EKA UNIVERSITY OF APPLIED SCIENCES

ECONOMICS AND CULTURE

Volume 16, Issue 2

Riga, 2019

Economics and Culture 2019, Volume 16, Issue 2

ISSN 2255-7563

e-ISSN 2256-0173

Publisher

SCIENDO

Bogumiła Zuga 32A Str.
01-811 Warsaw, Poland
T: +48 22 701 50 15

Table of Contents

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0018

REGIONAL LIMITATIONS OF STOCK INDICES PREDICTION MODELS BASED ON MACROECONOMIC VARIABLES

Tomas Sovijus Kvainickas[1], Jelena Stankevičienė[2]

[1,2]Department of Financial Engineering, Faculty of Business Management, Vilnius Gediminas Technical University, Saulėtekio al. 11, LT-10223 Vilnius, Lithuania
Email: [1] tomas-sovijus.kvainickas@stud.vgtu.lt ,[2]jelena.stankeviciene@vgtu.lt

Abstract

Research purpose. Stocks as well as other securities are a crucial part of the financial market that helps to redistribute financial resources amongst market participants, which in a modern economy include not only professional stock players but also many common individuals seeking to increase their capital. Previous studies found a strong relationship between the macroeconomic variables and stock returns but often the explanatory power of those models seems to be limited in the applicable region. The aim of this article is to establish whether each region's stock indices have to be predicted based on a separate set of variables.

Design / Methodology / Approach. The article uses correlation–regression analysis method to confirm the initial hypothesis regarding regional limitations of such prediction models.

Findings. The same set of independent variables cannot be directly applied to different regions because although the chosen Y2B model did provide an accurate relationship between macroeconomic variables and stock indices in the United Kingdom, it failed to provide accurate (usable) results in other regions (Estonia, European Union, France, Germany, Latvia and Lithuania),

Originality / Value / Practical implications. The results are important in order to define the way that the smaller and less-researched economies should be examined because detailed researches of power economies such as the United States, the United Kingdom, China or Germany often cannot be directly applied outside the initial research region. Therefore, the need of separate studies for smaller regions such as Baltic States is confirmed.

Keywords: stock indices, macroeconomic variables, prediction, relationship, correlation – regression analysis.

JEL codes: G15; C53.

Introduction

Many authors (Ouma & Muriu, 2014, Gjerde & Sættem, 1999, Chen, 2008, Laichena & Obwogi, 2015, Larsson & Haq, 2016, Flannery & Protopapadakis, 2002, Wongbangpo & Sharma, 2002, Benaković & Posedel, 2010; N.-F. Chen et al., 1986, Cheung & Ng, 1998, Marcišauskienė & Cibulskienė, 2013) found a strong relationship between the macroeconomic variables and stock returns but often the explanatory power of results is limited both in their regional application. Furthermore, there is only a limited number of studies performed on the Baltic States, which leaves much to be desired in order to prevent possible financial loss because of the lack of predictive models available because most of the previous studies are focused on the United States, United Kingdom, Germany, Japan or other large markets as the size and short history of free market in the Baltic States both restricts the depth of the analysis of the relationship between the stock market and macroeconomic variables and might not be considered important enough to analyse, which only increases the demand for such study as the Baltic States, since the very first day of reclaiming their independence strived to integrate with the western world and their claims, have been best illustrated by joining the North Atlantic Treaty Organization (NATO), the European Union, Euro zone, the Organisation for Economic Co-operation and Development (OECD) and so on. Therefore, though economically insignificant, these markets carry the heavy weight of the transition from planned to free market economy.

This article aims to solve the problem whether there are regional limitations of stock indices prediction models based on macroeconomic variables. Research objects of this article are macroeconomic variables, stock returns and their relationship, because the aim of the paper is to test the ability of stock indices prediction models based on the same set of variables to explain the relationship between macroeconomic variables and stock indices in different regions and time periods.

Tasks:

1. Review scientific researches regarding the nature of relationship between macroeconomic variables and stock returns in order to identify the statistically important indicators and establish the initial hypothesis for further research.
2. Apply correlation and regression analysis methods to identify the limitations of selected set of variables by comparing the prediction power of created linear regressions in different countries.
3. Evaluate the need to the creation of region-specific stock indices prediction models for smaller economies.

The remainder of the article is organised as follows:

- Section 0 presents a brief background of previously attempted researches regarding the relationship of macroeconomic variables and stock indices in various regions.
- Section 0 Methodology provides the methodology used in the article;
- Section 0 presents the statistics of applied linear regression calculation;
- The final section provides the conclusions.

It is important to notice that the aim of this article is not to create a high-accuracy prediction model that would be suitable for different regions and different types of market indexes and to establish whether one model can be reused for different regions and or market indexes and the described relationship model is provided just to make an example of such limitations.

Literature review

The study on the relationship between macroeconomic variables and stock returns was begun in the middle of the past century and one of the most influential works regarding stock returns and their correlation with macroeconomic variables was written by Fama and Schwert (1977). In their study, the authors analysed the 1953–1971 period in which they discovered that the US government bonds and bills and private residential real estate were highly immune to expected inflation. Labour income showed little short-term relationship with either expected or unexpected inflation, but the most anomalous result was that common stock returns were negatively related to the expected component of the inflation rate and, probably, also to the unexpected component. A decade later, Chen et al. (1986) tested the multifactor model in the United States by using seven macroeconomic variables and found that consumer consumption and oil prices did not have significant impact on stock returns that is mostly influenced by industrial production, changes in risk premium and twists in the yield curve.

The scope of research has broadened and one of such examples is Cheung and Ng (1998) who focused their attention not only on the United States but also on Canada, Germany, Italy and Japan to investigate the relationship between stock prices and such macroeconomic variables as gross national product, money supply, consumption and oil prices by using Johansen co-integration technique. They established a mutual relationship between stock market prices and macroeconomic indicators. They found that index returns were typically related to transitory deviations from the long-run relationship and to changes in the macroeconomic indicators. Furthermore, the constraints implied by the co-integration results yielded some incremental information on stock return variation that is not already contained in dividend yields, interest rate spreads and future GNP (growth national product) growth rates.

Gjerde and Saettem (1999) examined the causal relation between stock returns and macroeconomic variables in Norway by using both global and local macroeconomic data. The results showed a positive linkage between oil price and real economic activity and stock returns, although the study failed to show a significant relation between stock returns and inflation. They also stated that consistent with the US

and Japanese findings, real interest rate changes affected both stock returns and inflation, and the stock market responded accurately to oil price changes; however, stock market showed a delayed response to changes in domestic real activity.

Flannery and Aris (2002) re-evaluated the effect of macro announcement series on the US stock returns. They found that three nominal factors (consumer price index [CPI], producer price index [PPI] and a Monetary Aggregate) and three real factors (balance of trade, housing starts, employment reports) seemed to affect stock returns but real GNP and industrial production did not seem to be related to stock returns. They used GARCH (generalized autoregressive conditional heteroscedasticity) model of daily equity returns, where realised returns and their conditional volatility depend on 17 macro series announcements.

Wongbangpo and Sharma (2002) investigated the relationship between stock prices and some macroeconomic factors (GNP, CPI, money supply, interest rate and exchange rate) in Indonesia, Malaysia, Philippines, Singapore and Thailand. The results suggested that stock prices were positively related to growth in output in the long run and in the short run, stock prices were found to be the functions of past and current values of macroeconomic variables, decent government economic or financial policies can yield considerable gains in stock market.

Ibrahim and Aziz (2003) investigated the relationship between stock prices and industrial production, money supply, consumer price index and exchange rate in Malaysia. They discovered that the relationship was the most obvious during long run. They also stated that CPI and industrial production had a positive effect, whereas money supply and exchange rate had a negative association.

Kandir (2008) investigated the role of macroeconomic factors in explaining Turkish stock returns. A macroeconomic factor model was used for the period that spans from July 1997 to June 2005. This study used data from all non-financial firms listed on the ISE (Istanbul Stock Exchange), although it was based on stock portfolios rather than on single stocks. A multiple regression model was designed to test the relationship between the stock portfolio returns and seven macroeconomic factors (growth rate of industrial production index, change in consumer price index, growth rate of narrowly defined money supply, change in exchange rate, interest rate, growth rate of international crude oil price and return on the MSCI World Equity Index). The study revealed that the exchange rate (tourism and foreign trade), interest rate (alternative investment options) and world market return (ISE movement towards global integration) seem to affect all of the portfolio returns, whereas inflation rate (results inconclusive) was significant only for 3 of the 12 inspected portfolios. On the other hand, industrial production (asks for debate about the well-functioning of Turkish financial markets), money supply and oil prices (despite Turkey being net importer) did not appear to have any significant effect on stock returns.

Chen (2008) investigated whether macroeconomic variables can predict recessions in the stock market of the United States by using the Markov-switching model to identify the recession periods in the stock market. The study suggested that amongst the macroeconomic variables that were considered, yield curve spreads and inflation rates were the most useful predictors of Bear Stock Markets according to in-sample and out-of-sample forecasting performances.

Humpe and Macmillan (2009) examined whether industrial production, CPI, money supply and long-term interest rates affected the stock markets in the United States and Japan. The data showed the US stock prices were positively related to industrial production (relation significant) and money supply (relation insignificant) and negatively related to both the consumer price index and a long-term interest rate (both factors significant) within single co-integrating vector. Japan seems to have had two vectors; in one, price was influenced positively by industrial production and negatively by the money supply, and in the second, industrial production was negatively influenced by the consumer price index and a long-term interest rate.

Benaković and Posedel (2010) analysed the returns on 14 stocks on Zagreb market during 2004–2009 in relationship with inflation, industrial production, interest rates, market index and oil prices as factors by investigating both the direction and strength of the relation between the change in factors and returns. The calculation results showed that the market index had the largest statistical significance for all stocks and a positive relation to returns. Interest rates, oil prices and industrial production also marked a positive relation to returns, whereas inflation had a negative influence. Furthermore, cross-sectional

regression with the estimated sensitivities used as independent variables and returns in each month as dependent variables was performed, which resulted in time series of risk premiums for each factor. The most important factor affecting stock prices was proved to be the market index, which had a positive risk premium. Inflation was also a statistically significant factor in 2004 and 2008, marking a negative risk premium in 2004 and a positive one in 2008. The remaining three factors were not significant. The authors stated that stock prices are greatly affected by investors' expectations, so they respond very quickly to any publicly disclosed information, for example, economic or political news. For that reason, they suggested that when analysing influences on stock prices, whenever it is possible, it would be better to use indicators that measure changes in expectations about future values of macroeconomic factors, for instance, changes in expected inflation or economic activity, instead of indicators measuring the changes in realisations of macroeconomic variables.

Laichena and Obwogi (2015) analysed the East African stock market that includes all the member countries of the East African Community (in this case Kenya, Uganda and Tanzania), which tend to make effort towards integration in numerous aspects including common currency during 2005–2014. This study sought to find out the effects of interest rate, inflation rate, exchange rate and gross domestic product (GDP) on stock returns. Descriptive analysis and panel data regression analysis were applied in the study, and it was found that interest rate had a negative impact, inflation rate that was also associated with the increase in money supply had a positive significant relationship, exchange rate (applied to USD) had an inverse significant relationship and GDP had a positive significant relationship with the East Africa stock market.

Peiró (2016) analysed the dependence of stock prices on macroeconomic variables in the three largest European economies: France, Germany and the United Kingdom. According to the author in the recent decades, industrial production and long-term interest rates were the important significant variables accounting for approximately one half of annual movements in stock prices. Both factors seem to be equally important, but a closer examination revealed that the weight of these factors had clearly moved from interest rates to production. This evidence is common to all three of these European countries and is in sharp contrast with the results for the United States.

Gilbert (2011) showed that there exists an empirical relation between stock returns on macroeconomic news announcement days and the future revisions of the released data but that this link differs across the business cycle. The author analysed news regarding nonfarm payroll, GDP and industrial production and stated that stock prices positively react to this news during expansion period and negatively during recession. Gilbert also noted that revisions matter and the investors care not only about initial macroeconomic announcements but also about the confirmations of such news. The results seem to be consistent with the predictions of rational expectations trading models around public announcements combined with well-established empirical results on the asymmetric interpretation of information across the business cycle.

Larsson and Haq (2016) investigated the short- and long-run relationship between the S&P500 and macroeconomic indicators (personal spending, initial jobless claims, money supply, building permits, Michigan Consumers Sentiment index and the ISM (Institute for Supply Management) manufacturing index) during 2000–2016 using the autoregressive distributed lags model (ARDL). The study stated that all indicators except personal spending were significant in the long-run on the one-percent level, in at least one time regime. All indicators had significant results also in the short run except the money supply, depending on which time period was under investigation. They concluded that indicators had different characteristics depending on the current dynamics of the stock market, economic state and other related markets. Moreover, it was noted that the development of the variable was more important than its value at specific data point.

Boreika and Pilinkus (2009) applied correlation method to identify the statistical relationship between macroeconomic variables and stock market (OMX Vilnius). They stated that inflation caused by increasing oil and food prices had a negative effect on consumer consumption that had a negative effect on business expansion and that real estate market was the first one to be hit by global financial crisis because of restrictions on house loans and higher interest rates. They observed a strong relationship

amongst GDP, money supply, unemployment, personal consumption and construction price index and stock market prices.

Bareikienė and Sūdžius (2011) aimed to evaluate the impact of financial crisis of 2007–2008 on the Lithuanian stock market because after this crunch, lots of investors started to doubt about the reliability of stock market. The data of 2003–2010 were analysed and the study showed that the global crisis made the biggest impact on OMX Vilnius during 2008 when the GDP started to shrink, which shows that stock markets are more volatile than the common macroeconomic variables. Real GDP, inflation and interest rate were considered. The study also found that decrease and increase periods had similar total changes to the stock prices, but the decrease periods were longer; therefore, the investors had more time to sell their stocks and buy obligations.

Koncevičienė and Janickaitė (2011) investigated the effect of macroeconomic factors in 2002–2011 on the stock returns of NASDAQ OMX Vilnius companies from different sectors (food production, beverages, gas, electricity, pharmaceutical, telecommunications, paper, personal goods, consumer products, retail, construction, transportation, chemicals, oil, banking and financial services). Industrial production, CPI, interest rates, money supply, inflation, exchange rates (LTL/USD, LTL/RUB) and European Brent oil prices were considered. The study also showed how cyclical stocks were more sensitive to changes in macroeconomic variables than defensive ones; oil price shocks had a stronger effect on sectors heavily dependent on oil; currency changes had a stronger influence on stock returns of sectors producing goods mainly for export. Moreover, studies showed that macroeconomic factors differently affect stock returns of different sectors and the impact depends on peculiarity of the country.

Marcišauskienė and Cibulskienė (2013) aimed to identify which macroeconomic indicators were influencing the Baltic stock prices by using multinomial regression model. They investigated the relationship between the macroeconomic indicators of the Baltic States and the OMX index by using the data for the first quarters of 2000–2012. The authors have identified a strong and direct relationship between OMXV and M1, OMXV and FDI (foreign direct investments); a moderate and direct relationship between OMXV and PPI (producer price index), OMXV and GDP per capita; a strong and direct relationship between OMXR and M1; and moderate and direct relationship between OMXR and GPD per capita. The OMXR relationship with HCPI (harmonized consumer price index), FDI and PPI was direct but weak. The multinomial regression model of Baltic Stock Exchanges indexes and macroeconomic variables of the analysed period indicated that both OMXV and OMXR indexes were affected by their previous values as well as GDP per capita and unemployment rate that also had a negative effect on both indexes. The OMXT index was affected by its previous value as well, but it was also affected by M1, government debt that had a negative effect on the OMXT.

Rudzkis and Valkavičienė (2014) examined the dependencies of individual sectoral stock price indices of OMX Baltic security market on macroeconomic indicators by constructing regression models with quarterly time series of 2000–2011. The authors concluded that OMX Baltic securities market was significantly impacted by dollar/euro exchange rate and gold and oil prices. Econometric analysis of OMX Baltic security market also proved the hypothesis that the set of macroeconomic regressors vary considerably depending on the individual sector's price indices, especially in the case of small open economy with immature stock markets. According to the authors, the linear regression models have a fairly high level of precision and provide additional opportunities for investors who are shaping their portfolio taking into account the macroeconomic forecasts but because of the shortness of the available time series, the influence of several factors on the models was not reflected, and the models should be expanded and updated in view of the new data accumulated by including not only macroeconomic indicators as factors that affect sectoral indices but also the statistical data of the respective economic activities, and in case of longer time series, one should apply a generalised least squares method.

Alexakis et al. (2016) examined the emerging stock market contagion during the Global Financial crisis and the Euro zone Sovereign Debt Crisis. They focused on the three emerging Baltic markets and developed European markets, proxied by the EUROSTOXX50 stock index. They explored asymmetric dynamic conditional correlation dynamics across stable and crisis periods. The study showed that Latvia and Lithuania were affected during global crisis and Estonia was mainly affected only by Euro zone crisis. The authors tend to believe that the results could be attributed to financial and macroeconomic

characteristics of the Baltic countries before and after the turmoil periods and the introduction time of the Euro as a national currency.

Ouma and Muriu (2014) analysed the impact of the macroeconomic variables on stock returns in Kenya during the period 2003–2013 using the arbitrage pricing theory (APT) and capital asset pricing model (CAPM) framework for monthly data. The ordinary least square (OLS) technique was applied to test the validity of the model and the relative importance of different variables that may have an impact on the stock returns. The analysis found that there existed a significant relation between stock market returns and money supply, exchange rates and inflation, whereas interest rates was not important in determining long rung run returns in the NSE (national stock exchange).

Jareño and Negrut (2016) in their study analysed relationship between the US stock market and GDP, CPI, industrial production index, the unemployment rate and long-term interest rates from which all factors except CPI showed significant relationships with the stock market. They claimed that the stock market can be conceived as a leading indicator of the real economy, because the market index tends to advance the behaviour of the economic cycle through a period of 6–12 months.

It should be noted that different authors used a wide variety of different calculation methods in order to establish the relationship between the macroeconomic variables and stock indices:

- APT (Ouma & Muriu, 2014), which is a multi-factor asset pricing model based on the idea that the asset's returns can be predicted using the linear relationship between the asset's expected return and a number of macroeconomic variables that capture systematic risk;
- CAPM (Ouma & Muriu, 2014), which is a model that describes the relationship between systematic risk and expected return for assets, particularly stocks;
- OLS (Ouma & Muriu, 2014), which is a type of linear least squares method for estimating the unknown parameters in a linear regression mode;
- Multivariate VAR (Gjerde & Sættem, 1999) approach and its co-integrated representation by VECM (Adam & Tweneboah, 2008);
- Markov-switching multifractal (MSM) (Chen, 2008), which is a model of asset returns that incorporates stochastic volatility components of heterogeneous durations;
- Descriptive analysis (Laichena & Obwogi, 2015), which uses brief descriptive coefficients that summarise a given data set that can be either a representation of the entire or a sample of a population;
- Panel data regression analysis (Laichena & Obwogi, 2015), which is widely used in econometrics to analyse two-dimensional (typically cross sectional and longitudinal) panel data;
- ARDL (Larsson & Haq, 2016) co-integration technique is preferable when dealing with variables that are integrated of different orders, I(0), I(1) or combination of the both, and robust when there is a single long-run relationship between the underlying variables in a small sample size;
- GARCH model (Flannery & Protopapadakis, 2002) of daily equity returns, which is based on the ARCH model by adding the lagged conditional variance term;
- Granger causality test (Wongbangpo & Sharma, 2002), which is a statistical hypothesis test for determining whether one time series is useful in forecasting another;
- Multifactor model (Benaković & Posedel, 2010; Chen et al., 1986), which is a financial model that uses multiple factors in its calculations to explain market phenomena and/or equilibrium asset prices;
- Johansen and Juselius co-integration test (Cheung & Ng, 1998), which makes it possible to estimate all co-integrating vectors when there are more than two variables;
- General correlation–regression analysis methods (Marcišauskienė & Cibulskienė, 2013).

In regards of the objectivity of this research, the difference in the macroeconomic variables that had impact on the stock indices can be explained because of different calculation methods used in the previous researches, which is why in order to establish the regional limitation of the prediction models, the same set of variables for different countries should be examined in same calculation model.

Methodology

This study aims to define the presence or absence of the regional limitations of stock indices prediction models; therefore, the most important task is to identify the relationship between the independent (macroeconomic) and dependent (stock indices) variables, which is achieved by performing correlation–regression analysis. It should be noted that other methods may or may not be affected by regional limitations, but in case of regional limitations present in the accuracy of regression equations based on same set of variables in different regions, the possibility of general regional limitations should be considered.

The expression of linear regression is written as follows:

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i + \varepsilon, \quad (1)$$

where y_i is the dependent variable, β_0 is the population *Y* intercept, β_1 is the population slope coefficient, x_i is the independent variable, ε is the random error component.

The dependent variables are the stock indices that represent the companies with highest capitalisation in each of the analysed regions:

- Estonia, Latvia and Lithuania – OMX is the only stock market index for these countries (OMX Tallinn, OMX Riga, OMX Vilnius, respectively);
- European Union – EURO STOXX 50 is made up of 50 of the largest and most liquid Eurozone stocks;
- France – CAC 40 is a benchmark French stock market index that represents the 40 most significant values amongst the 100 highest market caps on the Euronext Paris;
- Germany – DAX is a blue-chip stock market index consisting of the 30 major German companies traded on the Frankfurt Stock Exchange;
- United Kingdom – FTSE 100 is a share index of the 100 companies listed on the London Stock Exchange with the highest market capitalisation.

The selection of market indices is limited because Baltic States have only one option, but this restriction would only provide additional argumentation to the fact that a prediction model designed for a specific region (and / or index) should not be used outside its initial purpose limits.

For the best possible result in order to determine the presence of regional limitations, they must be found amongst similar countries, and according to current political situation, the European Union and its members are the best candidates for such research because of their inner dependability (main trade partners, political and economic integration, geographical distance, mostly single currency, etc.). The specific regions were chosen because of their size (3 biggest economies of the European Union [France, Germany and the United Kingdom] and the Union itself) and the less-researched region of the Baltic States, which consists of Estonia, Latvia and Lithuania.

The independent (macroeconomic) variables and assumption for their impact on this model are

- GDP is a most widely used macroeconomic variable to display the changes in the economy though because the Baltic states are facing the decline in population as opposed to the increase in population in the United Kingdom, Germany, France or the European Union; in general, the sum value is supposed to be less objective than per capita values but it has to be noted that GDP and GDP values of the European Union can be considered misleading in this calculation especially

considering the increase in the number of the member countries most of which have lower than average GDP values. It is assumed that the growth of GDP has a positive effect on stock indices;

- Long-term government bonds are one of the safest investing options and are characterised by low returns; therefore, the increase in their returns shows the increased risk that adds to the economic uncertainty and should have negative effect on the stock returns;
- Unemployment statistics can be considered both way, as the lowering unemployment ratio shows the economic growth of the country and, therefore, companies can sell their production and services more easily; however after reaching specific point, the unemployment becomes problem for company profits because they face higher competition when hiring workers, which in low unemployment rate environment have more bargaining power; therefore, it is assumed that increase in unemployment will have a positive effect on stock indices;
- Labour cost is related to the second effect of the decrease in unemployment ratio and directly affects production costs, which in theory should decrease the profits and, therefore, lower the growth of stock indices; therefore, it is assumed that the increase in labour cost will have a negative effect on stock indices;
- Industrial production shows the value of goods produced and should have a positive effect on the income of commercial entities, therefore, adding to the growth (positive effect) of stock indices, although it must be noted that industrial production does not account for the provided services.
- PPI indicates the changes in producers' costs of their production output, and although it is linked to the labour cost, it is affected by material prices, taxes and so on as well; therefore, it should play a significant role in the final balance sheets and have a negative effect on stock indices;
- CPI measures the changes in the price level of market basket of consumer goods and services purchased by households and indicates the higher income per unit for the commercial entities, although it does not provide information regarding the volume of goods and services purchased but it is assumed that the positive effect due to larger expenditure will outweigh the limited purchasing power.

Other authors have also considered variables such as currency exchange rate but the selected countries (except the United Kingdom) use the same currency (Euro) for almost the whole time period that was analysed (Germany, France, most of the European Union as a whole) or their currency was linked to the Euro before the country adopted the single currency (applicable to Estonia and Lithuania, not applicable to Latvia) and most of their trade (import and export) are made within the European Union, which makes the exchange rate a less-significant macroeconomic variable compared with others (not applicable to the United Kingdom, but the aim of this study is to apply the same variables as much as possible and the results show that the United Kingdom had the highest result accuracy despite the lack of exchange rate variable). Other possible variables such as oil prices are the same for all the countries and should be represented in the intercept values and variables such as tourism apply only to a smart part of each of these economies and were considered of less importance. Qualitative variables such as political regime and involvement in foreign conflicts are proven to have effect on the stock indices; however, most of the conflict involvement is similar amongst the countries because of their membership in NATO and the political regimes were more or less stable during the considered time period.

The data for the independent variables are provided by Eurostat (European Statistical Office). Two correlation–regression models are applied:

- Year-to-year (Y2Y) model analyses the relationship between stock indices and macroeconomic variables by calculating the relationship of their growth rate (year-to-year value changes);
- Year-to-base (Y2B) model analyses the relationship between stock indices and macroeconomic variables by calculating the relationship of change in their value when compared to year 0 (2013).

The R-squared value (coefficient of determination) is the proportion of the variance in the dependent variable that is predictable from the independent variable(s) and is calculated using the formula

$$R^2 = 1 - \frac{SS_{res}}{SS_{tot}}, \quad (2)$$

where SS_{res} is the residual sum of squares and SS_{tot} is the total sum of squares.

Because the models use relatively large number of independent variables when compared to the number of observations, the adjusted R-squared value is also considered:

$$\bar{R}^2 = 1 - (1 - R^2)\frac{\mathrm{n}-1}{\mathrm{n}-\mathrm{p}-1}, \quad (3)$$

where R^2 is the R-squared value, n is the number of observations and p is the number of independent variables.

Results

First, the covariance calculations were applied using Microsoft Excel add-on 'Data Analysis – Covariance', which showed little to none of joint variability of two random variables amongst all the countries (several values were close to 0.6 but by the rule of the thumb, intercorrelation is present when the values are >0.8); therefore, the multicollinearity problem is absent.

According to the results shown in Table 1, the R-squared values when using Y2Y model are rather low amongst all the analysed countries, although it has to be noticed that the R-squared value of the United Kingdom is highest amongst all the analysed countries, but it is easily seen that such calculation model shows almost no relationship between macroeconomic variables and stock indices, at least on the acceptable level. The adjusted R-squared value shows even lower accuracy of the Y2Y model.

Table 1. Y2Y calculation model regression statistics (Source: author's compilation)

Regression Statistics	Estonia	European Union	France	Germany	Latvia	Lithuania	United Kingdom
Multiple R	0.68833	0.80339	0.84192	0.70969	0.69594	0.82062	0.85284
R-Squared	0.47379	0.64543	0.70883	0.50367	0.48434	0.67342	0.72733
Adjusted R-Squared	0.02276	0.23177	0.36913	−0.07539	−0.11727	0.29241	0.40921
Standard Error	0.35540	0.15334	0.14070	0.19401	0.32571	0.28957	0.10526
Observations	14	14	14	14	14	14	14

According to the results shown in

Table 2, the Y2B model is clearly more accurate than the Y2Y model as the R-squared value in each occasion is higher than the ones calculated using Y2Y model and the R-squared value of the United Kingdom and Germany is higher than 0.9 and their adjusted R-squared values are above 0.85, which is also a good result; however, the standard error in case of Germany is significantly higher than that in the case of the United Kingdom.

Table 2. Y2B calculation model regression statistics (Source: author's compilation)

Regression Statistics	Estonia	European Union	France	Germany	Latvia	Lithuania	United Kingdom
Multiple R	0.81170	0.90388	0.85169	0.96556	0.94656	0.92285	0.96589
R-Squared	0.65885	0.81700	0.72538	0.93231	0.89597	0.85166	0.93294
Adjusted R-Squared	0.36644	0.60350	0.40498	0.85334	0.77460	0.67859	0.85471
Standard Error	0.72137	0.12034	0.16428	0.25608	0.33165	0.41475	0.07651
Observations	14	14	14	14	14	14	14

Although Y2B calculation model provides higher accuracy results, it is worth mentioning that the Y2Y results of France and the United Kingdom, which have the highest R-squared values of Y2Y model, are higher than the values for Estonian stock indices calculated using Y2B model. Furthermore, it is obvious that changes in stock indices of the United Kingdom are most accurately represented despite the type of model applied, which confirms the initial hypothesis of the need of specific set of variables for each country.

Table 3 shows the coefficients and p-values, and after their analysis, it is obvious that Y2Y model has very low prediction power as all except one, p-values are higher than 0.05, which means that factors are not significant, but it is worth noticing that the single p-value that is below 0.05 is the list of the UK variables.

Table 3. The coefficients and p-values of regression model for each country (Y2Y model) (Source: author's compilation)

	Estonia		European Union		France		Germany		Latvia		Lithuania		United Kingdom	
Factor	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value
Intercept	0.49	0.06	0.02	0.90	−0.04	0.78	0.30	0.21	0.20	0.28	0.40	0.19	0.14	0.31
Government bonds long			0.06	0.89	0.48	0.18	0.03	0.69	0.08	0.84	0.29	0.49	−0.33	0.22
GDP per capita	0.39	0.76	0.81	0.44	−0.18	0.83	0.11	0.92	0.20	0.94	0.90	0.51	0.80	0.15
Unemployment	0.58	0.25	0.57	0.47	1.11	0.27	1.03	0.25	0.41	0.61	0.68	0.18	0.76	0.09
Labour cost	0.37	0.87	7.44	0.09	3.65	0.10	−2.32	0.29	0.50	0.69	−0.14	0.93	−1.46	0.04
Industrial Prod	1.70	0.73	0.42	0.42	3.48	0.17	0.78	0.69	2.00	0.34	3.16	0.51	1.64	0.42
PPI	8.95	0.39	-0.73	0.86	−16.5	0.30	−1.14	0.84	1.38	0.86	0.97	0.83	−2.43	0.23
CPI	−14.5	0.18	-9.18	0.40	14.38	0.54	−4.95	0.82	−6.08	0.35	−14.4	0.18	−1.86	0.81

On the contrary, the p-values presented in Table 4 are almost ideal for the United Kingdom (except for the intercept value, which is 0.06, just slightly above 0.05); therefore, the model is suitable for the United Kingdom, although the p-values for other countries are well above 0.05 as in Y2Y model as well.

After checking the coefficients values in

Table 4, the conclusions regarding the predicted relationship nature of the macroeconomic variables and stock indices can be made, which state that in the case of the United Kingdom,

- As predicted, the growth of GDP (in this case GDP per capita) has a positive effect on the stock market indices;
- As predicted, the long-term government bonds return change have a negative effect on the stock market indices;
- The increase in unemployment seems to have a positive effect because of the higher bargaining power of the commercial entity;
- As predicted, the labour cost has a negative effect on the stock indices;
- As predicted, the industrial production has a positive effect on the stock indices;
- As predicted, the producer price index has a negative effect on the stock indices;
- As predicted, the consumer price index has a positive effect on the stock indices.

Table 4. The coefficients and p-values of regression model for each country (Y2B model) (Source: author's compilation)

	Estonia		European Union		France		Germany		Latvia		Lithuania		United Kingdom	
Factors	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value	*Coefficients*	p-Value

Intercept	1.12	0.11	0.26	0.33	0.35	0.14	−0.82	0.27	0.41	0.36	−0.39	0.63	0.17	0.06
LT government bonds			−0.49	0.26	−0.59	0.63	−0.22	0.88	0.90	0.06	0.03	0.95	−1.14	0.02
GDP per capita	−1.13	0.48	0.63	0.61	0.14	0.92	0.23	0.92	−1.36	0.36	0.78	0.54	0.99	0.03
Unemployment	−0.94	0.51	1.55	0.07	0.70	0.57	4.05	0.19	−1.63	0.21	0.44	0.79	0.80	0.02
Labour cost	−1.13	0.79	11.21	0.04	4.61	0.07	2.31	0.68	0.31	0.82	−5.27	0.04	−1.94	0.01
Industrial Prod	14.17	0.38	0.81	0.04	1.71	0.38	2.84	0.16	7.23	0.02	15.94	0.07	4.80	0.04
PPI	−17.90	0.40	4.30	0.42	0.26	0.98	−3.56	0.48	−2.12	0.79	−5.79	0.07	−4.62	0.01
CPI	16.01	0.43	−24.37	0.09	−11.32	0.33	22.22	0.14	3.05	0.65	5.01	0.46	6.01	0.02

When reviewing residuals in Y2Y model as shown in Table 5, it is hard to define the reasons for the spotted inaccuracies; therefore, it can only be mentioned that the biggest differences in the UK stock indices predictions are spotted before the financial crisis of 2007–2008 and after both the expansion of the European Union and the Brexit vote (1 year after the events) but the accuracy of these explanations might be dubious.

Table 5. Residuals based on Y2Y calculation model (top 2 [dark grey] and bottom 2 [light grey] values are highlighted) (Source: author's compilation)

Year	Estonia	European Union	France	Germany	Latvia	Lithuania	United Kingdom
2004	19.15%	4.50%	8.25%	−3.54%	36.04%	−1.75%	−1.25%
2005	30.71%	0.77%	7.49%	−6.64%	41.81%	31.46%	14.98%
2006	16.22%	13.08%	3.17%	13.36%	−5.52%	1.44%	−7.51%
2007	4.71%	−8.29%	−14.26%	3.31%	−4.04%	16.74%	−9.39%
2008	−25.82%	−8.77%	−9.19%	−24.96%	−21.46%	−16.33%	−7.96%
2009	2.07%	−5.29%	−10.18%	5.90%	5.80%	6.00%	2.78%
2010	21.50%	−2.50%	−8.87%	14.41%	−21.14%	10.17%	7.62%
2011	−47.68%	−18.84%	−8.62%	−2.34%	−25.24%	−44.21%	−1.58%
2012	40.58%	18.05%	14.57%	20.59%	−14.71%	20.01%	1.53%
2013	7.38%	9.90%	2.82%	3.36%	3.01%	−8.50%	−0.15%
2014	−41.26%	2.93%	3.68%	−4.18%	−24.47%	−17.82%	4.71%
2015	−0.76%	−11.76%	−8.63%	−25.27%	28.85%	−15.79%	−4.26%
2016	−19.56%	−3.76%	11.48%	7.02%	−3.82%	−0.27%	−7.49%
2017	−7.25%	9.97%	8.30%	−1.01%	4.88%	18.85%	7.98%

In order to display the difference in predicted and actual Y (change of stock indices) values more clearly, both the predicted and actual values are presented in Table 6.

Table 6. Comparison of actual and predicted changes (based on Y2Y model) in stock indices (Source: author's compilation)

Year	Estonia		European Union		France		Germany		Latvia		Lithuania		United Kingdom	
	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual
2004	38%	57%	1%	5%	−1%	8%	8%	5%	7%	43 %	70%	68 %	12%	11%
2005	17%	48%	23%	24%	19%	26%	40%	33%	22%	64%	21%	53%	4%	19%

2006	13%	29%	0%	13%	10%	13%	6%	20%	2%	−3%	8%	10%	15%	8%
2007	−18%	−13%	−1%	−9%	1%	−13%	−2%	1%	−5%	−9%	−12%	4%	4%	−5%
2008	−37%	−63%	−32%	−41%	−30%	−39%	−12%	−37%	−33%	−54%	−49%	−65%	−21%	−29%
2009	45%	47%	29%	24%	36%	26%	23%	29%	−3%	3%	40%	46%	22%	25%
2010	51%	73%	9%	6%	16%	7%	12%	26 %	62%	41%	46%	56%	5%	13%
2011	24%	−24%	1%	−18%	−9%	−18%	−6%	−9%	20%	−6%	17%	−27%	−2%	−3%
2012	−2%	38%	−6%	12%	−1%	13%	0%	20%	21%	7%	−1%	19%	9%	10%
2013	4%	11%	2%	12%	9%	12%	16%	20%	13%	16%	27%	19%	4%	4%
2014	34%	−8%	8%	11%	7%	11%	19%	15%	13%	−11%	25%	7%	−1%	4%
2015	20%	19%	3%	−9%	5%	−4%	17%	−8%	17%	46%	23%	7%	−6%	−10%
2016	39%	20%	10%	6%	−4%	8%	11%	18%	27%	23%	15%	15%	24%	17%
2017	23%	15%	2%	12%	7%	15%	15%	14%	31%	36%	−2%	17%	−2%	6%

After reviewing the residuals in Table 7, it can be noted that the UK Y2B model shows significant relationship errors in four periods, which can be partially explained in this manner:

- 2004 – it is hard to summarise this year, but it is possible that the UK commercial entities and stockholders had negative opinion regarding the expansion of the European Union;
- 2005 – according to the macroeconomic variables, the stock indices should have grown by 10% less than they did (when comparing total growth to the base year of 2003), which probably can be linked to the formation of financial crisis because the commercial entities and stock holders were more optimistic than the macro variables should account for; therefore, additional variables that can predict financial bubbles should be included in models, although they are hard to acquire and such differences work in favour of the investors (growth larger than expected) and the upcoming problems can be addressed by reviewing past year data (if stocks grow up faster than the model predicts, it can signal the possibility of upcoming crisis), and it is also possible that the United Kingdom has changed its mind regarding the new EU members and they had a positive impact on the UK stock indices;
- 2010 – it seems that stock markets were more optimistic regarding the recovery from 2007–2008 financial crisis caused by the US subprime mortgages than the macroeconomic variables would predict;
- 2016 – it is obvious that macroeconomic variables did not fully account for the Brexit vote, which proves the need of including political regime/decisions variables to future prediction models.

In summary, the main reasons for the model's inaccuracy tend to be political events that are discussed in the research made by Larsson and Haq (2016) as well as the financial crisis. Although the sudden political changes can be hard to predict, the risk of sudden growth of financial bubbles can be seen when comparing the real and assumed growth of stock indices.

Table 7. Residuals based on Y2B calculation model (top 2 [dark grey] and bottom 2 [light grey] values are highlighted) (Source: author's compilation)

Year	Estonia	European Union	France	Germany	Latvia	Lithuania	United Kingdom
2004	−69%	−6%	2%	0%	−17%	−56%	−8%
2005	21%	−8%	−10%	−15%	32%	38%	10%
2006	95%	21%	16%	16%	−26%	16%	2%
2007	35%	−3%	4%	24%	30%	11%	−1%

2008	−113%	−1%	−5%	−41%	−37%	−17%	−4%
2009	−27%	4%	4%	−4%	19%	0%	−1%
2010	43%	−1%	−6%	16%	−5%	46%	5%
2011	−29%	−14%	−19%	2%	10%	−45%	−1%
2012	23%	6%	−2%	3%	−36%	7%	−3%
2013	27%	6%	9%	7%	8%	−2%	−2%
2014	15%	3%	12%	9%	13%	23%	5%
2015	−48%	−3%	−10%	−26%	−6%	−17%	2%
2016	−7%	−6%	−13%	3%	−3%	−4%	−8%
2017	33%	3%	17%	7%	18%	−1%	5%

In order to display the difference in predicted and actual Y (change in stock indices) values more clearly, both the predicted and actual values are presented in Table 8.

Table 8. Comparison of actual and calculated changes (based on Y2B model) in stock indices (Source: author's compilation)

Year	Estonia		European Union		France		Germany		Latvia		Lithuania		United Kingdom	
	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual	Predicted	Actual
2004	126%	57%	11%	5%	6%	8%	5%	5%	61%	43%	124%	68%	18%	11%
2005	112%	132%	38%	30%	46%	36%	55%	40%	103%	135%	119%	157%	21%	31%
2006	105%	200%	26%	47%	38%	54%	51%	67%	154%	127%	166%	182%	40%	41%
2007	125%	160%	37%	34%	29%	34%	44%	69%	77%	106%	183%	195%	35%	34%
2008	109%	−4%	−20%	−21%	−13%	−18%	48%	7%	31%	−6%	20%	3%	−1%	-5%
2009	69%	42%	−6%	−2%	−1%	3%	43%	38%	−22%	−3%	50%	50%	19%	18%
2010	101%	144%	5%	4%	16%	10%	58%	74%	41%	37%	89%	135%	28%	34%
2011	114%	86%	−1%	−15%	10%	−9%	57%	59%	19%	29%	117%	71%	30%	29%
2012	134%	157%	−10%	−5%	5%	3%	89%	92%	73%	37%	97%	104%	46%	43%
2013	159%	186%	0%	6%	6%	14%	122%	129%	51%	60%	144%	142%	50%	48%
2014	149%	164%	15%	18%	14%	27%	154%	163%	28%	42%	136%	159%	49%	54%
2015	263%	215%	10%	7%	32%	21%	168%	141%	112%	106%	196%	179%	37%	39%
2016	283%	277%	20%	14%	43%	31%	182%	184%	158%	155%	224%	220%	70%	62%
2017	302%	335%	24%	27%	33%	51%	218%	225%	228%	246%	275%	274%	67%	72%

After reviewing the residuals, it can be objectively stated that specific set of variables is accurate only for a certain region, in this case, the United Kingdom, and should be not used directly for other countries, for example, the biggest difference between predicted and actual change in the UK stock indices was 10% in 2005, whereas the smallest difference of the same model in Estonia was −7% in 2016 and the biggest one was −113% in 2008.

After analysing the values given in Figure 1, it should be noted that the lack of accurate results based on one model does not mean the inability of this set of variables to provide accurate prediction when using another model as it is shown in the figure, where the use of the same variables results in higher accuracy by Y2B model when compared to Y2Y model.

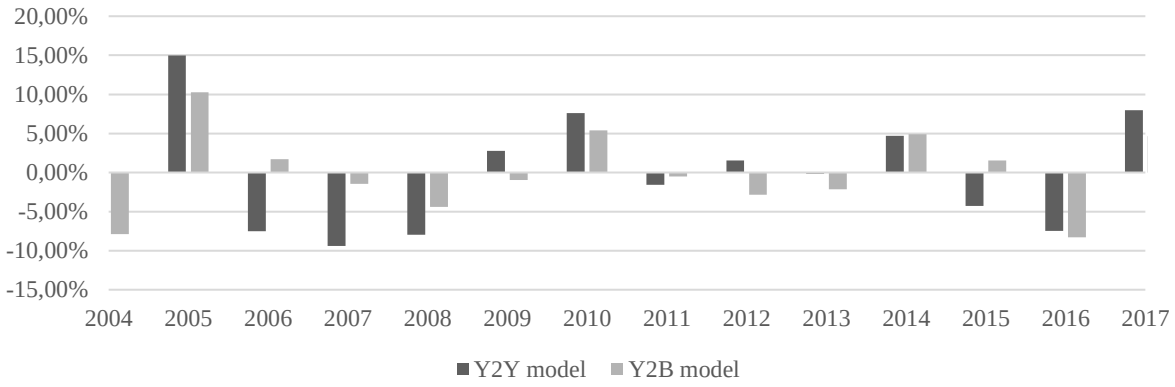

Fig. 1.The comparison of residuals between Y2Y and Y2B models for the United Kingdom (Source: authors' developed)

Furthermore, it is clear that political events might have a significant impact on the value of the dependent variable; therefore, they should be included in calculation models or at least considered if there is political uncertainty.

Conclusions

The literature study implies that the results of previous researches might have been inconsistent because of the narrowed scope of investigations because although most researchers have analysed similar macroeconomic variables, not all of them considered the impact of global trends or did hourly or daily observations on how speculations regarding the change in macroeconomic variables might have impacted the stock returns. This statement suggests that in order to establish an accurate prediction or explanatory model, it is important to apply as many initial variables as possible to refine the most significant ones and not just rely on several indicators that might prove to provide inconsistent or incorrect results. The studies were also limited to only few calculation models. It is worth to note that authors such as Gilbert (2011) have used somehow nonstandard methods of investigating the impact of economic publications as well as their revisions rather than only the factual variations in macroeconomic variables; Bali et al. (2014) examined the uncertainty effect; and Larsson and Haq (2016) also considered the impact of political regime.

The most influential and discussed macroeconomic variables were GDP, GDP per capita, CPI or inflation, PPI, long- and short-term interest rates, exchange rates, world market returns, industrial production, labour income, unemployment, oil prices, consumer consumption and few others. It is also frequently noted that stock returns depend not only on the value of macroeconomic variables at any data point but on their change as well as predictions regarding the change. Furthermore, the importance of global and regional factors on local markets is discussed, which implies that smaller or less-developed markets are dependent on leading economies, but small markets seldom influence the global trends.

The linear regression model agrees with the assumptions made based on the literature study and shows the negative effect of long-term government bonds, labour cost and producer price index, whilst the positive effect is driven by GDP growth, unemployment rate, industrial production and consumer price index.

