

## МИРОВАЯ ЭКОНОМИКА

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### TRADE FREEDOM AND REVENUE FROM TRADE TAXES: A CROSS-COUNTRY ANALYSIS

Trade liberalization as consequence of gradual abolition of tariff and non-tariff barriers generally leads to the decrease in government tax revenue. In order to estimate the relationship between trade freedom level and revenue from trade taxes we used the data for 104 countries worldwide for 2012. For further analysis we divide countries into two groups according to their income level as specified in the World Bank classification. Also, we investigated the dependence between revenue from taxes on international trade and trade freedom in resource abundant countries. We find a significant negative correlation between trade freedom and revenue from international trade taxes in low-income and lower-middle-income economies which allowed us to make conclusions about economic policy of countries at different stages of trade liberalization. Refs 26. Tables 2. Figs 4.

*Keywords:* international trade, trade taxes, tax revenue, trade freedom, developing countries, resource countries.

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### СВОБОДА ТОРГОВЛИ И ДОХОД ОТ НАЛОГОВ НА ВНЕШНЮЮ ТОРГОВЛЮ: МЕЖСТРАНОВОЙ СРАВНИТЕЛЬНЫЙ АНАЛИЗ

Либерализация внешней торговли как следствие постепенной отмены тарифных и нетарифных барьеров, в целом ведет к сокращению налоговых доходов государства. Для оценки взаимосвязи между уровнем свободы торговли и дохода от внешнеторговых налогов в статье были использованы данные по 104 странам мира за 2012 г. С целью дальнейшего анализа рассматриваемые страны были распределены на две группы в зависимости от их уровня дохода согласно классификации Всемирного банка. Также анализируется взаимосвязь между уровнем свободы торговли и доходом от внешнеторговых налогов для стран, богатых природными

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ресурсами. Результат показал значимую отрицательную корреляцию между уровнем свободы торговли и доходом от внешнеторговых налогов для стран с низкими доходами и доходами ниже средних, что позволило сделать выводы об экономической политике стран на различных этапах либерализации внешней торговли. Библиогр. 26 назв. Табл. 2. Ил. 4.

*Ключевые слова:* внешняя торговля, налоги на внешнюю торговлю, налоговый доход, свобода торговли, развивающиеся страны, страны, богатые природными ресурсами.

## Introduction

Trade liberalization in countries worldwide in the form of gradual abolition of tariff and non-tariff barriers in foreign trade, generally leads to decrease in revenue obtained from collection of trade taxes. To compensate the revenue loss by domestic tax receipts, a given country should have a well-organized and well-administered tax system. Hence it is possible mainly in developed economies where regulatory function of taxation instead of the fiscal one comes to the fore. While in developing and transition countries taxes on international trade play a significant fiscal role which is primarily conditioned by simplicity of their collection. But at the same time trade taxes significantly distort production and consumption choices; so their replacement by domestic taxes, which impose less distortion or inefficiency costs, is required.

Thus in developing and transition economies it can be assumed that the more liberalized is the economy and the higher is the level of trade freedom, the share of trade taxes in total tax revenue declines more slowly. I. e., *ceteris paribus*, the tax system is able to better adapt to the changes.

So, the main purpose of this paper is to estimate the relationship between trade freedom level and revenue from trade taxes. It will also focus on some aspects of international trade for resource-rich countries. To do this we structured paper as follows. Section 2 reviews theoretical and empirical research on the impact of trade liberalization on government tax revenue. Section 3 provides brief theoretical background of effects of tariffs and trade liberalization on tax revenue and welfare. Section 4 describes data and methodology used for the analysis. In Section 5 we discuss the obtained results. Finally, Section 6 presents some concluding remarks.

## 1. Literature review

The largest part of research studies the impact of trade freedom on economic growth. See for example Krueger [1974], Rivera, Romer [1991], Chheng [2005], Lundstrom [2003], Pogorletskiy, Sutyurin [2010], Auboin [2012], Gorlach, Le Roux [2013], Mahmood [2014], etc. These papers usually use a panel data in order to investigate such impact. They concluded that trade freedom is highly significant and is positively related to economic growth.

Another set of papers studies the influence of trade freedom on certain macroeconomic and foreign trade variables, notably on foreign direct investment inflows to 12 developing countries of Middle East and 43 other developing countries for 1995–2006 [Beheshtitabar, Irgaliyev, 2008], on bilateral trade and RTAs, using an unbalanced panel dataset for 33 African countries [Naanwaab, Diarrassouba, 2013], on the economic performance of labor and capital productivity for 18 MENA countries over the period 1995–2009 using nonlinear Panel Least Squares regression [Emara, 2014], etc.

The investigations studying the impact of trade freedom and income inequality should be emphasized separately.

Norhazlin [2010] examined the issues of income inequality and trade freedom towards economic growth in developing countries using the World Development Indicators and 2009

Index of Economic Freedom data. The results of the study established that in some cases trade freedom will increase income inequality.

Batuo and Asongu [2012] using panel data of 26 African countries spanning the period 1996–2010, examined the effect of liberalization policies with particular focus on financial, trade, institutional, political and economic liberalizations on income-inequality. They applied two methods, the dynamic panel econometric method and the “before and after” approach. Generally, their findings tend to suggest that overall the liberalization policy reforms have increased income inequality in African countries. Crechet [2012] provided an empirical analysis for 45 developing and emerging countries covering a period of 1990–1997 and regressed synthetic indexes of inequality on trade, in interaction with a measure of financial development. He concluded that trade freedom increases income inequalities in some developing countries. Pérez-Moreno and Angulo-Guerrero [2012] examined the relationship between economic freedom and income inequality in the 28 EU countries using panel data for the period 2000–2010. They suggested that economic freedom seems to entail greater income inequality. But not all areas of economic freedom affect income distribution similarly. Thus while government size and regulation appear to be robustly associated with income inequality, legal system and property rights, sound money, and trade freedom are not significantly related with income distribution in the EU countries.

