

South Asian Network on Economic Modeling (SANEM)

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TITLE OF THE PAPER :

Enhancing capabilities in the manufacturing sector: An approach of skill development





OBJECTIVE

To find the **IMPACT** of **TECHNOLOGY** on **EFFICIENCY** and on **COMPETITIVENESS**



EFFICIENCY



TECHNOLOGY



COMPETITIVENESS



LITERATURE REVIEW

Satterlee (PG 12) defines Human skills as a manager's ability to interact and work well with others.

Katz (1974) suggests that technical, human and conceptual skills are three important managerial skills which must be cultivated and enhanced by an organization.

Shingal (October, 2010) documents the correlation between skills and services export.

LITERATURE REVIEW

Porter (1990) suggests that firms create competitive advantage by inventing new products or finding new technologies

Lennon (2009) finds that years of schooling, secondary school enrollment, and high school educational attainment in both the importing and exporting country affect services trade.

Saxenian (1999, 2000, 2004) suggests that transnational entrepreneurial networks have played an essential role in the development of exports from several developing countries

COMPARATIVE ANALYSIS



Firm level primary survey data are taken from enterprise survey world bank

4 key issues for capacity comparison are

1

Technological
capabilities

2

Production
capabilities

3

Trade Analysis

4

Workforce
Analysis

TECHNOLOGICAL CAPABILITIES

Indicator	Bangladesh (2013)	India (2014)	Sri Lanka (2011)	Pakistan (2013)	Nepal (2013)	Bhutan (2015)	Afghanistan (2014)
Quality certification	14.3	27.5	9.1	35.8	8.2	3.7	22.1
Technology from foreign companies	16.7	9.4	9.3	22.1	1.6	14.4	6.3
Use of email	36.6	78.0	30.5	54.4	48.3	71.4	64.9
External Auditors	37.2	69.9	60.3	37.5	70.7	35.8	13.1
Website	26.3	48.9	18.6	46.9	26.1	31.3	21.8

Source- Enterprise Survey Data : World Bank

PERFORMANCE OF THE FIRMS

Indicator	Bangladesh (2013)	India (2014)	Sri Lanka (2011)	Pakistan (2013)	Nepal (2013)	Bhutan (2015)	Afghanistan (2014)
Capacity utilization (%)	84.0	81.8	75.6	76.8	70.4	73.7	80.7
Real annual sales growth (%)	0	-3.2	4.7	4.7	1.6	11.8	2.8
Annual employment growth (%)	4.7	5.2	5.4	5.4	5.5	13.4	6.9
Annual labor productivity growth (%)	-4.7	-8.3	0.7	0.7	-3.8	2.8	-1.6

Source- Enterprise Survey Data : World Bank

TRADE PERFORMANCE OF THE FIRMS

Indicator	Bangladesh (2013)	India (2014)	Sri Lanka (2011)	Pakistan (2013)	Nepal (2013)	Bhutan (2015)	Afghanistan (2014)
Direct/Indirect export (%)	22.4	9.6	9.9	18.6	5.9	16.9	6.7
Direct export (%)	18.5	7.8	5.1	13.2	4.3	3.4	3.0
Proportional domestic sales	79.2	95.2	92.8	89.3	97.0	86.9	96.8
Proportional direct sales export	14.9	3.7	2.6	7.9	1.8	2.4	1.3
Proportional indirect sales export	5.9	1.1	4.6	2.8	1.2	10.7	1.9
Firms using foreign material inputs and/or supplies	50.4	17.7	14.8	27.1	44.9	55.1	71.0
Proportion of domestic total inputs	71.3	98.0	91.4	88.3	72.3	61.5	49.0
Proportion of foreign total inputs	28.7	2.0	8.6	11.7	27.6	38.5	51.0

Source- Enterprise Survey Data : World Bank

WORKFORCE ANALYSIS

Indicator	Bangladesh (2013)	India (2014)	Sri Lanka (2011)	Pakistan (2013)	Nepal (2013)	Bhutan (2015)	Afghanistan (2014)
Firms with formal training (%)	21.9	35.9	18.4	32.0	31.9	26.0	31.7
Proportion of workers offered formal training	70.4	63.45	57.7	46.7	54.2	25.9	29.0
Top manager's experience (years)	13.3	11.0	18.2	13.2	16.1	12.1	13.4
Permanent skilled production workers	178.8	34.5	31.8	106.4	8.1	14.0	13.7
Permanent unskilled production workers	36.8	15.6	5.6	13.3	2.5	4.1	11.4
Proportion of unskilled workers	21.3	33.4	14.6	19.7	15.2	29.3	45.1

Source- Enterprise Survey Data : World Bank

QUANTITATIVE APPROACH



- 1 Original model and modified model
- 2 Variables
- 3 Final model
- 4 Data description and methodology
- 5 Regression result analysis
- 6 Limitation



Original Model $Y = AK^\alpha L^\beta$

$\ln Y = \ln \theta^* X + \alpha \ln K + \beta \ln L + \varepsilon$ Modified model



VARIABLES



Capacity
building



Skilled workers



Firm's age



Technology



Education



Research Expenditure



Exports

FINAL MODEL



$$\ln Y = \alpha \ln \text{capital} + \beta \ln \text{labor} + \partial_1 \text{workerskill} + \partial_2 \ln \text{firmage} + \partial_3 \text{tech} + \partial_4 \text{capacity} + \partial_5 \text{exports} + \partial_6 R_{\text{exp}} + \partial_7 \text{education} + \varepsilon$$

DATA DESCRIPTION & METHODOLOGY



Primary data taken for the manufacturing sector of Bangladesh

Panel data used for the years 2007, 2011 and 2013

REGRESSION RESULT ANALYSIS

	(1)
Variables	Insales
Inlabor	0.352*** (0.0782)
Incapital	0.277*** (0.0452)
Workerskill	0.0006*** (0.0001)
Infirmage	-8.251 (13.80)
Tech	0.143*** (0.0534)
Capacity	0.0116*** (0.0041)

	(1)
Variables	Insales
Exports	0.0053** (0.0023)
Rexp	0.115** (0.0494)
Education	0.0492* (0.0274)
Constant	73.04 (105.0)
Observations	201
Number of panelid	116

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

LIMITATIONS



- 1 Capabilities are not easily quantifiable.
- 2 Exclusion of poor proxy variables.

CONCLUSION



- 1 Policy Focus should be learning related mechanism.
- 2 Policies should be taken on firm level, national and international levels.
- 3 For implementing these policies private learning mechanism should be improved.



THANK YOU