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Development of an Optimal Geographical Location Index to Reduce Transfer Pricing Risks

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ABSTRACT

The aim of this theme is to identify a solution to support companies wishing to set up a subsidiary in a particular country or area of the world other than their home country where they can benefit from the tax advantages considered optimal by those companies. In order to achieve the proposed goal, we have set the following objectives: analysis of the defining framework, of the transfer pricing assessment methods existing at international level and of the methods for setting these prices; analysis of the BEPS action plans from the perspective of transfer pricing according to OECD guidelines, by providing theoretical and practical knowledge; examining how transfer pri-cing is used as a practice to reduce the taxable base at the level of multina-tional groups. In the first stage of the research, the necessary data has been collected to construct the working sample, consisting of 157 countries located in the main regions of the world. In this stage, information consi-dered relevant by the authors on the influence of multinationals to open a subsidiary in a given country (information on tax pressure and burden and country risk) was identified and selected. In the second stage of the rese-arch methodology, after applying the inclusion and exclusion criteria, 76 countries located in different regions of the world remained in the race. The dependent variable is the geographic location index in terms of transfer prices, determined by a linear multiple regression method that includes as independent variables the following indicators: GDP, country risk, corporate tax rate and country-specific sovereign CDS (credit default swap). The obta-ined results consist in the

development of an econometric model to identify the areas considered the most optimal in terms of the levied taxes and country risk for multinational companies wishing to open a new subsidiary in another country.

INTRODUCTION

In the current global economic context, the business environment shows an increasing trend towards complex organisational forms. The complexity of these is evident both in terms of the structure of these companies and in terms of their geographical location, i.e. their spatial orientation, depending on their medium and long-term economic objectives. As a rule, these companies form multinational groups that operate in global markets and tend to expand into different jurisdictions. In these situations, various problems obviously start to arise from an economic, legal and tax point of view, especially if we take into account the strong level of centrality at the decision-making level, which leads to a multiplicity of taxes and duties and therefore to particular situations that are legally relevant. Although they are formally and legally independent, the extension of these subsidiaries or branches involves a series of special legal relationships, due to the fact that they are part of a multinational group and certain taxes cannot be determined and calculated independently of the subject to which they are attributable. In recent years, the number of multinational entities has increased significantly and their role in world trade has doubled. This trend is also due to the phenomenon of globalisation, which is constantly expanding and has far-reaching consequences for the countries involved in international trade.

So, in addition to the positive effect of stimulating the economy, from a tax perspective, this trend also implies difficulties for both tax administrations and entities, as tax rules differ from country to country. An important role here is played by the transfer prices at which multinational entities sell goods, intangible assets and services to associated enterprises.

Developing the concept of transfer pricing in line with the OECD Council Recommendations, participating countries have developed the *arm's length* principle, according to which special conditions should apply to profits received from a transaction between related enterprises. In this way, most international trade takes place within companies that have commercial relationships with their affiliates, which can be called "intra-group transactions" or "controlled transactions" (UN, 2017). In this context, towards the end of 2010 it was estimated that between 35% and 50% of world trade was accounted for by deals within multinational companies (Folfas, 2009).

In this context, the *aim of* our *paper* is to identify transfer pricing solutions, depending on the jurisdiction in which a multinational wants to expand its activity by opening a new subsidiary. In order to achieve the proposed goal, we have set the following objectives: *objective 1* - analysis of the defining framework, of the transfer pricing assessment methods existing at international level and of the methods for setting these prices; *objective 2* - analysis of BEPS action plans from a transfer pricing perspective according to OECD guidelines by providing theoretical and practical knowledge. As for *Objective 3* - this is focused on examining how transfer pricing is used as a practice to reduce the taxable base at the level of multinational groups.

The results are an econometric model to identify the areas considered most optimal in terms of levied taxes and country risk for multinational companies wishing to open a new subsidiary in another country. The usefulness of the obtained results is reflected in the fact that they are a real help for all companies wishing to opt for expanding their activity beyond the country's borders, but also for various categories of stakeholders such as: shareholders, potential investors, management and even commercial partners such as customers or suppliers.

1. LITERATURE REVIEW

In order to be able to understand how transfer prices are assessed, it is very important to first understand what these prices are and the context in which they arise. Transfer prices are the prices at which transactions are made between companies that are part of the same group, called related parties.

According to the regulations, the transaction between related parties must be made at a market price, as if it was concluded between independent parties under comparable economic conditions. The transfer pricing problem is usually described as a problem of finding the price or the pricing schedule that comes closest to inducing an efficient level of trade between two divisions of a company (Riedel, et al., 2015).

