

## EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN LABOR PRODUCTIVITY AND EXPORTS AMONG MANUFACTURING FIRMS OF IRAN

Sakineh Sojoodi\*

***Abstract:** Labor as an important input in the production process has a major role in the economic development, in a way the correct management of human resources considers as one of the tools of authorities to increase the economic efficiency and production growth. But certainly the labor density itself cannot be fruitful in taking growth path and economic development and quality of labor is more important than quantity. In other words, the economic growth of countries is not determined based on their labor existing but based on their labor productivity. Therefore, paying attention to the productivity of the labor and strive to improve it can have a significant impact on the countries' economic situation. In this regard, exports consider also a key variable for the expansion of production and paying attention to it consider of the requirement to achieve the economic goals. On the other hand, exports can have a bilateral relationship with the productivity of the labor. Despite the importance of these two variables in the process of economic growth, studies in developing countries don't pay attention much to investigation of the relationship between these two variables. This study investigates the relationship between these two variables among manufacturing firms of Iran and concluded that there is a two-way relationship between the exports and labor productivity of manufacturing firms.*

***Keywords:** Labor productivity, Exports, Self-selection hypothesis, Learning by exporting hypothesis*

***JEL codes:** C12, F10, F20, F40, L1, L2, and L6*

### 1. INTRODUCTION

The importance of the labor productivity role in the production growth and economic performance has always been the emphasis of the great theoretical and experimental studies. One of the most important economic variables that are associated with the labor productivity is the exports. The relationship between these two variables at the micro level in recent years has been the researchers' consideration in different countries. Empirical evidence indicates that there are dramatic differences in labor productivity of exporting firms and firms that don't to export. These observations have created a massive wave of studies that seek to determine the direction of causality in this relationship. The results of these studies

---

\* Department of Economics, University of Tabriz, Tabriz, Iran, E-mail: s\_sojoodi@tabrizu.ac.ir

are dividable in two major theories; self\_selection theory and learning by exporting theory. According to the first theory, firms need to increase the productivity to a certain level to enter the export markets and in other words from the productivity of labor to export is the direction of causality. In the second theory the direction of causality is from the export to the productivity and entry into export markets using different mechanisms leading to increase the productivity of labor. The results of experimental studies that test this two theory in different countries show that the validity of these two theories dependent on the economic structure of those two countries. The empirically test of the two theories can be useful in the economic plan for export and increase the labor productivity. So, this study investigates the relationship between these two variables among Iran's industrial firms. First, an overview will be provided on the topic literature and then introduces the research methodology and providing the findings of this study. Conclusions and policy recommendations presented at the end.

## 2. REVIEW OF TOPIC LITERATURE

Experimental observations show that the exporting firms have much higher productivity than to firms that act in the domestic markets. However, the direction of causality in this relationship isn't clear exactly. In this regard, there are two popular theories, the first theory that is known as the self-selection theory, state that the direction of causality has been from productivity to exports and only the firms can export that have high productivity. For entry to export markets need to incur the irreversible fix cost that firms with low productivity cannot afford it. Also, to compete in foreign markets with high productivity has great importance (Saxa, 2009). One of the popular theories that support the theory of self\_selection is the heterogeneity theory of firms that was presented by Melitz (2003) for the first time. He used the heterogeneous business firm model to justify the difference of the firm export behavior. In this model, firm faces to fix cost to enter the export markets and can only assume these costs when have a threshold level of productivity.

In addition to fixed costs, higher productivity, particularly labor productivity enables firms to act through reducing the cost by product and increasing the competitiveness power in global markets. Production costs play an important role in the determining the price of manufactured goods and subsequently, at the International Competitiveness of goods. One of the most important components of variable cost forms the labor unit costs (ULC). Labor unit cost in addition to the wage level is dependent to the productivity of the labor. As a result, labor unit cost represents the wage for a single product. Thus we have:

$$ULC = \frac{W}{Q} \quad (1)$$

So that  $W$  is the compensation of employees and  $Q$  is the actual production. By dividing  $W$  and  $Q$  on labor ( $L$ ) can write this equation as the ratio of the wage rate ( $w$ ) to the labor productivity ( $LP$ ):

$$ULC = \frac{W/L}{Q/L} = \frac{w}{LP} \quad (2)$$

So the labor productivity growth can lead to reduce of production cost and increase of competitiveness of firm and prepare the firm to participate in the export markets.

