

Small and Medium Enterprise Productivity and its Determinants: Evidence from Vietnamese manufacturing SMEs

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Motivation for the Study

Importance of SMEs

- Business numbers
- Employment creation
- Output
- Exports
- Poverty alleviation, economic empowerment
- Incubator of entrepreneurship and innovation

SMEs in economic integration (WTO, ASEAN, RCEP, TPP)

▪ *Opportunities*

- Expanding market; high skilled labour and technology, productivity spillover;
- Joining regional supply chain.

▪ *Challenges*

- Competition;
- Obstacles (lack of information, finance, technology, low skilled labour, management);
- Significant gap in efficiency/productivity.

Importance of improving efficiency and productivity of SMEs

Firm characteristics
(age, size, innovation, export status, location)

Entrepreneur characteristics
(age, gender, experience, education, network)

Business environment characteristics
(competition level, government assistance, sunk costs, trade and FDI openness, region)

Efficiency level

Productivity growth

- Efficiency change
- Technological change

Policy recommendation for improvement of efficiency and productivity of SMEs

- By manufacturing industry
- By sub-manufacturing sectors

Method

A two-stage efficiency/productivity analysis

- Data Envelopment Analysis (DEA)
- The Malmquist productivity index
 - Efficiency change
 - Technological change
- Bootstrapping
 - Evaluate confidence intervals for the DEA efficiency score
 - Regression of the impact of the environmental variables

Data

- Data source
 - The SME survey from Vietnam;
 - 2005, 2007, 2009, 2011 and 2013;
 - 2500 sample of SMEs in manufacturing industry (mostly in private sector);
 - 10 provinces.
- A balanced panel data
 - 678 non-state manufacturing SMEs

Variables for measurement of DEA score and Malmquist indices

Variable	Definitions/ Description	Mean	Std. dev
Output	Real revenue from sales (million VND)	1,786.73	40,601.51
Capital input	Total value of productive physical assets (million VND)	1,430.9	3,480.6
Labour input	The total wages bill (million VND)	127.26	251.16
Intermediate Input	The costs of raw materials and energy (million VND)	1,396.8	39,004.04

(1usd \approx 22,000VND)

Explanatory variables (1/3): Related to firm characteristics

Variables	Description	Mean	Std. dev
Age	The number of years since establishment	14.46	9.19
Size	The number of full-time regular employees	17.75	26.92
Inn1	Dummy variable representing innovation if the firm introduced any new products in the previous two years	0.16	0.37
Inn2	Dummy variable representing innovation if the firm improved existing products in the previous two years	0.57	0.50
Inn3	Dummy variable representing innovation if the firm introduced new production processes/new technology in the previous two years	0.23	0.42
Exp	Dummy variable representing if the firm directly exports	0.04	0.19
Own1	Dummy variable representing if the firm is a household enterprise	0.63	0.48
Own2	Dummy variable representing if the firm is a private/sole proprietorship company	0.11	0.31
Own3	Dummy variable representing if the firm is a partnership/collective /cooperative company	0.04	0.19
Own4	Dummy variable representing if the firm is a limited liability company	0.20	0.40
Own5	Dummy variable representing if the firm is a joint stock company	0.02	0.15

Explanatory variables (2/3): Related to business environment characteristics

Variables	Description	Mean	Std. dev
Zone	Dummy variable representing if the firm is located in an industrial zone	0.07	0.25
Urb	Dummy variable representing if the firm is located in an urban area	0.42	0.49
Reg	Dummy variable representing if the firm is located in the South of Vietnam	0.48	0.50
Com	Dummy variable representing if the firm is facing competition in the market	0.97	0.29
Assf	Dummy variable representing if the firm received financial support	0.08	0.27
Sunk	Dummy variable representing if the firm had to pay bribes	0.41	0.49

Explanatory variables (3/3): Related to entrepreneur characteristics

Variables	Description	Mean	Std. dev
Eage	The age of the entrepreneur	45.20	10.38
Esex	Dummy variable representing if the entrepreneur is female	0.30	0.46
Eexp	A dummy variable representing if the entrepreneur owned or managed other firms before establishing the present firm	0.04	0.20
Edu1	Level of general education of the entrepreneur	4.53	0.74
Edu2	Level of professional education of the entrepreneur	2.57	1.06