Akin et al. [2014] investigated the relationship between economic growth and economic freedom for different income groups using the data for 94 countries covering the period 2000–2010. They found a statistically significant positive relationship between the level of trade freedom for all income groups and economic growth.

Empirical research estimating the impact of trade freedom on tax revenue is generally provided for selected countries and regions, where such influence is significant. Typically this is true for developing and least-developed countries, notably in Africa. See for example [Kabbashi, 2005; Pupongsak, 2009; Cottarelli, 2011; Mushtaq et al., 2012; Nwosa et al., 2012; Gaalya, 2015] etc.

Some regional level studies were provided for the Middle-East and North Africa (MENA) countries [Mansour, 2015]. IMF experts find that from a revenue perspective, tariff policy has evolved toward more liberalization in this region and less reliance on tariffs as a revenue source. Trade taxes average about 1 % of GDP in both resource and non-resource MENA countries, and they rarely exceed percent of GDP. Their share in total tax revenues declined from about 26 % in the early 1990s to 15 % in 2012. The same tendency — decrease of trade tax revenue — according to the Banque de France, could be observed in franc zone countries (Pays de la Zone Franc, PAZF) in Africa [La mobilisation fiscale dans... 2016].

The cross-country studies of Baunsgaard and Keen [2010] and Cage and Gadenne [2014] deserve a special mention. Baunsgaard and Keen [2010] used a panel data for 117 countries over 32 years in order to estimate the compensation of lost revenue (from trade liberalization) by income obtained from collection of domestic taxes. They found

that high income countries have been recovered those revenues while middle and low income countries have been not.

Cage and Gadenne [2014] used a novel dataset on total and trade tax revenues covering 130 countries from 1792 to 2006 in order to compare the fiscal cost of trade liberalization in developing countries and in today's rich countries at earlier stages of development. They concluded that trade liberalization led to larger and longer-lived decreases in total tax revenues in developing countries since the 1970s than in rich countries in the 19<sup>th</sup> and early 20<sup>th</sup> centuries.

## 2. Theoretical background

According to the IMF [Mansour, 2015], tariff policy as a key element of trade policy, is distinct from domestic tax policy in that its primary role is to protect domestic production by creating a wedge between prices of imported goods and services and those of domestically-produced substitutes.

For developing and least-developed countries tariffs are important for the following reasons.

First, they generate revenue which can be important to state budgets, and hard to replace when governments liberalize trade.

Second, even when tariffs do not increase significantly the revenue, such as when they are prohibitively high or used jointly with quotas, reducing tariffs could have serious consequences on the composition of the various tax bases of country's tax system.

Third, protection provided by tariffs to domestic production sectors may generate returns on investment above normal rates of return (comparing to those required by investors in markets with perfect competition). Governments may want to tax such economic rent at rates above standard rates.

Fourth, investment tax incentives may be ineffective when tariff rates are high on imported intermediate and capital inputs; for example, a corporate tax rate holiday may be of little use to a firm facing a high tariff rate on imported capital that has no domestic substitutes.

### 2.1. *Impact of tariffs and trade liberalization on tax revenue and welfare*

Let's briefly examine some approaches to the impact of tariffs (taxes on imported goods) and trade liberalization on both tax revenue and welfare in a small open economy.

On country's market for one good under free trade, the domestic price equals the world price. A tariff raises the prices of imported goods above the world price by the amount of the tariff. Domestic suppliers of good, competing with sellers of the imported good, at this stage can sell these goods for the world price increased by the amount of the tariff. Accordingly, the price of import and domestic goods — both — will rise by the amount of the tariff and will be closer to the price without trade.

The change in price affects the behavior of domestic consumers and sellers. Because the tariff raises the price of good, it reduces the demanded domestic quantity. Consequently, the tariff will reduce the quantity of imports and will move the domestic market closer to its equilibrium without trade. Since the tariff leads to the increase of the domestic price, domestic sellers are better off, and domestic consumers, respectively, are worse off. In addition the government's tax revenue increases.

At origin, government surplus equals zero. Once a government levies a tariff, the domestic price exceeds the world price by the amount of the tariff, effectively changing consumer and producer surplus, as well as government surplus.

Additionally the tariff causes a deadweight loss because a tariff is a type of tax. Like most taxes it distorts incentives and allocation of resources. In this case, it has two effects. First, when the tariff raises the domestic price of good above the world price, it encourages domestic producers to increase production. Even though the cost of making these incremental units exceeds the cost of buying them at the world price, the tariff makes it profitable for domestic producers to manufacture them nonetheless. Second, the tariff encourages domestic consumption, effectively inducing domestic consumers to cut back their purchases. These two effects cause the deadweight loss from both the overproduction and underconsumption.

Thus, the introduction of a tariff in a small open one-good economy reduces consumer surplus, increases the producer surplus and increases the government tax revenue. Total surplus is reduced by deadweight loss arising from the overproduction and underconsumption [Feenstra, 2003; Mankiw, 2014].

