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ВЗАИМОСВЯЗЬ ПРЕДПРИНИМАТЕЛЬСКОЙ АКТИВНОСТИ И ПРЯМЫХ ИНОСТРАННЫХ ИНВЕСТИЦИЙ

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Аннотация. Экономическая открытость государства включает в себя международную торговлю и международное движение капитала. Так как большинство стран мира являются открытыми экономиками, существует вероятность и подозрение, что такие факторы смогут иметь влияние на предпринимательскую составляющую экономики стран. Предпосылки к этому раскрыты в обзоре литературы. В связи с такими предположениями подобраны факторы экономической открытости и четыре фактора предпринимательства. Цель статьи — выявление возможных взаимосвязей между международным экономическим взаимодействием и уровнем развития предпринимательства в национальной экономике. В соответствии с этим выдвигаются четыре гипотезы о влиянии прямых иностранных инвестиций и международной торговли на количество вновь созданных фирм, воспринимаемые возможности для предпринимателя, внедрение НИОКР в производственные процессы и рыночные барьеры для входа фирм. На основе выборки по 25 странам за 20 лет проведен эконометрический анализ, который использует панельные методы 2SLS и Fixed&Random effects, Pooled OLS. Объясняющими переменными являлись прямые иностранные инвестиции, коэффициент экономической открытости, тарифы и налоги на импорт и экспорт. В результате выявлено либо положительное, либо нейтральное влияние на аспекты, связанные с предпринимательством таких переменных, как прямые иностранные инвестиции и коэффициент экономической активности, при этом входящие потоки ПИИ способны вытеснять национальную предпринимательскую активность. Тем не менее сделан вывод о выгодности и необходимости поддержания внешних связей для развития бизнеса.

Ключевые слова: экономическая открытость, предпринимательство, международная торговля, прямые иностранные инвестиции, внешнеэкономическая деятельность

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Original article

THE INTERCONNECTION BETWEEN ENTREPRENEURIAL ACTIVITY AND FOREIGN DIRECT INVESTMENTS

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Abstract. A nation's economic openness includes international trade and international capital flows. Since most countries of the world are open economies, there is the possibility and suspicion that such factors can have an impact on the entrepreneurial component of countries' economies. The background to this is revealed in the literature review. In connection with such assumptions the factors of economic openness and four factors of entrepreneurship are selected. The aim of the article is to identify possible relationships between international economic interaction and the level of development of entrepreneurship in the national economy. Accordingly, four hypotheses on the impact of foreign direct investment and international trade on the number of newly created firms, perceived opportunities for the entrepreneur, implementation of R&D in production processes, and market barriers to entry for firms are put forward. Based on a sample of 25 countries over 20 years, an econometric analysis was conducted using panel methods of 2SLS and Fixed&Random effects, Pooled OLS. The explanatory variables were foreign direct investment, economic openness coefficient, tariffs and taxes on imports and exports. The results revealed either positive

or neutral effects on the entrepreneurship aspects of variables such as foreign direct investment and the economic activity ratio, with inward FDI flows being able to displace domestic entrepreneurial activity. Nevertheless, it is concluded that it is beneficial and necessary to maintain foreign relations for business development.

Keywords: economic openness, entrepreneurship, international trade, foreign direct investment, foreign economic activity

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Introduction

Entrepreneurship is generally considered as one of the drivers of economic growth and development, thus governments of countries are directly interested in its' promotion and extension. Enterprises created by entrepreneurs mainly lead to employment and productivity growth, introduction of innovative products and service [1]. Hence, for successful provision of favourable conditions for entrepreneurs, it is necessary to identify main determinants of its expansion. The substantial body of literature is devoted to this issue, considering diverse factors from different categories. These factors are mostly connected with internal situation and context of the country; however, it is worth studying the effects of globalization and external relationships of states. Being part of globalized world means that countries obtain economic openness, which is expressed in international trade and international capital movement. It is highly probable that these factors could influence the level of entrepreneurial activity.