Tax planning is one of the main sources of profit for the modern enterprise, especially for those companies operating in countries with different tax regimes whose aim is to make profits through affiliate allocation options such as tax relief. In business economics, a transfer price is considered to be the amount charged by one part of an organisation for a product, asset or service that is provided to another part of the same organisation. These transfer costs help determine the revenue of both parties involved in a cross-border transaction, therefore the transfer price influences the taxable base of the multinationals from different countries that participate in such transactions. In any cross-border tax scenario, the parties involved are represented by relevant group entities and tax authorities of the countries involved in the transaction (Dallyn, 2017). When in one country the tax authority adjusts the profit of a group member, this can have an effect on the taxable base of the other country. In other words, cross-border tax situations involve issues of jurisdiction, income allocation and assessment of the tax base.

By *manipulating* intra-group transaction prices, companies can easily shift profits from one state to another and may be tempted to take advantage of tax disparities that may exist between states that, to some extent, compete by offering a more or less welcoming tax environment. Multinational corporations take advantage of different tax rates levied in different jurisdictions by minimizing the total tax liabilities of groups . Therefore, the transfer pricing operation and the choice of transfer pricing method are of particular importance for both multinational enterprises and the countries where they are located (Smolarski et al., 2019).

Today, *profitable businesses* are turning their sights to organisational structures also known as global value chains (Lee & Yi, 2018). Thus, in order to minimize operating costs, entities recognize a new variable to avoid legal barriers by dividing global processes through vertical corporate structures. Based on the above, the topic is of particular interest in the spectrum of countries tending towards a liberalization of economies, as such business strategies are likely to produce conflicts with their economic policies and interests. A concrete example of such a problem arises when multinational companies conduct intra-group operations and distort market price dynamics in order to minimise their overall tax levels. Essentially, this phenomenon refers to the manipulation of the "transfer prices" of a transaction and becomes particularly important when the economic linkage situation is instrumented to set prices that allow the allocation of revenues across business units of the same group (Duong, 2018).

This gap reiterates that the issue of transfer pricing is topical, but it does not intensely captivate contemporary economic theory. To exemplify the addressed situation, at present, the persistent approach to transfer pricing issues is tax law, the maximum exponent of which is concentrated in the Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations of the Organisation for Economic Co-operation and Development (OECD, 2017). In this context, the premise for setting objective number 1 of the paper is circumscribed: *analysis of the defining framework, of the transfer pricing assessment methods existing at international level and of the methods for setting these prices.*

Further on, we review the literature which has focused in particular on the selection of an optimal transfer pricing method. In doing so, the selection process should take into account: the strengths and weaknesses of the methods recognised by the Organisation for Economic Co-operation and Development; the suitability of the method under consideration given the nature of the controlled transaction, as determined in particular by a functional analysis; the availability of reliable information (especially in uncontrolled comparisons) needed to apply the selected method and/or other methods; the degree of comparability between controlled and uncontrolled transactions, including the reliability of comparability adjustments that may be needed to eliminate significant differences between them (OECD, 2017). Currently, transfer pricing methods are classified into two broad classes, namely traditional methods and transactional profit methods (Figure 1).

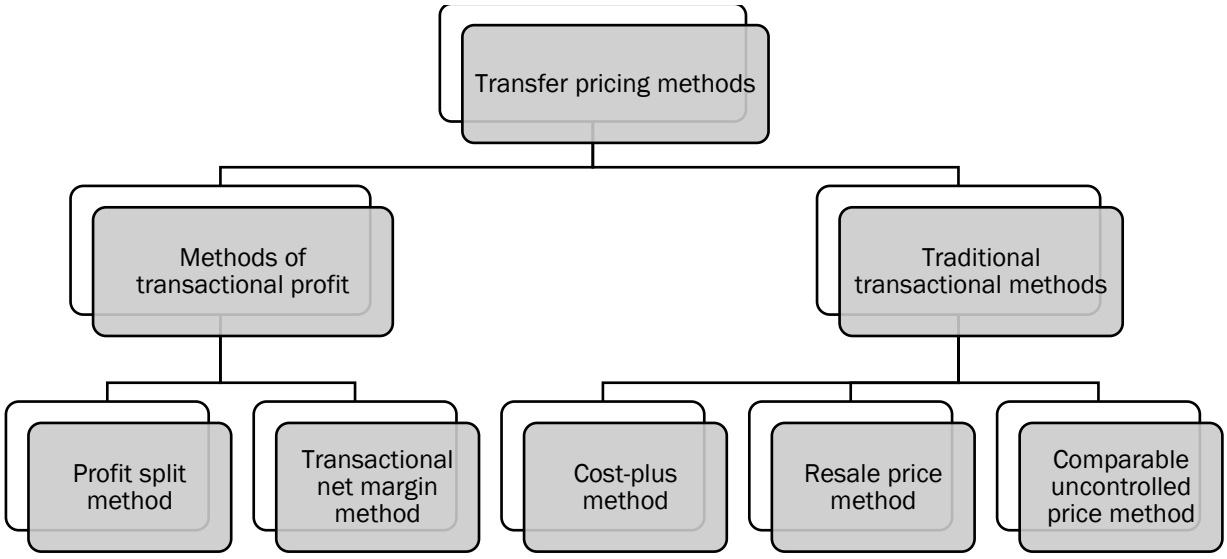

Figure 1. Transfer pricing methods

Source: adapted from OECD (2017)

