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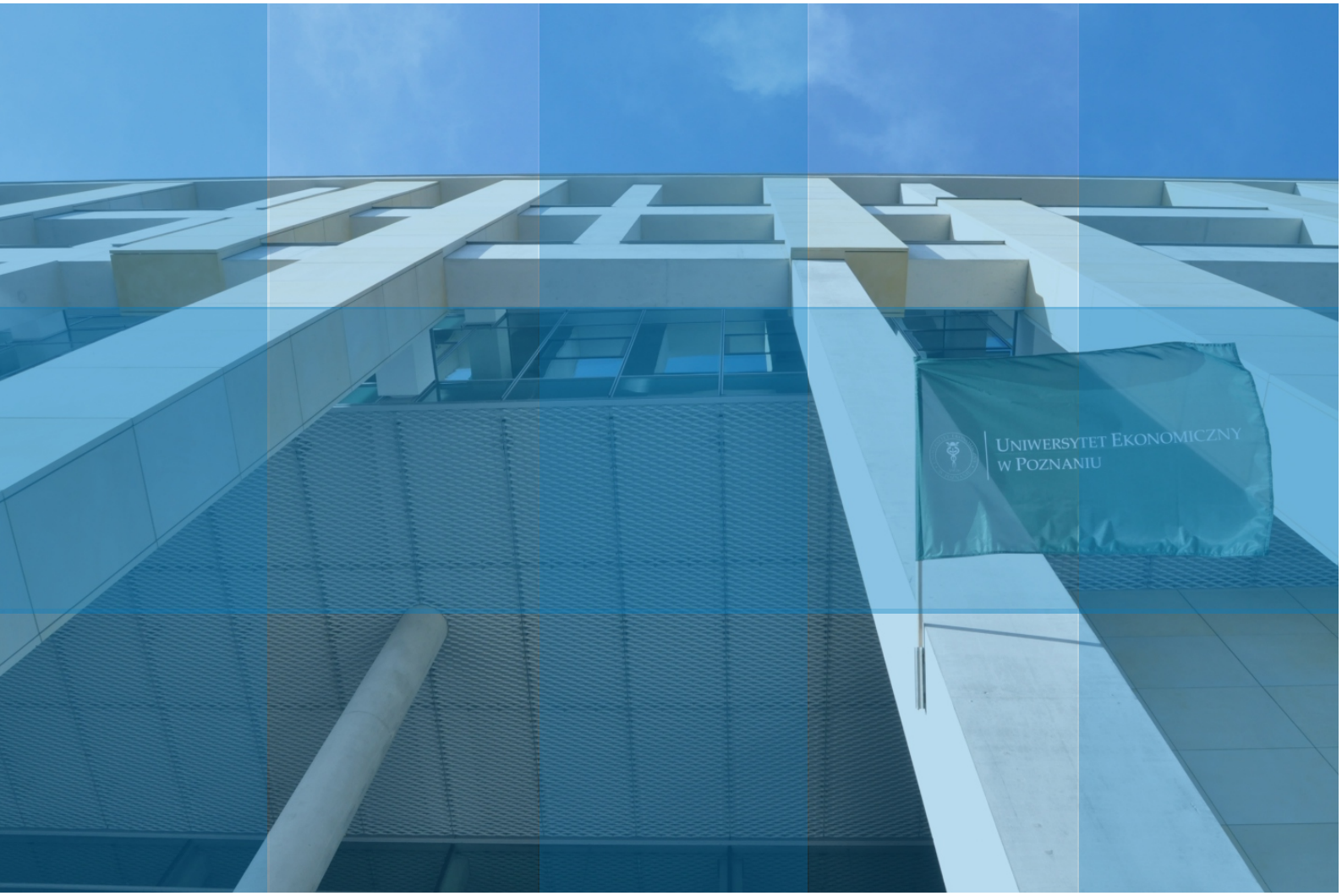

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Aleja Niepodległości 10, 61-875 Poznań, Poland

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PREFACE

Dear Readers,

We are pleased to present the next issue of the Research Papers in Economics and Finance published by the University of Economics and Business in Poznan, Poland. We have selected five articles from different parts of Europe.

This issue opens with a great paper, which received three excellent reviews, written by **Mihaela Simionescu** from the Institute for Economic Forecasting of the Romanian Academy entitled "*Bayesian combined forecasts and Monte Carlo simulations to improve inflation rate predictions in Romania*". The author has proved, using empirical data for Romania, that the Bayesian combined forecasts using experts' predictions as priors, when the shrinkage parameter tends to infinity, improved the accuracy of the predictions based on individual models.

The second paper entitled "*Risk management system references in construction*" has been written by four authors: **Volodymyr Tkachenko**, **Maryna Klymchuk**, **Tetiana Ilina** from Kyiv National University of Construction and Architecture and **Iryna Tkachenko** from the Academy of the State Penitentiary Service in Kyiv, Ukraine. In this paper the authors examine the basic methods of risk management in construction: avoidance of risk, localisation, dissipation and compensation. Formalised functional structuring of risk management in construction was proposed, allowing for the implementation of management functions at two levels – executive and coordinating, with the help of a special structural component in the enterprise management system or a specialised unit in the organisational structure.

The next paper concerns "*Information demand of foreign labour market from the point of view of Chinese students*". This paper has been written by **Anna Pilarczyk** and **Tomasz Naprawski** from the University of Szczecin, Poland. The authors have used the companies' and students' surveys which identified the main problems facing employers (like a small number of applicants or lack of expertise and experience) and foreign employees (like organisational problems or formal requirements in a foreign country) during the job application process. The proposed information-logistics engine was designed as a core for the software architecture of target-oriented application, in which the user requirements are not clear but have the highest priority.

The fourth paper has been created by **Joanna Ratajczak** from the University of Economics and Business in Poznan, Poland, and concerns "*Recruitment and motivation of Generation Z in the face of the employee's market*". The study involved 390 students in Leszno, Poland. The author has proved that despite the low level of unemployment and the problem of finding people willing to work in Leszno in 2018, employers did not fully respond to the expectations of young people. The employee market in the opinion of the employees themselves, especially in smaller towns, where a low unemployment rate is observed, does not translate into improved employment conditions.

The last paper entitled "*Statutory regulations and corporate governance standards in cooperative banks*" has been written by **Mikołaj Jalinik** from Bialystok University of Technology, Poland and **Krzysztof Łukaszuk** from the Cooperative Bank in Bielsk Podlaski, Poland. According to the authors' research, although the regulations of the European Parliament duplicate the solutions already existing on the domestic legal grounds in some areas, they are part of the general policy and practice of developing financial sector regulations, unifying requirements for financial institutions and raising standards in the area of corporate governance. In the case of cooperative banks, doubts arise as to whether, being entities different from commercial banks, implementing solutions (including those of the European Parliament) under pressure from the regulator, the results obtained will prove to be adequate to the specificity of the entities covered by it.

Yours faithfully,

dr hab. Piotr Lis, prof. UEP
– Editor in Chief

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RESEARCH PAPERS
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Bayesian combined forecasts and Monte Carlo simulations to improve inflation rate predictions in Romania

Mihaela Simionescu[1]

[1]Institute for Economic Forecasting of the Romanian Academy, Romania

ABSTRACT

There are many proposals in literature for improving the forecast performance. In this paper we applied the regression approach and Bayesian inference to obtain more accurate forecasts of the inflation rate in the case of the Romanian economy. The necessity of using the most accurate forecasts for the inflation rate is required by the realisation of economic criteria for the accession to the eurozone and by the inflation targeting strategy of the National Bank of Romania. Considering the assumption that simple econometric models provide better forecasts than complex models, in this paper we combined various forecasts from individual models using as prior information the expectations of experts. The empirical findings for Romanian inflation rate forecasts over the horizon of 2016-2018 indicated that a fixed effects model performed better than other simple models (autoregressive moving average model, dynamic model, simple and multiple linear model, VAR, Bayesian VAR, simultaneous equations model). The Bayesian combined forecasts that used experts' predictions as priors, with a shrinkage parameter tending to infinity, improved the accuracy of all predictions using individual models, outperforming also naïve forecasts and zero and equal weights forecasts. However, predictions based on Monte Carlo simulation outperformed all the scenarios in terms of the mean error and mean absolute error.

Keywords: forecasts accuracy, Bayesian forecasts combination, shrinkage parameter, econometric model.

1. Introduction

The evolution of inflation is directly supervised in Romania in the context of the eurozone accession that requires, among other economic criteria, price stability (an inflation rate that does not exceed 1.5 percentage points the average of the first three countries with the lowest inflation rate in the eurozone). Therefore, inflation forecasting is essential in the efforts to achieve the convergence criteria in Romania. The National Bank of Romania implemented a prudent monetary policy in the last years as to keep a low level of inflation. The relationship between the inflation rate and the exchange rate evolution influences the conversion rate for RON/Euro. When Euro is adopted, the fixed conversion rate will influence the nominal revenues and all the prices. Therefore, before entering ERM2, it is necessary to have a comparative price level that is bearable by the national economy, but compatible with the eurozone.

Inflation targeting should be based on accurate inflation forecasts for good implementation of the monetary policy. The evolution of the inflation rate might be described by various econometric models that could also be used to build predictions. National banks used to employ more alternative models in describing the evolution of inflation, and the predictions based on these models are later combined to get a better prediction of inflation. Recent advances in literature indicated that the combined predictions that use more individual models perform better than individual forecasts. The recent economic crisis emphasized the need to reduce the forecast uncertainty (Julio Roman, Bratu Simionescu, 2013). The reduction of forecast uncertainty has advantages at the macro-

economic and microeconomic levels by improving the decision-making process (Terceno and Vigier, 2011).

The most used method to improve forecast accuracy nowadays is the construction of combined forecasts, different ways of building them, described by Timmermann (2006). Recent advances in this field are represented by the use of Bayesian techniques. In this context, Diebold and Pauly (1990) proposed a Bayesian shrinkage method that includes prior information for building better combined forecasts. Wright (2008) and Koop and Potter (2003) employed an equal-weights or zero-weights prior mean. The Bayesian weights are calculated by Gomez, Gonzalez and Melo (2012) in the context of a rolling window estimation method using co-integrated data series of order one.

The main purpose of this paper is to provide a way for improving inflation rate forecasts in Romania. We chose only Romania in the analysis, because it had a particular evolution of the inflation rate from the transformation of the centrally planned economy to the functional market economy. This framework is completed by new challenges like inflation targeting that has been implemented since 2005 and the necessity to achieve the criteria for the entrance to the eurozone. Contrary to other countries in the region, in Romania, there are more alternative predictions for usual macroeconomic indicators, and the policy makers should know exactly what is the best forecast to be used in the decision-making process and how this forecast might be improved by combining a subjective perspective of experts with an objective perspective given by quantitative forecasting methods. The Dobrescu model for the Romanian economy has an international recognition, but the forecasts of the National Commission for Prognosis are used in the government decisions. The National Bank of Romania employs a complex model for constructing short term and medium-run forecasts. However, none of these individual predictions are based on a Bayesian combination of forecasts in order to improve the forecasts' accuracy. As a novelty for the economic literature in Romania, in this paper new inflation rate predictions are built using own econometric models and experts' expectations based on the Bayesian combination technique. After a brief literature review on inflation modelling for predictions, the methodological background is described. Empirical data are used to show the improvement of inflation rate forecasts in Romania. The paper uses a prior mean that considers the forecasts based on the Dobrescu macro-model for the Romanian economy. Starting from the conclusion of Simionescu (2014) that simple econometric models perform better than the complex ones, in this paper, we will build forecasts based on usual econometric models (time series models and panel data models).

2. Literature review

Inflation forecasting is a difficult task, but many papers in literature focused on this topic by proposing various forecast methods. The paper of Atkeson and Ohanian (2001) is considered as a milestone in the economic literature related to inflation forecasting. The authors considered more standard Phillips curve forecasting models, showing that none of them performed better than a four-quarter random walk benchmark in the period 1984–1999. The next studies after Atkeson and Ohanian showed that their results are dependent on the forecast horizon and sample period. In case of other benchmark models, the results might change. For example, if the model of Stock and Watson (2007) is used as a benchmark (unobserved component-stochastic volatility model), the forecasts based on Phillips curve are not anymore better than univariate predictions.

There are single-equation or multiple-equations inflation forecasting models. In the case of single-equation models, we have four types of inflation forecasts:

a) Forecasts based only on past inflation;
b) Predictions using activity measures (forecasts based on Phillips curve);
c) Forecasts built up from other predictions;
d) Forecasts that use other predictors.

The forecasts using the past inflation use the following methods: univariate time series models, autoregressive integrated moving average – ARIMA models and time-varying or nonlinear univariate models. This type of forecasts includes also those predictions in which one or different inflation measures other than the forecasted one is/are predictors(s) (e.g. past core inflation based on the consumer price index, previous wage growth could be used for predicting the overall CPI inflation). Some of these models are often used as benchmark models: the direct autoregressive model, the random walk model used by Atkeson and Ohanian (2001) and the unobserved components--stochastic volatility model employed by Stock and Watson (2007).

Phillips curve forecasts are those that include predictions based on an activity variable like the output gap, output growth or unemployment rate in interaction with other variables to predict the inflation evolution or the changes in inflation. There are two types of Phillips

curve forecasts: backward-looking curves and New Keynesian Phillips curves, with the latter being rarely used in inflation forecasting. There are two frequently used prototypes of Phillips curves: the triangle model used by Gordon (1990) in which inflation is regressed using lagged inflation, supply shock variables and unemployment rate. This model was extended by Gordon (1998) to include the predicted values of predictors, where these forecasts are based on univariate autoregressive models for shocks, import inflation, energy and food inflation. Another usual prototype of Phillips curve eliminates the supply shock indicators and step-function restriction.

Inflation forecasting is a key element in monetary policy elaboration, whether the central banks have fixed a target for inflation rate or not. A simple Phillips curve that uses unemployment rate for predicting inflation rate is the most used forecasting method. However, many studies showed a lack of utility in using Phillips curve for inflation forecasting (Sovbetov and Kaplan, 2019; Furtula et al., 2018).

Forecasts based on other forecasts refer to those inflation predictions based on implicit or explicit expectations or other forecasts. In this case, we may have regressions using implicit expectations coming from asset prices, like predictions extracted from the structure element of the nominal Treasury debt or from Treasury inflation-protected securities yield curve. In this case, we may also have those forecasts using explicit predictions of others (mean forecasts, median forecasts from surveys such as the Survey of Professional Forecasters).

Forecasts that use other predictors refer to predictions using other variables than those regarding activity or expectations. The 1970s-vintage monetarist model is an example in this sense, with M1 growth being used for predicting inflation. In most cases, this type of forecast performs worse than the other three types, being rarely used in the literature.

In Romania, more macroeconomic models were built to predict the evolution of the inflation rate. The Dobrescu macromodel for the Romanian economyis the most used model for making predictions on macroeconomic indicators in Romania, with the consumer price index being one of them. Other predictions are provided by the National Commission for Prognosis.

The Dobrescu model for the Romanian economy was developed in the transition period from the centrally planned system to the market economy. It is the first international recognized model for the Romanian economy. The first version was released in 1996 and the last version was built in 2012, still being in use to make predictions for the following years. The model includes 6 macroeconomic blocks:
(1) Production function and output gap;
(2) Employment, capital, labour income;
(3) Domestic absorption and foreign trade;
(4) General consolidated budget and public debt;
(5) Prices, exchange rate, monetary variables;
(6) Balance of payments and external debt;
(7) Primary energy and CO2 emissions.

The block used for predicting the inflation rate includes 10 accounting relationships and 7 econometric relations (Dobrescu, 2017). The first difference in the consumer index price and fixed capital formation was stationary, and a causality in Granger sense was detected from the inflation rate to the interest rate. The lag of the first difference in the interest rate was included in the specification of the investment price index and consumer price index with a positive sign. The results indicated that the economic operators are adapted to high interest rates that are included in the expected cash flows through the corresponding prices.

The National Commission for Prognosis has, among attributions, the elaboration of short--run, medium-run and long-run predictions for the economic and social aspects in Romania. These forecasts are strongly correlated with the stipulations of the political factor, with the strategies for development and with the national and international actual tendencies. The changes in the dynamics of recent evolution of inflation rate are presented by Liao (2014):
- Less inflation persistence;
- The Phillips curve is more flattened;
- Inflation is not anymore so sensitive to shocks.

There are several studies in the subject literature that modelled the inflation rate in Romania using econometric models. For example, for the period of 1992-2000, Budina et al. (2006) showed, using a co-integration approach, that inflation in the 1990s was a monetary phenomenon, a fact that allows us to show the utility of inflation predictions in the creation of the monetary policy in Romania. A vector error correction model was employed by Dritsakis (2004) to show the causal relationship from inflation to productivity in the period between 1990-2003. Various time series models (autoregressive and moving average models) were estimated by Baciu (2015) using data from January 1997 to August 2013 in order to predict the inflation rate in Romania. Mihai et al. (2016) used linear regression models to show that unemployment had a significant impact on the inflation rate in Romania during 2007-2014. However, these authors used a very short sample in estimations and the results should be cautiously retained.

In the context of alternative forecasts for the same indicator, it is essential to select those predictions that perform better and to improve their accuracy. One way to get more accurate predictions is to construct combined predictions. This recommendation is also among the nine generalizations of Armstrong (2005) for improving the forecasts accuracy (selection of the best forecasting method, good knowledge of the domain in which forecasts are built, use of experts' predictions, realistic representation of the economic phenomenon, use of econometric models when causal relationships among variables are well known, issue's structuration, use of simple econometric models, utilization of conservative forecasts when more sources of uncertainty are identified, use of combined forecasts). In the last conferences of the International Institute of Forecasters, a specific importance was assigned to the techniques for combing forecasts. For example, at the conference held in Seoul in 2014, a new scheme of Bayesian combination was proposed for predictions based on different models in case of Columbia's inflation (Velandia et al., 2014). Other new techniques for combining forecasts in order to improve their accuracy were proposed by Poncela et al. (2011) who combined some methods to reduce dimensionality in forecasts, using in the end the ordinary least squared method for combination. On the other hand, Tian and Zhou (2013) proposed a scheme for global minimum variance weighting which combines the usual techniques such as random walk, moving average, moment mean and GARCH-M.

However, most of the individual models for the inflation rate or those based on combination require a lot of time, data and computational power and, in most cases, the intervention of the monetary authorities cancels the utility of the model.

In this paper, a new technique of combination is proposed based on the Bayesian approach. This type of combination scheme has not been used before for predicting the inflation rate in Romania, but it is proved that it provides valuable results for improving inflation forecasts in this country.

3. Methodology

Let us start with a number of m h-step-ahead predictions of a certain variable y_t: $f^{1}_{t/t-h}$,..., $f^{m}_{t/t-h}$. According to Granger and Ramanathan (1984), we should start with a certain forecast combination:

$$y_t = \alpha' f_{t/t-h} + \varepsilon_t \quad (1)$$

y_t – variable of interest at time t;
ε_t – error term;
$\alpha = (\alpha_0, \alpha_1, \dots, \alpha_m)'$ – vector including regression parameters;
$f_{t/t-h} = (1, f^{1}_{t/t-h}, \dots, f^{m}_{t/t-h})'$ – vector including intercept and m forecasts (vector size: m+1).

The intercept is considered to have an optimally determined bias correction.

