

*Economics*

## The Impact of Services Sector on Export Performance of Manufacturing Firms in Transition Economies

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(Presented by Academy Member Leo Chikava)

**ABSTRACT.** The objective of the current paper is to explore the impact of services inputs on export performance of manufacturing firms in transition economies. The results of the study provide a new understanding of the consequences of trade liberalization in services sector. In particular, positive impact of services sector efficiency on export performance of manufacturers is revealed. Thus, advancing liberalization reforms in telecommunications, electric power, railway transport, road transport, and water distribution sectors as well as in banking sector will stimulate expansion of export activities of manufacturers. Along with services impact, we find that firm specific characteristics such as introduction of new products, investments in research and development, employment of advanced technologies, and employee skills are key drivers of export performance in manufacturing sector in transition economies. Firm's size and foreign investments do matter as well. The results of the study have several policy implications. The first insight is that an efficient service sector infrastructure represents a strategic and underexploited resource of export enhancement that can be influenced by policy makers. To stimulate export performance of manufacturing industries policy makers must emphasize further reforms and liberalization of their services sectors. These reforms must be focused on providing adequate access to services for downstream industries and thus on reducing their costs of doing business. Moreover, government should create favorable conditions for attracting foreign direct investments and encourage investments in innovation, research and development, employment of advanced technologies. A final policy point is that reducing trade related costs through trade and customs procedures facilitation would also increase exports. © 2012 Bull. Georg. Natl. Acad. Sci.

**Key words:** *services sector, transition economies, export performance, manufacturing industry, panel data analysis.*

Exporting is an important type of economic activity that many consider crucial to the growth of productivity and living standards. The experience of the East Asian tigers provides evidence that exporting is an important component of the growth strategy in

emerging markets [1]. Ensuring a favorable environment for exporting thus represents one of the key challenges for transition economies on their path to economic development.

Discussions of factors that determine success of

export performance have been ongoing for many years. Both the factors that are under the control of firm and external factors have been studied extensively in the academic literature. However, the role of services sector as one of the external factors in promoting export performance of downstream sectors remained relatively unstudied. The existing research of the consequences of services sector liberalization is limited mainly to the analysis of the impact of services sectors on the productivity in downstream industries [2-5].

In this paper we extend the existing research by emphasizing the relationship between the services sectors and the export performance of downstream industries. In particular, the objective of the study is to explore the impact of services inputs on export performance of manufacturing firms in transition economies.

The results of the study are intended to improve our understanding of the consequences of services sector policy, and thus they extend the existing theoretical framework. However, the findings of the current research are important not only for theoretical but also for practical considerations. They provide grounds for recognizing key determinants of manufacturers' export performance in transition economies. In that way, the research contributes to the ongoing political debate on economic development issues and provides insights for targeting of public policies.

This paper focuses on the role of the services sector in influencing export performance of manufacturers in transition economies. The literature indicates that countries in transition can benefit from increased exports. An increase in exports might boost productivity through "learning by exporting" of individual companies; or it may allow additional imports of high tech products. Either avenue would stimulate economic growth.

Though the productivity-export link has been studied very extensively in recent years, some aspects of this relationship remain relatively unexplored. For instance, the now large heterogeneous firms' litera-

ture initiated by Melitz [6] suggests that the more productive firms are the ones that export. Melitz assumes that there is a fixed cost in selling in export markets and only the more productive firms will choose to export, while less productive firms will decide to serve the domestic market. In this stream of research, high-productivity of firms that self-select into export markets is considered as an outcome of firm's deliberate strategy. However, the productivity of firms can be caused also by factors external to the firm and which are not under its control. The recent empirical research of the relationship between export activity and external factors influencing productivity is focused mainly on the study of the effects of business climate variables. For instance, Clarke [7] in a study of African exporters finds that in addition to enterprise characteristics, policy-related variables also affect export performance. In particular, the author suggests that restrictive trade and customs regulations as well as poor customs administration can discourage manufacturing enterprises from exporting. Balchin and Edwards [8] find that the business climate is closely associated with firm-level manufacturing export performance in Africa. The empirical evidence on the effects of business climate and infrastructure on manufacturers' export supply capacity is also documented in [9-12].