Traditional trading *methods* are considered the most direct ways of setting terms in commercial and financial relationships between associated enterprises (OECD, 2017). This is because any difference in the price of a controlled transaction relative to the price of a comparable uncontrolled transaction can normally be traced directly in the commercial and financial relationships undertaken or imposed between firms and independent competitive conditions can be established by directly substituting the price in the comparable uncontrolled transaction for the price of the controlled transaction (OECD, 2017).

Based on the comparable uncontrolled price (CUP) method, a comparison is made of the price charged or paid for the transferred property or services provided in a comparable, uncontrolled transaction or in a series of such transactions. Such a price is adjusted to account for differences, if any, between the transaction and the comparable non-controlled transaction or between enterprises engaged in such transactions that affect prices. The adjusted price is assumed to be the arm's length price for the property transferred or services provided as part of the transaction. The comparability criteria between an uncontrolled transaction and controlled transaction assume the fulfilment of two essential requirements: there are no differences that could materially affect the open market price and reasonable price adjustments could be made to achieve closer comparability (UN, 2017). This method is usually applicable to commodity transactions where comparable prices are obtained based on price quotes from government agencies that are transparent statistical agencies that publish information about commodity indices in the public domain (Putra & Saptono, 2021). Comparability analysis is in fact the essence of the whole process considering transfer pricing, i.e. an action that compares a controlled transaction between two affiliates with independent or uncontrolled transactions in order to establish the degree of comparability between controlled and uncontrolled (Lips, 2018). More specifically and much more detailed as a level of understanding, a comparability analysis basically involves two distinct, yet related, analytical processes. The first process aims at understanding the transaction under analysis and at the same time identifying the economic characteristics with relevant impact, including the roles and responsibilities that each participant in the transaction has, in order to determine a functional profile which is also crucial in the selection of the transfer pricing method and related indicators (Cobham & Jansky, 2018). The second process focuses on comparing prices or margins (depending on the chosen method) and other transaction conditions with prices, margins and conditions used in transactions between independent firms, which of course take place in circumstances that can be considered comparable to those under analysis.

Another commonly used method is the cost plus method (CPM), which determines the direct costs and indirect production costs incurred by the tested entity with respect to the transferred property or provided

services to a related entity (Marcuta, et al., 2021). The increase in normal gross profit is adjusted to account for functional and other differences, if any, between the tested transaction and the comparable uncontrolled transaction or between entities that engage in such transactions that could materially affect such an increase in the open market (Falcão, 2021).

Transactional Net Margin Method determines the net profit resulting from a transaction between unrelated companies in relation to a certain parameter (costs, revenues, fixed assets). The positive aspects of this method are that only one party's financial data is examined and net margins are less influenced by functional product differences and allow for high data availability. Obviously, there are also some disadvantages due to the fact that it is used by only one party and drawbacks may occur especially when there are unique intangible assets (Sari, et al., 2020). In this context, the premise of setting objective number 2 of the paper is circumscribed: *to analyse BEPS action plans from a transfer pricing perspective according to OECD guidelines by providing theoretical and practical knowledge.*

Regardless of the methods chosen for determining transfer prices, there is an OECD reference practice, namely *BEPS Action 13* (*Transfer Pricing Documentation and Country-by-Country Reporting*). Base erosion and profit shifting (BEPS) mainly refers to cases where the interaction of different tax rules leads to non-taxation or lower taxation than reality (Abu, et al., 2020). At the same time, BEPS refers to arrangements that achieve no or low taxation by shifting profits from the jurisdictions where the activities that create those profits take place. Zero or low taxation is not in itself a cause for concern, but becomes so when it is associated with practices that artificially separate taxable income from the activities that generate it. In other words, what creates tax policy problems is that, because of loopholes in the interaction of different tax systems and, in some cases, because of the application of bilateral tax treaties, income from cross-border activities may remain untaxed anywhere or may only be unjustifiably low taxed (Burgers & Mosquera, 2017). BEPS refers to international tax avoidance, i.e. the exploitation of differences between the tax systems of different countries. Tax evasion by individuals or non-compliance by businesses with domestic tax rules does not constitute BEPS.