Diebold and Pauly (1990) proposed a method that includes prior information in regression that combines forecasts by using the g-prior model of Zellner (1986). In this case, the error is independently, identically and normally distributed of null average and constant variance σ^2. A natural conjugate normal-gamma prior is employed:

$$p_0(\alpha,\sigma) \propto \sigma^{-m-v_0-2} \exp\{-\tfrac{1}{2}\sigma^2[v_0 s^2_0 + (\alpha - \alpha^*)' M (\alpha-\alpha^*)]\} \quad (2)$$

α, α^*, v_0 – parameter;
σ – standard deviation;
$p_0(\alpha, \sigma)$ – prior;
m – number of forecasts;
s^2_0 – estimated variance;
M^0 – expected value (mean).

The likelihood function has the following form:

$$L(\alpha,\sigma/Y,F) \propto \sigma^{-T} \exp\{-\tfrac{1}{2}\sigma^2(Y - F\alpha)'(Y - F\alpha)\} \quad (3)$$

$Y = (y_1, \dots, y_{t-h})'$ – vector of variables;
$F = (f_{1/1-h}, \dots, f_{t-h/t-2h})'$ – distribution function;
$L(\alpha, \sigma/Y, F)$ – likelihood function;
T – sample volume;
$\sigma 2$ – variance;
α – parameter;
h – horizon length;
σ – standard deviation.

$$p_1\left(\frac{\alpha}{Y}, F\right) \propto [1 + \frac{1}{v_1}(\alpha - \bar{\alpha})' s_1^{-2}(M + F'F)(\alpha - \bar{\alpha})]^{-\frac{m+v_1+1}{2}} \quad (4)$$

$p_1\left(\frac{\alpha}{Y}, F\right)$ – marginal posterior;
α, v_1 – parameters;
$\bar{\alpha}$ – average of α;
F – distribution function;
σ – standard deviation;
Y – vector of variables;
m – number of forecasts.

The marginal posterior average is:

$$\bar{\alpha} = (M + F'F)^{-1}(M\alpha * + F'F\hat{\alpha}) \quad (5)$$

where:

$\hat{\alpha}$- estimated α

$v_1 = T + v_0$

$\hat{\alpha} = (F'F)^{-1}F'Y$

$$s_1^2 = \frac{1}{v_1}[v_0 s_0^2 + Y'Y + \alpha *' M\alpha * - \bar{\alpha}'(M + F'F)\bar{\alpha}]$$

Diebold and Pauly (1990) demonstrated the validity of the relationship for the g-prior analysis (M=gF'F):

$$\bar{\alpha} = \frac{g}{1+g}\alpha * + \frac{1}{1+g}\hat{\alpha} \quad (6)$$

$g \in [0, \infty)$ represents the shrinkage parameter. It controls the relative weight based on a maximum likelihood estimator and the prior average in the posterior mean.

Wright (2008) used zero weight as the prior mean, but Diebold and Pauly (1990) previously used equal weights. Geweke and Whiteman (2006) built the prior distribution in Bayesian forecasting by using the experts' forecasts. In this current study, our prior weights are represented by the estimated coefficients of the regression between the h-step predictions of the experts $f_{t/t-h}^{expert}$ and the forecasts using various econometric models. In our case, the prior mean is:

$$f_{t/t-h}^{expert} = \alpha_t' f_{t/t-h} + \varepsilon_t \rightarrow \alpha *_t = (F'_{t-w+1,t}, F_{t-w+1,t})^{-1} F'_{t-w+1,t} F_{t-w+1,t}^{expert} \quad (7)$$

where:

$$F_{t-w+1,t} = (f_{t-w+1/t-h-w+1}, \dots, f_{t/t-h})'$$

$$F_{t-w+1,t}^{expert} = (f_{t-w+1/t-h-w+1}^{expert}, \dots, f_{t/t-h}^{expert})$$

$f_{t/t-h}^{expert}$ – prior mean of experts' forecasts;

$F_{t-w+1,t}^{expert}$ – vector of experts' forecasts.

In the case of non-stationary data series, Coulson and Robins (1993) employed a linear model to build the combination technique:

$$y_t - y_{t-h} = \alpha' \widetilde{f_{t/t-h}} + \varepsilon_t \quad (8)$$

$$\tilde{f}_{t/t-h} = (1, f_{t/t-h}^1 - y_{t-h}, \dots, f_{t/t-h}^m - y_{t-h})' \quad (9)$$

$f_{t/t-h}^{expert} - f_{t-h/t-2h}^{expert} = \alpha_t' \bar{\bar{f}}_{t/t-h} + \varepsilon_t$, where $\bar{\bar{f}}_{t/t-h} = (1, f_{t/t-h}^1 - f^{expert}{}_{t-h/t-2h}, \dots, f_{t/t-h}^m - f^{expert}{}_{t-h/t-2h})'$ (10)

In Table 1, the extreme cases of the posterior mean used by Coulson and Robins (1993) are indicated.

Table 1: Posterior mean of the extreme cases using the method of Coulson and Robins (1993)

Prior	g→∞
Experts' forecasts	Experts' weights
Equal weights	Equal weights
Zero weights	Random walk weights

Source: own calculations.

For zero weights prior, when g tends to infinity, the posterior mean is actually a zero-weight vector. This implies a naïve forecast. The Bayesian approach with equal and zero weights priors supposes that the combination uses the forecasters' expectation as covariate.

4. Bayesian combined forecasts for the inflation rate in Romania

The experts' forecasts that are employed in this study are based on the Dobrescu macro-model for the Romanian economy. We will use the available data for inflation rate forecasts from 1997 to 2018. The data are organized into two samples. The first sample (1997-2015) is used to estimate the forecast combination model, while the second sample (2016-2018) is used in assessing the accuracy of predictions based on individual models and on a combination of models.

Romania's transition from the planned economy to the market economy was marked by high inflation rates. According to Dobrescu (2009), in the transition process downward price rigidity had a huge role, but the influence of the other determinants of inflation were, indeed, decisive. In his macromodel, Dobrescu (2009) computed sectoral prices indices under the hypothesis of zero inflation. The author calculated minimal price indices that represent lower prices at which the production might be sold. These minimal price indices are provided by taking into account the suppliers' behaviour and real price indices.

A short presentation of the evolution of the inflation rate in Romania will be made to understand the importance of inflation evolution for the overall economy and the necessity to predict it for the elaboration of the macroeconomic policies. The evolution of inflation rate (%) in Romania based on monthly average in the period 1991-2018 can be observed in Figure 1, the data being provided by National Institute of Statistics from Romania. The necessity of providing the most accurate forecasts for inflation might be explained by the National Bank of Romania strategy in the context of inflation targeting that was introduced since 2005. The Central Bank proposed to maintain the inflation rate under the level of 10%. This criterion is in connection with other objectives of the National Bank: the consolidation and increase in the credibility of the Central Bank, fiscal consolidation, gain in independence and transparency, exchange rate flexibilization, a better prediction of macroeconomic behaviours and of mechanisms that ensure the evolution of the economy.

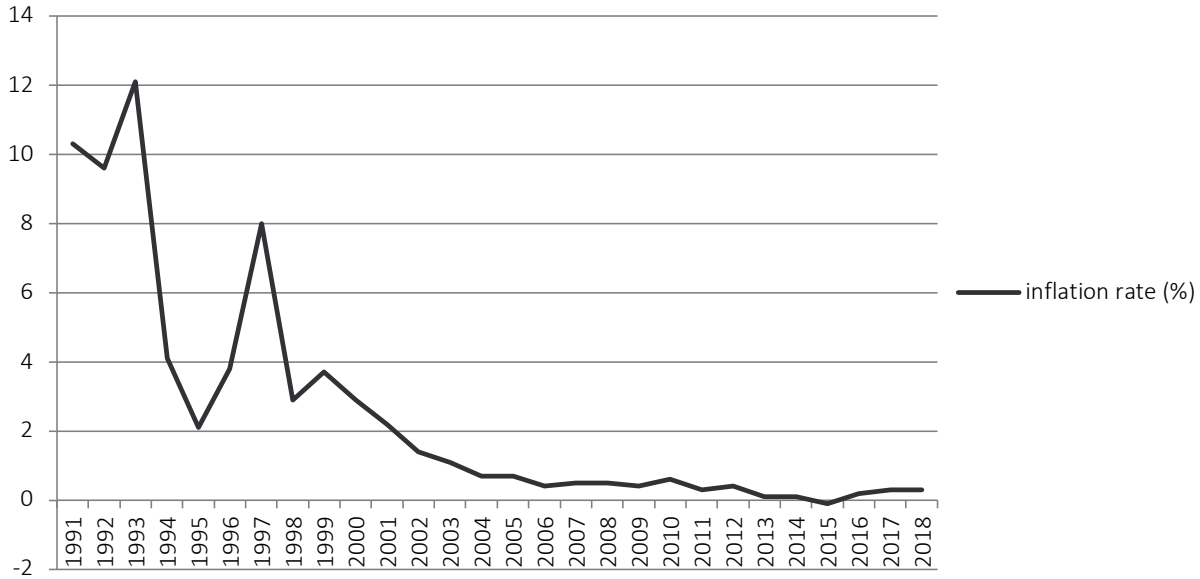

Figure 1. The evolution of inflation rate (%) in Romania based on monthly average (1991-2018)
Source: own calculations

In the 1990s, inflation was one of the main instability factors in the Romanian economic environment because of its volatility and high level. In this context, inflation forecasting and the associated costs coverage were difficult to make. The economy was characterized by persistent shocks in aggregate demand and supply which generated, in first transition years, the transformation of corrective inflation into structural inflation that might be controlled only if the monetary policy is correlated with the other macroeconomic policies. In the 1990s, the high level of inflation and its oscillations were explained by: the consequences of late restructuration of the economy, the interruptions of applied measures for stabilization, large fiscal indiscipline and inadequate wage policies. In the period between 1991-1993, inflation increased in the context of prices liberalization and fiscal reforms, achieving a maximum level in 1993 (the annual average inflation rate of more than 256%). In 1994, inflation reduced amid the resumption of economic growth and prices reforms temporizations. The economic growth reinforcement under the old structures did not bring long-run positive effects and inflation reignited in 1997 in the last phase of prices liberalization. The inflation expansion continued in 1998 and 1999 in an economic environment marked by economic decline, VAT increase, exchange rate depreciation and increases in prices for public services.

In 2000, together with the economic recovery, a new process of disinflation started, with consumer prices decreasing by 14 percentage points. In the next two years, the disinflation process accelerated and in 2003 a stagnation of disinflation was observed in the context of tensions in supply and pressures generated by consumption increase. In the next years, until 2006, the inflation rate registered a tendency of decrease, even more than expected in 2006. In 2004, the national currency appreciation, the more pronounced tendency for saving and restrictive fiscal policies sustained the disinflation process, even if the growth in consumption

and an average brute salary as well as arrears accumulation acted in the opposite sense. In 2005, the disinflation was encouraged by the national currency appreciation with respect to euro and the decrease in the dynamics of administered prices. The disinflation intensified in 2006 under the base component reduction, changes in volatile prices and a higher competition on retail market. In 2007, the volatile prices evolution and fast appreciation of national currency in nominal terms accelerated the inflation evolution. Since 2007, the inflation has changed its trajectory, with the increases in prices being attributed to: unexpected increase in the volatile prices of agricultural products, rise in the prices of some foods, exchange rate adjustment when the demand was in excess. In 2008, the inflation pressure was generated by the shocks in supply (tensions on the agri-food market, rise in the prices for agricultural import of raw materials and unprocessed products) and in demand (rise in fuel and natural gas prices). Since August 2008, these factors have begun to diminish their influence, but the demand-side effects of fiscal policy relaxation, the laxity of wage policy, the expansion of lending activity persisted.

The severe economic contraction in 2009 in Romania characterized by persistent structural rigidities on the labour market and the production market diminished the rhythm of prices reduction. In 2010, the influence of the external prices increase in the context of the global demand decrease were strongly felt on volatile food prices. In 2011, the inflation rate suddenly decreased due to volatile food prices. An unexpected increase in prices was registered in 2012 because of the internal and international shocks in supply, especially increases in the prices of vegetal raw materials. The shocks in demand (persistence of demand deficit) were represented by changes in oil prices, the exchange rate for RON/euro and adjustments in administered prices. In 2013, the inflation rate enrolled on a pronounced descendent trajectory due to the end of the effects of supply shocks and the persistence of demand deficit correlated to a good agricultural year and reductions in V the VAT rate for some bakery products. The low level of inflation in 2014 was ensured by the relative stable evolution of the exchange rate against euro and the lack of pressures on external prices. The prices decline in 2015 was explained by reduction in the VAT rate and demand deficit, the mitigation in import prices dynamics and reduction in oil prices on international markets. In 2016, the reduction in the VAT rate at the beginning of the year and the first signals from the external environment regarding the dissipation of disinflation determined an attenuation in the inflation decline in the third quarter of 2016. However, global evolution of the inflation rate in 2016 indicated a consistent disinflation. In the second quarter of 2017, the prices grew because of the pressures on a constant increase in production costs. The consumer price evolution was adjusted as to take into account the effects of fiscal changes in the first 2 months of 2017 (lower standard VAT tax, elimination of overcharging for fuels and of some non-fiscal taxes). The evolution was mainly due to exogenous factors in the context of the liberalization for natural gas intern production price and the consistent support for electric energy production based on renewable sources. The ascending trajectory accentuated in the last quarter of 2017 due to supply shocks such as growth of electricity price on the local concurrence market, increase in the price of aliments and higher excise duty on fuels. In the second quarter of 2018, the inflation rate in Romania registered the maximum value in the last five years. In September 2018, inflation reduced due to exogenous components.

The forecasters anticipated an increase in the inflation rate in Romania in the next years based on the increase in the excess of aggregate demand, more expansionist fiscal policy, increase in the disposable income and more encouraging real monetary conditions.

Some accuracy measures are calculated for comparing the forecasts accuracy (U1Theil's statistic, U2 Theil's statistic, root mean square error (RMSE), mean error (ME), mean absolute error (MAE)). Some individual econometric models are built to forecast the inflation rate in Romania using data series for the inflation rate, unemployment rate and exchange rate in the period between 1991-2013. These models are used to make predictions for the inflation rate over the horizon of 2014-2016. According to the Augmented Dickey-Fuller test and Phillips-Perron test, the data for inflation rate and unemployment rate are stationary in the first difference (d_inflation and d_unemployment), while the data for an average RON/Euro exchange rate are stationary in the second difference at 5% level of significance.

The Phillips curve cannot be identified using data series from the Romanian economy. A valid simple linear model was built on stationary data:

$$d\_inflation_t = -7.363 + 6.877 \cdot d\_unemployment_t \quad (11)$$

For eliminating the disadvantage of a small set of data, the parameters were estimated by

bootstrapping, when the residuals are resampled using 10 000 replications:

$$d\_inflation_t = -7.382 + 6.9 \cdot d\_unemployment_t \quad (12)$$

At each increase with one per cent in the variation unemployment rate, the absolute change in the inflation rate increases by 6.9 percentage points. The Durbin-Watson tests and Breusch-Godfrey test for a lag equalled to 1 indicated errors' independence. The residuals are homoscedastic, as the White test showed.

A multiple regression model is built, adding as explanatory variable of the RON/euro average exchange rate. The multiple regression model is built using bootstrapped coefficients. The errors are homoscedastic (prob. corresponding to the White test is 0.301) and the auto-correlation is ignored.

$$inflation_t = -98.125 + 21.22 \cdot unemployment_t - 74.94 \cdot d\_excange\ rate_{t-1} \quad (13)$$

There is a negative correlation between inflation and variation in the exchange rate in Romania. The principal forces behind the national currency depreciation were unfavourable business conditions of the domestic market and lower inputs of capital.

There is a positive correlation between inflation and unemployment in Romania. The unemployment rate was significantly lower in the last years in Romania having direct implications for inflation slowing.

A simultaneous equations model is considered:

$$inflation_t = a + b\ unemployment_t + c\ exchange\ rate_t + u_t \quad (14)$$

$$exchange\ rate_t = d + e\ exchange\ rate_{t-1} + v_t \quad (15)$$

$exchange\ rate_t$ – real exchange rate at moment t

$inflation_t$ – inflation rate at moment t

$unemployment_t$ – unemployment rate at moment t

$unemployment_t, exchange\ rate_t$ – endogenous variables

$unemployment_t, exchange\ rate_{t-1}$ – exogenous variables

The type of the simultaneous equations model is fixed for choosing the most suitable model. The model is over identified, because the first equation is exactly identified and the second equation is over identified. The first equation is exactly identified, because the number of missing variables is 1, a number that equals the number of endogenous variables minus 1 (2-1=1). The second equation is over identified, because the number of missing variables in the second equation is greater than the number of endogenous variables minus 1 (2-1=1). In the case of the over identified model, the estimation method used is two stages ordinary least squares.

Stage 1: the endogenous variable *exchange rate*$_t$ (the endogenous variable in the second equation and exogenous one in the first equation) is regressed using the exogenous variables in the model ($unemployment_t$, $exchange\ rate_{(t-1)}$).

$$exchange\ rate_t = \alpha + \beta\ unemployment_t + \gamma\ exchange\ rate_{t-1} + w_t \quad (16)$$

According to the F test, the coefficients of independent variables are statistically significant. The Breusch-Godfrey test indicated that the errors are independent.

Stage 2: The estimated values of *exchange rate*$_t$ are introduced in the first equation.

$$inflation_t = a + b\ unemployment_t + c\ \widehat{exchange}\ rate_t + u_t \quad (17)$$

For the ARMA model, stationary data of the inflation rate are used. The best model for first differentiated inflation rate is an ARMA(1,1).

$$d\_inflation_t = -6.8813 - 0.4415 \cdot d\_inflation_{t-1} + 0.55 \cdot \varepsilon_{t-1} + \varepsilon_t \quad (18)$$

According to Figure 2, the inverse roots are inside the unit circle.

According to the White test, the errors are homoscedastic. We do not have reasons to reject the hypothesis of homoscedasticity (Prob. is 0.346, greater than 0.05). The study of the correlogram shows that the errors are independent. The Jarque-Bera test indicates that there is not enough evidence to reject the normality distribution of errors (the JB test statistic is 0.43, lower than the critical value of 5.99).

