Annals of "Dunarea de Jos" University of Galati
Fascicle I. Economics and Applied Informatics
Years XXIII – nº3/2018
ISSN-L 1584-0409 ISSN-Online 2344-441X
www.eia.feaa.ugal.ro

DOI https://doi.org/10.26397/eai1584040927

Identification of Significant Economic Risks to the International Controlled Transactions

Constantinos CHALLOUMIS*

ARTICLE INFO

Article history:
Accepted December 2018
Available online December 2018

JEL Classification
F6, F40, F43, F62, F63

Keywords:
Companies, Identification of risks, Controlled transactions

ABSTRACT

This paper shows the types of risks that an enterprise which participates in controlled transactions should undertake to its risk examination procedure. This work clarifies these risks and analyzes them. The identification of risks pends on the business abilities of the companies which participate in these commercial transactions. The special issue about this paper is that uses a quantification method (Q.E. method) to determine with a quantity approach the issue of the identification of the enterprises' risks.

1. Introduction

This paper analyzes strategic risks of the companies of controlled transactions (as acronym would be used the term C.C.T.s) and more precisely aims to the financial risks, the operational risks, the economic hazard risks, the transactional risks, the contractual risks, and in general the most related risks. Thereupon, is scrutinized in this thesis these issues. The uncertainty is the root of the risks. Without the appropriate specification of risk analysis by the companies is not plausible to clarify the economic dangers, of their activities. Thence, any economic opportunity simultaneously has and economic hazards. The C.C.T.s should identify those risks. The concept of profits and losses has the same time and risks. Thereupon, every time the companies spend for tangibles and intangibles this happens because they undertake the adequate economic hazards to earn profits. There are many definitions of risk which would be showed to the next sections. (OECD, 2001) The wide range of definitions in the economic field of risks is because of the too many commercial hazards. (Boland, 1991) Influence of economic hazards takes place when the predicted beneficial effects fail to materialize. (Zax, 1988) The drawback administration of uncertainty associated with opportunities which come from the commercial and business activities of these enterprises. (OECD, 2017) This thesis analyzes the issues of the identification of risks through a gradual analysis of a series of important risk factors. For the scope of this work about the risk have been used a series of risk parameters, which make the overall risk that the undertake the companies of the international controlled transactions. Then, the market risks, the operational risks, the hazard risks, the financial risks, the regional risks, the entrepreneurial risks, the transactional riks, the collection risks, the business risks, and the product risks, are the risks which consist with a gradual form the risk which these enterprises face their international controlled transactions. Thence, the gradual formation of the risk, which used in this paper reveals the impact of the risk parameters in the aggregate risk analysis.

2. Methodology

The methodology that used to this paper is the Q.E. method, which based on the theoretical scrutiny of quality data, with scope to pass to a quantification approach. Therefore, this reasoning is used principles of this methodology, which accompanied the concept of the generator and of the feedback to the transformation of the quality data into quantity data. The transformation of quality data to quantity data stands on the concept of the fuzzy logic, and in the idea of the feedback procedure. Therefore, using a computational approach is able to administrate the quality data. The key point is the iterations which allow the modification of the model multiple times until the initial hypothesis to comply with the expected results. Additionally, the fuzzy logic is used as the main process, where happens the modification of the model of study. (Challoumis, 2018) The concept of fuzzy logic is used by this methodology through the randomization method of the generator, wherein to this stage the clarification of the model is established. Thence, the theoretical terms of the fuzzy logic and the sense of the feedback are the bases for the application of the Q.E. method. After the

* National Kapodistrian University of Athens (N.K.U.A.), Athens, Greece. E-mail address: challoumis_constantinos@yahoo.com

determination of the model, is applied a feedback to change the comparison between the studying equation with the basic equation. After many iterations of this procedure, the identification of the complete behavior of the model is plausible. Moreover, should be notified that the key element of this replica is the axiomatic theory. More precisely we have the application of the multiple axiomatics method. The axiomatic method stands on the concept that there is the initial assumption, which the scientist should confirm if wanted to have credible scientific results. Hence, there is and the theory of multiple axiomatics method of the Q.E. method. The idea of multiple axiomatics method is based on the fact of the iterations through the feedback operation, where many readjustments of the model happen. Then, through the repetitions is plausible to adjust the model in a suitable form to comply with the initial scope of the assumption. The tools which needed for this procedure are the behavior analysis and the frequency behavior analysis. With them, we are able to extract the appropriate conclusions, about the behavior of the model.