The second theory that is known as the theory of learning by exporting, expresses that the direction of causality has been from export to productivity and on the other hand enter to export markets leads to increase of firm productivity. This effect can occur in three ways, exporters learn the production techniques from foreign buyers and by using it in production achieve to higher productivity, expanding the size of the market give them the opportunity of using the scale and press of competition forcing them to improve their productivity. In other words, firms that attempt to export, undesirably enter to compete with firms from other countries and can achieve to the higher level of knowledge production through the learning by exporting and improve the level of their efficiency (Wagner 2005). In fact, the effect of learning by exporting in the away years has been the economic researchers' consideration. According to Arrow (1962), the production experience as a factor in the production has special importance. In Arrow model, production hasn't been dependent only on physical inputs and dependent to inputs such as the knowledge, experience and skills that are generated by firm activity. Romer (1986) by extending the model of Arrow showed that increasing the knowledge of countries is done through communication and knowledge exchange with other countries. Therefore, exports through increasing of knowledge cause to improve the productivity. Of course, these two theories don't have any heterogeneous with each other and may be hold simultaneously. In small economies and less developed, second theory is the more powerful. For the least developed countries, dramatic differences in the level of domestic and foreign technology, increases productivity benefits of communication with developed business partners. In other words, firms in the least developed countries due to the advantage of the ultimate player have greater potential for learning by exporting. Also the smaller country and more limited domestic markets, entry into export markets will help more likely to have the firm from the scale (Saxa, 2009).

While experimental studies confirmed the self\_selection theory obviously theory, the results of studies in relation to learning by exporting theory has been vague and in some countries, it has been rejected and in some other has been

approved. One of the first studies in this field is the study of Clerides *et al.* (1998) that by using the data of firm in Colombia, Mexico and Morocco have confirmed the theory of self\_selection. The study hasn't found a detailed evidence to confirm the learning by exporting theory in Colombia and Mexico. Study of Bernard and Jensen (1999) for the US, Arnold Hussinger (2004) for Germany, Isgat (2001) showed the hypothesis of self\_selection is confirmed and the hypothesis of learning by exporting isn't confirmed. Delgado *et al.* (2002) in Spain confirmed the hypothesis of self\_selection and have found little evidence for the confirming of learning by export hypothesis. From the studies that confirmed the hypothesis of learning by exporting can note to Girma *et al.* (2002) in England and Bigsten *et al.* (2004) in four countries in Africa, Castellani (2002) in Italy, Wagner (2002) Germany and Bleaney *et al.* (2000) in Russia, Belarus and Ukraine. Table 1 has reflected for an overview of some of the empirical literature.

**Table 1**  
An overview on the experimental literature

<i>Author</i>	<i>Country</i>	<i>course</i>	<i>Self-selection hypothesis</i>	<i>learning by exporting theory</i>
Bernard and Jensen (1995)	America	1992_1984	Confirmed	Rejected
Aw <i>et al.</i> (2000)	Taiwan	1991,1986_1981	Confirmed	Confirmed
Eaton <i>et al.</i> (2004)	France	1986	Confirmed	---
Alvarez and Lopez (2005)	Chile	1996_1990	Confirmed	Confirmed
De Locker (2007)	Slovenia	2000_1994	---	Confirmed
Greenaway and Kneller (2008)	England	2002_1988	---	Confirmed
Eliasson <i>et al.</i> (2009)	Sweden	2006_1997	Confirmed	Rejected
Hahn and Park (2010)	South Korea	1998_1990	---	Confirmed
Ranjan-Raychaudhuri (2010)	India	2006_1990	Confirmed	Rejected
Mallick and Yang (2010)	China	2002_2000	Confirmed	Confirmed
Mukim (2011)	India	2008_1989	---	Confirmed
Qian <i>et al.</i> (2011)	China	2007_1999	Confirmed	Confirmed
2012)) Haida	India	2004_1991	Confirmed	Rejected
Neil Foster <i>et al.</i> -2014	19 sub-Saharan African countries	---	Confirmed	