International capital movement comprises investments, which in turn are divided into direct and portfolio ones. In this regard we suspect that entrepreneurial activity can depend on both of these kinds of investments, especially from foreign direct investments. The notion of FDI is controversial as both positive and negative effects can be observed depending on the area of consideration. These effects are often characterized as spillover effects. The known positive effects of inflows include GDP growth, unemployment decrease, tax revenue rise, increase in exports, and, most important, transfer of new, more advanced technologies from other countries, which accelerate productivity rise [2]. Presumably, the last effect is stronger in developing countries or countries in transition. Moreover, coming foreign companies can stimulate domestic firms to produce complementary or substitutive goods and services. It is also important to mention that FDI carry additional industrial demand, which integrates into supply chain in the form of forward or backward linkages, which represent demand from local firms for production of foreign enterprises and vice versa.

Nevertheless, we still should take into account the negative effects for domestic entrepreneurs, such as considerable rise in competition, emergence of entry barriers and shift of qualified workforce towards branch of foreign enterprise. Moreover, there is empirical evidence that foreign investments tend to substitute the national ones on the example of Russian Federation [3]. This fact enhances the competition between national and foreign investment projects instead of cooperation, which is controversial. Outflows, in turn, increase profits and influence of national companies, making certain firms more viable because of outer incomes, while firms operating only on national markets can suffer from owning of unequal resources and more fierce competition. Therefore, it is important to find out the empirical effect domestic entrepreneurs experience under influence of FDI.

The second kind of foreign investments, which is called as portfolio investments, can have only indirect impact on entrepreneurs. In this case funds are invested only in instruments of financial market such as securities and derivatives with the purpose to get profits thanks to change in price on assets traded on exchange rather than to get control over any firm [4]. As a result, due to increased or decreased demand, price of assets can fluctuate and generate profits or losses for firms, which deposit their funds into the same kind of investments. This influence can be only indirect and theoretically have little or tiny effect, which can be determined as a result of empirical research.

Foreign economic relations at the present stage represent an integral part of the activities of various sectors of the national economy, acting as a means of social, economic, scientific and technological progress of society, part of which is represented by international trade. International trade is made up of import and export and both could be important determinants of success or failure of entrepreneurs. Exports allow for companies to expand their sales market, enter into global market as a competitor, become a part of global production chain and get payments in foreign currencies. As long as transportation costs exceed the costs of local production, company would prefer to provide FDI for local production. However, it is expected that exports will impact entrepreneurship positively because of expanding opportunities for sales rise. Imports, in turn, gives

access for goods and services, which are unavailable in producer's country or have lower costs. However, imports can lead to substitution of goods and services, which are domestically produced by cheaper imported ones. This, in turn, can lead to entrepreneurship decrease as this can be seen as demotivating factor for creating an enterprise. Consequently, it is necessary to find out if international trade and economic openness affect any indicators of entrepreneurial activity.

To verify our assumptions, we conduct an econometric analysis based on empirical data taken from open sources. To perform an analysis, we implement numerically denoted variables connected with entrepreneurship. This includes indicators provided by Global Entrepreneurship Monitor (GEM)[1] such as percentage of nascent entrepreneurs, perceived opportunities index, R&D transfer rate and existing entry barriers and market burdens. Based on abovementioned suspicions and reasonings we can formulate the following hypotheses to be verified by econometric model:

H1. FDI and international trade have a certain impact on level on number of newly opened firms as incentives caused by these factors are significant for potential benefits young entrepreneurs seek.

H2. FDI have a decreasing effect on perceived opportunities people see for a successful enterprise at the moment. On the contrary, international trade has positive effect on this index.

H3. Inwards FDI can accelerate transfer of new technologies into manufacturing processes.

H4. FDIs significantly increase market barriers for entry, while economic openness can decrease them or have no influence.

To check all these hypotheses, we require some theoretical grounds as well as empirical evidence. Therefore, we have collected panel data, which is used for econometric modelling. This work has the following structure: firstly, we provide existing findings similar to our topic in the literature review, after that methodology section goes with description of data and methods and study. Then we provide discussion of results and conclusions.

Literature review

There are lots of studies devoted to the consequences and impacts of FDI on economies of countries. Firstly, we can observe the influence on economic development and GDP, which can be indirectly connected with entrepreneurial activity. This interconnection is controversial: studies say that effects can be both positive and negative [5—9]. However, scientists from Malta [10] managed to develop the robust model involving artificial intelligence for verifying the causality. As a result of implementing ANN mechanism for the sample of 9 years, they came to conclusion that inward FDI leads to increased GDP growth, therefore authors recommend accelerating reforms, which can enhance investment attractiveness of the country. Consequently, we can implicitly assume that GDP and entrepreneurial activity is connected, thus FDI can be potentially positively linked with entrepreneurship, which, of course, should be tested. Nevertheless, if our assumption is true, we should investigate the regulations, which can change FDI inflows.