- Behavior analysis: This scrutiny of the structural characteristics approves the extraction of acquired conclusions about the model which is under examination. Then is possible the assessment of attributes of the model into a two-dimensional and to three-dimensional evaluation pending on the case. (Challoumis, 2018) Thence, the behavior analysis determines the attributes of the one case in comparison with the other cases of study. Therefore, according to this procedure is plausible to clarify the behavior of the model.

- Frequency analysis behavior: The frequency assessment conduct scrutinizes the structured variables, estimating basically the effect of one unbiased variable with one or more others independent variables. The key element to that case is the number of the appearances of one dependent variable in comparison with the other depended variable, which has been modified. (Challoumis, 2017) The comparisons in the frequency analysis have as sope to clarify the number of appearances of the one case in comparison with other cases, allowing to extract conclusions, about the model of study.

As shown to the prior two bullets there are two axes to the scrutiny of the data by the Q.E. approach. The behavior analysis is used for the determination of the conduct of the mathematical equations and the background theory that supports each equation of the model, which is under examination. The frequency behavior analysis has as mainstream the comparison between equations but from the view of the frequency approach. This means that the comparison of the examined equations is done by the number of appearances of one mathematical equation in a study with the other equation. Thence, using this two tools we are able to clarify the behavior of the model. Both of these methodological tools have as root the concept of fuzziness which established by randomization processes. Should be mentioned that there are four critical steps in this model. The first step is about the scope of the search. The second step is about the application of the generator to the model. Finally, the other two steps are about the conclusions and the feedback of the of the model. Should be mentioned that the feedback is the key factor for the repetitions of the model. The iterations are these which determine how many comparisons will be made between the equations, to perceive how the model conducts to value changes and to the exclusions or the additions of the independent variables. Thereupon, using the Q.E. methodology we are able to proceed to the next sections, for the application of the theory to the replica.

3. Risks and identification of economic hazards of the companies

In this section are showed the factors that are related to the identification of the economic hazards of the enterprises. These factors would be used to the next section for the mathematical analysis of the model from the point of view of the Q.E. method. Forasmuch as we have that:

- The issue of the market risks (factor m): The enterprises of controlled transactions have to administrate the commodity risks, the currency risks, the equity risks, and the interest rate risks. The interest rate risk covers the interest rate fluctuations based on fundamental factors. These fundamental factors are about the monetary policies which follow the central banks. This kind of risk is more affiliated with fixed income securities; the most common are the bonds. On more issue about the market risks are the equity risks. The equity rate risks are connected with the changes in the prices of the stock investments. The market risks are the commodity risks, which are about the changes in the prices of the commodities. (Investopedia LLC, 2018) Additionally, the currency risks are related to the changes in the price of the currency. These are external risks caused by means of the political environment, financial and regulatory issues. (OECD, 2017) Thereupon the market risks caused because of the changing prices in the markets. The volatility is measured by the value-at-risk method, the calling VaR method. Ergo, the statistical risk administration is very important for the risk assessments of the C.C.T., as index the prior economic hazards. Should be mentioned that the market risk is also called systematic risk because it is a kind of risk that always be in the market financial activities of the companies. Additionally should be considered in the market risks the theme of the

development of the market, the advertisement, the business cycle risk, the asset redundancy risk, the volume risk, and the service risk. (United Nations, 2013) Inasmuch as market risks include the fluctuations in the cost, the demand, the inventory, and the prices. The fluctuations are the source of the volatility and consequently the issue of the market risks. (Feinschreiber, 2004)

