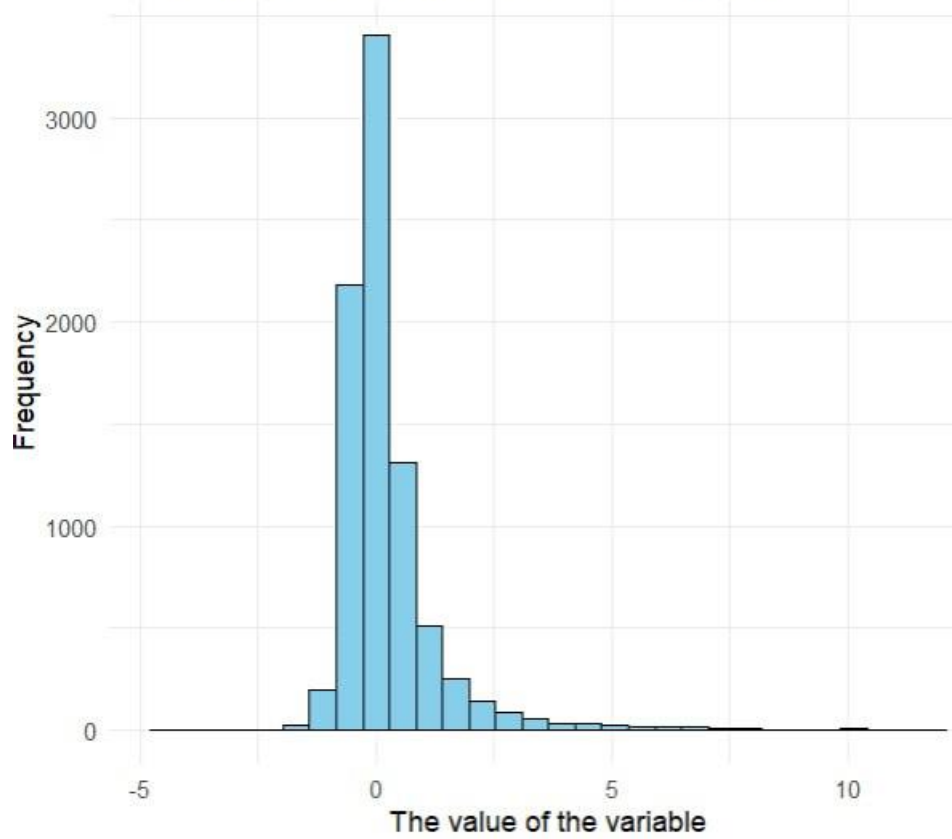
References

Vargo, J., & Seville, E. (2011). Crisis strategic planning for SMEs: Finding the silver lining. *International Journal of Production Research*, *49*(18), 5619–5635.

Gunasekaran, A., Rai, B. K., & Griffin, M. (2011). Resilience and competitiveness of small and medium size enterprises: An empirical research. *International Journal of Production Research*, *49*(18), 5489–5509.