A vector-autoregressive model (VAR model) is built on stationary data series, the data series for inflation and the unemployment rate being differentiated once while the data for exchange rate were differentiated twice. Most of the

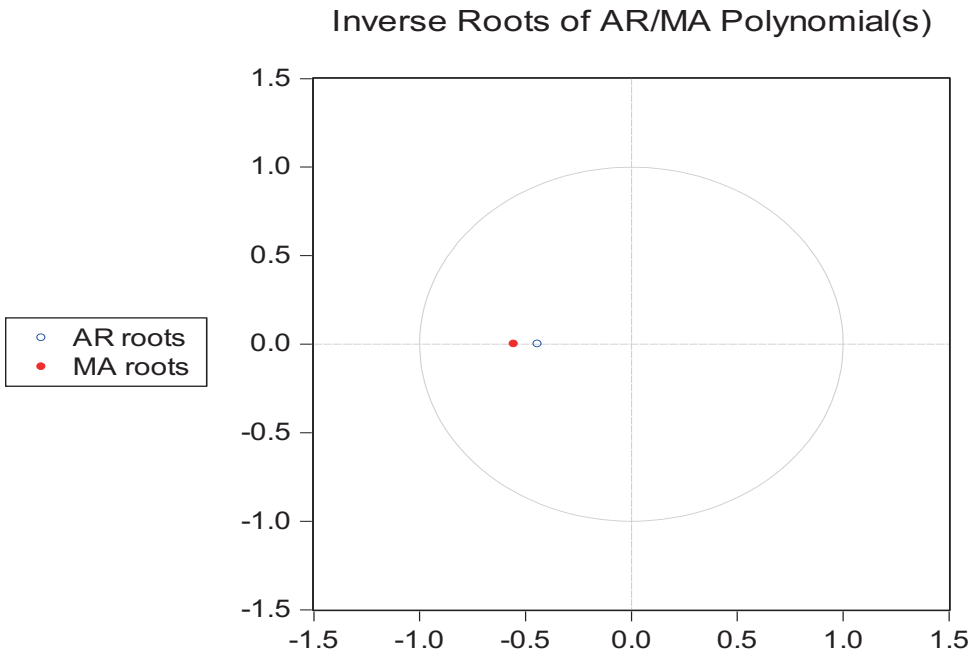

Figure 2. The inverse roots of ARMA(1,1)
Source: own calculations

selection criteria indicated a lag of 1. The Portmanteau test indicates error independence. Moreover, the errors are homoscedastic (prob. is 0.6514 which is greater than 0.05).

Four scenarios are used for making predictions of the variables in the first difference: baseline scenario S1 (dynamic and determinist simulation), baseline scenario S2 (static and determinist simulation), baseline scenario S3 (dynamic and stochastic simulation) and baseline scenario S4 (static and stochastic simulation). These scenarios are utilized to forecast the original variables over the horizon of 2014-2016 and are presented in Table 2.

For the unemployment rate in Romania, the best forecasts were provided by two scenarios: S1 and S3 scenarios. For the inflation rate in 2016, all the scenarios indicated deflation which did not happen in reality, but in 2017 and 2018 a slow deflation process was observed in Romania. S1 scenario was the best prediction for the inflation rate, if we consider only the scenarios based on VAR(1) model. All in all, there were not any significant differences between inflation rate scenarios based on VAR model.

The variance decomposition shows that inflation volatility is mostly due to the evolution of this indicator, but its influence decreases in time, from lag 1 to 10. Till the lag 3, the unemployment rate volatility is explained by the inflation influence, but then, till the end, the contribution of the exchange rate is more significant, more than 50% of the unemployment volatility being explained by the exchange rate. For the exchange rate, more than 65% of its volatility in each period is explained by the same indicator, even if the unemployment rate has a rather high influence (more than 32% in each period). The unemployment rate is a cause of inflation evolution, while overall the exchange rate and the unemployment rate influence the inflation rate. According to the Granger causality test, inflation and the exchange rate influence the unemployment evolution.

In the case of a shock in inflation, immediately after the shock, only the inflation rate changes, the variations in unemployment rate

Table 2: Forecasts for the inflation rate (i) (%) and unemployment rate (u) (%) using VAR(1) models (horizon 2016-2018)

Year	S1		S2		S3		S4	
	i	u	I	U	I	u	i	u
2016	-1.89	5.53	-1.89	5.4	-2.02	5.55	-1.95	5.51
2017	-1.75	5.06	-1.98	5.14	-2	5.4	-1.84	5.3
2018	-1.25	4.71	-1.88	4.74	-1.98	5.03	-1.82	5

Source: own calculations.

and exchange rate not being explained by these shocks. In the second period after that shock in inflation, 75.37% of the changes in inflation, 24.55% of the changes in unemployment and 0.07% of the changes in exchange rate are due to that shock. Only after three periods, 2.85% of the changes in exchange rate are due to a shock in inflation rate. After 4 periods, the influence of the inflation rate shock on unemployment changes became stable with a contribution of around 23.8%. In conclusion, according to variance decomposition, we can state that the inflation rate in Romania is most sensitive to direct shocks in inflation that could be controlled by the National Bank. However, a significant contribution in the inflation changes is due to the unemployment variation. In this case, the inflation rate is less sensitive to the exchange rate compared to unemployment. Therefore, for achieving price stability more attention should be attributed to the issues of the labour market than to the exchange rate control.

Bayesian VAR models were also built (BVAR(1) models) based on Minnesota and non-informative priors. These Bayesian models with intercepts are used to construct direct and repeated predictions. The impulse-response analysis is made by adapting the Matlab program of Koop and Korobilis (2010) using stationary data sets for the inflation rate, unemployment rate and exchange rate.

The BVAR model is written as: Y(t) = X(t) x A + e(t), where e(t) ~ N(0,SIGMA),A- vector with coefficients.

The data are represented as a matrix of dimensions T*M (T- number of observations, M-number of variables). The X matrix includes all the variables (intercept, dependent variables with lag, exogenous variables). In Table 3, we have the inflation rate forecasting based on BVAR(1) models with intercept over the horizon of 2016-2018.

In the case of direct forecasts using non-informative priors and repetitive forecasts using the Minnesota priors, a decrease in the inflation rate is observed from one year to another in the period between 2016-2018. The deflation process specific to 2015 and 2016 was not reflected by the forecasts based on BVAR models.

Another type of models was built to make forecasts for the inflation rate in Romania: a panel data approach. The data used in the model consist unregistered values of the inflation rate and the unemployment rate in Romania and the forecasts provided by experts: the Dobrescu model, the National Commission for Prognosis and the European Commission during 2001-2018. The panel data regression model is written as:

$$inflation_t = c + b \cdot prediction\_inflation_{it} + d \cdot prediction\_unemployment_{it} + e \cdot unemployment_t + a_i + \varepsilon_{it} \quad (19)$$

$inflation_t$ – actual inflation rate at time t

$unemployment_t$ – actual unemployment rate at time t

$prediction\_i_{it}$ – inflation rate forecast of expertiat time t

$prediction\_u_{it}$ – unemployment rate forecast of expertiat time t

a_i – individual effects

ε_{it} – random error

After more estimations, we decided that a fixed effects model is more suitable. Individual predictions based on econometric models were used in building combined forecasts. The shrinkage parameters took the values 0, 1 and g→∞. The prior is based on experts' forecasts, but we also employed zero-weight and equal-weight priors.

Moreover, Monte Carlo simulations were conducted in R software to provide scenarios for the inflation rate in Romania, under the subjective hypothesis that the expected annual increase will be 10% and the volatility will be

Table 3: Forecasts of the inflation rate (%) using BVAR(1) models with intercept (horizon 2016-2018)

Prior	Years	Direct forecasts	Repetitive forecasts
Non-informative prior	2016	1.3	2.06
	2017	1.01	1.18
	2018	0.56	086
Minnesota prior	2016	1.45	1.73
	2017	0.95	1.4
	2018	1.2	1.3

Source: own calculations.

20%. The initial inflation rate that is introduced in the model is the level from December 2014 (1.1%).

In Table 4, we have the measures of forecast accuracy for inflation rate forecasts in Romania. The first part of the table refers to individual models, followed by combined models. The predictions performance is dependent on the range of the shrinkage parameter g and the window size. According to the value of the mean error, the combined forecasts based on g→∞ and experts' predictions as prior presented the lowest errors in average. Other accuracy measures such as the absolute mean error, root mean squared error and U1 Theil's coefficient confirmed that these combined predictions had the best performance. Moreover, the U2 coefficient is less than 1, which indicates that these forecasts are better than naïve predictions. The experts' forecasts proved to be more informative. In the group of combined forecasts with g=0, the equal weights forecasts were the best,

Table 4: Measures of forecast accuracy for one-year-ahead inflation rate predictions in Romania (2016-2018)

Type of models	ME	MAE	RMSE	U1 Theil's statistic	U2 Theil's statistic
Individual models					
Simple linear model	7.62	7.62	4.42	0.83	3.81
Dynamic model	6.45	6.45	3.35	0.74	3.02
Simultaneous equations model	5.14	5.14	3	0.68	2.54
ARMA model	5.19	5.19	3.02	0.79	2.61
S1 scenario using VAR(1) model	1.30	1.46	1.07	0.67	0.92
S2 scenario using VAR(1) model	1.58	1.58	1.10	0.63	0.95
S3 scenario using VAR(1) model	1.67	1.67	1.15	0.64	0.99
S4 scenario using VAR(1) model	1.54	1.54	1.10	1.69	0.95
BVAR(1) model based on non-informative prior- direct forecasts	-1.29	1.29	0.87	0.71	0.75
BVAR(1) model based on non--informative prior- repetitive forecasts	-30.08	30.08	29.17	0.99	25.15
BVAR(1) model using Minnesota prior- direct forecasts	-1.53	1.53	1.04	0.77	0.90
BVAR(1) model using Minnesota prior- repetitive forecasts	-1.81	1.81	1.17	0.77	1.01
Fixed effects model1	1.25	1.21	1.55	0.17	1.16
Fixed effects model2	-2.54	2.56	2.90	0.25	0.57
Fixed effects model3	-0.84	1.34	1.54	0.15	1.22
Combined models					
g=0					
Prior: Experts' predictions	1.33	1.33	1.64	0.19	0.99
Prior: Equal weights	-0.38	0.88	1.09	0.12	1.32
Prior: Zero weights	1.68	1.68	2.09	0.17	0.83
g=1					
Prior: Experts' predictions	-1.25	1.25	1.45	0.13	0.99
Prior: Equal weights	-3.97	3.97	3.45	0.30	0.37
Prior: Zero weights	-0.24	1.2	1.12	0.1	1.22
$g\to\infty$					
Prior: Experts' predictions	-0.11	0.65	0.78	0.07	0.65
Prior: Equal weights	-2.3	2.3	2.5	0.21	0.78
Prior: Zero weights	0.75	0.75	1.22	0.12	1.28
Model based on Monte Carlo simulations	-0.1	0.64	0.8	0.08	0.69

Source: own calculations.

while in the case of predictions with g=1, zero weights forecasts are the most accurate. All in all, for g→∞, the experts' combined predictions outperformed all the proposed forecasts based on individual and combined models. The result is in line with the expectations. The subjective information given by the experts is based on a large experience from practice which is well combined with the objective forecasts based on econometric models. The experts proved that they anticipated the sense of evolution well the in case of the inflation rate, but they have problems with the magnitude of the changes from one year to another. Moreover, the scenarios based on Monte Carlo simulations performed better than all the other predictions in terms of the mean error and the mean absolute error.

Our results which proved the superiority of the forecasts that use experts' expectations as prior are in line with the results of Diebold and Pauly (1990) and Gomez et al. (2012). These combined forecasts proved to be better than those predictions using simple econometric models. Using these improved forecasts for the inflation rate, we may have a clear image of the future measures for monetary policy and for the steps that should be made in achieving the criteria for the entrance to the eurozone. According to converge criterion related to prices stability, the inflation rate should not be by 1.5 percentage points higher than the rate of the first three countries in the eurozone with the lowest inflation. Romania faces difficulties in achieving this criterion because the country struggles with the inability to pay caused by non-performing loans, which ruined the banking system. Losses of billions of euro were then taken over to the state budget from the former Bancorex and the former Bank agricultural. In the actual context of turbulences generated by COVID-19, the National Bank of Romania decided to decrease the interest rate monetary policy by 0.5 percentage points. The governments' measures to face the recession caused by COVID-19 by offering liquid money to population will generate high inflation that should be anticipated and alternative methods should be taken to alleviate the negative effects.

5. Conclusions

In this study, starting from inflation predictions based on individual models, we proposed different Bayesian forecasts combinations. Then, we checked if these combined forecasts succeeded in improving the initial forecasts.

As a novelty for the economic literature in Romania, the Bayesian combinations were constructed using as prior the experts' expectations. This research is based on forecasts using the Dobrescu macromodel and the expectations of the European Commission and National Commission for Prognosis. The shrinkage parameter g had more values (0, 1 and g→∞). The one-step-ahead inflation forecasts were made for a period of 3 years (2016-2018). For Romania, we proved on empirical data that the Bayesian combined forecasts using experts' predictions as priors, when the shrinkage parameter tends to infinity, improved the accuracy of the predictions based on individual models. However, the predictions based on the Monte Carlo simulation outperformed all the scenarios in terms of the mean error and the mean absolute error. Our research is limited by the fact that the results are dependent on the types of the forecasts and on the window size. Moreover, a short horizon was considered due to the limited availability of data in the sample used in the estimations. In future research, a larger horizon should be considered and more experts' forecasts will be added.

The VAR analysis indicated that the inflation rate in Romania proved to be more sensitive to changes in unemployment rather than changes in exchange rate. The issues on the labour market should be a priority for the government in order to achieve prices stability. We recommend the use of econometric models that link inflation with unemployment and their utilisation for predictions. These simplistic models provide good forecasts, but a Bayesian combination that uses experts' expectations as priors should be considered in elaborating better the inflation rate forecasts in Romania.

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References

Armstrong, J. S. (2005). *The Forecasting Canon: Nine Generalizations to Improve Forecast Accuracy*. International Journal of Applied Forecasting, 1, 29-35. Available at SSRN: https://ssrn.com/abstract=868496

Atkeson, A., & Ohanian, L. E. (2001). *Are Phillips curves useful for forecasting inflation?* Federal Reserve Bank of Minneapolis. Quarterly Review-Federal Reserve Bank of Minneapolis, 25(1), 2-11.

Baciu, I. C. (2015). *Stochastic Models for Forecasting Inflation Rate. Empirical Evidence from Romania*. Procedia Economics and Finance, 20, 44-52.

Budina, N., Maliszewski, W., De Menil, G., &Turlea, G. (2006). *Money, inflation and output in Romania*, 1992–2000. Journal of International Money and Finance, 25(2), 330-347.

Coulson, N., Robins, R. (1993). *Forecast combination in a dynamic setting*, Journal of Forecasting, 12, 63-67.

Diebold, F.X., Pauly, P. (1990). *The use of prior information in forecast combination*. International Journal of Forecasting, 6, 503-508.

Dobrescu, E. (2009). *Measuring the Interaction of Structural Changes with Inflation*. Journal for Economic Forecasting, 6(5), 5-99.

Dobrescu, E. (2017). *Modelling an Emergent Economy and Parameter Instability Problem*. Journal for Economic Forecasting, 20(2), 5-28.

Dritsakis, N. (2004). *A causal relationship between inflation and productivity: An empirical approach for Romania*. American Journal of Applied Sciences, 1(2), 121-128.

Furtula, S., Durkalić, D., & Simionescu, M. (2018). *Testing Phillips Curve for Serbian and Romanian Economy*. Romanian Statistical Review, 3(2018), 40-51.

Geweke, J., Whiteman, C. (2006). *Bayesian forecasting*, Handbook of economic forecasting, 3-80.

Gomez, M.I., Gonzalez, E.R., Melo, L.F. (2012). *Forecasting food inflation in developing countries with inflation regimes*. American Journal Of Agricultural Economics, 94, 153-173.

Gordon, R. J. (1990). *The Phillips curve now and then* (No. w3393). National Bureau of Economic Research.

Gordon, R. J., & Stock, J. H. (1998). *Foundations of the Goldilocks economy: supply shocks and the time-varying NAIRU*. Brookings papers on economic activity, 1998(2), 297-346.

Granger, C.W.J., Ramanathan, R. (1984). *Improved methods of combining forecasts*. Journal of Forecasting, 3, 179–204.

Julio, J.M., Bratu Simionescu, M. (2013). *The evaluation of forecasts uncertainty for rate of inflation using a fan chart*. Journal of Economic Computation and Economic Cybernetics and Research, 2, 115-128.

Koop, G., Korobilis, D. (2010).*Bayesian Multivariate Time Series Methods for Empirical Macroeconomics*, http://personal.strath.ac.uk/gary.koop/kk3.pdf.

Koop, G., Potter, S. (2003). *Forecasting in large macroeconomic panels using Bayesian model averaging*. Staff report 163, Federal Reserve Bank of New York.

Liao, Y. (2014), *Inflation Forecast Literature Review 1969-2013*, SSRN 2444121, available online at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2444121.

Mihai, N. D., Cristina, S. M., Lucian, B., Lucia, C., & Gabriel, I. (2016). *Inflation in Romania and its evolution in view of accession to the eurozone*. Journal of Information Systems & Operations Management, 1.

Poncela, P., Rodríguez, J., Sánchez-Mangas, R., &Senra, E. (2011). *Forecast combination through dimension reduction techniques*. International Journal of Forecasting, 27(2), 224-237.

Simionescu, M. (2014). *The Performance of Predictions Based on the Dobrescu Macromodel for the Romanian Economy*. Journal for Economic Forecasting, (3), 179-195.

Sovbetov, Y., & Kaplan, M. (2019). *Empirical examination of the stability of expectations-Augmented Phillips Curve for developing and developed countries*. Theoretical & Applied Economics, 2(2), 63-78.

Stock, J. H., & Watson, M. W. (2007). *Why has US inflation become harder to forecast?* Journal of Money, Credit and Banking, 39(s1), 3-33.

Terceno, A., Vigier, H. (2011). *Economic – Financial Forecasting Model of Business Using Fuzzy Relations*. Journal of Economic Computation and Economic Cybernetics and Research, 1, 215-233.

Tian, J & Zhou, Q 2013, *Predictability of technical analysis: a combination approach*, The 33th International Symposium on Forecasting 2013, Seoul, Coreea, 23-26 June 2013, http://forecasters.org/isf/submissions/proceedings/

Timmermann, A. (2006). *Forecast combination*. Handbook of economic forecasting, 135-196.

Velandia, L. F. M., Maya, R. A. L., & Villamizar-Villegas, M. (2014). *Bayesian Combination for Inflation Forecasts: The Effects of a Prior Based on Central Banks' Estimates* (No. 012323). BANCO DE LA REPÚBLICA.

Wright, J.H. (2008). *Bayesian model averaging and exchange rate forecasts*. Journal of Econometrics, 146, 329-341.

Zellner, A. (1986). *On assessing prior distributions and Bayesian regression analysis with g-prior distributions*. Journal of Econometrics, 40, 183-202.

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Risk management system references in construction

Volodymyr Tkachenko[1], **Maryna Klymchuk**[2], **Iryna Tkachenko**[3], **Tetiana Ilina**[4]

[1, 2] Kyiv National University of Construction and Architecture, Ukraine
[3] Academy of the State Penitentiary Service, Ukraine
[4] Kyiv National University of Construction and Architecture, Ukraine

ABSTRACT

The article examines the basic methods of risk management in construction: risk aversion, localization, dissipation, compensation. The methods are adapted to the specificity of construction companies, taking into account the main directions of their development. For the purpose of effective risk management, formalized functional structuring of risk management in construction is proposed, which will enable the implementation of management functions at two levels – executive and coordinating, with the help of a special structural component in the enterprise management system or a specialized unit in the organizational structure..

Keywords: construction, risk management, dissipation, localization.

1. Introduction

Risk management in construction is carried out through the preparation and implementation of measures aimed at reducing the risk of making false decisions and reducing possible negative consequences of undesirable development based on the results of the decision-making process. To ensure sustainability and competitiveness of construction enterprises, operating in a dynamic market economy and anticipation of risks of industrial and commercial activities, there is a need to develop and implement an effective organizational and economic risk management system in construction.