Similarly, liberalization of the services sectors can be considered as one of the external factors that positively influences costs and productivity of downstream firms' and thus promotes their export activities. Services can be viewed as a factor of production along with labor, capital and other inputs. The enhancement of services inputs can reduce production costs, increase the marginal productivity of other inputs and raise output. The impact of services sector liberalization on the productivity in downstream sector is well documented in academic literature [2-5]. These studies indicate that the availability of high-quality and low cost services contributes to the reduction of costs and increase of productivity of downstream manufacturing firms. Taking into account

the fact that services sector efficiency is an important determinant of manufacturing firm productivity and productivity is a crucial factor of exporting, one may hypothesize that services sector liberalization through the improvement of productivity of the firms in downstream industries can increase their exports.

Again relying on Melitz [6], services sector liberalization can positively influence not only the export intensity of manufacturers but also their decisions to participate in export markets and the number of export markets that they serve. To be more precise, theory suggests that a more efficient services sector through increasing the productivity of firms and reducing the fixed costs of exporting can boost the number of firms in downstream industries that “self-select” into export markets. Thus, services sector liberalization, by increasing the efficiency, variety and quality of services markets, can then increase exports.

Though theory indicates that better services should increase exports (both intensively and extensively), the empirical links are not well studied. Further, those studies that do exist are based on African or Latin American data, so there is a lack of literature based on transition country data. In this research we try to fill this gap by examining the relationship between performance of services sector and export performance of manufacturing firms in transition economies.

Based on the literature review, the main research hypothesis of the study can be formulated as follows: ***the enhancement of services sector positively and significantly influences both the decision of manufacturers to participate in export markets (“extensive margin”) and their export intensity in any market (“intensive margin”).***

**Research Methodology.** In order to test the research hypothesis and to estimate the impact of services inputs on export performance of manufacturers we use the following panel data regression model:

$$EI_{it} = \gamma' SI_{it} + \psi' C_{it} + \varepsilon_{it}$$

where  $\gamma'$ , and  $\psi'$  are vectors of parameters to be estimated

*EI*- export intensity (exports/total sales).

*SI*- vector of services input variables that reflect performance of three services sectors – telecommunications, electricity, finance. In this study we use two groups of services input variables. The first group reflects the subjective measures that are based on firm’s valuation on a scale from 1 to 5 as to how much of a constraint they consider telecommunications, electricity and finance for their business. The second group of variables are EBRD (European Bank for Reconstruction and Development) indices of policy reforms [13], which reflect the overall liberalization of services sector. In particular in this study we employ: EBRD overall index of infrastructure reform, which reflects reforms in telecommunications, electric power, railway transport, road transport, and water distribution sectors; and EBRD index of banking sector reform.

*C*-set of control variables: firms size; employment of advanced technologies; dummy variable, which reflects whether the firm in the last three years invested in research and development; dummy variable, which reflects whether the firm in the last three years introduced new products or services; dummy variable for foreign ownership; industry type; employee skills is measured by percent of employees with tertiary education; degree of competition; regulatory quality; dummy variable which reflects whether the firm is located in the capital; European Union membership.

$\varepsilon_{it}$  is an error term, which consists of two error components:  $a_i$  - the unobservable individual (time-invariant) effect which may be correlated with the observed variables  $SI_{it}$  and  $C_{it}$ ; and  $v_{it}$  - the remainder disturbance, which varies with individuals and time and can be thought of as the usual disturbance in the regression.  $a_i$  and  $v_{it}$  are assumed to be *i.i.d.*  $(0, \sigma_a)$  and *i.i.d.*  $(0, \sigma_v)$ , respectively.