The study, which devoted to indication of FDI determinants [11], uses the sample of 189 countries in order to exactly define the governmental regulations, which can impact FDI inflows. As a result, authors come to conclusion that Multinational Enterprises (MNEs) prefer to invest into companies with less regulation at the start of company's lifecycle, hoping for radical changes in the institutional climate in the country later in the cycle, when MNEs expect to get high profits. Moreover, scientists have identified crucial conditions for attraction of new investments: rule of law, which implies feasibility of contracts execution in the legal way as well as easiness of international trade, which means free physical trans-border transportation of goods and services. This requirement is very important, because international companies are highly integrated into global value chains and international trade allows for them to produce their output at a cheaper pFig. Therefore, international trade is connected with the notion of FDI. Accordingly, this study tells us that institutional conditions are significant in development of the factors, which are used as an explanatory in our study. However, it is also necessary to refer to the studies about direct effect of FDI to entrepreneurship.

Kim and Li [2] investigate effects of FDI directly on entrepreneurial activity, which is defined as number of opened firms in the studied period. In addition to the variable of FDI authors decided to test the influence of institutional factors similar to situation with FDI in the previous study. Authors argue that FDI have more positive effects on entrepreneurs in countries with poor political and social institutes rather than in countries with strong institutional support for private sector development. As a result of analysis of sample for the period from 2000 to 2009 for 104 countries they came to conclusion that this hypothesis is accepted, which means that institutional factors matter, and its' influence is similar to impact on FDI: the lower the institutional quality — the more influence these factors

[1] Entrepreneurial behaviour and attitudes // Global Entrepreneurship Monitor (https://www.gemconsortium.org/data/key-aps).

can bring. For example, inward FDI in countries with low regulatory quality increased the number of opened firms, while in countries with high regulatory quality it conversely decreased. The same principle can be traced with the notions of political stability (FDI in unstable countries enhance entrepreneurship while in stable countries there is no effect) and tertiary education (effect is the same). These facts show that FDI can be especially beneficial in developing countries and countries in transition, while in developed countries there are more negative effects than positive and restrictive measures can be justified in some cases in order to achieve neutral rather than negative effect on entrepreneurship.

The issue of mechanism of FDI in developed states is raised in the work of Albulescu and Tamasila [12]. Authors implement sample of 16 European countries, which can be considered as developed. Authors conduct econometric analysis using FDI inflows and outflows as independent variables, while dividing dependent variable of entrepreneurial activity into necessity-driven entrepreneurs, who have no other opportunity for income than running an own enterprise, and for opportunity-driven entrepreneurs, who are willing to improve their living conditions. As a result, we can see there is no influence of FDI in common case, for opportunity-driven entrepreneurs inward FDIs are positive and significant, for opportunity-driven entrepreneurs outward FDIs are positive and significant, which is logically explained. Although scientists defined positive effect of inward FDIs, the explanatory power of model is low, thus the influence of this factor is small and in developed countries does not have any significant importance. The similar results were obtained in another study on 16 European countries using local-linear least squares method. Coefficients of FDI inflow for total entrepreneurial activity are diverse, being positive and negative in different countries, however, there is a tendency for negative signs for necessity-driven entrepreneurs. It means that inward FDIs can be good only for entrepreneurs, who can make sufficient investments into their firm in order to compete or become partners with foreign company. Otherwise, domestic entrepreneurs are no longer competitive and cannot see any prospects for running a business so that the entrepreneurial activity decreases. That means that policies regarding FDI should be selective and act more delicately, depending on prevailed group of entrepreneurs.

Analogous to the previous studies, there is a paper devoted to impact of FDI in developing and transition countries, particularly in Macedonia [13]. At the start of transition, inward FDIs significantly increased the employment in the country, but decreased its productivity rise. Regarding entrepreneurial activity, results show that there is a positive structural effect of FDI in favor of entrepreneurship development in the domestic market. The creation of new firms and the expansion of managerial capacity have risen sharply, mainly due to the growth of entrepreneurial confidence, since the dominant factor is the presence of foreign ownership and everything that it brings to the domestic market. Nevertheless, author admits that the likelihood of crowding-out is high, which means that qualified personnel prefers to stay employed for foreign firm rather than to be hired by local entrepreneur, thus domestic firms have lower potential of development. However, despite the negative spillover effects, it is recognized that foreign firms are able to bring advanced technologies, which would lead to productivity growth of local firms, especially in case of their integration into production chain. Beneficial effect of FDIs is approved by high positive and significant value of coefficient in the econometric Tobit model constructed by author.