Efficient operation in construction depends on the ability to assess the situation, prepare and implement a range of measures to reduce and prevent the occurrence of risks. In this connection, most typical for the construction industry are the following risks: violation of the building process, disposal of fixed assets, reduction of qualitative indicators; risk of changing currency rates and prices, inflation and competition.

2. Literature review

General concepts of risk and uncertainty are considered in the works of foreign economists, e.g. Bernard, Pelley, Haley (2003). Additionally, scientists Gerasimova and Avdeyeva (2015) analyse in their work the issues of classification and the prospect of formation of an effective risk management system. Ratushniak outlines in his research work the methods of management based on qualitative and quantitative risk assessment of innovative energy-saving projects in construction (2010). In his writings, Kloman notes that the new step of risk research is "comprehensive, strategic, holistic or enterprise risk management", because it is based on the idea „to consider risks holistically rather than separately as [it] was previously [done]" (Kloman, 2000).

The authors (Mishra, Kumar, Joshi & D'souza, 2018) have conducted a thorough study of the problems of financial risks in the implementation of energy efficient projects. Within this framework, the authors have investigated a possibility of attracting additional financial

resources for the implementation of energy saving measures through the issuance of municipal bonds and compensatory financing based on deferred tax payments (Tax Increment Financing-TIF).

The study of local borrowing practices in Ukraine has shown the fragmentation of the existing system. However, by providing appropriate regulatory framework and considering the experience of other countries, the development of the local borrowing market can be a source of financial resources for the implementation of energy saving projects.

According to the results of the study of the financial countervailing technology – Tax Increment Financing (TIF), the authors (Tkachenko, Klymchuk, Ivakhnenko, Ploska, 2018) have provided suggestions for the formation of an investment mechanism for enterprises – institutional participants of the construction energy cluster, the structure of which was extracted by levers, tools, methods of financing energy saving measures; additionally, the focal point of the construction energy cluster has been identified and the participants in this integration formation have been suggested.

Chernyshev (2018) analyzed the modern practice of urban constructive innovations, which is based on the principles of biosphere compatibility. The authors analyze the project solution of providing organizational and technological reliability of construction from the point of view of the possibility of realizing the functions of a biosphere compatible city and introducing innovative constructive, architectural and planning solutions. In relation to the construction project, the formalization of the methodology for calculating the indicators of the biosphere compatibility of cities and settlements, the quantitative indicators of the implementation of the functions of the city are determined. The obtained results of numerical analysis of the realization of city functions can predict the development of urban areas, assess the comfort and safety of the urban environment from the standpoint of biosphere compatibility of construction objects in order to harmonize the characteristics of the life cycle of these projects with the characteristics of the microenvironment of their implementation. The basis of such tools is: multifactorial, multicomponent modeling and multicriterial selection of alternatives for building construction projects, provided that the level of biosphere compatibility is used as the leading analytical coordinate of such simulation. These models, implemented in the format of modern construction, will serve as a basis for organizational, technological and environmental expertise of projects.

In modern conditions, what is relevant are the studies investigating the implementation of a comprehensive approach to the prevention of risks in construction because it is presented only fragmentarily. Effective risk management practices in the construction sector of our country's economy are also insufficiently investigated. The need to explore and resolve issues related to the formation of the risk management system in construction determined the direction and structure of scientific research.

3. Methodology

On the basis of the methodology of the system approach, risk management system references have been proposed in construction. The functional structuring of risk management in construction has been developed based on the principles of hieratical, integration, formalization, comprehensiveness and optimality. The study used the existing risk management techniques in construction, which made it possible to identify the conditions which were most adaptable to the market. To increase the efficiency reserve of risk management, the authors have proposed formalized and functional structuring of risks in construction with the possibility of its realization at the executive and coordination levels of management.

4. Results and Discussion

In the modern economic environment, construction companies use different methods of reducing risk levels that have a negative impact on the process of project implementation. In practice, four types of risk management methods are used (Gerasimova & Avdeyeva, 2015). (fig. 1): risk avoidance, localization, dissipation and risk compensation.

The methods of risk avoidance are most common in business practices, used by entrepreneurs who want to be confident in their actions.

Such managers reject the services of unreliable partners and work only with verified contractors – consumers and suppliers; they do not try to expand their range of partners. In construction, a list of such methods may be the following:

– refusal to conclude a contract;
– exclusion of risky situations during project realization;
– refusal of services from unknown or doubtful suppliers, which allows for reducing the risk.

The methods of risk localization are used in the cases where it is possible to clearly identify the sources of risk. By selecting the most economically dangerous stages, businesses or process activities, one can make it controllable, and thus reduce the final risk level for a construction company. The example of the localization method in the implementation of construction projects can serve as fencing the area of conducting particularly dangerous works, the construction of individual workshops and buildings for work with special equipment, capable of damaging valuable property, etc. Localization can also be carried out through preventive measures.

The methods of risk dissipation are more adaptive management tools and involve the allocation of overall risk by combining (with varying degrees of integration) with other stakeholders interested in the success of a joint business. A construction company has the opportunity to reduce the level of its own risks, attracting other enterprises as partners in solving common problems. Relying on general integration methods, we can allocate three main types of integration in order to reduce the risk:

- vertical integration – provides for the associations of a company with its suppliers (Visser & Malan, 2019). If the company creates a consortium with suppliers of equipment, building materials (or uses a different form of association), it will be possible to significantly reduce the cost of the project and re-allocate the appropriate funds for preventive measures or save them to increase the return on investment in the project;
- horizontal integration is combining the efforts of various organizations (competitors) for the implementation of any common goals (Mishra, Kumar, Joshi & D'souza, 2018). Such integration can be implemented in the form of the association, which is beneficial to create for a few construction companies to work on large projects. Investing a significant amount in the project of one customer for a period of about 5 years is a huge risk for any company. However, dividing the customer's objects into sectors can reduce this risk by dividing the work and liability with other participants;
- circular integration is a union of organizations that perform different activities to achieve common strategic goals. For example, a construction company can create a financial group in conjunction with the leasing organization or a bank. With this integration it will receive financing for construction projects, increasing its opportunities for project coverage and sharing project risks with its partners.

The second group of risk dissipation methods is diversification, which allows for increasing variations of cooperation with suppliers of materials, equipment, customers and territory on which projects are implemented. For the implementation of productive diversification risks, the company has to adapt the experience of insurance organizations in the field of risk management, associated with the redistribution of risks in space and time, as well as various services inside the company.

Based on the above presented approaches as well as the approaches of different authors (Visser & Malan, 2019), diversification is one of the risk management methods. We propose another version of risk management method in construction companies:

- diversification of the base of customers by types of activity and organizations;
- diversification of customers by size and scale of activity;
- diversification of suppliers of equipment, building materials.

Outsourcing certain business processes of construction projects.

A very important segment in the activity of the company is suppliers. If the funds are paid for equipment, and there is no actual supply of equipment for several months, or the equipment is delivered with defects and its replacement is necessary, then the settlement of all these issues will delay the time of project implementation and the economic return on the invested funds – diversification in time. Based on the experience of insurance activity, it is necessary to consider risk implementation in time. A rational solution would be to form some provision for the alignment of loss by years; diversification of energy-saving measures is the extension of the range of company services, the use of the latest information technologies in projects that will give the opportunity to reduce the risk of specific energy efficiency activities.

The presented group of risk management methods can be adapted to the activities of construction companies in accordance with the main directions of its development:

1. Strategic planning. Strategic planning in construction must be carried out for at least 5 years, first of all, due to the average duration of the construction of buildings – from 2 to 4 years. It is advisable for a construction company, to combine the work on some projects during this period in one general plan, which includes: a direct work plan at customer objects, a plan of preventive equipment inspec-

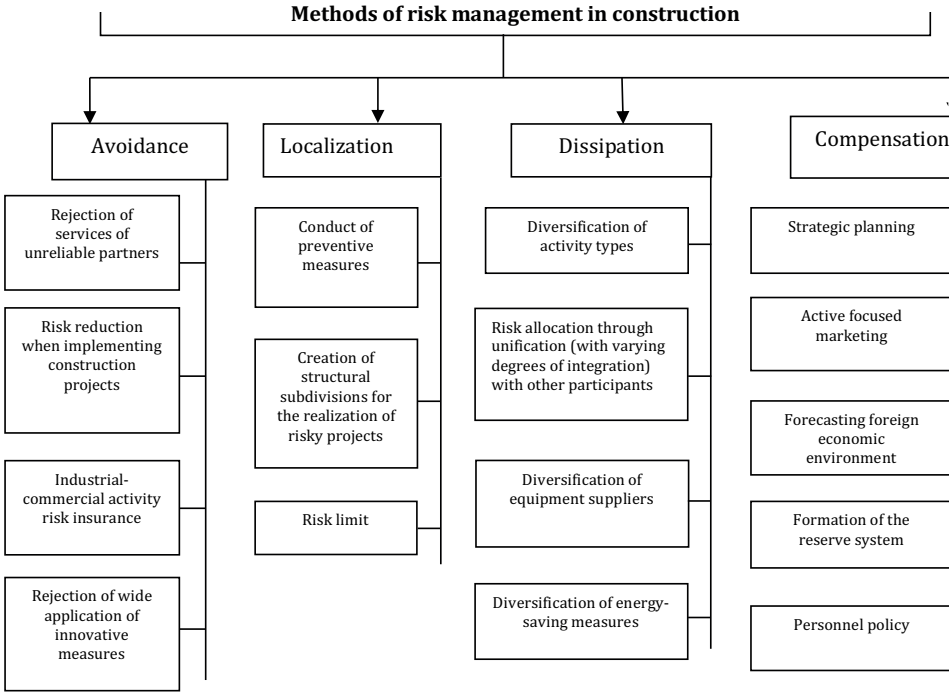

Figure 1. Risk management classification in construction
Source: based on (Kloman, 2000)

tion, an income and expense budget (to determine the cash flow for a given period of time and not to face the situation of lack of funds to calculate the obligations). Such a general plan provides an opportunity to achieve the goal of a construction company as a commercial organization and to ensure maximum involvement of labour and financial resources, to profit and remain solvent for a long-term period.

2. Prediction of the external economic situation lies in systematic estimation of the general economy and the areas in which the company implements its construction projects, to predict an economic downturn and possible accumulation of loss with only one economic sector.

3. Active targeted marketing is required in the construction company, as in any other commercial activity. Targeted marketing involves the use of tools for the intensive development of demand for the organization of products or services and market analysis:

- promotion to increase company rating and customers' attraction;
- expanding the range of performed works (application of perspective innovative or non-standard technologies in construction);
- targeting different groups of consumers with a specific set of measures for each group;
- analysis of the behaviour of competitors;
- development of competitive strategies;

4. Establishing the system of reserves. Each contract provides long-term cooperation between the developer and the customer. That is why the main criterion for the successful implementation of planned activities and obtaining returns in the form of savings will ensure the sustainability of both the company and the customer activities. The assurance of long-term financial sustainability can be achieved through the formation of the reserve system. The creation of a reserve system in construction means self-insurance in scientific terminology.

Self-insurance (internal insurance) as a way to reduce the level of risk reduction is based on the reserve organization of financial resources, making it possible to overcome the negative consequences of financial operations or other risky operations (Kloman, 2000). In other words, self-insurance involves the formation of the construction company's budget or financial fund to cover unforeseen losses. The basic forms of self-insurance are:

- formation of a reserve (insurance) fund for the elimination of the consequences of unforeseen risk situations, where 1-2% of the amount laid on the construction project is deposited;
- a reserve fund for additional preventive measures for risks detected as a result of equipment maintenance – 1-2% of the project cost;
-formation of typical consumable stocks, which the construction company applies in almost every project (cables, wiring, insulating materials, etc.), in size of 10-15% exceeding the total

amount of necessary materials, in case of additional needs;
- an undistributed profit balance, received in the reporting period, can also be considered as a reserve of financial resources aimed at eliminating the negative effects of various risks (Ratushniak, 2010).
5. The personnel policy of a construction company has a significant influence on the efficiency of work. Expensive equipment, a long term of interaction with the customer, the complexity of the calculations and works, company's guarantees – all these factors oblige to have highly qualified personnel. The main strategy of the personnel policy should be based on selecting the best staff from the labour market, motivating them with high wages, social packages and constant training.

In relation to construction activities, there are attempts to formulate a set of specialized risk management methods that have not been used previously. Therefore, the methods of risk management have been considered by the construction company, relying on the results of risk management in different spheres of the activity. For construction companies, four groups of risk management methods have been relevant to projects, i.e. risk avoidance, risk reduction, dissipation and risk compensation.

Within the framework of each group, two to five methods of risk management have been examined. Each method is considered concerning the activity of construction companies, which, given the lack of theoretical development in this field, caused some difficulties. Despite the fact that the work presents various methods of risk management, applying all the methods in each project would be inappropriate. However, taking into account a wide range of construction projects and a set of measures implemented in them; the presence of a large number of diverse external and internal risks, presented scientific and methodological development can be a guarantee of increasing the probability of successful implementation of the construction project.

The general characteristics for the presented methods of risk management is the potential opportunity to control the influence of the risk object, to ensure that there is a need for formation of an organizational risk management system in an enterprise. The process of formation of the organizational system of risk management in construction is based on the system approach methodology, which requires compliance with the laws and principles of management organization.

The analysis of the unstable environment of construction companies and the practical approaches to risk management reveals the following: risk management is generally organized on the basis of a structural and functional approach. Special infrastructure risk management in construction companies, as a rule, is not provided.

Market-based risk management techniques – hedging and insurance – predominate. There is no strategic planning in risk management; no research on potential risks is being conducted. We provide a systematic description of the risk management organizational model that has been developed in most construction companies (Table 1).

Table 1: Structuring elements of the risk management system in construction enterprises ("as-is" model)

Elements of the management system	Characteristics
Target	Preventing / reducing loss from adverse events.
Functions	Monitoring the financial condition of customers, accounts receivable; control; transfer of risk.
Tasks	Collecting, processing and registration of information concerning risk management.
Human resources	The position of a risk manager is not provided.
Risk management organization	There is no risk management department; functions, powers and responsibilities for certain types of risks (mainly financial (market) and credit) are allocated by structural and functional principles.
Methodological support	There are no internal regulations (management) on risks.
Information support	There is no full database of risks (only a part of such information is collected and registered and not in all departments)
Assessment methods of risks	Statistical; cost-effectiveness method; method of expert assessment; analytical; method of analogues.
Risk management toolkit	Risk transfer; diversification (providing services to enterprises operating in different industries).
Quantitative parameters used in the risk management system	Economic activity indicators of an enterprise (profitability, accounts receivable, efficiency indicators, liquidity), including financial ratios (debt, turnover, profitability, payback of investments, equity); market indicators.

Source: own research.

Analysing the described structuring elements of the risk management system of construction companies, it is possible to allocate a number of inherent organizational, economic and methodological problems: insignificant target orientation; a limited set of functions, tasks and principles of management that does not correspond to the spectrum of risks in production and economic activity; absence of the position of a risk manager who is competent in the field of risk management; lack of a common understanding of risk classification adaptation; limitation of risk information, with only certain types of risks collected and registered, such as financial and credit.

The main system determination approach is that the organizational structures and management methods at each stage of development must be adapted to the dynamic conditions of production functioning, scientific-based methods of analysis and substantiation of making effective management decisions. When solving the problem of risk management organization on the basis of a systemic approach, we have to consider the following:

– internal and external natural connections between the system elements and the external environment;

– the principles of the organizational management structure;

– the requirements that the organizational structure must meet to achieve the goals and objectives of enterprise management.

Management from the position of the system approach involves the creation or change of organization in the process of its functioning and development through the influence on its elements, as well as the implementation of the links themselves. Therefore, management performs a certain function aimed at maintaining the system. The organization of the management system (as a result of the realization of functions) demonstrates the organization of objectives, tasks, functions and relations between its elements, as well as the procedure and methods of obtaining, transformation and transmitting information, preservation (arrangement), the basis of which is the organizational structure (Kloman, 2000).

The specificity of industrial and commercial activity in construction influences the organizational structure of management, serving as a set of formal and informal management relations, as a way of the interrelation between the management decisions that provide effective functioning and development of the management system. The organization of risk management can be presented as a holistic formation, the interaction of elements which are directed at the achievement of certain functions, and in cases where there are such relationships between elements and their properties that changing an element or its properties leads to transformations in other elements and properties of the system control as a whole.

The nature of these relations regulates the structure of the risk management system. The structure of risk management, the degree of complexity depends on the composition and character of the functions performed by the system as a whole. The identification of the interrelations and dependencies between the risk management mechanism and the organizational management structure is one of the main tasks in the organization of the risk management system. As a basis of organizational forms of the risk management system in the construction, in the authors' opinion, is the systematic method of designing structures differentiated by the functions, and objectives of management should be laid (Ratushniak, 2010).

The main aspect of developing the systematic structure in risk management, in this case, is the analysis of risk management functions in construction. For effective implementation of risk management functions in construction, there is a need for resources. It is necessary to implement the functions of management by means of a special subsystem in the system of management of an enterprise or specialized unit in its organizational structure. This unit is a logical addition to traditionally independent functional subsystems of an enterprise. The risk management subsystem in construction can be constructed hierarchically. Taking into account the scientific works of some authors [6], we offer proposals that the process of risk management in construction is implemented on two levels – executive and coordinating (Fig. 2).

Two basic functions are realized at the executive level: firstly, continuous control of the risk level arising in the construction process, and, secondly, risk management, connected with the process of preparing solutions of all levels in an enterprise. The functions of the executive level ensure the implementation of specific risk analysis procedures during the implementation of the already accepted decisions and preparation of new management decisions. At the coordination level, the command-control procedures of coordination of all the units of the risk management subsystem in accordance with the target installations are carried out.

It is expedient to arrange the risk management procedures, that is, to specify the terms of work, form and volume of the presentation of results, to set the composition and procedure of implementation of analysis and evaluation

procedures, to prepare normative, reference and current information, to start the process of developing measures in order to reduce the risk level and bring the resulting proposals to the attention of the construction company management, to organize the implementation of anti-risk measures. This set of actions is part of the "coordination of the risk management process" function.

An optimized model of the risk management system in construction projects should be formed on the basis of solving problems inherent to the existing model, highlighted in Table 1. In the context of the systemic transformations, we provide a description of the necessary elements of the projected model, i.e. the theoretical and empirical structuring elements of the risk management system of construction projects ("as – is" model) shown in Table 2.

