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The Impact Factor of Tangibles and Intangibles of Controlled Transactions on Economic Performance

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Abstract

The tangible and intangible effects of controlled transactions on economic performance and tax revenue are examined in this paper. As a result, the transfer pricing procedure includes an analysis of the tangibles, which are the property with the services, and the intangibles, which are the assets of the controlled transactions (the transactions that take place between companies that control their transactions to have profits and control of their losses). Consequently, predicated on the method of the Q.E. and the R.B.Q. model established a comparison between the instance where there are just the tangibles and the case where intangibles are also included. The purpose of the study is to shed light on how businesses that engage in managed transactions of intangibles behave. The findings show that intangibles are utilized by tax evaders as leverage.

Keywords: tangibles, intangibles, controlled transactions, intra-group transactions

JEL: M41, E62, H21, L14

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1. Introduction

'Intra-group transactions' are defined as domestic and/or cross-border transactions carried out between affiliated undertakings. More specifically, those transactions that take place within a group of companies, have a strong element of dependence. This means that one company can impose itself on another, even at its expense. The main feature of intra-group transactions is the relationship of dependence with the imposition of effective administration, even if it is temporary.

Then, in affiliated undertakings, at least one of them is obliged to draw up documentation and they are therefore checked. The department responsible for the audit is called upon to check whether the company complies with the provisions in regard to the OECD guidelines on transfer pricing, and as they are updated each time. Additional responsibilities are the regular (final) tax inspection of the permanent establishments of foreign companies, whose registered office is abroad, having the obligation to draw up a documentation file. In addition, the tax authorities are asked to examine whether a company submits a concise table of information and whether it has prepared a documentation file, with the check being of both completeness and correctness (Marenco, Strohschoen and Joner, 2017; Ruiz *et al.*, 2017; Challoumis, 2019b; Engström *et al.*, 2020; Naudé and Dimitri, 2020; Syukur, 2020). In short, what is checked is the transactions carried out by related persons, on economic or commercial terms, which differ from those applicable between persons who are not affiliated or those persons who are not related to third parties, to identify those differences that increase the tax liability of the enterprise being audited. What has been observed in recent years is that the supervisory authorities during the audits are faced with overpricing or undercutting in transactions, with the result that the penalties imposed are severe.

The allocation between profits and losses is served better by the existence of the charged rights. The companies which participate in controlled transactions use the charged rights to present a minimum tax obligation, under certain circumstances, to the tax authorities. The tax tools of those companies are the same in the case of the tangibles and the intangibles. Therefore, the answer to the question whether there is a different methodological approach for the companies which have intangibles from that of the companies that use only tangibles, is that the tax procedure remains approximately the same. Then, in the case of intangibles, the arm's length principle, the comparability analysis, and the best method rule are applied. Consequently, these three criteria are used in the same way in the case of tangibles and the intangibles (Bartels, 2005; Domingues and Pecorelli-Pere, 2013; Dybowski and Adämmer, 2018; Silveira Porto and Viriato Memória, 2019; Prestianawati *et al.*, 2020). The scope of the current analysis is to demonstrate that the charged rights used in the case of the intangibles are maybe an expense for the companies but simultaneously make a tax tool for them, to allocate better their profits and losses. Companies engaged in controlled transactions deploy charged rights to optimize the allocation of their profits and losses. However, this simultaneously leads to a reduction in tax revenue for authorities, impacting overall economic performance. The Q.E. method was applied for the administration of intangibles to the behavior of the companies. The results show that the intangibles are used by companies to control transactions to allocate better their profits and losses, therefore the tax authorities should be alert to identify them.

