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EXPORTS AND Labour PRODUCTIVITY IN LITHUANIA'S MANUFACTURING INDUSTRY

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Saboniene A. Exports and labour productivity in Lithuania's manufacturing industry.

The research study aims to reassess the factors that influence Lithuania's manufacturing industry competitiveness and demand in international markets. The study analyses the relation between exports and labour productivity in Lithuania's manufacturing industry on macro level. The impact of international trade on labour productivity growth in manufacturing is actual problem so economic' policies under exports growth strategy have been widely supported on the argument that exposure to international market through exports helps to increase the productivity of firms-exporters.

Сабонене А. Экспорт і продуктивність праці в обробній промисловості Литви.

Мета наукового дослідження направлена на переоцінку факторів, що впливають на конкурентоспроможність обробної промисловості Литви та попиту на міжнародних ринках. Дослідження аналізує взаємозв'язок між експортом і продуктивністю праці в обробній промисловості Литви на макрорівні. Вплив міжнародної торгівлі на зростання продуктивність в промисловості є актуальною проблемою враховуючи, що економіческая політика, направлена на стратегію збільшення експорту, обґрунтована на аргументі, що розвиток експорту на міжнародному ринку сприяє збільшенню продуктивність фірм-експортерів.

Сабонене А. Экспорт и продуктивность труда в обрабатывающей промышленности Литвы.

Цель научного исследования направлено на переоценку факторов, влияющих на конкурентоспособность обрабатывающей промышленности Литвы и спроса продукции на международных рынках. Исследование анализирует взаимосвязь между экспортом и продуктивностью труда в обрабатывающей промышленности Литвы на макроуровне. Влияние международной торговли на рост продуктивность в промышленности является актуальной проблемой учитывая, что экономическая политика, направлена на стратегию увеличение экспорта, обоснована на аргументе, что развитие экспорта на международном рынке способствует увеличению продуктивности фирм-экспортеров.

The research problem. The role of international trade in promoting economic welfare has a venerable attention because exporting is often considered as a way to increase economic growth. Therefore it is important to evaluate the exports impact to producer's results in improving profitability, productivity and other indices. Traditional trade models predict the role of trade in improving productivity, for example, the Ricardian model with specialization after opening to trade yields increased welfare for all countries, where the relative price changes increase the real output produced in each country and labour moves towards the industry with comparatively high labour productivity. The exports and productivity are most significant indicators of Lithuania's manufacturing industry, nevertheless, after performing the analysis of scientific literature it became evident that the impact of exports to productivity growth in Lithuania's manufacturing industry had not been analyzed profoundly yet, this evaluation is actual scientific problem.

The analysis of recent studies and publications. The attention to the problem of long run output and productivity dynamic has increased and recent studies were focused on relation between international trade and economic growth. The theoretical issues of evaluation factors influencing productivity growth and methodology of researches of this problem were presented by foreign scientists Buckley, Pass, Prescott, Tangen, Grossman, Helpman, Parente, Prescott. Ben-David has provided empirical evidence that trade and growth are positively related. The links between international trade and productivity in different countries were analyzed by Bernard, Jensen, Sharma, Mishra, Falvey, Greenaway, Yu, Gullstrand, Wagner.

According to Bernard, Jensen, the relationship between exporting and productivity has important implications for several current areas of research and policy [3, p.17]. The issues related to productivity as factor of competitiveness in different Lithuania's economic activities in the scientific literature were analysed by Laskiene, Pekarskiene, Snieska, Bruneckiene, Saboniene. This empirical study assesses the changes of manufacturing sector's labour productivity and exports using data of Lithuania's manufacturing industry.

The analysis of competitiveness growth consists of studying effects of the main define factors. Productivity and exports are some of the basic indicators assessing the competitiveness of manufacturing industry. Exports development had contributed significantly in terms of capital inflows, employment, expansion of industry and widening the production base. Exports have also allowed companies of domestic industries to achieve some economies of scale, which otherwise would not have been possible due to the limited domestic market size. Productivity is one of competitiveness's items and in recent years researches productivity often was used as one of indicators of competitiveness and was applied in studies both macro and micro levels.