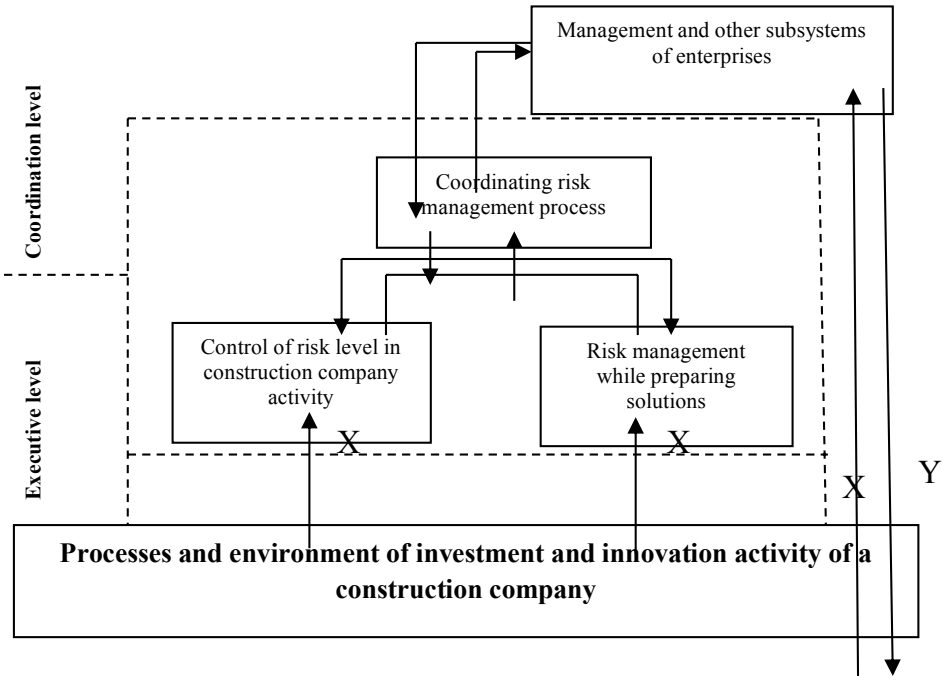

Figure 1. Risk management classification in construction
Source: based on (Kloman, 2000)

Table 2: Theoretical and empirical structuring elements of the risk management system in construction projects ("as – is" model)

Elements of the management system	Characteristics
Target	Reducing the impact on the company's external and internal adverse changes: increase of anti-crisis stability; saving resources; improving the quality of information for decision- making.
Functions	Planning (the formation of financial indicators system that determine the options for the development of a company in the case of various types of risk): organization (introduction of the risk manager position, fixing his/her responsibilities in job descriptions, development of methods and regulations); control (checking the quality of work to reduce the degree of risk, collecting information on the degree of implementation of the planned program of action); preventive measures to prevent risks.
Tasks	Organization of risk management infrastructure: regulation of risk management processes; allocation of authority and responsibility for risks; risk analysis and calculation of key indicators needed to formulate strategies, operational risk management plans; risk management costs planning (insurance, risk retention, risk manager remuneration, information support).
Principles	Systemic integrity (analysis and assessment of risks in all spheres of the company's activity); continuity (not fragmented, but established constant work of the risk management system); documenting (reports to the authorities on the work done on analysis, assessing risks with quantitative indicators, as well as calculating the cost of implementing measures to mitigate risks).
Methodological support	Regulatory risk management process, which defines key definitions, classifications, analysis and risk assessment methods, documentation, accounting, and reporting, risk management relationship with other departments.
Assessment methods of risks	Expert assessment and audit of risks: economic analysis (use of financial ratios); drafting protocols and summary table of company risks; combined methods.

Source: own research.

Considering the practical aspects of the implementation the new model, organizational and applied structuring elements of the risk management system of construction projects are presented in Table 3. The distinctive advantages of composition and content features of the modeled risk management elements system gives reason to expect that their use in practice will enable construction companies to successfully deal with the entire range of risks associated with their activities.

Table 3: Organizational – applied structuring elements of the risk management system of construction projects ("as – is" model)

Elements of the management system	Characteristics
Human resources	The risk manager position having access (on an advisory basis) to the leadership, in the future –expansion of the number of employees in this field.
The risks management organization	Establishment of risk management department; division of functions, authority and responsibility for risks: at the level of senior management – analysis of strategic risk and development of strategic management plans; at the subdivisions level – operational risk management; at the risk management department level – coordination, methodological support, consulting, information – analytical support.
Information support	Creation of a consolidated database for risk management in an enterprise that is formed on the basis of own risk research and other units of the financial department; incorporation of specialized information risk management systems.
Risk management toolkit	Transfer of risks (insurance, hedging – conclusion of contracts with suppliers concerning prices); redundancy (establishment of the risk fund); diversification, outsourcing.
Quantitative parameters used in the risk management system	Economic indicators of enterprise activity, including financial ratios; market indicators (prices, interest rate, currency exchange rates): risk ratings; cost of risks; performance indicators for the risk management system (the ratio of maintenance costs to financial results, the total loss level).

Source: own research.

5. Conclusions

The main task of risk management in construction is the proper selection of tools for the identification and classification of risk events, as well as the appropriate use of management methods. The article examines the basic methods of risk management in construction: avoidance of risk, localization, dissipation and compensation. It is adapted by the presented risk management group to the specificity of construction companies, taking into account the main directions of their development.

The study of the essence of financial risks, their direct interrelations with the strategies, targets of the company, stages of their life cycles, suggests that management should be carried out on the basis of a systematic approach. This approach, as the methodology of the research process, provides an opportunity to approach the formation of an effective risk management model for innovative projects in construction.

On the basis of analysis, the problems of risk management in construction projects, theoretical, empirical and organizational – applied structuring of the elements, have been elaborated, in which the authors have described the purpose, functions, objectives, principles, methodological support and the system of evaluation methods.

For the purpose of effective risk management, formalized functional structuring of risk management in construction is proposed, allowing for the implementation of management functions at two levels – executive and coordinating, with the help of a special structural component in the enterprise management system or a specialized unit in the organizational structure. Formalized functional risk structuring integrates management functions across coordination and executive levels.

References

Chernyshev, D., Ivakhnenko, I., Klymchuk, M. (2018). The organization of biosphere compatibility construction: justification of the predictors of building development and the implementation prospects. International *Journal of Engineering & Technology*, 7 (3.2), 584-586.

Gerasimova, M.V., Avdeyeva, L.A. (2015). Methodological Approach to Estimating the Total Risk of a Construction Enterprise, *Internet Magazine Science*, 7(3), 134-142.

Huddleston, J. R. (1986). *Distribution of development costs under tax increment financing*. Journal of the American Planning Association, 52(2), 194-198.

Meroño-Cerdán, A.L., López-Nicolás & Molina-Castillo, F.J. (2018) Risk aversion, innovation and performance in family firms. Econ. *Innov. New Technol*., 27, 189–203.

Visser, J.K.& Malan, H.T. (2019) Identification of risk associated with process automation systems. Int. J. *Econ. Manag. Eng*., 13, 1044–1051.

Kloman H. Felix (2000). Integrated risk assesment. Currnet views of risk management. *GARP Aricles*, http:// www.garp.com

Klymchuk, M. & Shegda M. (2016). Conceptual principles of the socially responsibile enterprise marketing management. *Economics and education*, N1, 58 – 61.

Mishra, A.K., Kumar, A., Joshi, P.K.& D'souza, A. (2018) Production risk, risk preference and contract farming: Impact on food security in India. Appl. Econ. Perspect. Policy, 40, 353–378.

Palepu, K.G., Healy, P.M., Bernard, V.L. (2003). *Business Analysis and Valuation Using Financial Statements. Text and Cases*. South-Western College Pub, 2 edition.

Ratushniak, O.G. (2010). Management of ecological and economic risks of innovative energy-saving projects in construction. *Project management and production development*, 3(35), 90-94.

Tkachenko, V., Klymchuk, M., Ivakhnenko, I., Ploska H. (2018). Compensatory financing of energy saving projects in construction: modification of TIF. *Research Papers in Economics and Finance*, 3(1), 47-51.

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Information demand of foreign labour market from the point of view of Chinese students

Anna Pilarczyk[1], **Tomasz Naprawski**[2]
[1,2] University of Szczecin, Poland

ABSTRACT

Today people are faced with a huge amount of information. Demand-oriented management of information can resolve this issue. Therefore, the measures that filter this information are the desired solution. One of these measures is information demand analysis, which can be easily used for defining problems on the labour market, where the term of talent import is becoming increasingly important. The main contribution of this study is the analysis of the challenges facing the foreign labour market from the point of view of an employee and an employer and a proposal of an information demand model for strengthening the foreign labour market information system. The information demand model is one of the stages of the development of an information-logistics engine, which ensures that the right information is available in the right location, time and quality.

Keywords: information-logistics engine, information demand analysis, information demand model, foreign labour market, demand-oriented management of information.

1. Introduction

Every day a huge amount of information is produced, and many people have easy access to a wide range of information, even to the one they do not need at all (Stamer et al., 2016). Therefore, the measures that filter this information are in great demand. One of these measures is information demand analysis, which can be easily used for defining problems on the labour market, where the term of talent import is becoming increasingly important.

The main contribution of this study is the analysis of the challenges facing the foreign labour market from the point of view of an employee and an employer and a proposal of an information demand model for strengthening the foreign labour market information system. The second section describes the terms and basic principles used in our paper, while the next section examines the information demand on the labour market from the point of view of an employee and an employer. With the help of surveys, their problems and potential are explicitly presented and described. Afterward, an information-logistics engine is developed and analysed. The final section summarises the results of the analysis and outlines future research directions.

The focus of this work is on the goal-oriented management of information for strengthening the labour market information system. Information logistics is a base for the technologies that guarantee the provision of relevant information and their separation from irrelevant information. For this reason, information logistic applications are focusing on the individual needs of the user. A prerequisite for this technology is the information logistics engine, which is responsible for intelligent and automatic information management. The engines integrate the data from various sources and match them with user profiles which describe user information demand (Fraunhofer-Institut, 2004).

2. Information demand on the labour market

The goal-oriented management of information is the basis for right decisions. The information demand analysis is understood as a method that leads to the determination of information in order to solve objective-defined

tasks (Kereimann, 1976). Additionally, the information demand analysis helps to determine the type, quantity and quality of information (Heinrich et al., 2014). The needs of the labour market are simultaneously seen as a potential for foreign workers. To solve these issues, it is necessary to identify problems as well as the information demand of employers and employees, which is the foundation for the development of an integrated technology solution.

2.1. Problems on the labour market from the employer's point of view

Nowadays the employers have more and more difficulties in finding the real talents on the labour market. Employers have problems filling vacancies in many countries, despite high unemployment rates. In a regular survey of 2015, Manpower Group shows that 38% of all employers in 42 countries demonstrate the problems with the shortage of skills. The most wanted professions are specialists, including positions such as skilled workers and sales staff, as well as technical positions like: engineers, technicians and IT workers, but also leadership, management and supervising positions are in demand around the world (Manpower Group, 2015).

The problems and reasons for the lack of specialists are also mentioned in the study by Manpower Group. Most of the respondents: 35% declare a small number of applicants, 34% show lack of expertise and 22% lack of experience. 17% the applicants do not have proper social skills, and 13% of applicants claim too much salary (Manpower Group, 2015). The above information shows a few examples of the problems on the labour market from the company's point of view, which has a significant influence on structuring a proper information demand model.

2.2. Problems on the labour market from the Chinese students' point of view

Most companies are suffering from a deficit of skilled candidates. That is why several companies need to use special strategies to increase the number of applicants, thus minimising the shortage of skills. One of the strategies is the expansion of the applicant pool by foreign workers. Therefore, the problems of potential foreign applicants need to be also determined and analysed. These problems can be identified on the basis of an example of Chinese students willing to work abroad.

In May 2017, we inquired 189 Chinese students from Guangdong University of Foreign Studies about their problems in finding work abroad. 20.3% of male students and 79.7% of female students were aged between 19 and 24. The online survey was conducted in the Chinese language. In order to define the applicant pool with potential foreign workers, we analysed the interest in the foreign labour market. We asked the students "if they were interested in a job abroad and how long they would like to work abroad?" For this question there were 5 answer options: "3 months, 6 months, 12 months, over 12 months, and I would not like to work abroad", see figure 1. Most students would be glad to stay abroad for 12 months or more to have the possibility to develop their skills, 30.5% of students were interested in a short-term job. No one replied that he/she has no interest in working abroad.

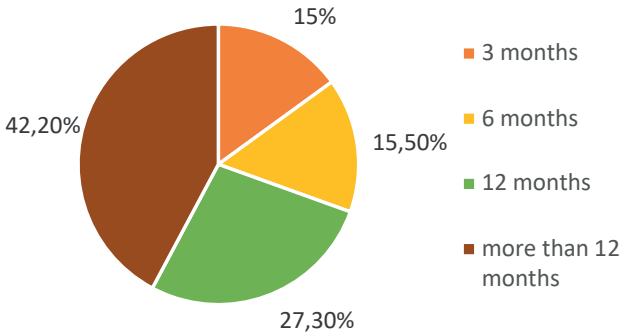

Figure 1. Interest in working abroad: How long would you like to work abroad?
Source: own research

The next question measured the requirements of professional knowledge. We asked the students whether they had any work experience (see figure 2). Most of the students (75.9%) had no work experience and 24.1% had "1-2 years of work experience".

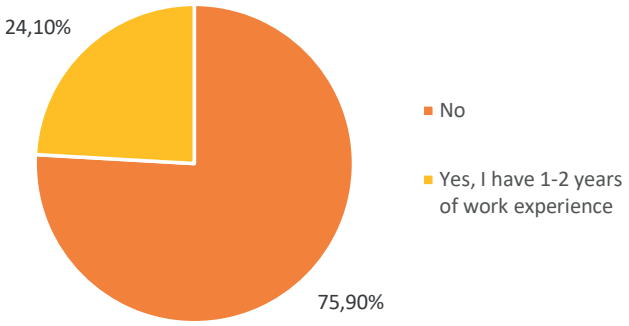

Figure 2. Students' work experience: Do you have work experience?
Source: own research

The next question measured the students' information demand during their internship abroad. We asked students about their problems and what would be the scariest thing for them? (see figure 3). The results show that the students were most concerned about the organisational problems (36.3%), for example searching for an apartment; additionally, formal requirements in a foreign country are seen as a problem. Some of the students (29.9%) were also scared that their certificates would not be acknowledged or equal with the certificates gained abroad. Cultural differences (12.8%) as well as staying alone abroad (10.1%) did not frighten the students so much.

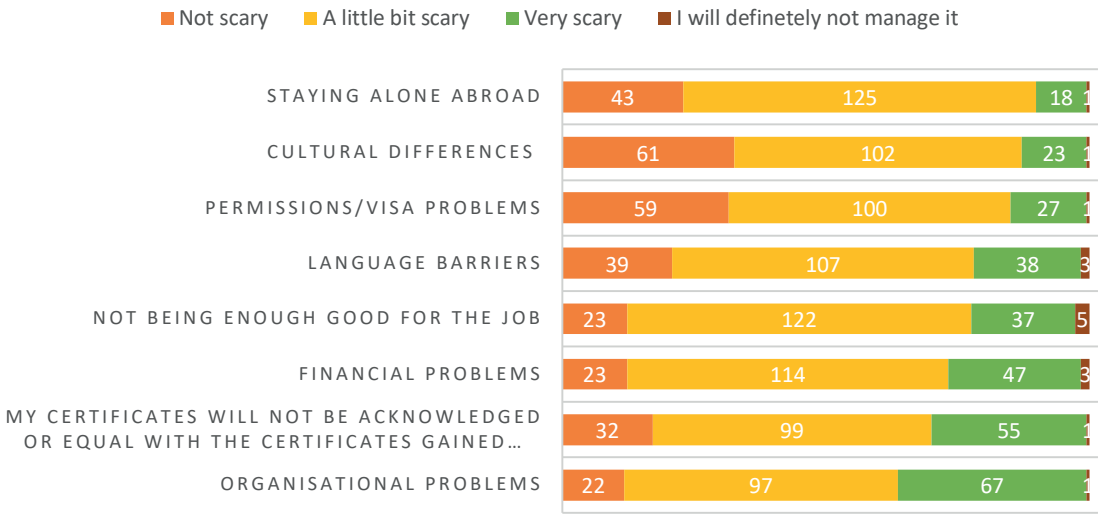

Figure 3. Information demand during work abroad: While applying for a job or internship abroad, what will you be scared about?
Source: own research

2.3. Problems on the labour market from the employer's and employee's point of view

On the basis of a short analysis of the difficulties on the labour market, a short summary of the main problems faced by employers and employees is presented (see Table 1). This summary should serve as an example of data that should be collected, normalised and analysed in the information demand model (see Figure 4).

The above data are only a presentation of the direction of research, which should be done in depth to obtain representative results and improve the algorithm that allows solving real problems on the labour market.

Table 1: Data example – the main problems on the labour market from the employer's and employee's point of view

Problems on the labour market from the employer's point of view	Problems on the labour market from the employee's point of view
small number of applicants	organisational problems
lack of expertise	certificates will not be acknowledged or equal with the certificates gained abroad
lack of experience	financial problems
applicants do not have proper social skills	not being good enough for the job
applicants claim too much salary	language barriers

Source: own research.

3. Development of an information-logistics engine

Data warehousing systems are often developed in a simple way, which does not consider any target-oriented information demand of the users. Therefore, there is a gap in the development of a data warehouse system which should consider the information demand of the users (Strauch, Winter, 2002). The concept of data warehousing is a part of an information-logistics engine (Fraunhofer-Institut, 2004), which is necessary for the development of a technology-driven application to strengthen the foreign labour market information system (see figure 4).

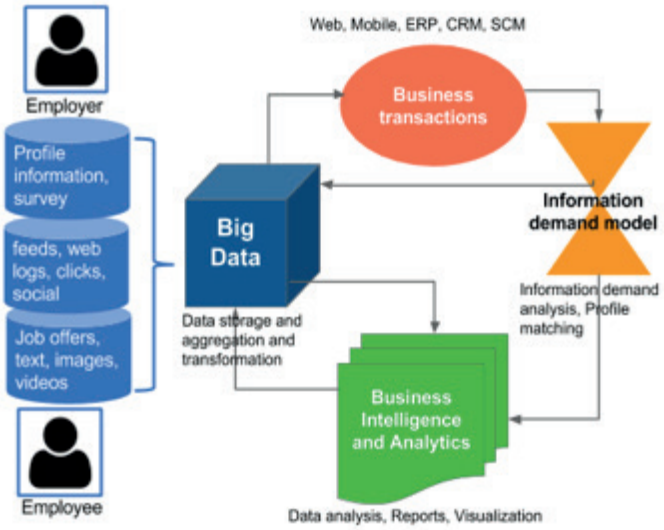

Figure 4. Information-logistics engine
Source: Based on Strauch, Winter (2002) and Fraunhofer-Institut (2004)

The proposed information-logistics engine solution consists of four main areas: Big Data, Business Transactions, Information Demand Model and Business Intelligence and Analytics. This model shows how these four systems are interrelated to achieve the maximum value and effectiveness of all forms of data, with the purpose to use them in a web-based application that can be useful in foreign human resources management.

In the Big Data system, all data about employers as well as employees are stored, aggregated and transformed into usable formats. The data gathered from personal profiles of employees and employers, as well as through surveys, help to analyse their information requirements. The data of job offers, their videos and images lead to better understanding of how customers (employees and employers) deal with the product. User behaviour data are also collected from weblogs, clicks, social interactions and feeds, which provides effective user orientation.

The Big Data system interacts simultaneously with Business Transactions and Business Intelligence systems, which helps to understand customer needs. The business transaction system analyses key parameters of available resources and actions of the organisation, which is responsible for the development of the web-based application. The Business Transaction system considers among others: customer relationship management, enterprise resource planning as well as web and mobile resources.

The transformed data from the Big Data and Business Transaction systems are confronted with the Information demand model. What is analysed here is the labour market data, as well as employer's and employee's problems.