- The theme of operational risks (factor o): The operational risks are about the economic hazards that a company takes from its commercial and financial activities in the field of industry. It is a risk that remains after the identification of the market economic hazards. This risk is connected with the decisions and the business activities of the companies. The operational risk changes between companies it is affected by the human factor. (Investopedia LLC, 2018) The impacts of these economic hazards are established on the activities and the uncertainties that an enterprise assumes. (OECD, 2001) Some infrastructure dangers are externally pushed and may additionally contain, employee capability, outsourcing arrangements, laws and regulations, transport links, system format and execution availability of assets, functionality, IT themes, political and social situations. (OECD, 2017)

- The issue of the hazard risks (factor h): These are plausible to encompass negative exterior activities that may motive losses, accidents, and natural disasters. (Challoumis, Year XXIII) Such risks can regularly be administrated through insurance. (OECD, 2001) Thence, the hazard risks are about these factors which considered as external impacts to the businesses of the companies.

- The theme of the financial risks (factor f): The financial risks related to the revenues and financial costs of the enterprises. (United Nations, 2013) All economic dangers are possible to have an effect on a company's financial performance; however, there are precise monetary economic dangers associated to the company's potential to manipulate financial capacity, liquidity and money flow (Wilson, 1986) The uncertainty can be externally driven, for instance by way of financial shock or deposit crisis, funding decisions, and infrastructure economic hazards. (OECD, 2017) Videlicet, the financial risk consists of the method of funding, the losses, the fluctuation and the foreign exchange risk in interest rates. (United Nations, 2013)

- The regional risks (factor r): The regional risks are related to the countries risks. Consequently, these dangers are about political risks, security risks, regularity risks and risks which come from the governmental policies. This risk factor measures the economic hazard to which a certain trading location exposes the international capital of the companies which are affiliated with controlled transactions. (King, 2009)

- The entrepreneurial risks (factor e): These risks are about the risk of loss which comes from the capital investments and the single customer risks.

- The issue of the transactional risks (factor t): These risks are about the terms of the payment and the prices of the worldwide controlled transactions. (OECD, 2001) The commercial transactions are for the tangibles and the intangibles (which are about the services, the property, and the materials). (Meier & Rosenbaum, 2000) The transactional risks are the exchange risks that are influenced by the time delay in the contracts. As larger is the time difference between the entrance and the final agreement of the contract then is greater the transaction risk. (Investopedia LLC, 2018)

- The collection risks (factor c): The collection risks are about the credit risks and the bad debt risks.

- The general business risks (factor g): These risks are affiliated with the ownership of property dangers and the economic hazards of the exploitation of an enterprise. (United Nations, 2013)

- The theme of the product risks (factor p): The product risks are about the economic hazards those companies should assume to their production process. Therefore, the product risk should include the after-sale services, the scheduling risk, the design and the development of the product, the risks of research and development (R&D) sector, the upgrading of product, the inventory risk, the product liability risk, and the intellectual property risk. (United Nations, 2013)

Thereupon, these are the fundamental risk factors that C.C.T. should identify to their risk assessments processes. In the following section, we have the application of the theory to a mathematical and a computational scrutiny of the model. Through the prior risk parameters are plausible to clarify the overall risk, as the risk that undertake the companies of controlled transactions is a matter of a series of risk factors. To the work "The Role of Risk to the International Controlled Transactions" has been showed that there are

three crucial economic elements about the risk analysis. The first thing is the identification of risk. For the identification of risk in this work are determined the prior ten risk parameters, which consist the overall risk. The second thing is the comparability scrutiny between the controlled and the uncontrolled transactions, to obtain if the companies satisfy the arm's length principle. Finally, the third thing is the contractual terms between the companies which are engaged in controlled transactions. Thence, using the previous logic, we are able to proceed to the mathematical scrutiny of the model.