2. Methodology

The applied methodology is based on the Q.E. approach and R.B.Q. concept, meaning that a quantitative approach is established with the purpose to confirm the hypothesis of the model. The main point of this concept is that an algorithmic approach is applied in a virtual environment to analyze the behavior of the model both with and without the use of intangibles by companies engaged in controlled transactions. Consequently, in one scenario, both intangible and tangible factors are considered together, while in the other scenario, intangibles are omitted, and only tangibles are included in the model. This situation was auto-repeated multiple times until the model adjusted to the theoretical background of the scientific literature and the hypothesis of the model. The mechanism of the Q.E. method uses three fundamental steps. The first step establishes the mathematical equation of the theoretical background. Thus, the theoretical and mathematical thesis presented in the current work is modeled in the first step. Afterwards, the second step applies the generator and the appropriate code to compile the model. The third step is crucial for the hypothesis, as it clarifies if the procedure should be repeated or not. If the hypothesis does not comply with the results of the theory, the whole procedure is repeated by feedback. This mechanism is repeated until the model is adjusted appropriately with the theory of the scientific literature, otherwise more analysis of the theoretical and mathematical background should be made. Through many repetitions, the model is confirmed and allowed to extract the appropriate conclusions for the intangibles (Adhikari, Derashid and Zhang, 2006; Porter, 2007; Amanor-Boadu, Pfromm and Nelson, 2014).

3. Arm's length principle

The choice of the appropriate methodology for controlled transactions is very important for each company that participates in transfer pricing business activities. The key elements for these methodologies are the arm's length principle, the comparability analysis, and the best method rule. Then, the three transfer pricing criteria are:

The arm's length principle is for the agreement between the OECD member countries for the transfer prices to avoid taxation. Then, the arm's length principle tackles the difference between controlled and uncontrolled transactions (the transactions which happen between companies free of control and allocation of profits and losses). This means the transactions which are under control by the enterprises to avoid taxation (controlled transactions) are different from the transactions between companies which are not affiliated (uncontrolled transactions) (Herrington, 2015; Rasmussen and Callan, 2016; Cruce and Quinn, 2019; Victral *et al.*, 2020). Thereupon, the profits in the controlled transactions are allocated between companies in such a way as to avoid or minimize the costs and maximize the profits.

The comparability analysis is this process that permits the identification of the transfer pricing of companies which have business activities that belong to control transactions. The comparability analysis is a tool that allows enterprises to eliminate the differences between controlled and uncontrolled transactions (Challoumis, 2018, 2020b, 2021). Therefrom, comparability could be considered an adjustment tool that can be used by enterprises to comply with the requirements of the tax authorities.

The best method rule is the procedure where the company which participates in controlled transactions chooses the method it thinks is the most appropriate method to serve its scope of business activities.

Hence, the arm's length principle and the comparability analysis are two elements that companies that participate in controlled transactions should have considered when they do business activities of transfer pricing. The best method rule is for the choice of method in which each company that participates in transfer pricing sought to maximize its profits. According to the arm's length principle, the scientific literature is in agreement with the earlier techniques (Azzone, 2018; Camous and Gimber, 2018; Ladvocat and Lucas, 2019; Strassheim, 2019; Goldsztejn, Schwartzman and Nehorai, 2020; Diallo, Shults and Wildman, 2021). Of course, one way to tackle these problems is to use the fixed-length approach. Since this type of transaction is associated with an allocation of profits and losses, the fixed-length principle, which supports additional tax for businesses that participate in international and control transactions, is another viewpoint that addresses profits and losses allocation in a standard manner (Ortún, López-Valcárcel and Pinilla, 2016; Ud Din, Mangla and Jamil, 2016; Schwartz, 2019; Jia *et al.*, 2020; Russo Rafael *et al.*, 2020; Ewert, Loer and Thomann, 2021). Since this type of transaction is associated with an allocation of profits and losses, the fixed-length principle, which supports additional tax for businesses that participate in international and control transactions, is another viewpoint that addresses profits and losses allocation in a standard manner.

4. Transfer pricing criteria

Regarding the categories of transfer pricing, it should be noted that they adhere to international transactions, the provision of services, and the protection of industrial and intellectual property. For the most part, intra-group transactions relate to transfers of tangible and intangible property, as well as the provision of services. The content of intra-group transactions is a key feature of transfer pricing transactions. Then the content of transfer pricing transactions is analyzed:

- Tangible property: these are the assets of an enterprise and each physical asset it possesses. It includes the sale of raw materials, the sale of goods produced, and fixed assets owned by the business. Where businesses are purely importing, intra-group transactions are the purchases of goods.
- Intangible property: under tax law, no specific definition has been included regarding the concept of intangible goods (rights) or any general definition or information material for each right. This category, based on the laws that have been established, includes technical assistance, various patents, trademarks, goodwill, copyright, the ways of organizing the business in question, know-how, specializations in the production of specific goods, designs of the processes used in the industrial part, types of intellectual property and any other form of rights such as leasing. Intangible fixed assets are financial assets capable of monetary valuation that are used by a company for production and may be the subject of a transaction. In today's global economic context, intangible assets are considered to be those that are able by their nature to create economic value for various businesses/organizations. Thus, businesses gain an advantage over their competitors, invade new markets more easily, and take a share of the promotion of their products. Regarding the issue of transfer pricing, the intangible assets that 22 relate to commercial activities are divided by the OECD into Industrial Intangibles and Marketing Intangibles. The category of Industrial intangibles includes activities whose cost is high (research activities, development activities). Marketing Intangibles include trademarks, symbols, and photographs that help promote products, as well as trade names, customer lists, and distribution channels.
- Services: these are the services that are performed and operated by the affiliated undertakings. The services are re-categorized according to how much they benefit the business or according to the ownership/beneficiary of the business. In general, intra-group transactions belong to international transactions. The difference lies in their modification in terms of the existence of various contractual terms, based on the type of transaction each time.

Some methods are the same for the tangibles and the intangibles. Therefore, the companies usually use the same method, both for the tangibles and the intangibles. But this does not mean that the same method is always used, as it depends on the circumstances. Moreover, the applied criteria for the tangibles and the intangibles in the process of transfer pricing are the same. Thence, the criteria for tangibles and intangibles are the best price method, the comparability analysis, and the arm's length price, as described in the previous section.

Forasmuch as the criteria of transfer pricing for the tangibles and intangibles are the same, in some cases, the criteria could be different for the intangibles, as instead of them the available data of the company of controlled transactions could be used. This occurs when a company engaged in controlled transactions chooses to use an unspecified method based on its internal data. When the tested party, defined as the company participating in controlled transactions, relies on its internal data for tax analysis, it avoids the comparability analysis procedure. This situation is illustrated in the following scheme:

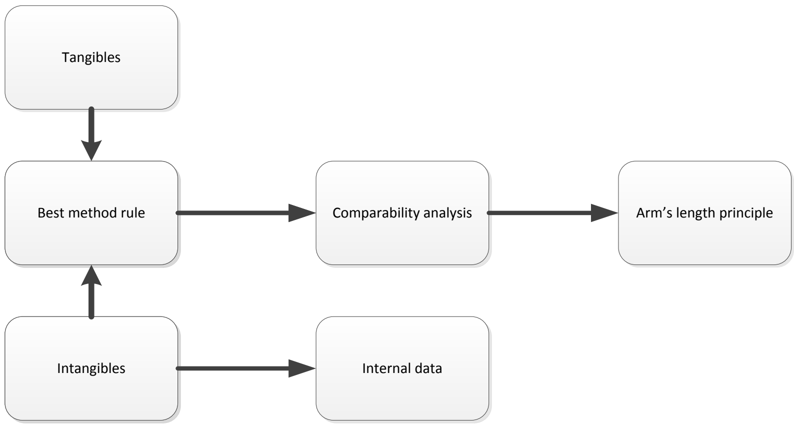


Figure 1. Transfer pricing criteria for tangibles and/or intangibles

In the previous figure, it is obvious that the intangibles have one more option, this of the internal data. Intangibles are more flexible, as they provide additional options to companies participating in controlled transactions, which are often considered unreliable. The next section clarifies the common methods of tangibles with the intangibles and the diversions between them.

5. Methods of controlled and uncontrolled transactions

The common methods between the tangibles and intangibles in controlled transactions of transfer pricing are these:

- A technique called the Comparable Profit Method (C.P.M.) is based on the profits of the businesses involved in controlled transactions. To implement the arm's length concept, this approach makes use of profit-level indicators. These indicators are used to determine the proper profit level for the organizations that are being evaluated (as a tested party is considered the company which applies the method to tackle tax purposes). The CPM technique is thought to comply with the best method rule if there is no dispersion between the profitability of regulated and uncontrolled transactions.