In this place the information demand analysis is conducted and a specialised matching algorithm is constructed, which determines the type, quantity and quality of the required data. The example of useful data was presented with the help of statistics in the previous section ("Problems on the labour market from the employer's and employee's point of view"). In the information demand model, a real-time information demand analysis is carried out. The analysis dynamically detects the actual and target state and compares them with each other, which leads in turn to goal-oriented requirements matching.

The target oriented and filtered information is delivered to the Business Analytics system, where it is analysed and presented in a visual form. This analysis can be used for driving the web-based application, which will automatically respond to customer's requirements.

4. Conclusion

The paper presents theoretical and practical examples of the information demand as well as challenges facing the foreign labour market. The examples are analysed using the companies' and students' surveys, which identified the main problems facing employers (like a small number of applicants or lack of expertise and experience) and foreign employees (like organisational problems or formal requirements in a foreign country), during the job application process.

The proposed information-logistics engine, described in the practical part of the paper, was designed as a core for the software architecture of target-oriented application, in which the

user requirements are not clear but have the highest priority. This kind of solutions can be used for example in a web-based application for managing human resources. The concept was built on the basis of a data warehouse model, which was constructed with the consideration of the information demand model. It has been demonstrated that the information demand model is one of the important areas of information logistics engines and is responsible for customer-orientation and filtration of the information.

Furthermore, it might be interesting to develop the approach model for the information demand analysis and define its exact states, in order to concretise the information demand model, which is a part of the information-logistics engine.

References

Stamer, D., Zeiner, V., Sandkuhl, K. (2016). Development and Validation of an Information Demand Pattern for a Team in Project Management. *Complex Systems Informatics and Modelling Quarterly CSIMQ*, 6, 54-72.

Fraunhofer-Institut für Software- und Systemtechnik ISST (2004). Jahresbericht 2004, Dortmund, https://www.isst.fraunhofer.de/content/dam/isst/de/documents/Publikationen/Jahresberichte/Fraunhofer-ISST_Jahresbericht_2004.pdf, 10.06.2017.

Kereimann, D., S. (1976). *Methoden der Informationsbedarfsanalyse*. Berlin: De Gruyter.

Heinrich, L., J., Riedl, R., Stelzer, D. (2014). *Informationsmanagement: Grundlagen, Aufgaben, Methoden*. De Gruyter Oldenbourg, 11 Edition.

ManpowerGroup. (2015). *Studie Fachkräftemangel. Deutsch Wirtschaft muss Aufträge ablehnen*. Eschborn 10 Edition. https://www.manpowergroup.de/fileadmin/user_upload/2015_06_22_MPG_TalentShortageSurvey_Broschuere_Deutschland_8Seiten.pdf, 15.06.2017.

Strauch, B., Winter, R. (2002). *Vorgehensmodell für die Informationsbedarfsanalyse im Data Warehousing. Vom Data Warehouse zum Corporate Knowledge Center*. Heidelberg: proceedings der Data Warehousing.

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Recruitment and motivation of Generation Z in the face of the employee's market

Joanna Ratajczak[1]

[1] Poznan University of Economics and Business, Poland

ABSTRACT

Contemporary demographic changes in the labour market pose many challenges. One of them is the need to reconcile the needs of employees from different generations. The youngest generation on the labour market – Generation Z – has very specific expectations, which are discussed in the paper. At the same time, the article describes the labour market in a poviat town on the example of Leszno. As it turned out, contrary to popular opinion, despite the low level of unemployment and the difficulty in finding employees in many industries, there is no employee market in Leszno. Employers do not respond to the expectations of job candidates, especially the youngest ones, which in turn leads to their travelling to other, larger cities. In this way Leszno is depopulating. A similar situation occurs in other small poviat towns. The article proposes one solution to this problem, which is one of the research purposes. The second purpose is recognision of Generation Z's expectations towards their future employers. The outcomes are described in the article.

Keywords: employees' market, Generation Z, age management, Leszno, Poland.

1. Introduction

Demographic challenges faced by modern organisations cause the necessity of employing workers from different generations – both the oldest and the youngest. At the same time, the existence of an employee's market in many industries requires adaptation to the expectations of job candidates. Therefore, it is necessary to recognise them. This is particularly important in smaller towns, where the number of young inhabitants is gradually decreasing, because they choose large cities, also for economic reasons.

The purpose of the article is to present the expectations of the youngest generation who are just entering the labour market and proposing specific solutions in the field of age management, which will help in effective recruitment and motivating process, and as a consequence keep the employees from Generation Z in the organisation and on the local labour market. Thanks to the proposed activities, enterprises can improve their image and become perceived as attractive employers, which is especially important for job seekers belonging to Generation Z.

To achieve the purpose, research has been conducted among secondary school students using the method of a diagnostic survey and survey technique. The results have shown that young people have unrealistic financial expectations; however, the needs for other areas of employment are not excessive. Unfortunately, employers operating in smaller towns, despite the low level of unemployment and problems with finding employees, do not respond adequately to the expectations of Generation Z, which is also discussed in the article.

2. Critical literature review

Membership in a generation is usually associated with a date of birth, which is a biological act (Pritchard & Whiting, 2014, p. 1620). However, generational identification or the individual's knowledge that someone belongs to a particular generation, as well as what roles, values and emotions are associated with it, is a separate matter (Lyons & Kuron, 2014, p. 141). People from a specific generation have

experienced the same historical events. This refers to a cultural phenomenon that creates a separate generation group. It can be said that the experience of early youth causes a kind of cognitive stigma, an "imprinted" model of interpretation that shapes the subsequent choices of the individual. Nostalgia and longing, e.g. for a specific period in pop culture (clothes, music, movie stars), also affect membership in the generation. Generations build their solidarity around shared memories, ideologies and leaders they followed in their youth. They consider the same cultural symbols as common, which are music or fashion. Identification with the generation, however, requires a sense of social closeness and genuine sharing of events or cultural phenomena (Parry & Urwin, 2011, pp. 81-84)

People currently entering the labour market belong to Generation Z. It is assumed that they are young people born in the second half of the 1990s and the first decade of the twenty first century. In the literature, there is noticeable disagreement as to the identification of Generation Z. Tulgan (2009) divides millenials into Generation Y (born in 1977-1990) and Z (whose date of birth falls between 1991 and 2000). However, most researchers believe that they are a separate generation (Żarczyńska & Chomątowska, 2016, p. 406).

The parents of Generation Z had a computer at home when people from this generation were born. They grew up with internet access. It can be stated that this is a distinguishing condition that decides to assign a person to Generation Z. They do not remember the times before Poland's accession to the European Union and the Schengen Area. The world has no limits for them. They are very pro-social. In contrast to generation Y (generation ‚I' or 'me'), they say ‚we' (Wiktorowicz & Warwas, 2016, p. 32). As a generation, they are by far the most diverse and economically, mentally and culturally divided group (Żarczyńska& Chomątowska, 2016, p. 408).

Representatives of Generation Z are also called generation C – from the word 'connected' (connected to the Internet, 24 hours a day, seven days a week). They are always online. Other words starting with the letter C, which also refer well to the most important features of this generation are: communicating, content-centric, computerised, community oreinted, always clicking (or always clicker), change (Wiktorowicz & Warwas, 2016, p. 32; Dolińska-Weryńska, 2016, p. 34; Dziopak-Strach, 2016, pp. 49-50). There is also a view that people belonging to Generation C can also be found in other age groups. Each of them includes people addicted to modern technologies. Other names of this generation are com generation, digital natives, children of the Internet, Facebook generation, Gen Wii, future generation, ICT generation, iGeneration, Instant Online, media generation, net generation, multitasking generation, Post Gen or lost generation (Bencsik, Horváth- Csikós, & Juhász, 2016, p. 93; Berkup, 2014, pp. 223-224; Galaj, 2014, pp. 85-99). They do not know the world without computers, smartphones, the Internet and computer games. They were born and grew up in a world of highly developed, modern technologies. So they are perfect in the world of technical innovations and gadgets. Modern technologies and virtual contacts are a natural environment for them, because, metaphorically speaking, technology is "part of their DNA". They cannot function without them. In fact, they cannot imagine living without the Internet, which is their "window to the world", providing almost unlimited access to information and knowledge. It is here that they seek solutions to all problems. Representatives of this generation themselves emphasise that they are addicted to access to the network. It is significant that many of them can no longer support mobile phones with keyboards. Constant access to the Internet means that young people have constant contact with friends through social media. They live on the border of the real and virtual worlds, which they consider to be parallel, interpenetrating and complementary. They move smoothly between them. Many are unable to adapt their lives online to the offline requirements, being addicted to technology, speed, freedom, individualism (Berkup, 2014, pp. 223-224; Wziątek-Staśko, 2015, pp. 51-52). They mastered virtual communication (mainly with friends using social media). Other forms of socialisation are extremely difficult for them. In this way, they love to share knowledge and experience. They rely on this form of promotion more than on others. Distance ceases to matter. They have friends on Facebook from every corner of the world. However, they have impaired verbal communication skills in the real world. They replace real life with virtual contacts, which are certainly not as close as those preferred by older generations. Due to the speed of communication, their pace of life also increases. Preferences of communication methods among Generation Z should not surprise. Half of the respondents value personal contacts most, but 16% prefer emails, 9% – phone calls, 8% of the respondents – social media, and 6% prefer communication via Skype. Of course, the results of the research depend on the country

of origin of the respondents (for example, as much as 91% of Czech Generation Z members prefer face-to-face contacts, while other forms of communication are preferred only by 1-2% of the respondents). In the work environment, however, the youth expectations should be taken into account. The correct form of contact with employees from Generation Z is an e-mail. It should constitute the basis for communication (Bencsik, Horváth-Csikós & Juhász, 2016, pp. 93 and 100; Galaj, 2014, pp. 85-99; Kubátová, 2016, p. 65).

Employees from Generation Z expect multitasking. There is a reason called multitasking after all. They claim that they are great at several events simultaneously. However, they are less competent in this respect than the representatives of Generation Y. In the case of performing many tasks simultaneously, the quality of work decreases. An increase in the number of errors is also observable (Berkup, 2014, pp. 223-224; Wziątek-Staśko, 2015, pp. 51-52; Żarczyńska-Dobiesz & Chomątowska, 2016, pp. 381-382).

It is also an instant generation, even more impatient than Generation Y. Generation Z members expect immediateness in all areas of life, as the Internet has become accustomed to. Assessment, feedback and remuneration must be best done in parallel with the performance of the tasks to which they relate. It seems that many representatives of this generation will have to verify their approach, in line with the "it should already be" principle (Galaj, 2014, pp. 85-99; Wiktorowicz & Warwas, 2016, p. 32).

The youth from Generation Z are just entering the labour market. They have special values, needs, attitudes towards work and work environment. They are afraid of the future, because they are well aware of the difficult situation. Young people are worried about possible unemployment. Generation Z members are, however, idealists (like probably every previous generation at this age). They believe they can change the world around them. Despite this, their expectations are extremely realistic. Some of them are dependent on their parents, willingly postponing the transition to independent living. In this way, they postpone the moment of entering adulthood. At the same time, their low level of independence towards their relatives and family should be noted (Galaj, 2014, pp. 85-99). Others, after a "collision" with reality, are often frustrated by the lack of the expected success. We must admit that entering the labour market is difficult for them. Sometimes they reach new career levels, using the achievements of their parents. For most, however, despite the so-called employee market, there is a little chance for a well-paid job at the beginning of their career path, especially in small towns. Generation Z members were brought up in the belief that only the best ones count. Therefore, they try to meet their internal requirements, which is not easy. In addition, a permanent change is currently underway in the labour market. At the same time, young people have unlimited access to education, which is an unquestionable opportunity that should be used. Their behavior is determined by the culture and system of values that they have taken from home. They grew up in an uncertain and complex environment. This determined their point of view on work. They have new consumer behavior. They are not loyal to a given brand or to an employer. They hope to quickly get their dream jobs. Many combine learning with work while gaining experience. This should of course be allowed for them. They have not been paid much attention in literature yet. However, Generation Z sould not be ignored. It is expected that their entry into the labour market will be a revolution (however, similar fears have also been raised for Generation Y, which did not significantly affect the personnel management in many organisations). This is the first truly mobile, global generation growing up in the world of smartphones and high-speed Internet. The challenge will be to keep them in the company for longer (Ariker & Toksoy, 2017, pp. 485-487; Bencsik, Horváth-Csikós & Juhász, 2016, pp. 93-94 and 103; Kubátová, 2016, pp. 61-62). However, they should be very desirable employees. By participating in many extracurricular activities, they developed early on the competences useful in the modern labour market (Wiktorowicz & Warwas, 2016, p. 32). They speak boldly in foreign languages. They have highly developed socio-emotional intelligence. They are open to the world and new experiences. Diversity is a matter of course for them, so they feel good in a multicultural environment. They are also creative and independent. Many of their ideas can be considered innovative. They value the opportunity to work during flexible hours. They are expected to perform many professions throughout their lives, some at the same time. They easily absorb new knowledge. They easily adapt to the changing conditions. They are constantly looking for increasingly difficult challenges and expect achievements. They show strong internal motivation, which they boast about. They believe in their own strength. They do quite well at searching and filtering information, which is necessary in the modern world. They choose the most valuable information from the other thickets. They look for it on the Internet, not in encyclopedias. They

can find answers to their bothering questions. However, they expect immediate results. They cannot wait. Sometimes, however, they feel lost in the sheer volume of messages to which they have unlimited access (Berkup, 2014, pp. 223-224; Galaj, 2014, pp. 85-99). They focus on self-development and satisfying their own ambitions. Lifelong learning is an obvious fact for them. They are focused on self-development, satisfying their own ambitions (Galaj, 2014, pp. 85-99). Their resourcefulness, practicality and intelligence should be emphasised. They are brave in pursuing their goals. They prefer tasks that are non-standard and personalised – specifically targeted at them (Wziątek-Staśko, 2015, pp. 51-52; Bencsik, Horváth-Csikós & Juhász, 2016, p. 93). They are very sensitive to the harm of others. They value socially responsible activities. They grew up aware of the climate change, in the conviction of the necessity of caring for the natural environment. They distinguish between good and evil very clearly. The reputation of the organisation in which they will work is therefore of key importance (Ariker, Toksoy, 2017, p. 487).

However, many employers believe that the youngest generation currently on the labour market cannot be trusted. They perceive them as selfish, lazy, arrogant, over-confident, "crafty and poser" who endure any criticism badly (Żarczyńska & Chomątowska, 2016, p. 409; Wiktorowicz & Warwas, 2016, p. 32). Of course, this can be due to the young age and related immaturity, which should not be forgotten. Generation Z members also have little confidence in the organisation. For fear of taking responsibility and entering adulthood, they do not want to become independent. In their opinion, the world is an unfriendly place. (Wiktorowicz & Warwas, 2016, p. 32). As long as they have the opportunity, they remain dependent on their parents. Their weaknesses include weakly developed soft competences (such as communication outside the virtual space), necessary in the modern world (Żarczyńska-Dobiesz & Chomątowska, 2016, pp. 381-382).

They also do not find themselves in the rigid rules of etiquette and in highly hierarchical structures (Żarczyńska-Dobiesz & Chomątowska, 2016, pp. 381-382). Described as impatient, having problems with focus and distracted attention. They themselves indicate the need to reduce bureaucracy to the minimum, because its excess distracts them. The analysis and evaluation of information in their implementation can be very superficial (Wiktorowicz & Warwas, 2016, p. 32). Some present a demanding attitude, which also does not gain supporters. It is also said that they are addicted to the Internet and modern technologies (Żarczyńska & Chomątowska, 2016, p. 409). They cannot work offline.

The employees from Generation Z also have strict expectations. However, it should be emphasised that, as with all generations, they depend on nationality and culture. (Kubátová, 2016, p. 67; Bencsik, Horváth-Csikós & Juhász, 2016, p. 93). They certainly value a good atmosphere in the workplace (Wiktorowicz & Warwas, 2016, p. 32). They also need unlimited autonomy. They want to control the course of their work to the maximum (Ariker, Toksoy, 2017, p. 487).

In 2014, Dan Schawbel published the results of the research conducted in the United States, Brazil, Canada, China, Germany, India, South Africa, Turkey and the United Kingdom, presenting factors determining the productivity of the employees belonging to Generation Z. It turns out that what is the most important is the type of work (65% of responses), the people they work with (65% of responses), personalisation of the work space (38% of the respondents), work location (the answer indicated by 36% of the respondents), the ability to listen to music at work (29% of responses), workplace privacy (27% of responses) and the size of the workplace (also 27% of responses). Similar research was carried out in the Czech Republic by Jaroslava Kubátová. The results showed that young Czechs are motivated to work effectively by the same factors, but in a different order. In the first place there were the people with whom employees from Generation Z work (up to 70% of responses), type of work (52% of responses), personalisation of space in the workplace (52% of responses), listening to music (as every third respondent answered), workplace privacy (30% of responses), workplace location (12% of responses) and workplace size (11% of responses). Generation Z also has different expectations about the workplace. While the respondents in D. Schawbel's research would like to work primarily in corporations (28% of responses) and then at home (the answer indicated by every fifth respondent), in the Czech Republic the results were slightly different. Czech employees from Generation Z prefer to work in corporations (up to 59% of responses). Only 6% of respondents would like to work remotely, at home. Nationality is therefore of great importance for the expectations of young people. This is not surprising. People are shaped by various factors (e.g. important historical, political or economic events) taking place during adolescence. It is obvious that they differ depending on the country of origin.

However, it is generally accepted that em-

ployees from Generation Z value the balance between private and professional life. They are happy to work in a virtual environment, because reality does not have to be tangible. Therefore, they are not afraid of working remotely and requiring support of compiled IT programs. They expect a flexible approach to the time and method of work from employers (Wziątek-Staśko, 2015, pp. 51-52; Bencsik, Horváth-Csikós & Juhász, 2016, p. 94). They expect interesting tasks that are a challenge (Żarczyńska-Dobiesz, Chomątowska, 2016, pp. 381-382). They are positive about corporate social responsibility activities. They are looking for a job in organisations for which social problems are important. They also expect positive attitudes towards the community, environment, emotionality, law, friendship and sensitivity to the problems of others. For them it is definitely a more important area than for employees from Generation Y (Ariker, Toksoy, 2017, pp. 486-487). They will gladly take part in mentoring programs. They need someone who will pay attention to them and provide reliable feedback. Until now, they received it from parents who told children that they are fantastic (Bencsik, Horváth-Csikós, Juhász, 2016, p. 94). The organisation's communication system and the transparency of its activities are also important. It should be remembered that Generation Z does not understand the principle of confidentiality of information. Special attention should therefore be given to them. It is noteworthy that Generation Z members have a strong need to lead (Bencsik, Horváth-Csikós, Juhász, 2016, p. 93). Many of them are born leaders. Therefore, they may have a problem with submitting to their superiors. To maximise their productivity, let them rest during the day. Of course, an important, fair level of remuneration and non-financial motivators also play an important role. The employees from Generation Z expect not only good earnings, but also the maximum adjustment of the workplace to their habits. The supervisor should show them respect. They want to feel appreciated, valuable team members. They expect respect (Wiktorowicz & Warwas, 2016, p. 32). It is also important to ensure development opportunities. They show considerable readiness to work. Generation Z does not want to build their own careers step by step. They want to use their potential at work. Until now, they were intensively stimulated by parents and teachers who cared for the development of their competences. They expect the same from the employer (Galaj, 2014, pp. 85-99).