### 3. METHODOLOGY

To test the two hypotheses of self\_selection (labor productivity effect on entry of firms to export markets) and learning by exporting theory use two different patterns that are discussed in this section to an introduction of these models. To test the hypothesis of self\_selection have often used the experimental studies of presented model in equation 3 (Lafuente and Stoian, 2011). In this study attempt to export

(EX) a measurement dummy variable that have the variable for exporting firms value of one and for the other firms the value of zero.

$$EX = f(LnS, LnK, R, O, LnLp) \quad (3)$$

So that:

- **LnS**: the size of firm, this variable is measured using the logarithm of firm sales and are expected to have positive effect on exports. As most economists believe that firms for having the compete in global markets should be in large size (Wagner, 1995)
- **LnK**: the logarithm of the ratio of capital to firm labor, the variable has been shown in some studies to demonstrate the firm's access to production inputs and the others to indicate the level of firm technology, but in both is expected to have a positive effect on firm exports.
- **R**: the innovation of firm, in the study will be used from the firm R&D expenditures as a measure of innovation. But given that the value of this expenditure is low in firms, the dummy variable of R will be used to show the status of research and development in the firm, so that this variable have the value of one for firms with R&D expenditure and value of zero for other firms. This variable is expected to have a positive effect on exports because innovation and technology development increase the country or industry competitiveness power in global markets (Sterlacchini, 2001)
- **O**: the ownership of firm, to show the effect of this variable on the firm export use a dummy variable that the dummy variable for private firms provide one number and for state firms provide zero number . About the effect of this variable on the probability of exports, many economists believe that the private sector than the public sector has more efficiency and productivity, and therefore more competitive and more likely to enter export markets. One of the major reasons that present for this problem is far of firms from the competitive environment, since most state firms due to government subsidy supports don't have any motivation for competition (Parker and Martin, 1995).
- **LnLP**: the logarithm of labor productivity and labor productivity has been obtained by dividing the value of production of each firm on the total power of firm.

Since in this pattern, the dependent variable is as discrete, the discrete logit regression method is used to estimate it.

To investigate the effect of exports on the productivity of labor, ie learning by exporting theory, the modified model of presented pattern and tested by Corvers (1997) is used. Corvers pattern (1997) starts with the assumption of exogenous changes in labor, with the introduction of Cobb-Douglas production function.

$$Y_i = AK_i^\alpha L_i^{*\beta} \quad (4)$$

In this function  $Y_i$ ,  $i$  is the firm production that is dependent on the input of physical capital,  $K_i$  and power inputs of Karomotor, is  $L_i^*$ .  $A$  is the indicator of firm production technology status. Effective labor also in addition to the number of labor is the indicator of education level in the firm. Usually "three levels of low, medium enter to the pattern in studies and labor function effectively is considered as follows.

$$L_i^* = L_i L_{1i}^{\theta_1} L_{2i}^{\theta_2} L_{3i}^{\theta_3} \quad (5)$$

$L_i$  represents the number of workers in the firm  $i$ ,  $s\theta L_s$  represents the ratio of workers with primary education ( $s=1$ ), average ( $s=2$ ) and high ( $s=3$ ) to the total labor. Parameter  $\theta$  show the intensity of each of the education levels on the labor of Karmotor of firm. By placement of equation (5) in equation of 4 and dividing the parties to  $L$  achieved the function of labor productivity as the following way.