Productivity indicator exposes the interaction between produced commodities and used resources. Tangen divided the category of productivity in two groups: partial productivity measures; total productivity measures [16, p.348]. Partial productivity identifies output levels in relation to one source of input (time, capital, labour, energy), total productivity measures output levels in relation to the total amount of input resources. The most using partial measure is labour productivity, often measures as output per man-hour or per employee. Labour productivity reveals the value added per employee and equates the turnover less the costs of product. The evaluation of total industrial productivity is problematic in the case of out of data, so usually databases submit the rates of labour productivity.

Growing share of exports in total output causes higher productivity growth rate, and growing share of imports in total output indicates a greater degree of specialization and competition. Sharma, Mishra separated two major hypotheses to explain the linkages between exporting and productivity at the firm level [14, p.4]:

Ü self-selection hypothesis, which describes the self-selection of the more productive firms into the export markets. Melitz developed a dynamic industry model with heterogeneous firms where trade causes reallocations of resources among firms in an industry and showed how the exposure to trade will induce only the more productive firms to enter the export market and will simultaneously force the least productive firms to exit [8, p.1695]. Roberts and Tybout suggested a model of exporting with sunk cost of entry and showed that only the relatively productive firms will choose to pay the entry costs and enter the foreign market [12, p.547]. According to their researches, the implied relationship between exporting to productivity is positive, but the causality runs from productivity to exporting. Sharma, Mishra investigated the productivity differences between exporting and non-exporting Indian manufacturing firms during different phases of transition in export market and found some evidence in support the self-selection hypothesis [14, p.14];

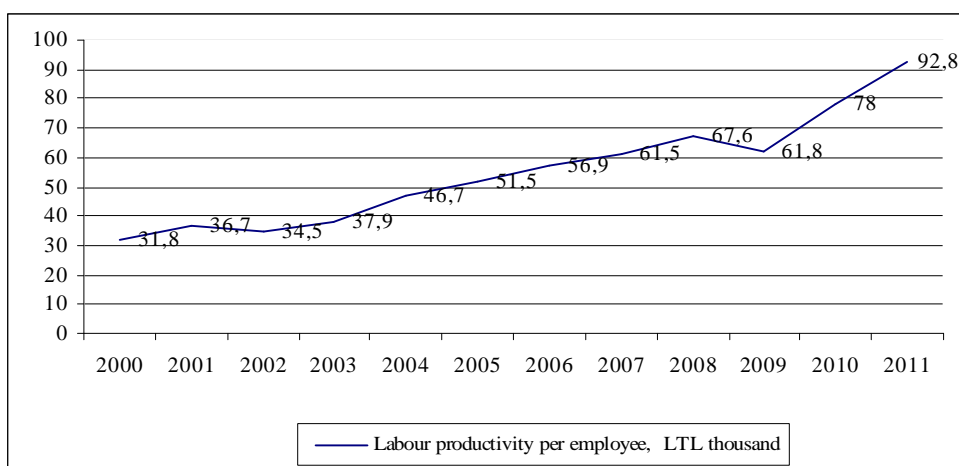
Ü learning-by-exporting hypothesis, which claims that exporting to foreign market gives many positive learning effects by exposing domestic firms to advanced technological innovations from international consumers and competitors and helps them to improve their productivity, then exporters are stimulated to be more productive, more skill-intensive and capital-intensive also bigger in size. Bernard, Jensen examined the interaction between exporting and productivity in U.S. manufacturing, they concentrated on learning-by-exporting hypothesis [3, p.2]. They concluded that exporting firms have substantially higher productivity levels, but there isn't evidence that exporting increases firm productivity growth rates, so the positive correlation between exporting and productivity levels appears to come from fact, that high productivity firms are more likely to enter foreign markets. The employment and output growth rates are much higher at exporters. The investigations of Sharma, Mishra rejected learning-by-export hypothesis although they tested it in two ways: by investigating impact of export-intensity on productivity of firms and by analyzing whether entering in export market has any positive effect on productivity [14, p.14]. Falvey et al. analyzed links between exporting and industry productivity growth in Sweden by using firm data and concluded that exporting has a sizeable impact on industry productivity growth which is independent of the links between exporting and firm productivity [5, p.21].