It is worth noting that employees from Generation Z leave work as soon as they stop meeting their expectations. They do not take into account the risk of finding a job even for a long time, despite the considerable difficulties they face after all, wanting to find a permanent job that matches their ambitions (Wziątek-Staśko, 2015, p. 51-52).

Generation Z is described as new conservatives. They value traditional values (e.g. family related). However, this depends largely on the culture and state in which they grew up (Kubátová, 2016, p. 68; Ariker, Toksoy, 2017, p. 487). It is visible, among others in the election results, not only in Poland, but also in other European countries (and not only). Young people willingly vote for extreme national groups that postulate strong conservative values.

3. Methodology

Despite many initiatives to encourage young people to work in Leszno, their reluctance to stay in their hometown is noticeable. Therefore, it was decided to find out the expectations of young people towards future employers, as well as their opinion on the local labour market.

Thus, a survey was conducted among the students of the last grades of Leszno secondary schools. Their goal was to learn the expectations of young people towards future employers and their opinions on the local labour market, which would allow for the preparation of recommendations for employers from the Leszno poviat, which could help in recruiting and motivating employees from the youngest generation on the labour market, i.e. Generation Z. The following research questions were formulated:

1) What non-wage expectations do the surveyed youth have?
2) What financial expectations do the respondents have?
3) What are the plans for the future workplace of young people studying in Leszno secondary schools and how do they justify them?
4) Is there an employee market in small cities like Leszno?

The research results were presented during the Leszczyński Employers' Conference organised by one of Leszno's secondary schools [Konferencja ..., 2018]. The study involved 390 students (which is about a quarter of all students in the last grades of secondary schools in Leszno), including 205 technical secondary school students, 145 high school students and 40 first degree vocational school students, which corresponds to the actual distribution of students in individual types of secondary schools. Almost 47% of the respondents were girls, with slightly more than 53% of boys. The research included a short survey.

4. Results and Discussion

It turned out that the youth expectations were not excessive and did not depend on the type of school they graduate from and future educational plans. The most important were: adequate remuneration, good work atmosphere, respect for the employee on the part of the employer and work stability. Especially the latter, in the context of the knowledge about Generation Z and its frequent job changes, is surprising. Next, students also pointed to the access to courses and training, employment under an employment contract, flexible working hours and the opportunity to reconcile work and private life. Every tenth student would like to receive additional benefits from the employer (bonuses, sports cards, cinema tickets, private medical insurance, etc.).

Students' financial expectations were also examined. It should be noted that they do not correspond to the reality of the labour market (at least in Leszno). Table 1 presents the outcomes in this area.

Table 1: Financial expectations of students

Salary in PLN	High school		Technical school		Basic vocational school	Together	
	Salary after completing secondary school	Salary afterhighe-reducation	Salary after completing secondary school	Salary after higher education	Salary after completing secondary school	Salary after completing secondary school	Salary after higher education
Less than 1500	6.9%	0.0%	0.5%	0.0%	0.0%	2.8%	0.0%
1500-2000	19.3%	1.6%	15.1%	1.7%	25.0%	17.7%	1.7%
2000-3000	36.6%	13.9%	63.4%	14.3%	52.5%	52.3%	14.1%
3000-5000	16.6%	39.3%	25.4%	33.6%	30.0%	22.6%	36.5%
5000-7000	1.4%	11.5%	1.0%	4.2%	0.0%	1.0%	7.9%
More than 7000	0.7%	9.0%	2.0%	5.0%	2.5%	1.5%	7.1%

Source: own study based on research results.

Immediately after graduating from secondary school, the respondents would like to earn about PLN 2700 net. Technical school students expected a salary of PLN 2760 net. Interestingly, high school students, who had significantly less professional experience and had no chance of obtaining a specific profession after completing secondary school, had higher financial expectations than students from a basic vocational school (approx. PLN 2730 net compared with PLN 2600 net of first degree vocational school students). At the same time, it should be noted that some secondary school students – 7% of the respondents – stated the amount below the minimum wage (currently it is about PLN 1630 net). This means that these people did not know the situation on the labour market. It is worth emphasising that such answers did not occur among students of basic vocational schools and technical colleges. The likely reason for this is that they entered the labour market earlier. Young people also had specific expectations of earnings after graduation. The average among high school students was PLN 2990 net, and among technical high school students – PLN 4160 net. The differences were also visible between students who intend to graduate in Leszno and those who plan to study in another, larger city. The first group would like to earn on average about PLN 3300 net, the second – about PLN 3900 net. In addition, some of the respondents would like to earn over PLN 7000 net. This amount of the expected salary after secondary school was given by 1.5% of the respondents, while after graduation – slightly more than 7%.

It is worth comparing these results to those obtained by Joanna Gajda (2017, p. 166). It studied twenty-year-olds, students of the Faculty of Management at the University of Economics in Wrocław, and therefore an older group, but also belonging to Generation Z. The respondents had similar professional expectations to those indicated by the youth from Leszno's schools. The first places were occupied by work-life balance (92% of responses), access to modern technologies (also 92% of responses) and high salary (91% of responses). Further on, freedom of action, professional development opportunities, friendly work atmosphere

and the possibility of remote work were pointed out. From the future employer, the respondents expect above all the lack of favoritism, keeping their word and openness to the needs of subordinates (92% of responses), as well as the development of skills, respect for their time and work, as well as fair and partner relations (Gajda, 2017, p. 168). Also the results of the research of Katarzyna Włodarczyk and Joanna Sikorska (2017, p. 210) show that for young people the material factor is of great importance. Development opportunities and a friendly atmosphere are also important in professional work.

It is worth noting that the financial expectations of older youth are much lower than those of Leszno's secondary school students. The declared average salary expected after graduation among students and graduates of the Wrocław University of Technology amounted to PLN 2647.89 net (Sulich, 2015, p. 25). The people under 30 who took part in the Human Capital Survey in 2010-2015, i.e. those belonging to Generation Y, had significantly lower financial expectations. The average expected salary in this group was PLN 1981 net (Jurczak, 2015). This clearly shows that the surveyed students from Leszno exhibit above average material needs.

Almost half of the respondents declared that they would first look for a job in Leszno or its surroundings. 49.8% of technical secondary school students and 80% of basic vocational school students had such plans. As justification for their decisions, these people mainly stated reasons related to emotional (35%) and sentimental (10%) factors, i.e. the fact of having family and friends in Leszno, as well as attachment to a place. The second position was short, cheap commuting – 27% of the answers. Only 12 people, i.e. slightly more than 4% participating in the survey, pointed to the positive aspects of the labour market in Leszno (e.g. enough job offers, many perspectives, development opportunities, good employment conditions). These results are presented in figure 1.

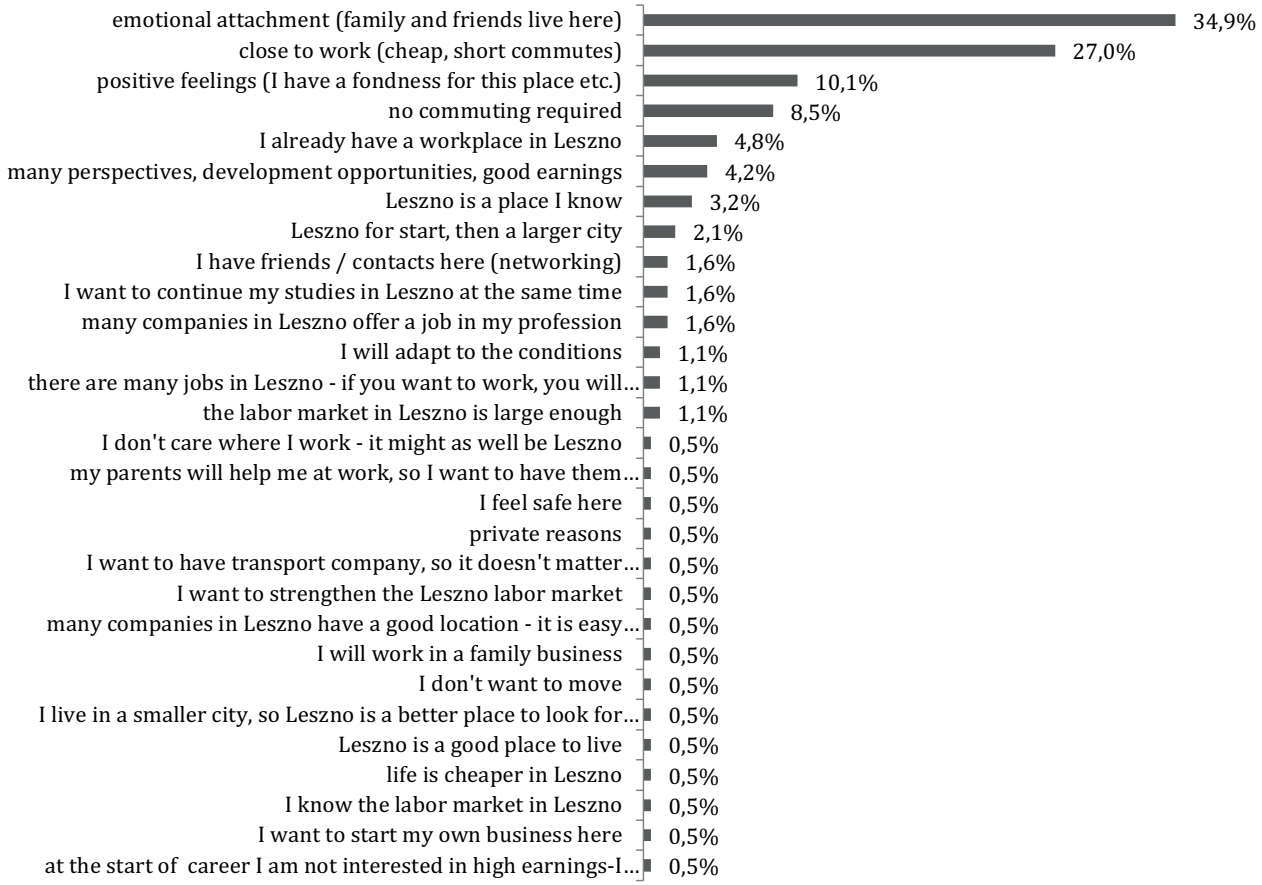

Figure 1. Reasons why young people want to work in Leszno
Source: own study based on research results

In turn, the majority of high school students (52.4%) were not convinced to work in their hometown. It is interesting, however, that as much as 82.2% of those who do not want to work in Leszno want to graduate. In this way, the city will lose young, well-educated potential employees. People who do not want to work in their homeland as the reason for their decision gave mainly the conviction that a larger city allows for better development prospects, better work (41%), conviction about the lack of jobs in the future profession in Leszno (12%) and low wages in Leszno (11.5%). Therefore, it can be seen that these are issues closely related to professional work (in contrast to the reasons given by people planning to start working in Leszno). These results are presented in figure 2.

Figure 2. Reasons why young people do not want to work in Leszno
Source: own study based on research results

It is also worth noting that after graduating in another city, every fourth high school student and 37% of technical school students intended to return to Leszno. It should be added, however, that 46.5% of the respondents who intended to leave Leszno for university did not plan to return to their hometown to look for work. 54.9% of high school students and 37.8% of technical secondary school students responded in this way.

It is therefore necessary to consider the reasons for these decisions. Only 14.5% of high school students and 10.7% of technical secondary school students declared that there were no job offers in Leszno in their future profession. Therefore, the problem lies elsewhere – probably in low wages and in the belief that there is no opportunity for professional development (promotion, etc.) in Leszno. This is confirmed by the fact that unattractive employment conditions were recognised as the biggest barrier on the labour market - low salary and no additional employee benefits. This answer was given by 50.3% of the respondents. Among the remaining obstacles to employment in Leszno, the students mentioned lack of jobs in the profession they would like to do and lack of jobs for young people.

It should also be added that in the majority of Poland there are so-called employee markets. This does not apply to all industries and professions, however, also in smaller towns of the Leszno Poviat, the unemployment rate has remained low for several years (in June 2019 it was 3.3% – data of the Poviat Labour Office in Leszno, http://leszno.praca.gov.pl/stopa-bezrobocia, access 28/09/2019), and employers admit that they have a problem finding employ-

ees in some professions, and the employment of Ukrainian citisens will not improve the situation. Several thousand, however, usually do simple, low-paid jobs [Adamek, 2017]. In the opinion of Leszno's Generation Z, the employee market in this city does not exist. Despite the low level of unemployment, employers do not offer young people the appropriate employment conditions they require. It is not the employees and job candidates that determine the employment conditions. Therefore, it is difficult to talk about a market favorable for the employee.

It is true that employers in Leszno admit that they need well-educated and qualified employees. However, they are not making efforts to encourage work in their organisations. Many assume that since they have managed without full cast so far, so will it be in the future.

Later in the article, the professions with the highest demand for employees in Leszno and the Leszno county are given. The average gross remuneration offered to candidates for work in these professions is given in brackets. These are the data coming from job offers from Leszno and the Leszno county, posted on the portal. praca.gov.pl, valid as of September 28, 2019. If the amount of remuneration has not been provided, it means that employees in a given profession were not sought during this period. In Leszno there is a large deficit of employees in such professions as bus, truck and tractor drivers (PLN 3640) and upholsterers. We may also notice a deficit, among others, in graphic designers (PLN 2250), ICT system analysts, designers and database administrators, programmers, accountants (PLN 3500), carpenters (PLN 2420), roofers (PLN 2270), hairdressers (PLN 2150), electricians (PLN 3700), tailors (PLN 2250), chefs (PLN 2250), warehousemen (2400 zlotys), car mechanics (PLN 3033), bricklayers (PLN 2785), machine tool operators (2690 zlotys) and specialists in electronics, automation and robotics [Competition barometer, forecast for the Leszno and county for 2018]. As we can see, even in shortage occupations, the salaries offered by Leszno employers are not high, often do not exceed the minimum. Considering the results of the conducted research, they certainly do not correspond to Generation Z attending secondary schools in Leszno.

At the same time, many people from Leszno work in exchange for a minimum salary. In 2016, the average salary in Leszno was PLN 3745.94 gross, i.e. slightly over PLN 2.675 net (Leszno in figures, 2018). These are data for enterprises employing more than nine employees. It is no secret that smaller organisations offer lower salaries.

It is a pity that employers, noticing the discrepancies between the situation on the labour market and the expectations of employees, do not respond to them in an appropriate way. In the following years, when the oldest employees retire, there will be a shortage of young people willing to work. At the same time we will have to deal with the so-called competence gap – along with the company's oldest employees will lose knowledge that was not to be passed on to anoybody.

Presumably, similar problems occur in other poviat towns in Poland. Despite the low level of unemployment, the employee market does not exist in many smaller towns.

The practical goal of the conducted research was to propose specific age management solutions that will serve to effectively acquire and motivate, and consequently retain Generation Z employees in the organisation. Thanks to the proposed activities, enterprises can improve their image on the labour market and become perceived as attractive employers, which is especially important for job seekers belonging to Generation Z.

There are several areas of age diversity management in an organisation, including recruitment, employee development, ergonomics and workplace adjustment, as well as employees leaving the organisation (Mahon & Millar, 2014, pp. 562-563). Each generation has different needs. It is worth knowing them to answer them appropriately.

By recruiting, employers have an impact on who they employ and what knowledge they will be able to have in the next years (Cerny, 2015). Organisations should make employment decisions based on the individual differences of job candidates. Unfortunately, the reluctance to employ inexperienced representatives of Generation Z is noticeable. However, planning the age structure, one must take into account age diversity. This will prevent excessive growth of the average age of employees. Otherwise, a situation may happen when most of the staff retire en masse. Only young people without training will be left in the organisation

Managing generational diversity in the area of recruitment and selection begins with a properly constructed advertisement, written in a specific way and placed in the right location (Broughan, 2013, p. 140). It is important to refer to the key competences of the generation we care about most. This is extremely important in times of the war for talents (Girard, Fallery & Rodhain, 2014, p. 100).

The advertisement directed to Generation Z, the youngest on the labour market, should be a showcase of the company. Interesting, surpri-

sing, it must inform about what the employer offers. It should include the requirements that can be expected from graduates, such as the ability to solve problems, make decisions, self-organisation, organisational skills, teamwork and verbal communication (Stewart & Knowles, 2000, p. 30). The advertisement should show real development opportunities under the guidance of experienced employees. Young people are also attracted to the international work environment (Warwas & Wiktorowicz, 2016, p. 77). It is worth emphasising the possibility of online work and work-life balance, which for Generation Z means that all activities carried out during the day can be combined in an appropriate, effective and trouble-free way. Thus, if Generation Y assumes that they will go to work for 8 hours and then have free time, then the youngest on the labour market expect them to perform their tasks, without giving up going to the office or cinema during the day. Generation Z looks forward to tasking. They are focused on the tasks and not on the time of their completion. Work should be a passion. In the vacancy notice, it is worth including information on the possibilities of working with devices and programs using modern technologies. Importantly, it is also good to include specific information on remuneration. Young people find this fair on the part of the employer. In this way, one will also show respect for the time of a young job applicant. If the proposed conditions do not suit them, they will not have to unnecessarily get involved in the recruitment process.

It also seems that if we want to recruit employees from Generations Y and Z, part of the recruitment process should take place virtually. For the youngest generation, information about a potential employer, which is sought mainly on the Internet, is important. It is therefore worth updating the information on the organisation's website and official profiles in social media – Facebook, YouTube or Instagram, where it is also worth placing job ads. It turns out that in the United States as many as 70% of job candidates view job ads using a mobile phone. It may probably be similar in Poland. The company's website should therefore be adapted to be viewed on mobile devices (Dziopak-Strach, 2016, pp. 50-51).

The youngest generations pay special attention to the professionalism of recruiters (Warwas, Wiktorowicz, 2016, p. 76). During the recruitment process, it is worth highlighting the development opportunities, the manner of remuneration (preferable remuneration for results) or the possibility of maintaining a balance between work and private life. This is very important for the young generation of employees. Therefore, young people do not want to work overtime or spend long hours on commuting. The way of communication with job candidates from Generation Z is also important. It is best if it takes place via SMS or e-mail. It is also worth to remind them about the date and time of the recruitment meeting (Dziopak-Strach, 2016, pp. 50-51). It can be a supplement to the initial telephone conversation with the candidate.

According to the members of Generation Z, recruitment should be friendly, not stressful. It can take the form of gamification (an example is the Gra o Bro portal run by Kompania Piwowarska in 2013 or the game Unilewergame). It is also worth using edu recruiting, i.e. recruitment through education, which involves sponsoring fields of study and creating patronage classes in order to attract well-educated employees in the future (Warwas & Wiktorowicz, 2016, pp. 86-90). Young people are also worth recruiting at universities and secondary schools.

It is important for Generation Z that their employer is socially involved (Warwas & Wiktorowicz, 2016, p. 85). Therefore, all CSR activities are welcome.