The BEPS package includes 15 actions equipping governments with the necessary domestic and international tools to fight tax evasion. Countries now have the tools to ensure that profits are taxed where profit-generating economic activities take place and the value is created. These tools also give businesses greater certainty by reducing disputes over the application of international tax rules and standardising compliance requirements (OECD, 2017). One aim of the BEPS plan is to minimise the scope for multinational entities to shift profits using transfer pricing in an abusive way. Profits should be allocated according to actual shares and based on value creation (Lips, 2018).

The OECD paper on "Base erosion and profit shifting" addresses several aspects of transfer pricing. The strong focus on these elements are built on the basic assumption proposed by the OECD that multinational enterprises use tax-based transfer pricing strategies within the corporate group to shift profits to low or no-tax jurisdictions. The factual context is to a large extent the growing importance of intangible assets. Intangible assets combine two critical characteristics: they are highly mobile, i.e. they are easy to transfer to subsidiaries in low-tax jurisdictions and they are difficult to value, i.e. multinational enterprises enjoy a high degree of discretion both in the pricing of intangible assets when they are transferred to a low-tax jurisdiction and when they are licensed to other subsidiaries in high-tax jurisdictions. Within the Organisation for Economic Co-operation and Development, including the G20 on base erosion and profit shifting, over 135 countries are working together to end tax strategies that artificially shift profits to tax haven jurisdictions. Knowing the distribution of corporate income between countries is critically important in this debate, both to determine appropriate BEPS countermeasures and to assess the effectiveness of tax policy changes. Tremendous effort has gone into developing methods to measure BEPS, with surprisingly little focus on assessing how well different data sources capture the appropriate distribution of income. It is pointed out that a fatal flaw in the BEPS literature is the lack of knowledge of how accounting methods affect the empirical distribution of group profits (Blouin & Robinson, 2020).

This challenge is the premise for setting objective number 3 of the paper: *examining how transfer pricing is used as a practice to reduce the taxable base at the level of multinational groups.*

In order to establish the research hypotheses, we will start a short meta-analysis of the literature in which we will include the most relevant and current research studies on the topic of tranfser prices (Table 1).

Table 1. Literature meta-analysis

Author and publication year	*Article title*	*Aim*	*Results*	*Impact*
Le & Phan, 2022	State Management of Transfer Pricing Activities of Foreign-Invested Enterprises in Vietnam	Evaluate the impact of State management factors on transfer pricing activities of foreign direct investment enterprises in Vietnam.	The solutions to increase the efficiency of State management on transfer pricing operations of foreign-invested businesses in Vietnam based on the research findings.	Regulations on controlling transfer pricing activities have been promulgated based on documents to provide solutions and effective coordination mechanisms to improve the state's management capabilities. Furthermore, the inspection of transfer pricing operations should concentrate on the inspectors' professional qualifications, professionalism and inspection pressure on foreign-invested firms in Vietnam.
Kiki & Bahtiar, 2022	Pengaruh Transfer Pricing, Return On Asset, Financial Leverage, Firm Size Terhadap Income Shifting Pada Perusahaan Consumer Goods Yang Listed Di BEI Period 2014-2019	The purpose of this research is to examine and analyze the effect of transfer pricing and return on assets on income shifting.	The results showed that there was no positive relationship between Transfer Pricing and Income Shifting. There is no positive effect on income shifting. There is no effect of Financial Leverage on Income Shifting	There is an effect of firm size on income shifting proven and accepted.
Utami & Irawan, 2022	Pengaruh Thin Capitalization dan Transfer Pricing Aggressiveness terhadap Penghindaran Pajak dengan Financial Constraints sebagai Variabel Moderasi	The purpose of this study was to determine the effect of thin capitalization and transfer pricing aggressiveness on tax avoidance, having financial constraints as moderating variable.	The results show that thin capitalization, transfer pricing aggressiveness and financial constraints have a positive effect on tax avoidance.	The further research shows that financial constraints strengthen the effect of thin capitalization on tax avoidance, but financial constraints do not moderate the effect of transfer pricing aggressiveness on tax avoidance