In this model productivity doesn’t enter in the equation directly. We proxy the productivity by firm-

specific characteristics, like size, foreign ownership, employee skills, etc. and services inputs variables.

However, some issues can arise while estimating the model. First, since the export intensity is a truncated variable the sample selection bias issue can arise while estimating the model. The second problem is related to potential endogeneity of service input variables as well as some other independent variables.

To deal with selection bias problems the two-stage estimation process will be employed in this study [14-16]. First, we formulate a model for the probability of exporting. At this stage we employ the following selection variable: *EF* – export facilitation index constructed using principal component factor analysis from the *Doing Business* database ([www.doingbusiness.org](http://www.doingbusiness.org)). The index consists of the following elements: number of all documents required to export goods; time necessary to comply with all procedures required to export goods; cost associated with all the procedures required to exporting. The estimation is conducted using standard probit regression.

At the second stage, we correct for self-selection by incorporating a transformation of the predicted individual probabilities or the inverse Mills ratio (obtained from the first stage probit regression estimation) as an additional explanatory variable to regression equation.

To address the problem of endogeneity of the services input variables, which are very likely to be correlated with individual specific effect ( $a_i$ ), the export intensity equation will be estimated by applying Hausman-Taylor IV estimation procedure [17].

The main source of the data for the research is the micro-level unbalanced panel data from the Enterprise Surveys database (Business Environment and Enterprise Performance Survey (BEEPS) Panel - <https://www.enterprisesurveys.org/>). The surveys were conducted by the EBRD and the World Bank Group (the World Bank) in 2002, 2005, 2007, and 2008/09 for firms

in 29 countries in the European and Central Asian region. The panel provides totally 29,386 observations. Since the objective of our study is the export performance of manufacturing firms, we limit the sample only to manufacturing sector. This gives us the final sample size of 11,293 observations at the firm level, which corresponds to 10263 firms. On average there are 1.1 years of data per firm available.

**Results.** Five different specifications of the model are estimated. Each of five services input measures enters the model one by one (The discussion of the first-stage probit equation estimation results is omitted here. The full version of the study can be found in [18]).

Table presents results of the estimation of the impact of services input variables on the export intensity of manufacturers. Hausman-Taylor estimation procedure employed at this stage allows controlling for endogeneity of services input variables caused by their correlation with unobserved individual level heterogeneity. All the five equations have Wald chi-square significant at 1% level. The inverse Mills ratio is significant at  $p < 0.01$  level and positive, which reflects the significance of the first-stage selection equation. In conformity with the main research hypothesis electricity and telecommunications sector have significant ( $p < 0.01$ ) impact on export intensity of manufacturers. According to data from Table the obstacles created by these two service sectors for the business activities of individual manufacturers have negative impact on their export performance. The obstacles formed by finance sector also have negative impact on manufacturer's exporting. However, this impact is not statistically significant.

Similarly, the overall liberalization of service sector (EBRD index of infrastructure reform) and reforms in banking sector (EBRD index of banking sector reform) have significant (at 5% level) and positive effect on export performance of downstream firms. Thus deep reforms and liberalization in such service sectors as electric power supply, railways, roads, tel-

Table. Export Intensity Models.