$$\frac{Y}{L} = A \left( \frac{K}{L} \right)^\alpha L^{\alpha+\beta-1} (1-L_2-L_3)^{\beta(1-\theta_2-\theta_3)} L_2^{\beta\theta_2} L_3^{\beta\theta_3} \quad (6)$$

According to this equation, the level of labor productivity directly dependent to the proportion of labor with average and higher education level in the firm, the intensity of physical capitals, the number of employees and firm production technology. Based on the learning by exporting theory, production technology ( $A$ ) is dependent to the issuer of firms. Also in the experimental studies usually "R&D expenditure as a variable that has a positive effect on the production technology is in the pattern. The final pattern of the study in the logarithmic form will be as follows.

$$\ln LP_i = \alpha_0 + \alpha_1 \ln L_i + \alpha_2 \ln L_{1i} + \alpha_3 \ln L_{2i} + \alpha_4 \ln K_i + \alpha_5 R_i + \alpha_6 EX_i + \mu_i \quad (7)$$

So that:

**LnLP:** the logarithm of labor productivity and labor productivity has been obtained by dividing the value of production of each firm on the total power of firm.

**LnL:** the logarithm of the number of the employees that is indicator of the size of firm.

**LnL1:** the logarithm of the labor ratio with diploma education and associate degree to all the firm employees.

**LnL2:** the logarithm of the labor ratio with a bachelor degree and higher to all the firm employees.

**LnK:** the log-intensity physical capital intensity and capital stock intensity has been obtained of dividing the firm physical capital on the number of the employees of firms.

**R:** the dummy variable to indicate the status of the research and development in the firm and provide the value of one if the firm has a research and development department, and otherwise will be zero,

**EX:** the dummy variable is to show the status of firm exports, this variable provide the value of one if the firm has export and otherwise will be zero.

OLS technique will be used to estimate the above equation. All statistical data for the study have been achieved from the census design of Iran industrial workshop in 2011. The project consists of 12310 active firms which the number 1179 has been exported.

#### 4. FINDINGS

In this section before the estimation of the study pattern, based on the available information, the average of labor productivity in two groups of exporting firms and other firms that only act on the domestic market, in Table 2 are presented. As it can be seen the average of productivity in exporting firms is more. Thus, the question occurs:

- Does the possibility of entering the firm to export markets increase by increasing the labor productivity? (Self\_selection theory)
- Does it cause the increasing of labor productivity in the firm by entering the firm to the export markets? (Learning by exporting theory)

**Table 2**  
**The statues of firm exports and labor productivity (Million Rials per person)**

<i>The statues of firm exports</i>	<i>The average of labor productivity</i>
Non_exporting firms	443
exporting firms	906

To answer the first question equation 3 using software STATA and logit method estimates and the results are in Table 3. Based on the results:

- The size of firm variable that is shown with LnS has a positive and significant coefficient. This phenomenon shows that firms with larger size more likely enter to the export markets.
- The coefficient of the logarithm the intensity of physical capital (LnK) is positive and significant that indicating the positive effect of technological progress and input of firm on the exports.

- The coefficient of dummy variable research and development (R) is positive and quite significantly. This subject indicates the role of the expenditure in promoting the innovation in the firm and increase of the product quality and quantity, and thus competitiveness and productivity of firm.
- The coefficient of dummy variable ownership (O) is indicator of positive effect, but as non sense of firm ownership by non-governmental agencies on exports.
- The coefficient of the logarithm variable of labor productivity (LnLP) is positive and significant; this result is indicator of confirmation the self\_selection hypothesis among Iran industrial firms. The entry to export markets the increasing of labor productivity is the one of the requirements of industrial firms.
- Lagrange multiplier (LR chi2) is the indicator of simultaneous significant of all the variables in estimation.