Wagner concluded that exporters are more productive than non-exporters and that export markets outside euro-zone have higher entry cost that can only be paid by more productive firms [17, p.11].

The main aim of the research is to evaluate the impact of exports to aggregated labour productivity in Lithuania's manufacturing industry. The methods of the scientific research that have been employed in the paper are scientific analysis and summarizing of literature, comparative analysis, mathematic calculations, correlation of statistic indices.

The research findings. The practice of foreign countries economic development presented that advanced technologies industries are key industries which are expected to play an significant role in the increasing the indices of productivity. The high-technologies and medium-high constitute relative small part in Lithuania's manufacturing structure, accordingly only 1.3 percent and 5.7 percent of total manufacture production in 2011. The traditional industrial branches with low-technological susceptibility prevail in Lithuania, where almost 72.1 percent of all manufacture production is made in 2011; in the sector of medium-low-technologies – 20.9 percent (calculations are based on classification of Amador *et al.* [1, p.56]). This is one of reasons why labour productivity of Lithuania's manufacturing is relative lower than in other European countries. The changes of Lithuania's manufacturing industry structure in accordance with the level of technological developments showed that low-tech and medium-low-tech industries gradually grow, but the parts of high-tech and medium-high-tech industries decline in general industrial structure.

The analysis of the labour productivity in Lithuania's manufacturing industry showed, that values constantly increased during 2000 – 2008, the indices in 2009 declined below 2007 levels, but increased in 2010-2011 (Figure 1). The labour productivity indices are largest in *Manufacture of chemicals and chemical products* and in 2011 labour productivity consists of 409.5 LTL thousand per employee per year. It is interesting to notice, that during ten years the level of productivity increased from 53.9 LTL thousand per employee in 2008. Evident growth of labour productivity is achieved in *Manufacture of computer, electronic and optical products* (from 37.5 LTL thousand per employee in 2001 to 124.8 in 2011). Also labour productivity is rising in *Manufacture of basic pharmaceutical products and preparations* (from 19.5 LTL thousand per employee in 2001 to 303.4 in 2011) and in *Manufacture of transport equipment* (from 47.8 LTL thousand per employee in 2001 to 112.8 in 2011). *Manufacture of machinery and equipment* also is defined as manufacturing with relative high labour productivity (108.7 LTL thousand per employee in 2011, while it was only 24.8 in 2001).



Source: the data of The Department of Statistics to the Government of the Republic of Lithuania.

Figure 1. The dynamics of labour productivity per employee in Lithuania's manufacturing industry 2000-2011, thousand LTL.

Manufacture of textiles, wearing apparel, leather products is the industry with lowest labour productivity. Although the indices of productivity consistently increased each year (from 26 LTL thousand per employee in 2001 to 40.9 in 2011), the level of productivity remained low. *Manufacture of wood, paper, printing and reproduction* and *Manufacture of furniture* are industries remained considerable parts in structure of Lithuania's manufacturing industry, but their labour productivity indicators are also among the lower ones (accordingly 73 and 65.8 LTL thousand per employee in 2011, in comparing 30 and 23.5 in 2001).

Manufacture of food products, beverages, tobacco has a sufficiently high level of labour productivity, it accounts 91.5 LTL thousand per employee in 2011 (41.8 in 2001). Relative low labour productivity level is noticed in *Manufacture of electrical equipment* – only 67 LTL thousand per employee in 2011 (37.1 in 2001). *Manufacture of basic metals and fabricated metal products, except machinery and equipment* also achieved low level of labour productivity (66.3 LTL thousand per employee in 2011 accordingly 34 in 2001). *Manufacture of rubber, plastics and mineral products* has relatively high labour productivity indices: 104.4 LTL thousand per employee in 2011 (48.7 in 2001).