4. Mathematical analysis of the identification of risks in controlled transactions

Through the mathematical analysis of the identification of risks, we are able to clarify the behavior of the model. The tools of the Q.E. method which are the behavioral analysis and the frequency behavioral analysis allow us to examine the interaction between the dependent and the independent variables. Using the mathematical statements of the paper "The Role of Risk to the International Controlled Transactions" we have the following equation to our inquiry. (Challoumis, 2018) Thence, are represented the next equations:

$$r_k = s_k * i + c_k + f_k \quad (1)$$

$$\text{Where, } 0 \leq s_k, c_k, f_k \leq 1 \quad (2)$$

The r_k is the factor about the risk of the C.C.T., meaning their aggregate risk. The symbol of s_k is about the appropriate information which have the C.C.T., about their business activities. The symbol of i is about the theme of the identification of the risks. The values of i could be 0 or 1. The interpretation of these two discrete magnitudes is that we are able to have or not to have the risk, then we perceive that there could be only two values [we will see to the equation (3) that the presence or not of risks is changed between not the values of 0 and 1, but between 0 and 0.1]. The symbol of c_k is about the adequate rate in compatibility between controlled and uncontrolled transactions of the MNEs (is an acronym of the global multinational enterprises). In addition, the symbol of f_k is about the risk rate that comes from the financial terms of the C.C.T., which sign to their contractual terms. Therefore, for this model we have that:

$$i = m + o + h + f + r + e + t + c + g + p \quad (3)$$

$$\text{Where, } m, c, h, f, r, e, t, c, g, p = 0.1 \text{ or } 0 \quad (4)$$

As we perceive from the equations (3) and (4), we have factors which consist the risk identification of the risk. If we have value 1 for i this means that the company's' analysis identified all the factors of the risk. Otherwise, if the value of i takes value zero means that there is no identification of any risk. The coefficients m, o, h, f, r, e, t, c, g, and p correspond to the analysis of the bullets in the prior section (see the interpretations of them to the prior section). These factors have value 0.1 if exist and 0 if do not exist. Therefore, is not a range of values for them, but only for the total risk identification of i. The symbol of the factor of i for the identification of risk in comparison with the work "The Role of Risk to the International Controlled Transactions" has gradual values and not two binary values of existence and not existence.

Thence, we are able to determine the behavior of the model using the Q.E. method for the following coefficients of the equations (1), (2), (3), and (4). Then, applying this methodology we have that:

Factors	Values (complete identification of risk)	Values' (non-identification of risk)
s_k	0.7	0.7
i	1	0
c_k	0.6	0.6
f_k	0.5	0.5

Table 1. Compiling coefficients

Thereupon, the generator using these coefficients and the prior equations allow us to obtain the behavior of the model. This means that we are able to proceed to the behavior scrutiny of the model. Using the prior table to the application of the Q.E. methodology we receive that:

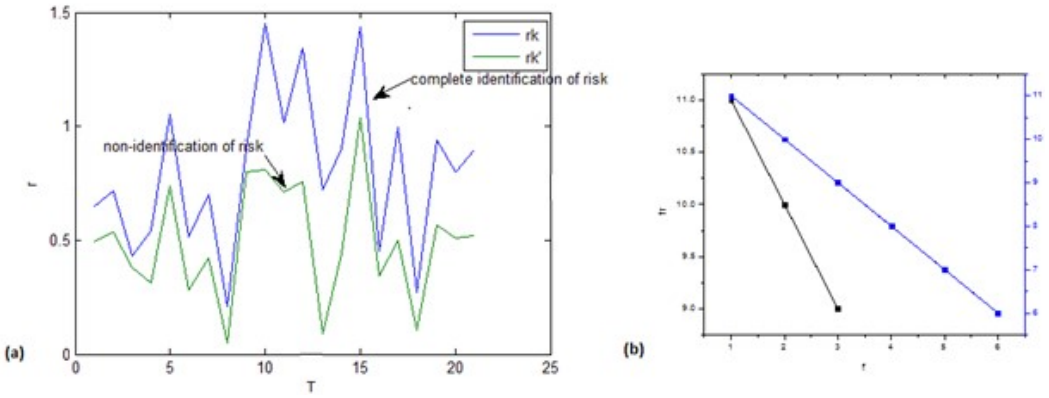

Figure: (a) Behavioral analysis (b) Frequency behavioral analysis

Thereupon, we have from the figure (a) that when there are included all the parameters of identification of risk then the economic hazard is higher, as we expected (blue line). Forasmuch as, the risk when contains all the parameters of the equation (3) increased. When there are not the identification factors of risks of the comparability analysis we have declined risk (green line); as we perceive is not zero, because there are the coefficients of c_k, and of f_k. To the frequency analysis, we perceive as expected consequently, that the number of appearances of risk is lower when we have all the identified risk factors (black line) and higher to the case that there we have an absence of the identification factors of risk. The interpretation of this is that there is a tendency from the companies to avoid seeing all the risk factors. It is obvious then that C.C.T. should take as more as possible risk factors to their taxation methods, for a reliable risk assessment. Consequently, the enterprises should identify which risks exist in their cases. However, if there is no identification of any risk maybe that could mean a lack of risk assessment by the C.C.T. showing that is not accomplished the regular risk analysis. Thereupon, have been used the outliers of the values as they define the limits between the other internal gradual values, allowing to extract the appropriate conclusions, about the model.

5. Conclusions

Through this paper has clarified the identification of risk that C.C.T.s have to their business activities. It is obvious that when these companies identify the risks are able to apply their tax methodologies in a secure way. The reliability risk analysis is important for the determination of the profits and losses. Thence, enterprises should consider to their risk assessments all the plausible economic hazards which come from the market risks, the hazard risks, the business activities risks, the operational risks, the collection risks, the financial risks, the entrepreneurial risks, the regional risks, the transactional risks, and the product risks.

We conclude from this scientific work that these risk parameters are giving to the risk that the companies estimate to their risk assessment, a gradual form different from the binary logic form which pends on the existence or the nonexistence, meaning the zero value or the one value. This means that the risk factor could take a gradual magnitude which covers values between zero and one. The value of zero as showed above that defines if the companies are in the ideal position to do not have any risk, and the value of one means that the companies have included the full risk parameters. Should be mentioned that the risk parameters are equally separated between them. The thing is that these parameters of the risk, take the values of zero or of 0.1, with the interpretation of this to be that the zero shows no risk factor, and the value of 0.1 to mean that the risk parameter exists. The aggregate value of risk, when are used all the risk parameters, has the value one, as there used ten risk parameters, for the scrutiny of the prior sections.

The identification of risks is defined between those factors, which are the most critical parameters of the average risk. The maximum rate of risk receives the value one as shown in the prior figures, where the companies of controlled transactions estimating all the parameters of the riks and considering that all the risks exist. Moreover, that case showed that the companies of controlled transactions, when they identify these risk parameters decline their activities. On the other hand, has been showed the case where the contractual terms between the companies exist, and the comparability rate also is there as the C.C.T.s should consider to their business plan analysis the methodology that they must follow to be compatible with the arm's length principle.

To the work " The Role of Risk to the International Controlled Transactions" (Challoumis, 2018) has been following the same skeptic, but the main difference was that there no gradual values have been used for the reasoning of the risk assessment. There the procedure was more closely to the concept of the binary logic where only two plausible cases were for the risk, the zero value, and the value of one, without to be plausible to use intermediate values with a specific determination, as to the case of this paper, where the risk factors have clarified accordingly. Inasmuch as the aim in this thesis is the correspondence of certain risks for the identification of overall risk. Thence, the companies must identify the market risks, because of the currency risks, the commodity risks, and the interest rate which cause fluctuations to the market risk analysis, putting