The statement of difference of FDI effectiveness in different income countries is confirmed in the study made for 87 countries [14] containing three groups of countries: high income, low income and emerging countries. As a result, authors highlight the importance of international trade specifically for low-income countries for improving the entrepreneurial activity. However, the strongest positive impact of FDIs was recorded in emerging countries. Moreover, the institutional quality in these countries accelerates the influence of FDIs. Meanwhile, authors have not mentioned any of these conclusions in relation to high-income countries; therefore, we may assume that in developed countries the role of FDIs can be even negative, hence any restrictive measures can be introduced depending on particular case in the considered state and time. Institutional quality is also of great importance. In our study we would like to concentrate our attention on studying the effect of FDI in diverse countries, mainly for developed ones. Our goal is to research the impact of factors of internationalization not only on entrepreneurial activity but also on other similar factors using econometrics.

Methods and data

Previous works were mainly aimed on identifying the effect of FDI on the number of newly created firms in different countries based on its' income. However, it would be desirable to find the impact of all factors of economic openness. In our case, the objective of this work is to quantitatively measure the presence of impact of both FDI and international trade on various aspects of entrepreneurship. To distinguish the influ-

ence of supposed factors the econometric modelling is used as it is reliable instrument, which allows to effectively identify the correlation, interconnection and causality. Entrepreneurial activity is often determined as the number of newly created firms. In our approach, we would like to study entrepreneurship comprehensively, hence, we implement not only the concept of newly opened firms but also the sentiments of population towards opportunities they see, the extent of transferring of new technologies to business processes and entry barriers.

The data for our analysis represents the dataset of panel data for 25 countries, mainly developed ones, for the time period 20 years from 2001 till 2020, thus we have 500 observations for each indicator. We do research on these countries and time period due to data availability for these observations trying to extend the sample as much as possible. The main data sources are Global Entrepreneurship Monitor (GEM) organization[1], World Bank (World development indicators)[2] and United Nations Conference on Trade and Development (UNCTAD) statistics[3]. The variables used for analysis are described in the table 1.

[1] Entrepreneurial behaviour and attitudes…

[2] Databank World Development Indicators // The World Bank (https://databank.worldbank.org/source/world-development-indicators).

[3] Data center // UNCTADSTAT (https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx?sCS_ChosenLang=en).

Table 1

Indicators used in analysis

Indicator	Designation	Description
Foreign direct investment: Inward and flows and stock	Inward, lninward — natural logarithm of inward FDIs	Foreign direct investment (FDI) is an investment made by a resident enterprise in one economy (direct investor or parent enterprise) with the objective of establishing a lasting interest in an enterprise that is resident in another economy (direct investment enterprise or foreign affiliate). The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise. The ownership of 10 % or more of the voting power of a direct investment enterprise by a direct investor is evidence of such a relationship
Foreign direct investment: outward flows and stock	Outward, lnoutward — natural logarithm of outward FDIs	Foreign direct investment (FDI) is an investment made by a resident enterprise in one economy (direct investor or parent enterprise) with the objective of establishing a lasting interest in an enterprise that is resident in another economy (direct investment enterprise or foreign affiliate). The lasting interest implies the existence of a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise. The ownership of 10 % or more of the voting power of a direct investment enterprise by a direct investor is evidence of such a relationship
Share of imports and exports in GDP	Trade	Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments
Total early-stage Entrepreneurial Activity (TEA) Rate	Tea	Percentage of 18—64 population who are either a nascent entrepreneur or owner-manager of a new business
Perceived Opportunities Rate	Opindex	Percentage of 18—64 population (individuals involved in any stage of entrepreneurial activity excluded) who see good opportunities to start a firm in the area where they live

Table 1 (continued)