In the practical part, it was also clearly established that the same set of independent variables cannot be directly applied to different regions because although the chosen Y2B model did provide an accurate relationship between macroeconomic variables and stock indices in the United Kingdom, it failed to provide accurate (usable) results in other regions (Estonia, European Union, France, Germany, Latvia and Lithuania), which fall in line with the claims of Alexakis et al. (2016); they mentioned that Latvia and Lithuania were affected during global crisis and Estonia was mainly affected only by Euro zone crisis, which clearly states that even countries of similar size, population and geographical location still

have different economic trends and individual prediction models should be applied in order to get a clear picture of the future stock indices changes.

Although the calculations are based on the past values, the model presumably can be used for future calculations using predictions for macroeconomic variables, which only confirms the need for specific sets of variables for each region because applying incorrect method without acknowledging the consequences of such actions might lead to unfortunate results.

Further studies should focus their attention not only on macroeconomic variables but also on the market efficiency, media authority, differences in dominant political parties, the impact of global and regional macroeconomic and political situation because political and other qualitative factors might have significant effect on the stock returns.

References

Alexakis, P. D., Kenourgios, D., & Dimitriou, D. (2016). On emerging stock market contagion: The Baltic region. Research in International Business and Finance, 36, 312–321. https://doi.org/10.1016/J.RIBAF.2015.09.035

Bali, T. G., Brown, S. J., & Tang, Y. (2014). Macroeconomic Uncertainty and Expected Stock Returns. Working Paper, (646), 1–77.

Bareikienė, D., & Sūdžius, V. (2011). Finansų krizės poveikis Lietuvos vertybinių popierių rinkai. *Verslas: Teorija Ir Praktika*. https://doi.org/10.3846/btp.2011.24

Benaković, D., & Posedel, P. (2010). Do macroeconomic factors matter for stock returns? Evidence from estimating a multifactor model on the Croatian market. *Business Systems Research*, *1*(1–2), 39–46. https://doi.org/10.2478/v10305-012-0023-z

Boreika, P., & Pilinkus, D. (2009). Makroekonominių Rodiklių Ir Akcijų Kainų Tarpusavio Ryšys Baltijos Šalyse. *Relations Between Macroeconomic Indices and Stock Prices in the Baltic Countries.*, 692–699. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=41976539&site=ehost-live&scope=site

Chen, N.-F., Roll, R., & Ross, S. A. (1986). Economic Forces and the Stock Market. *The Journal of Business*. The University of Chicago Press. https://doi.org/10.2307/2352710

Chen, S. (2008, March 1). Predicting the Bear Stock Market: Macroeconomic Variables as Leading Indicators. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1106100

Cheung, Y.-W., & Ng, L. K. (1998). International evidence on the stock market and aggregate economic activity. *Journal of Empirical Finance*, *5*(3), 281–296. https://doi.org/10.1016/S0927-5398(97)00025-X

Fama, E. F., & Schwert, G. W. (1977). Asset returns and inflation. *Journal of Financial Economics*, *5*(2), 115–146. https://doi.org/10.1016/0304-405X(77)90014-9

Flannery, M. J., & Protopapadakis, A. A. (2002). Macroeconomic Factors *Do* Influence Aggregate Stock Returns. *Review of Financial Studies*, *15*(3), 751–782. https://doi.org/10.1093/rfs/15.3.751

Gilbert, T. (2011). Information aggregation around macroeconomic announcements: Revisions matter. *Journal of Financial Economics*, *101*(1), 114–131. https://doi.org/10.1016/J.JFINECO.2011.02.013

Gjerde, Ø., & Sættem, F. (1999). Causal relations among stock returns and macroeconomic variables in a small, open economy. *Journal of International Financial Markets, Institutions and Money*, *9*(1), 61–74. https://doi.org/10.1016/S1042-4431(98)00036-5

Humpe, A., & Macmillan, P. (2009). Can macroeconomic variables explain long-term stock market movements? A comparison of the US and Japan. *Applied Financial Economics*, *19*(2), 111–119. https://doi.org/10.1080/09603100701748956

Ibrahim, M. H., & Aziz, H. (2003). Macroeconomic variables and the Malaysian equity market. *Journal of Economic Studies*, *30*(1), 6–27. https://doi.org/10.1108/01443580310455241

Jareño, F., & Negrut, L. (2016). US stock market and macroeconomic factors. Journal of Applied Business Research, 32(1), 325–340. https://doi.org/10.19030/jabr.v32i1.9541

Kandir, S. (2008). Macroeconomic variables, firm characteristics and stock returns: evidence from Turkey. *International Research Journal of Finance*, *16*(16). Retrieved from https://www.researchgate.net/profile/Serkan_Kandir/publication/254023824_Macroeconomic_Variables_Firm_Characteristics_and_Stock_Returns_Evidence_from_Turkey/links/568bc58f08ae129fb5cb80e0.pdf

Koncevičienė, I., & Janickaitė, D. (2011). Makroekonominių veiksnių įtaka NASDAQ OMX Vilnius listinguojamų įmonių akcijų pelno normoms, *2*(22), 93–105.

Laichena, K. E., & Obwogi, T. N. (2015). Effects of macroeconomic variables on stock returns in the East African community stock exchange market. *International Journal of Education and Research*, *3*(10), 305–320.

Larsson, R., & Haq, S. (2016). The dynamics of stock market returns and macroeconomic indicators: An ARDL approach with cointegration. Retrieved from http://www.diva-portal.org/smash/record.jsf?pid=diva2%3A950080&dswid=9719

Marcišauskienė, J., & Cibulskienė, D. (2013). Baltijos šalių makroekonominių rodiklių ir akcijų rinkos kainų tarpusavio ryšio vertinimas. *Ekonomika Ir Vadyba: Aktualijos Ir Perspektyvos*, *1*(29), 51–61.

Ouma, W. N., & Muriu, P. (2014). The Impact of Macroeconomic Variables on Stock Market Returns in Kenya. International Journal of Business and Commerce Www.Ijbcnet.Com International Journal of Business and Commerce, 3(11), 1–31. https://doi.org/10.4038/suslj.v6i1.1689

Peiró, A. (2016). Stock prices and macroeconomic factors: Some European evidence. *International Review of Economics & Finance*, *41*, 287–294. https://doi.org/10.1016/J.IREF.2015.08.004

Rudzkis, R., & Valkavičienė, R. (2014). Econometric models of the impact of macroeconomic processes on the stock market in the Baltic countries. *Technological and Economic Development of Economy*, *20*(4), 783–800. https://doi.org/10.3846/20294913.2014.949901

Wongbangpo, P., & Sharma, S. C. (2002). Stock market and macroeconomic fundamental dynamic interactions: ASEAN-5 countries. *Journal of Asian Economics*, *13*(1), 27–51. https://doi.org/10.1016/S1049-0078(01)00111-7

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0019

UNIFORMITY OF APPLICATION OF THE EU CUSTOMS LAW: PROBLEMATIC ASPECTS IN THE BALTIC STATES

Gediminas Valantiejus[1], Saulius Katuoka[2]

[1]*Professional Law Partnership „iLAW"(http://www.en.ilaw.legal/)/Mykolas Romeris University, Vilnius, Lithuania, gvalantiejus@mruni.eu*

[2]*Mykolas Romeris University, Vilnius, Lithuania, skatuoka@mruni.eu*

Abstract

Research purpose. The EU Customs Law is a significant branch of the EU substantive law. On the basis of the Union Customs Code (UCC; Regulation [EU] No. 952/2013) and the Combined Nomenclature of the European Union (Regulation [EU] No. 2658/87 and its Annexes), it regulates the international trade of the European Union and its Member States with the third countries, in particular the taxation of the international trade operations by applying the customs duties/tariffs. However, after the adoption of the UCC, which imperatively requires all the customs administrations of the EU Member States to work as one, the problem of the uniform application of the EU customs law remains very important. Therefore, the authors analyse the practice of the Baltic States (i.e. Republics of Estonia, Latvia and Lithuania) in this area, based on the case law of the Court of Justice of the European Union (CJEU) in cases involving references to the CJEU by the national courts of different Baltic States.

Design/Methodology/Approach. The authors used the thematic analysis method and the method of generalisation of professional (judicial) practice as the basis of the chosen methodology and its design. Therefore, first of all, the authors have selected the judicial cases of the CJEU (in the period from 2010 to 2018) related to a certain theme – customs duties. Second, the authors compared the practice of the CJEU in such cases, which are attributable to the relevant EU Member State in order to identify the problems of uniformity in the application of the EU customs law (specific to the different Baltic States). Finally, by using comparative insights and comparative method, the authors present proposals for the improvement of legal regulation to ensure the compatibility of national rules and practices with the EU law.

Findings. During the investigation, the authors established that the problems of the uniform application of the EU customs law in the Baltic States arose in specific areas. Such areas were tariff classification of goods, determination of the origin and value of goods (in the case of Latvia), regulation of customs procedures (in the case of Estonia), customs duties and other import taxes preferences (in the case of Lithuania). At the same time, it was established that the national courts of the Republic of Lithuania were the least active in ensuring co-operation with the CJEU this area, which could have been caused by the improper national legal regulations.

Originality/Value/Practical implications. The authors present (after the assessment of the experience of the Baltic States) the proposals for the improvement of both the legal regulations of the EU customs law as well as national legal regulations (in particular – in the Republic of Lithuania) to improve the areas that cause systemic irregularities of the uniform regulation of the international trade regulatory measures of the European Union. Whilst some of the similar studies were completed in the recent years (e.g. Limbach 2015), they do not provide a detailed comparative analysis of the issues that were investigated, specifically considering the situation in the Baltic States.

Keywords: international trade; customs duties; Court of Justice of the EU; national courts; Baltic States

JEL codes: F13; K34

Introduction

The topicality of the research. The policies of the European Union and the areas of its competences has traditionally focused on the harmonious regulation of external trade with the third countries and ensured the effective functioning of the customs union. For this reason, the EU Common Customs Tariff (uniform customs duty rates used for the taxation of international trade in goods) is usually considered (see, e.g. Kolliker, 2006, Craig and de Burca, 2015) as a guarantee of the effectiveness of the EU trade

and other external policies (Common Commercial Policy). Therefore, from a strategic point of view, the objectives of the European Union as a customs union include, *inter alia*, improving the regulatory framework of international trade. They also include ensuring both the continued protection of the fiscal and other economic interests of the European Union and supporting the initiatives needed to strengthen the competitiveness of the European Union in international trade markets (see Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee 'On the State of Customs Union', COM(2012) 791 final, 2012). It is noteworthy to mention that the essential instrument that ensures accomplishment of such goals and the correct application of the EU Common Customs Tariff is the Union Customs Code (UCC). It was adopted on 9 October 2013 and has entered into force since the 1 May 2016 (see Regulation No. 952/2013 of the European Parliament and of the Council of 9 October 2013 laying down the UCC, 2013). The importance of the UCC for the application of customs duties in the European Union is fundamental, especially regarding the factors for the calculation of customs duties such as the value of goods, their origin as well as customs procedures and administration of customs duties and other import taxes (by customs authorities). For example, the UCC requires that all customs administrations in the EU Member States should work as one administration (see Article 3 of the UCC), which is essential for the uniform regulation of international trade with the third countries in all the EU Member States.

It should be noted that the provisions of the UCC itself have been developed in advance by taking into account the fact that the principle of subsidiarity does not apply to the regulation of legal relations related to the collection and calculation of customs duties. Their regulation falls within the exclusive competence of the European Union and belongs to the area of the EU Common Commercial Policy (see 'Explanatory Memorandum to COM(2012)64 - Union Customs Code', 2012 [Chapter 3.6]). Also, the UCC itself now directly declares the need to 'promote further the uniform application of customs legislation' (para. 15 of the preamble to the UCC) and ' to ensure an equivalent level of customs control throughout the Union so as not to give rise to anti-competitive behaviour at the various Union entry and exit points'. Thus, according to the provisions of the UCC and current practice of Court of Justice of the European Union (see cases Ioannis Christodoulou and Others v. Elliniko Dimosio, 2013; HARK GmbH & Co. KG, Kamin-und Kachelofenbau v. Hauptzollamt Duisburg, 2013; Steinel Vertrieb GmbH v. Hauptzollamt Bielefeld, 2013), the primary objective of the Member States and their institutions (including customs administrations and other national authorities such as national courts) is to ensure uniform application of the EU customs legislation. Such objective applies to both the areas of calculation of customs duties and the implementation of other regulatory measures towards the international trade operations.

It is essential to note that, although regulation of customs duties (as it was mentioned before) is included into the scope of the EU Common Commercial Policy and fall under an exclusive competence of the European Union, on the practical level, the EU Member States compete with each other in the areas of their administration/application. For example, they usually seek to collect the most significant possible amount of customs duties and other import taxes, which are calculated based on the EU customs legislation (see Radžiukynas, Belzus, 2008; Baronaitė, 2010; Sarapinienė, Avižienis, 2008; Truel, Maganaris, 2015; Limbach, 2015, Walsh, 2015). Therefore, they pursue different practices for the implementation of control procedures (applicable to the collection of customs duties) and adopts more comprehensive sources' national legislation that regulates in detail the application of specific provisions of the EU customs legislation (by taking into account the local situation and the peculiarities of the functioning of national customs authorities). It is important to note that the possibility to apply national provisions in such situations is also directly mentioned in the UCC (Art. 5, para. 2) and in other sources of the EU customs law (Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee 'On the State of Customs Union', COM(2012) 791 final, 2012; para. 1.4.2). However, such existing situation may also lead to cases when the EU customs law is applied (interpreted) differently in the individual EU Member States, for example, in their national courts that settle disputes concerning the decisions of national customs administrations. Thus it also creates preconditions for the uneven implementation of the EU customs policy in the EU Member States.

Moreover, it also threatens the consistent application of the EU Common Customs Tariff that should be applicable across the European Union towards goods originating in the third countries. Therefore, it is

essential to look for legal solutions in the Member States to create a business-friendly legal environment, to promote investments related to the development of international trade with due respect to the requirements of the EU Common Commercial Policy and the EU customs law. For this reason, the authors of this article formulated the following *aim of the research* to identify the problems of uniformity in the application of the EU customs law (specific to the different Baltic States) and to present proposals for the improvement of legal regulation to ensure the compatibility of national rules and practices with the EU law. To achieve this goal, the author's have applied certain specific *research methods*, such as the methods of thematic analysis and the method of generalisation of professional practice/experience. To complete the thematic analysis of the selected topic of the research and to generalise its results, the authors have selected the judicial cases of the Court of Justice of the European Union (CJEU; in the period from 2010 to 2018) related to specific topic – application of customs duties in the Baltic States (Lithuania, Latvia and Estonia). The authors also compared the practice of the CJEU in such cases (in total – 13 of them). On the basis of this comparative analysis and generalisation of the judicial practice, the authors identified and presented the problems of uniformity in the application of the EU customs law (specific to the different Baltic States). They also presented proposals for the further improvement of substantive EU law itself and the national laws of the Member States (particularly – the Republic of Lithuania).

Main research results. During the investigation, the authors established that the problems of uniform interpretation of the EU customs law in the Baltic States are related to all significant factors, relevant to the proper calculation of customs duties and application of the EU Common Customs Tariff. They, first of all, include cases related to the proper tariff classification of goods, determination of the origin and value of goods (in the cases originating in the Republic of Latvia). Second, they include regulation of customs procedures (in the cases originating in the Republic of Estonia), and, third, they include the application of exemptions/preferences of customs duties and other import taxes (especially in the cases originating in the Republic of Lithuania). At the same time, it was established that the national courts of the Republic of Lithuania and the Republic of Estonia were the least active in ensuring co-operation with the CJEU this area, which could have been caused by the improper national legal regulations, at least in the cases involving Lithuania.

Literature Review

The scientific novelty of the research that is presented in this article can be justified by the fact that the national level of regulation and application of customs duties in the individual Member States was not comprehensively analysed in the scientific literature. During the past five-year period (since 2013), only a limited number of such studies completed by other authors were published and they only partially described the experience of some individual EU Member States, such as the Federal Republic of Germany (analysed by Limbach, 2015), Kingdom of the Netherlands and the French Republic (analysed by Truel and Maganaris, 2015), the United Kingdom (analysed by Lyons, 2015), Slovak Republic (analysed by Novačkova, 2013). However, in the context of the Baltic States, namely, the Republic of Lithuania, similar types of legal research were not completed. For example, although the problems related to competition in a field of taxation were analysed in the doctoral dissertation of M. Lukas, the author of the dissertation did not address the issues of competition between the EU Member States in the area of application of customs duties. Also, the author did not describe related national regulatory practices by merely stating the importance of customs duties in the national tax systems are now declining (see Lukas, 2013). So in this respect, the research presented in this article complements the other above-mentioned foreign and Lithuanian authors' investigations where the national context of the application of customs duties in the EU Member States was mentioned but has not been explored in detail. It should also be noted that even in a longer perspective, the problem of uniform application of customs duties as an international trade regulatory measures of the European Union and the associated legal or regulatory issues were analysed only fragmentary in the national legal doctrine. Almost no attempts were made to assess them from the perspective of the EU customs law and to relate them to the practice of the settlement of tax disputes and practice of administration of taxes. This type of research, covering not only the theoretical aspects of the application of customs legislation but also the existing legal practice, was only carried out by the following authors: Radžiukynas (2003, 2005), Gurevičienė

(2005), Medelienė and Paulauskas (2008) and Baronaitė (2010). However, most of these studies have been completed only immediately before or after the entry of the Republic of Lithuania to the European Union (in 2004).

On the other hand, later (in the past decade since 2011), no practical, applied research studies related to the application of customs duties (in the Republic of Lithuania) were completed, although, at the same time, other types of taxes and regulatory issues related to them were analysed in the national legal doctrine (Puzinskaitė, Klišauskas, 2012; Puzinskaitė, 2013; Lučinskienė, Rimkus, 2010; Medelienė, 2012). As an exception, its is possible to mention studies of Bikelis (2012, 2013, 2015, 2017) that examined problems related to the application of sanctions for offenses of customs legislation. It is also possible to mention publications of A. Medelienė, A. Paulauskas, M. Lukas, V. Vasiliauskas, A. Milinis, and K. Pranevičienė. These publications analysed the individual tax dispute cases in which the legality of calculation of customs duties was examined and the national courts referred to CJEU or cases where the validity of the EU legislation (legal acts of EU itself) was questioned (see Medelienė, Vasiliauskas, 2012; Lukas, Medelienė, Paulauskas, 2014; Milinis, Pranevičienė, 2016). The situation in other Baltic States (the Republic of Estonia and Republic of Latvia) was assessed (in studies prepared in English language) only in a fragmented way. For example, only some of the problems related to the uniform application of the EU customs legislation in these countries were mentioned (by taking into account referrals of national courts to the CJEU) in the articles of Rodriguez and Dulguerova (2013) and Gavier and Rovetta (2011). However, these articles present only the problems involving one particular area of the EU customs law, that is, tariff classification of goods and does not mention any other issues, even if they were reflected in the practice of the CJEU, involving cases from the Republic of Latvia and Estonia. Besides, there are no complex or comparative studies in this field, which compare the situation in the different Baltic States and makes the generalisations of the existing situation or proposes ways to solve existing problems. Therefore, the authors seek to fill this gap and to provide a comprehensive comparative analysis of the situation in all Baltic States and on this basis to provide the proposals how to ensure the consistent application of the EU customs legislation (both at the EU and the national level, especially in the Republic of Lithuania).

Methodology

The following research methods were applied to study and investigate the application of the EU customs law in the Baltic States: logical–analytical (analysis and synthesis), systematic, comparative, statistical, historical and the method thematic analysis as well as generalisation of professional experience (case law/legal practice). The sophisticated application of these methods was essential to ensure the correctness and reliability of the generalisations and conclusions made by the authors. The main research methods were comparative method and method of thematic analysis – this aspect of the research design was essential, and it reflects the paradigm of the study as other general methods of scientific research that were used in this article complement them. The methodological basis of the research carried out was a qualitative study, which means that the data were collected in a verbal (textual) form, expressed in textual statements or categories and evaluated subjectively. To sort out the data for the investigation and to summarise the experience of all the Baltic States in the researched area during the investigated period (2010–2018), the authors have selected the cases of the CJEU in which the national courts of the Baltic States referred to this EU Court. All of these cases have the same characteristic – in all of them, the national courts have raised the questions regarding the explanation of the EU customs legislation. To perform the thematic analysis of these cases and the texts of the CJEU's decisions in them (see Patton, 1990, regarding the methodological assumptions of such types of research), the cases were divided into three main themes/topics. Such themes/topics were: 1. Cases involving the Republic of Latvia; 2-3. Cases involving the Republic of Lithuania and the Republic of Estonia). Each topic/theme was analysed in detail according to the sub-themes/sub-topics that further describe them, such as '1.1. Cases related to the tariff classification of goods'; '1.2. Cases related to the regulation of customs procedures'; '1.3. Cases related to the customs valuation of goods'; '1.4. Cases related to the customs origin of goods'; '2-3(1). Cases related to the regulation of exemptions from customs duties'.

All in all, based on the official information in the database of the CJEU case law, the authors have selected and analysed 13 of such cases, 2 of which involved Lithuania and Estonia (Cases C-250/11 and

C-3/13, all of them were related to the regulation of exemptions from customs duties). Eleven cases involved Latvia, and they are listed below:

1) Cases C-382/09, C-558/11, C-233/15, C-547/13, C-199/09 (all the previously mentioned cases were related to the tariff classification of goods);
2) Cases C-571/12, C-286/15, C-154/16 (all the previously mentioned cases were related to the regulation of customs procedures);
3) Cases C-46/16, C-430/14 (the case was related to the customs valuation of goods) and C-47/16 (the case was related to the determination of customs origin of goods).

Finally, the legal problems raised in all these cases were compared with an existing case law of the CJEU (involving other Member States of the European Union) and, as authors mainly focussed on the situation in the Republic of Lithuania, with the relevant existing national judicial practice of national courts. On the basis of this comparative analysis, the authors provided the recommendations for the improvement of the EU customs law and national laws (particularly in the Republic of Lithuania) and presented them in the following sections of the article.

Results

1. Cases involving the Republic of Latvia.

1.1. Cases related to the tariff classification of goods: It should be noted that the tariff classification of goods is one of the most critical areas of the EU customs law. It involves legal actions related to allocation of the eight-digit code to a specific unique product (type of goods), on which the amount of payable customs duty (set in the Combined Nomenclature of the European Union, see Council Regulation [EEC- European Economic Community] No. 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and the Common Customs Tariff, 1987; hereinafter referred to as CN) depends. For this reason, a relatively high number of legal disputes within the European Union, especially at the national level (in the EU Member States), is usually related to the issues of correct interpretation (or the inequality of interpretation) of the content of the CN governing the tariff classification of goods. It is important to mention, that the empirical studies that were carried out during the analysed period (see, e.g. Javorcik, Narciso, 2013) also confirmed that the incorrect (inappropriate) tariff classification of goods is one of the most common customs duties avoidance practices on a worldwide scale. Therefore, this area receives more and more attention both at a theoretical level and at a practical level. It should be noted that such types of problems were also reflected in the practice of the Baltic States, in particular in the Republic of Latvia, namely, in Case C-382/09 (Stils Met SIA v. Valsts ieņēmumu dienests, 2010) that has been examined by the CJEU. In this case, the national courts in the Republic of Latvia addressed the issue of the tariff classification of ropes and cables imported from third countries. The main legal question, which arose in the described case, was whether ropes and cables made of specific alloy steel should be classified as steel ropes and cables (CN codes 7312 1083 19, 7312 108419 and 7312 1086 19) or as 'other iron products', belonging to the same heading 7312 of the CN but having different full eight-digit codes. The CJEU explained that in the present case, note 1 to the chapter 72 of the CN defines 'steel products' in general and these definitions are relevant to the whole CN, including its section 73. For this reason, according to the explanations of the CJEU, categories 'stainless steel' and 'other alloy steel' should be understood as special steel grades/types that should be considered as belonging to the common category of 'steel/steel products' (para. 38 of the Court's decision). Such explanation of the CJEU in its essence coincides with the theoretical assessments of the legal doctrine and jurisprudence (see, e.g. Rovetta, Gavier, 2011), which reiterated the need to refer to the title of the heading/subheading and the additional explanatory notes to the relevant section and chapter of the CN as a basic rule for the classification of goods. Such basic provision (i.e. the fact that the main criterion determining the correct classification of goods depends on the general characteristics of the goods described in the headings of the CN and the notes of its sections and chapters) has been repeatedly applied in other CJEU cases during the analysed period (since 2010), see Case C-291/11 (Staatssecretaris van Financiën v. TNT Freight Management (Amsterdam) BV, 2011). Also, the interpretations of the CJEU in Case C-382/09 (Stils Met SIA v. Valsts ieņēmumu dienests, 2010) are important as they emphasised another important general principle of tariff classification of goods, which must be consistently observed in the EU

Member States. According to this principle, to ensure uniform tariff classification of goods, it is necessary to follow not only the notes to the sections and chapters of the CN but also the Explanatory Notes (Harmonized System Explanatory Notes [HSENs]) prepared by the World Customs Organization (WCO). Therefore, the HSENs (which set international standards for the uniform nomenclature of classification of goods) are also considered as essential tools for ensuring the uniform application of the EU Common Customs Tariff (see also Cases C-450/12 [HARK GmbH & Co. KG, Kamin-und Kachelofenbau v. Hauptzollamt Duisburg, 2013] or C-635/13 [SC ALKA CO SRL v. Autoritatea Națională a Vămilor - Direcția Regională pentru Accize și Operațiuni Vamale Galați and Direcţia Generală a Finanţelor Publice a Municipiului București, 2015]). They can be used as a basis for the interpretation of the CN (even if they were not adopted by the EU itself as its sources of law). However, in the recent years, this position was constantly questioned by the national courts in the Republic of Lithuania (see Valantiejus, 2016). Such trend can be explained by the fact that the relevant sources of the EU customs law (e.g. the UCC and/or the Regulation [EEC] No. 2658/87) still does not include any regulations directly governing the settlement of collisions between the CN and the HSENs. Therefore, the establishment of such regulations can be seen as one of the directions of the further development of the EU customs law.

On the other hand, it can be added that Case C-382/09 (Stils Met SIA v. Valsts ieņēmumu dienests, 2010) has highlighted the existence of some other fundamental issues arising from the interpretation and application of the CN. They are mainly related to the linguistic aspect of its interpretation (when it is necessary to identify what types of goods are covered by one or another general term in the CN, as by the concept of 'steel products' in the present case). It should be emphasised that from a theoretical, comparative point of view, the attitude of different countries to the tariff classification of goods is different. Such approach can be qualified as conservative (where the application of tariff classification rules aims to ensure that as few goods as possible are classified according to their general characteristics as homogeneous goods). It can also be qualified as liberal (as many as possible types of goods are intended to be classified as homogeneous goods without further dividing them into parts or elements and specific products), see Rauch (1999). As it was confirmed by the case law of the CJEU in Case C-382/09 (Stils Met SIA v. Valsts ieņēmumu dienests, 2010) and other similar cases (such as Case C-450/12 [HARK GmbH & Co. KG, Kamin-und Kachelofenbau v. Hauptzollamt Duisburg, 2013]), it can be concluded that the European Union has chosen to follow the liberal model of linguistic interpretation of the CN. The same trend was also confirmed by another case in the CJEU from the Republic of Latvia, that is, Case C-286/15 (Valsts ieņēmumu dienests v. SIA 'Latvijas propāna gāze', 2016). In this case, the CJEU explained that even the mixtures of various products could be classified as homogeneous goods by taking into account both the essential properties of mixed products and other relevant factors described in the CN (para. 22–29 of the decision). Similar argumentation was also used in the previous practice of CJEU in other cases such as Case C-35/93 (Develop Dr. Eisbein GmbH & Co. v. Hauptzollamt Stuttgart-West, 1994). In this particular case, the CJEU primarily supported the position of the EU Member State (Federative Republic of Germany) and its customs authorities, according to which goods imported in the customs territory of the European Union (in this particular – parts of copying machines) should be considered as incomplete primary goods (copying machines) and classified as such. Thus, by applying this liberal model, the final classification of goods is determined by the universal features/properties of their general type.

On the other hand, the application of such a model and such universal rules does not help to avoid the increasing number of new disputes in this area (see cases Panasonic Italia SpA, Panasonic Marketing Europe GmbH, Scerni Logistics Srl v. Agenzia delle Dogane di Milano, 2014; Agenzia delle Dogane, Ufficio di Verona dell'Agenzia delle Dogane v. ADL American Dataline Srl, 2014; Rohm Semiconductor GmbH v. Hauptzollamt Krefeld, 2014; Hauptzollamt Hannover v. Amazon EU Sàrl, 2015). Owing to the complexity of technology and the emergence of many new types of goods, mainly consisting of many different parts (elements), the constant problem related to a proper linguistic interpretation of the CN remains. The significance of this problem is highlighted by the fact that importers often seek to avoid payment of higher trade defense customs duties by classifying the imported goods not as a final product but only as separate parts of final goods (which are not covered by trade defense duties), see Vermulst (2015). It should be noted that implementation of proper tariff

classification still poses significant challenges and problems at the national level (in the EU Member States, as it is evidenced by the cases originating in the Baltic States, namely, the Republic of Latvia). Such a situation exists both because of the reasons related to constant technological advances and because the classification process itself is not yet automated, it is necessary to apply additional sources for the classification (not only the CN itself but also in WCO documents, namely, HSENs). Therefore, proper classification requires the use of specific knowledge or expertise to interpret and apply classification rules correctly (see Laurinavičius *et al*., 2014). According to the authors' assessment, this problem could be addressed in the EU Member States by ensuring a much broader and more effective application of the Binding Tariff Information (BTI) Institute (Article 33 of the UCC). As the CJEU has emphasised, BTI aims to provide legal certainty to the trader when there are any doubts about the classification of goods (see Case C-153/10; Staatssecretaris van Financiën v. Sony Supply Chain Solutions [Europe] BV., 2010). Thus, the decision to issue the BTI confirms the classification of the certain types of goods according to the CN and protects the person (taxpayer) from any subsequent changes in the position of customs authorities regarding the classification of a specific product. It is noteworthy to mention that these goals are also being pursued by the new UCC which, for example, establishes additional procedures (see Art. 33-34 of the UCC) ensuring that decisions regarding the issuing of the BTIs in the EU Member States do not differ and BTIs are issued under the same conditions. However, it should also be noted that even the existing legal framework does not eliminate all possible problems related to the efficiency of the BTI institute. For example, the original decision-making procedure under the provisions of the UCC remains decentralised (falls under the responsibility of an individual EU Member States), see also Limbach (2015). Therefore, there still remains a scope for different decision-making, as it is noticed by the authors in the Baltic States (Laurinavičius *et al*., 2014) and can be confirmed by certain practical examples, such as Case C-199/09 (Schenker SIA v. Valsts ieņēmumu dienests, 2010), where the conditions related to the issuing of BTIs in Latvia were also assessed by the CJEU. Besides, under the provisions of UCC, the BTI applies only directly to the subject (person) mentioned in the decision and other related subjects (such as subsidiaries of parent company operating in certain EU Member State) cannot rely on it in the other EU Member States (Article 33, para. 2 of the UCC), see also Shu-Chien Chen (2016). Thus, it is clear that these problems could only be fully resolved in the future and only if a centralised single BTI system would be applied in all the EU Member States to all the persons concerned. In the authors' opinion, the creation of such a system is currently not possible because it requires not only the formal changes in the existing legislation. First of all, such changes should include the centralisation of the BTI system, and the creation of a single BTI procedure will require organisational and administrative changes, such as development of a centralised EU customs administration system, replacing the national customs administrations. On the other hand, the centralisation of at least individual functions of customs administration, such as the classification of goods and the issuing of BTI, and the transfer of such functions to the EU institutions can be evaluated as a positive transformation. It is important to note that the functioning of the existing BTI system (taking into account the inefficiency of cooperation between the Member States) has been widely criticised by both the EU Commission and other institutions such as the Court of Auditors (see Binding Tariff Information [BTI] – efficiency and new working methods. Note to the CPG 27, 2011; Court of Auditors, Special report No. 2/2008 on binding tariff information with the answers of the Commission, 2008).

Whilst analysing other specific cases regarding the tariff classification of goods that were originated in the Republic of Latvia and were later settled by the CJEU, it can be observed that they reveal some other general and fundamental (constitutional) problems of the EU law. Such cases include, in particular, Case C-558/11 (SIA 'Kurcums metal' v. Valsts ieņēmumu dienests, 2012) and Cases C-233/15 (SIA 'Oniors Bio' v. Valsts ieņēmumu dienests, 2016) as well as C-547/13 (SIA 'Oliver Medical' v. Valsts ieņēmumu dienests, 2015). Similarly as analogous/related disputes in other new EU Member States (not only in the Baltic States, see e.g. case C-180/12 (Stoilov I Ko EOOD v. Nachalnik na Mitnitsa Stolichna, 2013), the described category of cases raises questions about the functioning and effectiveness of the national courts in the EU Member States and the cooperation mechanism between them and the CJEU itself. For example, in Case C-558/11 (SIA 'Kurcums metal' v. Valsts ieņēmumu dienests, 2012), the Supreme Court of the Republic of Latvia (*Augstākās tiesas Senāts*) applied to the CJEU for the clarification of the attribution of specific classification codes to certain types of goods (wire ropes and fasteners). The CJEU stated that 'when the Court is requested to give a preliminary ruling on a matter of tariff

classification, its task is to provide the national court with guidance on the criteria which will enable that court to classify the goods at issue correctly in the CN, rather than to effect that classification itself' (para. 28 of the decision).

On the other hand, the final judgment of the CJEU, in this case, does not fully comply with this explanation. For example, in the final (operative) part of the judgment, the Court nevertheless clarified and explained which specific eight-digit tariff classification code/subheading should apply to the product in question (e.g. 5607 49 11, 7317 00 90). Therefore, the Court described the final tariff classification code of goods (according to the content of the CN) and not limited itself to describe only the essential criteria for classifying the goods. Such example of the CJEU practice essentially confirms that in some individual tariff classification cases, the principle of cooperation between national courts of the EU Member States and the CJEU (which is currently enshrined in Article 267 of the Treaty on the Functioning of the European Union, 2012; hereinafter – TFEU) on the practical level is interpreted in a rather specific way. In this case, the national courts were not only provided with guidance regarding the interpretation of the substantive law based on which the national court should decide the case.

On the contrary, the CJEU itself applied the law to the specific facts, that is, reserved the right to clarify itself the issue of final classification of goods in the disputes regarding their classification code. Such position of the CJEU in the legal doctrine (see Barnard, 2016; Limbach, 2015) is described based on pragmatism and the need to ensure a uniform interpretation of the EU law – the factors that have traditionally been emphasised in other cases dealt by the CJEU and at the academic level as well. However, according to the authors' opinion, it also creates some problematic issues, for example, whether the examining of the specific technical issues related to the classification of individual goods is compatible with the primary mission of the CJEU, as it is described in the TFEU (see, e.g. Art. 267).

It should be noted that the assignment of a proper, accurate full product tariff classification code may require a specific expert assessment of physicochemical or physical properties of goods as well as laboratory tests (Gurevičienė, 2005). Therefore, such investigations can only be provided by the specialised national authorities such as customs laboratories, and in many cases, there is no possibility of conducting such investigation whilst the case is settled in the CJEU. However, as it can be seen from the case law of the CJEU, in cases falling within the topic under investigation (i.e. tariff classification cases originating from the Baltic States, i.e. the Republic of Latvia), the position of the CJEU itself on this issue remains inconsistent. For example, in Case C-558/11 (SIA 'Kurcums metal' v. Valsts ieņēmumu dienests, 2012), the CJEU has emphasised the need to distinguish itself (as the judicial institution of the European Union) as much as possible from performing the tariff classification of goods and stressed the need to fulfill only the function of interpretation of law. However, only in some of the cases (e.g. C-233/15 [SIA „Oniors Bio" v. Valsts ieņēmumu dienests, 2016]; C-547/13 [SIA 'Oliver Medical' v. Valsts ieņēmumu dienests, 2015]), the CJEU refrained from explanation of the final specific eight-digit tariff classification code applied to goods in question and provided only general clarifications (guidelines for the interpretation of the law) regarding the provisions of the CN.

In the authors' opinion, such situation involving above-mentioned legal inconsistencies and the transfer of technical disputes regarding the calculation of customs duties to the level of the CJEU cannot be solved by merely limiting the possibility for national courts to refer to the CJEU with the questions regarding the interpretation of the CN. Such a strict position could be evaluated as unreasonable and could give rise to numerous legal discussions (Craig, 2010; Turičnik, 2014). On the other hand, this problem could be solved by the CJEU itself in its practice. It can be done by distinguishing more specific criteria explaining when it is necessary to provide clarification on the attribution of a specific CN code and when only general explanations should be provided, such as explanations involving only the assignment of a product/good in question to the relevant chapter, heading or subheading of the EU Combined Nomenclature. Therefore, the determination of a specific code should be attributed to the competence of the national court (and other national tax authorities and tax administrations). Also, as a more specific alternative to these measures, the revision of the existing legal framework could be considered. For example, it is possible to impose imperatively (in the Combined Nomenclature of the European Union) that the competent authorities of the EU Member States themselves are responsible for the proper classification of goods and assignment of their eight-digit tariff classification codes (the authors suggest to establish such rule in the Art. 12 of the Regulation [EU] No. 2658/87, 1987).

Another issue raised in Case C-558/11 (SIA 'Kurcums metal' v. Valsts ieņēmumu dienests, 2012) could be related to the problems of linguistic interpretation of the EU customs legislation (in this particular case – provisions of the Council Regulation [EC] of 2 August, 2001, No. 1601/2001, which imposed definitive anti-dumping duties on imports of certain iron or steel ropes and cables originating, *inter alia*, in Russian Federation). In the present case, one of the essential arguments of the applicant (importer of goods), *SIA Kurcums Metal*, which imported the disputed goods (steel wire ropes) from the Russian Federation to the Republic of Latvia, was related to the fact that description of the product in question in the Latvian language version of the Regulation No. 1601/2001 could be interpreted as stating that the anti-dumping duties do not apply to the products that could be classified in the subheading 7312 10 98 of the CN. On the other hand, in the versions of the same EU regulation and its texts in other official languages of the EU Member States, the same disputed product (according to its tariff classification code) was classified as the product subject to anti-dumping duties. It is important to note that the analysis of the CJEU ruling in this case (SIA 'Kurcums metal' v. Valsts ieņēmumu dienests, 2012) confirms that this linguistic contradiction has been overcome (eliminated) by interpreting the EU law (Regulation [EC] No, 1601/2001) based on the teleological/purposive approach (method of interpretation of law). This means that the CJEU has pointed out that 'the provision in question must thus be interpreted by reference to the general scheme and the purpose of the rules of which it forms part' accordingly, in the light of the rules of Regulation No. 1601/2001 (see para. 48 and para. 50 of the Court's decision). Therefore, the Court ruled that although no reference was made to the disputed product and its code (subheading) according to the CN in the Latvian language version of the Regulation No. 1601/2001, the relevant provisions cannot be interpreted as not applicable to the importation of goods (steel wire ropes) into Latvia (as an EU Member State). On the other hand, it is vital to note that the CJEU has applied this method of interpretation only after it established the existence of the 'divergence between the various language versions' (para. 48 of the Court's decision) of the relevant source of the EU law. Thus, in the authors' opinion, it can be stated that, according to the position of the CJEU, the teleological interpretation of the EU legal regulations (on the basis of their structure and purpose) is still possible only after a literal (linguistic) analysis of the applicable legal regulation and comparison of their different linguistic versions was completed. Substantially, the same common position has also been followed in other recent cases of the CJEU, such as Case C-74/13 (GSV Kft. prieš Nemzeti Adó-és Vámhivatal Észak-Alföldi Regionális Vám-és Pénzügyőri Főigazgatósága Debreceni Közigazgatási és Munkaügyi Bíróság, 2014). The above-mentioned case was related to the interpretation of other sources of the EU customs legislation (Combined Nomenclature itself) and involved not only Baltic States (Latvia) but also other Member States of the European Union. According to the authors' opinion, the explanations of the CJEU mentioned above are undoubtedly crucial for the further development of the EU customs law in the context that they clarify the process of interpreting the EU customs legislation. It is important to note that some of the views expressed in the doctrine of law (see Broberg, 2008; Broberg and Fenger, 2014) argue that the literal interpretation of the provisions of the EU law that is carried out by comparing their different language versions in different official languages of the Union is not expedient or should be limited. Therefore, the priority should be given to a teleological/purposive (contextual) interpretation. However, it can be noted that in practice (at least in the field of customs law) such an approach is not yet dominant, nor it is universally accepted. On the other hand, greater legal certainty in this area could also be achieved by certain transformations and improvements of the EU legislation. For example, it is recommended to use a more precise definition of CN interpretation stages. For this reason, it is necessary to set imperative provisions that the linguistic interpretation procedure should always be considered as the first and mandatory stage of interpretation and the national institutions of the Member States (e.g. national courts) applying EU customs legislation (provisions of the CN) should also follow this particular rule/order. Such provision can be included into the text of the CN itself, that is, into General rules for the interpretation of the Combined Nomenclature, Section I, chapter "A" of the CN. It is important to note that similar situations have arisen in the other Baltic States, such as the Republic of Lithuania (UAB Profisa v. Muitinės departamentas prie Lietuvos Respublikos finansų ministerijos, 2007). The existence of similar cases in the other Baltic States confirms the systemic character of this problem, primarily because the necessary applicable order of interpretation of the Combined Nomenclature (as the CJEU explained it to the national courts) was also similar.

1.2. Cases related to the regulation of customs procedures: Other legal issues related to customs clearance of goods imported from third countries were dealt with by the CJEU in Case C-571/12 (Greencarrier Freight Services Latvia SIA v. Valsts ieņēmumu dienests, 2014). In the case mentioned above, which was referred to the CJEU for a preliminary ruling by the national court in Latvia, the CJEU assessed the legal situation in which the taxpayer Greencarrier Freight Services Latvia re-imported biscuits and chocolate bars into the territory of the Republic of Latvia for a release for free circulation in the European Union. In this case, the Latvian State Tax Administration, based on the results of the partial verification of the goods indicated in the subsequent customs declarations, carried out documentary checks on identical imported goods that were previously imported and released for free circulation. During this procedure, the Latvian State Tax Administration have not examined the characteristics and composition of the disputed goods and found that the goods were declared by using the incorrect CN code. Accordingly, the case raised the question of the existence of the right of the customs authorities to extrapolate (transfer) the results of partial verification of the goods covered by the same declaration to the goods covered by previous declarations made by the same declarant and under what conditions? According to the authors' assessment, this problematic issue is also relevant in the context of the current application and interpretation of the provisions in the UCC, which defines the powers of the EU Member States to lay down national rules on customs clearance procedures and to adjust their content. It is important to mention that the EU customs law does not regulate this issue in detail, traditionally leaving it to the Member States and the discretion of their institutions. It should be noted that the response of the CJEU to this question was mostly positive. On the basis of the provisions of Article 78 of the Community Customs Code (which was in force at the time when the legal relationship of the dispute arose and which corresponds to the current Article 48 of the UCC), the CJEU has acknowledged that such extrapolation in principle was possible.

It should be noted that similar practices have been followed by courts in the other Baltic States, such as the Republic of Lithuania (especially in the cases related to the so-called 'special customs procedures' (currently listed in Article 210 of the UCC) when the goods brought into the customs territory of the European Union were later re-exported to the third countries. However, the national courts of the Republic of Lithuania in similar situations have not referred to the CJEU but solved these issues and made quite similar conclusions on a national level (see, e.g. Baronaitė, 2010). It should be emphasised that such precedent of the case law (as it was formulated in Case C-571/12 [Greencarrier Freight Services Latvia SIA v. Valsts ieņēmumu dienests, 2014]) allows the customs administrations to carry out *a posteriori* checks. Therefore, the customs administrations have the right to complete the investigation of goods that were already declared in customs by questioning the previously submitted declarations on the basis of written documents and does not have an obligation to inspect the goods in question physically. Such position is in principle also consistent with the practice that was formulated by the CJEU in other cases, such as Case C-320/11 (Digitalnet OOD and Others v. Nachalnik na Mitnicheski punkt — Varna Zapad pri Mitnitsa Varna, 2012) and Case C-290/01 (Receveur principal des douanes de Villepinte v. Derudder & Cie SA, and Tang Frères, 2004). A similar position was also supported by the CJEU in Case C-156/16 (Tigers GmbH v. Hauptzollamt Landshut, 2017).

On the other hand, we must take into account the fact that certain assumptions for the further corrections and transformations in this practice exist after the entry into force of the UCC and in particular its provisions, regarding transfer of customs procedures into the electronic environment (Article 6 of the UCC). Therefore, the priority of formal documents as the sources of evidence is no longer emphasised. Besides, under the new provisions of the UCC (see Art. 22, 'Decisions taken upon application'), it is quite clear that new decisions of customs administrations can only be made after the individuals have been provided with more detailed information on the legal status of the results of their customs procedures and the legal possibilities of reviewing them later (*a posteriori*). However, to ensure practical implementation of such provisions, it is also necessary to make improvements to the legal regulations (at the national level). As it was already mentioned, such a trend was especially evidenced by the situation and cases in the Republic of Lithuania during the analysed period; however, the new Law on Customs of the Republic of Lithuania (2016), see Articles 29-38, does not include any imperative provisions to regulate such issues and, therefore, criticised in this respect.