in economic danger the decisions of the companies of controlled transactions. The operational risks are connected with the human factor where is difficult to avoid, as the ideal case is far away from the reality because the economic environment persistingly changes. The hazard risks which are about the external influences of the economy are able to increase the risk of the enterprises. Moreover, financial deposits and similar factors could be made higher the risk factor. The regional risks are connected precisely with the choice of the C.C.T.s about the countries which are engaged to their controlled transactions. In addition, the capital investments are affiliated with the entrepreneurial risks, having an impact on the overall risk of the companies. The terms of payments between the companies cause the transactional risks, and the same time the credits administration has an impact on the collection risks. The property of the enterprises of controlled transactions affect the general business risk and simultaneously the production of the goods also includes its own hazard which is about the production risk factor. Forasmuch as these series of risk factors determine the overall risk of the C.C.T.s deriving to an appropriate risk assessment if they are analyzed adequately by these companies.

Thereupon, this thesis clarifies with accuracy the overall risk which has to be estimated by the companies of controlled transactions. The risk factors define this risk and show to the companies of controlled transactions if they are able to proceed to their international economic controlled activities. A central role has a gradual risk analysis, as the series of these risk factors define the special attributes of the risk assessment. The concept is that thought the gradual determination of the risk is plausible to have an accurate perception about the characteristics of the risk. Thence, we obtain that the complete risk impact is a safe guide for these companies, but contemporaneously this makes them be more moderate to their activities, as the identification of the risks makes them be more careful to their decisions.

References

1. *Boland, L. A. (1991). The Methodology of Economic Model Building. London and New York: Routledge.*
2. *Challoumis C. (2017). Quantification of Everything (A Methodology for Quantification of Quality Data with Application and to Social and Theoretical Sciences). SSRN.*
3. *Challoumis C. (2018). Arm's Length Principle and Fix Length Principle Mathematical Approach. Retrieved from SSRN: Challoumis, Constantinos, Arm's Length Principle and Fix Length Principle Mathematical Approach (March 23, 2018). Available at SSRN: https://ssrn.com/abstract=3148276 or http://dx.doi.org/10.2139/ssrn.3148276*
4. *Challoumis C. (2018). Fuzzy Logic Concepts in Economics. Retrieved from SSRN: Challoumis, Constantinos, Fuzzy Logic Concepts in Economics (June 4, 2015). Available at SSRN: https://ssrn.com/abstract=3185732 or http://dx.doi.org/10.2139/ssrn.3185732*
5. *Challoumis C. (2018). Methods of Controlled Transactions and the Behavior of Companies According to the Public and Tax Policy. ECONOMICS, De Gruyter, Sciendo, 6(1)(ECONOMICS, 6(1), 33-43. doi: https://doi.org/10.2478/eoik-2018-0003), 33-43.*
6. *Challoumis, C. (2018) The Role of Risk to the International Controlled Transactions. Annals of "Dunarea de Jos" University of Galati Fascicle I. Economics and Applied Informatics no3.*
7. *Feinschreiber, R. (2004). Transfer pricing Methods An Application Guide. new Jersey: John Wiley&Sons.*
8. *Investopedia LLC. (2018). Retrieved from Investopedia: https://www.investopedia.com/terms/m/marketrisk.asp*
9. *Investopedia LLC. (2018). Retrieved from Investopedia: https://www.investopedia.com/terms/o/operational_risk.asp*
10. *Meier, B. D., & Rosenbaum, D. T. (2000). Making single mothers work: Recent tax and welfare policy and its effects. 53 (4).*
11. *OECD. (2001). Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations. Paris: OECD.*
12. *OECD. (2017). OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations. Paris: OECD Publishing.*
13. *Timothy, R. J. (2010). Fuzzy Logic with engineering applications.*
14. *United Nations. (2013). Practical Manual on Transfer Pricing for Developing Countries. New York: United Nations Department of Economic & Social Affairs.*
15. *Wilson, J. D. (1986). A theory of interregional tax competition journal of Urban Economics. 19 (3) pp.296-315.*
16. *Zax, J. S. (1988). Fringe benefits, income tax exemptions, and implicit subsidies. Journal of Public Economics, 171-183.*