- The Profit Split Method (P.S.M.) is a technique that divides profits between companies; it is subdivided into two more precise profit split techniques by the legislation. The Comparable Profit Split Method (C.P.S.M.) and the Residual Profit Split Method (R.P.S.M.) are the first and second, respectively. The comparable profit split technique thus relies on distributing operating profits among the controlled taxpayers in proportion to those resulting from uncontrolled activities. The residual profit approach, on the other hand, is for allocating the total operating profit or loss of uncontrolled transactions to the controlled taxpayers. The operating income is then passed to the participant whose commercial activity will provide a market return. Additionally, the remaining profit from the intangible asset is divided. These methods are used most times by both the tangibles and the intangibles. But there are other methods used for tangibles, which does not mean they are never applied to intangibles in special cases. Then, for the tangibles most used methods are these:
- The Resale Price Method (R.P.M.) is a methodology that relies on the distributor's profitability. This indicates that the distributor's determination of the gross margin is emphasized by this method. Then, this methodology bases the definition of the resale price margin on deducting from the uncontrolled resale price and applying the appropriate gross margin. Therefore, the corporation that participates in controlled transactions could calculate the resale price margin based on uncontrolled acquisitions and resales.

An approach known as the Comparable Uncontrolled Price (C.U.P.) is based on the taxpayer's judgment of the price charged in a controlled transaction. This indicates that by CUP, a comparison of the price charged for goods or services transferred in a controlled transaction with an uncontrolled transaction in an analogous situation should be made. The data from the uncontrolled transaction could be retrieved by the quotation media and the public exchanges, and the taxpayer should adjust these data to find if they comply with the arm's length principle (Amanor-Boadu, Pfromm and Nelson, 2014; Maestre-Andrés, Drews and van den Bergh, 2019; Challoumis, 2020a; Naudé and Dimitri, 2020; TUTER, 2020).

The Cost Plus Method seeks to reduce the cost-plus markup that is tacked on. To generate the right profit, this markup cost is added to the costs (costs incurred by the supplier of goods or services to a related buyer).

Also in the case of the intangibles the following methods are used with high frequency:

- CUT, or Comparable Uncontrolled Transaction, technique. This approach is based on the Comparable Uncontrolled Price (C.U.P.) approach, which makes comparison analysis using prices. The taxpayer then tries to scrutinize uncontrolled transactions and properly apply the comparable uncontrolled price approach to correct the data. To identify unregulated transactions, the government may feasibly take data from public exchanges and quote media.
- The Unspecified Method of Transfer Pricing. This method assesses whether the amount charged in a controlled transaction complies with the arm's length principle following the comparability analysis. The internal data and unmonitored transactions are then used for comparisons between

the tested party and the third party using an undisclosed mechanism (the company which participates in uncontrolled transactions). The issue with this method is that it uses data that plausibly are not so reliable, and for this reason, in many circumstances, this method could be considered not the best method.

Therefore, all the most prevalent examples of techniques utilized by tangibles and intangibles are listed. The following strategy then illustrates various methods:

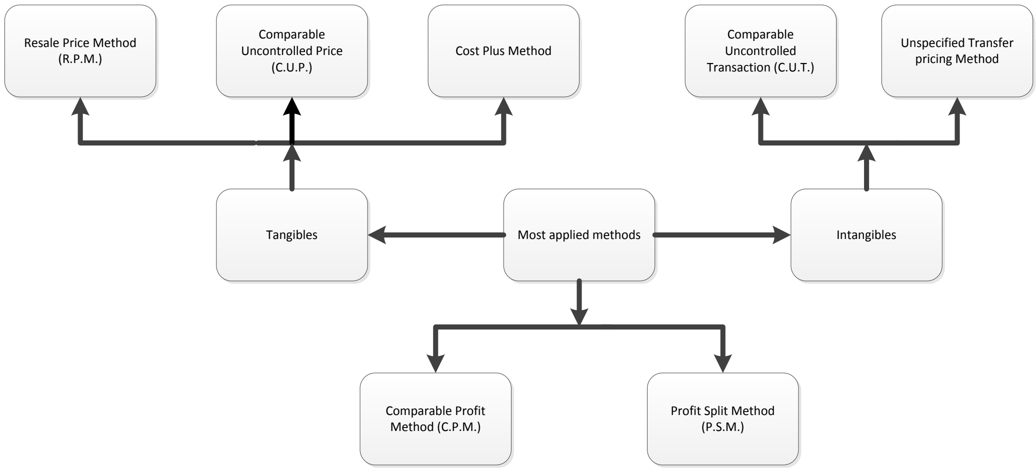


Figure 2. Tangibles and intangibles methods

Therefore, it should be noted that businesses involved in regulated transactions either employ the same methodology for both tangibles and intangibles or adopt a different methodology depending on their requirements. Because of this, businesses that test parties have the following options:

- For tangibles and intangibles, the same methodology is applied. The companies involved in controlled transactions then focus on a single issue, including both tangibles and intangibles.
- The companies involved in controlled transactions then focus on the tangibles and intangibles separately. This occurs because it is plausible that the companies which are the tested parties have some variations in the data of the comparability analysis of regulated transactions with the uncontrolled transactions and are unable to handle them using the same approach. The companies involved in controlled transactions then focus on the tangibles and intangibles separately. This occurs because it is plausible that the companies which are the tested parties have some variations in the data of the comparability analysis of regulated transactions with the uncontrolled transactions and are unable to handle them using the same approach. Therefore, companies try to administrate their internal data to face the differences that appear between controlled and uncontrolled transactions.

Afterwards, the next section presents an analysis of tangibles and intangibles using the Q.E. method.

6. Tax income comparison with low and high tax revenue

This section includes estimates for both tangibles and intangibles that make it possible to distinguish between cases where only tangibles are present and those where both tangibles and intangibles are employed in transfer pricing. Then, what follows is the impact factor of tax revenues of the countries which are tax havens. The equations are accordingly shown below:

$$s = \frac{k+l}{r+c+t} \quad (1)$$

Subject to:

$$\tilde{k} > k, \tilde{l} > l, \ r > \tilde{r}, t > \tilde{t}, \text{and } c > \tilde{c} \quad (2)$$

The symbol of s was defined previously and the new coefficients are k, l, r, t and c. The symbol of k is for the impact factor of capital, the l is the impact factor for the liability of the authorities of the tax system; meaning how much unbalanced it is (making a lot of changes), and the r is for the risk, the t is for how much trustworthy is the tax system (lack of bureaucracy), and the symbol of c is for the cost of enterprises. The symbols with the "~" are accordingly the same thing but from the view of uncontrolled transactions. Thus, the numerator is proportional to the income of taxes, as the investments and the stable tax environments, with a lack of bureaucracy, enhance the tax income. On the other hand, the denominator is inverted and proportional to the tax income, as the risk, the cost, and the unbalance of taxation cause less tax income.

Moreover, for the intangibles:

$$s_{\alpha} = \frac{k+l}{r+c+t+i} \quad (3)$$

Subject to:

$$i > \tilde{i} \quad (4)$$

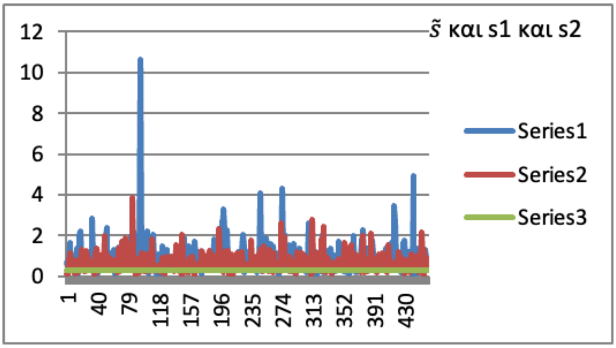
Then, the symbol of s shows the impact factor of the tax revenues of the countries which are tax heavens, including the intangibles. Forasmuch as i symbolizes the requirements from the intangibles. Thereupon, $\tilde{i}$ symbolizes the same thing from the side of uncontrolled transactions. For the intangibles, the companies which use them and are subsidiaries, pay the companies which are the owners of them. This issue has effects on the impact factor of tax revenues (Challoumis, 2019a). Therefore, by using the Q.E. method:

Table 1. Compiling coefficients of tangibles and intangibles

Factors	Values of s	Values of s_a
k	0.4	0.4
l	0.4	0.4
r	0.6	0.6
c	0.3	0.3
t	0.21	0.21
i	-	0.18
fs	<0.3	<0.3
$f\tilde{s}$	>0.3	>0.3