Indicator	Designation	Description
R&D Transfer	R&D	The extent to which national research and development will lead to new commercial opportunities and is available to SMEs
Internal Market Burdens or Entry Regulation	Barriers	The extent to which new firms are free to enter existing markets
Net barter terms of trade index	Tot	Net barter terms of trade index is calculated as the percentage ratio of the export unit value indexes to the import unit value indexes, measured relative to the base year 2000
GDP (constant 2015 US$)	GDP, Lngdp — natural logarithm of GDP	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2015 prices, expressed in U.S. dollars. Dollar figures for GDP are converted from domestic currencies using 2015 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used
Tariff rate, applied, weighted mean, all products,%	Tar rate	Weighted mean applied tariff is the average of effectively applied rates weighted by the product import shares corresponding to each partner country
Profit tax,% of commercial profits	Profit tax	Profit tax is the amount of taxes on profits paid by the business
Tax revenue,% of GDP	Tax revenue	Tax revenue refers to compulsory transfers to the central government for public purposes. Certain compulsory transfers such as fines, penalties, and most social security contributions are excluded. Refunds and corrections of erroneously collected tax revenue are treated as negative revenue
Taxes on goods and services (current LCU)	Gs tax, lngstax — natural logarithm of this tax	Taxes on goods and services include general sales and turnover or value added taxes, selective excises on goods, selective taxes on services, taxes on the use of goods or property, taxes on extraction and production of minerals, and profits of fiscal monopolies
Taxes on international trade (current LCU)	Int trade tax, lnint trade tax — natural logarithm of this tax	Taxes on international trade include import duties, export duties, profits of export or import monopolies, exchange profits, and exchange taxes

Note: created by author based on GEM, WB, UNCTAD.

Next, here is the description statistics (table 2).

Our methods comprise working with panel data; therefore, we will be using corresponding technics. The objective of research is to find out the impact on four different aspects of entrepreneurship, thus we have four independent variables: "tea", "opindex", "R&D" and "barriers", which will require 4 different regressions. Firstly, in case of number newly opened firms, it is highly probable that not only economic openness can influence the dependent variable, but vice versa, in other words there can be the problem of mutual effect or endogeneity. In this case, it is necessary to implement 2SLS method, using instrumental variables, instrumenting the "trade" variable by others, which cannot explain the "tea". In cases of "opindex", "R&D" and "barriers" theoretically there cannot be any endogeneity, thus we use fixed and random effects model as well as pooled OLS technique. All calculations are made with STATA MP 14 software, the appropriate model between fixed and random effects is chosen on the basis of Hausman test.

Results and discussion

The main indicator of entrepreneurial activity is undoubtedly the number of newly created firms, which is expressed in "Tea" indicator — percentage of nascent entrepreneurs, it is a good measure of sentiments and opportunities people see, indicated by empirical data of activity itself. As it was mentioned before, there is high likelihood of mutual impact of variables of "tea" and "trade", therefore 2SLS random effects model is implemented, with variable "trade" being instrumented by "lngdp" and "lninttradetax" variables, meaning logarithm of GDP in constant prices of year 2015 and the natural logarithm of number of taxes, connected with international trade, which directly impact international trade rather than entrepreneurial activity. The other explanatory factors are inwards and outwards FDIs, terms of trade and taxes. The overall model is presented in the table 3.

Table 2

Description statistics

Variable	Mean	Standard deviation	Minimum	Maximum
Inward	31459.66	55578	–115300	467625
Outward	33976.17	65217.88	–194412	396569
Tea	9.251983	6.246435	1.48	41.2525
Opindex	37.45653	15.62006	2.85	81.56
RD	4.185149	0.62811	2.64255	6.653446
Barriers	4.411428	0.587886	3.03	6.22
GDPconstan~P	1.95E+12	3.63E+12	3.33E+10	1.99E+13
tot	107.4675	28.038	58.44425	223.9618
trade	74.78326	40.91989	19.5596	252.3351
tarrate	2.789333	2.05391	0.43	15.44
profittax	17.56657	7.572912	–0.2	31.3
Taxrevenue	19.45395	5.66423	7.903518	28.90945
gstax	9.90E+11	2.85E+12	2.68E+09	2.01E+13
inttradetax	2.84E+10	8.01E+10	–2.97E+11	5.10E+11

Note: created by author based on GEM, WB, UNCTAD.

