A nemzetközi IT szektorban felmerülő pénzügyi kockázatok a nemzeti kultúra függvényében

Financial risks in the international IT sector as a function of national culture

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Abstract
The subject of the study is the culture-dependent characteristics of management of financial risks in the international IT market. The research aims to examine the hypothesis whether there is a relationship between IT foreign trade and national culture types at the global level. The study analyses countries' IT statistics derived from the World Bank database, depending on Hofstede's national cultural differences. Time series and relationship analyses are applied. Finally, the culture-dependent nature of risk management is examined as a case study for a global IT distributor, focusing in its Central Eastern European region.

Keywords: global IT sector, national cultures, financial risks, quantitative analyzes, Central and Eastern Europe

Absztrakt
A tanulmány tárgyát a nemzetközi IT piacon felmerülő pénzügyi kockázatok kezelésének kultúrafüggő karakterisztikája képezi. A kutatás célja annak a hipotézisnek a vizsgálata, hogy globális szinten kimutatható-e kapcsolat az IT külkereskedelem és a nemzeti kultúratípusok között. A kutatás először az IT szektor Világbanknál nyilvántartott statisztikáit elemzi az országok Hofstede szerinti kulturális különbözőségeinek függvényében. A kutatás módszerét leíró statisztikák, idősor- és kapcsolatvizsgálatok képezik. Ezt követően esettanulmány keretében vizsgálja egy globális IT disztribútor vállalat közép-kelet-európai régiójában a kockázatok kezelésének kultúrafüggő mivoltát.

Kulcsszavak: globális IT szektor, nemzeti kultúra, pénzügyi kockázatok, kvantitatív elemzések, Közép-Kelet-Európa

INTRODUCTION

The subject of the study was an IT distributor in Central and Eastern European region and the financial risk management of this company. Our research question focused on whether this is influenced by the differences in national culture.

Our motivation came from several sources. First, more and more news about risks has published since the crisis in 2008. For example, the following news came from Hungary last year, according to which: "there is still room for improving our risk management"[2], or

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[2] Source: http://www.piacesprofit.hu/kkv_cegblog/kockazatkezeles-meg-van-hova-fejlodni/. The news came out 4 July 2017 [25 May 2018]

„Hungary is still a medium-risk investment target"[3]. On the other hand, there are more and more companies specializing in risk management consulting, and gaining a lot of profit (e.g. the worldwide known Deloitte consulting company).
Not only did the daily news multiply after the crisis, but also the literature. Table 1 shows the Google Scholar results for some types of risks before and after the crisis. During the 9 years since the crisis, the number of technical literature has doubled on average compared to the 9 years prior to the crisis. Among the searched expressions the term 'financial risk' has increased most.

Table 1. Google Scholar results for some types of risks

Searched expression	Years		Growth rate: $\frac{2009-2017}{1999-2007}$
	9: 1999-2007	9: 2009-2017	
„country risk"	13 800	17 400	1.26
„currency risk"	8 270	16 600	2.00
„exchange risk"	9 770	16 500	1.69
„liquidity risk"	9 390	22 800	2.08
„credit risk"	22 300	51 100	2.29
„financial risk"	28 900	75 900	2.63

Source: own editing based on Google Scholar results https://scholar.google.hu/ [11 May 2018]

LITERATURE REVIEW

The study focuses on the IT sector, financial risks and national cultures. This chapter deals with the latter two. We have to distinguish the risk from the uncertainty and threats (See Table 2). The concept of risk is based on the probabilities of occurrences of events. In order to calculate the risk, these probabilities must be known. There is a further criterion for risk according to Knight (1921), the fact that it is not possible to know exactly what will happen. (If neither the event nor the probability of it is known, it is called uncertainty). According to Pálmai-Pallag (2017), the risk does not necessarily have a negative impact. (Negative impact defines threats.)

Table 2. Definitions: risk, uncertainty, threats

	Are the probabilities of occurrences known?	
	yes	no
Not possible to know exactly what will happen (Knight, 1921)	risk	uncertainty
by Pálmai-Pallag (2017)	Is there a negative impact?	
	not necessarily	yes
	risk	threats

Source: own editing based on Knight (1921) and Pálmai-Pallag (2017)

[3] Source: http://www.origo.hu/gazdasag/20170612-negyedeves-europai-befektetesi-felmeres.html. The news was released on 12 June 2017 [25 May 2018]

National culture has several definitions, for example, it is „the shared values and assumptions held by individuals within the nations" (Ford et al., 2009), or „Reflects the shared cultural meaning system of members of a certain country." (Fila – Wilson, 2018) There are several models of national culture, for example, models of Kluckhohn (1951), Kluckhohn and Stodtberck (1961), Hall (1977, 1981), Hofstede (1980), Hofstede et al. (2010), Adler (1991), Trompenaars and Hampden-Turner (2002).