Now consider a small open economy with two final goods, importables ( $M$ ) and exportables ( $X$ ), where importables and exportables are capital-intensive and labor-intensive respectively. Both goods are produced with constant-returns production functions under perfect competition. The public good is financed via tariff revenue and other tax revenue.

Figure 1 presents the basic model with an undistorted production frontier ( $F$ ) between goods  $M$  and  $X$ . The production at  $Q_0$  and consumption at  $C_0$  are induced by the world price  $P^*$ .

Any underlying taxes do not distort these decisions. The introduction of an ad valorem tariff at rate  $\tau$  induces a wedge between domestic and world prices such that  $P^d = (1 + \tau)P^*$ .

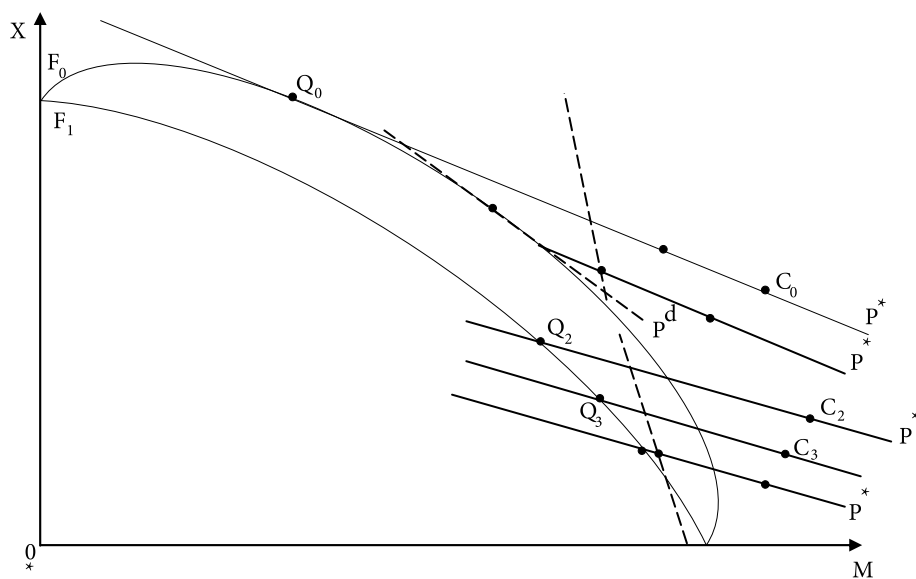


Figure 1. Capital tax, consumption tax and import tariffs in a small open economy

Source: [Konan and Maskus, 2000].

Thus, the production shifts to  $Q_0^f$  and consumption to  $C_0^f$ , with a reduced trade volume, while trade is balanced at world prices. In this case, the abolition of the tariff shifts the economy to the free-trade equilibrium and the welfare gain is a pure trade-liberalization effect. Let's assume that the economy has uniform tax rates on capital use in the two sectors. In a closed economy the output mix must satisfy the demand-determined equilibrium at a point on the frontier. Accordingly, the change of factor prices would be the only response to the introduction of the uniform tax. Similarly, in a small open economy the producer equilibrium remains at point  $Q_0^f$  by virtue of the fixed world price ratio and tariff rate. Consequently, for any uniform capital tax rates there must be a sufficient change in factor prices to support this equilibrium.

The higher is the tax the lower is the return to capital, but for a given tax rate a tariff cut would move the economy along the frontier.

Assume now that the economy has differential tax rates on capital use and the tax on exportables  $K_X$  is higher than the tax on importables ( $K_M$ ):  $t_x > t_m$ .

These taxes shift the economy on  $F_1$ , since they drive a wedge between the ratios of marginal labor and capital products in the two sectors. The higher is the ratio  $t_x / t_m$ , the larger is this wedge.

Then, producers face the tariff-distorted domestic price ratio  $P^d$ ; consequently the new equilibrium is established at point  $Q_1^f$ . So, the trade must be balanced at world prices, implying final consumption equilibrium at point  $C_1^f$ .

Now let's briefly analyze the case of trade liberalization with:

- replacement of the tariff by capital tax;
- replacement of the tariff by consumption (commodity) tax;
- no changes in the tax policy.

In the framework of trade liberalization the first-best policy is to remove the tariff and also to convert the capital tax into a non-distortionary lump-sum tax in order to replace the lost tariff revenues.

But in applied settings, the ideal lump-sum tax instrument is unavailable and the government may be constrained to retain the capital tax. If the government does not adjust the capital tax rates during trade liberalization, the economy would remain on frontier  $F_1$  with shifting of the production equilibrium to the  $Q_2$  and consumption equilibrium shifts to the  $C_2$  at world prices. The welfare gain from point  $C_1^f$  to  $C_2$  could be described as a pure trade liberalization gain, conditioned by unchanged capital tax rates.

However, because outputs have shifted between sectors, there would now generate different levels of capital tax revenue. In order to neutralize this effect the tax policy change is required. One possibility would be to change tax rates differentially, which would change the tax proportion  $t_x / t_m$ .

If the reduction of tax rates is induced since endogenous revenue rises more than tariff revenue falls, the economy would shift to the production point above  $Q_2$ , increasing welfare at fixed world prices. If tax rates increase in order to compensate lost tariff revenue, the economy would shift to the  $Q_3$ . This means that such tax increase alleviates the resource movement from trade liberalization. Consequently this leads to the reduction in the welfare gains, and it is possible that welfare could fall below its original level at  $C_1^f$ . Such shifting along the frontier is possible in an open economy with fixed international price ratio, since the rise in the proportional taxes increases the effective wedge between ratios of marginal products. The replacement of the tariff by capital taxes with a lump-sum

tax leads to the shifting from  $C_1^r$  to  $C_0$ . And if the policy is only to replace the capital taxes with a lump-sum tax but not to liberalize trade, the economy would move from  $C_1^r$  to  $C_0^r$ .