**Table 3**  
**Estimation results of equation (3) (dependent variable: EX)**

<i>variable</i>	<i>coefficient</i>	<i>Static t</i>
LnS	0.22	9.29*
LnK	0.24	4.53*
R	0.02	3.56*
O	0.17	1.01
LnLP	0.15	4.76*
Intercept	-1.50	-3.45*
LR chi2		798.78
Pseudo R <sup>2</sup>		0.13
Log Likelihood		-3879.9

Significant in one percent level\*

To answer the second question, equation 7 with OLS method is estimated in table (4). As it can be seen. Logarithm of the number of employees (LnL) despite the expectation has negative and significant impact on the labor productivity. The obtained results indicate that the smaller firms have higher labor productivity. The reason could be the fact that large firms often have more life and usually firms at the beginning of the establishment have smaller size. It is evident that young firms have up to date technology and advanced and therefore labor productivity is higher in them. Also the smaller firms have more flexibility to adjust the technological and can easily adapt the firm structure to new technologies It may also increase the size of firm to various reasons such as reduce of control and monitoring and evaluation of labor and mismanagement led to the hazards of the scale. LnL1 coefficient is positive and shows that for every one percent change in



the proportion of the labor with a diploma or associate degree in total employment, labor productivity 0.04 percent increase. LnL2 coefficient equal 0.19 and represents a significant and positive effect of number of employees with bachelor degree and higher to the total employees on labor productivity in the firm. This coefficient is larger than LnL1 factor that reflects higher labor productivity with a bachelor degree and higher in compare to diploma and associate degree employees. LnK positive coefficient indicates a positive effect of physical capital on labor productivity in the firm. R dummy variable coefficient was positive and indicates the positive effect of technology R&D expenditure on technology growth and improving the labor productivity in the firm. Although the value of this variable is low and represents little effect of it on the labor productivity, but it might be due to the low level of industrial R&D expenditures. Export dummy variable coefficient is positive and significant that indicates the importance of the entering the firm to the international markets in the promotion of technology and labor productivity as the result. This result confirms the learning by exporting theory. The coefficient of obtained determination was 0.21 and what is not so noticeable, but due to the large number of observations and comparisons with similar experimental studies, is acceptable.

**Table 4**  
**Estimation results of equation 7 using OLS method**

<i>variable</i>	<i>coefficient</i>	<i>Static t</i>
Intercept	6.16	9.76*
LnL	-0.21	-9.84*
LnL <sub>1</sub>	0.04	5.77*
LnL <sub>2</sub>	0.19	10.57
LnK	0.26	10.11*
R	0.01	4.13*
EX	0.09	9.07*
Adj. R <sup>2</sup>		0.21
Heterogeneity test of White variance		199.16 (0.0000)

Significant in one percent level\*

At the end of the table (4) the results of the White variance is reported that according to the statistic value and the probability level, the presence of heterogeneity of variance in the results can be confirmed. Despite the heterogeneity of variance, obtained coefficients of OLS, although still remain unbiased and consistent but it will not be efficient for asymptotic. To solve this problem, White suggests a method that is resistant against variance heterogeneity problem. In this study to confirm the validity of inferences based on OLS, the research pattern with White method once again is estimated in table (5). The obtained results indicate the validity of conclusions derived from the OLS method.

**Table 5**  
**Estimation results of equation 7 using White method**

<i>variable</i>	<i>coefficient</i>	<i>Static t</i>
Intercept	5.18	8.50*
LnL	-0.24	-9.45*
LnL <sub>1</sub>	0.04	5.15*
LnL <sub>2</sub>	0.18	10.11*
LnK	0.26	9.32*
R	0.01	4.78*
EX	0.08	10.11*
Adj. R <sup>2</sup>		0.21