1.3. Cases related to the customs valuation of goods: Whilst recognising that the primary and standard (standard) method of valuation of imported goods in the European Union is still a transaction value method (UCC, Art. 70, para. 1), we must acknowledge that there are also problematic issues in which legal situations are not required to be followed. It should be emphasised that the issues of this kind have been raised more than once in the recent practice of the CJEU, for example, Cases C-354/09 (Gaston Schul BV v Commission Staatssecretaris van Financiën, 2010), C-116/12 (Ioannis Christodoulou and Others v. Elliniko Dimosio, 2013), C-291/15 (EURO 2004. Hungary Kft. v National Tax and Customs Office Western Transdanubian Regional Customs and Finance Directorate, 2016) and, in particular, also in the cases originating from the Republic of Latvia, Case C-430/14 (State Revenue Service v. Arthur Stretinski, 2016). Whilst in this particular case, the CJEU has once again emphasised that the transaction value method should be considered as the most important (hierarchically), such provision was once again challenged by the national courts in the Baltic States (Republic of Latvia). Especially we can notice that in situations where national tax and customs authorities sought to challenge possible tax fraud related to the diminishing of real customs value of imported goods and used other (alternative) customs valuation methods to establish the customs value of imported goods. It is necessary to note that in similar situations, as it was done in Case C-263/06 (Carboni e derivati Srl v. Ministero dell'Economia e delle Finanze and Riunione Adriatica di Sicurtà SpA, 2008), para. 64, the CJEU emphasised the need to guarantee the importer's right to be heard when the customs authorities took the decision not to apply the transaction value method to calculate the customs value of the goods but also calculated it by other alternative methods. This conceptual provision was further developed in the latest case of Latvian origin: C-46/16 (Valsts ieņēmumu dienests v. "LS Customs Services", 2017). Here the CJEU stated that the importer has the right to know on what basis other specific (alternative) methods were chosen if the transaction value method was not applied, that is, why the customs authorities 'set aside one or more methods for determining customs value' (para. 44-45, 47). In other words, these precedents developed by the CJEU attempted to clarify the exceptions to the application of the transaction value method in the EU customs law. At the same time, they can also be seen as an attempt to provide broader safeguards of the right to defense (aligned with the Article 41 of the EU Charter of Fundamental Rights, 2012) and the right to proper administration. Such safeguards are binding not only on the Union itself but also on Member States in situations where national customs authorities need to deviate from the presumption of application of the transaction value method (as it was done by the authorities in the Republic of Latvia in the cases mentioned above). However, according to the author's assessment, it can be seen that this area of legal regulation that is mentioned remains particularly significant, especially because there is an increasing debate about the legality of appropriate anti-avoidance measures in taxation (Lasiński-Sulecki, 2015). Therefore, to ensure the consistent practice of the application of such measures, the above-mentioned procedural rights of importers (taxpayers) should be directly enshrined in the regulation that implements the UCC (e.g. Art. 144 of the Regulation [EU] No. 2015/2447). General problematic nature of similar issues is also confirmed by the case law of the Lithuanian courts (Giriūnienė *et al*., 2016). However, the problem is that they have chosen different reasoning of their decisions in such situations (regarding priority of transaction value method). These decisions were not based on the EU law but on direct application of the World Trade Organization (WTO) law (see, e.g. the Supreme Administrative Court of Lithuania, 5 March 2013 decision in the administrative case No. A-442-709/2013, 2013). Such legal reasoning may be considered a problem because it may contradict the general attitude of the CJEU to the relationship between the WTO and the EU legal orders (for further details on this issue, see Katuoka, Valantiejus, 2017).

1.4. Cases related to the origin of the custom of goods: One of the fundamental problems of the EU customs law, reflected in the practice of the CJEU is how to interpret the criteria for the determination of origin of imported goods. The second most important problem is how the burden of proof should be shared between the importer and the customs authorities in such situations (see, e.g. Case C-373/08, Hoesch Metals and Alloys GmbH v. Hauptzollamt Aachen, 2010). Therefore, usually in such cases, the CJEU receives questions such as should the process of determining the origin of the custom of the goods by the national customs authorities always be based on evidence (certificates, documents) issued by the country from which the goods were imported? In which cases, the customs authorities of the EU Member State of origin have the right to challenge the legality (admissibility) and reasonableness of the evidence provided by the same importer and to consider other additional evidence sources proving the customs

origin at its discretion (*ex officio*)? This problem is particularly relevant in the sense that, as is apparent from the legal doctrine, rules of origin can also be used for trade defense purposes. For example, instead of initiating a new investigation on the application of trade defense instruments (anti-dumping duties), the customs authorities of an EU Member State may challenge the declared preferential origin of the goods in question (Vermulst, 2008). For this reason, many disputes have arisen in this area in the EU Member States, including the Baltic States, such as Latvia (see arguments below) and Lithuania (see Valantiejus, 2016), especially given the fact that the EU legal framework is rather vague in this area.

It should be emphasised that after the decision of the CJEU in Case C-438/11, *Lagura Vermögensverwaltung* (para. 28-33), new practice began to take shape in this area. According to the explanations of the CJEU, in such legal situations where a third country from which the goods were imported, was subject to preferential tariffs and the taxpayer (importer of such goods) was acting in good faith, the origin of those goods may still be challenged later. The customs authorities may carry out additional verification by investigating whether possibly false information was provided by the exporter in the customs declaration and certificates of the origin of goods. It should be noted that, in principle, similar conclusions previously were also made in Case C-409/10 (Hauptzollamt Hamburg-Hafen v. Afasia Knits Deutschland GmbH, 2011), see para. 48 of the Court's decision. In this particular case, the CJEU stated that the issue of a specific certificate proving the customs origin of the goods cannot be qualified as an error made by the customs authorities, which does not give rise to the registration of customs debt (Community Customs Code, Article 220, para. 'b', which corresponds to the Article 119, para. 1, of the UCC). This provision shall apply in the event when these certificates were based on the false information provided by the exporter unless the authorities which issued such certificates were aware or should have been aware that the goods do not correspond to the conditions required for their preferential treatment. It is essential that similar questions related to similar circumstances were referred to the CJEU by the national courts in the Republic of Latvia (see e. g. case C-47/16 (Valsts ieņēmumu dienests v. "Veloserviss" SIA, 2017)). In the judgement that was adopted in this case, the CJEU stated that importer is obliged to verify the circumstances under which the origin certificate of goods was issued. For example, the importer has to verify the circumstances under which the export customs authorities in the exporting state issued such certificates as well as contribution of the exporter to the production of goods, in case if there are apparent reasons that raise doubts about the accuracy of the certificates of origin (para. 39 of the Court's decision). Thus, in this aspect, as it can be seen from Case C-438/11 (Lagura Vermögensverwaltung v. Hauptzollamt Hamburg-Hafen, 2012), the final position of the CJEU is such that the circumstances under which the importer can be exempted from the customs duties that were calculated because of inappropriately declared origin of goods should be interpreted narrowly and should be associated with a number of binding cumulative conditions. The most important of them is that the importer has to act in good faith and to check any doubts related to the issuing of certificates of customs origin/documents proving the origin of the custom. On the other hand, such a position has a subjective and evaluative nature as all the responsibility is transferred to the importer, which may not have any access to legal information collected in a foreign country. However, taking into account that application of such practice differs in the EU Member States (*inter alia*, the Baltic States, such as also the Republic of Lithuania, see Valantiejus, 2016), it is advisable to adjust the provisions of the UCC concerning the proof of origin of goods (Art. 64). At present, the UCC regulates only the duty to prove the non-preferential origin of goods and do not provide any such general provisions applicable to situations when it is necessary to determine the preferential origin of the goods (see e.g. Art. 61 of the UCC).

2-3. Cases involving the Republic of Lithuania and the Republic of Estonia.

2-3(1). Cases related to the regulation of exemptions from customs duties: it should be emphasised that one part of the cases involving the Baltic States such as Estonia and Lithuania was related to the explanation of the concept of customs debtor and the possibility to exempt certain categories of such persons from the application of such duties. The problem mentioned above was assessed by the CJEU in Case C-3/13 (Baltic Agro AS v. Maksu- ja Tolliameti Ida maksu- ja tollikeskus, 2014), which directly relates to both the Republic of Lithuania and the Republic of Estonia. The applicant, in this case was the company 'Baltic Agro' that engaged in agricultural business in Lithuania and Estonia, and the case itself was referred to the CJEU by the national courts of the Republic of Estonia. In Case C-3/13, the referring

national court asked the CJEU to ascertain whether Article 3, para. 1 of the Regulation (EC) No. 661/2008 must be interpreted as meaning that a company established in a Member State that has acquired ammonium nitrate originating in Russian Federation through the intermediary of another company established in a Member State of the European Union may be regarded as the first independent buyer of such goods in the Union. Therefore, the national court asked to explain whether such a company may benefit from the exemptions to the definitive anti-dumping customs duty imposed by the Regulation (EC) No. 661/2008 on ammonium nitrate. It is necessary to stress that the explanations provided in this case are essential to the development of the EU customs law. For example, in paragraph 24 of the judgment in Case C-3/13 (Baltic Agro AS v. Maksu- ja Tolliameti Ida maksu- ja tollikeskus, 2014), the CJEU stated that 'the exemption from anti-dumping duties may be made only under certain conditions, in cases specifically provided for, and thus constitutes an exception to the normal regime for anti-dumping duties. *The provisions which provide for such an exemption are, therefore, to be interpreted strictly* (note: highlighted by the authors)'. Such provision, which can also be distinguished from the other older and even recent cases, such as C-48/98 (Firma Söhl & Söhlke v. Hauptzollamt Bremen, 1999; para. 52), Case C-371/09 (Commissioners for Her Majesty's Revenue and Customs v. Isaac International Limited, 2010) and even cases related to already analysed Latvian cases („Latvijas Dzelzceļš" VAS v. Valsts ieņēmumu dienests, 2017), is now predominant in the practice of the CJEU. The described provision essentially prohibits as well as obliges customs administrations in the EU Member States to extend the conditions for the application of anti-dumping duties or even other mandatory regulatory measures (such as obligatory rules of customs procedures) unjustifiably. Therefore, in dealing with these issues, the applicable regulations should be interpreted *stricto sensu*. Thus, it is prohibited to apply any new exemptions that are not imperatively enshrined or to supplement the existing imperatively expressed conditions with new ones to facilitate/enhance the possibilities to apply the existing exemption, as well as to apply the different treatment of the same type of goods and persons importing them regarding the application of exemptions. It should be noted that during the analysed period, the case law of the national courts in the Republic of Lithuania (in legal cases/tax disputes regarding the calculation of anti-dumping duties) used a rather different approach for the solving of similar situations. For example, in the administrative cases No. A-261-146/2014, No. A-261-144/2014 and No. A-377-556/2016, the Supreme Administrative Court of Lithuania annulled the anti-dumping duties calculated to the applicants/taxpayers that imported goods from the People's Republic China, on the grounds that, according to the assessment of the Court, the customs authorities did not exhaust all the means to prove their customs origin. According to the Supreme Administrative Court of Lithuania, it was the obligation of customs authorities themselves 'to prove country of origin to which the anti-dumping duty applies' (see decision of the Supreme Administrative Court of Lithuania of 30 April 2014 in the administrative case No. A-261-146/2014, 2014; ruling of the Supreme Administrative Court of Lithuania of 20 August 2014 in the administrative case No. A-261-144/2014; the decision of the Supreme Administrative Court of Lithuania of 1 September 2016 in the administrative case No. A-377-556/2016). On the other hand, it should be noted that such special anti-dumping duty relief measure (possibility of exemption from such duties because customs administration is unable to prove the country of origin) is not and was not directly foreseen in the EU anti-dumping regulations or the UCC. On the contrary, the practice of the CJEU (Case C-416/15 [Selena România v. Direcția Generală Regională a Finanțelor Publice (DGRFP) București, 2016; para. 35-37] and the EU customs legislation [Art. 61 of the UCC] consistently follows the principle that the importer itself must prove the origin of the imported goods. This is also confirmed by the explanations in the already mentioned Case C-3/13 (Baltic Agro AS v. Maksu- ja Tolliameti Ida maksu- ja tollikeskus, 2014). For example, the CJEU has directly stated that 'the obligation to provide correct information in a customs declaration falls on the declarant', that is 'the principle of irrevocability of the customs declaration once it has been accepted' must be applied (see para. 43 of the Court's decision). In the context of the analysed situations mentioned above in Lithuania, this would mean that the importer who presented the customs declaration and indicated the country of origin of the product should bear all the possible negative legal consequences relating to the information contained in the customs declaration or, otherwise, should prove its correctness. It is noteworthy to mention, that the possibility to challenge the legality of the anti-dumping duties imposed on the importers or to interpret exemptions of customs duties/import taxes in accordance with the practice of the CJEU in the above-mentioned Lithuanian cases may also be negatively affected because

of the unclear provisions of the Law on Administrative Proceedings (Article 4). The national law does not provide clear mandatory conditions under which the national courts, which settle tax disputes, are obliged to submit a preliminary reference to the CJEU itself (see also Kavalnė, Valančius, 2009). The scale of this problem can be also confirmed by the fact that the extensive interpretation of the conditions for the application of the exemptions from customs duties was once again sought and ultimately rejected by the CJEU in another case from the Republic of Lithuania (Lietuvos geležinkeliai AB v. Vilniaus teritorinė muitinė and Muitinės departamentas prie Lietuvos Respublikos finansų ministerijos, 2012).

Conclusions

During the investigation, the authors established that the problems of uniform application of the EU customs law in the Baltic States arose in areas such as tariff classification of goods, determination of the origin and value of goods (in the cases/situations involving the Republic of Latvia), regulation of customs procedures and, in particular, application of exemptions from customs duties/import taxes (in the cases/situations involving the Republic of Estonia and the Republic of Lithuania). At the same time, it was established that whilst the national courts of the Republic of Latvia have initiated the most significant number of referrals to the CJEU regarding the interpretation and application of the EU customs legislation, the national courts of the Republic of Lithuania were the least active in ensuring co-operation with the CJEU this area. Such a situation could have been caused by the improper national legal regulations (provisions of the national Law on Administrative Proceedings in the Republic of Lithuania).

The research shows that the scope of the problems related to the uniform application and interpretation of the EU customs legislation in the Baltic States justify the existence of the systemic regulatory problems not only on the national level but also on the level of EU law itself (supranational level). On the basis of the results of the research, these problems can be identified as follows: (i) the absence of the collision norms that regulates the application of different sources of law (international and the European Union) in the process of tariff classification of goods and the settlement of their contradictions; (ii) referral of technical issues of tariff classification of goods to the CJEU itself (the absence of clear obligation to resolve them at the national level); (iii) decentralised system of the decisions regarding Binding Tariff Information throughout the European Union; (iv) non-assertion of the order for the application of interpretation methods of the EU customs law. Besides, it is possible to distinguish the lack of procedural guarantees for the importers during the process of customs valuation and the lack of rules regulating the proving of preferential customs origin of goods. However, to address these issues, it is also necessary to improve specific national rules (in the context of the Republic of Lithuania). For example, it is essential to enshrine specific new provisions, especially involving procedural guarantees of the taxpayers/importers to be heard and to be informed about the legal basis of repeated customs checks and investigations against them (in the national Law on Customs). It also should be noted that because of linguistic challenges during the research, the authors have not analysed (in detail) the related national case law in Latvia and Estonia, which can be considered as particular limitation of this article and the object of further studies.

References

Baronaitė, M. (2010). Naudotų apgadintų transporto priemonių muitinio vertinimo ypatumai [Particularities of Used Damaged Motor Vehicles Evaluation for Customs Purposes]. *Teisė*, 77, 66-67.

Bikelis, S. (2012). Permąstant sankcijas už kontrabandą: proporcingumo problema (I). Proporcingumo principas ir bausmės už kontrabandą [Rethinking Sanctioning for Trafficking of Goods: The Problem of Proportionality (I). Issues of Confication and Tax Duties]. *Teisės problemos*, 4(78), 5-24.

Bikelis, S. (2013). Permąstant sankcijas už kontrabandą: proporcingumo problema (II). Konfiskavimo ir mokestinių priemonių taikymo klausimai [Rethinking Sanctioning for Trafficking of Goods: The Problem of Proportionality (II). Issues of Confication and Tax Duties]. Teisės problemos, 1(79), 43-57.

Bikelis, S. (2015). Baudžiamosios ir mokesčių teisės sankirta: atsakomybė už neteisėtą praturtėjimą ir non bis indem principas [Crossroad of Criminal and Tax Law: Liability for Illicit Enrichment in the Context of Non Vis in Idem Principle]. *Teisės problemos*, 2(88), 54-69.

Bikelis, S., *et al*. (2017). Cigarečių neteisėta apyvarta: kompleksinė reiškinio ir kontrolės priemonių analizė [Illegal Turnover of Cigarettes: Complex Analysis of Phenomena and Control Measures]. Vilnius: Lietuvos teisės institutas.

Byla C-263/06, Carboni e derivati Srl v. Ministero dell'Economia e delle Finanze and Riunione Adriatica di Sicurtà SpA, 2008 E.C.R. I-01077.

Binding Tariff Information (BTI) – efificiency and new working methods. Note to the CPG 27 (2011). Brussels: TAXUD.

Broberg, M. P. (2008). Acte clair Revisited: Adapting the acte clair criteria to the demands of the times. *Common Market Law Review*, 45, 1383-1397.

Broberg, M. P., & Fenger, N. (2014). *Preliminary References to the European Court of Justice. Second edition*. New York: Oxford University Press.

C-291/15, EURO 2004. Hungary Kft. v. National Tax and Customs Office Western Transdanubian Regional Customs and Finance Directorate, 2016 EU:C:2016:455.

C-58/14, Hauptzollamt Hannover v. Amazon EU Sàrl, 2015 EU:C:2015:385.

C-74/13, GSV Kft. prieš Nemzeti Adó-és Vámhivatal Észak-Alföldi Regionális Vám-és Pénzügyőri Főigazgatósága Debreceni Közigazgatási és Munkaügyi Bíróság, 2014 EU:C:2014:243.

Case C-116/12, Ioannis Christodoulou and Others v. Elliniko Dimosio, 2013 EU:C:2013:825.

Case C-153/10, Staatssecretaris van Financiën v. Sony Supply Chain Solutions (Europe) BV., 2010 E.C.R. I-02775.

Case C-250/11, Lietuvos geležinkeliai AB v. Vilniaus teritorinė muitinė ir Muitinės departamentas prie Lietuvos Respublikos finansų ministerijos, 2012 EU:C:2012:496.

Case C-154/16, „Latvijas Dzelzceļš" VAS v. Valsts ieņēmumu dienests, 2017 EU:C:2017:392.

Case C-156/16, Tigers GmbH v. Hauptzollamt Landshut, 2017 EU:C:2017:754.

Case C-180/12, Stoilov i Ko EOOD v. Nachalnik na Mitnitsa Stolichna, 2013 EU:C:2013:693.

Case C-199/09, Schenker SIA v. Valsts ieņēmumu dienests, 2010 E.C.R. I-12311.

Case C-233/15, SIA „Oniors Bio" v Valsts ieņēmumu dienests, 2016 EU:C:2016:305.

Case C-250/11, Lietuvos geležinkeliai v. Vilniaus teritorinė muitinė, Muitinės departamentas prie Lietuvos Respublikos finansų ministerijos, 2012 EU:C:2012:496.

Case C-286/15, Valsts ieņēmumu dienests v. SIA "Latvijas propāna gāze", 2016 EU:C:2016:363.

Case C-290/01, Receveur principal des douanes de Villepinte v. Derudder & Cie SA, and Tang Frères, 2004 E.C.R. I-02041.

Case C-291/11, Staatssecretaris van Financiën v. TNT Freight Management (Amsterdam) BV, 2011 EU:C:2012:459.

Case C-3/13, Baltic Agro AS v. Maksu- ja Tolliameti Ida maksu- ja tollikeskus, 2014 EU:C:2014:2227.

Case C-320/11, Digitalnet OOD and Others v. Nachalnik na Mitnicheski punkt — Varna Zapad pri Mitnitsa Varna, 2012 EU:C:2012:745.

Case C-35/93, Develop Dr. Eisbein GmbH & Co. v. Hauptzollamt Stuttgart-West, 1994 E.C.R. I-02655.

Case C-371/09, Commissioners for Her Majesty's Revenue and Customs v. Isaac International Limited, 2010 E.C.R. I-07727.

Case C-382/09, Stils Met SIA v. Valsts ieņēmumu dienests, 2010 E.C.R. I-09315.

Case C-409/10, Hauptzollamt Hamburg-Hafen v. Afasia Knits Deutschland GmbH, 2011 E.C.R. I-13331.

Case C-416/15, Selena România v. Direcția Generală Regională a Finanțelor Publice (DGRFP) București, 2016 EU:C:2016:501.

Case C-430/14, State Revenue Service v. Arthur Stretinski, 2016 EU:C:2016:43.

Case C-438/11, Lagura Vermögensverwaltung v. Hauptzollamt Hamburg-Hafen, 2012 EU:C:2012:703.

Case C-450/12, HARK GmbH & Co. KG, Kamin-und Kachelofenbau v. Hauptzollamt Duisburg, 2013 EU:C:2013:824.

Case C-46/16, Valsts ieņēmumu dienests v. "LS Customs Services", 2017 EU:C:2017:839.

Case C-47/16, Valsts ieņēmumu dienests v. "Veloserviss" SIA, 2017 EU:C:2017:220.

Case C-472/12, Panasonic Italia SpA, Panasonic Marketing Europe GmbH, Scerni Logistics Srl v. Agenzia delle Dogane di Milano, 2014 EU:C:2014:2082.

Case C-48/98, Firma Söhl & Söhlke v. Hauptzollamt Bremen, 1999 E.C.R. I-07877.

Case C-546/13, Agenzia delle Dogane, Ufficio di Verona dell'Agenzia delle Dogane v. ADL American Dataline Srl, 2014 EU:C:2014:2348

Case C-547/13, SIA "Oliver Medical" v. Valsts ieņēmumu dienests, 2015 EU:C:2015:139.

Case C-558/11, SIA „Kurcums metal" v. Valsts ieņēmumu dienests, 2012 EU:C:2012:721.

Case C-571/12, Greencarrier Freight Services Latvia SIA v. Valsts ieņēmumu dienests, 2014 EU:C:2014:102.

Case C-595/11, Steinel Vertrieb GmbH v. Hauptzollamt Bielefeld, 2013 EU:C:2013:251.

Case C-63/06, UAB Profisa v. Muitinės departamentas prie Lietuvos Respublikos finansų ministerijos, 2007 E.C.R. I-03239.

Case C-635/13, SC ALKA CO SRL v. Autoritatea Națională a Vămilor - Direcția Regională pentru Accize și Operațiuni Vamale Galați and Direcţia Generală a Finanţelor Publice a Municipiului București, 2015 EU:C:2015:268.

Case C-666/13, Rohm Semiconductor GmbH v. Hauptzollamt Krefeld, 2014 EU:C:2014:2388.

Case Case C-354/09, Gaston Schul BV v. Commission Staatssecretaris van Financiën, 2010 E.C.R. I-07449.

Case Case C-373/08, Hoesch Metals and Alloys GmbH v. Hauptzollamt Aachen, 2010 E.C.R. I-00951.

Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee "On the State of Customs Union", COM(2012) 791 final. (2012). [Accessed 20.04.2019]. Available from Internet: http://eur-lex.europa.eu/legal-content/LT/TXT/HTML/?uri=CELEX:52012DC0791& from=lt.

Council Regulation (EEC) No 2658/87 of 23 July 1987 on the tariff and statistical nomenclature and on the Common Customs Tariff (1987). *Official Journal*, L 256.

Court of Auditors (2008). Special report No. 2/2008 on binding tariff information with the answers of the Commission. *Official Journal*, C 103/01.

Craig, P. (2010). *The Classics of EU Law Revisited: CILFIT and Foto-Frost. The Past and Future of EU Law: the Classics of EU Law Revisited on the 50th Anniversary of the Rome Treaty*. Oxford: Hart Publishing.

Craig, P., & de Burca, G. (2015). *EU Law: Text, Cases, and Materials*. Oxford: Oxford University Press.

Decision of the Supreme Administrative Court of Lithuania of 30 April 2014 in the administrative case No. A-261-146/2014. Available from Internet: <https://eteismai.lt/byla/86557037859732/A-261-146-14>.

Decision of the Supreme Administrative Court of Lithuania of 1 September 2016 in the administrative case No. A-377-556/2016. Available from Internet: <https://eteismai.lt/byla/151489826098556/A-377-556/2016>.

Decision of the Supreme Administrative Court of Lithuania, 5 March 2013 in the administrative case No. A-442-709/2013, 2013. . Available from Internet: <http://liteko. teismai.lt/viesasprendimupaieska/detali paieska.aspx? detali=2>.

Díaz Gavier, P., & Rovetta, D. (2011). A Survey of the EU Tariff Classification Case Law in Year 2010. *Global Trade and Customs Journal*, 6(7), 319-324.

EU Charter of Fundamental Rights (2012). *Official Journal*, C 326.

EU Monitor. (2012). *„Explanatory Memorandum to COM(2012)64 - Union Customs Code"*. [Accessed 15.04.2019]. Available from Internet: https://www.eumonitor.eu/9353000/1/j4nvhdfdk3hydzq_j9vvik7m 1c3gyxp/vix6t9sb46yj.

Giriūnienė, G., *et al*. (2016). *VAT Fraud in EU*. Vilnius: Mykolo Romerio universitetas.

Gurevičienė, J. (2005). Tarifinio prekių klasifikavimo sistema [Tariff Classification Work System]. *Jurisprudence*, 73(65), 39–47.

Javorcik, B. S., & Narciso, G. (2013). Accession to the World Trade Organization and Tariff Evasion. *CEPR Discussion Paper No. DP9592*, 1-27.

Valantiejus, G. & Katuoka, S. (2017). Application of the WTO Agreements in National Courts: Comparative Aspects of Worldwide and Lithuanian Judicial Practices. *International Comparative Jurisprudence*, 3(2): 195-212.

Kolliker, A. (2006). *Flexibility and European Unification: The Logic of Differentiated Integration*. Oxford: Oxford University Press.

Lasiński-Sulecki, K. (2015). Will the Court of Justice apply its anti-abuse doctrine in customs valuation cases? *World Customs Journal*, 9(2), 3-11.

Laurinavičius, A., *et al*. (2014). *Muitinė tarptautinės prekybos logistinė grandinėje* [Customs in International Trade Logistical Chain]. Vilnius: Mykolo Romerio universitetas.

Lietuvos Respublikos mokesčių administravimo įstatymas [the Law on Tax Administration of the Republic of Lithuania] (2004). *Valstybės žinios*, 63 (2243).

Lietuvos Respublikos muitinės įstatymas [Law on Customs of the Republic of Lithuania] (2016). *Register of Legal Acts*, 26857.

Limbach, K. (2015). *Uniformity of Customs Administration in the European Union*. Oxford: Hart Publishing.

Lyons, T. (2018). *EU Customs Law*. Oxford: Oxford University Press.

Lučinskienė, A., & Rimkus, V. Mokestinių sutarčių vieta tarptautinio apmokestinimo teisinio reguliavimo šaltinių hierarchijoje [Position and Role of Tax Treaties in the Hierarchy of the Sources of Legal Regulation on International Taxation]. *Societal Studies* 3, 7 (2010): 197-211.

Lukas, M. (2013). *Valstybių konkurencijos mokesčiais įtaka nacionaliniam mokesčių teisiniam reguliavimui* [The influence of international tax competition on national tax legislation] (doctoral dissertation). Available from Internet: http://talpykla.elaba.lt/elaba-fedora/objects/elaba:1922808/ datastreams/MAIN/content.

Lukas, M., Medelienė, A. & Paulauskas, A. (2014). Impact of Membership in the European Union on the Lithuanian National Taxation System, From G. Švedas (ed.), *Lithuanian Legal System under the Influence of European Union Law: Collection of Scientific Articles* (p. 499-543). Vilnius: Faculty of Law, Vilnius University.

Medelienė, A. (2012). Principai, kaip mokesčių teisės normų aiškinimo ir taikymo instrumentas nagrinėjant mokestinius ginčus [Principles as an Instrument for Interpreting and Applying Tax Law in Tax Disputes], From G., Švedas (ed.), *Nepriklausomos Lietuvos teisė: praeitis, dabartis ir ateitis: recenzuotų mokslinių straipsnių rinkinys* (p. 321-343). Vilnius: Vilniaus universitetas.

Medelienė, A., & Paulauskas, A. (2008). Sandorio vertė kaip prekių muitinio įvertinimo pagrindas [Transaction Value as a Key Concept of Customs Valuation]. *Teisė* 67, 25-47.

Medelienė, A., & Vasiliauskas, V. (2012). Europos Sąjungos teisės taikymas nagrinėjant mokestinius ginčus Lietuvoje [The Application of European Union Law in Tax Disputes in Lithuania], From V. Valančius (ed.), *Žmogus, teisinė valstybė ir administracinė justicija: mokslo studija, skirta Lietuvos vyriausiojo administracinio teismo dešimtmečiui* (p. 700-733). Vilnius: Lietuvos vyriausiasis administracinis teismas.

Milinis, A., & Pranevičienė, K. (2016). Conditions and Circumstances which Lead to Application to the Court of Justice of the European Union and Adoption of a Preliminary Ruling. *Baltic Journal of Law & Politics*, 9(2), 130-149.

Novačkova, D. (2013). International Trade Economic Measures Applied in Slovakia. *Czech Yearbook of International* Law, IV, 143-159.

Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods (2nd. ed.)*. Newbury Park, CA: Sage.

Puzinskaitė, E. (2013). Mokesčio apskaičiavimas taikant turinio viršenybės prieš formą principą [Tax Calculation Using the Principle of Substance Over Form]. *Jurisprudence*, 20(4), 1409-1426.

Puzinskaitė, E., & Klišauskas, R. (2012). Mokesčių teisės sistema ir apmokestinimo principai [Tax Law System and Charging Principles]. *Jurisprudence*, 19(2), 675-695.

Radžiukynas, J. (2003). Kai kurios importuojamų prekių muitinės vertės nustatymo problemos [Certain Problems on Customs Valuation of Import Goods]. *Jurisprudence* 46(38), 98-107.

Radžiukynas, J. (2005). Importuojamų prekių muitinio įvertinimo kontrolė Lietuvos muitinėje Europos Bendrijos muitinių strategijos kontekste [Customs Valuation Control of Imported Goods in The Lithuanian Customs in the Context of Customs Strategy of EU]. *Jurisprudence*, 73(65), 48-57.

Radžiukynas, J., & Belzus, A. (2008). *Importuojamų prekių muitinis įvertinimas ir kontrolė* [Customs Valuation and Control of Imported Goods]. Vilnius: Lietuvos pramonės, prekybos ir amatų rūmų asociacija.

Rauch, J. E. (1999). Networks Versus Markets in International Trade. *Journal of International Economics* 48, 7-35.

Regulation No. 952/2013 of the European Parliament and of the Council of 9 October 2013 laying down the Union Customs Code. (2013). *Official Journal*, L 269/1.

Rodriguez, E. V., & Dulguerova, E. (2013) Blues at the Border: The Quest for Uniform Tariff Classification in the European Union. *Global Trade and Customs Journal*, 8(11), 368-381.

Ruling of the Supreme Administrative Court of Lithuania of 20 August 2014 in the administrative case No. A-261-144/2014. Available from Internet: <https://eteismai.lt/byla/50951964777036/A-261-144-14>.

Sarapinienė, S., & Avižienis, J. Š. *Muitinės procedūros* [Customs Procedures]. Vilnius: Mykolo Romerio universitetas.

Shu-Chien, C. (2016). In the name of legal certainty? Comparison of advance ruling systems for tariff classification in the European Union, China and Taiwan. *World Customs Journal*, 10(2), 47-64

Treaty on the Functioning of the European Union (2012). *Official Journal*, C 326.

Truel, C., & Maganaris, E. (2015). Breaking the code: the impact of the Union Customs Code on international transactions. *World Customs Journal*, 9(2), 12-22.

Turičnik, E. (2014). Preliminary Reference Procedure – the Right, the Duty and Exceptions. *InterEULawEast: Journal for the International and European Law, Economics and Market Integrations*, 1(1), 1-18.

Valančius, V., & Kavalnė, S. (2009). *Europos Sąjungos teisės įgyvendinimas Lietuvos administracinėje teisėje: monografija* [Implementation of European Union Law in Lithuanian Administrative Law: Monograph]. Vilnius: Registrų centras.

Valantiejus, G. (2016). Application of Soft Law Instruments in International Economic Law: Insights on the Lithuanian Practice on the Legal Regulation of Customs Duties. *Social Transformations in Contemporary Society* 4, 97-108.

Valantiejus, G. (2016). *Application of Rules on Burden of Proving the Customs Origin of Imported Goods in International Trade: Problematic Aspects in Lithuania.* Whither our economies - 2016: 5th International Scientific Conference, October 20-21, 2016; Conference Proceedings, 124-136.

Vermulst, E. (2008). Origin Rules in EU Anti-Dumping Law and Practice: An Update. *Global Trade and Customs Journal*, 3(10), 337-348;

Vermulst, E. (2015). EU Anti-Circumvention Rules: Do They Beat the Alternative? *European University Institute Working Paper RSCAS* 57, 1-19.

Walsh, T. (2015). *European Union Customs Code*. Alphen aan den Rijn: Kluwer Law International.

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0020

MODERN TECHNOLOGIES IN FOREIGN LANGUAGE TEACHING: THE CASE OF L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY

Akzhan Abdykhalykova

L.N. Gumilyov Eurasian National University, Nur-Sultan, Kazakhstan, akzhan80@mail.ru

Abstract

Research purpose. The teacher of higher education should motivate students to use modern information technology training to study the discipline and develop professional competencies in foreign language teaching. The purpose of this research is to highlight the problem of finding the optimal didactic capabilities of modern information technologies used for improving the system of training specialists in the field of foreign languages teaching and to discuss the results of current studies in this direction.

Design/Methodology/Approach. The authors summarized the relevant literature and results of the research and teaching experience. The main theoretical methods of research are modelling and designing the process of incorporating modern information technologies into foreign language teaching at the university. Theoretical methods are supplemented by empirical methods, such as observation, survey, testing, experimental work and methodological analysis.

Findings. The article reveals the main components of the system of using modern technologies of foreign languages teaching at Theory and Practice of Foreign Languages Department of L.N. Gumilyov Eurasian National University. The article presents a description of training and monitoring online programs, their approbation in real conditions of pedagogical activity, the results of a pedagogical experiment, which proves the effectiveness of using modern technologies in the training of foreign and second language students.

Originality/Value/Practical implications. The electronic educational materials, recommendations developed by the authors, can be used in the teaching of foreign language and can serve as a basis for the development of information, communication and instrumental provision in other subjects. The need for further research is as follows: to create online platforms, multimedia and testing programs and to develop variants of using modern technologies in foreign language teaching.

Keywords: modern technologies; foreign language teaching; multimedia technology; online platform; testing program.

Introduction

Because of scientific and technological progress, the use of new technologies in various spheres of human activity imposes new requirements for the training of future specialists in the condition of informatization of education.

At the present stage of development of education, Kazakhstan higher school faces the task of improving the quality of training, which with the introduction of new state educational standards (both for undergraduate and graduate) is associated with the prospect of implementing a technological approach to learning science-based new pedagogical and information technologies. In this regard, the purpose of the study is to teach future teachers the ability to competently work with various kinds of information, to make the most of the opportunities of modern information technologies for professional improvement in the field of teaching foreign languages. Implementation of the technological approach in the preparation of the future teacher of English is hampered by the following contradictions:

- Between the rapidly growing level of development of Kazakhstan's information society and the ability of the higher education system to meet the growing requirements
- Between the need to improve the professional training of future teachers of foreign languages on the basis of technological approach and the weak readiness of university teachers.

- Between the broad didactic possibilities of ICT and the low level of their use in the practice of education at the university.

The following questions arise from the identified contradictions:

- Whether the existing system of professional training of future teachers of foreign languages is capable of providing formation of professional competences which meet new requirements.
- What should the training of future specialists in the field of foreign languages at the university be, so that they can continue to work competently with information and effectively use as well as be able to develop multimedia technologies in their activities?

These issues together defined the problem of the research, which is to improve the system of teaching disciplines on the methodology of teaching foreign languages at the university through information and communication technologies and their instrumental support. Referring to the analysis of the initial facts, contradictions and the problem, we highlight the following main idea of our research: the ability to navigate the ever-increasing volume of information, to use it correctly for various purposes, to use modern means of communication that should become essential components of the modern content of pedagogical education and a computer – a tool for managing the educational process.

Literature Review

According to Abbas Pourhosein Gilakjani (2017), the use of technology helps learners to get involved and learn based on their interests. It has been extensively accepted for teaching English in the modern world. Technology satisfies both visual and auditory senses of the learners (Solanki & Shyamleel, 2012). Kimwise and Mugabirwe (2018) opined that several studies in the whole world have shown that the appropriate use of multimedia technology in educational context would provide quite a lot of benefits.

Friggard (2002), Miner (2004) and Timucin (2006) confirmed that technology increases the development of teaching methods and learners' knowledge. Lam and Lawrence [6] also expressed that technology helps learners to regulate their own learning process and have access to any information that their teachers cannot provide. Gilakjani (2013) elaborated that the unique opportunities technologies provide have brought about new tools, approaches and strategies in the teaching and learning of language skills. Technologies are increasingly widespread, impacting many aspects of our social and work lives and many of our leisure activities. Many researchers stated that technology can be used as an instructional tool in teaching and learning skills. Bruce and Levin (2001) expressed that technology can be useful in the classroom by helping communication, making teaching products and assisting learners' self-expression. According to Gilakjani (2017), when we talk about instruction, education or training issues we have to consider the important role of technology. The researchers continued that the application of technologies in education opens a new area of knowledge and provides a tool that has a great potential to change the existing teaching methods.

The use of computer in teaching a foreign language is not limited to classroom activities. Various researchers offer options for the use of Internet technologies in the classroom and in extracurricular work of students. For example, the use of ICT in teaching foreign languages is considered in the works of Russian and Kazakh scientists such as Artykbayeva (2014), Nurgalieva (2002), Kapezovich and Toktarbekovna (2014) and Myamesheva (2015).

A promising direction in the study is the use of Internet technologies, various aspects of which are devoted to many publications. In recent years, teachers have been attracted to the mass open online courses (MOOC) as a new form of online education, since they allow anyone to learn practical training, regardless of time and location.

The question of formation of the content of foreign language teaching methods in universities has received plenty of attention from scientists. On the scope of application of ICT in teaching foreign languages, scientists such as Kunanbayeva (2000), Rogova et al. (1991), Zhusubalieva (1977) and Popov (1987) have made a great contribution to teaching English.

However, in our opinion, to date, the impact of online learning on the quality of education has been insufficiently studied. We also tried to work with students online, but at the moment we have not received enough results to mention this direction in the article. The analysis of literature and educational practice has allowed to conclude that in the conditions of fast growth of the volume of information, the computer can become the tool of management of the educational process. New information technologies do not displace the traditional system of education and innovative pedagogical technologies, but complement and strengthen each other. It is an integration process that requires further research to improve the quality of training of the future teacher of a foreign language.

Methodology

In the process of research the following methods were used: theoretical (analysis of pedagogical, psychological, methodical literature, normative and program – methodical documentation, Internet resources; generalization; forecasting, design and modelling), diagnostic (questioning, testing), empirical (pedagogical observation), experimental (pedagogical experiment) and methods of graphic representation of results.

The experimental base of the research was L.N. Gumilyov Eurasian National University, Philology Faculty, Theory and Practice of Foreign Languages Department, Specialty 'Foreign languages: two foreign languages'.

The problem was studied in three stages. In the first stage, a theoretical analysis of the existing methodological approaches in the psychological, pedagogical, methodical scientific literature and dissertations on the research topic was carried out; the problem, idea, purpose and methods of research were identified; the plan of the experimental research was drawn up. In the second stage, an information system of foreign language teaching was developed; a set of components of this system was identified and justified for the effective training of the future teacher of foreign languages. In the third stage, experimental work was carried out, analysed and tested; and refined insights obtained in the course of the pedagogical experiment were summarized and the obtained results reported.

Results

In the first stage of theoretical analysis of the existing methodological approaches to teaching a foreign language, the aim was to develop students' ability to understand the process of developing online technologies. Although the needs of the analysis have become an important stage in the development of a foreign language for professional purposes, the analysis has mainly provided information on what to teach, leaving unanswered the question of how to teach. Systematization of previous experience has led to the fact that the students' needs were in the centre of attention of developers of foreign language programs for professional purposes. This approach was called personality-oriented (learning-centred approach), in which the centre is the personality of the student and his cognitive activity, and the students' needs are the basis for the construction of the course.

Information technologies open up new opportunities for the future teacher of foreign languages and form a new way of thinking and action laying the foundations of new ethics and culture of understanding of the world. The basis of information technology of foreign language learning is computer training, the successful implementation of which (in addition to the computer as the main technical means) requires special didactic tools and thoughtful methods of working with them.

In the second stage, students developed multimedia products for teaching and learning English. This work was carried out by us in the following areas:

- Creation of electronic learning platforms, blogs that can be used as a means of visibility, submission and receiving of information, control of knowledge and skills, creative activity, etc.

- Creation of training and test programs, which can then be supplemented and improved by the students themselves.

In this article, we present the introduction of multimedia technologies in foreign languages teaching. Table 1 is a brief description of multimedia products that we use in our teaching process.

Table 1. A brief description of multimedia products

Electronic textbook, multimedia teaching materials of disciplines	A software tool designed to facilitate an active understanding and memorization using the computer in learning process involving aural and emotional memory. It is not only text information as such, but the whole technology of information delivery to the consumer, namely, multimedia components; interactive elements; controls; **powerful search engine;** hypertext link system; additional service capabilities (bookmarks, notes, filing, etc.); **opportunity** for **comfortable reading;** synchronous listening and a host of other things (Thamarana, 2015) Electronic textbook and multimedia teaching materials of disciplines as software for educational purposes can be represented as a system consisting of two subsystems: information (substantial part) and software (software). Informational part of the electronic textbook and multimedia teaching materials of disciplines may include well-structured training materials, multimedia illustrations, practical works with assignment examples and analysis of common errors, diagnostic and control system, methodological recommendations on the study of the course, additional materials, services (assistance, dictionary, etc.), information about the authors. The software part of the electronic textbook may include registration system, modules of educational materials, supplementary materials, the communication system (liaison between teacher and students), the service (help, dictionary, search system) and the protection system.
Multimedia encyclopaedia, multimedia lectures	The modern educational tool that combines the advantages of different multimedia technologies and facilitates the perception of even the heaviest educational material. Unlike traditional encyclopaedia or lectures, multimedia encyclopaedia and lectures can contain not only text and graphics, but also video and audio recordings, three-dimensional diagrams, drawings and much more (Young & Bush, 2004)
Electronic didactic aids	Visualized material, revealing the action or process necessary for a teacher to explain students the new teaching material; animated historical and geographical maps, electronic laboratory works and others (Thamarana, 2016)
Film about events	A film about important events: video congratulation, corporate celebration, anniversary, assigning categories, titles, awards, association or expansion, launching of a new product or production resources, opening new sites, etc. (Motteram, 2015)
Presentation film	A film about the activity area of educational institutions and companies offering products of exceptional quality, service, promotions, discounts, classic and original forms of services, guarantees and other features.
Representative films	The history of educational institutions, businesses, the main activities, a description of resources and processes, achievements, prospects, staff, goods, services, partners, covered market segments, etc.
Video showcase	Video sequence to show in a shopping centre or showroom. Video showcase is successfully used in combination with other videos (video clips, movies, etc.) (Kennedy & Soifer, 2017)
Video catalogue	Video catalogue of products and services of a company providing information on the competitive advantages of quantitative and qualitative characteristics of each item. Efficiency can be improved by combining the video catalogue with other videos.
Educational video film	Didactic videos which a teacher can use in the classroom to explain new educational material or to enhance students' learning.
Digitalization of books	Conversion of paper sources into electronic (digital) type (Healey et al., 2008)
Electronic library	The information system that allows safe and effective use of various collections of electronic documents (text, image, sound, video, etc.), localized in the system, and inaccessible communicational networks as well (Kobysia et al., 2017).