Let's assume now an alternative taxation possibility with consumption (commodity) tax, which is higher on domestic consumption of good  $M$  than on consumption of good  $X$ . In such situation, the consumer price ratio,  $P^{ct}$ , exceeds the producer price ratio,  $P^d$ , which itself is tied to the world price ratio through the tariff. Consistently, production and consumption equilibrium lie at  $Q_0^r$  and  $C_0^{ct}$  respectively, and trade is balanced at world prices. Here, removal or unification of the commodity tax, holding the tariff fixed, would yield a welfare gain from  $C_0^{ct}$  to  $C_0^r$  and subsequent tariff removal would shift the consumption to the  $C_0$ , producing additional gains. In case where distorted tax rates are fixed, the economy could remove the tariff, shifting the production equilibrium to the  $Q_0$ .

When there are both distorted capital and commodity taxes ( $C_1^{ct}$  in Fig. 1), trade liberalization could also be accompanied by no tax reform with consumption equilibrium on the price line through  $Q_2$  or  $Q_3$ , with a lower consumer price ratio by capital-tax reform with consumption equilibrium at  $C_2^{ct}$  by commodity-tax reform with consumption equilibrium at  $C_2$  or  $C_3$  and by reform in both taxes with full liberalization outcome at  $C_0$ .

Finally, consider trade liberalization with no changes in the tax policy. This situation leads to the shifting from production and consumption equilibrium at  $Q_1^r$  and  $C_1^r$  respectively to the free-trade equilibrium with production at  $Q_2$  and consumption at  $C_2$ . This change in welfare may arise due to pure trade-liberalization effects. But an offsetting change in the tax structure is required again to maintain revenues.

## *2.2. Trade liberalization and tax revenue in resource-rich countries*

Following to the analysis of World Trade Organization (WTO) experts, since natural resources are often concentrated in a few countries, producers and exporters of these resources could benefit from market power and obtain large rents, notably by restricting trade by means of import tariffs, export taxes, quotas or export subsidies.

Economists underline that import tariffs are usually levied by resource importing countries in order to extract rents from resource exporting countries (rent-shifting behavior). This argument is relevant for natural resources comparing with other types of products for several reasons.

First, since resource revenue largely consists of pure rents, import tariffs can be optimal in order to counteract the monopoly power of the resource abundant country. Moreover, usually exporters of natural resource are monopolists and consequently importers may enjoy monopsony power.

Second, import tariffs on natural resources cannot generally be justified as import substitution strategies, because natural resources stocks, such as oil and minerals, tend to be concentrated in relatively few regions and cannot be shifted from one country to another. So, it is evident that the rationale for imposing import tariffs cannot be regarded in terms of increase of domestic production

Third, since the real available supply of natural resources is unknown, it may be subject to random interruptions. And import tariffs could be optimal if supplies are subject to such interruptions because the higher domestic price could be regarded as premium that consumers pay for the vulnerability and uncertainty of imports.

Eckermann et al. [2012] also noted that the import tariff is to offset additional costs incurred by domestic extractors or manufactures that have to pay the resource tax. The

export refund compensates domestic industries for the domestic tax costs they have to incur, so as to level the playing field in foreign markets.

But, regardless of the motivations, the imposition of import tariffs will affect the distribution of pure rents associated with extraction. Notably, this is the case of the oil, which is available in a finite amount and the costs of its extraction are relatively low comparing with the initial investment. These high fixed and low variable costs mean that its supply curve is inelastic, i. e. it is not sensitive to price changes. Within this framework, if the importing country levies a tariff, the exporting country will have to lower the export price (at least as the size of the tariff) in order to be able to sell the total amount of the resource. Consequently, the burden of import tariff will fall on the exporter. And the higher the rent-extracting tariff imposed by the importing country, the higher the share of the rent that it can appropriate. According to Bergstrom (1982), the entire rent can eventually be extracted by imposing a high enough tariff rate, notably when the exporter is a monopolist.

There are a number of factor, determining the size of the rent that can be shifted from the resource-rich exporting to the importing country, notably

the size of the importing country comparing relative to the exporting country: the import tariff tends to be higher the larger the importing country;

the number of importing countries: generally, the share of the appropriated exporter's rent decreases with the number of importing countries;

the domestic demand for the resource: the size of the rent appropriated by importer, depends on the demand for the resource in the resource abundant country, notably on the part of local processing industry. If the exporting country can transform the natural resource into final goods with high value added within its own economy, then it can respond to the imposition of the tariff by restricting exports. Since now there is consumption both in the importing and exporting economies, the amount of resource supplied to the importing country is no longer fixed. Consequently, this limits the ability of importing economy to obtain the entire rent [Trade policy... 2010].

Collier and Venables [2008] empirically tested the fiscal consequences of tariffs for governments with large revenue from resource exports. They showed that in resource abundant economies it is likely that import tariffs do not generate net revenue. They also analyzed welfare-reducing effects of tariffs, arising, notably, in consequence of frustrating export diversification which is often a policy priority for resource-rich countries. So, there is a strong case that countries in which tariff revenue is illusory should have lower tariff rates than those in which they generate considerable revenue. But authors did not find such tendency, which allowed them to suggest that tariffs are excessive either because the illusory nature of revenue is not appreciated, or because of political advantages accruing to a shift of revenue between budget headings. And they concluded that in resource-abundant countries the tariff revenue is offset by unrecorded reductions in the real values of resource rents, and, consequently, the apparent revenue is illusory.