The generator of this procedure used the coefficients defined in the previous table (see Appendix). Thereupon, an analysis of s with the s_a:

(a) (b)



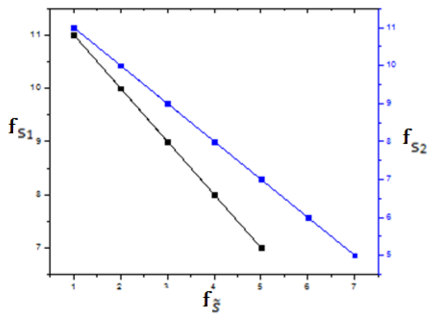


Figure 3. (a) Impact factors of s and s_a (b) frequencies of s and $\tilde{s}$

The previous figure uses s, which here is the same for the tangibles and the intangibles, because the aim is to specify the s and s_a. In the first case of s (blue line – series 1) of non-rights of use or free rights many points are higher than in the case of the charged rights of s_a (red line – series 2) – figure 3 (a). Higher the factor of i, lower is the tax on global income. Thereupon, i serves the economic scope of companies that use the tested parties. In the prior diagram -figure 3 (b) analyzed the frequency of the impact factor of the tax revenue. Consequently, the frequency of the tax revenue in the case of f_{s_α} is higher than the frequency of the impact factor of f_s. This means that when there are intangible rights the companies which participate in controlled transactions are increased, as they have fewer tools to allocate their profits and losses.

7. Discussion

Then there are some cases of transfer pricing transactions carried out by a financial conglomerate. These transactions are subject to a special supervisory regime, as they involve any type of transaction between group members and individuals connected to the group's undertakings. An additional regulated case of intra-group transactions is transactions carried out by an insurance group. It concerns loans, guarantees but also investments. As in the previous case, these transactions are also subject to supplementary supervision. According to the OECD, transfer pricing is important not only for businesses but also for any tax administration, since the degree of not only income but also of expenses and taxable profits is determined. However, transfer pricing becomes problematic when the prices of exchanged products, services, or intangible assets differ from those prevailing in the free market.

8. Conclusions

If the charged rights are not properly identified, they can reduce global tax revenue by enabling profit allocation that undermines the government's ability to operate efficiently. Transfer pricing is made more challenging by the subsidiaries' obligations for the use of intangibles as well as the fact that charging is a component that businesses do not take into account for their business plan activities but rather utilize to distribute their profits and pay less tax. As a result, while the charged rights may be an expense, they also serve as a mechanism for more effectively allocating profits and losses, enhancing the overall revenue of the organizations that engage in regulated transactions. According to the theoretical portion, the fixed-length principle, which accepts an additional tax from businesses that engage in international trade as a way to offset the tax authorities' losses through the allocation of profits and losses by those businesses, represents the alternative interpretation of the arm's length principle. The recent findings suggest that the tax authorities should replace their current fixed-length concept with an arm's length principle, which would require them to impose an additional tax to make up for the tax losses that emerge from the allocation of profits and losses. The way businesses handle controlled transactions involving intangibles impacts their financial performance, as it can reduce tax authorities' revenue due to improper detection. The topic of determining intangibles could be further discussed with a study of the Resale Price Method (R.P.M.) or the Profit Split Method (P.S.M.), describing a real-world case scenario with the potential to confirm the current findings and draw additional conclusions, using a particular methodology by the businesses that go on to control transactions.

Appendix

The code on Matlab, for the compilation of tangibles and intangibles:

```
%Q.E. method © ® 2017 Constantinos Challoumis
q=0;
while q<10
 q=q+1;
count=0;
counts=1;
counts1=1;
while count<10
if rand()<9
    k=0.4*rand();
end
if rand()<9
    l=0.4*rand();
end
if rand()<9
    r=0.6*rand();
end
if rand()<9
    c=0.3*rand();
end
if rand()<9
    t=0.21*rand();
```

```
end
s=(k+l)/(r+c+t);
s _ tilda=0.3;
    count=count+1
    if s<0.3
        counts=counts+1;
    else
        counts1=counts1+1;
    end
end
%on the first compile the ;vec is not used
vec=[c,count,counts,counts1,k,l,q,r,s,s _ tilda,t;vec];
end
```

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