Here we may emphasize the following advantages of multimedia products:

1. Teaching goes faster and knowledge acquisition is deeper, if a student takes a great interest in the subject.

2. Learning the ways of finding correct answers is more important for a student than just learning the answers themselves. That is, learning is more effective if the forms of the acquisition of knowledge and skills are such that they can easily be transferred to real life conditions (which they are designed for).

3. Teaching goes faster if students 'learn the result' of each of their answers immediately. If the answer is correct, then the students should immediately receive confirmation that they did well; if not, they learn about it quickly as well. Even a little delay in getting the results dramatically slows down the learning process. Oftentimes our students have to wait long for the results of their tasks in traditional learning.

4. Being aware of the results of tasks stimulates the completion of upcoming tasks. The difficulties that students have to overcome should appear before them one by one. And the successful solution of these problems has a positive influence on motivating and activating students to learn.

5. Teaching goes faster if the subject program is organized according to the principle of sequential complexity of educational material. The difficulty level of educational material is increasing on a daily basis. This will continue until the desired degree of proficiency and competency is reached (Nayef, 2015).

The use of new tools has significantly transformed the traditional scheme of organization of the process of training, ensuring the development and implementation in practice of the variable structure of the educational process of higher education with components that allow automating many processes.

New technology tools that we use in our teaching process are as follows:

- Speech tools for teachers: Announcify, Chrome Speak, DSpeech, FoxVox, PowerTalk
- Digital storytelling tools: Animoto, Capzles, Cartoonist, PicLits, Pixton
- Podcast tools: Audacity, Easypodcast, PodOmatic, SoundCloud, VozMe
- Survey, polls and quizzes tools: addpoll, Google Forms, Pollhost, Wufoo
- Exercise and testing tools: Kahoot, Socrative, Hot Potatoes
- Online teaching platforms: Padlet, Blog, Nicenet, Canvas, etc.

The use of various technologies allows implementing a differentiated approach to students by creating conditions for their independent work. A methodically well-constructed online material helps to replace the means of paper visibility, frees the teacher from writing on the board and allows one to trace the material of the lesson in dynamics.

The great advantage of using technologies in comparison with traditional means of visualization is the convenience of their storage and distribution with the ability to copy and edit. Colourful on-screen training material increases the interest and motivation of students to learn.

According to the method of using technology in teaching foreign languages, we implement three models of classes:

1. In demo mode (one computer on the teacher's desk + projector)

2. In the individual mode (occupation in a computer class without access to the Internet)

3. In individual remote mode (class in the computer room with Internet access)

To obtain relevant information, it is necessary to develop students' skills of searching for it in a constantly updated resource – the Internet. To do this, students are offered our catalogues of public sites and various online tools.

In the third stage, the experimental work was carried out to identify the impact of multimedia technologies on the academic performance of students. The study was conducted in two groups, one

experimental and the other control; each group had 25 students. Both groups were equivalent in the direction of training, academic performance and teaching program. In the first group (experimental) multimedia technologies were used in the educational process, and in the second group (control) the educational process was organized by the traditional method. The study was conducted during one semester. After the final testing of the level of performance, the results of the study were processed and analysed. When processing the results, a test was used to check the differences between the control and experimental groups. The analysis of the results of the final testing showed that there are statistically significant differences between the experimental and control groups; the statistical significance level was 47%. The best indicators of academic performance in the experimental group compared to the control group were noted, which emphasizes the contribution of multimedia technologies to the learning process.

Conclusions

In recent years, new technologies have had a significant impact on the improvement of the education system and have been an important focus of the restructuring of both general and higher education. The main educational value of information technologies is that they allow creating a multisensory interactive learning environment with almost unlimited potential opportunities, which appear in the teaching and learning environment. In contrast to the technical means of education, information technology allows not only to saturate teaching with a large amount of knowledge, but also to develop the intellectual and creative abilities of students, their ability to acquire new knowledge as well as to work with various sources of information. Using the above information, educational technology for teaching foreign languages helps to increase motivation to study a particular discipline, deeper assimilation of the material, the development of skills of search, analysis and structuring of information and, ultimately, the formation of general cultural and professional competencies defined in modern state educational institutions of higher education. The materials of this article may be of use for teachers engaged in the training of specialists in the field of foreign languages, as well as students of higher educational institutions. In conclusion, this article was designed for teachers who mainly adhere to traditional and outdated methods, whereas they are virtually not sophisticated in using modern devices, applications and sources in teaching.

References

Artykbayeva, E.V. (2014). Theory and Technology of E-Learning in Secondary School. Synopsis of a Thesis, Almaty.

Bruce, B., & Levin, J. (2001). Roles for new technologies in language arts: Inquiry, communication, construction, and expression. In J. Jenson, J. Flood, D. Lapp, & J. Squire (Eds.), The handbook for research on teaching the language arts. NY: Macmillan.

Frigaard, A. (2002). Does the computer lab improve student performance on vocabulary, grammar, and listening comprehension? ERIC Document Reproduction Service No. ED476749

Gilakjani, A. P. (2013). Factors contributing to teachers' use of computer technology in the classroom. *Universal Journal of Educational Research*, 1(3), 262-267.

Gilakjani, A. P. (2017). A Review of the Literature on the Integration of Technology into the Learning and Teaching of English Language Skills. Retrieved from https://www.researchgate.net/publication/318740321_A_Review_of_the_Literature_on_the_Integration_of_Technology_into_the_Learning_and_Teaching_of_English_Language_Skills

Healey, D. (2008). *TESOL Technology Standards Framework*. Virginia: Teachers of English to Speakers of Other Language.

Kapezovich, K. G., & Toktarbekovna, D. T. (2014). E-Learning in the system of the pedagogical education in Kazakhstan. *Procedia-Social and Behavioral Sciences*, 152, 179-183.

Kennedy, S., & Soifer, D. (2013). *Technology-driven innovations for teaching English learners.* VA: Lexington Institute.

Kimwise, A., Mugabirwe, B. (2018). A Literature Review on Acceptance of Multimedia Technologies to Enhance E-learning in Higher Education Institutions; Focusing on Challenges. https://www.researchgate.net/publication/329034174_A_Literature_Review_on_Acceptance_of_Multimedia_Technologies_to_Enhance_E-learning_in_Higher_Education_Institutions_Focusing_on_Challenges

Kobysia, V. M., Zarichanska, N. V. & Bobliienko, O. P. (2017). Creating and using electronic textbooks for language learning. *Information Technologies and Learning Tools*, 61(5), 15-23.

Kunanbayeva S. S. (2000). Methodical preparation of students in the conditions of informatization of the theory and methods of foreign language teaching. Almaty.

Lam, Y., & Lawrence, G. (2002). Teacher-student role redefinition during a computer-based second language project: Are computers catalysts for empowering change? *Computer Assisted Language Learning*, 15(3), 295-315. https://doi.org/10.1076/call.15.3.295.8185

Miner, T. (2004). Using technology to enhance learning: Instructor-or student-moderated discussion boards: Which are more effective? Retrieved from http://www.cccone.org/scholars/0405/TomMiner_final_report.pdf

Motteram, G. (2013). *Innovations in learning technologies for English language teaching*. British Council.

Myamesheva, G. (2015). The virtue in the modern smart world. Bulletin KazNU. *Pedagogical Science Series*, 1(44), 152-157.

Nayef, B. H. (2015). The advantages and disadvantages of using multimedia in education. *Journal Of AL-Turath University College*, 2(19), 96-104.

Nurgalieva G. K. (2002). Pedagogical technologies of informatization of education. Almaty.

Popov A.I. (1987). Review of computer training programs on foreign languages. "Methods teaching foreign languages». Minsk, 48-51 p.

Rogova G. V., Rabinovich F. M., Sakharova I. E. (1991). Methods of teaching foreign languages in secondary school. Moscow.

Solanki, D., & Shyamlee1, M. P. (2012). Use of technology in English language teaching and learning: An analysis. International Conference on Language, Medias and Culture IPEDR vol. 33(2012)©(2012) IACSIT Press, Singapore. 150-156.

Thamarana, S. (2015). Role of Multimedia Resources in Teaching and Learning of English Language. *Teaching English Language and Literature: Challenges and Solutions*, 187-192.

Thamarana, S., Kumar, S., Prabhakar, T., Gulivindala, S., Matta, V., Seela, C. R., & Ramana, P. (2015). Use of multimedia technologies in english language learning: a study. *Journal of English Language and Literature*, 3(3), 537-541.

Timucin, M. (2006). Implementing CALL in the EFL context. *ELT Journal*, 60(3), 262-271. https://doi.org/10.1093/elt/ccl006

Young, C. A., & Bush, J. (2004). Teaching the English language arts with technology: A critical approach and pedagogical framework. *Contemporary Issues in Technology and Teacher Education*, 4(1), 1-22.

Zhusubalieva D.M. (1977). Theoretical bases of formation information culture of students in terms of distance learning training: Dissertation: 13.00.01. Almaty

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0021

PERSONAL QUALITIES IN THE CONTEXT OF SALES MANAGER COMPETENCE DEVELOPMENT

Aušra Gabrevičienė[1], Birutė Petrošienė[2], Danguolė Šidlauskienė[3]

[1]*Marijampole college, Marijampole, Lithuania,* aus.gabr@mkolegija.lt

[2]*Marijampole college, Marijampole, Lithuania,* bir.petr@mkolegija.lt

[3]*Marijampole college, Marijampole, Lithuania,* dan.sidl@mkolegija.lt

Abstract

Research purpose: The aim was to identify the personal qualities needed to develop sales manager competences.

Design/Methodology/Approach: The methods used were theoretical—systematic analysis of literature sources; empirical—employers' research questionnaire; descriptive statistical data analysis.

Findings. Having analyzed the competencies and personal qualities required for a sales manager, one can observe the tendency to look at the future specialist in a modern way. Both authors and respondents emphasize that the future employee must take the initiative to improve his/her professionalism. When comparing the competencies, required for the manager, indicated by the scientists and employers, the conclusion is that a large part of managerial competencies are partly or entirely of generic competences origin deriving from the personal qualities. For example, creativity in solving problems is a personal feature, but the ability to solve problems creatively must be accompanied by the ability to base the decision on appropriate knowledge. On the other hand, use of special knowledge must be based on creativity in the search for the necessary information, which is again a matter of personal qualities.

Originality/Value/Practical implications. Based on the results of the research carried out, the authors of the article propose measures to improve a sales manager's competence development(a) by training a sales manager, to reduce the scope of strategic knowledge subjects in the study process, and fill in loose credits with the subjects that develop the student's competences to identify perfectly the functional values of the products and services sold and to sell them but not just to offer as low price as possible; and (b) in the descriptions of management study programs, to emphasize the orientation to changing labor market factors: increase of personal responsibility, promotion of creativity and individual initiative, continuous learning and adaptation to changing conditions.

Keywords: social and personal skills; competence; development.

JEL codes: I23

Introduction

The main objective of the studies, conducted by the higher school, is to train a specialist for the labor market who is able to adapt to the changing conditions of economic life. Under the conditions of information technology development and globalization of economy, the knowledge and skills of the employees become the main competitive advantage. In order for a prospective specialist to successfully cross the boundary from knowledge to practical application of the knowledge, not only a number of different modules combining theory with practice should be included in the prospective employee competence development process, but also the conditions of the employers' interests. In modern business, the emphasis is on the change of organizational culture and work organization—flexible working conditions, development of nonhierarchical relations, increase of personal responsibility, promotion of creativity, and individual initiative and continuous learning. Employers want to hire not only knowledgeable managers of modern management, planning, finance, marketing, and sales techniques, but also who are able to apply them effectively in the work environment. Therefore, the

requirements for occupation include not only the competences acquired in the study process, but also the student's personal qualities.

There is noncompliance between the process of organizing higher education studies and the interests of the business world to develop the competences of specialists within management field. Although the study program descriptions emphasize the orientation to changing labor market factors, employers are not always satisfied with the competences acquired by future employees.

The aim of the research is to identify the personal qualities needed to develop sales manager competences. Research objectives are:

1. To perform the analysis of competence concept and sales manager competences
2. To identify employers' expectations for sales manager competences
3. To perform the analysis of the study subjects necessary for acquiring sales manager competencies
4. To evaluate the influence of personal qualities for acquiring sales manager competencies

Literature Review

In literature sources, the term "competence" is defined in various ways and is not yet fully explored. The authors of the article have discovered various definitions of competence that are presented in Table 1, when examining scientific literature.

Table 1. Definitions of the competence concept

Author(s)	Competence described
Good (1959)	Ability to apply the basic principles and techniques of certain content in practical situations
Dictionary of international words (1969)	Scope of any institution or person's scope of authority; question area in which a particular person has knowledge, experience
Jovaiša (1993)	Ability to perform the activity well by qualification, skills, knowledge; it is the power to do something; highly skilled knowledge
Ivanovic and Collin (1997)	Effectiveness, ability to perform the tasks required at work
Boyatzis (1982)	Individual characteristics that are causally related to effective or better performance
Spencer and Spencer (1993)	An essential characteristic of an individual that is associated with higher quality work in a particular job or situation; the characteristics of the individual, highlighting the versatility of the competence, ensuring the continuity of the personality, and creating the preconditions for predicting the behavior of the person in various operational situations
Grzeda (2001)	Ability to apply professional skills in practical situations
Makštutis (2001)	Compliance with duties, ability, knowledge, understanding of what to do and how to do in the workplace in accordance with job requirements (defined by organization statutes or regulations according to criteria, resources, norms, indicators)
Sokol (2001)	A combination of skills, knowledge, and abilities needed to accomplish the job task or role
Martinkus, Neverauskas, and Sakalas (2002)	Matching knowledge and skills and adapting them to specific circumstances, performing management functions, taking into account environmental and situation limitations

Petasis (2003)	Ability to perform specific tasks using a combination of knowledge, abilities, skills, and personal qualities
Petkevičiūtė and Kaminskytė (2003)	Ability allowing to achieve effectiveness in the particular organization using adequate ways in order to seek organization's strategic goals
Karlof and Lovingsson (2006)	Ability to use knowledge, skills, and experience to solve problems in order to achieve organizational goals
Jovaiša, Laužackas, Spūdytė, and Tutlys (2008)	Functional ability to adequately perform certain activities
Pacevičius and Kekytė (2008)	The combination of professional knowledge, abilities, and skills and the ability to adapt them to the requirements of the work environment
Cambal (2012)	Ability to apply professional knowledge, skills, personal qualities in practice and achieve desired company results

Analysis of the definitions in Table 1 shows that the concept of competence has changed little over half a century, so it is worthwhile to further analyze Guy Le Boterf's (2010) concept of competence in a rather detailed and innovative way. He argues that the primary meaning of the concept of competencies was formed in 1970, but despite the fact that over 45 years there were a lot of workshops, courses, lectures, and discussions of this topic, competency can be described as *a whole of knowledge, skills and behavior*. The author seeks to turn the competence into an investment object, taking into account the competitiveness of the companies and those who will have to offer their competences to the labor market. To this end, he proposes 15 ways of reasoning on the subject of competencies, from which the proposal to consider *competence as a process rather than the sum of sources* is very relevant in the opinion of the authors of this article. It is not enough simply to list the sources (knowledge, skills, behavior); it is necessary to distinguish what is meant by "to be competent" and "to have competencies." "Being competent" means being able to function successfully and competently in an operational situation by fully mobilizing the combinations of available sources (knowledge, skills, behavioral attitudes, ways of thinking, and physical inborn inclinations). Meanwhile, "having competencies" only means having sources for competent activity. It can be concluded that the availability of sources is a necessary but not sufficient condition for competent activities. It can be recognized that a person acts competently in a particular situation, when he/she is able to combine and mobilize the available personal resources (knowledge, skills, behavior) and media (databases, colleagues, experts, networks of other professions) and implement effective professional practice.

It is important to know what you are aiming for in developing employee competencies: whether they are more competent or that they have more competences, because both are not the same thing. In the first case, it will be necessary to help the employees implement good professional experience in a group of mastered situations by mobilizing appropriate source combinations, and in the second case, it can be limited to the acquisition of sources only.

When analyzing the concept of competence, one has to realize that companies want their staff not only to have competencies but also to act competently in mastering different professional situations. It is therefore necessary to adopt a completely new approach to competence. A professional worker is not limited to performing identically repetitive tasks. He is able to use the acquired sources in a new environment and apply them in different contexts. This means horizontal transfer (extending mastery of the same type of problem or situation) or vertical transfer (mastering the most difficult situation) (Guy Le Boterf, 2010). Transferring competences is not as easy as transporting an object, because professional competence is inseparable from its application field. It can be concluded that the field of application is part of the competence, and to be competent means to be able to act effectively and continuously in similar situations.

Analysis of competencies needed in sales manager's practical work. Knowledge and abilities of employees of modern companies become the main competitive advantage. Companies seeking to

implement competencies development means tend to start thinking about the definition of competence. An employee can have many competencies (knowledge, skills, behavior), but is unable to act competently in a particular situation. According to Guy Le Boterf (2010), what separates employees is not their knowledge, but their ability to use that knowledge effectively in a long-term operational situation. It can, therefore, be concluded that a competent person is one who is able to establish effective links between sources and practices in order to master professional situations and achieve the most effective goals.

According to Lambert et al. (2009), all competencies needed by the sales manager can be divided into four groups: partnering, insight, solution, and effectiveness. The authors of the article have noted different competences that are presented in Table 2, when examining scientific literature.

Table 2. The competencies needed by the sales manager

Competence	**Authors**					
	Vakola et al. (2007)	Piercy et al. (2009)	Punwatkar And Varhese (2014)	Barber and Tietje (2006)	Kim and Hong (2005)	Bush (2012)
Partnering						
Aligning to customers		x	x	x	x	x
Building relationships	x	x	x	x		x
Communicating effectively	x	x	x	x	x	x
Negotiating positions			x	x	x	x
Setting expectations				x	x	x
Spanning boundaries				x		x
Insight						
Analyzing capacity			x	x	x	x
Building a business case		x		x		x
Evaluating customer experiences		x	x	x	x	x
Gathering intelligence			x	x		x
Identifying options				x		x
Prioritizing stakeholder needs			x	x		x
Understanding business context	x	x		x		x
Solution						
Articulating value			x	x	x	x
Facilitating change		x	x	x		x
Formalizing commitment			x	x		x
Leveraging success		x		x		x
Managing projects				x		x
Resolving issues			x	x	x	x
Effectiveness						
Accelerating learning		x		x		x
Aligning to sales processes		x	x	x	x	x
Building business skill		x		x	x	x

Embracing diversity		x		x		x
Executing plans		x		x		x
Solving problems				x	x	x
Making ethical decisions			x	x	x	x
Managing knowledge		x	x	x	x	x
Maximizing personal time		x		x	x	x
Using technology		x		x		x

The analysis of the competencies required by the sales manager in Table 2 shows that all four competencies groups are considered important by the researchers. In summary, it can be stated that

- Partnering competencies enable the effective creation and leveraging of relationships within the sales context and facilitate sales interactions.
- Insight competencies enable the development of robust analysis and synthesis skills. They permit salespeople to use information effectively and efficiently.
- Solution competencies enable the effective development of strategies and support for the resulting solutions.
- Effectiveness competencies enable the demonstration and development of personal effectiveness and responsibility.

Time has passed when the career has been planned in advance and for life. Existing companies are in the process of constant reorganization and development, and so the skills of adapting to the new business context are very strongly appreciated. This means that the employee must not only keep the job, but also adapt to the changes taking place and influence the workplace.

A modern manager needs to create a supportive environment seeking to maximize the likelihood for his employees to take a combination of effective, initiative, and mobilizing sources. Employees with the greatest learning abilities will be most preferred. Accordingly, competitive companies will have to provide their employees with opportunities for learning, changing jobs, and performing various functions. Therefore, in management study programs, for competence development students need to pay much attention to those study subjects that develop learning abilities and promote professional mobility.

There are many definitions of competence available, but no single definition has been widely accepted. From an operational perspective, competences seem to cover a broad range of higher-order skills and behaviors that represent the ability to cope with complex, unpredictable situations. Human resource executives need to evaluate sales candidates on the basis of not only their conceptual knowledge, but also their skills and professional and personal values.

Prospective employees need to raise their level of intelligence, know how to use information technology, know foreign languages, acquire new competencies, and improve the ones they already possess. For these reasons, educational institutions are developing existing study programs and creating new ones. Business schools must provide students with the knowledge and all information they need in order to meet the demands and expectations of employers. Therefore, there is a need for dialogue between business and educational institutions. In order to evaluate the employers' opinion on the sales manager's competencies in practical work, the authors of this article conducted a survey of employers.

Research methodology

In the first stage of the research, theoretical research method is applied—analysis of competence concept, based on Lithuanian and foreign authors' research works and publications, was carried out to evaluate its role in a competitive labor market. In the second stage of the research, the empirical research method is applied—employers' questionnaire survey was carried out in order to find out the employer's

expectations regarding the competences acquired during the sales manager's studies. The research was conducted from December 2017 to January 2018

Applying the targeted selection and predefined selection criteria, the authors of this article chose trade companies as a whole, employing at least 10 employees and located in the municipalities of Marijampolė, Kalvarija, Kazlų Rūda, Šakiai, Vilkaviškis, Birstonas, and Prienai. A total of 114 trading companies were selected (excluding company branches and affiliates). The chosen method of data collection—questionnaire, which was carried out using the least costly form—was a purposeful and targeted electronical questionnaire. An invitation to participate in the research by e-mail was sent to selected institutions. The questionnaire was created on the website www.manoapklausa.lt. A link to the questionnaire was sent to the selected institutions. If the company has branches, the link to the questionnaire was sent to the parental company. In total, questionnaires were received from 28 companies.

Research results

First of all, the question "Does your company need a sales specialist?" was given, to which 64.3% of the respondents said they needed, 21.4% of the respondents replied that the work of this specialist was performed by other employees, 3.6% of the respondents stated that such a specialist is unnecessary. It should be noted that 10.7% of the respondents chose the answer "other" and explained that their company needed a sales specialist rather than a sales manager. This shows that specialists in this field are really needed in Marijampolė and nearby municipalities.

The second question in the questionnaire asked the respondents to evaluate the student's ability to apply the acquired knowledge. To achieve this, the study program envisages two learning outcomes: to apply national and European Community legislation and wide sales management knowledge for effective and innovative management solutions. When evaluating the first learning outcome, 42.9% of the respondents answered that these learning outcomes are appropriate and partially appropriate, respectively, 10.7% completely appropriate, and 3.6% inappropriate.

When evaluating the second learning outcome—in order to make effective and innovative management decisions the student will apply a wide range of marketing and sales knowledge—it was found that 17.9% of the employers think this learning outcome is completely appropriate, 53.5% appropriate, 25% partially appropriate, and 3.6% completely inappropriate.

The next question aimed to evaluate the student's ability to conduct research. For this purpose, the study program envisages three learning outcomes. Upon graduation, the student will assess the impact of the company's external environment on business and the company's potential. This learning outcome was evaluated as appropriate and completely appropriate by 82.1% of all respondents and partially appropriate by 5% (Table 3). For whether the student will be able to analyze and evaluate sales trends in the local and international market, 96.4% of the respondents evaluated as appropriate and 3.6% partially appropriate. For whether the student will be able to carry out market research and apply the results for project implementation and realization of products and services, 92.9% of the respondents evaluated appropriately, whereas the rest of the respondents (7.1%) indicated that this learning outcome is partially appropriate. After analyzing the results, it can be concluded that the student's ability to carry out research and the expected learning outcomes of the study program are appropriate.

Table 3. Evaluation of research conducting capability (%) (*n* = 28)

Learning outcome	**Completely inappropriate and inappropriate**	**Partially appropriate**	**Completely appropriate and appropriate**
Will evaluate the impact of the company's external environment on business and the company's potential	0	17.9	82.1

Will analyze and evaluate sales trends in the local and international market	0	3.6	96.4
Will carry out market research and apply the results for project implementation and realization of products and services	0	7.1	92.9

In the fifth question the respondents made suggestions and comments on the fourth question. Here, the respondents confirmed that market and targeted consumer research is of particular importance to sales management professionals and indicated the importance of practical work in this area. In their opinion, graduates, who have just graduated, are not given the task to do research in the company because they are not expected to be able to do it without practical experience. In addition, having gained practical experience, these skills and knowledge will need to be relearned and reacquired, because after a long period of time they will be lost. In the sixth question of the questionnaire, the respondents evaluated the student's special abilities. The results of the responses are presented in Table 4.

Table 4. Evaluation of special skills (%)

Learning outcome	Completely inappropriate and inappropriate	Partially appropriate	Completely appropriate and appropriate
Will organize activities of the marketing unit and ensure performance	3.7	11.1	85.2
Will apply new marketing strategies in the marketing and sales process	3.7	18.5	77.8
Will manage the elements of marketing and international marketing complex by applying appropriate marketing tools	3.7	11.1	85.2
Will organize logistics process in the company and adapt sales logistics objects to the proper functioning of the company	3.7	7.4	88.9
Will apply basic logistical principles and choose optimal distribution channels	0	7.4	92.6
Will apply quality management standards in the process of creating the company's added value	7.4	7.4	85.2
Will know provision sources of financial, material, and other resources, how to use them effectively, will know accounting and management	3.7	22.2	74.1
Will apply the principles of business ethics and intercultural communication in relation with business clients	0	15.4	84.6

The study program description indicates that having completed the study program, the student will organize the activities of the marketing unit and ensure performance, manage the elements of marketing and international marketing complex by applying the appropriate marketing tools, and will use quality management standards in the process of creating the company's added value. When analyzing the results of Table 4, it was found that even 85.2% of the respondents evaluated these abilities as appropriate. For whether the student will be able to apply new marketing strategies in the marketing and sales process, 77.8% of the respondents evaluated as appropriate and completely appropriate, 18.5% partially appropriate, and 3.7% completely inappropriate. For whether the students will be able to organize the logistics process in the company and adapt the sales logistics objects to the proper functioning of the company 88.9% of the respondents evaluated as completely appropriate and appropriate, 7.4% partially

appropriate, and 3.7% inappropriate. For whether the student will be able to apply the basic logistical principles and choose optimal distribution channels, 92.6% of the respondents evaluated as appropriate and completely appropriate and 7.4% partially appropriate. For whether the students will know provisional sources of financial, material, and other resources, will know how to use them efficiently, and will know accounting and management, 74.1% of the respondents chose the categories appropriate and completely appropriate, 22.2% partially appropriate, and 3.7% completely inappropriate. For whether the student will apply the principles of business ethics and intercultural communication in relation to business clients, 84.6% of the respondents evaluated it as appropriate and completely appropriate and 15.4% partially appropriate. It can be concluded that the teachers have planned the appropriate learning outcomes of the study program in order to train a competent sales management professional, but as Guy Le Boterf (2010) pointed out, it is important for the graduate to be able to function successfully and competently in operational situation by fully mobilizing available resources (knowledge, skills, behavioral attitudes, ways of thinking, physical inborn inclinations) combinations.

It should also be noted that in the proposals and comments submitted, the respondents argue that special skills are more in line with the executive's competencies than the manager's, and too much focus is on marketing and too little on sales. They, therefore, suggest adjusting special skills, taking into account the amount of knowledge the manager needs, claiming that the executive needs to "grow up" by continuous learning, as a good executive does not end when he finishes his studies. In addition, necessary strategic knowledge is minimal at the beginning of work; they can gain this knowledge later, going deeper into the specifics of work.

The significance of managerial competence for effective activity is also confirmed by the evaluation study of Lithuanian executives' attitude to managerial competence (Bakanauskienė, Bartnikaitė, 2006), which states that personal qualities are the most important, while managerial skills and theoretical management knowledge have lower priority. Therefore, the following questionnaire questions evaluated the student's social and personal abilities. Three learning outcomes were presented for social skills evaluation (Table 5).

Table 5. Evaluation of social skills (%) (*n* = 27)

Learning outcome	Completely inappropriate and inappropriate	Partially appropriate	Completely appropriate and appropriate
Will represent the company in the national and international business environment	3.7	29.6	66.7
Understand and apply the principles of social responsibility in dealing with internal and external stakeholders	0	14.8	85.2
Will be able to clearly, reasonably convey generalized marketing and sales information to company specialists in intercultural space	0	18.5	81.5

When analyzing the responses, it was found that 66.7% of the respondents believe that the learning outcome "Will represent the company in the national and international business environment" is completely appropriate and appropriate, 29.6% partially appropriate, and 3.7% inappropriate. When evaluating the learning outcome, "Whether the student will understand and apply the principles of social responsibility in dealing with internal and external stakeholders," 85.2% of the respondents consider it to be appropriate and 14.8% partly appropriate. Of the respondents, 81.5% believe that the student will be able to clearly and reasonably convey the generalized marketing and sales information to the company's specialists in the intercultural space.

Responding to social student abilities, the respondents once again suggest narrowing the study program and name it Sales Management, stating that Sales Management also includes marketing solutions, and that these professionals are now needed.

The study program Sales Management has provided three personal skills. The evaluation of the student's personal skills is presented in Figure 1.

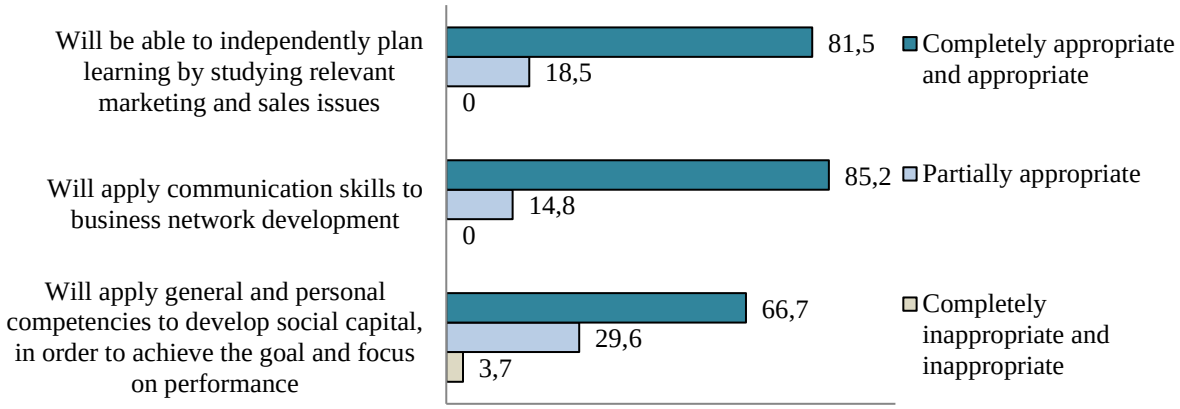

Fig.1. Evaluation of personal skills (%) (*n* = 26)

When analyzing the responses, it was found that the respondents appreciated personal skills. Of the respondents, 66.7% consider that the student will apply general and personal competences in the development of social capital in order to achieve the goal and focus on performance, 29.6% only partially agree with it, and 3.7% disagree. More than 80% of the respondents agree that the student will apply communication skills to business network development and will be able to independently plan learning by studying relevant marketing and sales issues, whereas 14.8% and 18.5%, respectively, partly agree. Summarizing the results of the research it can be concluded that the learning outcomes envisaged in the study program are appropriate.

Analysis of personal qualities required for a sales manager. In the knowledge economy, the difference in competitiveness is no longer just about the quality of production or services. The ways in which sales are made are very important, and the image that customers create on a company is usually the quality of communication. Guy Le Boterf (2010) stated that behavior, rather than the acquisition of technical skills, is the biggest problem. The success of a team or productivity and effectiveness of a performance group as a whole is increasingly dependent on the quality of the relationship. Collective relationships are influenced decisively by employee behavior, expressed in terms of personal qualities: ability to listen, economic judgment, persistence, initiative, curiosity, and others. The image of modern organizations is mainly influenced by correct and calm behavior of managers (Wrede-Grischat 2008), excellent manners to increase development in organizations. Therefore, during the research, the respondents were asked to indicate which of the given personal qualities are important and very important, partially important, and unimportant and completely unimportant. The findings of the research are presented in Table 6.

Table 6. Evaluation of personal qualities (%).

Personal quality	**Unimportant and completely unimportant**	**Partially important**	**Very important and important**
Analytical thinking	0	0	100
Strategic thinking	0	0	100
Logical thinking	0	0	100
Entrepreneurship	0	7.1	92.9
Confidence	0	0	100

Ability to work fast	3.6	25	71.4
Communicability	0	3.6	96.4
Pleasant appearance	7.1	25	67.9
Empathy	3.6	21.4	75.0
Creativity when solving problems	0	7.7	92.3
Effective communication with customers	0	0	100
Tactfulness	0	0	100
Diligence	0	3.6	96.4
Autonomy	0	7.1	92.9
Initiative	0	3.7	96.4
Ability to implement one's ideas	0	10.7	89.3
Flexibility	0	10.7	89.3
Ability to work in a team	0	3.7	96.3

When analyzing the results, it was found that all respondents (100%) consider personal qualities such as analytical, strategic, logical thinking, effective communication with customers, and tactfulness as very important and important. Over 90% of the respondents consider all the other features presented, such as entrepreneurship, communicability, diligence, autonomy, and initiative, as very important and important for a sales manager.

Having analyzed the competencies and personal qualities required for a sales manager, one can observe the tendency to look at the future specialist in a modern way. Both authors and respondents emphasize that the future employee must take the initiative to improve his/her professionalism. When comparing the competencies required for the manager, indicated by the scientists and employers, the conclusion is that a large part of managerial competencies are partly or entirely of generic competences origin deriving from the personal qualities. For example, creativity in solving problems is a personal feature, but the ability to solve problems creatively must be accompanied by the ability to base the decision on appropriate knowledge. On the other hand, use of special knowledge must be based on creativity in the search for necessary information, which is again a matter of personal qualities. Therefore, based on the results of the research carried out, the authors of the article propose measures to improve a sales manager's competence development:

- By training a sales manager, to reduce the scope of strategic knowledge subjects in the study process, and fill in loose credits with the subjects that develop the student's competences to identify perfectly the functional values of the products and services sold and to sell them but not just to offer as low price as possible.
- In the descriptions of management study programs, to emphasize the orientation to changing labor market factors: increase of personal responsibility, promotion of creativity and individual initiative, continuous learning and adaptation to changing conditions.

Limitations and Future Research. There are a couple of limitations in our current research that offer opportunities for refinement and development in future research. First, our study does not rely on competency scales that have already been validated in the sales research such as those offered by other researches. However, because we felt that employer might require a distinctive set of competencies, we thought it was more important to have sales management executives, deemed executives, to generate their own list of competencies. Another limitation of our research is that the response rate we obtained (24.6%) is somewhat low. Based on targeted selection and predefined selection criteria, the authors of

this article selected a sample of trading companies with at least 10 employees located in the research environment. Future research can be used to validate our findings among additional samples.

Conclusions

1. The concept of competence presented in scientific literature emphasizes the totality of knowledge, skills, and behavior, but an innovative approach to competence is required—to consider it as a process rather than a set of sources. The availability of resources is a necessary but not sufficient condition for competent activities. This means that in order to be competent in a competitive labor market, one must be able to function successfully and competently in the operational situation, by fully mobilizing the combinations of available sources (knowledge, skills, behavioral attitudes, ways of thinking, physical inborn inclinations).
2. From an operational perspective, competences seem to cover a broad range of higher-order skills and behaviors that represent the ability to cope with complex, unpredictable situations. Human resource executives need to evaluate sales candidates not only on the basis of their conceptual knowledge, but also on the basis of their skills and professional and personal values.
3. Management study programs is closely related to changes in the labor market, which cause significant changes in the study process, one of which is the development of social and personal skills. As a result, study programs descriptions need to emphasize a new concept of career paradigm that includes designing and managing your career, continuous learning and change, and adapting to different conditions.
4. The employers' attitude to the development of students' special abilities is very important in the process of developing managerial competences. The study shows that employers appreciate the learning outcomes of the study program in order to train a competent marketing and sales manager, but points out that special skills are more in line with the executive's competencies than the manager's, with too much focus on marketing and too little on sales. The employers suggest adjusting special skills, taking into account the amount of knowledge the manager needs, claiming that the executive needs to "grow up" by continuous learning, as a good executive does not end when he finishes his studies. In addition, necessary strategic knowledge is minimal at the beginning of work; they gain this knowledge later going deeper into the specifics of the work.
5. An employer survey of marketing and sales manager study subjects showed that lecturers selected the right subjects to develop managerial competencies. In the comments on the questionnaire, respondents suggested that subjects such as Trade Organization Technologies, Trade Business Management, Modern Technologies: Business Testing Systems, and Sales Management Systems be included in the study program. This demonstrates the benefits of employer surveys in developing a program to develop a competent marketing and sales manager.
6. The analysis of the personal qualities required for the sales manager has shown that employers appreciate personal qualities that contribute to the success of a team or productivity and effectiveness of a performance group as a whole. Comparing the competencies indicated by the scientists and employers that are required for the manager, it can be said that a large part of managerial competencies are partly or entirely of general competencies origin, derived from personal qualities.

References

Bakanauskienė, I., & Bartnikaitė, E. (2006). Managerial Competence: The Attitude of Lithuanian Manager. *Problems and Perspectives in Management,* 4(2).

Barber, C.S., Tietje B.C. (2006). A New Look at Industrial Sales and its Requisite Competencies. *Journal of Selling & Major Account Management,* 6(4), 27-40.

Boyatzis, R. E. (1982). *The Competent Manager*. New York, NY: Wiley.

Boterf, G. L. (2010). *Dar kartą apie kompetenciją. 15 pasiūlymų įprastoms idėjoms išplėtoti*. Klaipėda: Klaipėdos universiteto leidykla.

Bush, T.K. (2012). *Determining Competencies for Frontline Sales Managers in Fot-Profit Organizations.* Texas A&M University Dissertation. Action Ink, Inc.

Cambal, M., Caganova, D., & Sujanova, J. (2012). The Industrial Enterprise Performance Increase through the Competency Model Application. *Proceedings of the European Conference on Intellectual Capital*, 118-126.

Good, C.V. (1959). *Dictionary of Education*. London, NY: McGraw-Hill Book Company.

Grzeda, M. (2001). *Managerial Competence: Considerations for Resolving Conceptual Ambiguity*. Annual Meeting: Academy of Management.

Ivanovic, A., & Collin, P. (1997). *Dictionary of Human Resources & Personnel Management*. London: Peter Collin Publishing Ltd.

Jovaiša, L. (1993). *Pedagogikos terminai*. Kaunas: Šviesa.

Jovaiša, T., Laužackas, R., Spūdytė, I., & Tutlys, V. (2008). *Lietuvos kvalifikacijų sistemos metodologija*. Vilnius: Agora.

Karlof, B., & Lovingsson, F. (2006). *Vadybos koncepcijos ir modeliai nuo A iki Z*. Vilnius: UAB „Verslo žinios".

Kim, S.K., Hong, J.S. (2005). The Relationship between Salesperson Competencies and Performance in the Korean Pharmaceutical Industry. *Salesperson Competencies and Performance,* 16(2), 258-271.

Lambert, B.W., Ohai, T., Kerkhoff, E.M. (2009). *World-Class Selling – New Sales Competencies.* Alexandria, Virginia: ASTD press.

Makštutis, A. (2001). *Strateginio valdymo principai*. Monografija. 380 p.

Martinkus, B., Neverauskas, B., & Sakalas, A. (2002). *Vadyba: specialistų rengimo kiekybinis ir kokybinis aspektas.* Kaunas.

Pacevičius, J., & Kekytė, J. (2008). Vadovų vadybiniai gebėjimai: galimybių ir apribojimų analizė. *Ekonomika ir vadyba: aktualijos ir perspektyvos*, 4(13), 321-330.

Piercy, N.F., Cravens, D.W., Lane, N. (2009). Sales management control level and competencies: Antecedents and consequences. *Industrial Marketing Management,* 38, 459-467.

Petasis, A. (2003). *Management Dilemas*. Cyprus: Lefkosia the Philips College.

Petkevičiūtė, N., & Kaminskytė, E. (2003). Vadybinė kompetencija: teorija ir praktika. *Pinigų studijos*, 65-80.

Punwatkar, S., Varghese, M. (2014). Impact of Competencies on Sales Performance: Empirical Evidence on Salesmen at a Furniture Mart in Central India. *Pacific Business Review International,* Vol. 6, No 12, 81-86.

Werde-Grischkat, R. (2008). *Manieros ir karjera*. Vilnius.

Sokol, J. (2001). Idealaus vadybininko portretas. *Vadovo pasaulis,* (9), 4-10.

Spencer, L.M., & Spencer, S.M. (1993). *Competence at Work: Models for Superior Performance*.

Tarptautinių žodžių žodynas. (1969). Vilnius: Mintis, 402.

Vakola, M., Soderquist, K.E., Prastacos G.P. (2007). Competency management in support of organisational change. *Emerald. International Journal of Manpower,* Vol. 28 No. 3/4, p.p. 260-275.

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0022

CREATION OF HIGH TECHNOLOGIES: COMPARATIVE ANALYSIS OF COUNTRIES

Audrone Kvedariene[1]

[1]*Vilnius Gediminas Technical University, Vilnius, Lithuania, audrone.kvedariene@vgtu.lt*

Abstract

Research purpose. High technology creation, as a rule, requires national support systems although the flow of the created value in an international level is unexplored. The national innovation systems are becoming globalized; thus the distinct process of creation, dissemination and implementation of high technologies is becoming globally fragmented and therefore the added value distribution within the global value chain (GVC) should be investigated.

Design/Methodology/Approach. The brief and extensive academic literature review dedicated to high technology creation is introduced, although the empirical investigation is narrowed to the scientific research and development sector, depicted as M72 by NACE statistical classification. Thus empirical research design is based on the sectoral level data, considering M72 sector as the main economic activity for high technology creation. The data for the comparative analysis of countries is retrieved from the 2014 world input–output data (WIOD) which enables to exclude double counting of added value inherent for the convenient import and export data and holds information of intermediate and final consumption of added value within a country and between different countries. The descriptive statistic based on WIOD data is provided and further prescriptive statistics for the data interpretation is conducted. While developing the predictive models, the number of investigated countries varies while the data for M72 sector is not available for all countries provided in WIOD and including to the model basic science and technology indicators as independent variables, retrieved from the Organisation for Economic Co-operation and Development database, the number of countries reduced additionally, also due to the data shortage.

Findings. The key result is the provided methodology for the positioning of the countries evaluating the involvement in the upstream and downstream GVC processes, hereby introducing new indicators that may have an impact on the sector's performance.

Originality/Value/Practical implications. The evaluation of high technologies creation performance would provide insights into the international management and innovation policies, and the matrix concept for the positioning countries by the pattern of involvement to the GVCs could be applied to other sectors.

Keywords: high technologies sector; global value chain; comparative analysis of countries.

JEL codes: F60; O30; O57.

Introduction

There is a broad consensus that investments to the high technology sectors are central for economic productive capacity expansion and sustainable development. The economic activity of scientific research and development is considered as a pivot source of technology creation, and thus the output of the M72 sector by NACE classification. The aim of this research is to introduce new indicators for the perception of the complexity of the creation of high technologies in the international environment. The proposed method enables the positioning of the countries' scientific research and development sector's involvement in the global value chains (GVCs) pattern. The introduced matrix model for these indicators reveals the upstream and downstream involvement of the scientific research and development sector's in the GVC. This comparative analysis of countries identifies the scientific research and development sector's involvement in the GVC pattern, but does not disclose the impact on the creation of added value of the M72 sector. Therefore the linear regression model is applied to verify if the scientific research and development sector's process involvement into upstream and downstream GVC has no relation with this sector's performance: the share of added value from the overall added value of the country.

Thus in this research, the comparative analysis of the countries in the sectoral level is conducted by applying the proposed matrix model and also the linear regression models for the evaluation of the impact of developed indicators on the scientific research and development sector's significance to the domestic economy. The generated linear regression model results exposed that the lower level of the downstream involvement into the GVC of scientific research and development sector has a negative impact on this sector's performance relative to the overall sectors in the country, and business investments have almost twice higher impact on the scientific research and development sector's activities.

Literature review

The creation of technologies is a specialized activity with the dedicated departments in private companies and public sector institutions in distinct technological fields. This specialization enabled to effectively develop scientific and knowledge production. In the twentieth century mostly the private sectors' functional departments participated in the creation of high technologies. Scientific studies in the field of management provided an evidence that successful technological R&D executed in the companies where the partnership between functional departments is implemented, thus the project-oriented organization structures widely accomplished. Already in the nineteenth century, vertical disintegration was popularized and R&D activities were outsourced. B. A. Lundvall (1988) and other authors defined that these companies in many cases are interconnected, although the outsourcing of scientific and technological knowledge becomes the main strategy for many companies (Quinn, 2000), contemporarily denoted as the theory of the open innovations.