The resource abundant countries, especially developing and least developed ones, often extensively use export taxes. The trade theory considers that there is an optimal export tax: such policy may be welfare improving for the exporting country in the natural resources sector, since in a partial equilibrium framework with perfect competition and constant returns to scale the optimal export tax is the reciprocal of the elasticity of residual demand facing the exporting country. But in the long term export taxes may not



be an effective tool of maintaining high export prices of natural resources, because, first, high world prices could encourage importing countries to invest in new resource-saving technologies in order to reduce their needs in natural resource; and, second, high prices may also provide incentives to exploit resources that would not be exploited at normal prices (in the free trade framework) or to undertake exploration for new reserves [Trade policy... 2010].

So, taking into account all mentioned the main point of discussion is to analyze the relationship between revenue from taxes on international trade and level of trade freedom in countries worldwide.

### 3. Data and methodology

The trade freedom variable index (as a component of an aggregate Index of Economic Freedom) for 2012 is extracted from database of the Heritage Foundation [Trade freedom...]. According to their methodology, trade freedom is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. The trade freedom score based on two inputs: the trade-weighted average tariff rate and non-tariff barriers. Share of taxes on international trade in total revenue data come from the World Bank's World Development Indicators (WDI).

For further analysis in order to estimate the dependence between variables we used some econometric tools, notably correlation and regression analysis.

### 4. Results and discussion

#### 4.1. Low income and low-middle-income countries

Figure 2 illustrates the visual correlation between the share of taxes on international trade in total revenue for 2012 and the trade freedom index for the whole sample of 104 countries. A higher value of trade freedom index equates to lower tariff and non-tariff barriers.

This is not surprising that developed countries are situated in the lower right corner while most of developing and transition economies are located in the center part of the graph.

So the highly liberalized foreign trade translates to a decrease in trade tax revenue up to their absence like in Malta, Austria, United Arab Emirates, and Singapore etc.

Then it was of our particular interest to investigate more deeply the relations between share of taxes on international trade in total revenue and the trade freedom index for developing and transition economies. The main purpose is not only to confirm the correla-

Table 1. Country groups by income

Economy	Income, GNI per capita
Low-income economies	\$1,045 or less
Lower-middle-income economies	\$1,046 to \$4,125
Upper-middle-income economies	\$4,126 to \$12,735
High-income economies	\$12,736 or more

Source: [Taxes on international trade...].



tion, but primarily to examine the nature of such dependence. According to the classification of countries by their level of income proposed by the World Bank, we chose from the whole sample the low income and the low middle income economies as on 2012 (Table 1).

Figure 3 presents the correlation between the share of trade taxes in total revenue and the trade freedom index for these 39 economies. It should be noted that in developing and transition states levying of trade taxes is the prevailing measure of customs regulation by contrast with non-tariff barriers applying in developed countries.

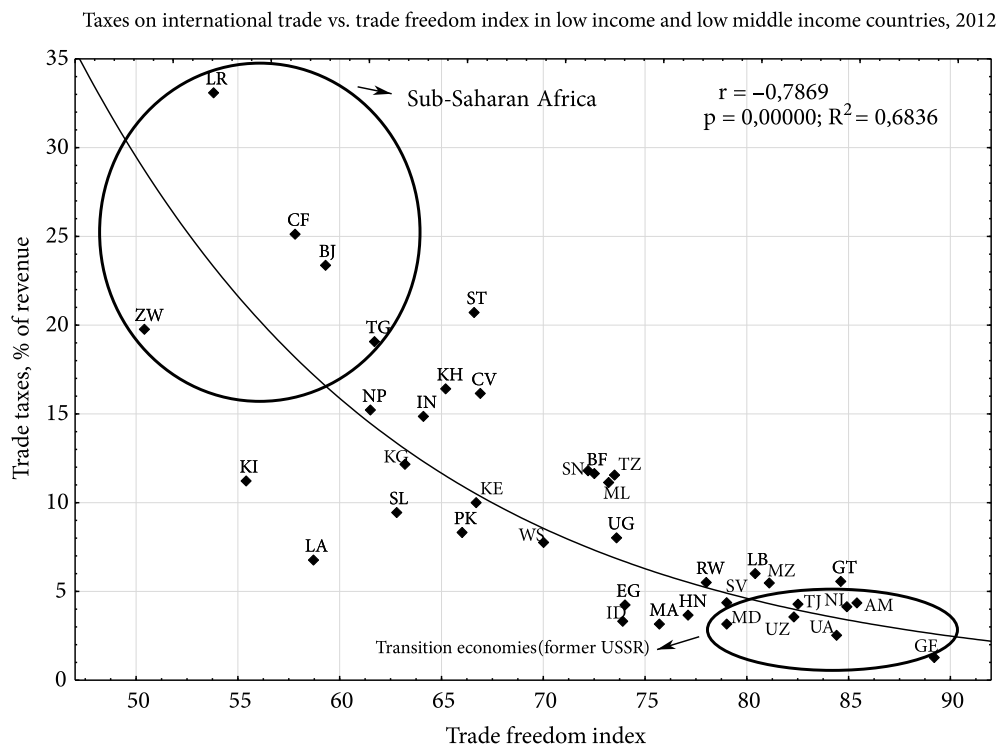


Figure 3. Taxes on international trade vs. trade freedom in low income middle and low middle income countries, 2012

As it can be seen from the Figure 3, here is a significant exponential relationship with negative slope and consequently with negative coefficient for the independent variable.