Significant in one percent level\*

## 5. CONCLUSIONS AND RECOMMENDATIONS

The aim of this study was to investigate the relationship between two variable of labor productivity and export among the industrial firms in Iran. In connection with this, a lot of theoretical and experimental studies have been conducted which the results are in two theory of self\_selection and learning by exporting theory respectively. According to the first theory, in the positive relationship between productivity and exports, the direction of causality is from productivity to export. In other words, by increasing the productivity the possibility of entering to the export markets increase. On the other hand the second theory is that entering to the export markets is the factor of increasing the labor productivity and this cause to have a positive relationship between these two variables. The results of these two theories in a sample of Iran industrial firms are the indicator of confirmation the mutual relationship between the exports and the labor productivity among these firms respectively. These results show that to increase competitiveness of industrial firms and to prepare them to enter the export markets, increasing the labor productivity is essential. So, planning to increase the productivity of human resources for export development is essential. On the other hand, entry to export markets is significant on the labor productivity. Thus, with regard to the role of productivity in the development of national production, it can be said that export is an appropriate tool for technology growth and productivity and as a result national production.

Based on the above results, the following policy guidelines recommends:

- Emphasis on the export orientation in the factory industry to improve the effects of knowledge and increase the labor productivity,
- Reduce the state monopolies and encourage the private sector activity in order to increase productivity in the industrial sector and the promotion of competitiveness in the sector and thus the development of non-oil exports,

- Provide the appropriate training to labor and other plans that can increase labor productivity through increase of labor knowledge,
- Employing the specialist labor and knowledge and high productivity in the industrial sector,
- Encourage the research and development activities in the industrial firms that have a positive effect on productivity and exports.

### *References*

- The static center of Iran, the census design of Iran industrial workshop, different years.
- Alvarez, R. and Lopez, R. (2005), Exporting and Performance: Evidence from Chilean Plants. *Canadian Journal of Economic*, 2005, 38(4), pp. 1384-1400.
- Arnold, J.M., Hussinger, K. (2005), Export Behavior and Firm Productivity in German Manufacturing. A Firm-Level Analysis. *Review of World Economics/ Weltwirtschaftliches Archiv* 141(2): 219-243.
- Arrow, J. K. (1962), The Economic Implications of Learning by Doing. *The Review of Economic Studies*, 1962, 29(3), pp. 155-173.
- Aw, B.Y., Chung, S., Roberts, M.J. (2000), Productivity and Turnover in the Export Market: Micro-level Evidence from the Republic of Korea and Taiwan (China). *World Bank Economic Review* 14(1): 65-90.
- Bernard, A.B., Jensen J. B. (1999), Exceptional Exporter Performance: Cause, Effect, or Both? *Journal of International Economics* 47: 1-25.
- Bigsten, A., Collier, P., Dercon, S., Fafchamps, M., Gauthier, B., Gunning, J.W., Oduro, A., Oostendorp, R., Pattillo, C., Söderbom, M., Teal, F., Zeufack, A. (2004), Do African Manufacturing Firms Learn from Exporting? *Journal of Development Studies* 40(3): 115-141.
- Bleaney, M.F., Filatotchev, I., Wakelin, K. (2000), Learning by Exporting: Evidence from Three Transition Economies. Centre for Research on Globalisation and Labour Markets, School of Economics, University of Nottingham, Research Paper 2000/6.
- Clerides, S.K., Lach, S., Tybout, J.R. (1998), Is Learning by Exporting Important? Micro-dynamic Evidence from Colombia, Mexico and Morocco. *Quarterly Journal of Economics* 113: 903-948.
- Castellani, D. (2002), Export Behavior and Productivity Growth: Evidence from Italian Manufacturing Firms. *Weltwirtschaftliches Archiv* 138(4).
- Corvers, F. (1997), The Impact of human capital on labor productivity in manufacturing sectors of the European Union. *Applied Economics*, 29(8): 975-987.
- Delgado, M., Farinas, J.C., Ruano, S. (2002), Firm Productivity and Export Markets: A Non-parametric Approach. *Journal of International Economics* 57: 397-422.
- De Locker. (2007), Do Exports Generate Higher Productivity? Evidence from Slovenia. *Journal of International Economics*, 2007, 73 (1), pp. 69-98.
- Eaton, J., Kortum, S. and Kramarz, F. (2004), Dissecting Trade: Firms, Industries, and Export Destinations. *American Economic Review*, 2004, 93(2), pp. 150-154.
- Eliasson, K., Hansson, P. and Lindvert, M. (2009), Do Firms Learn by Exporting or Learn to Export? Evidence from Small and Medium-sized Enterprises in Swedish Manufacturing. ETSG working papers, 2009.