Rosmawati & Ginting, 2022	Pengaruh Effective Tax Rate, Bonus Mechanism, Debt To Equity Ratio, Dan Exchange Rate Terhadap Keputusan Transfer Pricing	The purpose of this study is to examine the effects of tax rate, bonus mechanism, debt to equity ratio and exchange rate on transfer pricing decisions in 7 consumer goods industrial sector companies that are listed on the Indonesia Stock Exchange for the period 2011-2018.	Based on the research results on the Wald test, it was found that the effective tax rate did not affect transfer pricing decisions where the significance (sig.) of 0.236 was greater than 0.05.	The effective tax rate, bonus mechanism, debt to equity ratio and exchange eate simultaneously (together) affected Transfer Pricing decisions where the chi-square value was 10.285, greater than the chi-square table. 9.48773 and a significance value of 0.036, which is smaller than 0.05.
Kumarab et al., 2021	What do we know about transfer pricing? Insights from bibliometric analysis	The purpose of this study is to analyze the transfer pricing research through a bibliometric analysis.	Findings of this review suggest that there is a need for transfer pricing research to go beyond compliance and tax management and toward a more meaningful exercise of using transfer pricing as a strategic tool in business	The bibliometric review of transfer pricing (TP) has enabled to unpack the bibliometric attributes and intellectual structure of TP in existing research and to develop future research directions to enhance understanding of TP. It is evident from this review that TP should be used as a strategic tool in planning, production and revenue management rather than as a tax avoidance tool.
Grinenko et al., 2021	Improving transfer pricing in Ukraine using American experience	This study aims to analyse and compare the experience of transfer pricing regulation to adapt best foreign practices.	The results showed that the Ukrainian normative judicial practice is in the stages of establishment and needs further research.	Analysis of statistical information shows that tax disputes in Ukraine focus on "technical errors" and the withdrawal of capital to countries with low tax jurisdiction but, in contrast, the United States, tax disputes focus on intra-corporate transactions.
Petruzzi & Buriak, 2018	Addressing the Tax Challenges of the Digitalization of the Economy - A Possible Answer in the Proper Application of the Transfer Pricing Rules?	The aim of this article is to propose a possible solution to the challenges posed by the process of digitalization of the worldwide economy for international taxation.	The proper application of the transfer pricing rules solves a problem of profits attribution to all the jurisdictions where digitalized companies generate their value.	The existing transfer pricing rules could also cope with the challenges of the digitalization of the economy as soon as the concept of a digital EP[1] is developed and implemented. When the work on the concept of a digital PE is concluded, the authors believe that the current transfer pricing rules and the rules on the attribution of

[1] PE= Permanent Establishment

				profits to PEs, in line with the arm's length principle, should be used to tax profits on a net basis and where value is created.
Nazihah, et al., 2017	The Effect Of Tax, Tunneling Incentive, Bonus Mechanisms, And Firm Size On Transfer Pricing	The paper is focused to analyze the implications of different OECD methods to regulate transfer pricing and the role of a source tax on royalty payments for abusive transfer pricing.	The results of the panel data regression with random effect model shows that taxes, bonus mechanisms and firm size have a significant positive effect on transfer pricing.	The tunneling incentives do not affect transfer pricing.
Velikorosso, et al., 2019	Transfer Pricing for Taxation of Transnational Corporations under Innovative Economy Conditions	This article analyses the state regulation of a system of taxation of multinational corporations in the conditions of economic globalization, advantage of production placement and the centers of profit in the countries with the different level of taxation.	The method of calculation of a contribution to formation of income for different jurisdictions of the corresponding factors of production is offered.	The tax administration in the international sphere concerning coping with money laundering and ensuring tax transparency is becoming more and more labor-intensive and resource-intensive, intensifying the activities of tax administrations, which is due to the need to check and analyze the ever-increasing amount of data.
Cosmulese et al, 2019	The Influences of the Digital Revolution on the Educational System of the EU Countries	The object of this research is to analyse the statistical indicators reported for 2017 by Eurostat at the level of the European Union, for each member state of the union, obtaining a total of 29 statistical observations.	The study theoretically proves and empirically confirms that the function obtained through modelling can be assimilated to the service demand function and can be integrated into the offer function harmonized with the information factor.	The results of this study represent a contribution to the field of management of public utility companies and can be useful for educational institutions, students, the labour market and the general public, providing a starting point for further indepth research in this area.

Source: Own processing

Based on the literature review and the meta-analysis in Table 1, we formulate the following research hypotheses:

- *H1* - In general, companies with branches in different countries choose to transfer tax liabilities to low tax countries (Nazihah, Azwardi, Fuadah, 2017; Rosmawati, Ginting, 2022; Utami and Irawan, 2022);
- *H2* - The amount of tax has a significant effect on companies in choosing where to open subsidiaries (Petruzzi and Buriak, 2018; Susanti, 2018; Kumarab et al., 2021; Le and Phan, 2022);
- *H3* - Country risk significantly influences the opening/location of subsidiaries by multinationals (Cosmulese et al., 2019; Velikorosso, Chaykovskaya and Filin, 2019; Nazihah, Azwardi, Fuadah, 2017).

2. RESEARCH METHODOLOGY

In the first stage of the research, the necessary data has been collected to construct the working sample, consisting of 157 countries located in the main regions of the world. In this stage, information considered relevant by the authors on the influence of multinationals to open a subsidiary in a given country (information on tax pressure and burden and country risk) was identified and selected. The construction of the working sample was based on data collected from the OECD data base platform, World bank data and Eurostat.