The Hofstede model is the only one, which is quantified, thus his model was applied by us. This model evaluates the countries according to the following 6 dimensions (with two opposite extremes): Power Distance (high or low), Individualism (individualistic or collectivistic countries), Masculinity (masculine or feminine cultures), Uncertainty Avoidance (high or low), Long Term Orientation (long or short term orientated cultures) and Indulgence (indulgent or restraint societies).

What are the characteristics of the ends of these dimensions? Low values of these dimensions mean a society which "strives to equalize the distribution of power" (low power distance), "individuals can expect their relatives or members of a particular ingroup to look after them"

Individualism (low individualism, i.e. collectivism), prefers "cooperation, modesty, caring for the weak and quality of life" (low masculinity, i.e. feminine culture), doesn't „maintain rigid codes of belief and behavior", but „more relaxed attitude" (low uncertainty avoidance), focuses on the past, instead of the „challenges of the present and the future" (low long-term orientation, i.e. short-term orientated society). High values of the dimensions mean opposite of the above mentioned. (Hofstede Insights, 2018a)

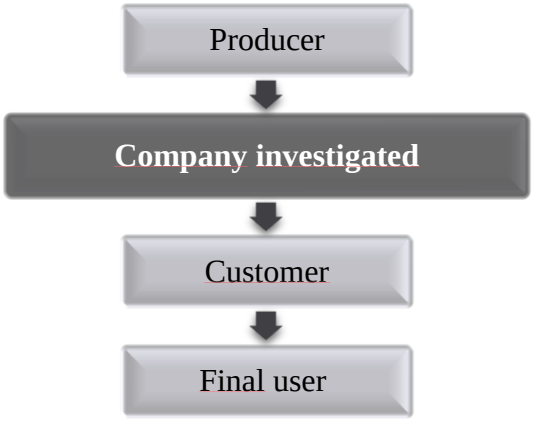
THE COMPANY INVESTIGATED

The two sub-section of this section presents the basic information of the company (1), then its risk management (2).

1. INTRODUCING THE COMPANY

The IT distributor examined can be found on 6 continents out of 7, it operations in 54 countries, sales in 160 countries, it has 154 logistics centers, it is listed among the top 10 global shippers, handles 1 out of 3 mobile devices in the United States. The company investigated is in the supply chain between the producers and customers (see Figure 1).

Figure 1. The location of the company investigated in the supply chain



Source: own editing

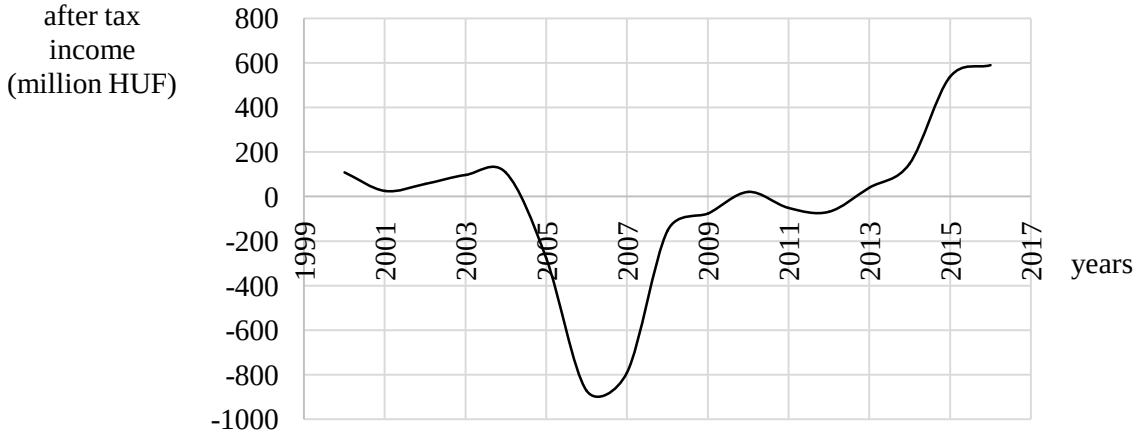
The Central and Eastern European (CEE) region of the distributor investigated consists of 10 countries marked with a dark background in Figure 2.