In this article, the creation of high technologies is considered as a specialized professional activity dedicated to scientific research and development. According to the United Nations industry classification system's International Standard Industrial Classification (ISIC) of all economic activities, the scientific research and development sector is assigned to the M72 division. This definition narrows the participants involved in the creation of high technologies. Moreover, there is a trend of the convergence of the scientific research and development activities into other economic activity sectors. It is particularly noticeable in the information, communication and nanobiotechnology sectors. It is empirically proved that the boundaries between these sectors are blurred (Preschitschek, Niemann, Leker, & Moehrle, 2013). Four convergence trends are distinguished: science, technologies, markets and industries. In the science activities, due to multidisciplinary disciplines, technologies overlap and new technology platforms are created, which consequently stimulate the convergence of markets (Sick, Preschitschek, Leker, & Bröring, 2018); this is especially evident in high technology sectors, where R&D activities are core, for example, electronics and pharmacy industries. In high technology sectors, short product life cycle and technological change are inherent; therefore the products are differentiated vertically while product reaches maturity and only afterwards are the technologies and products differentiated horizontally into other sectors, thus to the new markets. In these circumstances lack of knowledge about these new markets and new technologies was experienced by participants from the different sectors. This leads to various partnership forms: cooperation in R&D activities, establishment of strategic alliances or mergers and acquisitions of companies. These convergences of processes within sectors enable to develop new business models although clear boundaries of technological specialization and sectors are erased.

The exploration of the historical macro measurements' statistics indicates that till 1600–1800 the economies stagnated (Maddison, 2003); considerable economic growth was caused by the industrial revolution, although from retrospective view the attitude to the influence of technologies on economic impact varied. Neoclassicals asserted that technologies are neutral and distributed uniformly while increasing the productivity of physical and human capital (Solow, 1956). Based on this assumption the total factor productivity is evaluated in order to define the technological progress' impact on economic growth. This indicator is criticized by the post-Keynes (Domar, 2006; Harrod, 2006) and endogenous growth theory economic scientists (Romer, 1990) and new classical economics (Lucas, 1988), treating technologies as an endogenous factor; thus due to positive feedback the technologies accumulated in different countries and regions. These theories explain why some regions experience economic growth while others stagnate. The enhanced accounting methods fostered the empirical research and

econometric models that define the correlations among knowledge capital, usually expressed as accumulated R&D investments and GDP with traditional capital and labour force factors. Numerous researches reveal that R&D return for society is higher than to the company that created the technology and it is valid also in international level: the productivity of one country leads to the development of other countries. But this research does not explain the technology transfer channels: trade, mobility of labour, technological alliances and so on. Since 1980s, the endogenous attitude to technologies increased with models incorporating R&D processes. In pursuance of validation of the exogenous and endogenous economic growth models, Pennsylvanian University initiated the collection of data from over 100 countries, thus named the Penn world data. The confirmation that economies of different countries converge and countries reach the stable balanced position would prove the exogenous economic growth models and in opposition the divergence would endorse endogenous models; thus for the different countries the stages of balance vary. It is empirically proved that investments to R&D and economic growth between different countries differ; thus the semi-endogenous model and another closer to reality model that encounters the factors of dynamics are proposed (Norrbin & Schlagenhauf, 1988; Fuentes & Mies, 2011).

The heterogeneity of the sectors and their strategies inherent for technology development participants (Corsaro, Cantù, & Tunisini, 2012). The triple helix model analyses differences between private, public and academic sectors participants in technology development and transfer process (Etzkowitz & Leydesdorff, 2000). Other authors analyse the heterogeneity at micro-level (Van de Ven, 2016), evaluating the internal companies' factors that impact the development of technologies; at mezzo level the differences between sectors and industrial clusters (Cohen, Nelson, & Walsh, 2003; Cooke, 2002); and at macro-level highlighting the differences between countries (Dakhli & De Clercq, 2004; Lundvall, 2007). In this article, the combination of macro and mezzo levels is proposed by comparing scientific research and development sectors' performance in different countries.

Starting from the 1980s the developed countries started to apply policies for R&D commercialization in order to get the economic return to governmental R&D investments. One of the main indicators evaluating the R&D performance in public sector is the number of patents and licenses. Most of the Organisation for Economic Co-operation and Development (OECD) countries accepted the Bayh–Dole Act principle, according to which not a government but universities and research institutions become the owners of intellectual property (Åstebro, Braguinsky, Braunerhjelm, & Broström, 2018). This performance indicator is criticized due to the narrow attitude to the role of academic sector to the impact on technology development process and also that it doesn't encounter internationalization dimensions: capital, production, knowledge or human capital movement, international partnership between universities and private sectors (Leydesdorff, Etzkowitz, & Kushnir, 2016). Despite national policy efforts, there is a tendency of accumulation of high technology sectors within global clusters, specific geographical areas, by arguing that it is caused by tacit knowledge (Pavitt, 1987).

The significant and consistent public policies designed to fund the basic research and support private R&D investments encourage numerous researches assessing the economic performance of Science and Technology Policy. Thus the efficiency and comparative advantage of R&D varies across countries due to differences in the quality of national innovation systems. In order to evaluate the performance of innovation systems and detect the problems, various indicators are developed (Dziallas & Blind, 2019). These indicators by different perspectives can be categorized into more specific factors and broad field dimensions. Innovation indicators for innovation stages are the following: the front-end indicators refer to processes from idea generation till the formal development, ex-post phase signifies innovations that are already introduced into the markets, in contrary ex-ante indicators cover early stages of the innovations. Other researches focus on indicators like direct and indirect (Becheikh, Landry, & Amara, 2006); indicators referring to science, technology and innovation indicators (Freeman, & Soete, 2009); input, throughput and output indicators (Klomp & Van Leeuwen, 2001).

The OECD Innovation Strategy recognized that it is necessary to move beyond aggregated numbers and indices for measuring the functioning of innovation systems (OECD, 2010). The traditional 'positioning' indicators are produced for policy making based on the identification of the countries on a particular issue. There is an attempt by the statistical community to develop new methods to restructure

data collection in order to maximize microdata-linking opportunities and develop the 'experimental' indicators. The implementation of these incentives requires new statistical data and tools to link different data sources at an enterprise level (Nielsen, 2018).

The GVC is formatted on input–output architecture and it enables disaggregation of added value at a sectoral level, distinguishing the country origin of intermediate added value and final consumers of added value. Nowadays, with the second wave of the globalization the complexity of economic activities is increasing, and by recent estimates the exports include about 30 % of foreign inputs (OECD, 2016). The aim of the proposed comparative analysis is to position the countries' scientific research and development sectors according to the M72 sector's added value of the share of intermediate added value originating from the local country as well as the share of M72 sector's output consumed in the local economy. Although the world input–output data (WIOD) model is a dynamic and network-oriented content that enables to track the cross-border flow of added value at the sectoral level, there is an initiative within the European Statistical System to link existing data at the enterprise level and to develop the business function framework. It has to be considered that in recent decades the internationalization is a main driving force of GVC and academic literature signalling the need for more accurate and data-demanding indicators (Amador & Cabral, 2016).

Methodology for the comparative analysis of countries' involvement in the high technology creation

The proposed methodology dedicated to evaluate the country's involvement in scientific development and research of high technologies is based on WIOD database model with the sectoral level information (Timmer, Dietzenbacher, Los, Stehrer, & de Vries, 2015), where the sectors are classified according to NACE Rev.2 classification (Comissão Europeia, 2008). Section M – professional, scientific and technical activities, the division of Scientific Research and Development (M72), is depicted as the high technology knowledge-intensive service. The WIOD database enables disaggregation of added value in sectoral level by standard input–output table expressed in the matrix form (UNCAD, 2013):

$$X = T + Y \qquad (1)$$

where X is the aggregated value-added matrix, T is the intermediate demand and Y is a final consumption matrix, which defines the demand of open sectors: final consumers, public sectors and non-governmental organizations, also business sectors' expenditures to the gross fixed capital formation (GFCF). T matrix columns define the share of added value in export and the rows the distribution between countries, thus the domestic value added and foreign value added can be distinguished. The added value of scientific research and development M72 sector in this article is considered as the main source of high technology knowledge creation. WIOD model is based on the System of National Accounts and from 2008 edition (Ki-moon, Strauss-Kahn, Zoellick, Gurria, & Barroso, 2009) the GFCF is treated as R&D because statistically it is difficult to separate these activities. Also, inventories are not excluded from the total value added of the sector and these assumptions lead to the limitation of the introduced comparative model (Fig. 1).

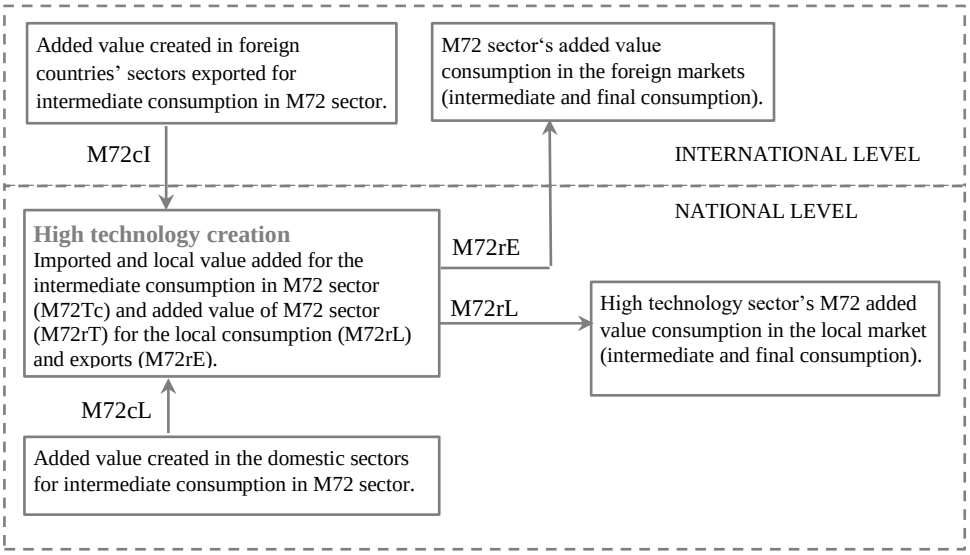

Fig. 1. High technology creation in the GVC concept (Source: author's compilation)

The creation of high technology process requires intermediate consumption (cT), with a share of intermediate consumption produced in the local market (cL) or otherwise imported. The overall output or results of the M72 sector (rT), as well as the results consumed in the domestic market (rL), includes intermediate consumption. The share of scientific development and research sector's results is used in the local market (rL) or exported. The value added of the M72 sector (M72VA) excludes intermediate consumption and this data is available in the level of the sector.

The quantitative comparative analysis of the countries' scientific research and development sector's involvement in the GVC is based on the indexes that enable to analyse and generalize complex phenomena of different size economies. In this investigation, relative aggregated values expressed in percentage will be used in order to evaluate and compare the M72 high technology domestic sector's involvement in the domestic and foreign economic activities in the context of GVC. The M72cL/M72cT indicator depicts upstream involvement into GVC processes; it indicates the share of domestic intermediate value added (M72cL) from the total intermediate value-added (M72cT) consumed in the local high technology sector. The M72rL/M72rT indicator reveals the involvement into downstream GVC processes; it indicates the share of final consumption of the domestic value added created in M72 high technology sector (M72rL) with respect to the total final consumption (rT). Based on these two indicators, countries are positioned in quadrants (Fig. 2).

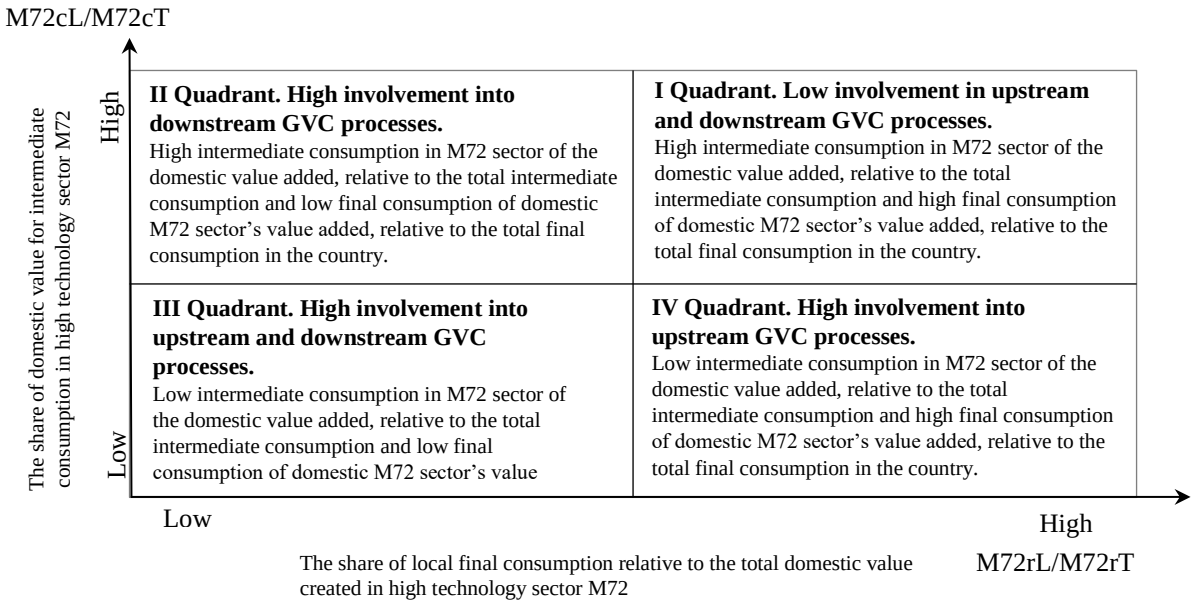

Fig. 2. The matrix concept for the comparative analysis of the sector's involvement in the GVC processes
(Source: author's compilation)

The first quadrant depicts countries where M72 sector has comparatively low involvement in GVC processes while in the domestic scientific research and development sector it consumes more than 50% of local intermediate value added relative to the total intermediate consumption (M72cL/M72cT), and the domestic final consumption of M72 high technology sector's results relative to the total output consumption in this sector (M72rL/M72rT) is more than 50%. It means that most of the M72 sector's output is absorbed in the local market for intermediate and final consumption. The second quadrant indicates countries with high involvement in downstream GVC activities of M72 sector where high technology sector consumes more than 50% of foreign intermediate total output, but less than 50% of the M72 sector's results are consumed locally and are exported for final or intermediate consumption. The third quadrant denotes high involvement in upstream and downstream GVC processes, thus there is a high foreign value-added intermediate and final consumption. The fourth quadrant positions countries that are highly involved in upstream GVC activities where more than 50% of value added for intermediate consumption in M72 sector is imported, but the M72 sector's results are consumed locally.

The WIOD is available for 43 countries and the rest of the world (RoW), but data for M72 sector's activities for Australia, Indonesia, India, Russia and Taiwan is not provided; thus the data for 38 countries is available along with the estimation for the RoW. The latest WIOD model was released with data for 2014 for the distinct economic activity sectors.

The comparative analysis positioning the countries' involvement in GVCs does not provide insight into the impact on the high technology M72 sector's performance from the national or global perspective. Therefore the linear regression model was conducted in order to define the value chain arrangement impact on value added creation of the M72 sector with respect to the overall added value of the country (M72VA/VA):

$$Y = b_0 + b_1 X_1 + b_2 X_2, \quad (2)$$

where Y is the evaluated domestic value added in M72 sector expressed as share from the total domestic value added of all sectors in percentage (M72VA/VA) for 38 countries,

b_0 is an estimated constant,

b_1, b_2 are estimated regression coefficients,

X_1 is the share of the domestic intermediate consumption in the M72 high technology sector in percentage (M72cL/M72cT),

X_2 is the share of the consumption of domestic value created in M72 high technology sector in percentage (M72rL/M72rT).

The model was expanded by adding the main science and technology (S&T) indicators and conducted for the countries that provide data for the OECD. Only 29 countries provide information to OECD about investments to the research and development activities, number of researchers and quantity of patents. Therefore the expanded model conducted for the reduced number of countries is

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7, \quad (3)$$

where Y is the evaluated domestic value added in M72 sector expressed in share from the total domestic value added of all sectors in percentage (M72VA/VA);

$b_3, b_4\ b_5, b_6, b_7,$ the estimated regression coefficients;

X_1 the share of the domestic intermediate consumption in the M72 high technology sector in percentage (M72cL/M72cT);

X_2 the share of the consumption of domestic value created in M72 high technology sector in percentage (M72rL/M72rT);

X_3 the average of higher education expenditures on R&D within 3 years (HERD); X_4 the average of business expenditures on R&D within 3 years (BERD); X_5 the higher education researchers (Hres); X_6 the number of business researchers (Bres); and X_7 the quantity of triadic patents (Tpat/VA).

The values X_3, X_4, X_5, X_6 are retrieved from the OECD online database ("OECD Statistics," 2011) and are normalized to the overall value added of the country. Due to data not available for Bulgaria, Brasilia, Canada, Cyprus, Mexico, Malta, Netherlands, Romania and the United States, they are excluded from the expanded model.

Hence the aim of the linear regressions – equations 2 and 3 – is to test the null hypotheses:

1. H_0: The M72 sector's activities involvement for 38 countries and ROW in the GVC upstream and downstream processes has no impact on the high technology M72 sector's performance with respect to the value added of the overall sectors in the country (M72VA/VA);
2. H_0: The 29 countries' M72 sector's activities involvement in the GVC upstream and downstream processes, investments to R&D activities, number of researchers and quantity of triadic patents in the country have no impact on the high technology M72 sector's performance with respect to the overall sectors' value added in the country (M72VA/VA).

Comparative analysis of countries' involvement in the creation of high technologies

The absolute values of scientific research and development M72 sector highlight (Fig. 3) that the United States is the leader in generating output, and other big economy countries like France, China, Korea and Germany have more than half lower output values.

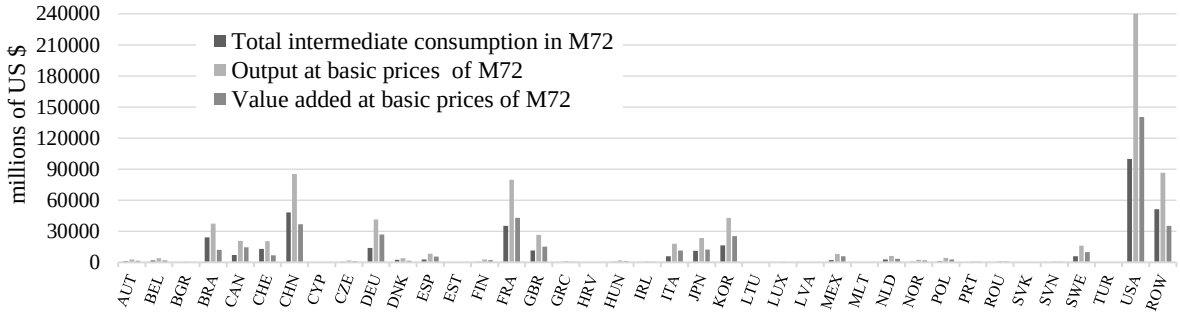

Fig. 3. Share of the intermediate consumption and value added from the total output of M72 sector
(Source: author's calculation based on WIOD (Timmer, Dietzenbacher, Los, Stehrer, & de Vries, 2015))

It can be noticed that in China, Switzerland and RoW the total intermediate consumption in the M72 sector exceeds the value added of the sector. This phenomenon is more extensively explored by expressing the share of intermediate consumption in the M72 sector and M72 sector's value added from the total output of M72 sector (Fig. 4). The intermediate consumption is weighty also in Denmark and exceeds M72 sector's added value, although Latvia, Ireland, Finland, Lithuania and Estonia have the lowest rate of intermediate consumption in the share of M72 sector's value added (M72rT). The intermediate consumption share of M72 output (M72cT/M72rT) and M72 sector's value added share of M72 output (M72VA/M72rT) indicators reflect the involvement of M72 sector in cooperation with local and foreign sectors to produce value added in the scientific research and development M72 economic activities.

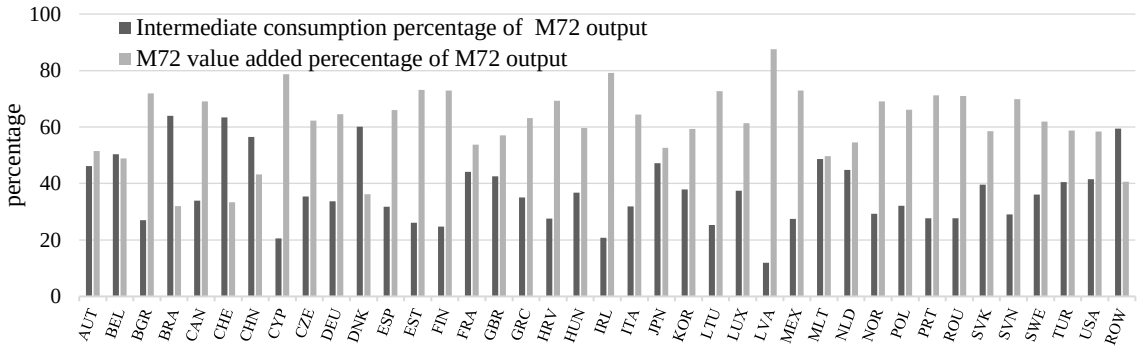

Fig. 4. Share of the intermediate consumption and value added from the total output of M72 sector
(Source: author's calculation based on WIOD (Timmer, Dietzenbacher, Los, Stehrer, & de Vries, 2015))

Based on WIOD it is estimated that the countries' M72 sector's share of added value from all sectors' global value added in 2014 is only about 0.0058%. The data about the added value of M72 sector (very low) indicates that India, Indonesia, Australia and Russia do not provide data for the M72 sector's output although the total value added of these countries are included. Therefore for better comparison of M72 sector's performance of the country in the global scale is to evaluate the ratio of M72 sector's value added of the country with respect to the M72 sector's value added of all countries (M72VA/M72GVA). The absolute leader is the United States with 32.7% of global M72 sector's value added (Fig. 5), with significantly lower outputs in France 10%, China 8.6%, Germany 6.2%, Korea 5.9%, Great Britain 3.5%, Canada 3.4% and for Japan, Brasilia and Italy about 3%.

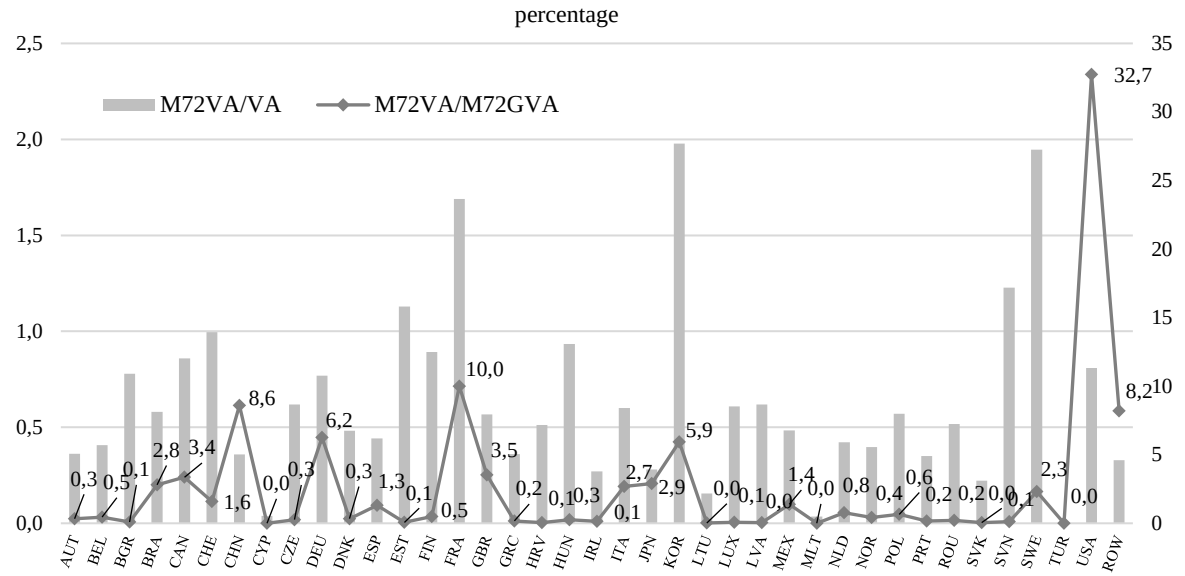

Fig. 5. Share of the intermediate consumption and value added from the total output of M72 sector
(Source: author's calculation based on WIOD, 2014)

The main reference of countries' involvement in GVC performance will be the ratio of M72 sector's added value with the overall added value of the country (M72VA/VA). This indicator reveals the most important M72 sector to be Korea, Sweden and France with about 2% of the M72 sector's share of added value from the overall value added in the country. The M72 sector's share is above 1% in small economies of Slovenia and Estonia, and for the rest of the countries, this indicator is lower.

Obviously the M72 sector's value-added share with respect to global value added of all M72 sector (M72GVA) reflects the size of the country and economy, while the M72 sector's value-added share with respect to overall value added of the country (M72VA) represents the scientific research and development sector's weight to the economy of the country.

Based on the WIOD, the matrix for positioning the countries' M72 sector's involvement in upstream and downstream GVC processes is conducted (Fig. 6). It is noticeable that most of the countries are concentrated in the II quadrant, thus in the M72 sector for intermediate consumption more than 50% of locally produced value added is consumed, but more than 50% of M72 sector's results are exported. The lowest rates of final consumption of M72 sector's results in the local markets are in Lithuania and Norway with less than 5%. In the I quadrant dominate the big economy countries, thus in the M72 sector, the intermediate consumption of domestic value added, as well as final and intermediate consumption of M72 sector's results, is exploited in the local markets. The III quadrant depicts three small economies with less than 50% of intermediate consumption in the M72 sector from the domestic added value as well as less than 50% of the final M72 sector's output consumption in the domestic market.

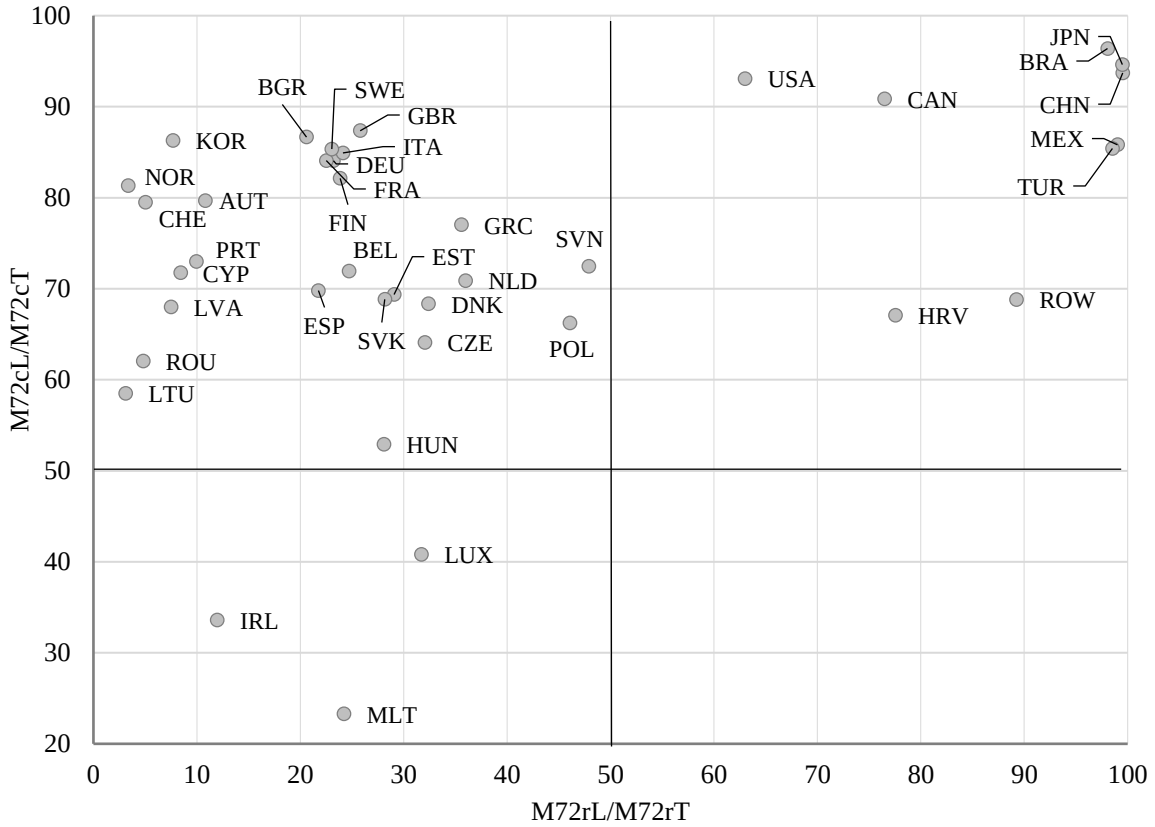

Fig. 6. The matrix for the comparative analysis of countries' M72 sector's upstream and downstream processes involvement in the global value chain (Source: author's calculation based on WIOD (Timmer, Dietzenbacher, Los, Stehrer, & de Vries, 2015))

The positioning of the countries' involvement in the GVC pattern highlights the peculiarity of the scientific research and development sector in different countries but does not indicate how this arrangement in GVC impacts this sector's performance. For that purpose, the linear regression model was developed and the share of value added of M72 (M72VA) sector from the total value added of the country (TVA) is chosen as the independent variable (Eq. 2). This indicator, denoted as M72VA/TVA, reveals the significance of scientific research and development sector within the domestic economy. The dependent variable then indicates the sector's involvement in the GVC pattern: involvement in upstream GVC processes or share of local output for intermediate consumption in M72 sector (M72cL/M72cT) and involvement in downstream GVC processes or the share of local intermediate and final consumption of M72 sector's results (M72rL/M72rT). The linear regression modelling was performed with the SPSS software. The result of the adjusted determination coefficient is equal to $R^2 = 0.382$, therefore the regressors fit the model, although $p = 0.251$ for the M72rL/M72rT value and $p = 0.018$ for the M72cL/M72cT indicate that only the regressor of intermediate consumption in the M72 sector is statistically significant. The regressors do not have multicollinearity because variable inflation factor for both regressors is VIF =1.171 and differences in beta show that the data has no outliers although the normality test for the distribution of standardized residuals does not indicate that data is normally distributed.

The second model (Eq. 3) was expanded by introducing new independent variables although the data about the investments to scientific research and development, number of researchers in private and public sector or number of the triadic patents are not available for nine countries and RoW. Calculated linear regression model determination coefficient is equal to $R^2 = 0.512$, therefore the additional regressors better define the model. Coefficients values (Table 1) indicate that regressor M72cL/M72cT is not significant and regressor M72rL/M72rT is significant. When comparing coefficients values of the linear regression model in the case with 38 countries and RoW, the significances differ. Thus in the case with all available countries the share of local intermediate consumption (M72cL/M72cT) is significant

for the results of M72 sector's performance and vice versa, but in the model with 28 countries the significant coefficient is M72rL/M72rT, but the coefficient value is negative. Therefore it could be concluded that in countries with higher share of M72 sector's value-added consumption locally, the M72 sector's performance is lower. This diversity of the significance and coefficient values in different linear regression models presumes that countries should be clustered by the size of the economy, regions or other factors. Another significant coefficient value in the model is BERD, in contrary to HERD. This result confirms other scientific research results that the business investment in M72 sector is the most significant factor for the high technology sector's performance. The model's VIF value is lower than 4; this model's independent variables does not face multicollinearity problem and the test of normality for standardized residuals does not reject the hypothesis of data normal distribution.

Table 1. Linear regression model coefficients values (Source: author's compilation)

	Unstand. Coefficients		Stand. Coef.			Collinearity Statistics	
	B	**Std. Error**	**Beta**	***t***	**Sig.**	**Tolerance**	**VIF**
(Constant)	–0.087	0.512		0.170	0.867		
M72cL/M72cT	0.006	0.007	0.165	0.881	0.389	0.694	1.441
M72rL/M72rT	–0.009	0.003	–0.461	–2.666	0.015	0.817	1.224
HERD/VA	0.199	0.494	0.081	0.404	0.691	0.604	1.656
BERD/VA	0.311	0.148	0.511	2.104	0.048	0.413	2.419
Hres/VA	–0.043	0.043	–0.251	–1.000	0.329	0.386	2.592
Bres/VA	0.071	0.071	0.218	1.003	0.328	0.518	1.932
Tpat/VA	–0.267	1.471	–0.045	–0.182	0.858	0.406	2.463

Dependent variable: M72VA/TVA share of M72 VA from TVA

The regression model was composed to show the dependent variable M72VA/VA's performance from two significant independent variables, M72rL/M72rT and BERD/VA. Then the determination coefficient is a bit lower $R^2 = 0.456$ but the significance of regressors is slightly increased (Table 2).

Table 2. A linear regression model with significant coefficients values (Source: author's compilation)

	Unstand. Coefficients		Stand. Coef.			Collinearity Statistics	
	B	**Std. Error**	**Beta**	***t***	**Sig.**	**Tolerance**	**VIF**
(Constant)	0.398	0.155		2.571	0.061		
M72rL/M72rT	–0.008	0.003	–0.399	–2.647	0.014	0.957	1.045
BERD/VA	0.385	0.092	0.634	4.203	0.000	0.957	1.045

Dependent variable: M72VA/TVA share of M72 VA from TVA

In the model there is no multicollinearity of independent variables and the test of normality of residuals does not reject the hypothesis of data normal distribution. Then the final regression model is

$$Y = 0.398 - 0.008X_2 + 0.385X_4, \quad (4)$$

where Y is the evaluated domestic value added in M72 sector expressed in share from the total domestic value added of all sectors in percentage (M72VA/rVA); X_2 the share of the consumption of domestic value created in M72 high technology sector in percentage (M72rL/M72rT); and X_4 the share of business expenditures on R&D (HERD/VA) from the overall added value of the country. The standardized coefficient beta for BERD/VA is 0.634 and for M72rL/M72rT is -0.399, thus the investments of business in scientific research and development have almost double higher influence than exports of M72 sector's value added.

The negative sign of the indicator M72rL/M72rT implies that final consumption of the domestic total output leads to lower share of total value added of M72 sector from the total value added of the country (M72VA/TVA). This imposes that higher involvement to the downstream GVCs could lead to higher significance of M72 sector at national economy. Not all of value added of M72 sector consumed

domestically is encountered by the variable M72rL. The domestic expenditures on GFCF and inventories are not included. GFCF doesn't necessary indicates expenditures on fixed assets while from 2008 by System of National Accounts standard it also embraces the investments to R&D. The inventories reveal the consumption of value added that was produced and accumulated in other than the current year, therefore it is also omitted from the local consumption of M72 sector's results. The proposition for future investigation is to introduce separate indicators for the domestic intermediate and final consumption as well as GFCF and inventories. In this case the methodology for the positioning countries for evaluating involvement in GVC could be expanded for various factors: domestic intermediate consumption, domestic government and non-profit organization final consumption, domestic final household consumption, investments to GFCF and consumption of inventories. The gross domestic consumption of M72 sector's results should encounter all these expenditures to represent the overall level of involvement to the downstream GVCs. The GFCF could be an appropriate indicator for the creation of technologies within companies considering that investments to the R&D are treated as investments that generate long-run added value, although the constraint due to mutually accounted fixed assets should be encountered.

Conclusions

This research is focused on the scientific research and development sector M72 as the main specialized economic activity dedicated to the high technology creation. The vast investigations are devoted to evaluating R&D investments and technologies impacting the economic performance of the country. The global competitive environment in high technology sectors encouraged to comprehensively investigate the scientific research and development M72 sector's involvement in the upstream and downstream GVC by deriving new factors that may trigger the performance of the M72 sector. The WIOD enables to disaggregate domestic and foreign added value flow at a sectoral level within 43 countries and RoW. Despite the limitations of the sectoral level data the comparative analysis of the M72 sector's involvement in GVC pattern indicates that most of the developed countries do not use intensively M72 sector's added value for final and intermediate consumption. These different patterns of the M72 sector's involvement in GVC should be investigated further to understand the nature of high technology creation and to strengthen a country's competitive position in the GVCs.

References

Amador, J., & Cabral, S. (2016). Global value chains: A survey of drivers and measures. *Journal of Economic Surveys*, *30*(2), 278–301. https://doi.org/10.1111/joes.12097

Åstebro, T., Braguinsky, S., Braunerhjelm, P., & Broström, A. (2018, December 10). Academic Entrepreneurship: The Bayh-Dole Act versus the Professor's Privilege. *ILR Review*, p. 001979391881980. https://doi.org/10.1177/0019793918819809

Becheikh, N., Landry, R., & Amara, N. (n.d.). Lessons from innovation empirical studies in the manufacturing sector: A systematic review of the literature from 1993-2003. https://doi.org/10.1016/j.technovation.2005.06.016

Cohen, W. M., Nelson, R. R., & Walsh, J. P. (2003). Links and Impacts: The Influence of Public Research on Industrial R&D. *Management Science*, *48*(1), 1–23. https://doi.org/10.1287/mnsc.48.1.1.14273

Comissão Europeia. (2008). *NACE 2 REV - Regulamento Comissão Europeia Nº 1893/2006 do Parlamento Europeu e do Conselho*. Retrieved from https://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF

Cooke, P. (2002). Regional Innovation Systems, Clusters, and the Knowledge Economy. *Industrial and Corporate Change*, *10*(4), 945–974. https://doi.org/10.1093/icc/10.4.945

Corsaro, D., Cantù, C., & Tunisini, A. (2012). Actors' Heterogeneity in Innovation Networks. *Industrial Marketing Management*, *41*(5), 780–789. https://doi.org/10.1016/j.indmarman.2012.06.005

Dakhli, M., & De Clercq, D. (2004). Human capital, social capital, and innovation: a multi-country study. *Entrepreneurship & Regional Development*, *16*(2), 107–128. https://doi.org/10.1080/0898562041000167783 5

Domar, E. D. (2006). On the Measurement of Technological Change. *The Economic Journal*, *71*(284), 709. https://doi.org/10.2307/2228246

Dziallas, M., & Blind, K. (2019). Innovation indicators throughout the innovation process: An extensive literature analysis. *Technovation*, *80–81*, 3–29. https://doi.org/10.1016/j.technovation.2018.05.005

Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations. *Research Policy*, *29*(2), 109–123. https://doi.org/10.1016/S0048-7333(99)00055-4

Freeman, C., Soete, L. L., Freeman, C., & Soete, L. (2009). *Research policy. Research Policy* (Vol. 38). Elsevier Science Publishers B.V. (North-Holland). Retrieved from https://econpapers.repec.org/article/eeerespol/v_3a38_3ay_3a2009_3ai_3a4_3ap_3a583-589.htm

Harrod, R. F. (2006). Themes in Dynamic Theory. *The Economic Journal*, *73*(291), 401. https://doi.org/10.2307/2228576

Klomp, L., & Van Leeuwen, G. (2001). Linking Innovation and Firm Performance: A New Approach. *International Journal of the Economics of Business*, *8*(3), 343–364. https://doi.org/10.1080/13571510110079612

Leydesdorff, L., Etzkowitz, H., & Kushnir, D. (2016). Globalization and growth of US university patenting (2009–2014). *Industry and Higher Education*, *30*(4), 257–266. https://doi.org/10.1177/0950422216660253

Lucas, R. E. (1988). *ON THE MECHANICS OF ECONOMIC DEVELOPMENT*. Journal of Monetary Economics* (Vol. 22). Retrieved from https://www.parisschoolofeconomics.eu/docs/darcillon-thibault/lucasmechanicseconomicgrowth.pdf

Lundvall, B.-Å. (2007). Why study national systems and national styles of innovation? *Technology Analysis & Strategic Management*, *10*(4), 403–422. https://doi.org/10.1080/09537329808524324

Lundvall, B. A. (1988). Innovation as an Interactive Process: From User-Producer-Interaction to the National Systems of Innovation and Internationalization. *Technology and the Wealth of Nations. London: OECD*, 277–300. Retrieved from https://vbn.aau.dk/en/publications/innovation-as-an-interactive-process-from-user-producer-interacti-2

Nielsen, P. B. (2018). The puzzle of measuring global value chains – The business statistics perspective. *International Economics*, *153*, 69–79. https://doi.org/10.1016/j.inteco.2017.05.004

Norrbin, S. C., & Schlagenhauf, D. E. (1988). An inquiry into the sources of macroeconomic fluctuations. *Journal of Monetary Economics*, *22*(1), 43–70. https://doi.org/10.1016/0304-3932(88)90169-9

Pavitt, K. (1987). The Objectives of Technology Policy. *Science and Public Policy*, *14*(4), 182–188. https://doi.org/10.1093/spp/14.4.182

Preschitschek, N., Niemann, H., Leker, J., & Moehrle, M. G. (2013). Anticipating industry convergence: Semantic analyses vs IPC co-classification analyses of patents. *Foresight*, *15*(6), 446–464. https://doi.org/10.1108/FS-10-2012-0075

Quinn, J. B. (2000). Outsourcing Innovation : The New Engine of Growth. *Management*, *41*(4), 13. Retrieved from http://web.nchu.edu.tw/pweb/users/arborfish/lesson/8714.pdf

Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*. The University of Chicago Press. https://doi.org/10.2307/2937632

Sick, N., Preschitschek, N., Leker, J., & Bröring, S. (2018, August). A new framework to assess industry convergence in high technology environments. *Technovation*. https://doi.org/10.1016/j.technovation.2018.08.001

Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *The Quarterly Journal of Economics*, *70*(1), 65. https://doi.org/10.2307/1884513

Timmer, M. P., Dietzenbacher, E., Los, B., Stehrer, R., & de Vries, G. J. (2015). An Illustrated User Guide to the World Input-Output Database: The Case of Global Automotive Production. *Review of International Economics*, *23*(3), 575–605. https://doi.org/10.1111/roie.12178

Van de Ven, A. H. . (2016). Central Problems in the Management of Innovation. *Management*, *32*(5), 590–607. https://doi.org/10.2307/2631848

Ki-moon, B., Strauss-Kahn, D., Zoellick, R. B., Gurria, A., & Barroso, J. M. (2009). System of National Accounts 2008 European Commission International Monetary Fund. Retrieved from https://unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf

Fuentes, R., & Mies, V. (2011). Productivity Differences in Developing and Developed Countries : Where are the Bottlenecks ? 1–23. Retrieved from https://www.isid.ac.in/~pu/conference/dec_12_conf/Papers/RodrigoFuentes.pdf

Maddison, A. (2003). The World Economy. OECD. https://doi.org/10.1787/9789264104143-en

OECD. (2010). *Measuring Innovation: A New Perspective. OECD Innovation Strategy*. Retrieved from https://books.google.lt/books?id=yQSS1DmTJzgC&pg=PA12&lpg=PA12&dq=restructure+data+collection+in+order+to+maximize+microdata-linking+opportunities+and+develop+the+“experimental”+indicators.&source=bl&ots=LulJDS3WDv&sig=ACfU3U3626CXhn_0n8Ik

OECD. (2016). Global value chains: Investment and trade for development (pp. 121–202). OECD. https://doi.org/10.18356/f045c54c-en

OECD Statistics. (2011). Retrieved July 17, 2019, from https://stats.oecd.org/

UNCAD. (2013). Global Value Chains and Development: Investment and Value Added Trade in the Global Economy. Retrieved from https://unctad.org/en/PublicationsLibrary/diae2013d1_en.pdf

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0023

THE ROLE OF SMALL BUSINESS IN THE ECONOMY AND METHODS OF ITS GOVERNMENT SUPPORT USING THE EXAMPLE OF THE REPUBLIC OF LATVIA

Ludmila Verovska[1], Renate Zujeva[2]

Ludmila Verovska, Baltic International Academy, Riga, Latvia, mila.v@inbox.lv.

Renate Zujeva, Baltic International Academy, Riga, Latvia, zujeva.renate@gmail.com

Abstract

Research purpose. The purpose of this study was to determine the role of small and medium enterprises in the economy, as well as to study and evaluate the effectiveness of government support methods for small business entities (SMEs) using the example of the Republic of Latvia. The subject of the research was the system of state regulation and promotion of SME development. The object of the research was the sphere of small business in the Latvian economy, including SMEs, infrastructure support and development of small business.

Design/Methodology/Approach. The study used basic methods of scientific knowledge of economics: an interdisciplinary approach combining methods of systems and comparative analysis, an integrated approach, induction, deduction, analysis, synthesis, methods of organization theory and management, logical analysis, strategic management and also economic analysis of small businesses.

Findings. The research resulted in a system of state regulation and promotion of SME development in Latvia developed by the author, based on an assessment of the impact of measures provided to support SMEs, taking into account the importance of the role of small business in the economy of the Republic of Latvia.

Originality/Value/Practical implications. The practical significance of the work is that the study completes a number of conclusions and practical recommendations in the field of organizational measures for effective support and multilateral development of the SME sector in the economy, recognition of the role of small business as the basis of the economic stability of the Republic of Latvia and the effectiveness of its support as the main state economic policy goal.

Keywords: government support for small businesses; Latvian economy; small business; SME.

JEL codes: E60; G28; H71; R11.