Variables	Coefficients				
	I	II	III	IV	V
Dependent Variable: Export Intensity (EI)					
Electricity as an obstacle	-2.281*** (.6238)	-	-	-	-
Telecommunications as an obstacle	-	-6.093*** (.7216)	-	-	-
Finance as an obstacle	-	-	-.1498 (.5666)	-	-
EBRD index of infrastructure reform	-	-	-	9.297** (3.885)	-
EBRD index of banking sector reform	-	-	-	-	9.3904*** (2.837)
Innovation during last 3 years	11.894*** (1.563)	11.929*** (1.472)	12.724*** (1.575)	4.116*** (1.069)	11.358*** (1.513)
R&D during last 3 years	5.878*** (1.492)	5.348*** (1.452)	2.817* (1.479)	2.281 (1.434)	5.630*** (1.608)
Technological level of company (high-speed internet connection)	8.989*** (2.185)	7.674*** (2.082)	6.053*** (2.277)	7.823*** (2.511)	5.737*** (2.183)
Employee skills	.0527** (.0265)	.048* (.0259)	.034* (.0267)	.014 (.0274)	.0669** (.0303)
Foreign ownership	24.513*** (2.205)	23.741*** (2.127)	23.604*** (2.300)	11.606*** (2.035)	23.725*** (2.310)
Size (small firm)	-44.511*** (3.88)	-44.052*** (3.747)	-43.043*** (3.933)	-16.047*** (3.626)	-45.776*** (4.409)
Size (medium firm)	-16.066*** (1.67)	-15.981*** (1.665)	-16.370*** (1.729)	-9.592*** (1.724)	-17.406*** (1.832)
Location in Capital	-8.914** (3.856)	-2.335 (3.439)	-9.131** (3.875)	11.451*** (3.94)	-10.029** (4.012)
European Union country	6.336*** (1.518)	6.078*** (1.561)	6.733*** (1.607)	-	-
Competition	10.851*** (1.136)	10.689*** (1.093)	9.902*** (1.135)	4.173*** (.4676)	9.457*** (1.094)
Regulatory quality	4.556*** (1.212)	5.235*** (1.264)	4.520*** (1.242)	-4.515 (4.907)	-5.564 (5.772)
Inverse Mills ratio	21.651*** (3.525)	19.990*** (3.235)	19.054*** (3.598)	6.510** (2.844)	19.499*** (3.619)
sigma_u	90.479	99.150	100.946	87.660	96.306
sigma_i	13.732	13.355	13.804	13.731	13.892
rho	.9774	.9821	.9816	.9760	.9796
Number of observations	2598	2598	2511	2507	2507
Wald chi-sq (df)	769.02*** (22)	825.44*** (22)	760.75*** (22)	698.87*** (21)	727.90*** (21)

Standard errors are in parentheses. \*\*\* — significant at  $p < 0.01$  level; \*\* — significant at  $p < 0.05$  level; \* — significant at  $p < 0.1$  level.

ecomunications and water supply as well as in banking sector substantially improves export activity of manufacturing firms. These findings, in general, provide support for the main research hypothesis of the study that the enhancement of services sector positively and significantly influences export performance of downstream industries.

The effects of firm specific characteristics – innovations, research and development, employment of advanced technologies, employee skills, size and foreign ownership - are generally significant (in most specifications at 5% level) and have expected signs. Introduction of new product and services, investment in research and development as well as employment of advanced technologies (high-speed, broadband internet connection) increase competitiveness of the manufacturing firms at global markets and thus encourage export intensity.

Firm size and foreign ownership also have positive and significant impact on the expansion of export activities. Large firms have more advantages in accessing to finance, necessary for establishing distribution networks at global markets. Generally larger firms have more resources for investments necessary for attaining of competitive advantage globally. This is especially true for transition economies. Foreign ownership, in turn, facilitates transfer of advanced managerial expertise, skills and technologies that makes firm more competitive at international markets. Employee skills variable is also expected to have a positive impact on export performance. This variable measured as a percentage of employees with tertiary education, is supposed to enhance firm's productivity and thus to improve its competitiveness at export markets. The results in Table show that employee skills have positive effect on export intensity; however, this effect is not significant in all specifications.

Among the environmental variables competition, regulatory quality and membership in European Union are important predictors of export performance of manufacturers. Study results show that competition measured as a pressure on companies to develop a

new product and reduce costs encourages export intensity of manufacturers (significant at  $p < 0.01$ ). Regulatory quality has positive and significant at 1% level effect (non-significant in models IV and V) on export intensity. Better business environment reduces costs of doing business, improves competitiveness and thus makes it easier to expand business activities at export markets. The non-significant coefficients of this variable in models IV and V can be explained by correlations with respective EBRD indices used in these specifications. The same is true for the variable which reflects membership in European Union. Industry effect is controlled but not reported in the Tables.