Figure 2. The countries of Central and Eastern European region

Source: own editing with https://mapchart.net/europe.html

The information about the income of the company was gathering by us from the official webpage of Hungarian companies' annual reports (E-beszámoló, 2018). The company's after-tax income has been increasing since 2007 (see Figure 3). This income reached 600 million Forint (HUF) in 2016. The decrease in 2006 and 2007 was caused by the introduction of new software.

Figure 3. After-tax income of the company investigated, 2000-2016



Source: own editing based on E-beszámoló (2018)

It is important for the company to know the credit ratings of their partner countries in the CEE region. Table 3 summarizes the credit ratings of 10 countries considering the year 2018 by Standard and Poor's and the Moody's. Both organizations rated each country as A or B (Macedonia is not reviewed by Moody's). Within these A and B categories, Standard and

Poor's applies the following ratings from the best to worst: AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-, BB+, BB, BB-, B+, B, B-. Moody's uses a slightly different classification from the best to worst: Aaa, Aa, A, Baa, Ba, B. „Moody's appends numerical modifiers 1, 2, and 3 to each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category, the modifier 2 indicates a mid-range ranking, and the modifier 3 indicates a ranking in the lower end of that generic rating category." (Emery, 2018). According to Standard and Poor's and also the Moody's: the Czech Republic is the best partner, and Albania is the worst.

Table 3. Credit ratings of the 10 countries, 2018

	Countries	Credit ratings by	
		STANDARD &POOR'S	MOODY'S
1	Albania	B+	B1
2	Czech Rep.	AA-	A1
3	Croatia	BB+	Ba2
4	Poland	BBB+	A2
5	Hungary	BBB-	Baa3
6	Macedonia	BB-	N/A
7	Romania	BBB-	Baa3
8	Serbia	BB	Ba3
9	Slovakia	A+	A2
10	Slovenia	A+	Baa1

Source: own editing based on Trading Economics (2018)

2. RISK MANAGEMENT OF THE COMPANY

This sub-section is based on an interview with an employee of the company.

The risk management of the company is based on several pillars, depending on the type of risk. Treating exchange rate risk and credit risk are the most relevant types of risk management. Because USD means the functional currency, the Accounts Receivable team starts the covering of the exposure with the central treasury department. The credit risk management is realized in several forms, as credit insurance, claim assignment, escrow account, corporate guarantee, other corporate guarantee and personal guarantee. The approval matrix ensures that the appropriate person deals with the given case.

In the CEE region, there are slight differences between the countries from the risk management point of view. There are two differentiated groups within the region, where risk management has a different status. The first group includes countries in the southern part of the region i.e. Croatia, Serbia, Albania, Macedonia, Slovenia and Romania. In these countries, risk management is not in the focus of the business. The foreign-exchange (FX) risk is hardly manageable in case of countries outside the European Union. There are different regulations regarding the financials. Also, the financial market is still underdeveloped, so there is a lack of financial instruments for FX risk management. The company is facing the highest level of credit risk in the southern part of the region. One key issue is that in a lot of cases the written contracts are missing. Gentleman agreement is still working in these countries. This means risk in a legal case because there is no legal base to get back the company's money. In that group of countries, credit insurance is not a common practice. Deals are not insured because insurance costs for the company and there are only a few credit insurers on the market.

Countries in the northern part of the region like Czech Republic, Poland, Hungary and Slovakia are focusing more on risk management. FX risk management is easier because these countries are within the EU where financial instruments exist on the market to hedge deals. Credit insurance is a daily practice in these countries. The risk appetite of credit insurers is greater on these markets. Importance of written contracts and agreements are higher. There are strict policies for each type of risk management.

DATA, METHODOLOGY

The research is based on 2 online secondary data sources and own risk management experiences with the company.

The data about IT sector derives from the World Development Indicators of World Bank (2018), which contains more than one thousand five hundred annual indicators about 217 countries from the year 1960 until today. We analyze the 10 countries of the CEE region of the company. Four ICT indicators are available for the last 10 years (2008-2017):

- ICT goods exports (% of total goods exports)
- ICT service exports (% of service exports)
- ICT service exports (current US$)
- ICT goods imports (% total goods imports)

The data about national culture derives from the organization „Hofstede Insights" (2018b). The Hofstede model has 6 dimensions: Power Distance, Individualism, Masculinity, Uncertainty Avoidance, Long Term Orientation and Indulgence. Each dimension is measured on a 0-100 scale. Each country – except Macedonia – has a point between 0 and 100.