Exclusion criteria applied were: business sectors where companies did not have complete financial statements; countries where we could not obtain information on Sovereign CDS and tax rate applied on gross profit or country risk information.

The criteria for inclusion in the sample were all countries for which we obtained complete information on country risk, Sovereign CDS, corporate tax rate and GDP value.

In the second stage of the research methodology, after applying the inclusion and exclusion criteria, 76 countries located in different regions of the world remained in the race, these being numbered as it follows: 1 = Arab Emirates; 2 = Eastern Europe and Russia; 3 = Western Europe; 4 = Africa; 5 = Central and South America; 6 = Caribbean; 7 = Australia and New Zealand; 8 = Asia; 9 = North America.

The dependent variable is the *geographic location* index *in terms of transfer prices*, determined by a linear multiple regression method that includes as independent variables the following indicators: GDP, country risk, corporate tax rate and country-specific sovereign CDS (credit default swap) . [2]

3. RESULTS OF RESEARCH AND DISCUSSION

Transfer pricing plays an important role for multinational companies as they can reduce their income or corporate tax base in countries with higher tax rates and increase profits in countries with lower rates. So transfer pricing presents a global tax problem. A first consequence of these actions is lower liabilities to tax authorities which is reflected in less revenue accruing to the countries where entities carry out their economic and commercial activities. Another consequence is that transfer prices are most likely to be different from the prices the company would charge other independent companies. Also, transfer pricing could be used in such a way that entities avoid taxation of certain income or profits altogether.

Transfer pricing methods are procedures used by related persons to decide the value of transactions within a multinational group. Entities use these procedures to determine the charged transfer prices, but also to calculate a more tax-efficient tax base. State governments use transfer pricing methods to verify the correctness of the value of transactions between companies in a group and their actual profits.

When it comes to transfer pricing in multinationals, it is closely linked to the implementation strategy of the plan to achieve their objectives and is based on the assessment of internal and external factors that directly affect the company's business. Thus, in applying transfer pricing, multinationals apply differentiated strategies, taking into account several major factors affecting the multinational's consolidated prices.

The objective of the analysis we are about to perform is to design an econometric model that aims to establish an optimal Geographical Location Index/Transfer Pricing Index, depending on the objectives of the enterprise that usually and particularly reflect in the minimization of the amount of corporate or income tax. In other words, the Geographical Location Index in terms of transfer pricing will allow companies to identify the most advantageous geographical area - where it has subsidiaries - from the point of view of the tax base calculation and certainty provided for the transfer of capital.

[2] CDS is a derivative financial instrument or contract that allows an investor to "swap" or offset its credit risk with that of another investor. For example, if a lender is concerned that a borrower will default on a loan, it could use a CDS to offset or swap this risk.

Table 2. Variables Entered/Removed[a]

Model	*Variables introduced*	*Method*
1	Sovereign CDS, Corporate tax rate, GDP (in trillions) in 2019, Country risk[b]	Enter

[a] Dependent variable: Geographical Location Index/Transfer prices

[b] All requested variables entered.

Source: Own processing in SPSS 26

Considering that the Geographical Location Index/Transfer Pricing is influenced by correlations between GDP, country risk, corporate tax rate and Sovereign CDS indicators, we have developed an econometric model to identify an optimal geographical location index for companies wishing to apply transfer pricing, so as to facilitate decision making on the choice of the geographical area that corresponds to the company's objectives, either to minimise the amount of tax or to transfer the capital to a safe area where investments are protected.

$$Geographical\ Location\ Index/Transfer\ Pricing = \alpha + \beta 1 * PIB\ (in\ billions) in\ 2019 + \beta 2 * Country\ risk + \beta 3 * Corporate\ tax\ rate + + \beta 4 * Sovereign\ CDS + \varepsilon$$

Table 3. Model Summary[b]

Model	*R*	*R²*	*R² adjusted*	*Standard error*
1	.507[a]	.257	.215	2.056

[a] Predictors: (Constant), Sovereign CDS, Corporate tax rate, GDP (in billions) in 2019, Country risk

[b] Dependent variable: Geographical Location Index/Transfer prices

Source: Own processing in SPSS 26

Following the analysis, we find that the correlation ratio value for the model summary is 0.507, so there is an average relationship between the model variables Geographical Location Index/Transfer Pricing, Country Risk, Corporate Tax Rate Value, Country Rating and GDP Value. According to the determination ratio of 0.257, 25.7% of the variation in the geographical location index/transfer prices is explained by the variation in the analysed independent variables. Thus, in the determination of the geographical location/transfer price index there are other factors influencing the transfer price record. According to researchers, transfer pricing file is influenced by firm size, foreign ownership, organizational factors, mainly by management objectives, as well as maximizing tax value reduction (Stephanie et al., 2017). The influence of politics on the transfer pricing file is quite high because political instability creates social, economic and legal instability that affects the whole transfer pricing file process (Doğan, et al., 2013). By applying the ANOVA test, we were able to econometrically validate the multiple linear model, as shown in Table 4.