Table 3

Estimations of factors, which influence the total early-stage entrepreneurial activity (Tea)

Independent variable	Coefficient	Standard error	Z-criterion	Significance probability	Lower confidence interval	Upper confidence interval
trade	0.024 767 4	0.031 827 6	0.78	0.436	–0.037 613 60	0.087 148 3
lninward	0.025 120 7	0.070 033 5	0.36	0.720	–0.112 142 40	0.162 383 8
lnoutward	–0.154 338 7	0.061 043 3	–2.53	0.011	–0.273 981 30	–0.034 696 0
tot	0.044 479 3	0.016 555 7	2.69	0.007	0.012 030 70	0.076 927 8
tar rate	0.598 024 2	0.149 974 9	3.99	0.000	0.030 407 88	0.891 969 5
profit tax	0.137 397 6	0.057 572 5	2.39	0.017	0.024 557 50	0.250 237 7
lngstax	1.671 729 0	0.400 916 7	4.17	0.000	0.885 946 30	2.457 511 0
tax revenue	–0.190 216 2	0.091 600 1	–2.08	0.038	–0.369 749 20	–0.010 683 3
constant	–39.356 170 0	11.521 630 0	–3.42	0.001	–61.938 150 0	–16.774 190 0

Notes:
— R-squared = 0.3467 for overall regression, Wald chi2 = 62.72 (probability = 0.000);
— created by author based on GEM, WB, UNCTAD.

As we can see, the coefficient of factors, which are assumed as main explanatory variables, such as trade, inward and outward FDIs are insignificant. Moreover, the R-squared is equal to 0.3467, meaning that only 34, 67 % of variance is explained by the model. Given, we can conclude that there is no or little influence of factors of international interaction on entrepreneurs. Apparently, entrepreneurs do not take into account the factors of international trade, these factors are not essential in the process of creation of new firm. FDIs also do not have global impact. The only significant indicator is terms of trade, thus the prevalence of exports over imports has some significance, and it is a positive impact.

However, taking into account the results of regression, we can state that our first hypothesis, that international trade and FDIs matter, is rejected. More important factors, connected with the entrepreneurial activity, are taxes and tariffs. Import tariffs, taxes on profit and goods and services taxes are significant and positive. This indicates that in countries with high business activity, the taxes imposed by government are higher as a response for development of entrepreneurs. Tax revenue, as a share of taxes in income of the state budget, is negative and significant, indicating

that the more government relies on taxes — the less activity it can expect. Nevertheless, this regression gives us clear understanding that assumed high influence of FDI inflows for production chains is overestimated and have no significant impact based on the sample, which includes predominantly developed states of Europe, however, also incorporates large-scale countries, such as Brazil, China, Australia, Mexico, and South Africa. If developed countries cause bias, then even including these states, we cannot see the proposed result. Nonetheless, we should also concentrate on the next three characteristics, the first of which is people's opportunities index.

In this case there would be no mutual influence, because opportunities sentiments index cannot directly impact the international trade. In accordance with that, we implement standard fixed and random effects models. By conducting the Hausman test, it was indicated that random effects model is most appropriate. The dependent variable is "opindex", independent ones are FDIs, trade, terms of trade, GDP, international trade taxes and profit taxes. The result is presented in the table 4.

Based on this regression, we can claim that employed factors have almost no influence on the perceived opportunities of starting the new business as explained variance is too low. We can state that FDIs have no influence and are not taken into account by population. International trade is significant at 10-% level and positive, which means that it has a certain degree of impact and contributes to slight increase of people's sentiments for business activity. Also, GDP and terms of trade have positive and significant impact, the bigger potential and exports the country has — the more confident people about their success in entrepreneurship. Significant negative coefficient for profit tax indicates that obviously taxes are negative factors for businesses. Despite this, we can accept our second hypothesis only partially: FDIs have no influence on opportunities, while international trade has positive impact as it was assumed. Nevertheless, these results should not have much influence in making decisions about development of entrepreneurship as the explanatory power of the model is low.

Our next assumption was that international interaction is able to accelerate the research and development practices transition from theoretical concepts, patents and drafts. It is based on idea that inward FDIs bring more advanced technologies into economies, which could be adopted or copied be national research and then implemented in domestic production lines. To verify our hypothesis, we make random effects regression with the same independent factors. The result of random-effects regression is presented in the table 5.