Our analyses are interpreted at a 5% significance level. Relationship analyses (rank correlations) were applied as the method of our examinations. The relationships between the ranks of indicators above were examined with Spearman's rank correlation (Rho), which can be set at interval [-1, 1]. This Rho value can be interpreted if its associated p (Sig.) value is less than 0.05. In this case, the strength of the relationship can be assessed on the basis of the absolute value of the Rho: below 0.4 means weak relationship, above 0.7 means strong relationship.

RESULTS

Table 4 summarizes the results of Spearman's rank correlations between the dimensions of national culture and ICT indicators.

Table 4. Results – Spearman's Rho rank correlation

Hofstede's dimensions	ICT			
	goods		service	
	exports	imports	exports	
	of total goods		of service exports	current US$
	exports	imports		
Power Distance	-0.294	-0.375	-0.051	-0.534
Individualism	0.840	0.859	0.182	0.790
Masculinity	0.511	0.512	-0.047	0.150
Uncertainty Avoidance	-0.179	-0.198	0.557	0.375
Long Ter	0.331	0.368	-0.291	-0.208
Indulgenc	0.160	0.135	-0.246	0.168

The strongest relationships

Notations: not significant at level 0.05

the relationship by its strength:	|Rho| ∈
weak	[0 – 0.4[
moderately strong	[0.4 – 0.7[
strong	[0.7 – 1]

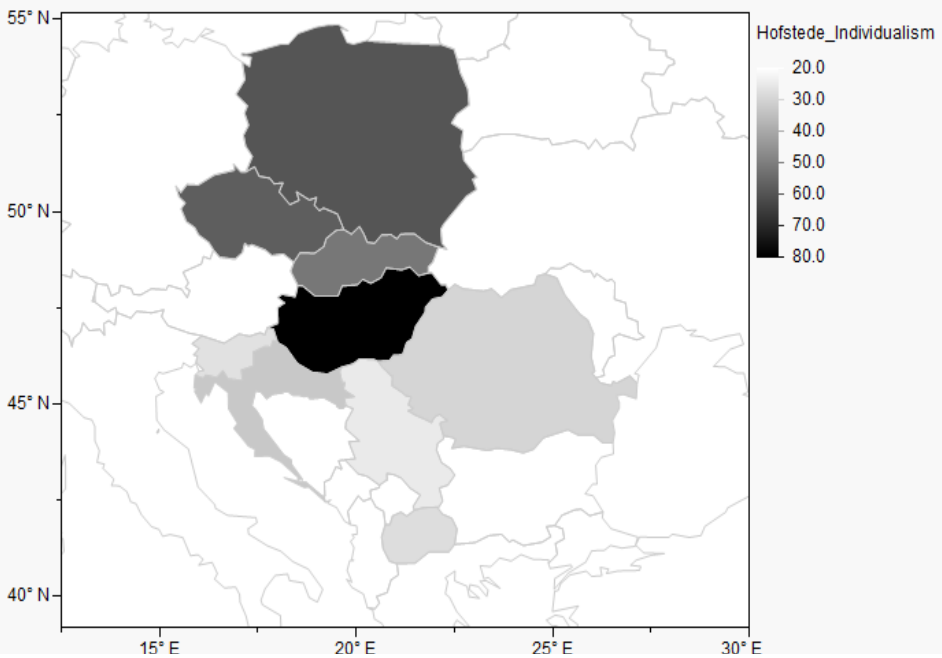
Source: own research

The crossed-out cells of this matrix sign the not significant results at the level of 0.05. The remaining cells are colored with grey. The darker the grey, the stronger the relationship. It is interesting, that all of the 3 biggest Rho are related to the individualism dimension of Hofstede. It means that the more individual a country is,

- the higher the proportion of ICT goods exports and imports of total goods export or import are
- the higher the service exports in current USD.

Figure 4 colored countries by individualism score. Black means the highest scored individualistic countries, where the term „I" is more important than „we". Light grey means the low scored collectivist countries, where the term „we" is more important than „I". It is interesting, that Hungary could be mentioned as the most outlier country out of the examined 10 because Hungary is extremely individualistic between them.

Figure 4. Map of 10 countries by their individualism score



Source: own editing with software JuMP based on data of Hofstede Insights (2018b)

The experiences gained during negotiations in these countries shows that in collectivist countries (i.e. less individualistic countries, like the states south from Hungary) it is easier to work together as a team. In more individualistic countries it is difficult to implement an approval matrix or process because people want to make decisions on their own, they want more "freedom". However it means that risk management is working better, the company has to invest less effort in risk management in more individualistic countries.