Table 4. ANOVA

Model		*Sum of Squares*	*df*	*Mean Square*	*F*	*Mr*
1	Regression	103.590	4	25.897	6.125	.000[b]
	Residual	300.200	71	4.228		
	Total	403.789	75			

[a.] Dependent variable: : Geographical location index/Transfer prices

[b] Predictors: (Constant), Sovereign CDS, Corporate tax rate, GDP (in billions) in 2019, Country risk

Source: Own processing in SPSS 26

According to the ANOVA table it can be seen that the value of Fischer coefficient is e 6.125 and the value of F-test is less than 0.05, thus, the determined multiple linear model explains the dependence between the analyzed variables. From the statistical point of view, the predicted model is 95% validated.

Table 5 shows the regression parameters of the multiple linear model.

Table 5. Coefficients[a]

Model		*Unstandardized Coefficients*		*Standardized Coefficients*	*t*	*Mr*
		B	*Std. Error*	*Beta*		
1	(Constant)	1.145	.885		1.294	.200
	GDP (in trillions) in 2019	.000275	.000	.354	3.312	.001
	Country risk	.212	.310	.185	.683	.497
	Corporate tax rate	.101	.033	.336	3.115	.003
	Sovereign CDS	-25.409	34.822	-.198	-.730	.468

[a] Dependent variable: : Geographical location index/Transfer prices

Source: Own processing in SPSS 26

The determination of the regression parameters leads to the estimated equation, i.e. the modelling of the Geographical Location Index/Transfer Prices. The model equation has the form:

$$Geographical\ Location\ Index/Transfer\ Pricing = 1.145 + 0.000275 * PIB\ (in\ billions)\ in\ 2019 + + 0.212 * Country\ risk + 0.101 * Corporate\ tax\ rate - - 25.409 * Sovereign\ CDS + \varepsilon$$

From an econometric point of view, the multiple linear model provides us with a number of insights into how the geographical location index/transfer pricing is influenced by the independent variables under analysis. Thus, if GDP (in billions) in 2019 increases by one unit and the other variables remain constant, then the Geographic Location Index/Transfer Prices increases on average by 0.000275 units. There is a very strong link between the two variables, so the increase in GDP leads to a more reliable geographical location index, i.e. optimal transfer prices for that company. In another vein, companies that want to open new subsidiaries in countries with high GDP are attracted mainly to emerging economies where their return on investment is assured and taxes are low, validating hypothesis H1: *companies with branches in different countries choose to transfer tax liabilities to low-tax countries*.

If the corporate tax rate increases by one unit and the other variables remain constant, then the Geographical Location Index increases and although it provides certainty in terms of country risk or CDS, that company may face higher expenses than if it would be relocated to countries with lower tax rates. Under these circumstances, we can speak of transfer prices that will increase on average by 0.101 units. We observe a strong and positive relationship between the corporate tax rate and the geographical location index/Transfer prices, so increasing the corporate tax rate leads to a less recommended geographical location index and an increase in transfer prices, which validates hypothesis H2: *The amount of tax taxes has a significant effect on companies in choosing the country where to open their subsidiaries*.

If country risk increases by one unit and the other variables remain constant, then the geographical location index reflects reduced certainty and transfer prices will increase by 0.212 units on average. Thus, there is a direct positive link between these two variables, but it is not recommended for a company wishing to locate a new associated entity in such a region. In other words, country risk (macroeconomic risk, level of regulation of the business environment, political risk, social risk) is a significant indicator that has a strong influence on the decisions of multinationals to open subsidiaries in countries where this indicator shows high values, which validates hypothesis H 3.

If the sovereign CDS increases by one unit and the other variables remain constant, then the geographic location index becomes more certain and transfer prices fall by 25,409 units on average. There is an inverse relationship between the sovereign CDS and the geographical location index/transfer prices. Increasing CDS leads to a more secure geographical location index in terms of lower transfer prices .

We therefore observe that as the value of the sig. coefficient gets closer and closer to 0, the sensitivity of the dependent variable to changes in the other variables increases, which confirms once again the validity of the developed model. The histogram is equivalent to a frequency table plot and should follow a normal distribution. Analysing the obtained histogram, it is observed that it follows a normal distribution, confirming that it is possible to establish the geographical location index/transfer price based on the analysed independent variables.