Introduction

Today, according to statistics, small and medium businesses (hereinafter referred to as SMEs) are the basis of the socio-economic well-being of the countries of the European Union. The rapid growth of the small business sector in all industries and agriculture in Europe began in the mid-1970s and continues to this day. Small business is characterized by flexibility, agility, the ability to quickly respond to the slightest changes in the economic environment and market requirements. This contributes to expanding the range and improving the quality of goods and services and introducing innovations and new technologies and also plays a significant role in creating new jobs and, as a result, reducing unemployment.

Understanding the important role of small business in the EU countries and taking into account the priorities of the Europe 2020 long-term development strategy, the absolute majority of developed countries provide feasible support in creating and further developing small business sector enterprises.

Analysing the current state of the Latvian economy, it seems that the state policy of the Republic of Latvia regarding the support of small and medium-sized businesses is insufficient. This hypothesis formed the basis of the study.

The purpose of this article is to explore the features of state policy aimed at supporting and developing small business in the European Union and the Republic of Latvia and to assess the attitude of business towards its implementation.

Literature Review

As mentioned above, SMEs in the modern world are key elements of a stable and strong market economy, without which it is impossible to imagine the effective development of any state. In the context of a progressive and protracted economic crisis, one of the most promising areas for the all-round development of the European Union, creating new jobs and, as a result, reducing unemployment and social tension and filling the consumer market with affordable and competitive, as well as innovative products and services, is the comprehensive support and promotion of the development of small and medium-sized businesses.

However, to begin the study, it is necessary to determine the terminology used: the fulfilment of which criteria allows the enterprise to be classified as a small business?

So, in the European Union, of which the Republic of Latvia has been a member since 2004, the issue of classifying enterprises as small and medium-sized businesses is almost solved at the legislative level. The definition of SMEs is specified in EU Recommendation 2003/361 (European Commission, 2003). According to the context of this document, an enterprise is considered to be any unit, regardless of its organizational and legal form, engaged in economic activity. This includes, in particular, individual entrepreneurs (self-employed persons) and family enterprises that are engaged in craft activities or other activities, as well as partnerships or associations that are regularly engaged in economic activities. To simplify the understanding and determination of the status of an economically active business entity, on 6 August 2008, the European Commission announced Regula No. 800/2008 (European Commission, 2008), in which the main definitions and criteria were given. The main factors determining whether an enterprise belongs to SMEs, hereinafter referred to as small enterprises, are: number of staff and net turnover, or the total book value.

The basis for regulating the activities of small enterprises in the European Union is the initiative of the European Commission, which was adopted in June 2008 and was called 'Think first about the small first' – 'Small Business Act for Europe' (SEC,2008), which was approved by the Council in December 2008. The Small Business Act (SBA) provides a comprehensive policy framework for SMEs, promotes entrepreneurship and enshrines the 'Think Small First' principle in law and policy to improve the competitiveness of SMEs. The SBA establishes 10 principles and sets out policy and legislative measures to promote the development of SMEs for their growth and job creation, both at EU level and at the level of Member States. These principles, set out in detail, are necessary to provide added value at EU level, create equal conditions for SMEs and improve the legal and administrative environment throughout the EU.

The long-term goals of small business development and support are described in the European Development Strategy – Europe2020 (European Commission, 2010), and the main provisions of the SBA are also reflected in the long-term development strategies of the European Union member countries, for example, in the state program 'Latvia 2020' (VARAM, 2013). The European Commission monitors the implementation of the Law 'On Small Business' and annually publishes the results of this study (European Commission, 2016, 2019). Such a great attention to SMEs at the EU leadership level is not paid accidentally, because at the moment, it is the value of the SME sector in the EU countries that is determined by its share in the total number of enterprises, total turnover and total number of employed people. Table 1 provides summarized data on the number and size of enterprises in EU countries, the number of employees and the total value added, as well as the percentage ratio of these indicators as of the beginning of 2019.

Table 1. SME key performance indicators in the EU as on 1 January 2019. (Source: European Commission SME Performance Review 2019)

Class size	Number of enterprises		Number of persons employed		Value added	
	Number	Share	Number	Share	Billion EUR	Share
Micro	22 830 945	93.1%	41 980 528	29.4%	1 513	20.7%
Small	1 420 693	5.8%	28 582 254	20.0%	1 302	17.8%
Medium-sized	231 857	0.9%	24 201 840	17.0%	1 341	18.3%
SMEs	**24 483 495**	**99.8%**	**94 764 622**	**66.4%**	**4 156**	**56.8%**
Large	46 547	0.2%	47 933 208	33.6%	3 166	43.2%
Total	**24 530 042**	**100.0%**	**142 697 830**	**100.0%**	**7 322**	**100.0%**

As can be seen from Table 1, small and medium-sized enterprises are indeed the basis of the economic and social well-being of the European Union, since, constituting more than 99.5% of the total number of enterprises in the EU, more than 66% of the working staff are employers and bring in the cumulative budget of about 60% of value added. That is why the effective support and promotion of development at both the pan-European and regional levels is given special attention.

The main purpose of building an enterprise support system in the EU countries is to create a certain balance between the interests of the state and business representatives, and the following areas of this regulation are provided for 1) formation of a single domestic market; 2) internationalization of business structures; 3) elimination or significant reduction of administrative barriers, and 4) unification of the legal framework for small business enterprises.

The national policy in the countries of the European Union is aimed at creating and enabling environment for business development. State assistance to the development of small and medium-sized businesses includes the provision of most favoured nation treatment and creation by state institutions of legal and economic conditions for its successful development and functioning, including the provision of material and financial resources on preferential terms. State regulation of SME is based on the application of special legislation, a system of targeted programs of financial, technological, informational and personnel support. The system of state support and regulation of the SME sector began to take shape in Europe since the early 1970s: actions were taken to reduce administrative barriers, measures were taken to simplify and harmonize the value-added tax, adjustments were made to the terms of financing and lending, increased transparency of payment systems and availability of banking services. In general, the system of state support for small businesses can be represented in the form of the diagram shown in Figure 1.

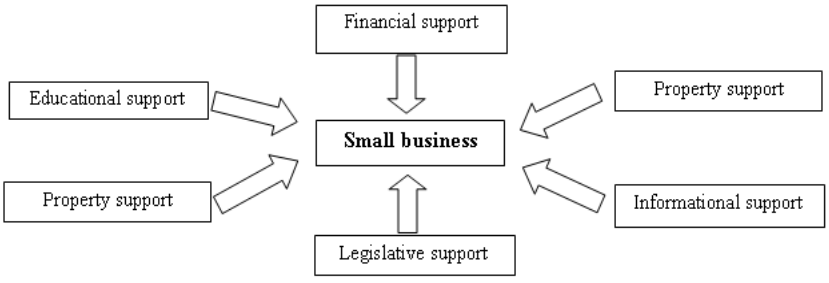

Fig.1. Methods of government support for SME (Source: authors' compilation)

The implementation of a wide range of forms and methods of state support can have a significant impact on the development and functioning of both an emerging and an active enterprise. Financial support at this stage is government subsidies for setting up a business, concessional lending from the state budget, state guarantees for the creation and development of an enterprise, financing investment and innovation projects, program business angels and so on. Property support from the state may look like the creation of business incubators, technology parks, the transfer of movable and immovable property for temporary or permanent use, as well as in the ownership of an entrepreneur, preferential leasing conditions. Information support is expressed in the organization of the information distribution system, the creation of a centralized network for the exchange of business information, information seminars and stands, and the organization of industry or regional exhibitions. The most important forms of support are educational (aimed at creating conditions for enhancing the professional knowledge and skills of an entrepreneur, developing comprehensive educational programs, as well as training seminars and lectures) and a consulting form of support aimed at creating organizations that provide consulting services in organization, development assistance and peculiarities of doing business, as well as compensation to businessmen for the costs of consulting services. But, of course, one of the most significant forms of support should be considered legislative, which is primarily aimed at simplifying and reducing the tax and administrative burden, such as reducing the forms and types of reporting, the number of procedures for registering a company and introducing preferential tax regimes.

As mentioned above, the main documents for EU member states regarding small enterprises are the regulations and guidelines of the European Commission. However, each country of the European Union has its own internal regulatory documents. In Latvia, the activities of small enterprises are not regulated by separate regulatory acts, with the exception of a separate Law of the Republic of Latvia of 9 August 2010, 'On microenterprise taxpayers' (LR Saeima , 2010), and Cabinet of Ministers Regulations No. 776 of 16 December 2014, 'On the procedure for a commercial company to declare its compliance with the status of a small and medium-sized enterprise'. The last regulatory act is related to the status declaration in the situation of an enterprise receiving state support.

Of course, taking into account the importance of this sector of the economy, scientists from all over the world are engaged in the study of small businesses. Some are analysing the possibility and effectiveness of using additional financing in the form of bank loans and grants, as well as government subsidies and loans (Kodongo 2015, Bhusal 2015, Abdulsaleh, Abdulaziz M. A, 2016, Wang, 2016, Moritz, 2015). Others turn their attention to the problems of managing small enterprises and the possibilities of introducing control and management systems (Tsõgankova 2014). Still others study the role of the human factor and the characteristics of personnel management to increase the efficiency of entrepreneurship development in the small business sector (Abduli 2013, Soinsaari 2014, Ozoliņa-Ozola 2011, Ali Husien 2012). In 2014, a very interesting study was conducted by young scientists from the Polish University of Technology in Lodz (Matejun 2014), comprehensively examining the main problems that small enterprises in this country face: starting from the possibilities of obtaining financing, using various funds, business incubators and introducing new technologies, to problems with the search and management of personnel in small family enterprises.

According to the data of the annual report of the European Commission, small and medium-sized businesses also form the basis of the social and economic welfare of the Republic of Latvia. The main indicators by the number of enterprises, employed persons and total value added as of 1 January 2019 are shown in Table 2.

Table 2. SME key performance indicators in Latvia as of 1 January 2019. (Source: European Commission SME Performance Review, 2019)

Class size	**Number of enterprises**		**Number of persons employed**		**Value added**	
	Number	Share	Number	Share	Billion EUR	Share
Micro	104 795	92.1%	208 970	33.5%	2.5	20.9%

Small	7 344	6.5%	146 547	23.4%	2.8	23.0%
Medium-sized	1 421	1.2%	138 276	22.1%	3.2	26.1%
SME`s	**113 560**	**99.8%**	**493 793**	**79.0%**	**8.5**	**70.0%**
Large	195	0.2%	131 173	21.0%	3.6	30.0%
TOTAL	**113 755**	**100.0%**	**624 966**	**100.0%**	**12.1**	**100.0%**

Comparing the figures of Table 2 with the general data for the European Union – the data in the first section – it can be stated that the share of micro enterprises with up to 10 employees in the European Union is slightly higher than in Latvia – 93.1% and 92.1%, respectively; however, the share of small and medium-sized enterprises in Latvia is somewhat higher than in the EU as a whole, although the overall percentage is the same – 99.8%. However, analysing the number of people employed in small (SME) enterprises, the share in Latvia is significantly higher than in the European Union as a whole – 79.0% versus 66.4%, respectively. The situation is similar with value added: in Latvia, the share brought by small enterprises, according to the EC study, is 70.0%, while in the EU as a whole, this figure is just over half – 56.8%. Taking into account the data of the above analysis, we can state the following: the small business sector is particularly important from both the economic and the social side, because it makes a significant contribution to the state budget, provides jobs, thus reducing unemployment and social tension. That is why comprehensive support and promotion of development should be the basis of the economic development program of the Latvian state.

Unfortunately, it is the state influence in the field of legislation that is the most significant factor for the development and existence of a small business in Latvia (Central Statistical Bureau of Latvia, 2019). State-led tax changes and reforms do not always lead to the expected result. For example, in mid-2017, several legal acts related to significant changes in the tax legislation of the Republic of Latvia were again approved, which in the future should have led to an increase in tax revenues to the state budget in order to compensate for the growing budget expenditures. These changes were called ‘Tax Reform 2018’.

Of course, the final results of tax reform can be seen only after 2 years, as presented by the government: it was precisely during 2 years that it was planned to significantly increase tax revenues, remove part of the business from the shadows and improve the social environment by increasing the minimum wage, introducing income tax differentiation from the population. However, at the moment it can already be stated that the tax reform did not stop the outflow of the population from the country, because due to the increase in taxes such as the excise tax on fuel, prices for industrial goods and food increased and the cost of transport and other services increased, which did not simply offset the increase in net wages, but also led to a reduction in incomes. ‘Tax reform 2018’ (Zujeva, 2016) also had a negative impact on the development of small and medium-sized businesses. Table 3 provides information on the registration and liquidation of enterprises in Latvia for the period from 2008 to 1 January 2019.

Table 3. The number of established and liquidated enterprises in the period from 2008 to 2019 (Source: author’s compilation, Lursoft, 2019)

Year	Registered	Liquidated	Balance
2008	11 347	–4 765	6 582
2009	9 228	–5 715	3 513
2010	13 422	–8 833	4 589
2011	18 044	–3 921	14 123
2012	16 891	–4 306	12 585
2013	16 365	–4 152	12 213
2014	14 965	–6 402	8 563

2015	13 485	–10 066	3 419
2016	11 206	–12 227	**–1 021**
2017	10 210	–16 480	**–6 270**
2018	10 660	–20 745	**–10 085**
2019*	8 538	–21 157	**–12 619**

Table 3 was compiled by the authors on the basis of data from a study by the company Lursoft, and it vividly illustrates the attitude of entrepreneurs to the possibilities of doing business in our country. If in the post-crisis period, starting from 2008, the number of registered enterprises grew and significantly exceeded the number of liquidated enterprises, reaching the largest peak in 2010–2011, after the introduction of a preferential regime for micro-tax payers, significant changes in tax legislation in 2016, a constant increase in tax rates, introduction of additional restrictions and a multiple increase in administrative burden, business representatives began to liquidate their enterprises en masse. In February 2019, Lursoft reiterated in its blog (Lursoft, 2019) that the enterprise register eliminated 6647 merchants in just one day on 14 January, and during the day of 13 February, 3408 enterprises were also liquidated. Considering that from the beginning of the year and until 1 October 2019, according to the Register of Enterprises, only 8538 enterprises were created, the statistics of this year again show a negative picture – entrepreneurs see no reason to create their own business in the Republic of Latvia.

Unfortunately, such extensive studies of the small business sector in the Baltic countries were not conducted; however, scientists still considered the regional characteristics of entrepreneurship in Latvia, Lithuania and Estonia (Zujeva 2016, 2018, Dickinson 2014, Vaitkevicius, 2014, Kochetkov & Sventitskaya 2016). Young Latvian scientists turned their attention to increasing the competitiveness of small enterprises (Volvenkins 2012, Driņķe & Bruksle 2018, Vanags 2019). However, on the topic of assessing the state support system for small businesses and the effectiveness of its application in the Latvian Republic, no studies have been conducted before.

Methodology

As already mentioned in the first section of this article, to stimulate the creation and development of small businesses, the government can provide the following types of support: financial, property, informational, educational, consulting and legislative; the description of each of them has also been given earlier. However, it is interesting to analyse the expectations of business representatives regarding the possible support from the state. In other words, which types of support are the most important and essential for future and current entrepreneurs?

Data analysed in the current study was obtained from survey participants organized and developed by the study authors. In March 2019, 367 respondents, active Facebook users who are not indifferent to the economic situation in the Republic of Latvia, participated in the survey.

To be representative, the sample size should be approximately 1,188 participants, taking into account population statistics for 2017 in the age group of 18–56 years (Central Statistical Bureau, 2017). The authors had data from only 104 participants who provided high-quality answers to all questions.

Of the participants, 71% women, and 29% were men; 75% had higher education; 48% of the total number of participants represented the city of Riga (the capital of Latvia).

The questionnaire was developed by the authors of the study and consisted of 13 questions suggesting different answer options, such as choosing a specific answer from the proposed ones, as well as a 6-point priority system for evaluating various indicators.

All questions were grouped into three content blocks:

1. Data on survey participants, such as gender, age, place of residence, level of education, type of employment of the respondent.

2. A group of questions regarding the purpose of the study: respondents were asked to place the proposed elements of the state support system for small businesses, such as financial, legislative, business, information, educational and consulting, in order of importance in the creation, development and active work of small businesses in the Republic of Latvia – from the most important to the most insignificant, based on a 6-point rating system, according to the number of elements presented, respectively; the higher the position of the element, the higher its value in the system and the greater the coefficient. It was also proposed to determine what the position of the state in relation to SMEs was, assessing the level of state support from significant to complete lack thereof.
3. The third block was devoted to the assessment by respondents of their own knowledge and skills needed to create, register and conduct their own small businesses, as well as the ease of doing business in the Republic of Latvia and the thoughts of respondents regarding the topic of the study.

Below are summarized the results of the study received from respondents in Part B, which correspond to the immediate purpose of this article. Part C results will be presented in the next article.

Results

An analysis of the data of the study shows (Fig.2.) that respondents consider financial assistance in the form of subsidies, additional financing, soft loans, investment financing and innovative projects to be the most important at all stages of enterprise development from registration to activities. Further, with a small margin and legislative support follows, respondents especially noted difficulties in perceiving the norms of the Latvian legislation, complex and incomprehensible forms of reporting and constant changes in regulatory acts. The property support form is also important, in which entrepreneurs expect help in the form of preferential leasing conditions, the possibility of simplified access to business incubators and industrial parks. An informational, educational and consulting form of support is also noted as desirable; however, according to respondents, they are significantly behind in importance from the first three described above.

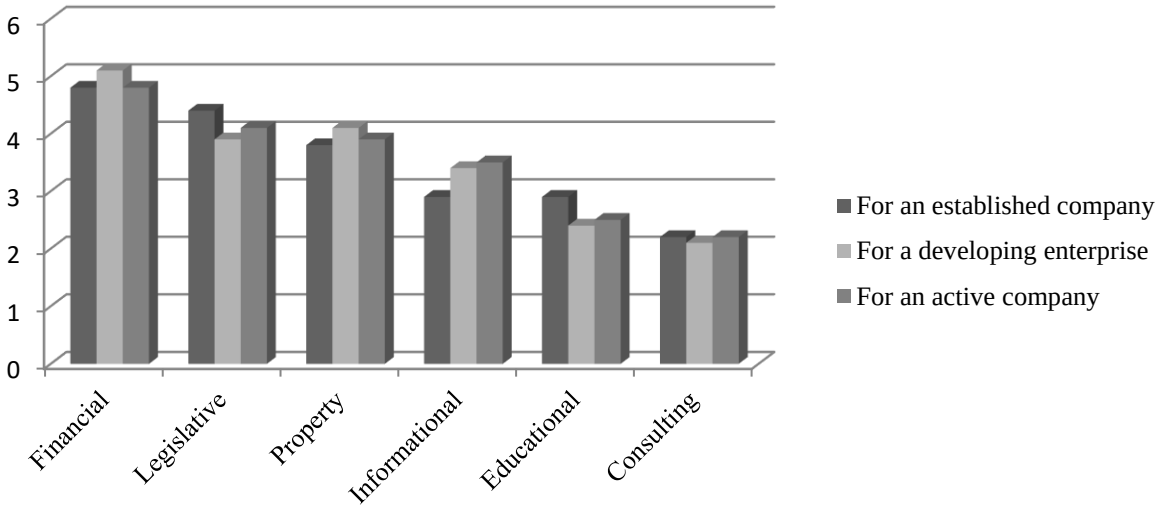

Fig.2. Priorities of types of state support for the enterprise at different stages of its existence
(Source: author's research results)

To the research question regarding the level of state support to small and medium-sized enterprises, the following answers were received (illustrated in Fig. 3): the majority of respondents are sure that the state is not doing enough to develop small business in Latvia, such was 51% of all respondents. And 45% of respondents are convinced that the state does nothing at all for the successful

development of small and medium-sized businesses in Latvia, whereas only 4% said that the state provides all possible assistance in supporting and developing this sphere of entrepreneurial activity.

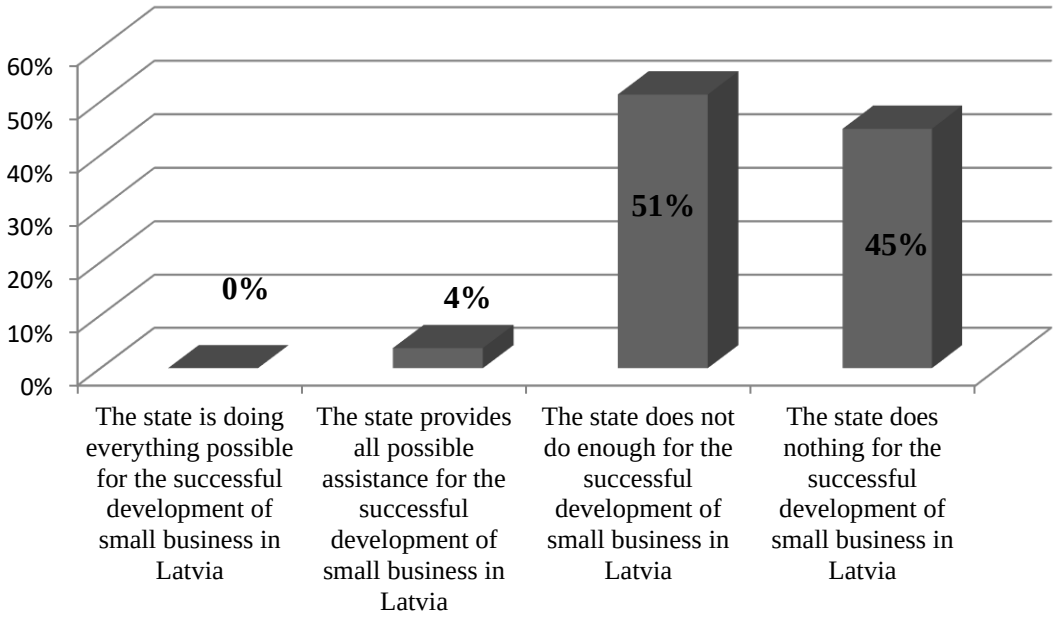

Fig.3. Priorities of types of state support for the enterprise at different stages of its existence
(Source: author's research results)

During the survey, a public opinion poll was also conducted on whether it was easy to do business in Latvia. According to the responses received, 88.5% of respondents noted that it is very difficult to engage in entrepreneurial activities in Latvia due to the large number of restrictions, too high requirements of the legislation and complex reporting. Many of the respondents complained about the difficulties in the perception of regulations and incomprehensible and biased tax system, due to which the company incurs a large number of unplanned costs, which in turn push away potential investors. Among those interviewed were those who were forced to close their business precisely because of the aforementioned difficulties. Research in this area will be continued.

Conclusions

The study conducted in this article shows that small business can rightfully be called the basis of the economic and social well-being of the European Union as a whole and the Republic of Latvia in particular. Enterprises in this sector of the economy create new jobs and make a significant contribution to budget revenues and to the growth of the gross national product of the EU countries.

Recognizing the role and importance of small enterprises, the European Union has created a number of documents regulating the support of these enterprises and has developed a comprehensive assistance system to create and promote the development of this sector of the economy – financial, informational, educational and so on.

Based on the research and questionnaire data, a number of problems were identified in the state support system for small businesses, which significantly limited the activities of enterprises in this sector of the Latvian economy. This, in turn, runs counter to the general policy of the European Commission regarding the policy of active support and stimulation of the development of small business in the European Union. Analysing the research of scientists in the field of small business development in other European countries, for example, the extensive study of Polish scientists mentioned above, we can conclude that, in general, the situation in many countries is very close: enterprises encounter difficulties in obtaining financing, selecting and HR management, regional features of the law. And sometimes the

measures taken by the government of a particular state do not always meet the interests of small and medium-sized businesses in a particular region or even the country's population. As a result, significant imbalances arise, clearly illustrated by the example of the Republic of Latvia in the earlier section of this article.

Therefore, when addressing serious issues such as a significant change in tax legislation, government agencies should conduct a preliminary comprehensive assessment of the impact of the proposed changes, taking into account the opinions of representatives of all types of businesses and the recommendations of international organizations. The implementation of tax reform and other important changes in the legislation in the field of entrepreneurship should correspond to the priorities of the development of the country and small business, which today is a priority for the development of the EU economy, as has been repeatedly emphasized. It is small business that plays a significant role both in GDP growth in all countries of the European Union and in employment. And the legislative system is a key tool for the harmonious regulation of this environment.

References

Abdulsaleh, M. A, Worthington A. (2016). Bank Financing for Small and Medium-sized Enterprises (SMEs) in Libya, [Accessed 28.03.2019]. Available from Internet: https://www.semanticscholar.org/paper/Small-and-Medium-Sized-Enterprises-Financing%3A-A-of-Abdulsaleh-Worthington/f2d063d474408ebbf20eae1cb1b5e7905e7382d8

Bhusal R.(2015). SME Finance in Nepal: relevance of bootstrapping finance [Accessed 28.03.2019]. Available from Internet: https://www.researchgate.net/publication/281901241_SME_Finance_in_Nepal_relevance_of_bootstrapping_finance

Central Statistical Bureau of Latvia, (2019). Statistics for Latvia's SME [Accessed 30.03.2019]. Available from Internet: https://data1.csb.gov.lv/pxweb/lv/uzn/uzn__uzndarb/SBG020.px/table/tableViewLayout1/?rxid=491bb190-2600-453b-867d-5ac9b6a69264

Driņķe Z., Bruksle I. (2018). Quality management system as tool for corporate development and competitiveness increase in small and medium companies [Accessed 28.03.2019]. Available from Internet: https://llufb.llu.lv/conference/economic_science_rural/2018/Latvia_ESRD_47_2018-65-72.pdf

European Commission, (2003). Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (Text with EEA relevance) (notified under document number C(2003) 1422) [Accessed 29.03.2019]. Available from Internet: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32003H0361

European Commission, (2008). A "Small Business Act" for Europe {SEC(2008) 2101} {SEC(2008) 2102} "Think Small First", [Accessed 29.03.2019]. Available from Internet: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52008DC0394

European Commission, (2008). Commission Regulation (EC) No 800/2008, [Accessed 29.03.2019]. Available from Internet: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:214:0003:0047:en:PDF

European Commission, (2008). Indicators to support the Europe 2020 strategy, [Accessed 28.03.2019]. Available from Internet: http://ec.europa.eu/eurostat/documents/3217494/7566774/KS-EZ-16-001-EN-N.pdf/ac04885c-cfff-4f9c-9f30-c9337ba929aa

European Commission, (2008). User guide to the SME Definition, [Accessed 29.03.2019]. Available from Internet: http://ec.europa.eu/regional_policy/sources/conferences/ state-aid/sme/smedefinitionguide_en.pdf

European Commission, (2010). Europe 2020 Strategy, [Accessed 28.03.2019]. Available from Internet: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/europe-2020-strategy_en

European Commission, (2019). SME Performance Review, SBA Fact sheets of Latvia and EU, Accessed 30.03.2019]. Available from Internet: https://ec.europa.eu/growth/smes/business-friendly-environment/performance-review_en,

Kodongo O. (2015). The role of financial access in the success of small and medium enterprises in Swaziland - [Accessed 30.03.2019]. Available from Internet: http://wiredspace.wits.ac.za/jspui/bitstream/10539/21039/1/Zethu%20Mthethwa%20Final%20Paper%20Aug%202015.pdf

LR Ministru kabinets (2014). LR Ministru kabineta noteikumi Nr.776, Kārtība, kādā komercsabiedrības deklarē savu atbilstību mazās (sīkās) un vidējās komercsabiedrības statusam, [Accessed 29.03.2019]. Available from Internet: https://likumi.lv/ta/id/271191-kartiba-kada-komercsabiedribas-deklare-savu-atbilstibu-mazas-sikas-un-videjas-komercsabiedribas-statusam

LR Saeima.(2010). likums "Mikrouzņēmumu nodokļa likums", [Accessed 29.03.2019]. Available from Internet: https://likumi.lv/doc.php?id=215302

Lursoft. (2019). Liquidated enterprises. Statistic facts, Lursoft blog. [Accessed 29.03.2019]. Available from Internet: http://blog.lursoft.lv/tag/likvidetie-uznemumi/

Moritz A. (2015). Financing of Small and Medium-Sized Enterprises in Europe - Financing Patterns and 'Crowdfunding', [Accessed 28.03.2019]. Available from Internet: https://ubt.opus.hbz-nrw.de/opus45-ubtr/frontdoor/deliver/index/docId/693/file/Dissertation_Alexandra_Moritz.pdf

Nguyen S.T. (2017). An Analysis of SMEs Funding, Bank Efficiency and Barriers to Lending: Three Essays,, [Accessed 28.03.2019]. Available from Internet: https://eprints.soton.ac.uk/378767/1/Final%2520PhD%2520thesis%2520-%2520Son%2520Nguyen.pdf

Ozoliņa-Ozola, I.(2011). Cilvēku resursu vadīšanas efektivitātes novērtēšanas problēmas. *Ekonomika un* uzņēmējdarbiba. Nr.21, 2011, 67.-75.lpp. ISSN 1407-7337 [Accessed 28.03.2019]. Available from Internet: https://ortus.rtu.lv/science/lv/publications/12510

Soinsaari A. (2014). Creating human resource policy for an sme company. [Accessed 28.03.2019]. Available from Internet: https://www.theseus.fi/bitstream/handle/10024/83932/Soinsaari_Anssi.pdf?sequence=1&isAllowed=y

VARAM (Vides aizsardzības un reģionālās attīstības ministrija), (2013). Latvijas Nacionālais attīstības plāns 2014. - 2020.gadam, [Accessed 29.03.2019]. Available from Internet: http://www.varam.gov.lv/lat/pol/ppd/ilgtsp_att/?doc=13858

Volvenkins S. (2012). Mazo un vidējo uzņēmumu konkurētspējīgu priekšrocību radīšana un virzīšana tirgū, izmantojot mārketinga instrumentus interneta vidē. [Accessed 28.03.2019]. Available from Internet: https://dspace.lu.lv/dspace/bitstream/handle/7/5117/22844-Sergejs_Volvenkins_2012.pdf?sequence=1

Wang J. (2016). SME financing in Zhejiang province, [Accessed 28.03.2019]. Available from Internet:http://etheses.dur.ac.uk/11675/1/SME_financing_in_Zhejiang_province_WANG_Jinhua.pdf?DDD2+

Zujeva,.R, (2016). BIA, Влияние государственной политики в сфере налогообложения на развитие малого бизнеса Латвии, in V International Scientific Conference Transformational Processes in Law, Regional Economics and Economic (BSA Conference proceedings, 2016, 78-82)

Zujeva,R., (2018). BIA. Mazo un vidējo uzņēmumu loma Baltijas valstu un Eiropas Savienības ekonomikā, in VII International Scientific Conference Transformational Processes in Law, Regional Economics and Economic (BSA Conference proceedings, 2018,114-119)

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0024

SENIOR DIGITAL UP-SKILLING – ERASMUS PLUS PROGRAMME PROJECT DIAL CASE STUDY

Iveta Cirule[1], Monta Balta[2], Irena Komarova[3], Ina Gudele[4]

[1]*NGO Project Net, Riga, Latvia, projectfund@inbox.lv*

[2]*NGO Project Net, Riga, Latvia,* monta.balta7@gmail.com

[3]*RISEBA University, Riga, Latvia, irena.komarova@riseba.lv*

[4]*Internet Association Latvia, Riga, Latvia, ina.gudele@gmail.com*

Abstract

Research purpose. With the current and progressive ageing of the population globally, in Europe over the past three decades, the urgency of creating a specific theoretical and educational model for older adults, in which the professional purpose is not the most important, is rising. Senior digital up-skilling is one of the pathways to widen the horizon of senior citizens (aged 55 plus) to be socially included in both society and labour market. The research article reveals the results of the project 'Digital Acquisition through Intergenerational Learning' (DIAL No. 2017-1-LV01-KA204-035455, Erasmus Plus programme) senior survey on training needs of digital skills from Latvia.

Design/Methodology/Approach. The research was carried out based on a quantitative survey conducted in four project partner countries in 2018, totally reaching out 1003 respondents. The sample of Latvia represents 236 adult learners, aged 55 plus. The survey was conducted based on two main scales: 'skill self-assessment and study needs' and four subscales 'computer essentials, communication and collaboration, hardware and Internet'. The main aim of the research was to estimate digital literacy level among senior citizens in project countries and develop training and teaching materials for adult learners and teachers based on survey results.

Findings. The main finding reveals the senior digital skill self-assessment and study needs. The majority of respondents revealed that they lack skills of communication in social media; at the same time they are willing to learn how to use Facebook and Viber, but they are not interested to use WhatsApp and Twitter for communication purposes with friends and family. The respondents are interested in apprehending video skills via mobile phones and e-governance service tools. These are only some findings out of almost 70 survey statements.

Originality/Value/Practical implications. The training materials in five languages (English, Latvian, Portuguese, Turkish and Greek) were developed based on the senior digital skills self-assessment and study needs survey. This is a practical intellectual output and value of the project DIAL – creation of innovative teaching materials for senior digital up-skilling.

Keywords: Education; Non-formal education; Adult learners; Senior students

JEL codes: A29

Introduction

The ageing process of the world's population is affecting our society as such. Maturing is a natural process. The elderly population symbolizes the essential and ever-growing part of our European community, economy and society. Regardless of the on-going situation, this highlights such questions as to how the member states can best safeguard that these citizens are socially well established, are actively engaged and can relish in their rights.

The research article reveals the results of project 'Digital Acquisition through Intergenerational Learning" (DIAL No. 2017-1-LV01-KA204-035455, Erasmus Plus programme) senior survey on training needs of digital skills from Latvia. The main survey aim was to assess the training study needs for seniors in four project partnership countries – Latvia, Portugal, Turkey and Cyprus – that need to be improved in order to develop on-line (*Moodle* platform) teaching and training materials. The main research question is what are the teaching and training needs of senior citizens in Latvia. The research

is based on a quantitative survey conducted in four project partner countries in 2018 totally reaching out 1003 respondents. Latvian sample represents 236 adult learners aged 55 plus.

The training materials in five languages (English, Latvian, Portuguese, Turkish and Greek) were developed based on the senior digital skill self-assessment and study needs survey. These training materials will be publicly available on *Moodle* platform for adult learners in June 2019, free of charge. This is a practical intellectual output and value of the project DIAL – creation of innovative teaching materials for senior digital up-skilling.

Literature Review

An innovative and skill development oriented programme created on the principles of intergenerational and lifelong learning (LLL) opportunities ensures that seniors (adults aged 55 plus), as it is stated in the Digital Competence Reference Framework of the EC (2016), obtain important digital competences with the participation of their significant others (i.e. children, grandchildren), hence backing up in a detailed way their social inclusion, e-access and participation, personal growth and active ageing.

Although a number of senior citizens enjoy remarkable health conditions, the difficulties that arise with ageing sometimes prevent the elderly from obtaining goods and/or services as well as the ability of living independently. Granting accessibility to everyone is equally a matter of fundamental rights and an essential part for making the most of the seniors' social and economic potential.

According to the Europe 2020 Strategy for smart, sustainable and inclusive growth (EC, 2010), the development of LLL and skills is recognized as a key component with regard to the on-going economic crisis, population ageing and EU's overarching economic and social strategy.

Studies show that elders lack digital literacy skills and due to digital gap their social participation and ability to follow information significantly decreases. Elders lack not only an upgraded digital skill set, but also distrust operations related to purchases of electronic services online and are more likely to use traditional over social media; however, they have a growing interest in becoming familiar with e-mail and Facebook usage (Nimrod, 2016; Román-García et al, 2016). A study carried out in 2017 highlighted a paradox that experience is a crucial factor in digital skill apprehension process for elderly; however, without indispensable support and accompaniment it is rather difficult to implement this process. One of the ways to provide such support is by involving family and other close companions not only to assist in the learning process, but also to help elders understand the utility of digital skills for their own benefit (Shreurs et al, 2017; Quan-Haase et al, 2017).

The economic crisis has highlighted the major importance of adult learning and what role it can play in obtaining the Europe 2020 targets by allowing the adults to boost their ability to adapt to the changes in the labour market, domestic life and society. Adult learning grants the means of up-skilling or re-skilling those affected by age and long-term unemployment, as well as making significant contribution to social inclusion, active citizenship and personal improvement.

Still, there is rising consensus that the adult learning is currently the most fragile link in establishing a national, LLL system. Cooperation in adult learning activities has fallen from 9.8% of the 25- to 64-year-old demographic group in 2005 to only 10.7% in 2014, therefore making the increased 'ET2020' an objective for 15% and by 2020 an even more significant challenge (EC, 2015).

'The Eurydice Report for Adult Education and Training' published in 2015 started more significant challenges in dealing with adults' basic skill levels and their shortfalls which undeniably influence the economy and social cohesion: (1) approximately one in five adults possesses low literacy level and numeracy skills and nearly one in three shows very low or no information and communication technology (ICT) skills at all; (2) adults with respectable education and training need to have at least a chance to benefit from their lifelong intellectual investment; (3) at the same time countries' policy agendas commonly focus on the admission of the LLL for those adults who are lacking the basic skills or who do not have sufficient qualifications since they rarely specify distinct aims that are sought to be reached.

ICT has become a more interesting subject for elders since 2000s, as a study showed that 93% of elders at the age of 75+ did not use Internet at the time, while in 2016 that number had descended close to 50% (Orlov, 2016). Jacobson et al. (2017) researched the use of mobile devices among seniors and came to a conclusion that there is a significant technological knowledge gap between generations and 'seniors are still largely lagging behind other age groups'. The concept of 'silver surfers', referring to elders easily apprehending modern communication channels and tools, was described as not yet actual, emphasizing the urge to reduce disparities of intergenerational gap of technology use.

When developing study programmes for elders, it is important to take into account biological processes also in the human body, that is, the fact that the working memory deteriorates with age. Knowledge of such cognitive changes can help to adapt the best learning tools, for instance, creating materials describing step-by-step actions for the apprehensible activities with computer, rather than practice a lecture-based approach, which is proved to be less effective among elders (Heaggans, 2012).

Among the reasons considered to be pro-integrating the silver generation into digital world, it is worth highlighting 'independence' as a significant factor for seniors, as the so-called 'on-liner' elders admit that Internet helps them to stay independent for a longer period of time as they age (Seifert & Schelling, 2018).

Methodology

The research development is based on a quantitative survey conducted in four project partner countries in 2018 totally reaching out 1003 respondents. Latvian sample represents 236 adult learners aged 55 plus. The survey was conducted based on two scales – skill self-assessment (Likert scale 1–4) and study needs (yes/no reply options) – and four subscales: computer essential, communication and collaboration, hardware and Internet. The main aim of the research was to estimate the situation in project countries and, based on survey results, develop training and teaching materials for adult learners and teachers (Fig. 1).

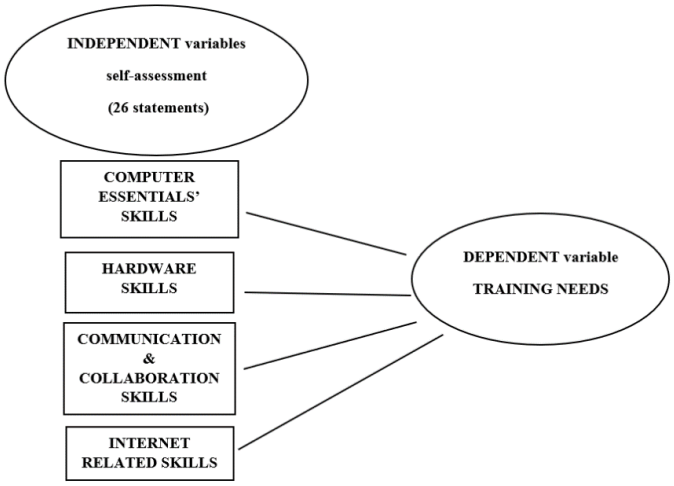

Fig. 1. Survey conceptual model *(*Source: authors' compilation)

The survey was launched in November 2017 via project online platform http://survey.dialproject.net/ created by project partnership in English, Latvian, Turkish, Greek and Portuguese. Data collection was on-going for 3 months until January 2018.

The demographical description of Latvia's sample is as follows: Latvia's sample was collected by regional survey coordinators (total three persons) by visiting senior citizens at home and public buildings (library, elderly houses and local municipality). Regional coordinators distributed survey in hard copies as senior citizens in Latvia lack the skills to fill online survey and they simply do not have access to Internet and/or computer at home.

Latvia's sample consists of 236 respondents (175 females and 61 males), which is a quite regular gender misbalance in this age group in Latvia due to social activity and mortality rate of females and males (Fig. 2). Respondents are mostly still working (n = 109) or retired (n = 107) (Fig. 3). Respondents had mostly vocational education (n = 96) and university degree (n = 81) (Fig. 4).

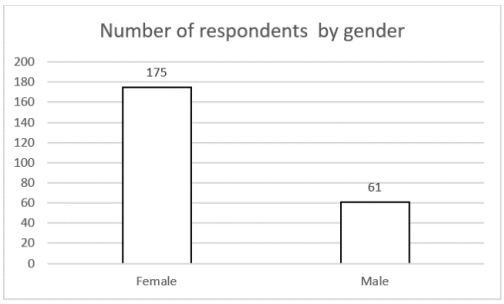

Fig. 2. Number of respondents by gender (Source: authors' compilation**)**

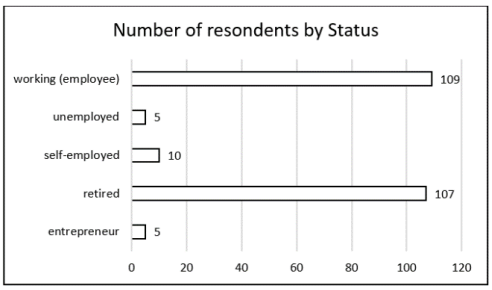

Fig. 3. Number of respondents by status (Source: authors' compilation**)**

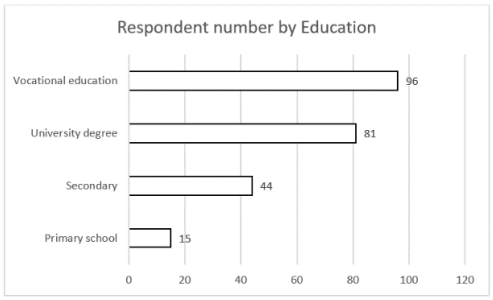

Fig. 4. Number of respondents by education (Source: authors' compilation**)**

Results

Respondents determined self-evaluation and training needs by assessing 26 statements from 1 (poor) to 4 (very good). Some findings from scale 'computer essentials' self-assessment data are below. Half of Latvian respondents evaluated skill 'to create/delete/rename a document' as poor; the same refers to the ability to print and scan files. The majority of respondents know how to turn on and off a computer (Fig. 5). These statements described basic essential computer skills, which seem self-evident for younger generations, in contrast to senior adults who labelled the mentioned skills as poor.

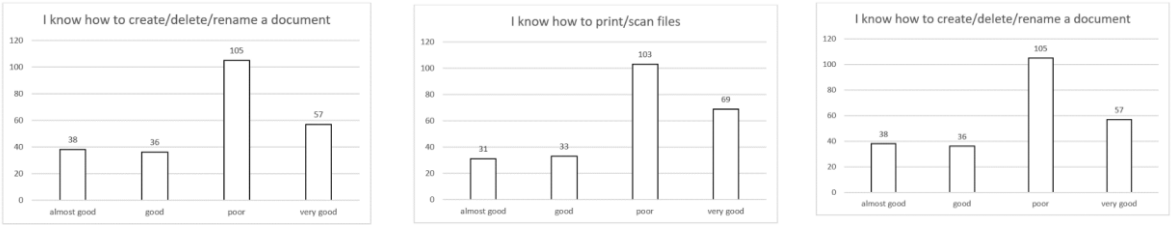

Fig. 5. Survey statements (Source: authors' compilation**)**

The data were treated with SPSS software comprising of the following steps. The first step is the reliability statistics – calculation of Cronbach's alpha coefficient. All scales are reliable as coefficient for all scales is high, $\alpha > 0.7$ (Table 1).

Table 1. Scales' reliability statistics (Source: authors' compilation)

Reliability Statistics
Scale "Computer essential"

Cronbach's Alpha	N of Items
.946	6

Reliability Statistics
Scale "Hardware

Cronbach's Alpha	N of Items
.846	5

Reliability Statistics
Scale "Communication and Collaboration"

Cronbach's Alpha	N of Items
.910	5

Reliability Statistics
Scale "Internet"

Cronbach's Alpha	N of Items
.956	8

The second step was to determine normal distribution. The authors used the analysis of Kolmogorov–Smirnov *Z* criteria significance or Sig. (Table 2); as Sig. was lower than 0.05, the data does not correspond with normal distribution and Spearman's rho coefficient was conducted (Table 3).