In order to estimate the influence of exports to labour productivity in Lithuania's manufacturing industry it is necessary to determine the time interval between the dynamics of indicators. This study covers a period 2001 – 2011 and the annual data were used. For determining interaction, correlation analysis method was used where exports indicator was chosen as independent (x) variable and labour productivity indicator was chose as depended (y) variable. The main research results are presented in Table 1. As presented by research results, the correlation between manufacturing industry (total C group) exports and labour productivity is positive and strong, calculated coefficient $r_{xy}=0,9803$. The significance of this interaction was confirmed by Student coefficient.

Table 1. Exports and labour productivity correlation and determination coefficients (calculations are based on Lithuania's manufacturing industry data 2001-2011)

Coefficients	Correlation coefficient r_{xy}	Determination coefficient R^2
C Manufacturing	0,9803	0,9610
C10,C11,C12 Manufacture of food products, beverages and tobacco	0,9244	0,8545
C13,C14,C15 Manufacture of textiles, wearing apparel, leather and related products	-0,5264*	-
C16,C17,C18 Manufacture of wood, paper, printing and reproduction	0,8729	0,7620
C20 Manufacture of chemicals and chemical products	0,8361	0,6991
C21 Manufacture of basic pharmaceutical products and pharmaceutical preparations	0,9489	0,9005
C22,C23 Manufacture of rubber and plastics products, and other non-metallic mineral products	0,9108	0,8295
C24,C25 Manufacture of basic metals and fabricated metal products, except machinery and equipment	0,9168	0,8405
C26 Manufacture of computer, electronic and optical products	-0,7005*	-
C27 Manufacture of electrical equipment	0,5375	0,2889
C28 Manufacture of machinery and equipment n.e.c.	0,8688	0,7548
C29,C30 Manufacture of transport equipment	0,2906*	-
C31,C32,C33 Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment	0,8860	0,7849

* Student coefficient not confirmed r_{xy} significance of interaction.

The relationship between exports and labour productivity was calculated using statistical data in different manufacturing industries and it is interesting to review research findings. The correlation is positive and strong in *Manufacture of food products, beverages and tobacco, Manufacture of basic pharmaceutical products and pharmaceutical preparations, Manufacture of rubber and plastics products, and other non-metallic mineral products, Manufacture of basic metals and fabricated metal products, except machinery and equipment*, the correlation coefficient is higher than 0.9 and accordingly the determination coefficient is higher than 0.8. These manufacturing industries are defined as medium-low and low-tech industries. Quite strong stochastic relationship between exports and labour productivity is observed in *Manufacture of wood, paper, printing and reproduction and Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment*. These traditional low-tech industries have relative low labour productivity values and relative high exports amounts. *Manufacture of chemicals and chemical products* and *Manufacture of machinery and equipment* also have relative strong interaction between exports and labour productivity. But on the contrary this interaction is weak in *Manufacture of transport equipment* only 8.4 percent of labour productivity changes were influenced by exports.

The correlation coefficient between analyzed indicators is negative in *Manufacture of textiles, wearing apparel, leather products* and correlation's testing not confirmed significance of this interaction. The same situation is observed in *Manufacture of computer, electronic and optical products*. This manufacturing industry is branch with high technology susceptibility and the increasing of labour productivity indicators isn't based on exports dynamics. *Manufacture of electrical equipment* according level of technology is medium-high, the calculation presented average strong relation between exports and labour productivity, it is evident that labour productivity depends on other factors, exports influence on the labour productivity only by 29 percent. It is also necessary to pay attention to fact that larger volume of data would cause increasing of evaluations credibility and it is a reason for further studies. Moreover, investigated variables depend on a number of factors simultaneously and it is difficult to indicate which of them are the most influential.