- Girma, S., Greenaway, D., Kneller, R. (2004), Does Exporting Increase Productivity? A Microeconometric Analysis of Matched Firms. *Review of International Economics* 12 (5): 855-866.
- Greenaway, D. and Kneller, R. (2007), Firm Heterogeneity, Exporting and Foreign Direct Investment. *The Economic Journal*, 2007, 117(517), pp. 134-161.
- Hahn, C. H. and Park, C. G. (2010), Learning-by-Exporting and Plant Characteristics : Evidence from Korean Plant-Level Data. *Korea and World Economy*, 2010, 11(3), pp. 459-492.
- Haidar, Jamal Ibrahim (2012), Trade and productivity: self-selection or learning-by-exporting in India Documents de travail du Centre d'Economie de la Sorbonne 2012.46 - ISSN : 1955-611X. 2012. <halshs-00717624>
- Isgut, A. (2001), What's Different about Exporters? Evidence from Colombian Manufacturing. *Journal of Development Studies* 37 (5): 57-82.
- Lafuente, E., Stoian, C. (2011), Time to Have a Look at Export Behaviour in CEE Emerging Markets? Internal Export Determinants in the Romanian SMEs Context, CEBR working paper series WP 01/2011.
- Mallick, S. and Yang, Y. (2010), Export Premium, Self-selection and Learning-by-exporting: Evidence from Matched Chinese Firms. *The World Economy*, 2010, 33(10), pp.1218-1240.
- Melitz, M. (2003), The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity. *Econometrica* 71 (6): 1695-1726.
- Mukim, M. (2011), Does Exporting Increase Productivity? Evidence from India. LSE working papers, March 15, 2011.
- Neil FosterMcGregor, Anders Isaksson, Florian Kaulich) (2014), Learning-by-exporting versus self-selection: New evidence for 19 sub-Saharan African countries, *Economics Letters*, Volume 125, Issue 2, November, Pages 212-214.
- Parker, David, Martin, Stephen (1995), The Impact of UK Privatisation on Labour and Total Factor Productivity, *Scottish Journal of Political Economy*, 42(2 (May)), 201-20.
- Pavcnik, N. (2002), Trade liberalization, exit, and productivity improvements: Evidence from Chilean plants. *Review of Economic Studies* 69(1): 245-276.
- Qian X.F., Liu Xiuyan, Zhao Wei and Xu Kangning<sup>5</sup> (2011), Exports and the Productivity of Chinese Industrial Enterprises: Self-selection Effect or Learning by Exporting Effect? *The Journal of Quantitative & Technical Economics*, No. 2, 2011.
- Ranjan, P. and Raychaudhuri, J. (2011), Self-selection vs Learning: Evidence from Indian Exporting Firms. *Indian Growth and Development Review*, Emerald Group Publishing, 2011, 4(1), pp. 22-37.
- Romer, P. M. (1986), Increasing Returns and Long-Run Growth. *The Journal of Political Economy*, 1986(94), pp. 1002-1037.
- Saxa, Branislav (2009), Essays on Exporting Behavior of Firms and on Inflation Persistence, CERGE: Center for Economic Research and Graduate Education Charles University Prague.
- Wagner, J. (2002), The Causal Effects of Exports on Firm Size and Labor Productivity: First Evidence from a Matching Approach. *Economic Letters* 77: 287-292.

Wagner, Joachim (2005), Exports and Productivity: A Survey of the Evidence from Firm Level Data, HWWA Discussion Paper, No. 319.

Wagner, J. (1995), Exports, Firm Size and Firm Dynamics, *Small Business Economics*, 7(1), pp. 29-39.