Table 2. One-sample Kolmogorov–Smirnov test (Source: authors' compilation)

One-Sample Kolmogorov-Smirnov Test

	Computer_essential	hardwere	internet	komuni
N	214	214	214	214
Kolmogorov-Smirnov Z	1.755	1.498	1.43	1.581
Asymp. Sig. (2-tailed)	**0.004**	**0.023**	**0.033**	**0.014**

Table 3. Spearman's rho test (Source: authors' compilation)

		Computer essential	Hardware	Internet	Communication and collaboration
Computer essential	Spearman's rho	1			
	Sig. (two-tailed)	0			
	N	214			
Hardware	Spearman's rho	0.715**	1		
	Sig. (two-tailed)	0	0		
	N	214	214		
Internet	Spearman's rho	0.770**	0.725**	1	
	Sig. (two-tailed)	0	0	0	
	N	214	214	214	
Communication and collaboration	Spearman's rho	0.711**	0.756**	0.853**	1
	Sig. (two-tailed)	0	0	0	0
	N	214	214	214	214

**Correlation is significant at the 0.01 level (two-tailed).

After conducting Spearman's rho coefficient, the conclusion is that data is not multicollinear as coefficient is less than 0.9. Third, Mann–Whitney test was performed to test differences between gender, age, status and education (Table 4).

Table 4. Test statistics (Source: authors' compilation)

	Computer essential	Hardware	Internet	Communication and collaboration
Mann–Whitney *U*	3781	4296	3648.5	3601
Wilcoxon *W*	5492	6007	5359.5	5312
Z	–1.857	–0.568	–2.18	–2.306
Asymp. Sig. (two-tailed)	0.063	0.57	0.029	0.021

There are statistically significant differences between genders (Sig. ≤ 0,05) and Internet usage and communication and collaboration scales.

Fourth, ANOVA was performed according to respondent status: 1 (entrepreneur), 2 (working), 3 (unemployed), 4 (retired), 5 (self-employed). There are statistically significant differences in all criteria between all statuses (Sig. ≤ 0.05) (Table 5).

Table 5. ANOVA status test (Source: authors' compilation)

		Sum of squares	*df*	Mean square	*F*	Sig.
Computer essential	Between groups	39.85	4	9.962	9.408	0
	Within groups	221.312	209	1.059		
	Total	261.162	213			
Hardware	Between groups	20.969	4	5.242	6.832	0
	Within groups	160.376	209	0.767		
	Total	181.345	213			
Internet	Between groups	40.311	4	10.078	12.952	0
	Within groups	162.613	209	0.778		
	Total	202.924	213			
Communication and collaboration	Between groups	34.627	4	8.657	9.099	0
	Within groups	198.848	209	0.951		
	Total	233.475	213			

As presented in table 6, there are statistically significant differences in all criteria between status 2 (working) and 5 (self-employed).

Table 6. Multiple comparisons (Source: authors' compilation)

Dependent variable	(*I*) status	(*J*) status	Mean difference (*I*–*J*)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Computer essential	1	2	0.87544	0.47215	0.346	-0.4238	2.1747

		3	0.6381	0.60254	0.827	-1.0199	2.2961
		4	1.13333	0.65082	0.411	-0.6575	2.9242
		5	0.01765	0.47134	1	-1.2794	1.3147
	2	1	-0.87544	0.47215	0.346	-2.1747	0.4238
		3	-0.23734	0.40301	0.977	-1.3463	0.8716
		4	0.25789	0.47215	0.982	-1.0413	1.5571
		5	-0.85779*	0.14672	0	-1.2615	-0.454
	3	1	-0.6381	0.60254	0.827	-2.2961	1.0199
		2	0.23734	0.40301	0.977	-0.8716	1.3463
		4	0.49524	0.60254	0.924	-1.1628	2.1533
		5	-0.62045	0.40206	0.536	-1.7268	0.4859
	4	1	-1.13333	0.65082	0.411	-2.9242	0.6575
		2	-0.25789	0.47215	0.982	-1.5571	1.0413
		3	-0.49524	0.60254	0.924	-2.1533	1.1628
		5	-1.11569	0.47134	0.129	-2.4127	0.1813
	5	1	-0.01765	0.47134	1	-1.3147	1.2794
		2	0.85779*	0.14672	0	0.454	1.2615
		3	0.62045	0.40206	0.536	-0.4859	1.7268
		4	1.11569	0.47134	0.129	-0.1813	2.4127
Hardware	1	2	0.98526	0.40193	0.106	-0.1207	2.0913
		3	0.71429	0.51292	0.633	-0.6971	2.1257
		4	1.28	0.55402	0.146	-0.2445	2.8045
		5	0.4	0.40124	0.857	-0.7041	1.5041
	2	1	-0.98526	0.40193	0.106	-2.0913	0.1207
		3	-0.27098	0.34307	0.933	-1.215	0.6731
		4	0.29474	0.40193	0.949	-0.8113	1.4007
		5	-0.58526*	0.1249	0	-0.929	-0.2416
	3	1	-0.71429	0.51292	0.633	-2.1257	0.6971
		2	0.27098	0.34307	0.933	-0.6731	1.215
		4	0.56571	0.51292	0.805	-0.8457	1.9771
		5	-0.31429	0.34226	0.89	-1.2561	0.6275
	4	1	-1.28	0.55402	0.146	-2.8045	0.2445
		2	-0.29474	0.40193	0.949	-1.4007	0.8113
		3	-0.56571	0.51292	0.805	-1.9771	0.8457
		5	-0.88	0.40124	0.186	-1.9841	0.2241
	5	1	-0.4	0.40124	0.857	-1.5041	0.7041
		2	0.58526*	0.1249	0	0.2416	0.929
		3	0.31429	0.34226	0.89	-0.6275	1.2561
		4	0.88	0.40124	0.186	-0.2241	1.9841
Internet	1	2	0.92947	0.40472	0.15	-0.1842	2.0432
		3	0.95429	0.51649	0.349	-0.467	2.3755
		4	1.14	0.55787	0.249	-0.3951	2.6751
		5	0.07922	0.40403	1	-1.0326	1.191
	2	1	-0.92947	0.40472	0.15	-2.0432	0.1842
		3	0.02481	0.34546	1	-0.9258	0.9754
		4	0.21053	0.40472	0.985	-0.9032	1.3242

		5	-0.85026*	0.12577	0	-1.1963	-0.5042
	3	1	-0.95429	0.51649	0.349	-2.3755	0.467
		2	-0.02481	0.34546	1	-0.9754	0.9258
		4	0.18571	0.51649	0.996	-1.2355	1.607
		5	-0.87507	0.34464	0.086	-1.8234	0.0733
	4	1	-1.14	0.55787	0.249	-2.6751	0.3951
		2	-0.21053	0.40472	0.985	-1.3242	0.9032
		3	-0.18571	0.51649	0.996	-1.607	1.2355
		5	-1.06078	0.40403	0.069	-2.1726	0.051
	5	1	-0.07922	0.40403	1	-1.191	1.0326
		2	0.85026*	0.12577	0	0.5042	1.1963
		3	0.87507	0.34464	0.086	-0.0733	1.8234
		4	1.06078	0.40403	0.069	-0.051	2.1726
Communication and collaboration	1	2	0.95158	0.44755	0.213	-0.28	2.1831
		3	0.93143	0.57114	0.479	-0.6402	2.5031
		4	1.24	0.6169	0.265	-0.4576	2.9376
		5	0.17373	0.44678	0.995	-1.0557	1.4032
	2	1	-0.95158	0.44755	0.213	-2.1831	0.28
		3	-0.02015	0.38201	1	-1.0713	1.031
		4	0.28842	0.44755	0.968	-0.9431	1.52
		5	-0.77785*	0.13908	0	-1.1606	-0.3951
	3	1	-0.93143	0.57114	0.479	-2.5031	0.6402
		2	0.02015	0.38201	1	-1.031	1.0713
		4	0.30857	0.57114	0.983	-1.2631	1.8802
		5	-0.7577	0.38111	0.275	-1.8064	0.291
	4	1	-1.24	0.6169	0.265	-2.9376	0.4576
		2	-0.28842	0.44755	0.968	-1.52	0.9431
		3	-0.30857	0.57114	0.983	-1.8802	1.2631
		5	-1.06627	0.44678	0.123	-2.2957	0.1632
	5	1	-0.17373	0.44678	0.995	-1.4032	1.0557
		2	0.77785*	0.13908	0	0.3951	1.1606
		3	0.7577	0.38111	0.275	-0.291	1.8064
		4	1.06627	0.44678	0.123	-0.1632	2.2957
*The mean difference is significant at the 0.05 level.							

ANOVA was performed according to respondent age (Table 7). There are statistically significant differences in all criteria between age groups (Sig. ≤ 0.05) (Table 8). The age groups are 1 (55–59), 2 (60–65), 3 (66–70), 4 (71–75) and 5 (75 and older).

Table 7. ANOVA testing (Source: authors' compilation)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Computer_essential	Between Groups	23.784	4	5.946	5.235	0
	Within Groups	237.378	209	1.136		
	Total	261.162	213			
Hardware	Between Groups	19.49	4	4.872	6.292	0
	Within Groups	161.856	209	0.774		
	Total	181.345	213			
Internet	Between Groups	23.981	4	5.995	7.002	0
	Within Groups	178.943	209	0.856		
	Total	202.924	213			
Communication & Collaboration	Between Groups	31.865	4	7.966	8.258	0
	Within Groups	201.61	209	0.965		
	Total	233.475	213			

Table 8. Multiple comparisons (Source: authors' compilation)

						95% confidence interval	
		(*J*) age	Mean difference (*I*–*J*)	Std. error	Sig.	Lower bound	Upper bound
Dependent variable	(*I*) age	4	0.69176*	0.23646	0.031	0.0411	1.3424
		5	0.94487*	0.25442	0.002	0.2448	1.645
		4	0.64796	0.25247	0.08	-0.0468	1.3427
		5	0.90106*	0.26937	0.009	0.1598	1.6423
		3	0.48351*	0.1727	0.044	0.0083	0.9587
		4	0.69208*	0.19525	0.004	0.1548	1.2294
		5	0.79612*	0.21009	0.002	0.218	1.3742
		5	0.67240*	0.22243	0.023	0.0603	1.2845
	4	1	-0.69208*	0.19525	0.004	-1.2294	-0.1548
		3	0.56264*	0.18159	0.019	0.0629	1.0623
		4	0.81014*	0.2053	0.001	0.2452	1.3751
		5	0.92644*	0.2209	0	0.3186	1.5343

Table 8 shows that there are statistically significant differences between education groups.
ANOVA was performed according to respondent education (Table 9). There are statistically significant differences in all criteria between education groups (Sig. $\leq$ 0.05) with education groups being 1 (primary), 2 (secondary), 3 (university degree) and 4 (vocational education). These results coincide with studies carried out in 2016, which show that age, gender and education are significant factors when analysing the use of online social networks by older active Internet users (Román-García et al., 2016; Vošner et al., 2016).

Table 9. ANOVA testing (Source: authors' compilation)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Computer_essential	Between Groups	52.985	3	17.662	17.816	0
	Within Groups	208.176	210	0.991		
	Total	261.162	213			
Hardware	Between Groups	13.745	3	4.582	5.741	0.001
	Within Groups	167.6	210	0.798		
	Total	181.345	213			
internet	Between Groups	30.726	3	10.242	12.49	0
	Within Groups	172.198	210	0.82		
	Total	202.924	213			
Communication & Collaboration	Between Groups	29.075	3	9.692	9.957	0
	Within Groups	204.4	210	0.973		
	Total	233.475	213			

Latvia's data sample is reliable according to Cronbach's alpha testing results. The main research question, what are the training needs of senior citizens in Latvia, was addressed. Results proved that in Latvia senior citizens are willing to learn digital skills. Based on ANOVA performed according to respondent education, age and occupational status, the overwhelming conclusion is that there are statistically significant differences in all criteria between education, age and occupational status of respondents. This leads to the main conclusion presented next.

Conclusions

The main conclusions developed for adult educators in the field of digital skills are as follows: (1) organize training groups of senior adults by selecting the adult learners by age group and education; (2) organize training groups of senior adults by selecting the adult learners by occupational status as well. Latvia's results showed that there is statistically significant difference between two groups – group 2 (working senior adults) and group 5 (self-employed senior adults) – that could be explained by different daily usage of skills. (3) Organize training programme focusing on very simple activities to be taught, for example, opening word document, renaming document, deleting file, printing file, scanning file. The results reveal that there is a significant lack of knowledge about basic essential digital skills among Latvia's seniors reached out during this survey.

Future research may focus on country profile comparison based on collected data in four partner countries, the total reach being 1003 respondents (Latvia 236, Portugal 327, Turkey 259, Cyprus 181).

Acknowledgements

Support for this work was provided by project 'Digital Acquisition through Intergenerational Learning' (DIAL No. 2017-1-LV01-KA204-035455) funded by Erasmus Plus programme and international team

of project partnership from Portugal (The Association of Third Age Universities Network – RUTIS), Turkey (S&G – System and Generation Association), Cyprus (the 'Emphasys Centre').

Publicity Disclaimer
This publication reflects the views of the author. The managing authority of the programme is not liable for how this information may be used.

References

Adult education and training in Europe – widening access to learning opportunities (2015). EU publication. [Accessed 15.03.2019]. Available on Internet: https://publications.europa.eu/en/publication-detail/-/publication/aaeac7ed-7bad-11e5-9fae-01aa75ed71a1/language-en

Anabel Quan-Haase, Guang Ying Mo & Barry Wellman (2017). Connected seniors: how older adults in East York exchange social support online and offline, Information, Communication & Society, 20:7, 967-983, DOI: 10.1080/1369118X.2017.1305428

Digital Competence Reference Framework of the EC (2016). EU publication. [Accessed 15.03.2019]. Available on Internet: https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

EUROPE 2020 A strategy for smart, sustainable and inclusive growth (2010). [Accessed 18.03.2019]. Available on Internet: http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf

Heaggans, R. C. (2012). The 60's Are the New 20's: Teaching Older Adults Technology. *SRATE Journal*, *21*(2), 1-8.

Jacobson, Jenna, Lin, Chang, & McEwen, Rhonda. (2017). Aging with technology: Seniors and mobile connections. Canadian Journal of Communication, 42(2), 331–357.

Nimrod, G. (2016). Older audiences in the digital media environment. Information, Communication & Society, 1-17. doi: http://dx.doi.org/10.1080/1369118X.2016.1164740

Orlov, Laurie M. (2016). 2016 technology survey: Older adults, age 59-85+. Mason, OH: Aging in Place Technology Watch. Available on Internet: https://www.ageinplacetech.com/files/aip/Linkage%202016%20Technology%20April%202016.pdf [Accessed 27.09.2019].

Project DIAL (2019). *Project.* [Accessed 20.03.2019]. Available on Internet: https://dialproject.eu/project/background/

Project DIAL Survey (2019). Survey. [Accessed 18.03.2019]. Available on Internet: http://survey.dialproject.net/

Román-García, S., & Almansa-Martínez, A. (2016). Adultos y mayores frente a las TIC. La competencia mediática de los inmigrantes digitales. *Comunicar*, *24*(49), 101-109.

Schreurs, K., Quan-Haase, A., & Martin, K. (2017). Problematizing the digital literacy paradox in the context of older adults' ICT use: Aging, media discourse, and self-determination. *Canadian Journal of Communication*, *42*(2).

Seifert, A., & Schelling, H. R. (2018). Seniors online: Attitudes toward the internet and coping with everyday life. *Journal of Applied Gerontology*, *37*(1), 99-109.

Vošner, H. B., Bobek, S., Kokol, P., & Krečič, M.J. (2016). Attitudes of Active Older Internet Users towards Online Social Networking. Computers in Human Behavior, 55, 230-241. (http:// - goo.gl/jiOmI6) (2016-06-03).

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0025

TAX LIABILITIES OF THE BOARD MEMBER IN LATVIA: LEGAL-ECONOMIC ASPECTS

Ināra Brante[1], Ilona Lejniece[2]

[1]EKA University of Applied Sciences, Lomonosova 1/5, Riga, Latvia, Inara.Brante@inbox.lv

[2]EKA University of Applied Sciences, Lomonosova 1/5, Riga, Latvia, Lejniece.Ilona@gmail.com

Abstract

Research purpose. To analyse the content of legal acts regulating the personal responsibility of the Member of the Board for overdue tax payments by a legal person, to carry out an analysis of the legal and economic conditions of business development.

Design/ Methodology/ Approach. The study is based on the economic and legal analysis of legal acts using descriptive, analytical, deductive and inductive methods, on the basis of which the authors draw conclusions about the responsibility of the Members of the Board, their rights and obligations towards the state and society, deliberately avoiding compulsory taxes. The research has been created as a systematic review, including searching in databases The Legal acts of the Republic of Latvia and The Commercial Register of the Republic of Latvia, specific literature, publications of expert, methodically analysing, compiling and including and excluding information.

Findings. The responsibility of the Member of the Board for losses incurred by a legal person in Latvia has so far been an insufficiently researched topic and there is a lack of publications and case summaries. This creates problems for the uniform application of the law in practice. This study will analyse current issues – the conditions for the responsibility of a Member of the Board as a natural person for the tax liabilities of a legal person, analysis of statistical data. Changes in statistical data and legislation in the study cover the period from the entry into force of changes in legislation that provide for the personal financial responsibility of the Member of the Board for a legal person's tax debts.

Originality/Value/Practical implications. The study contributes to the analysis of the business environment in two aspects: 1) economic aspects related to changes in the legislation on the personal responsibility of the Member of the Board for corporate tax debts; 2) the legal conditions that affect the role and responsibility of the Member of the Board in a commercial company in case of damages.

Keywords: Tax liabilities; entrepreneurship; responsibility of the member of the board; law; Latvia

JEL codes: K20

Introduction

National tax policy is linked to all major processes in the country – competitiveness, purchasing power, exportability, as well as the promotion of demography and innovation. According to the Ministry of Finance, state tax policy also has a significant impact on employment, business environment and structure, as well as it determines the volume and quality of public services (Ministry of Finance of Republic of Latvia, 2019).

The system of taxes and duties of the Republic of Latvia consists of: state taxes, state duties and municipal duties. State taxes are mandatory payments specified by law in the state budget or local government budgets. State duties are a mandatory payment to the state budget or, in the cases specified by law, to the local government budget as compensation for security provided by public authorities for business or services rendered, as well as for specific purposes prescribed by law - maintenance and

development of roads, ports and communication systems, ecological protection of the population and nature, the improvement of the territory and other purposes (Ministry of Finance of Republic of Latvia, 2019).

Latvia together with Estonia and New Zealand ranked in the top three in the International Tax Competitiveness Index Survey among all OECD countries in 2016. More than 40 different indicators, measuring not only the tax burden, but also the tax structure, including state corporate taxes, personal income taxes, property taxes, consumption taxes, and the taxation of profits earned abroad have been taken into account in the assessment. The purpose of the index assessment is to assess the extent to which a national tax system is based on competitiveness and neutrality. If these two conditions are met, it contributes to sustainable economic growth and investment, as well as provides sufficient income for national priorities (Tax Foundation, 2016).

In order to increase the efficiency of tax collection and administration, as well as to increase the level of responsibility of the current or former Members of the Board of a legal person with regard to the payment of taxes to the state or local government budget, changes in the Law 'On Taxes and Duties' entered into force on 1 January 2015, which provide the personal financial responsibility of a Member of the Board for the tax debts of a legal person. In accordance with Paragraph 170 of the transitional provisions of the Law, the responsibility shall apply to the late payment of the tax due by the legal person, which have been incurred after 1 January 2015. The changes in the Law are due to the fact that the State Revenue Service (SRS) often has to recognize, when collecting tax debts, that the company has neither financial resources nor assets to cover its debt. In accordance with Section 221, Paragraph one and Section 301, Paragraph one of the Commercial Law, the Board is the executive body of a capital company, which manages and represents the company. According to Paragraph 170 of the Transitional Provisions of the Act, the liability shall apply to the late tax payments of the legal person established after 1 January 2015. The responsibility of the Members of the Board of a corporation is laid down in the first paragraph of Section 169 of the Commercial Law, according to which a Board Member must perform his duties as a diligent and careful owner. In addition, the second paragraph of Section 301 of the Commercial Law emphasizes the responsibility of the Board of the Joint Stock Company for the commercial activities of the Joint Stock Company, as well as for the accounting in accordance with the law (Legal acts of the Republic of Latvia, 2015; Saeima of the Republic of Latvia, 2015; Public administration official publisher 'Latvijas Vēstnesis' information platform, 2015).

The shadow economy in Latvia is still larger than in the two Baltic neighbours Lithuania and Estonia. The largest part of the shadow economy in Latvia consists of underreporting of business income or tax evasion, which accounts for almost 45% of the total shadow economy in Latvia; its tax evasion discipline is assessed in the annual Baltic State Shadow Economy Survey of Stockholm School of Economics in Riga (Sauka, Putnins, 2018). The study concludes that the Members of the Board of a legal person often do not behave as diligent and careful owners in carrying out their duties. However, under the Commercial Law, the responsibility of a Member of the Board of a legal person for the breach of duty may only be claimed by the creditor of the legal person in the event of failure to obtain satisfaction from the legal person itself and it is possible to prove, that a Member of the Board has caused damage to a legal person through his actions. Although the SRS becomes a creditor of a legal person in the event of failure to pay overdue tax payments within the term prescribed by regulatory enactments, the SRS does not conduct a personal assessment of the activities of the guilty employees or Board Members and it is not the SRS's task. Moreover, damage recovery cases are relatively rare in practice.

Based on the above, the authors of the study set out the objective of this study: to analyse the content of legal acts regulating the personal responsibility of the Board Members for late payment of a legal person, to analyse the legal and economic conditions of business development. To facilitate the achievement of the research objective, the authors will describe and analyse the system of taxes and duties in Latvia.

Literature Review

Tax and duties system in the Republic of Latvia

The Law 'On Taxes and Duties' in the Republic of Latvia regulates the types of taxes and duties and regulates the procedure for their determination, collection and recovery, the rights, duties and responsibilities of taxpayers and tax administration, registration of taxpayers, the procedures for challenging and appealing decisions taken in tax and tax matters as additional tax administration and credit information office, responsibilities for the processing of personal data in the case of information relating to the income of a natural person. According to the Law 'On Taxes and Duties', the system of taxes and duties in Latvia: state taxes on which objects are to be taxed and the rate of which is determined by the Saeima; state duties, which are imposed in accordance with this Law, other Laws and Cabinet regulations; municipal duties levied in accordance with this Law and binding local government regulations; taxes directly applicable in the European Union. There are 14 taxes in Latvia, which are imposed according to the tax law (State Revenue Service of the Republic of Latvia, 2019).

The State Revenue Service is obliged by law to publish annually the information about the total amount of taxes paid by merchants and the average number of persons employed in the previous year. The provision on the public register in the tax 'umbrella' law has been introduced to encourage voluntary payment of taxes. At the same time, it is the information that can be used to judge what funds enter the state budget and which provide revenue. Latvia is not the only country that publishes the amount of taxes paid. Such a list is also in Estonia.

Every year, the SRS prepares special thank-you letters to taxpayers for their good faith obligations and significant contributions to the state budget. Around 2,500 taxpayers receive them each year. Such recognition also implies that the SRS does not burden the taxpayer with controls. Those selected for recognition are chosen according to certain criteria (tax revenues in the state budget exceed €100,000 per year, the average wage for workers is not less than 70% of the national average, etc.) (State Revenue Service of the Republic of Latvia, 2019).

In 2018, the total budget revenue administered by the State Revenue Service amounted to 9.41 billion euros, which is an implementation of the revenue plan by 101.3%. Compared to 2017, tax revenue has increased by 788.42 million euros, or 9.1%, driven by economic growth and SRS performance. The tax revenue for 2018 was also affected by significant changes in tax laws and regulations as well as the preventive measures taken by the tax administration to discipline taxpayers (State Revenue Service of the Republic of Latvia, 2019).

The Responsibility of the Member of the Board for Tax Liabilities of a Legal person

To comply with the rights to property guaranteed by Section 105 of the Constitution, to increase the efficiency of tax collection and administration, as well as to increase the level of the responsibility of existing or former Members of the Board of a legal person with regard to the payment of taxes and other mandatory payments of a legal person in the State or local government budget and the fulfilment of other duties specified in the regulatory enactments, the amendments to the Law came into force for the Members of the Board in determining personal responsibility with regard to the payment of taxes and other mandatory payments of a legal person in the State or local government budget and the fulfilment of other duties specified in the regulatory enactments. On 1 January 2015, the amendments to the Law came into force for a Board Member in determining personal responsibility for a legal person's overdue tax payments in certain cases. The legal provisions were drafted in such a way that the responsibility of a Member of the Board (individual) for the commitment of a legal person would only arise in exceptional cases where irresponsible behaviour regarding statutory obligations is established (Legal acts of the Republic of Latvia, 1993).

In addition, by 2015, 5724 legal entities with a tax debt of more than 18,000 euros had a total public debt of 574 million euros. In view of the above, there are no less restrictive means to protect the rights established in Section 105 of the Constitution. Consequently, the restriction on the rights of the individual in the bill is proportionate to the aim pursued by the bill: promoting voluntary tax payment and improving tax administration, thereby generating the revenue necessary to meet the needs of the society, and promoting fair competition by improving the business environment. With the introduction of the new norms, a mechanism was created whereby the State Revenue Service is entitled to request a Member of the Board to cover the tax liability of a legal person (Saeima of the Republic of Latvia, 2015).

On the other hand, Section 26 of the Law 'On Taxes and Duties' provides for the action of the State Revenue Service in the case of late tax payments for the tax payer.

The State Revenue Service shall have the right to require a Member of the Board to pay personally the debts incurred during his time if the following five conditions are met, which must be fulfilled simultaneously under Section 60 of the Law 'On Taxes and Duties': the minimum monthly wage bill (see Table 1); the decision on the recovery of tax arrears is notified to the legal person; it is established that, after the arrears of tax payments, the legal person has disposed of assets to a person who, in relation to a Member of the Board, meets the concept of a stakeholder within the meaning of the Insolvency Law; an act of impossibility of recovery has been drawn up; the legal person has not complied with the obligation under the Insolvency Law to submit an application for the insolvency proceedings of a legal person (Saeima of the Republic of Latvia, 2015).

Interested persons in relation to the debtor – a legal person – are listed in Section 72 of the Insolvency Law: members (shareholders) or members of the partnership of the debtor, members of administrative bodies; procurator and trustee; a person consisting of the debtor's founder, member (shareholder) or member of a partnership, members of the administrative bodies in marriage, affinity or affinity to the second degree; creditor in the same group as the debtor (Legal acts of the Republic of Latvia, 2015).

In 1993, the Republic of Latvia ratified 'Minimum Wage Fixing Convention' No 131 of 22 June 1970, which means that the financial threshold for a Board Member's liability depends on the national minimum monthly wage.

Although, above all, the increase in the minimum monthly wage is a struggle against poverty – raising the standard of living for the poorest and most vulnerable groups and raising the average living standard, but as shown in the table, the increase in the minimum monthly wage specified in the Republic of Latvia serves as an instrument for raising the financial threshold for the Member of the Board. With the increase in state welfare from 2015, the financial threshold for Board Member responsibility has also increased by 19% in 2018 (See Table 1).

Table 1. Financial threshold for Board Member responsibility per year, 2015–2018 (Source: author's calculations based on regulations Cabinet of Ministers of the Republic of Latvia, 2015–2018)

	2015	**2016**	**2017**	**2018**
National minimum monthly wage (*euro*)	360	370	380	430
Financial threshold for Board Member responsibility (*euro*)	18,000	18,500	19,000	21,500

The second paragraph of Section 60 of the Law 'On Taxes and Duties' provides that, where a legal person has several Members of the Board, they shall be jointly liable for late payment by the legal person (Legal acts of the Republic of Latvia, 2015).

In its turn, Section 60 paragraph 3 of the Law 'On Taxes and Duties' provides that, if there are objective reasons for not filing an insolvency proceeding with the court, as well as evidence that, after the arrears of tax payments, be considered as an interested party within the meaning of the Insolvency Law, be of an economic nature, or have evidence, which certifies that the Board Member is not responsible for the taxpayer's late payment of taxes and the disposal of the legal person's assets (division of Board Members' duties, justifying reasons, etc.), the Board Member shall inform the State Revenue Service supporting documents for the period within one month, where the list of supporting documents is specified in Section 60, sub-paragraphs 1, 2, 3, 4 and 5 of this Law (Legal acts of the Republic of Latvia, 2015).

The Law does not directly provide the possibility, for example, for a Board Member in marketing or production matters to avoid liability for those obligations committed, knowingly or unknowingly, by a Board Member in financial matters. The law also states that the Members of the Board are jointly liable for non-payment of taxes to the state (Legal acts of the Republic of Latvia, 2015).

Comparison between legislation of Latvia and several European countries

When studying foreign experience, it can be concluded that in cases where a company has incurred late payments to the tax administration, a broader legal framework has been established regarding the rights and duties of the tax administration to recover these late payments. Namely, in certain cases, the tax debt of a company is 'transferred' to the responsible officials of these legal persons. In the UK – until 2009 – the responsibility of the Members of the Board was applied only in relation to the Value Added Tax, whereas from the audit surcharges of 2009, the personal responsibility of the Members of the Board may be applied not only to the Value Added Tax but also to other taxes. In Estonia, in relation to the audit surcharge, Board Members are jointly liable in cases of fraud or gross negligence, where it is not possible to recover the debt from the tax debtor. In the Netherlands, there is a 'subsidiary liability for Board Members' in relation to the audit surcharge. In Denmark, the debts of legal persons are transferred to the responsible natural persons in case of malicious insolvency. The Swedish Tax Code contains rules on the responsibility of former company officials for late payment of taxes in cases where the tax administration proves that the official acted intentionally or with gross negligence as a typical example of such failure to file an insolvency petition.

However, it should be noted that there are also sharply divergent views on the amendments to the Law 'On Taxes and Duties'. Criticism of amendments to the Law 'On Taxes and Duties' was expressed by the Council of Foreign Investors (FICIL Foreign Investors Council in Latvia, 2015).

Karin Madisson in her research 'German and Estonian laws' compares legislation between both countries in terms of liabilities of the Members of the Board and points out that legislation is relatively similar regarding these issues. German and Estonian commercial law determines the Member of the Board obligation to act bona fide and compensate losses (Madisson, 2012).

In the article 'Liabilities of the Members of the Board of Directors of Capital Companies Under Turkish and Belgian Laws', the Turkish ADMD Law Office compares the legislation between Turkey and Belgium in terms of liabilities of Members of the Board. The author of the article points out that in case the founders, board members, managers and liquidation officers breach their liabilities defined by the law and articles of association due to their fault, they shall be deemed responsible for the loss they cause against the company, shareholders and company creditors.

Similar legislation exists in Latvia. However, Belgian legislation regulation concerning the liabilities of the Members of the Board differ completely from Latvia, Germany and Turkey. In comparison, the Belgian system does not possess the same clarity. Indeed, different pieces of legislation provide for the liability of directors. The grounds on which board members may encounter civil liability are spread in the Belgian Company Code and Civil Code. Much precision regarding the scope of each type of responsibility is to be found in the case of law and the research of scholars and practitioners. A particularity of the Belgian regime is to recognize the criminal liability of companies (Balfroid, 2012).

Lastly, it is important to note that under the Turkish and Belgian laws, board members may encounter specific liabilities for the non-payment of taxes and other public receivables such as social security contributions. Liabilities of Members of the Board in terms of non-payment of taxes are regulated in the same manner in the Latvian regulatory enactment.

Austrian legal regulation is similar to German rights. For example, in the Austrian Limited Liability Companies Act (GmbHG), Paragraph 25 determines that Members of the Board are responsible about the losses they have caused to the company, failing to fulfil their obligations. Board members in Austria must take the responsibility of losses caused to creditors, if the Member of the Board fails to submit insolvency process application (Novicāne, 2013).

In a letter to the Saeima, the Employers' Confederation of Latvia has pointed out that Board Members who do not participate in 'risky' decisions or who do not have sufficient financial competence, but who, according to the proposed changes to the law, will be jointly liable for the decisions of other Board Members. Also, in the Saeima on December 17, the new norms triggered a widespread debate. Deputy Gunārs Kūtris, former Chairman of the Constitutional Court, holds that the newly introduced Section 11 is in conflict with the Convention for the Protection of Human Rights and Fundamental Freedoms and also with the Constitution – Sections 91, 92 and 105 (Zanfelde, 2015).

It is considered that there is a loophole in the change of law, since the changes do not apply to the partnership carriers and to represent the eligible members, as well as to the decision-making bodies of a legal person, who may also have the right to accept such issues as the Board, the owner of the shares of Ltd, who may dispose of the specified assets and the company's proxies (Zanfelde, 2015).

The European Court of Human Rights, on the other hand, has said that the criminal procedure and the fine or amount of the fine are of the Criminal Law nature, and thus, the principle of the presumption of innocence applies here, but the bill requires the person to prove his innocence. The Saeima Legal Bureau has also expressed the opinion that the above mentioned regulation in the wording proposed in the draft law may contradict Sections 91 and 105 of the Constitution and possibly also Section 92 and other Sections of the Constitution (Saeima of the Republic of Latvia, 2014).

According to the above, on December 29, 2015, the 2nd Chamber of the Constitutional Court initiated the case 'On the Compatibility of Sections 60, 61 and 62 of the Law "On Taxes and Duties" with Section 91, the first sentence, Section 92 and Section 105 of the Constitution of the Republic of Latvia.' Twenty members of the Saeima submitted their application to the Constitutional Court. The Saeima deputies consider that the contested norms disproportionately restrict the right to property established in Section 105 of the Constitution, indicating that the separation of property liability shall be regarded as mandatory for a legal person. On the other hand, under the contested provisions, the liability of a legal person for late payment is, in certain cases, not borne by the legal person itself but by its Members of the Board (Constitutional Court of the Republic of Latvia, 2015).

On November 15, 2016, the Constitutional Court declared the contested norms to be in compliance with the principle of equality included in the first sentence of Section 91 of the Constitution. The Court stated, inter alia, that in conducting a commercial activity in any of the forms of commercial activity provided for in the Commercial Law, the individual must act in a manner consistent with the obligation to pay taxes in the public interest. Thus, the Constitutional Court declared the contested norms to be in compliance with the first sentence of the Constitution and Section 91, Section 92 and Section 105 of the Constitution. The judgment of the Constitutional Court is final and not subject to appeal, it came into force on the day of its official publication (Constitutional Court of the Republic of Latvia, 2016).

It should also be taken into account that according to Section 25 of the Law 'On Taxes and Duties', the SRS extinguishes tax debts to the taxpayer, in the case provided for in Section 26, Paragraph 61 of this Law, if no decision on overdue tax is taken within three years of the due date. recovery of payments, as well as if the taxpayer is excluded from the Registers of Companies in the cases provided for by regulatory enactments and, if provided for by the Commercial Law, the creditor's rights of claim expire (SRS, 2019).

In the report of the Saeima Public Expenditure and Audit Commission, it was stated that within two years of the law requiring personal responsibility of Board Members for delayed tax payments, the State Revenue Service has not claimed responsibility from any Board Member and has not collected a cent based on this provision of the Law, there has been no recovery process against a natural person, a Board Member, and no cent has been recovered (Saeima of the Republic of Latvia, 2017).

In other words, it can be said that, at the moment, a provision has failed to provide for the personal responsibility of the Members of the Board of companies for their corporate tax debts. In order to eliminate the loopholes of the law, the State Revenue Service addressed the Ministry of Finance, which intends to improve this provision by 2019 as a part of the tax reform. Meanwhile, the companies, that had challenged the Board Member's liability law in the Constitutional Court, consider that this form of punishment should be abolished at all because of the decrease in the desire to start business (Čīka, 2017).

Methodology

The study is based on the economic and legal analysis of the legislation, revealing loopholes in the law, using descriptive, analytical, deductive and inductive methods to draw conclusions about Board Members' responsibility, their rights and obligations towards the state and society deliberately avoiding the payment of mandatory taxes for the company. The study is designed as a systematic review, including searching databases The Legal acts of the Republic of Latvia and The Commercial Register of the Republic of Latvia, specialist literature, the publications of expert, methodological analysis, compilation, inclusion and exclusion of information.

Research limitations. The research is based on a scientific research analysis method analysing economical and legal conditions of liabilities of Member of the Board towards legal person tax liabilities, including:

1) analysis about tax and duties system in the Republic of Latvia and changes of legal norms to enhance voluntary payment of taxes and improve tax administration, using databases of The Legal acts of the Republic of Latvia;
2) analysis about available data in the research about registered enterprises in The Commercial Register of enterprises in Latvia by types (2015–2018), using database of The Commercial Register of enterprises and liability of financial threshold of Member of the Board depending on minimum monthly wage (2015–2018) during a year in absolute numbers, when Latvia has changed a normative regulation that foresees personal financial liability of the Member of the Board for legal person tax liabilities;
3) comparison of legal regulation between Latvia and several European countries that foresee liability of the Member of the Board for losses caused to a legal person;
4) analysis about discipline of publications and researches of expert who is internationally recognized in the field of shadow economy and competitiveness of entrepreneurs.

Using monographic or descriptive scientific research method, the authors investigate the liability of a Board Member towards commitments of legal person based on the analysis of legislative changes in Latvia, describing not only the liabilities of Board Member losses towards legal persons but also the liabilities of the Member of the Board on tax liabilities.

Authors used document analysis scientific research method to obtain information and evaluate processes that concern the liabilities of the Members of the Board regarding tax liabilities of legal persons. Any written and digital materials that include information about phenomenon researched are considered documents.

Based on scientific induction and scientific deduction methods, authors of the research conclude that legal loopholes may contribute to the risk of reducing the responsibility of the Member of the Board, which may have an impact on the economic situation in the country.

Changes in statistical data and legislation in the study cover the period from the entry into force of changes in legislation that provide for the personal financial responsibility of the Member of the Board for a legal person's tax debts. Research time period 2015–2018, because in order to increase the efficiency of tax collection and administration, as well as to increase the level of responsibility of the current or former Members of the Board of a legal person with regard to the payment of taxes to the state or local government budget, changes in the Law 'On Taxes and Duties' entered into force on 1 January 2015, which provide the personal financial responsibility of a Member of the Board for the tax debts of a legal person.

The following criteria were used choosing expert publications and opinions: well recognized expert in Latvia or abroad in the following fields – shadow economy, competitiveness of enterprises and business expansion in international markets, cooperation with OECD and different industry associations, unions and non-government organizations in Latvia that are social partners of the government.

Results

Analysing the factors that determine the personal responsibility of the Board Members in practice for the company's tax debts, the paper investigates those legal and economic factors that significantly influence the implementation and realization into practice the amendments to the Law 'On Taxes and Duties'.

In other words, in order to carry out tax control measures for taxpayers with the highest risk of tax evasion and budget payment and to use the resources at the disposal of the SRS, SRS pays great attention to planning tax control measures and selecting the objects to be inspected. For SRS tax control measures, taxpayers are selected on the basis of a Risk Analysis (See Fig. 1).

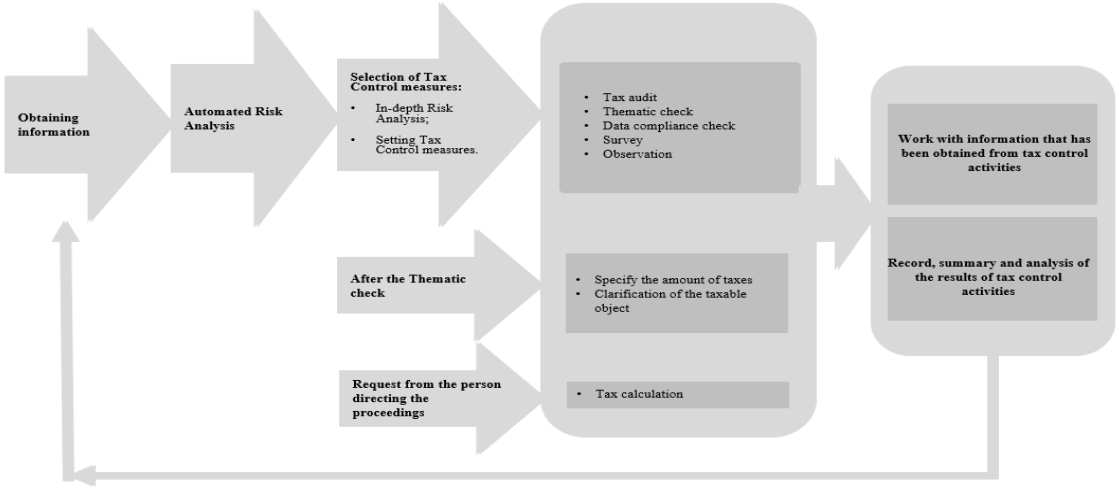

Fig. 1. Tax control process diagram (Source: State Revenue Service of the Republic of Latvia, 2019)

The purpose of tax control is to ensure the full, timely and fair assessment and collection of taxes and duties. If the taxpayer does not eliminate the errors or inconsistencies found in the tax returns, as a result of which the cooperation between the SRS and the taxpayer has not achieved the desired result, the SRS, taking into account the available information and the results of risk analysis, assessing the information at hand and the results of the risk analysis, shall take appropriate tax control measures for the taxpayer.

Although the total number of taxpayers – legal persons from 2015 – has decreased by 8% in 2018, but as shown in the table, from 2015 to 2018 the average number of legal persons as taxpayers in the Republic of Latvia is over 200 thousand (See Table 2).

Table 2. Registered enterprises by type (legal persons - taxpayer), 2015–2018 (Source: The Commercial Register of the Republic of Latvia data, 2015–2018)

	2015	**2016**	**2017**	**2018**
Cooperatives	1894	1871	1859	1854
Partnership	698	719	744	761
Stock company	1032	1038	1025	1055
Limited liability company with no minimum capital requirement	36,297	39,589	42,152	44 630
Limited liability company	126,467	124,468	117,116	105,565
Individual merchant	12,525	11,891	11,645	11,371
Farm	28,027	26,949	26,202	25,725
Individual enterprises	13,111	12,540	12,061	11,771
Other	1183	1146	1137	1124
TOTAL:	**221,234**	**220,211**	**213,941**	**203,856**

The most popular type of company is a limited liability company and a limited liability company with no minimum capital requirement, which together account for an average of 73%. However, almost 40% of the Ltd. included in the statistics do not have any employees. This was one of the risk indicators for the introduction of a legal framework for the person at risk.

Section 1 (31) of the Law 'On Taxes and Duties' sets out the criteria for persons at risk, and at least one of these criteria must be met in order for a natural person to be considered a person at risk. The broader objective of the legal status of a person at risk is to limit the activities of merchants whose real purpose is to act as intermediaries in money laundering and tax fraud schemes and whose organizers and beneficial owners are not identifiable in the administrative process. There are criteria for identifying persons who need to be effectively deterred from further involvement in the commercial environment by temporarily limiting their right to represent businesses. The Senate has previously acknowledged that the purpose of listing a person at risk is to target unscrupulous merchants whose exclusion from the business environment will promote fair competition and business development in general, in the public interest. The inclusion of a person on the list of persons at risk also serves the broader purpose of protecting the interests of creditors and other merchants, promote the safety of the business environment and voluntarily discharging tax obligations, and includes the ability to return to the business environment the reason to consider it a risky person (Legal acts of the Republic of Latvia, 2019).

Section 222 Paragraph 3 of the Law 'On Taxes and Duties' defines the characteristics of a transaction as suspicious in the field of taxation: income, earnings, savings, property or changes in their value; an unusually large transaction volume; incoming transactions make many small amounts, but outgoing transactions are large amounts. The purchase of real estate for a manifestly inappropriate price; cash transactions over 60,000 euros; striking changes to the account balance; carries out complex or unusual transactions for which the terms used for the transaction, or the amount of the tax, are not clearly understood for their economic or legal purpose by themselves or by separate provisions (Legal acts of the Republic of Latvia, 2019).

The availability of such information makes it possible to identify, in a more timely manner, persons or businesses at high risk of tax evasion, as well as those who conceal the real incomes that are often used, for example, to pay 'envelope salaries'. This information also enables timely prevention of Value Added Tax fraud and the fraudulent creation of illicit cross-transaction schemes.

In 2016, before extending the scope of the Anti-Money Laundering and Terrorist Financing Prevention (AMLF) Law, the SRS received 262 reports of suspicious tax transactions from credit institutions and payment service providers, containing information on 4,473 transactions (SRS, 2016).

This information is used by the SRS to take targeted preventive measures and to plan more effective tax control measures. As a result, the SRS has so far taken decisions on suspension and termination of business activities, exclusion from the SRS Value Added Tax Register, commencement of thematic inspections, commencement of tax audits, as well as informing the Enterprise Register of the Republic of Latvia regarding the rights of taxpayer representation.

On 6 June 2017, Latvia signed the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting. The Convention was drafted by the OECD with the aim of ensuring, as soon as possible, and as uniformly as possible, the implementation and application of minimum standards and recommendations in the activities of the OECD BEPS Preventive Action Plan with respect to tax treaties. Latvia has chosen to apply only those provisions of the Convention that ensure the introduction of a minimum standards for BEPS in the tax plan. This means that Latvia fully supports the fight against tax evasion and aggressive tax planning, both at global and European Union level (Legal acts of the Republic of Latvia, 2017).