The regression equation is:

$$y = 608,52e^{-0,061x}$$

where  $x$  and  $y$  denote the trade freedom and revenue from taxes on international trade respectively.

It will be observed that the division by geographical distribution is sufficiently clear. Thus, in the upper left corner there are a group of Sub-Saharan African countries: Liberia, Zimbabwe, Benin, Togo and Central African Republic. For these economies is typical the high level of trade taxes and low level of trade freedom. In the lower right corner of the

graph there are located transition economies — countries of the former USSR: Moldova, Georgia, Ukraine, Armenia, Tajikistan and Uzbekistan. So they are closer to the developed countries with regard to ratio of the trade tax revenue to the level of trade freedom.

The same analysis made for the upper middle income and high income countries showed that the bulk of these economies are located in the lower left corner of the graph as on the Fig. 1, but there is no clear relationship between variables.

The properties of exponential relationship as applied to this graph imply that the rate of decline of revenue obtained from collection of trade taxes falls with proportional increase of trade freedom index. This means that the higher is the level of liberalization, the share of trade taxes revenue in total receipts falls more slowly.

This analysis provided evidence that among low income and low middle income economies transition countries have more flexible tax system (comparing with other developing countries) which supposes their possibility to compensate the revenue loss from trade liberalization by receipts obtained from collection of domestic taxes, like high income (developed) countries.

#### *4.2. Resource economies and trade liberalization*

As it was mentioned above, resource sectors are often treated differently from other economic activities because of their special nature, or being a fiscal incentive aimed to attract investors. According to IMF [Guide on Resource... 2007] resource-abundant economies should rely on the non-resource fiscal balance, because import tariffs shift revenue from the resource account to the non-resource account. And, consequently, the concept of the non-resource fiscal balance unintentionally encourages trade restrictions.

Analysis of trade and tariff policy in MENA countries, provided by IMF [Mansour, 2015], showed that in resource-abundant countries by 2012, both trade taxes and the collected tariff rate, calculated as ratio of total trade taxes divided by the value of imports, have declined more from already low levels in the early 1990s, while the tax base, i. e. import, expanded significantly, from 33 % to over 55 % of GDP as on 2012. Trade taxes have not increased or at least remained stable in resource countries for two main reasons: first, there are much lower tariff rates today than in the 1990s, especially in Gulf countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates), where a single common external tariff of 5 % applies to most imports; and second, is the use of exemptions, reduced rates and other types of tariff preferences.

In non-resource MENA countries, there is also a clear and significant decline in both trade taxes and the collected tariff rate, from 5 % in 1990 to 0,5 % of GDP in 2012. But, unlike resource-rich countries, there is little sign of a significant expansion of the tax base — the increase in the early 2000s receded somewhat in recent years, especially particularly in Mashriq countries (Lebanon, Palestine, Jordan, Syria and Iraq).

We analyzed the dependence between revenue from taxes on international trade and trade freedom in top-oil producing countries as on 2012. For this, we've chosen 16 countries from the top 20 oil-producing countries (Table 2).

The availability of relevant data on revenue from taxes on international trade in these countries as on 2012 determined the selection of only 16 countries from this list.

The results are presented on Fig. 4.

Table 2. Top 16 oil-producing countries, their level of trade freedom revenue from taxes on international trade as on 2012

Country and abbreviation	Trade freedom index	Taxes on international trade, % of revenue
Angola (AO)	65,2	3,4
Brazil (BR)	69,7	2,7167
Canada (CA)	87,9	1,24
China (CN)	71,6	15,0713
Ecuador (EC)	68,1	5,31
Kazakhstan (KZ)	79,6	16,89
Kuwait (KW)	81,6	0,8183
Nigeria (NG)	63,9	5,49
Norway (NO)	89,3	0,2181
Oman (OM)	83,7	1,8587
Qatar (QA)	82,5	2,1
Russia (RU)	68,2	26,485
Saudi Arabia (SA)	82,3	1,16228
United Arab Emirates (UAE)	82,6	0,0079
United States (US)	86,4	1,2433
Venezuela (VZ)	58,8	5,6499

Source: [Taxes on international trade...; Free monthly oil statistics..., 2016].