**Conclusions.** Generally, the key finding of the study is that improvement in the services sectors would enhance the export performance of manufacturers in transition economies. In particular, the study results suggest that reducing constraints and obstacles originating from inefficiencies in electricity, telecommunication, infrastructure and banking will encourage export performance of downstream industries. Thus, advancing liberalization reforms in telecommunications, electric power, railway transport, road transport, and water distribution sectors as well as in banking sector will stimulate expansion of export activities of manufacturers. Our results also suggest that services reform impacts more strongly on the intensity of existing exporters than it does in encouraging new exporters or new export markets.

This paper looks at firm specific factors that affect the export performance of manufacturers in transition economies as well. Consistent with the results in existing research, we find that firm specific characteristics such as the introduction of new products, investment in research and development, employment of advanced technologies, and employee skills are key drivers of export performance in the manufacturing sectors of transition economies. Introduction of new products and services, investment in research and development as well as employment of advanced

technologies (high-speed, broadband internet connection) increase the competitiveness of the manufacturing firms in global markets and thus improve export performance.

We find that size of the firm and foreign investment do matter as well. These factors significantly and positively affect not only the decision to export, but also export intensity of manufacturers. Large firms have more advantages in accessing to finance, which is necessary to establish distribution networks in foreign markets. Generally they have more resources for the investment necessary for attaining of competitive advantage globally. This is especially true for transition economies. Foreign ownership, in turn, facilitates transfer of advanced managerial expertise, skills and technologies that makes the firm more competitive in international markets. We also find that other factors such as trade facilitation, regulatory quality, the degree of competition, membership in European Union also positively affect exports.

The results of the study have several policy implications. The first insight is that an efficient service sector infrastructure represents a strategic and underexploited resource of export enhancement that can be influenced by policy makers. To stimulate export performance of manufacturing industries policy makers must emphasize further reforms and liberali-

zation of their services sectors. These reforms must be focused on providing adequate access to services for downstream industries and thus on reducing their costs of doing business. Moreover, government should create favorable conditions for attracting foreign direct investments and encourage investments in innovation, research and development, employment of advanced technologies. A final policy point is that reducing trade related costs, through trade and customs procedures facilitation, would also increase exports. Private entrepreneurs should also expect that their investments in innovation, research and development, employee skills and advanced technologies will be beneficial for their export activity.

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## ეკონომიკა

## მომსახურების სექტორის გავლენა სამრეწველო ფირმების საექსპორტო საქმიანობაზე გარდამავალ ეკონომიკებში

### გ. ბერულავა

პ. გუგუშვილის ეკონომიკის ინსტიტუტი, ი. ჯავახიშვილის სახ. თბილისის სახელმწიფო უნივერსიტეტი

(წარმოდგენილია აკადემიის წევრის ლ. ჩიქავას მიერ)

ამ სტატიის მთავარი მიზანია მომსახურების სექტორის სამრეწველო საწარმოების საექსპორტო საქმიანობაზე გავლენის შესწავლა გარდამავალ ეკონომიკებში. კვლევა მომსახურების სექტორის ლიბერალიზაციის შედეგებზე ახალ შეხედულებას გვთავაზობს. კერძოდ, კვლევის მიერ დადგენილია მომსახურების სექტორის ეფექტიანობის დადებითი გავლენა მწარმოებლების საექსპორტო საქმიანობაზე. გარდა ამისა, აღმოჩენილია ინოვაციის, კვლევისა და განვითარებაში ინვესტიციების, ახალი ტექნოლოგიების, მომსახურე პესონალის უნარ-ჩვევების მნიშვნელოვანი გავლენა საწარმოების საექსპორტო საქმიანობაზე გარდამავალ ეკონომიკებში. ფირმის ზომა და უცხოური ინვესტიციები აგრეთვე თამაშობენ მნიშვნელოვან როლს.

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