Conclusions

The authors of the study conclude that the following legal loopholes may contribute to the risk of reducing the responsibility of the Member of the Board, which may have an impact on the economic situation in the country.

Until January 2015, when the amendments were adopted to the Law 'On Taxes and Duties', which provided for the personal financial responsibility of a Member of the Board for the tax debts of a legal person, following the adoption of a decision on the recovery of late tax payments, the bringing of a person to administrative responsibility for failing to submit an application for insolvency proceedings, when the SRS has a legally approved act on recovery impossibility, there was no state-regulated

mechanism to further facilitate the fulfilment of the duties of a Member of the Board, related to the termination of the activities of a legal person in accordance with the procedures specified in regulatory enactments and the payment of taxes.

Until January 2015, there was no complete legal framework for the fulfilment of the duties of the taxpayer specified in regulatory enactments, including the payment of taxes and fees within the prescribed time limits and in full, which did not motivate the Members of the Board of a legal person to fulfil their duties as a good and careful master.

The regulatory enactments governing the personal responsibility of a member of the board are incomplete and require additional changes, since the legal provisions providing for personal responsibility of a member of the board of the company's tax debts do not work in practice, as well as the case law in matters of responsibility of the Member of the Board is currently underdeveloped in Latvia, since the Law provides for requesting personal responsibility from 2017. For the Member of the Board of companies, the State Revenue Service (SRS) has not claimed responsibility from any Member of the Board;

According to the Section 61 of the Law 'On Taxes and Duties', the SRS has the right to recover unpaid taxes from a Member of the Board as natural persons only in court, because both the legal person and the individual are entitled to appeal the decision taken by the Authority to the Administrative Court. An application in which a decision regarding the reimbursement of overdue tax payments is contested shall suspend the operation of this decision from the day on which the submission was received in the institution until the day when the decision taken by an official of the State Revenue Service has become undisputed or unappealable.

Section 60 of the Law 'On Taxes and Duties' stipulates the joint liability of the Members of the Board for delayed taxes of the legal person, but the Law does not directly provide for the Members of the Board to carry liability only for the economic sphere, which was under their direct supervision.

The Commercial law shall allow a Member of the Board not to answer for the actions of other Members of the Board, if he can prove it, because Section 169, Paragraph 3 of the Commercial Law determines that a Member of the Board and the Council shall not be liable if he or she proves that he or she has acted as a good and careful master.

References

Balfroid C. 2012. Liabilities of the Members of the Board of Directors of Capital Companies Under Turkish and Belgian Laws. ADMD Law Office. Available from Internet: http://www.admdlaw.com/liabilities-of-the-members-of-the-board-of-directors-of-capital-companies/#.XdWqE-gzY2w. Access: 10.10.2019.

Broka B., Johansen S. (2017). Juridiskā analīze un tekstu rakstīšana. Tiesu namu aģentūra.

Čīka I., 2017. Public-LETA. Neviena uzņēmuma valdes loceklis nav saukts pie atbildības par nodokļu parādiem. Available from Internet: https://skaties.lv/zinas/latvija/sabiedriba/neviena-uznemuma-valdes-loceklis-nav-saukts-pie-atbildibas-par-nodoklu-paradiem/. Access: 07.08.2019.

Commercial law issues at stake Latvian and Europe: Commercial transactions, Responsibility, Commercial disputes. 2013. Tiesu namu aģentūra.

Constitutional Court of the Republic of Latvia, 2015. Applicant: 12. Saeimas deputāti: Gunārs Kūtris, Jānis Urbanovičs, Dainis Liepiņš, Inguna Sudraba, Silvija Šimfa. Case No 2015-25-01. Available from Internet: http://www.satv.tiesa.gov.lv/en/cases/?case-filter-years=%5B2015%5D&case-filter-status=&case-filter-types=&case-filter-result=&searchtext=. Access: 10.08.2019.

Constitutional Court of the Republic of Latvia, 2016. Judgement For the Republic of Latvia Riga, November 15, 2016in case no. 2015-25-01. Available from Internet: https://likumi.lv/ta/id/286612-par-likuma-par-nodokliem-un-nodevam-60-61-un-62-panta-atbilstibu-latvijas-republikas-satversmes-91-panta-pirmajam-teikumam. Access: 10.08.2019.

Legal acts of the Republic of Latvia, 1993 (adoption 1922). Law 'The Constitution of the Republic of Latvia'. Available from Internet: https://likumi.lv/ta/en/en/id/57980. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 1993. Decision of the Supreme Council of the Republic of Latvia "Ratification of the International Labour Organization Conventions". Available from Internet: https://likumi.lv/doc.php?id=63029. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 2000. Law 'The Commercial Law'. Available from Internet: https://likumi.lv/ta/en/en/id/5490. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 2013. Law 'On Taxes and Duties'. Available from Internet: https://likumi.lv/doc.php?id=33946. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 2015. Law 'Insolvency Law'. Available from Internet: https://likumi.lv/ta/en/en/id/214590. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 2015. Law 'On Taxes and Duties'. Available from Internet: https://likumi.lv/ta/en/en/id/33946. Access: 09.08.2019.

Legal acts of the Republic of Latvia, 2017. Law 'Law on the Prevention of Money Laundering and Terrorism Financing'. Available from Internet: https://likumi.lv/ta/en/en/id/178987. Access: 13.08.2019.

Madisson K. 2012. RGSL RESEARCH PAPERS NO. 7 , Duties and liabilities of company directors under German and Estonian law: a comparative analysis. Available from Internet: https://www.rgsl.edu.lv/uploads/research-papers-list/16/7-karin-madisson-final.pdf. Access:10.10.2019.

Ministry of Finance Republic of Latvia, 2019. Tax system of Latvia. Available from Internet: https://fm.gov.lv/en/s/taxes/. Access: 12.08.2019.

Novicāne E. 2013. Commercial law issues at stake Latvian and Europe: Commercial transactions, Responsibility, Commercial disputes. 2013. Latvian: Tiesu namu aģentūra, 234-278pp.

Public administration official publisher 'Latvijas Vēstnesis' information platforms, 2019. Skaidrojums: Likums daudzpusējās konvencijas nodokļu līgumu piemērošanai. Available from Internet: https://lvportals.lv/skaidrojumi/306721-likums-daudzpusejas-konvencijas-nodoklu-ligumu-piemerosanai-2019. Access: 12.08.2019.

Republic of Latvia Supreme Court Senate Department of Civil Cases February 8, 2012 judgement. Available from Internet: http://www.at.gov.lv/downloadlawfile/164. Access: 05.08.2019.

Republic of Latvia Supreme Court Senate, 2019. Judicature archive data. Available from Internet: http://www.at.gov.lv/lv/judikatura/judikaturas-nolemumu-arhivs/civillietu-departaments/klasifikators-pec-lietu-kategorijam/komerctiesibas/valdes-locekla-atbildiba?lawfilter=1. Access: 10.08.2019.

Rezevska D. Vispārējo tiesību principu nozīme un piemērošana. 2015. Latvian: Daigas Rezevskas izdevums. 176pp.

Saeima of the Republic of Latvia, 2013. Available from Internet: http://titania.saeima.lv/LIVS11/SaeimaLIVS11.nsf/0/0EFEF951A488C4DAC2257BF700498EF2?OpenDocument. Access: 09.08.2019.

Saeima of the Republic of Latvia, 2015. Available from Internet: http://titania.saeima.lv/LIVS12/SaeimaLIVS12.nsf/0/EB75F1CD6B5CDFF5C2257DA900470C22?OpenDocument. Access: 05.08.2019.

Sauka A., Putniņš T., 2018. Shadow economy in the Baltic states 2009-2017. SSE Riga Sustainable Business Center. Available from Internet: https://www.sseriga.edu/sites/default/files/2018-07/sseriga_enu_ekonomikas_indekss_2009-2017.pdf. Access: 05.08.2019.

State Revenue Service of the Republic of Latvia, 2019. Available from Internet: https://www.vid.gov.lv/lv/nodoklu-administresana. Access: 05.08.2019.

Tālis J. Putninš, Arnis Sauka, 2015. Measuring the shadow economy using company managers. Journal of Comparative Economics: Volume 43, Issue 2, May 2015, Pages 471–490. Access: 05.08.2019.

Tax Foundation, 2016. 2016 International Tax Competitiveness Index. Available from Internet: https://files.taxfoundation.org/20170630141955/TF-ITCI-2016.pdf. Access: 09.08.2019.

The Commercial Register of the Republic of Latvia, 2019. Available from Internet: https://www.ur.gov.lv/en/register/. Access: 06.08.2019.

Zanfelde D. 2015. Public administration official publisher ‘Latvijas Vēstnesis’ information platforms, 2015. Skaidrojums: Valdes locekļu atbildība par nodokļu parādiem (I). Available from Internet: https://lvportals.lv/skaidrojumi/268040-valdes-loceklu-atbildiba-par-nodoklu-paradiem-i-2015. Access: 05.08.2019.

Zanfelde D. 2015. Public administration official publisher ‘Latvijas Vēstnesis’ information platforms, Skaidrojums: Valdes locekļu atbildība par nodokļu parādiem (II). Available from Internet: https://lvportals.lv/skaidrojumi/268040-valdes-loceklu-atbildiba-par-nodoklu-paradiem-i-2015. Access: 05.08.2019.

ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0026

SMART CITIES AND THE CHALLENGES OF CROSS DOMAIN RISK MANAGEMENT: CONSIDERING INTERDEPENDENCIES BETWEEN ICT-SECURITY AND NATURAL HAZARDS DISRUPTIONS

Busbach-Richard Uwe,[1] Gerber Brian J.[2]

[1]University of Applied Sciences Kehl, School of Public Administration, Kehl – Germany, busbach@hs-kehl.de

[2] Arizona State University, Watts College of Public Service & Community Solutions, USA, Brian.Gerber@asu.edu

Abstract

Research purpose. Smart City technologies offer great promise for a higher quality of life, including improved public services, in an era of rapid and intense global urbanization. The use of intelligent or smart information and communication technologies to produce more efficient systems of services in those urban areas, captured under the broad rubric of "smart cities," also create new vectors of risk and vulnerability. The aim of this article is to raise consideration of an integrated cross-domain approach for risk reduction based on the risks smart cities are exposed to, on the one hand, from natural disasters and, on the other, from cyber-attacks.

Design / Methodology / Approach. This contribution describes and explains the risk profile for which smart cities are exposed to both natural disasters and cyber-attacks. The vulnerability of smart city technologies to natural hazards and cyber-attacks will first be summarized briefly from each domain, outlining those respective domain characteristics. Subsequently, methods and approaches for risk reduction in the areas of natural hazards and ICT security will be examined in order to create the basis for an integrated cross-domain approach to risk reduction. Differences are also clearly identified if an adaptation of a risk reduction pattern appears unsuitable. Finally, the results are summarized into an initial, preliminary integrated cross-domain approach to risk reduction.

Findings. Risk management in the two domains of ICT security and natural hazards is basically similar. Both domains use a multilayer approach in risk reduction, both have reasonably well-defined regimes and established risk management protocols. At the same time, both domains share a policymaking and policy implementation challenge of the difficulty of appropriately forecasting future risk and making corresponding resource commitments to address future risk. Despite similarities, different concepts like the CIA Triad, community resilience, absorption capacity and so on exist too. Future research of these concepts could lead to improve risk management.

Originality / Value / Practical implications. Cyber-attacks on the ICT infrastructure of smart cities are a major vulnerability – but relatively little systematic evaluation exists on the topic. Likewise, ICT infrastructure is vulnerable to natural disasters too – and the risk of more severe natural disasters in the context of a global trend toward massive cities is increasing dramatically. Explicit consideration of the issues associated with cross-domain integration of reduction of interdependent risk is a necessary step in ensuring smart city technologies also serve to promote longer-term community sustainability and resilience.

Keywords: smart cities; risk reduction; disasters; IT-security; natural hazards; cybersecurity; risk management

JEL codes: Q55; M15.

Smart Cities and the Challenge of Complex and Interdependent Risk

In the last ten years or so, "Smart City" projects have become more common across national settings. A long-term global trend towards greater urbanization – steady increases in densely populated urban areas – has necessitated a response for the need to support a higher quality of life in cities, including improved public services. The use of intelligent information and communication technologies (ICT) to produce more efficient systems of services in those urban areas, which can be captured under the rubric of "Smart Cities" offers the promise of enabling the linkage of high technology, greener environmental practices

with lower adverse impacts and a greater overall well-being for urban residents. However, the exact nature of complex risk and vulnerabilities occurring across a broad range of critical infrastructure and other key systems in a smart city context is a question generally not developed robustly by most discussions of performance effectiveness. Cyber-attacks on the ICT infrastructure of a smart city are widely recognized as a major potential vulnerability. But there is relatively limited systematic evaluation used to minimize community-scale risk associated with such attacks. And beyond cyber-attacks, it is also important to recognize the ICT infrastructure that underpins the efficient operation of services expected by citizens and businesses is also subject to disruption from natural hazards.

Risk and vulnerability associated with natural hazards are dramatically increasing not only because of the global climate change but also because the trend towards intense urbanization—including megacities often located in coastal areas that are subjected to higher risk of disruption. This means a greater natural hazard risk exposure to the global population in the aggregate, which in turn increases the level of risk for disruption of ICT infrastructure in a smart city setting.

Though risk reduction is an established construct in disaster management, the new challenges of cross-domain or interdependent risks associated with the development of smart cities are not sufficiently understood at present. The topic of how risks in domains such as natural hazards might also affect the levels of risk in the domain of smart ICT has not been addressed explicitly to date. Risk management related to ICT infrastructure is often a separate silo from risk management related to natural hazards even though smart technologies are related to key infrastructure systems (e.g., transportation, emergency response services) that are affected by natural hazard disruptions. And of course, natural hazards (e.g., floods, extreme weather, drought) can adversely affect the operations of smart ICT. This is the straightforward proposition of cross-domain or interdependent risk. Further, it seems likely that risk management of both ICT infrastructure and other critical physical infrastructure would benefit by the assessment of potential interdependencies between disruption to smart systems from both human sources (e.g., hacking) or natural hazards sources (e.g., extreme weather) in order to build and improve the capacity of Smart Cities to serve an overall risk reduction imperative in densely populated urban environments. What is not so clear is the best way to assess and manage such cross-domain risk interdependencies.

As a result, the aim of this article is to raise consideration of the potential for an integrated cross-domain approach for risk reduction based on the risks smart cities are exposed to, on the one hand, from hazards disruptions in the ICT technical domain, such as cyber-attacks, and on the other, from disruptions to ICT systems arising from natural hazard risk and vulnerability. The vulnerability of smart city technologies to natural hazards and cyber-attacks will first be summarized briefly from each domain, outlining those respective domain characteristics. Risk dependencies and cascading risk situations are also considered. Subsequently, methods and approaches for risk reduction in the areas of natural hazards and ICT security will be examined in order to create the basis for an integrated cross-domain approach to risk reduction. Differences are also clearly identified if an adaptation of a risk reduction pattern appears unsuitable. The result is a preliminary consideration of a possible integrated approach for risk reduction as a component of smart cities systems and suggestions for further research to operationalize the assessment of such an integrated risk management approach for a Smart City setting.

Defining the Concept of Smart Cities

First, we begin with the basic notion of what constitutes a so-called Smart City, given the various uses of that term. From our perspective, “smart” in the context of identifying or describing a smart city, or smart city systems, may be seen as having three key elements. One key feature of “smartness” is the efficient provision of services for citizens and businesses. The city is increasingly composed of networked, digitally-enabled devices directly embedded into the fabric of cities (e.g., smart meters, transponders, sensor networks, software-controlled equipment) that produce continuous streams of data that dynamically feed into management software and control rooms enabling the real-time regulation of city systems to provide more efficient services in, for example, transport management, energy supply, emergency services and so on. These are supplemented by new media such as smartphone apps that both present a range of information about the city and generate data about its citizens such as location and

activity. Connecting, integrating and analyzing the data produced by these various forms of ubiquitous computing and digitally instrumented devices provides a more cohesive and smart understanding of the city that enhances the efficiency and sustainability (Hancke et al., 2013; Townsend 2013). Furthermore, the rich seams of data can be used to better depict, model and predict urban processes and simulate the likely outcomes of future urban development (Schaffers et al., 2011; Batty et al., 2012).

A second element of smartness in this context is the idea that urban policy, development and governance are improved by the modern ICT infrastructure allowing for reconfiguration of human capital, creativity, innovation, education, participation, sustainability, and administration (Caragliu et al., 2009). A smart city utilizes e-government, publishes open data and fosters an open data economy, creates citizen-centric dashboards about city performance, encourages citizen participation in reporting issues and planning, enables urban test-bedding wherein companies can try new technologies for improving urban services, actively nurture start-up companies and promote the use of ICT in education programs.

A third element in the use of the smart city construct emphasizes the use of digital technologies and ICT to promote a citizen-centric model of urban development and management that promotes social innovation and social justice, civic engagement and transparent and accountable governance (Townsend 2013). A smart city thus promotes a smart society that provides equal opportunities, serves local communities, and reduces inequalities. Participatory planning and community development, open source platforms, software and data, freedom of information and digital and data literacy are basic ideas in this conception of a smart city.

Although these three elements are recognized as appropriately related to the use of the smart city construct, they are also sufficiently distinct from one another that they might not be utilized simultaneously when the term is applied in a given case. Whatever the nuances of usage, the key is that these elements all are rooted in the same framework: a continually available, networked technical infrastructure that continuously provides data whose evaluation serves to control and improve urban life.

While this is a reasonable approach to defining the use of the smart city term as referring to several critical dimensions, it is also important to note one essential characteristic or dimension that is lacking from most standard approaches to the concept. It is difficult to speak of "smartness" in cities and their essential systems without addressing the question of whether such systems simultaneously serve to reduce risk and promote sustainability in the aggregate. That is, it is important for smart city approaches to include not only the efficient provision of services in a city but also to likewise include risk reduction as a macro-level goal essential to smartness along with attention to efficient precautions for essential risks such as disruption to essential services through cyber-attacks or natural hazards. This lack of attention to coupling smart city approaches for risk reduction is an important omission in the field because of the simultaneous trends of globalization increases urbanization and increases natural hazards vulnerability. Thus, it seems imperative that the essential goals of a smart city approach – livability, efficiency, equity – should be understood as likely to be realized only to the extent that those same systems contribute to the promotion of community resiliency and reduced risk.

Because suitable conceptualization of integrated risk management seem to be lacking in terms of current discourse on smart cities – approaches to disaster risk reduction and ICT security are generally treated as separate domains – we offer preliminary thoughts here on why and how greater attention can be paid to the necessary linkages of both in practice.

Smart Cities, ICT, Natural Hazards and Risk and Vulnerability

The standard definition of risk used in the world of practice and research in the area of crisis or disaster management is to think of risk as being a function of the probability of a disruption occurring weighted by the potential adverse impact from the hazard on human safety, on the built environment (infrastructure comprising a community), on human systems that permit a community to function, and/or on natural environmental systems. A hazard itself can be thought of as generally consisting of items (e.g., a natural phenomenon like extreme weather, human actions, such as hacking or terrorism) that are capable of acting against some type of asset in a manner that can result in harm. For example, a flood is a natural hazard and a hacker (or the activity of hacking) can be thought of as a hazard as well. The key

consideration is that threats apply the force (water, wind, exploit code, etc.) against an asset that can cause a loss event to occur. Though there are some common characteristics in thinking of cyber and natural hazards, each category has its unique or specific characteristics, which will be discussed below.

Vulnerability and resulting risks from natural hazards: While hazards such as various forms of extreme weather and seismic activity are natural; a crisis or a disaster itself is, as many have noted, a social phenomenon that results from human decisions and actions (Quarantelli, 2000; United Nations, 2010). Among other things, this means that the adverse effects of a disaster are not evenly distributed across a community. This basic insight calls attention to the idea of social vulnerability to disaster, defined by Bankoff (2006) as: "Social systems generate unequal exposure to risk by making some people more prone to disaster than others and these inequalities are largely a function of the power relations (class, age, gender and ethnicity among others) operative in every society." A body of research on disasters and crises has recognized these considerations and offers explication of various dimensions of social vulnerability (Thomas, et al., 2013).

Vulnerability and resulting risks to cyber-attacks: In general terms, three categories of vulnerabilities can be distinguished: availability, integrity, confidentiality. These three together are referred to as the security CIA triad (Perrin, 2008). If a system suffers loss of confidentiality, then data has been disclosed to unauthorized individuals. This could be high level secret or proprietary data, or simply data that someone wasn't authorized to see. For example, if an unauthorized employee is able to view payroll data, this is a loss of confidentiality. Similarly, if an attacker is able to access a customer database including names and credit card information, this is also a loss of confidentiality.

Loss of integrity means that data or an IT system has been modified or destroyed by an unauthorized entity. This could be the modification of a file, or the change in the configuration to a system. For example, if a file is infected with a virus, the file has lost integrity. Similarly, if a message within an email is modified in transit, the email has lost integrity. Availability ensures that data and systems are up and operational when they are needed. Or said in another way, loss of availability indicates that either data or a system is not available when needed by a user. For example, if a Web server is not operational when a customer wants to purchase a product, the Web server has suffered a loss of availability. Since the information technology infrastructure of a smart city implements highly distributed systems, all the "classic technical" vulnerabilities of distributed systems appear here as well: messages can be lost in the network system, pure bandwidth or overloading respectively, administration/operating of networks, the need to interface primarily incompatible information technology systems, denial of Service attacks etc. (Harinath et al., 2017).

If smart cities are defined in such a way that the focus is on smart delivery of smart services, availability is obviously one of the most essential problems regarding the vulnerability of the information technology infrastructure. Here, the highly complicated information systems themselves, the high degree of networking of the components and the volume of data (Townsend, 2013) are to be mentioned above all. In addition, there is the special circumstance that the information technology systems of the individual participants in the provision of Smart Services – electricity supplier, water supplier, local public transport, city and county administration – must be highly integrated in order to be able to offer their services really smartly.

The primarily incompatible information technology systems of the different actors have to be connected to each other partly via proprietary interfaces. As these are a multitude of information technology systems, the number of interfaces tends to be very high. Firstly, each interface itself is a potential point of attack. Secondly, the high number of interfaces often leads to a loss of overview as to which interface has which relevance or function. This problem is exacerbated by the fact that the documentation of information technology systems is often inadequate due to time pressure and a lack of resources. Very often, source code is regarded as the best resource for software maintenance (Garousi et al., 2015). In the event of an attack, this may lead to the situation that no rapid countermeasures can be taken even when identifying the point of attack. Understanding source code is usually more difficult than reading normal documentation.

Loss of data integrity, for example, through corruption in the context of cyber-attacks, can have a massive impact on all three approaches, as one can define the term smart city. First of all, erroneous

data can cause serious problems in the availability of IT infrastructure. This would affect the first concept of the term smart city. The second concept focuses more on the use of data to continuously improve a city's services and, if necessary, control them in real time. At the technical level, manipulated data can lead to reduced performance or, under certain circumstances, impair the availability of services. On an administrative or political level, manipulated data can lead to faulty decisions that seriously impair the coexistence in an urban society.

The third perspective on the term smart city is affected by the problem of data corruption. Transparent and accountable governance plays a central role in the model of citizen-centered development and administration. Threats to the credibility of politicians, administrative staff or citizens' movements through manipulated data represents serious risk of undermining the basic principles and concepts of a smart city. Such risk is to not only to the data, but it is a type of political integrity in democratic governance is adversely affected as well. This security category of confidentiality influences the development of a user-centric city too. Lack of confidentiality violates privacy. Although open data platforms aim at transparency and accountability in open urban societies with democratic governance, this does not imply in any way that individual citizens prefer or support public exposure of otherwise private data. In other words, data corruption due to cyber-attacks or abuses within a public sector administrative system represented a threat of diminished trust in government. The plausible net effect of the loss of both confidentiality and data integrity is a loss in the perceived political integrity of governance systems that undergird smart city efforts.

Integrated, Cross-Domain Risk Management

Disaster risk reduction: There are well-established international efforts aimed as disaster risk reduction and overall management improvement. The major doctrine on disaster risk reduction, from an international perspective (rather than a specific nation state), is best summarized by three key documents produced under the auspices of the United Nations: the Yokohama Strategy in 1994, the Hyogo Framework in 2005, and the Sendai Framework for Disaster Risk Reduction in 2015 (see de la Poterie & Baudoin, 2015; Ray-Bennett, et al, 2020 for descriptive summaries of the three frameworks). Doctrine in the area of natural hazards and disasters has emphasized the promotion of coordination between organizations across and between governmental and nongovernmental sectors—and key organizations within of course. To summarize, the trend over the last several decades in numerous countries has been to move beyond narrower command and control response systems (oriented toward post-incident management) and towards more proactive systems of mitigation, risk reduction, and cross-sector coordination and collaboration.

In terms of defining the basic concept of disaster risk reduction, the UNISDR (2009, p. 10) provides the elements constituting it in practice: "the concept and practice of reducing disaster risk through systematic efforts to analyze and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events." Efforts aimed at reducing risk have the effect of contributing to community resilience. Again relying on the UNISDR (2009, p. 24) for a basic definition, resilience is explained as: "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions."

Risk minimization in ICT: A closer look at the area of risk minimization ICT field reveals that this is a multi-level approach. In order to achieve confidentiality, integrity and availability, measures must be implemented in the technical, organizational and management areas. With regard to management, operational, analytical and executive levels are affected.

At the lowest level, technical measures are taken to ensure ICT security. This includes, for example, the physical security of data transmission, encryption, access control, availability networks of servers using redundancy, and so on. A closer look reveals that this lowest level is subdivided. One distinction relates to the possible involvement of end users, who must actively authenticate themselves, for example, in access control. A further distinction is made between the various ICT disciplines that implement the

security measures. While the physical security of data transmission is arranged in the network area, the conception of availability networks of servers is located in the architectural design area, before it is transferred to the server administration area after implementation. Already here, it becomes apparent that IT security is a complex topic. Even at the lowest implementation level, different groups of people and ICT disciplines are involved, which can only achieve risk minimization through interaction.

On the second level, which addresses organizational issues, a collection of ICT security patterns was created (Yoder et al., 1997; Fernandez-Buglioni, 2013) to minimize complexity and apply coherent and useful solutions. The model approach was originally developed in the field of architecture (Alexander, 1977) and initially adapted for ICT in the field of software engineering (Gamma, 1994). The selection of ICT security measures for implementation is facilitated by these IT security patterns. However, unlike the patterns in software engineering, IT security patterns lack both a model system that categorizes patterns by purpose and context and a model language that addresses the dependencies between patterns to minimize more complex IT risks.

The third level, which addresses management issues, is often associated with the concept of information risk management. The term information indicates that the use of data in the work context and its value for the work context are addressed. On the other hand, the term management shows that ICT security is not only a technical issue, but also – or above all – a management task. On this level, there are approaches that essentially consist of a collection of methods and processes. Organizational and normative aspects are addressed.

ISO/IEC 27005 emphasizes the process perspective but does not recommend or even name any specific risk management method (ISO/IEC 2018). It does implies that it is a continual process consisting of a structured sequence of activities, some of which are iterative: establishing the risk management context, quantitatively or/and qualitatively assess, treat, keeping stakeholders informed throughout the process and monitor and reviewing risks, risk treatments, obligations and criteria on an ongoing basis, identifying and responding appropriately to significant changes. In contrast to ISO/IEC 27005, the Risk IT framework (ISACA 2009) is more comprehensive because it complements ISACA CobiT (ISACA 2019), which provides a comprehensive framework for the control and governance of business-driven information technology solutions and services. While CobiT already provides a set of controls to mitigate IT risk, Risk IT Framework complements this approach with a set of procedures to identify, control and manage ICT risks across the enterprise. All in all, this results in a very comprehensive, holistic approach.

This is the goal of the Framework for Improving Critical Infrastructure Cybersecurity des National Institute of Standards and Technology too (NIST2018). The Framework is a risk-based approach to manage cybersecurity risk, and is composed of three parts: the Framework Core, the Framework Implementation Tiers, and the Framework Profiles. Each Framework component reinforces the connection between business/mission drivers and cybersecurity activities. The Framework Core is a set of cybersecurity activities, desired outcomes, and applicable references that are common across critical infrastructure sector presenting industry standards, guidelines, and practices in a manner that allows for communication of cybersecurity activities and outcomes across the organization from the executive level to the implementation/operations level. The Framework Implementation Tiers provide context on how an organization views cybersecurity risk and the processes in place to manage that risk. Tiers describe the degree to which an organization's cybersecurity risk management practices exhibit the Framework (e.g., risk and threat aware, repeatable, and adaptive). The Framework Profile can be characterized as the alignment of standards, guidelines, and practices to the Framework Core in a particular implementation scenario. In a sense, it is the most comprehensive approach as it combines methods and approaches of the Center for Computer Security, the National Institute of Standards and Technology, the CobiT approach, the International Society of Automation and the ISO standard. In addition, the concept of profiles places a clear focus on the operational implementation in the respective organizations.

Even if these theoretical approaches are manifold, the following statement often applies to the practical implementation:

"The information security community does a great job of identifying security vulnerabilities in individual technologies and penetration testing teams help secure companies. At the next level of scale, however, things tend to fall apart" (Conti, et al., 2015).

What are the reasons for these implementation problems? Within the multi-level approach regarding ICT security, the two lowest levels – the concrete ICT security measures and the ICT security patterns – lack a process-oriented, integrational view to support the implementation of the described measures in organizations. The management-oriented third level addresses information risk management. However, it is doubtable whether the proposed frameworks overcome this lack of process orientation and integration. The problems that occur when implementing new processes and changing organizational structures is not considered in a serious way. Change Management methods are not integrated into the frameworks; they are missing. Furthermore, anti-patterns in policy-making in the area of cybersecurity implementations are normally not reflected (Busbach-Richard, 2019).

Looking at smart cities in particular, additional aspects with respect to IT risk management have to be taken into account. Firstly, it can be said that each city is unique in terms of their corporate network. Secondly, there is the need to provide a 24/7 availability. And thirdly, a large city easily has 30 or more administrative units that place different business demands on IT, and consequently, on IT security. These requirements often compete with each other (Hayslip, 2016). In many cases, the administrative units do not see the overall task that a city should fulfil, but only its isolated area. This can be named as silo perspective. The dependencies are understood only to a very limited extent. In order to resolve this, communication, coordination and mediation between individual administrative units is absolutely necessary. There might be no optimal solution with regard to risk management with respect to competing requirements.

Integration of Approaches to Risk Management: Nussbaum (2014) argues that "while the risk assessment community has been involved in the trial and error application of various risk models to various problems, there have been some difficulties with attempting to use models like these to look at sector and jurisdiction level risks." The key issue, according to Nussbaum, is related to scale and/or scope. Traditional risk assessments are oriented toward either a specific (i.e., single) system or singular or discrete tasks. This suggests that there are nontrivial challenges in translating risk assessment to a very complex set of both operational relationships (in a system or systems context) and complex governance relationships in the case of an entire urban area with multiple jurisdictional authorities (e.g., other adjacent cities, counties and/or other regional authorities, provincial or state authorities and national government authorities. Such considerations are core to the challenge of pursuing an integration of risk management strategy and practical approach for joint or interdependent risk between locally-prevalent natural hazards and ICT systems that undergird smart cities.

Likewise, it is important to understand at least four categories of challenges associated with, and as potential drivers of, interdependent risk. First, communication problems are a definitional characteristic of any crisis situation; that applies here as well. Second, discrete operational silos exacerbate the management of comprehensive risk. Likewise, stakeholders from different disciplines make coordinated efforts difficult. And lastly, pure policy patterns present essential challenges in the form of short term reaction versus long term strategic planning for risk reduction.

When the challenge of addressing cross-domain assessment, that is, reducing silos in assessment and management, and of addressing long-term strategic planning over interdependent risk, we can think of such efforts as an integrated risk management approach. In practice, this means several things. First, explicit assessment of systems' interactions are required in order to measure and understanding how to define operational vulnerabilities and mitigate associated risks. Second, potential cascade points of failure also need to be defined and measured in order to produce appropriate risk mitigation strategies. Third, it is necessary to develop explicit communication mechanism on layers, ICT systems and stakeholders.

While the scope or scale of the challenges listed above are fundamentally important, it is also helpful to recognize a basic similarity of risk management in the two domains of ICT security and natural hazards. Both domains use a multilayer approach in risk reduction, both have reasonably well-defined regimes and established risk management protocols, and importantly, the fundamental concepts used in both

areas are similar. This promises a degree of potential consonance as approaches to establishing smart city systems. Table 1 highlights this potential for consonance or a future of more fundamentally integrated risk management practices. The table notes similarity in key concepts, a relatively similar set of policy challenges and administrative approaches, and some degree of similarity in operations' practices—even though the administrative and operational systems of the two domain are quite different, of course.

Table 1 highlights the proposition that similar challenges have to be overcome in risk minimization in both ICT security and natural hazards management. Cross-organizational coordination across several levels and between different governmental and non-governmental institutions requires defined, but at the same time flexibly changeable interfaces. The attempt to systematically minimize or reduce risks can be found in both ICT risk management and disaster management. And at the same time, both domains share a policymaking and policy implementation challenge of the difficulty of appropriately forecasting future risk and making corresponding resource commitments to address future risk. Despite certain similarities in otherwise separate risk management domains, the challenge is to investigate areas that could lead to new findings to improve risk management integration between the domains. For instance: Can the CIA Triad provide new insights in the context of broader disaster management? How can key concepts of community resilience, hazard mitigation, absorption capacity in the natural hazards domain translate to useful practices in ICT security?

Table 1. Comparisons in Smart City ICT and Natural Hazards Risk Management

Common Organizing Concepts	*Key Concepts: Natural Hazards Domain*	*Key Concepts: ICT Domain*
Risk reduction Risk minimization Operational efficiency Cross-sector governance	Disaster Risk Reduction (DRR) for natural hazards hazard mitigation, community resilience, absorption capacity (for disruptions)	CIA-Triad: Confidentiality, integrity and availability
Common Policy Challenges	*Administrative Considerations*	*Current Approaches*
- level of scale dysfunctionality - imbalance between resources to meet protection needs and underlying extant vulnerabilities - challenges in producing long-term strategic risk management - span of control: explicit public sector responsibilities versus private property ownership and control of private resources	- disaster management systems designed to accommodate increasing scale – difficult to resource appropriately in practice - ICT: risk management systems are designed to solve problem at hand. Scaling is rarely addressed - ICT: Short term reaction in favor of long term strategic planning	- International and national disaster response and recovery frameworks, with DRR emphasis - ICT risk management: ISACA CobiT
Common Challenges in Operations	*Operations Needs*	*Current Approaches*
- cross-organizational interface - risk assessment and communication - systematic efforts to analyze risks comprehensively - Focus on either a specific system or a discrete task	- required for both ICT protection and NH risk management - defined, but at the same time flexibly changeable interfaces	- Separation of technical (operational), organizational and management level - DRR practices for natural hazards; ICT security practices - Natural hazards: routine assessment; - ICT: penetration tests, routine assessment; ISO/IEC 27005

Conclusions

This article represents a brief, preliminary statement on a complex challenge. Its basic premise is that as communities attempt to develop a comprehensive smart city status, or attempt to deploy a set of what might be considered smart city systems, attention should be paid to a broad range of interdependent risks. Because risks associated with natural hazards, such as heat, drought, flooding, cyclones, or other extreme weather, pose a broad set of important challenges to densely populated urban areas, the challenge for smart city systems is to integrate tradition ICT security efforts as part of a broader integrated risk management strategy for a community (or larger national governance systems). This seems straightforward, but as discussed above, a considerable degree of complexity is involved in operationalizing this premise. However, if smart cities are to be smart in terms of real-world efficacy, then risk reduction strategies should strive to be integrated across domains in order to maximize community resilience—and community resilience should be incorporated as a central value of smart cities, along with efficiency, equity and livability concerns.

Such an imperative means a close and coordinated exchange of risk management information and practice between those in the ICT domain and those in the traditional natural hazards management domain. Such an integration of risk management practice and coordination of resources and effort is also likely to depend on the development of research agendas motivated by this theme. Existing research literatures on measuring and assessing risk interdependencies should be expanded to consider how, in a context of intense global urbanization and the emergence of smart cities' systems, the linkage between ICT infrastructure and built physical infrastructure, and the new vectors of risk that emerge from those systems' exchanges.

In order to achieve the goal of an integrated risk management strategy, it appears necessary to analyze and understand common policy challenges such as "level of scale dysfunctionality", "lack of visibility in politics and public" for the prevailing risks in order to find suitable bases for an efficient, targeted and solution-oriented governance strategies. Similarly, straightforward applied research on how key public and private sector practitioners and systems of governance contribute to, or inhibit development of, comprehensive risk management integration. In terms of governance, assessment of governmental and nongovernmental organizational interactions is necessary to understanding the potential efficacy of both structural and non-structural risk mitigation practices. In terms of key practitioners, understanding how those public sector agencies charged with responsibility for critical infrastructure protection complete their tasks is needed—along with how cross-sector coordination with their private sector counterparts functions in practice.

Ultimately, the central challenge is to promote awareness of cross domain risk and how more comprehensive integrative risk management strategies and governance regimes can promote efficient, livable, equitable and resilient communities, if they are to be considered "smart" in a meaningful sense.

References

Alexander, C. (1977). A Pattern Language: Towns, Buildings, Construction. Oxford: University Press.

Andress, J. (2014). The Basics of Information Security: Understanding the Fundamentals of InfoSec in Theory and Practice. Amsterdam: Syngress.

Batty, M., Axhausen, K. W., Giannotti, F., Pozdnoukhov, A.,Bazzani, A., Wachowicz, M., et al. (2012). Smart cities of the future. European Physical Journal Special Topics, 214 (1), 481–518

Birkmann, J. J., & von Teichman, K. (2010). Integrating disaster risk reduction and climate change adaptation: Key challenges—scales, knowledge, and norms. *Sustainability Science*, *5*(2), 171–184.

Busbach-Richard, U. (2019). The Case of IT-Security: Anti-Patterns in Policy Making and its Implementation. Book of Abstracts of the First International Conference on Sustainable Development in Business and Economics. Skopje: IBI/IBF.

Caragliu, A., Del Bo, C., and Nijkamp, P. (2009). Smart Cities in Europe. Series Research Memoranda 0048. Amsterdam: VU University Amsterdam, Faculty of Economics, Business Administration and Econometrics.

Conti, G., Cross, T., Raymond, D. (2015). Pen Testing a City Retrieved from https://www.blackhat.com /docs/us-15/materials/us-15-Conti-Pen-Testing-A-City-wp.pdf on September 24th 2019.

De la Poterie, A. T., & Baudoin, M. A. (2015). From Yokohama to Sendai: Approaches to participation in international disaster risk reduction frameworks. *International Journal of Disaster Risk Science*, *6*(2), 128–139.

Essays, UK. (2018). The Importance Of Security In Distributed Systems Information Technology Essay. Retrieved from https://www.ukessays.com/essays/information-technology/the-importance-of-security-in-distributed-systems-information-technology-essay.php?vref=1 on September 24th 2019.

Garousi, G., Garousi-Yusifoglu, V., Ruhe, G., Zhi, J., Moussavi, M., & Smith, B. (2015). Usage and usefulness of technical software documentation: An industrial case study. Information and Software Technology, 57, 664–682

Fernandez-Buglioni, E. (2013) Security Patterns in Practice: Designing Secure Architectures Using Software Patterns. Hoboken: Wiley Publishing

Gamma, E., Helm. R., Johnson, R. & Vlissides, J. (1994). Design Patterns (the Gang of Four book). Boston: Addison-Wesley.

Garousi, G., Garousi, V., Ruhe, G., Zhi, J., Moussavi, M., & Smith, B. (2015). Usage and usefulness of technical software documentation: An industrial case study. *Information & Software Technology, 57*, 664–682.

Hancke, G. P., de Carvalho e Silva, B., & Hancke, G. P, Jr. (2013). The role of advanced sensing in smart cities. Sensors, 13 (1), 393–425.

Harinath , D., Satyanarayana , P. (2017). A Review on Security Issues and Attacks in Distributed Systems. Journal of Advances in Information Technology, 8 (1), 1–9.

Hayslip, G. (2016) What I have learned as CISO for a Smart City. Retrieved from https://www.linkedin.com/ pulse/what-i-have-learned-ciso-smart-city-cissp-cisa-crisc-ccsk?articleId=6099504343512272896#comments-6099504343512272896&trk=prof-post on September 24th 2019.

ISACA (2009). The Risk-IT-Framework-Excerpt. Retrieved from https://m.isaca.org/ Knowledge-Center/Research/Documents/Risk-IT-Framework-Excerpt_fmk_Eng_0109.pdf on September 26th 2019.

ISACA (2019). COBIT 2019 Publications & Resources. Retrieved from http://www.isaca.org/ COBIT/Pages/ COBIT-2019-Publications-Resources.aspx on September 26th 2019.

ISO/IEC (2018). ISO/IEC 27005:2018 - Information technology - Security techniques - Information security risk management (third edition). Retrieved from https://www.iso27001security.com/ html/27005.html on September 26th 2019.

Mijalkovic, Sasa & Cvetković, Vladimir. (2013). VULNERABILITY OF CRITICAL INFRASTRUCTURE BY NATURAL DISASTERS.

NIST (2018). Framework for Improving Critical Infrastructure Cybersecurity. Retrieved from https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.04162018.pdf on September 26th 2019.

Nussbaum, B. (2014). The 'Levels of Analysis' Problem with Critical Infrastructure Risk. In Journal of Physical Security, 7(1), 43–50.

O'Rouke, T.D. (2007). Critical infrastructure, interdependencies and resilience. The Bridge Vol. 37 No. 1, 22–29.

Perrin, C. (2008). The CIA Triad. Retrieved from https://www.techrepublic.com/blog/it-security/the-cia-triad/ on September 24th 2019.

Ray-Bennett, N. S., Mendez, D., Alam, E., & Morgner, C. (2020). Inter-agency collaboration in natural hazard management in developed countries. In B. J. Gerber (Ed.), *The Oxford encyclopedia of natural hazards governance*. New York, NY: Oxford University Press.

Robert, B., Morabito, L., Cloutier, I., & Hémond, Y. (2015). Interdependent critical infrastructures resilience: Methodology and case study. *Disaster Prevention and Management*, *24*(1), 70–79.

Schaffers, H., Komninos, N., Pallot, M., Trousse, B., Nilsson,M., & Oliveira, A. (2011). Smart cities and the future internet: Towards cooperation frameworks for open innovation. J. Domingue, et al. Eds.), Future Internet Assembly pp. 431–446. LNCS: Springer.

Townsend, A. (2013).Smart cities: Big data, civic hackers, and the quest for a new utopia. New York: W.W. Norton & Co.

Thomalla, F., Downing, T., Spanger Siegfried, E., Han, G., & Rockstrom, J. (2006). Reducing hazard vulnerability: towards a common approach between disaster risk reduction and climate adaptation. *Disasters*, *30*(1), 39–48.

Thomas, D. S., Phillips, B. D., Lovekamp, W. E., & Fothergill, A. (2013). *Social vulnerability to disasters*. Baton Roca, FL: CRC Press.

United Nations. (2010). *Natural hazards, unnatural disasters: the economics of effective prevention*.

UNISDR (United Nations International Strategy for Disaster Reduction). (2009). *2009 UNISDR terminology on disaster risk reduction*. Geneva, Switzerland: United Nations.

Yoder, J. , Barcalow, J. (1997). Architectural patterns for enabling application security. In Proceedings of the 4th Conference on Patterns Languages of Programming (PLoP'97).

Economics and Culture 2019, Volume 16, Issue 2

ISSN 2255-7563; e-ISSN 2256-0173

Abstracted/ indexed

- Baidu Scholar
- Cabell's Directory
- CEJSH (The Central European Journal of Social Sciences and Humanities)
- CNKI Scholar (China National Knowledge Infrastructure)
- CNPIEC
- Dimensions
- DOAJ (Directory of Open Access Journals)
- EBSCO (relevant databases)
- EBSCO Discovery Service
- EconBiz
- EconLit
- Google Scholar
- J-Gate
- JournalTOCs
- KESLI-NDSL (Korean National Discovery for Science Leaders)
- Naviga (Softweco)
- Primo Central (ExLibris)
- ProQuest (relevant databases)
- Publons
- ReadCube
- Research Papers in Economics (RePEc)
- Summon (Serials Solutions/ProQuest)
- TDNet
- Ulrich's Periodicals Directory/ulrichsweb
- WanFang Data
- WorldCat (OCLC)

Full-text papers are available at https://content.sciendo.com/view/journals/jec/jec-overview.xml

The publication of the journal is financed by the EKA University of Applied Sciences, Lomonosova 1/5, Riga, LV1019, Latvia

Publisher

SCIENDO
Bogumiła Zuga 32A Str.
01-811 Warsaw, Poland
T: +48 22 701 50 15