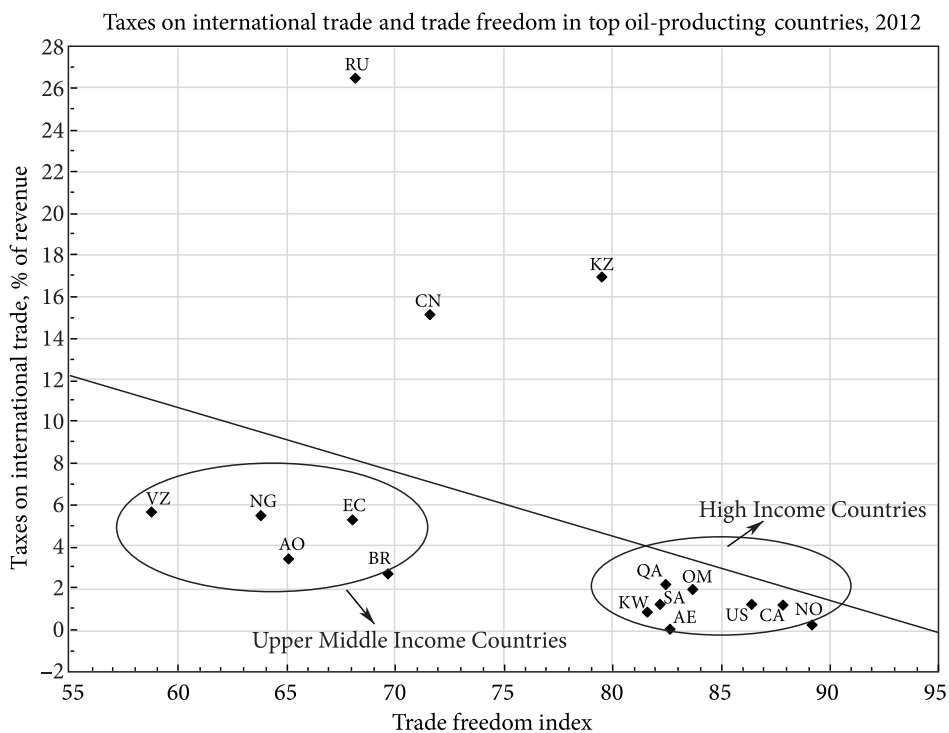


Figure 4. Taxes on international trade vs. trade freedom in top-oil producing countries, 2012

In large economies, notably in Brazil, China, Russia, USA, a significant part of the resource production (extracted or processed) is consumed domestically. In this case, a duty, imposed on resource export, could be regarded as a subsidy on domestic consumption in terms of its price and quantity effects. The rents related to the oil production shift partially from the producer to the government (in the form of export tax revenue) and to the consumers (in the form of available resources) in the exporting country.

While in countries where a significant part of resource is exported (notably, Gulf countries) an export duty only has distributional effects, i. e. rents shift from the producer to the government in the form of export tax revenue. In such situation the producer cannot shift the export tax burden onto foreign consumers (by increasing the export price), since some part of resources will remain unsold.

In terms of trade freedom the obtained results coincide in some manner with statements of WTO's experts [Trade theory..., 2010], according to which resource-rich countries with high level of property rights protection and enforcement capability tend to maintain high level of trade freedom. But resource abundant economies where a large number of economic agents have access to the resource, harvesting technologies are more productive and overharvesting is hard to detect, prefer to restrict their trade liberalization.

## Conclusion

In the paper we empirically tested the assumption that in transition economies the tax systems are more flexible comparing with other developing and least developed countries which in turns allows more efficient reallocation of sources of revenue.

At various stages of trade liberalization the tariff policies of low income and low middle income countries differ.

Developing and especially least developed countries maintain the high level of taxes on international trade since the tax systems in such economies are underdeveloped and they are able to generate returns primarily from easily collected indirect taxes like trade taxes. For this reason these states cannot efficiently promote trade liberalization, by eliminating tariff barriers.

For that matter transition countries are closer (according to the regression equation) to developed ones with upper middle and high income levels. Their tax systems allow faster shifting from fiscal to regulatory tools of taxation compared with other developing countries.

As it was mentioned above the properties of exponential relationship relating to this topic imply that decrease of level of trade freedom will determine the increase at a quick rate the share of trade taxes in total revenue.

Defining whether this increase is induced by direct rise of amounts of collected trade taxes or by "collapse" of economics at large accompanied by reduction of domestic tax and non-tax revenue, requires further investigation.

The model is limited in some manner by the data as of 2012, but this is conditioned by the available data, notably on share of trade taxes in total tax revenue. But the proposed methodology allows to use data of any time period.