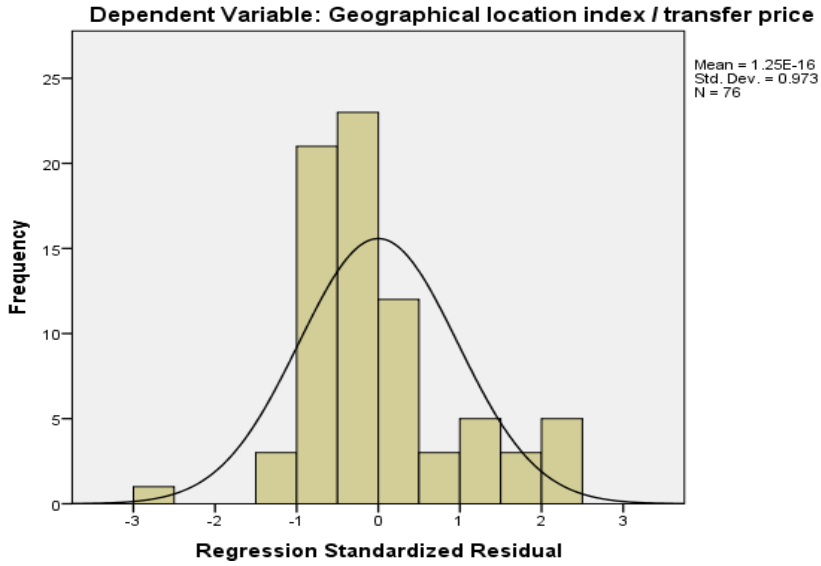

Figure 3. Histogram of errors

Source: authors' projection according to SPSS 26

The results of the research presented in this section are consistent with those presented by other researchers in their work (Stephanie et al., 2017). In the transfer pricing file, the most important determinant is the value of the tax rate, as one of the main objectives of the firm is to minimize the value of the tax, followed by the value of GDP and country risk. Minimising the value of the tax occurs by redistributing profits between countries with high and low tax rates. Applying the Goeographic Location Index, it allows us to identify not only a low tax rate area, but also a safe one, by analysing country risk, the value of Gross Domestic Product and the Sovereign CDS.

Applying a clear global transfer pricing methodology will help to eliminate tax avoidance and ensure transparency in the transfer of capital between companies and subsidiaries in line with market prices. In practice, transfer pricing is a specific price which performs the same functions as market prices. Transfer pricing records allow state institutions to control the prices applied in controlled transactions by comparing them with market prices, being also a good mechanism for measuring the tax base and the profit obtained in the case of transfer pricing, fact that ensures the efficiency of the enterprise's economic activities/services. As an essential element of the economic policy of multinational companies, transfer pricing is used in planning and control and the establishment of a geographic location index of transfer prices comes as an input in their planning and control, according to the needs of enterprise management. Thus, the establishment of the geographical location index of transfer prices ensures the achievement of the enterprise's objectives regarding the planned performance indicators. At the same time, it contributes to cost reduction, playing an important role in the planning and control of the financial plan of the enterprise and with the help of the geographical location index the decision to allocate resources within the company will be much easier to take.

CONCLUSIONS

Transfer pricing strategies and methods are quite complex and their application is associated with certain difficulties: restrictive and diversified legislation from one country to another and lack of clear methodologies on the transfer pricing file. The complex and restrictive transfer pricing legislation has a disruptive effect on the ability of multinationals to apply transfer pricing and especially on the application of market prices.

Thus, we believe that OECD and G20 countries contributing to the BEPS Action Plan should establish a globally valid tax code, whereby countries involved in international transactions ensure that profits are subject to taxation where the activities took place and where they created value, thus avoiding tax evasion.

The use of transfer pricing involves checking the reasonableness of prices for export and import transactions. Defining a comprehensive legislative framework, a comprehensive tax code and their correct application ensures the attraction of investment and sets fair rules to maintain a balance between the state and the participants in transactions. Undoubtedly, the desire for such a balance means reciprocal trade-offs, enshrined in regulatory and enforcement practice.

The Geographical Location Index helps multinationals to identify the most optimal areas in terms of levied taxes and country risk for those of them who wish to open a new subsidiary in another country. At the same time, the results of our research have validated that the amount of tax is an important factor in determining the transfer pricing case, as multinationals aim to reduce their tax burden by applying transfer pricing.

The limitations of our research are that in establishing the geographic location/transfer pricing index, only certain variables were taken into account, these being those which we considered to be the most representative in establishing the transfer pricing file. Thus, this research is much more complex and future research directions involve identifying all the determinants in the determination of the transfer pricing file and correlating them to obtain a more representative geographical location index.

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