Conclusions. The exports and productivity are most significant indices of economy and serve as indicators of competitiveness in both macro and micro levels. Does growing share of exports cause higher productivity growth rate of exporters? This research issue allowed researches to focus their studies on two major hypotheses to explain the linkages between exporting and productivity at the firm level: *self-selection hypothesis*, which describes the self-selection of the more productive firms into the export markets and *learning-by-exporting hypothesis*, which states that exporting to foreign market gives many positive learning effects by stimulating domestic firms to improve their productivity. Exporting has positive effects by exposing exporters to advanced technological innovations from international consumers and competitors. Moreover exporters are stimulated to be more productive, more skill-intensive and capital-intensive also greater in size. The traditional industrial branches with low-technological susceptibility prevail in Lithuania and labour productivity indices of these manufacturing industries are relative low. Ordering to analyze the factors impacting labour productivity growth, the interaction between exports and labour productivity was evaluated in this study using annual data of 2001 – 2011. For determining interaction, correlation analysis method was applied where exports indicator was chosen as independent variable and labour productivity indicator was estimated as depended variable. The correlation between manufacturing industry exports and labour productivity is positive and strong, calculated coefficient $r_{xy}=0,9803$. The significance of this interaction confirmed that exports influence on the labour productivity. The relationship between exports and labour productivity was analyzed in different Lithuania's manufacturing industries as well.

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Ключові слова: експорт, продуктивність, конкурентоспроможність, обробна промисловість, кореляція.

Ключевые слова: экспорт, продуктивность, конкурентоспособность, обрабатывающая промышленность, корреляция.

Key words: exports, productivity, competitiveness, manufacturing industry, correlation.

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ДОЛАРИЗАЦІЯ ЯК ФАКТОР МОНЕТАРНОЇ ЗАЛЕЖНОСТІ

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Резнікова Н. В., Відякіна М. М. Доларизація як фактор монетарної залежності.

У статті розкрито економічний зміст поняття «доларизація», суть якого полягає у використанні іноземної валюти в якості грошового засобу та зберіганні резидентами країни своїх активів у готівковій іноземній валюті й у вигляді валютних внесків у вітчизняних банках. Розвиток доларизації, інспірований незадовільним виконанням національною валютою покладених на неї основних функцій порівняно з іншою іноземною валютою, продукує розвиток її різних форм, серед яких депозитна та офіційна доларизація. У роботі доларизація досліджується як чинник монетарної залежності, зокрема виокремлюються наслідки даного явища, серед яких зменшення або втрата контролю за грошовою та валютною політикою; обмеження ефективності монетарної політики; часткова або повна втрата прибутку від сеньйоражу; отримання прибутку від сеньйоражу країнами-емітентами іноземної валюти-замінника; зниження ефективності здійснення платежів; зростання балансового ризику унаслідок часткової доларизації, що фактично спричиняє банківську та макроекономічну кризи; підвищення ймовірності виникнення кризи ліквідності; небажання економічних агентів повертатися до використання місцевої валюти через суттєві трансакційні витрати тощо. Переваги доларизації, таким чином, є короткостроковими, а витрати ведуть до корегування боргової, валютної та монетарної політики держави, змушуючи відштовхуватися, в першу чергу, від умов співіснування з країною-емітентом валюти прив'язки.

Резнікова Н. В., Відякіна М. Н. Долларизация как фактор монетарной зависимости.

В статье раскрыта экономическая сущность понятия «долларизация», смысл которого состоит в использовании иностранной валюты в качестве денежного средства и сбережении резидентами страны активов в наличной иностранной валюте, а также в форме валютных вкладов в отечественных банках. Развитие долларизации, инспирированное неудовлетворительным исполнением национальной валютой, возложенных на нее основных функций сравнительно с другими иностранными валютами, порождает развитие разных ее форм, среди которых депозитная и официальная долларизация. В работе долларизация исследуется как фактор монетарной зависимости, в частности выделяются последствия данного явления, среди которых уменьшение или утрата контроля денежной и валютной политики; ограниченная эффективность монетарной политики; частичная или полная потеря прибыли от сеньйоража; получение прибыли от сеньйоража странами-эмитентами валюты-заменителя; снижение эффективности осуществления платежей; возрастание балансового риска вследствие частичной долларизации, что фактически вызывает банковский и макроекономический кризис; повышенная вероятность возникновения кризиса ликвидности; нежелание экономических агентов возвращаться к использованию местной валюты в связи с существенными трансакционными издержками и т.п.. Преимущества долларизации, таким образом, имеют краткосрочный характер, потери же ведут к корректировке