## References

- Auboin M. International Trade in the Global Economic Crisis [Mezhdunarodnaia torgovlia v period global'nogo ekonomicheskogo krizisa]. *Vestnik of Saint-Petersburg University. Series 5. Economics*, 2012, issue 3, pp. 75–81. (In Russian)
- Akin C., Aytun C., Aktakas B. The impact of economic freedom upon economic growth: an application on different income groups. *Asian Economic and Financial Review*, 2014, vol. 4(8), pp. 1024–1039.
- Batuo M., Asongu S. The Impact of Liberalisation Policies on Inequality in Africa. *MPRA Paper*, no. 43344, 2012. 38 p.
- Baunsgaard T., Keen M. Tax Revenue and (or?) Trade Liberalization. *Journal of Public Economics*, 2010, vol. 94, issue 9–10, pp. 563–577.
- Beheshtitabar E., Irgaliyev A. The Impact of Economic Freedom on FDI Inflows to Developing Countries: The Case of the Middle East. *Jönköping University*, 2008. 29 p.
- Bergstrom T. Capturing oil rents with a national excise tax. *American Economic Review*, 1982, no. 71, pp. 194–201.
- Cage J., Gadenne L. *Tax revenues, development, and the fiscal cost of trade liberalization, 1792–2006*. Working Paper, University College London, 2014. Available at: [http://scholar.harvard.edu/files/cage/files/cage\\_gadenne\\_2014.pdf](http://scholar.harvard.edu/files/cage/files/cage_gadenne_2014.pdf) (accessed 04.02.2016).
- Chheng K. *How do economic freedom and investment affect economic growth? Graduate School of International Cooperation Studies, Kobe University, 2005*. Available at: <http://econwpa.repec.org/eps/mac/papers/0509/0509021.pdf> (accessed 04.02.2016).
- Collier P., Venables A. Illusory revenues: Import tariffs in resource-rich and aid-rich economies. *Journal of Development Economics*, 2011, vol. 94, no. 2, pp. 202–206.
- Cottarelli C. *Mobilisation des recettes dans les pays en développement*. Fonds Monétaire International. Département des finances publiques, 2011. 99 p.
- Créchet J. *Libéralisation commerciale, développement financier et inégalités de revenu Université de Montréal*, 2012. Available at: <https://papyrus.bib.umontreal.ca/xmlui/handle/1866/8764> (accessed 04.02.2016).
- Eckermann F., Golde M., Herczeg M., Mazzanti M., Montini A., Zoboli R. Resource taxation and resource efficiency along the value chain of mineral resources. *European Topic Centre on Sustainable Consumption and Production. ETC/SCP Working Paper*, 2012, no. 3. 63 p.
- Emara N. Quantitative Evaluation of the Struggle of Economic Performance: The Case of MENA Countries. *Topics in Middle Eastern and African Economies*, 2014, vol. 16 (2), pp. 184–191.
- Feenstra R. *Advanced International Trade: Theory and Evidence*. Princeton: Princeton University Press, 2003. 496 p.
- Free monthly oil statistics*. International Energy agency. 2016. Available at: <http://www.iea.org/statistics/topics/oil/> (accessed 04.02.2016).
- Gaalya M. Trade Liberalization and Tax Revenue Performance in Uganda. *Modern Economy*, 2015, no. 6, pp. 228–244.
- Gorlach V., Le Roux P. The Impact of Economic Freedom on Economic Growth in the SADC: An Individual Component Analysis. *Economic Research Southern Africa*, 2013. Working Paper no. 327. 21 p.
- Guide on Resource Revenue Transparency*. International Monetary Fund (IMF), 2007. 73 p.
- Kabbashi M. *The Impact of Trade Liberalization on Revenue Mobilization and Stability in Sudan*, 2005. Available at: <https://www.imf.org/external/np/res/seminars/2005/macro/pdf/sulima.pdf> (accessed 04.02.2016).
- Konan D., Maskus K. Joint trade liberalization and tax reform in a small open economy: the case of Egypt. *Journal of Development Economics*, 2000, vol. 61, pp. 365–392.
- Krueger A.O. The political economy of the rent-seeking society. *The American Economic Review*, 1974, vol. 64 (3), pp. 291–303.
- La mobilisation fiscale dans les pays de la Zone franc: principaux enseignements sur longue période. *Rapports annuels de la Zone franc*, 2016. Banque de France 2016, pp. 106–115.
- Lundstrom S. *Effects of economic freedom on growth and the environment — implications for cross-country analysis*, Göteborg University, 2003, Working Paper no. 115. 35 p.
- Mahmood K. *Trade Liberalization and Economic Growth: A Case Study of Selected SAARC Member Countries*. Islamabad: PRIME Institute, 2014. 50 p.
- Mankiw N.G. *Principles of Economics*. Cengage Learning, 2014. 880 p.
- Mansour M. *Tax Policy in MENA Countries: Looking Back and Forward*. IMF, 2015, Working Paper no. 15/98. 51 p.
- Mushtaq S., Bakhsh K., Hassan S. Estimating impact of trade liberalization on tax revenue in Pakistan. *Journal of Agriculture & Social Sciences*, 2012, no. 8, pp. 148–150.

- Naanwaab C., Diarrassouba M. The Impact of Economic Freedom on Bilateral Trade: A Cross-Country Analysis. *International Journal of Business Management and Economic Research*, 2013, vol. 4 (1), pp. 668–672.
- Norhazlin I. Income Inequality, Economic Freedom and Economic Growth. *European Journal of Economics, Finance and Administrative Sciences*, 2010, no. 25, pp. 144–157.
- Nwosa P., Saibu M., Fakunle O. The Effect of Trade Liberalization on Trade Tax Revenue in Nigeria. *African Economic and Business Review*, 2012, vol. 10, no. 2, pp. 28–43.
- Pérez-Moreno S., Angulo-Guerrero M. *Income Inequality and Economic Freedom in the EU countries*. University of Malaga. 2012. Available at: [http://www.disei.unifi.it/upload/sub/pubblicazioni/seminari/pdf-seminari/perez\\_unifi.pdf](http://www.disei.unifi.it/upload/sub/pubblicazioni/seminari/pdf-seminari/perez_unifi.pdf) (accessed 04.02.2016).
- Pogorletskiy A. I., Sutyryn S. F. Perspectives of Forming the Global Tax Regulation System [Perspektivy stanovleniia sistemy global'nogo nalogovogo regulirovaniia]. *Vestnik of Saint-Petersburg University. Series 5. Economics*, 2010, issue 2, pp. 47–59. (In Russian)
- Pupongsak S. *The effect of trade liberalization on taxation and government revenue*. University of Birmingham. Department of Economics College of Social Sciences, 2009. Available at: <http://etheses.bham.ac.uk/837/1/Pupongsak10PhD.pdf> (accessed 04.02.2016).
- Rivera B., Romer P. Economic integration and endogenous growth. *The Quarterly Journal of Economics*, 1999, vol. 106 (2), pp. 531–555.
- Trade policy and natural resources. *World Trade Report 2010. Trade in natural resources*. WTO, 2010, pp. 112–159.
- Trade theory and natural resources. *World Trade Report 2010. Trade in natural resources*. WTO, 2010, pp. 72–111.
- Taxes on international trade (% of revenue)*. *The World Development Indicators*. Available at: <http://data.worldbank.org/indicator/GC.TAX.INTT.RV.ZS> (accessed 04.02.2016).
- Trade freedom. Index of Economic Freedom*. *The Heritage Foundation*. Available at: <http://www.heritage.org/index/trade-freedom> (accessed 04.02.2016).

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