This regression indicates much stronger influence of factors of internalization. Inwards FDIs stay insignificant contrary to our assumptions, while outward FDIs are significant and positive. It shows that companies prefer to implement more advanced and cutting-edge technologies as investments in outer countries. This desire accelerates the development of R&D. International trade also has positive and significant impact, favorably influencing the technologies transfer. Significance of GDP coefficient indicates that the more developed the country — the more it has the ability to enhance the development of new technologies. Negative sign at "profit tax" variable means that taxes, imposed on firms, inhibit the development of firms, which, in turn, stand for development of innovations and their implementation in real production chains. All in all, our third hypothesis is again rejected, however, we can state that the international interaction is still beneficial for the aspect of technological advancement.

Finally, we should check, how interaction with the outside world can affect the situation on domestic market, making entry for new firms harder or easier, in other words, the levels of entry barriers. We assume that both FDI inflows and outflows can increase these barriers, because these investments strengthen the companies both foreign and domestic, extending their power, influence and market coverage. International trade in this regard is controversial, can be either positive and negative or have no effect. Our assumptions should be verified on regression of the same setup as previous ones.

Contrary to our assumptions, FDIs have no effect on entry barriers as well as taxation. Only international trade has clear significant positive effect, thus it can be unfavorable for country, if markets are too monopolized. Moreover, we can also claim that in countries with higher GDP the difficulties, connected with entrance on market are higher, due to significant positive coefficient. As a result, this model indicates importance only of one factor, and this factor cannot explain the full variance of entry barriers, but only 27 %, hence this factor cannot be considered as essential. Our hypothesis number four is again rejected, while international trade actually has a positive effect on barriers, although FDIs do not make any difference. To sum up, we have constructed regressions, in an effort to explain four different factors of entrepreneurial activity. The last three regressions are presented in the summary table 7.

Table 4

Estimations of factors, which influence perceived opportunities index

Independent variable	Coefficient	Standard error	Z-criterion	Significance probability	Lower confidence interval	Upper confidence interval
lninward	–0.289 918	0.220 244	–1.32	0.188	–0.721 587	0.141 752
lnoutward	–0.163 524	0.186 250	–0.88	0.380	–0.528 568	0.201 519
Trade	0.083 411	0.045 625	1.83	0.068	–0.006 012	0.172 834
lngdp	7.239 587	1.676 505	4.32	0.000	3.953 697	10.525 480
tot	0.243 083	0.049 859	4.88	0.000	0.145 362	0.340 805
Ln int trade tax	–0.175 997	0.130 762	–1.35	0.178	–0.432 285	0.080 291
Profit tax	–0.386 040	0.187 707	–2.06	0.040	–0.753 939	–0.018 142
constant	–176.292 100	47.276 750	–3.73	0.000	–268.952 900	–83.631 420

Notes:
— R-squared = 0.0464 for overall regression, Wald chi2 = 41.41 (probability = 0.000);
— created by author based on GEM, WB, UNCTAD.

Table 5

Estimations of factors, which influence R&D transit

Independent variable	Coefficient	Standard error	Z-criterion	Significance probability	Lower confidence interval	Upper confidence interval
lninward	0.010 938 8	0.007 397 7	1.48	0.139	–0.003 560 4	0.025 438 1
lnoutward	0.012 701 9	0.006 251 2	2.03	0.042	0.000 449 7	0.024 954 1
Trade	0.005 699 4	0.001 507 1	3.78	0.000	0.002 745 5	0.008 653 3
lngdp	0.163 749 1	0.054 188 9	3.02	0.003	0.057 540 9	0.269 957 3
tot	0.000 079 8	0.001 656 0	0.05	0.962	–0.003 166 0	0.003 325 6
Ln int trade tax	–0.002 152 0	0.004 345 0	–0.50	0.620	–0.010 668 1	0.006 364 1
Profit tax	–0.013 720 3	0.006 234 1	–2.20	0.028	–0.025 938 9	–0.001 501 6
constant	–0.663 004 7	1.532 500 0	–0.43	0.000	–3.666 649 0	2.340 640 0

Notes:
— R-squared = 0.3252 for overall regression, Wald chi2 = 39.33 (probability = 0.000);
— created by author based on GEM, WB, UNCTAD.