Power distance has a negative relationship with the rate of ICT goods export and import (weak relationships), and ICT service export measured in current USD (medium strong relationship). It means bigger (lower) power distance in a country results in lower (bigger) ICT indicators mentioned in the previous sentence. The power distance score (measured in scale 0-100) of countries by Hofstede are the following: Hungary (46), Czech Republic (57), Poland (68), Slovenia (71), Croatia (73), Serbia (86), Romania (90), Albania (90) Slovakia (100).
Everyday experience shows more efficient work with countries having lower power distance (Hungary, Czech Republic, Poland), thus the risk management requires less investment and effort.

CONCLUSION

The subject of the study was the Central and Eastern European region of an IT distributor and the financial risk management of this company. Our research question focused on whether this is influenced by the differences in national culture. The results showed that all dimensions of national culture by Hofstede have a significant relationship with at least 1 of the 4 indicators considered (foreign trade data on ICT goods and services).
The results of rank correlation show the strongest relationship in connection with individualism dimension of national culture. More individual a country is,

- the higher the proportion of ICT goods exports and imports of total goods export or import
- the higher the service exports in current USD.

REFERENCES

Adler, N. J. (1991) *International Dimensions of Organizational Behavior* (2nd ed.). PWS-Kent Publishing Co., Boston.

E-beszámoló (2018) *Income statements of the company investigated, 2000-2016*. http://e-beszamolo.im.gov.hu/oldal/kezdolap Downloaded: 10. 02. 2018.

Emery, K. (2017) *Rating Symbols and Definitions. Moody's Investors Service*. Moody's Investors Service. https://www.moodys.com/researchdocumentcontentpage.aspx?docid=PBC_79004 Downloaded: 02. 06. 2018.

Fila, M. J. – Wilson, M. S (2018) Understanding Cross-Cultural Differences in the Work Stress Process. In: Maheshkar, C. – Sharma, V. (eds.): *Handbook of Research on Cross-Cultural Business Education*. IGI Global, Hershey, PA. pp. 224-249.

Ford, D. P. – Conelly, C. E. – Meister, D. B. (2009) Hofstede's Dimensions of National Culture in IS Research. In: Dwivedi, Y. K. – Lal, B. – Williams, M. D. – Schneberger, S. L. – Wade, M. (eds.): *Handbook of Research on Contemporary Theoretical Models in Information Systems*. IGI Global, Hershey, PA. pp. 455-481.

Hall, E. T. (1977) *Beyond Culture.* Anchor Press, Doubleday, New York

Hall, E. T. (1981) *The Silent Language.* Anchor Press, New York.

Hofstede Insights (2018a) *The 6 dimensions of national culture.* https://www.hofstede-insights.com/models/national-culture/ Downloaded: 12. 05. 2018.

Hofstede Insights (2018b) *Country comparison tool*. https://www.hofstede-insights.com/ Downloaded: 15. 05. 2018.

Hofstede, G. (1980) *Culture's consequences: International differences in work-related values.* CA: Sabe Publications, London and Beverly Hills.

Hofstede, G., Hosfstede, G. J., & Minkov, M., (2010) *Cultures and Organizations: Software of the Mind.* McGraw-Hill, New York.

Kluckhohn, C. K. (1951) Values and Value Orientations in the Theory of Action. In: Parsons, T. – Shils, E. A. (eds.): *Toward a General Theory of Action.* Harvard University Press, Cambridge, Massachusetts. pp. 388-433.

Kluckhohn, F. R. – Strodtbeck, F. L. (1961) *Variations in Value Orientations.* HarperCollins, New York.

Knight, F. H. (1921) *Risk Uncertainty, and Profit.* Hart, Schaffner & Marx; Houghton Mifflin Co, Boston, Massachusetts.

Pálmai-Pallag D. (2017) *Kockázatok azonosítása és kezelése a bizalmi vagyonkezelőnél*. https://www.step.org/sites/default/files/Branches/hungary/2017/014_Prezi_David_STEP_170427_050517.ppt Downloaded: 12. 02. 2018.

Trading Economics (2018) *Credit Rating of countries*. https://tradingeconomics.com/country-list/rating Downloaded: 20. 03. 2018.

Trompenaars, F. – Hampden-Turner, C. (2002) *Riding the waves of culture: Understanding diversity in global business*. Nicholas Brealey Publishing. London.

World Bank (2018) *ICT indicators and*. http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators&preview=on# Downloaded: 20. 02. 2018.