Result of the regression model of productivity growth (1)

	Whole manufacturing	Food and beverages	Wood	Rubber	Fabricated metal	Furniture
Ineff	-0.675***	-0.595***	-0.726*	-0.226*	-0.062**	-0.032*
	(0.0304)	(0.0521)	(0.0214)	(0.0746)	(0.0514)	(0.0264)
Age	0.0028***	0.0017**	0.0021*	0.0051***	0.0024***	-0.0038**
	(0.0004)	(0.0009)	(0.0011)	(0.0018)	(0.0009)	(0.0014)
Size	0.0001	0.0003	0.0006*	-0.0007	-0.0003	0.0006*
	(0.0001)	(0.0004)	(0.0003)	(0.0007)	(0.0003)	(0.0003)
Inn1	0.0203	0.0607*	0.0340	0.0155	-0.0419	0.0547
	(0.0153)	(0.0347)	(0.0423)	(0.0660)	(0.0341)	(0.0564)
Inn2	0.0447***	0.0487***	0.0309	0.0015	0.0216	0.0561***
	(0.0073)	(0.0175)	(0.0199)	(0.0300)	(0.0164)	(0.0213)
Inn3	0.0276***	0.0772***	0.0549*	0.0585	0.0251	0.0262
	(0.0098)	(0.0234)	(0.0308)	(0.0386)	(0.0232)	(0.0280)
Exp	0.0615***	0.0857*	0.0349	0.0330	0.0767	0.0173
	(0.0193)	(0.0504)	(0.0544)	(0.0738)	(0.0490)	(0.0670)

Result of regression model of productivity growth (2)

	Whole manufacturing	Food and beverages	Wood	Rubber	Fabricated metal	Furniture
Zone	0.0304**	0.0582	0.0142	-0.0144	-0.0201	0.1262
	(0.0670)	(0.1080)	(0.0460)	(0.1258)	(0.1246)	(0.0942)
Urb	0.0384*	0.0270	-0.0468**	-0.0965	-0.0252	0.1475**
	(0.0680)	(0.1107)	(0.0573)	(0.1353)	(0.1280)	(0.0958)
Reg	0.0501	0.1592	0.0023*	-0.1798	0.1020	0.0235
	(0.0685)	(0.1200)	(0.0573)	(0.1627)	(0.1230)	(0.1219)
Com	0.0420*	0.0535	0.0355	0.0068**	-0.0104	0.1550**
	(0.0672)	(0.1092)	(0.0482)	(0.1254)	(0.1250)	(0.0945)
Assf	0.0906**	0.1850**	0.0578*	0.0459	0.0923***	0.0270
	(0.0707)	(0.1214)	(0.0789)	(0.1455)	(0.1360)	(0.1107)

Result of regression model of productivity growth (3)

	Whole manufacturing	Food and beverages	Wood	Rubber	Fabricated metal	Furniture
Eage	0.0028**	0.0017**	0.0021*	0.0051**	0.0024*	0.0038
	(0.0004)	(0.0009)	(0.0011)	(0.0018)	(0.0009)	(0.0014)
Esex	-0.0001	0.0003	-0.0006*	-0.0007	-0.0003	-0.0006*
	(0.0001)	(0.0004)	(0.0003)	(0.0007)	(0.0003)	(0.0003)
Eexp	0.0203**	0.0607*	0.0340	0.0155	-0.0419	0.0547
	(0.0153)	(0.0347)	(0.0423)	(0.0660)	(0.0341)	(0.0564)
Edu1	0.0447	0.0487	0.0309	0.0015	0.0216	0.0561
	(0.0073)	(0.0175)	(0.0199)	(0.0300)	(0.0164)	(0.0213)
Edu2	0.0276***	0.0772***	0.0549*	0.0585	0.0251**	0.0262
	(0.0098)	(0.0234)	(0.0308)	(0.0386)	(0.0232)	(0.0280)

Conclusion

- Improvement of Efficiency scores and Productivity index over the period 2005-2013
 - Efficiency scores
 - Productivity growth (mainly from technology change)
- Significant impact of different environment variable productivity growth of SMEs across sub-sectors
 - size, age, export and innovation activities
 - industry zone, financial support
 - age, experience, professional education of entrepreneurs

Thanks for your attendance!