Table 6

Estimations of factors, which influence on entry barriers

Independent variable	Coefficient	Standard error	Z-criterion	Significance probability	Lower confidence interval	Upper confidence interval
lninward	0.003 205	0.008 013	0.4	0.689	–0.012 500	0.018 910
lnoutward	0.009 246	0.006 768	1.37	0.172	–0.004 020	0.022 511
Trade	0.006 448	0.001 615	3.99	0.000	0.003 282	0.009 613
lngdp	0.128 270	0.057 339	2.24	0.025	0.015 889	0.240 652
tot	–0.002 180	0.001 781	–1.22	0.222	–0.005 670	0.001 315
Ln int trade tax	0.004 549	0.004 674	0.97	0.33	–0.004 610	0.013 709
Profit tax	0.002 579	0.006 704	0.38	0.700	–0.010 560	0.015 718
constant	0.424 036	1.624 417	0.26	0.000	–2.759 760	3.607 833

Notes:
— R-squared = 0.2746 for overall regression, Wald chi2 = 23.74 (probability = 0.001);
— created by author based on GEM, WB, UNCTAD.

Table 7

Summary table on 3 last regressions

Independent variables	Dependent variables					
	Opindex		R&D		Barriers	
	Coefficient	Probability	Coefficient	Probability	Coefficient	Probability
Lninward	–0.289 918	0.188	0.010 94	0.139	0.003 21	0.689
Lnoutward	–0.163 524	0.380	0.012 70	0.042	0.009 25	0.172
Trade	0.083 411	0.068	0.005 70	0.000	0.006 45	0.000
Lngdp	7.239 587	0.000	0.163 75	0.003	0.128 27	0.025
Tot	0.243 083	0.000	0.000 08	0.962	–0.002 20	0.222
Ln int trade tax	–0.175 997	0.178	–0.002 20	0.620	0.004 55	0.330
Profit tax	–0.386 040	0.040	–0.013 70	0.028	0.002 58	0.700
Constant	–176.292 100	0.000	–0.663 00	0.000	0.424 04	0.000
R-squared	0.0464		0.3252		0.2746	

Note: created by author based on GEM, WB, UNCTAD.

This table indicates some common patterns for different independent variables. Firstly, FDI inflows do not have any significant impact on any variable of entrepreneurship, which means that its importance is overrated. Outwards FDIs are controversial, because they decrease the confidence of nascent businessmen, while accelerating the new technologies transfer. International trade has positive influence in all cases, increasing the sentiments, Research and development and entry barriers, which has ambiguous effect. Also, it is not surprising that taxes on profit are able to decrease the entrepreneurial activity. As a result, we have analyzed the effects of factors of international interaction on example of four regressions, which revealed incorrectness of our expectations about these factors.

Conclusion

The topic of internalization in economic relationships is one of the most discussed in the literature. There are many debates if economic openness is beneficial for national economies or not and this dispute depends on factor of consideration. In our case this factor was entrepreneurship, and our view was directed at impact of factors of economic openness, particularly volume of FDIs and international trade as shares of exports and imports in GDP summarized. GDP and taxes were also chosen as explanatory factors. Studies, which we have mentioned in literature review, tell that FDIs have positive effect on entrepreneurship in low-income countries and countries in transition. Due to data availability our sample contained panel observations on predominantly high or middle- income countries. Despite this fact, our expectations were connected with significant impact of FDIs on entrepreneurship, international trade was assumed as positive factor of entrepreneurship growth and development. To verify our hypotheses, we have conducted econometric analysis on four factors of entrepreneurship.

Regressions have revealed that FDIs and international trade do not have significant influence, which means that these factors are not important in developed countries. Low determination coefficients and insignificant variables indicate that entrepreneurship does not depend on internalization to high extent, and highlighted factors are not primary. However, we can still make some conclusions about the impact of international trade. It positively affects Research and development as well as sentiments towards businesses of population, therefore it is though considered as positive factor and, thus, should be developed and promoted. Net barter terms of trade is also positive and significant factor, hence the prevalence of exports over imports is also important. Outwards FDIs accelerate new technologies transfer.

In this way, we still can distinguish some positive factors, which internalization provides, therefore, we can make a conclusion that international interconnection is beneficial for national entrepreneurs, though, to a lesser degree. Results of estimations tell that we can observe either positive or no effect but cannot observe negative consequences. Therefore, economic openness should be increased in order to get little positive effect in entrepreneurship growth. Of course, our study has some disadvantages. It is focused mainly on economically developed countries; therefore, recommendations can be applied only for them. Nevertheless, it provides us the reason to study other determinants of entrepreneurship, other than economic international interaction.

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