Prior to sending the application documents, the candidate from Generation Z thoroughly checks the future employer. Websites and company profiles in social media should be updated and present the organisation in an attractive way. It is important to take care of relations with the candidate at every stage of recruitment. We should also remember about proper implementation of the newly recruited employee. This process should be adapted to its age and experience, as well as the resulting needs (Zając, 2014, pp. 30-31)

Organisations are increasingly holding completely virtual recruitment. As many as 49% of French recruiters use social media for this purpose (Girard, Fallery & Rodhain, 2014, p. 98). This brings a number of benefits, both for the job applicant and for the enterprise itself. It allows strengthening the attractiveness of an enterprise as an employer, mainly in the opinion of the youngest generations – they are the ones who particularly use social mediam (Doherty, 2013, p. 13; Holland & Jeske, 2017, p. 301). Often, recruiters receive many senseless applications; social media allow them to choose the best – quickly and without costs. The employer gets better quality applications, and thus better suits people to the workplace. Absenteeism and the number of those leaving work is therefore reduced.

Social media allows them to increase long-term engagement. Relations between job candidates and employers can be facilitated by others. It may also be part of the company's

communication strategy (Ladkin & Buhalis, 2016, p. 337).

In addition, thanks to social media, more people learn about recruitment for a given position. It also facilitates the recruitment of candidates and employers (Recruitment goes virtual, 2013, p. 19). They have more and more users.

They also help in getting to know job candidates better (Ladkin & Buhalis, 2016, p. 332), They also create greater opportunities for contact with the job candidate (Girard, Fallery, Rodhain, 2014, p. 99). They allow interacting with candidates who have been passive until now. In addition, the use of social media for recruitment is faster and cheaper than other methods (Doherty, 2010, pp. 11-12). At the same time, it is possible to set an application limit, ensuring their quality. It is a less expensive and more effective method than the others.

However, from the point of view of a job applicant, social media allows him/her to get to know the organisation better (Girard, Fallery & Rodhain, 2014, p. 99). It is also easier for him/her to apply. He does not waste time preparing a current CV. Thanks to this, the organisation does not lose potential job candidates. Both application and recruitment become easier. The recruiter can get to know the candidate in a few seconds (e.g. by searching only for a given word in the CV). Similarly, it works the same way in the case of a job applicant who has received an opportunity to quickly check the most important information about the organisation that interests him/her (Doherty, 2010, p. 12).

Candidates complain about the lack of feedback. Social media allows for easier and faster feedback from the recruiter (Recruitment goes virtual, 2013, p. 20). In this way, we do not discourage further candidates from further recruitment.

An interesting solution is also the use of the mobile application to conduct a video interview. Examples include Sparcin or HireVue, used successfully at the first stage of recruitment by Ikea.

It is worth adding that candidates from Generation Z will gladly take part in the process requiring the preparation of presentations or samples of work. Young people are also worth recruiting during open days organised in the enterprise. Thanks to such events, potential candidates have the opportunity to test themselves during a typical work day, learn about the organisational culture and company values (Dziopak-Strach, 2016, pp. 50-51).

To get to know the expectations of employees from Generation Z as to how to motivate them, it is worth starting with the results of several studies. One should consider what increases the productivity of employees from Generation Z. Research shows that these are primarily: the type of work (65%), the people they work with (65%), personalisation of the work space (38%), location of work (36 %), ability to listen to music at work (29%), workplace privacy (27%) and the size of the workplace (27%). However, it should be emphasised that these needs vary depending on the country of origin of young people. Therefore, they depend on nationality and culture (Galaj, 2014, pp. 85-99; Kubátová, 2016, pp. 65-67). It should be remembered that for Generation Z members remuneration (financial motivation) is much more important than for older age groups. (Although Polish research has shown that for 75% of employees from Generation Z, only decent wages count.) Then they are motivated primarily by relationships in the workplace, including relations with the supervisor (Grenčikova, Guščinskiene & Španková, 2017, pp. 250-251). Therefore, it seems more important to create opportunities for continuous learning and to propose unconventional tasks. Competition should be replaced by cooperation. Good atmosphere and close correct relations are important. The employer should appreciate the experience gained during internships, work in student organisations and scientific associations (Żarczyńska & Chomątowska, 2016, p. 413). Nevertheless, Generation Z is young, educated, curious about the world, people with many passions, which they have developed since early childhood. They like to brag about them. Employers should be prepared to accept them in their organisations (Bencsik, Horváth-Csikós & Juhász, 2016, p. 93) and provide them with opportunities to develop their interests. The youngest generation on the labour market values a good atmosphere at the workplace. Expects no discrimination based on age. They want to be appreciated and respected by their superiors and colleagues. Frequent praise is therefore a good option. These employees want to be treated seriously. They expect individual attention and care. Parents raised them in the belief that they are fantastic. They now need support from older generations (Żarczyńska, Chomątowska, 2016, pp. 410-411; Galaj, 2014, pp. 85-99). They value frequent feedback. They also want to have an influence on their work (Bencsik, Horváth-Csikós, Juhász, 2016, p. 94). They do not take into account the risk of looking for a job for even a long time. And they have difficulties finding a permanent job that suits their ambitions. Similarly to Generation Y, they leave work as soon as employment conditions cease to satisfy them (Galaj,

2014, pp. 85-99; Wziątek-Staśko, 2015, pp. 51-52; Bencsik, Horváth-Csikós & Juhász, 2016, p. 94). They are focused on cooperation, not competition. They do not feel well working in a corporation. They value the organisation for its positive attitude towards the community, environment, emotionality, law and for being sensitive to the problems of others. The employer's transparency is important. However, they do not understand the confidentiality of information, for which they sometimes run into trouble (Ariker & Toksoy, 2017, pp. 487-497). They value the work-life balance even more than Generation Y. They expect challenging, interesting remote work, flexible working hours, preferably in the task mode. Reality does not have to be tangible. To maximise their productivity, they should be allowed to rest during the day (Bennett, Pitt & Price, 2012, p. 285). According to the results of the research of Grenčikova, Guščinskiene and Špankova (2017), despite many similarities, Generation Z differs from Generation Y. For slightly older 'Ys' the type of work performed is most important. Salary is in the second place, along with relationships at work. Financial motivation is most important for the youngest age group on the labour market. 'Ys' simply want to earn fairly. Generation Z has much higher financial expectations. Non-financial benefits should also be provided to them (Żarczyńska & Chomątowska, 2016, p. 410). At work, they want to make their dreams come true, do what their passion is. It will therefore be appropriate to provide them with diverse, interesting, inspiring tasks, preferably in the form of projects. Work should be enjoyable and adequate to their competences (Żarczyńska, Chomątowska, 2016, p. 411). Generation Z members want to lead, even though they often lack the competence to do so. Therefore, they need autonomy and independence (Bencsik, Horváth-Csikós, Juhász, 2016, p. 93; Kubátová, 2016, p. 68). They fear being treated stereotypically. They do not want employers to see them only as young, inexperienced, demanding employees with excessive self-esteem (Żarczyńska, Chomątowska, 2016, p. 409). When they take up work, they try to bring out the best of it, to use it in the future. They are great at tasks that give development opportunities (Galaj, 2014, pp. 85-99). Despite their young age, they expect stable employment under an employment contract (Bencsik, Horváth-Csikós, Juhász, 2016, p. 94). Unfortunately, employers often offer them employment under civil law contracts. Young people expect the use of ubiquitous technology in the workplace, for example, to communicate with superiors, colleagues and clients. They want to experience this already during recruitment. Modern technology is to provide unlimited space for communication with people inside and outside the organisation. Newly employed for generations It is worth creating a know-how base about the company and discussion groups in which they can consult the team (Żarczyńska, Chomątowska, 2016, p. 413). It is also worth creating opportunities for them to achieve successes, even the smallest ones. A good solution will be activities in the field of so-called gamification.

5. Conclusions

The results of the conducted research show that young people have unrealistic financial expectations. However, those concerning other areas of employment are not excessive. Unfortunately, despite the low level of unemployment and the problem of finding people willing to work, employers do not fully respond to the expectations of young people. It is therefore worth taking measures in the field of age management, especially in the area of recruitment and employee motivation, which will avoid the negative effects of demographic change.

Certainly, this subject requires further research. It is interesting to see the employee market in the opinion of the employees themselves, especially in smaller towns, where a low unemployment rate is observed, but it does not translate into improved employment conditions.

It is worth noting that, although this was not the purpose of the study, significant differences in the financial expectations of girls and boys were noticed. The surveyed students would like to earn on average around PLN 1200 less than their classmates after finishing secondary school and about PLN 1700 less after graduating from a univeristy. They probably assess the labour market conditions more realistically. On the other hand, they may underestimate their knowledge and skills (in turn boys can overestimate them). Certainly, in order to accurately explain the results obtained in this area, further research should be carried out. This is undoubtedly an interesting phenomenon, all the more in the context of efforts to date for equality between employees of different genders in the workplace.

References

Adamek J. (2017). *Ukraińcy w Lesznie*, http://elka.pl/content/view/84859/150/ (4.09.2019).

Ariker Ç., Toksoy A. 2017, Generations Z and CSR. Antecedents of purchasing intention of university students. *Kafkas University Economics and Administrative Sciences Faculty KAUJEASF*, 8(16), 483-502.

Bencsik A., Horváth-Csikós G., Juhász T. (2016). Y and Z generations at workplaces. *Journal of Competitiveness*, 8(3), 90-106

Berkup B.B. (2014). Working with generation X and Y in generation Z period. Management of different generations in business life. *Mediterranean journal of social science*, 5(19), 218-229.

Broughan Ch. (2013). An evidence based approach to creating an age-friendly culture. *Strategic HR Review*, 12(3), 138-144.

Cerny D. (2015). Who gives whom? – generations in the workplace and perceptions of transfer processses in business enterprises. *International journal of infonomics*, 1(1), 6-10.

Doherty R. (2010). Getting social with recruitment. *Strategic HR Review*, 9(6), 11-15.

Dolińska-Weryńska D. (2016). Motywacje i potrzeby pracowników pokolenia Y w gospodarce opartej na wiedzy. *Zeszyty naukowe Politechniki Śląskiej*, 92, 2016, 31-47.

Dziopak-Strach A. (2016). Pokolenie Y wyswaniem dla działów HR. *Zeszyty naukowe WSH*, 2, 45-56.

Gajda J. (2017). Oczekiwania przedstawicieli pokolenia Z wobec pracy zawodowej i pracodawcy, *Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, 491, 158-171.

Galaj W. (2014). *Pokolenie Z na rynku pracy* In: A. Rogozińska-Pawelczyk (eds.) *Pokolenia na rynku pracy*. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 86-111.

Girard A., Fallery B., Rodhain F. (2014), *Integration of Social Media in Recruitment: A Delphi Study* In: *Social Media in Human Resources Management*, 97-120.

Grenčikova A., Guščinskiene J., Španková J. (2017). The role of leadership in motivating employees in a trading company. *Journal of security and sustainability issues*, 7(2), 250-251.

Konferencja Pracodawców Regionu Leszczyńskiego, https://leszno.pl/Konferencja_ Pracodawcow_Regionu_ Leszczynskiego.html (4.09.2019).

Kubátová J. (2016). Work-related attitudes off Czech generation Z. Interational comparison. *Central European business review*, 5(04), 61-70.

Ladkin A., Buhalis D. (2016). Online and social media recruitment: Hospitality employer and prospective employee considerations. *International Journal of Contemporary Hospitality Management*, 28(2), 327-345.

Leszno in figures 2018, https://www.leszno.pl/DATA/Leszno_w_liczbach_PL.pdf (28.09.2019)

Lyons B. J., Wessel J. L., Tai J. Ch., Ryan A.M. (2014). Strategies of job seekers related to age-related stereotypes. *Journal of Managerial Psychology*, 29(8), 1009-1027.

Mahon J.F., Millar C., (2014). ManAGEment: the challenges of global age diversity for corporations and governments. *Journal of Organisational Change Management*, 27(4), 553-568.

Parry E., Urwin P. (2011). Generational differences in work values. A review of theory and evidence. I*nternational journal of management reviews*, 13, 79-96.

Peter Holland P., Debora Jeske D. (2017). *Changing Role of Social Media at Work: Implications for Recruitment and Selection* In: *Electronic HRM in the Smart Era*, 287-309.

Pritchard K, Whiting R. (2014). Baby boomers and the lost generation. On the discursive construction of generations at work. *Organziational studies*, 35(11), 1605-1626.

Profession barometer. Forecast for the Leszno and poviat for 2019, https://barometrzawodow.pl/wielkopolskie/prognozy-dla-powiatow (28.09.2019).

Recruitment goes virtual: Use web-based technology intelligently for best results in recruitment (2013). *Human Resource Management International Digest*, 21(3), 19-21.

Schawbel, D. (2014). *Generation Z. Understanding the Next Generation of Workers*, http://millennialbranding.com/2014/geny-genz-global-workplace-expectations-study (28.09.2019).

Stewart J., Knowles V. (2000). Graduate recruitment and selection practices in small businesses. *Career Development International*, 5(1), 21-38.

Sulich A. (2015). Oczekiwania płacowe studentów i absolwentów Politechniki Wrocławskiej wobec pierwszego pracodawcy. *E-mentor*, 2, 24-27.

Tulgan B. (2009). *Not Everyone Gets A Trophy: How to Manage Generation Y*, San Fran¬cisco: Jossey-Bass.

Warwas I., Wiktorowicz J. (2016). *Nabór pracowników otwarty na różnorodność - rekrutacja, selekcja, adaptacja* In: J. Wiktorowicz, I. Warwas, M. Kuba, E. Staszewska, P. Woszczyk, A. Stankiewicz, J. Kliombka-Jarzyna, *Pokolenia - co się zmienia?* Warszawa: Wolters Kluwer, 75-95.

Włodarczyk K., Sikorska J. (2017). Aspiracje zawodowe młodych osób na polskim rynku pracy. Studia Ekonomiczne. *Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 310, 201-214.

Work offers, Poviat Labour Office in Leszno, http://leszno.praca.gov.pl/stopa-bezrobocia (28.09.2019).

Wziątek-Staśko A. (2015). Wiek kluczowym wyróżnikiem różnorodności próbników - implikacje dla motywowania. *Społeczeństwo i edukacja*, 16(1), 47-60.

Zając M. (2014). Znaczenie różnorodności wiekowej pracowników w kontekście wybranych obszarów zarządzania wiedza w organisacji. *Zeszyty Naukowe Politechniki Częstochowskiej*, 15, 25-36.

Żarczyńska-Dobiesz A. Chomątowska B. (2016). Zarządzanie wielopokoleniowymi zespołami – wybrane problemy i wyswania. *Innowacje w zarządzaniu i inżynierii produkcji,* 1, 379-386.

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Statutory regulations and corporate governance standards in cooperative banks

Mikołaj Jalinik[1], **Krzysztof Łukaszuk**[2]

[1] Bialystok University of Technology, Poland
[2] Cooperative Bank in Bielsk Podlaski, Poland

ABSTRACT

Eleven years after the last financial crisis, many banks (as well as the entire financial system) are still working out their organisational backlogs and severe financial losses. Apart from the expansionary monetary policy and faulty financial innovations, the lack of proper supervision of the financial sector is considered one of the main sources of the global economic crisis. The expectations of shareholders led banks to take more courageous risks, more leverage and more speculation. Ownership supervision failed as a result, as virtually no bank was prepared for the imminent catastrophe. To prevent a similar scenario in the future, reforms in the financial sector were considered necessary, and above all the strengthening of corporate governance was considered necessary. Although the co-operative banks operating in Poland are small entities with a local character, they have also to some extent been affected by the global crisis. This has been delayed, and on a somewhat smaller scale, but has worsened the performance of many banks. Given numerous proposals for additional corporate governance regulations, in addition to the existing national laws and codes of good practice, regulations were implemented at the European level, and the national supervisor, the Polish Financial Supervision Authority, introduced additional guidelines - corporate governance rules for supervised institutions.

Keywords: corporate governance, organisational structure, cooperative bank, management.

1. Introduction

Savings and loan cooperatives are the oldest branches of cooperative activity in Poland (Potocki, 1996). In 2018, 157 years passed since the establishment of the first credit cooperatives in Poland, and the first Polish savings and credit cooperative is considered to have been established in 1861 Loan Society for Industrialists of the city of Poznan. The oldest cooperatives include the Loan Societies in Brodnica and Golub, founded in 1862. At present, cooperative banking comprises 550 cooperative banks (Associate, 2018, p.6) associated in two structures of associated banks (Bank BPS S.A. associating 351 banks, i.e. 63.81% of the total number of cooperative banks and SGB-Bank S.A. associating 199 banks, i.e. 36.18%) and three non-associated cooperative banks cooperating with Bank BPS S.A. (Bank Polskiej Spółdzielczości, 2018). The period of one and a half centuries of cooperative activity allowed developing many effective mechanisms of supervision over the activity of cooperative banks, which to a large extent protected them from the financial crisis spreading across Europe. However, many solutions were created in the distant past when the business model of a cooperative bank was different from the modern one, and the then founders of cooperative banks did not even dream of today's technical solutions. Technical progress, the pace of life, new risks and a different approach to the banking business need to be complemented by the existing corporate governance regulations.

2. The essence of the organisation – organisational structure

Natural understanding of the notion of organisation (from gr. organon, Latin organum - order), means a targeted social group functioning according to certain rules and principles, cooperating to achieve a specific goal (Griffin 1998). This idea accurately reflects the sense of the existence of an organisation based on cooperative law – a cooperative bank. Under Article 1 § 1 of the Act on Cooperative Law, a cooperative is a voluntary association (...) which, in the interest of its members, conducts joint economic activity (Act of 16 September 1982). The essence of the organisation is the awareness of principles, rules, missions and goals and synergy (matching and supporting the activities of others), and its immanent feature is an ordered (structured) social and technical system composed of interconnected technical and social elements (Kożuch, 2001; Kast, Rosenzweig, 1970). Kotarbinski emphasises in the organisation such cooperation of parts that contribute to the success of the whole, while Griffin (1998) characterises the organisation as a group of people who cooperate in an orderly and coordinated way to achieve a certain set of goals. In this context, within a bank, in terms of individualised principles of management, supervision and shareholder relations, we may consider the concept of corporate governance – the system through which a bank is managed and controlled (Cadbury, 1992).

According to the definition contained in Art. 2 of the Banking Law a bank is a legal person (...), acting based on permits authorising to perform banking activities, encumbering with risk the funds entrusted under any repayable title. The juxtaposition of both legal acts regulating the framework for the functioning of a cooperative bank (banking law and cooperative law) implies an entity (cooperative bank), as a voluntary association conducting joint economic activity in the interest of its members. After defining the directions and objectives, the organisation faces the problem of choosing a specific organisational structure, its individual structural elements and the arrangement of relationships between the individual elements that can be used for shaping the organisation in the form of mutually related elements (while the overriding objective remains to maintain an adequate level of security of the entrusted funds). The specific layout of the internal elements of the organisation and their interrelationships are referred to as the organisational structure.

3. National regulations

General organisation of processes requires cooperation of the components of organisational elements (Zieleniewski, 1978), however, the specificity of banking activity is a strong dependence of the shape of the organisational structure on the formal and legal environment, relating directly to the form of conducting business (banking law), and indirectly shaping ownership relations in the bank (cooperative law), functioning in the legal and economic system in a given country (Act of 7 December 2000), or standardised customs commonly accepted for a given type of activity. Due to the state regulation of banking activities, the freedom to shape the organisational structure applies only to its parts and to certain organisational units of the bank. The generally binding regulations define the shape and functions of the governing bodies representing banks expressing their will as a legal person[1]. The central supervisor is also responsible for several decision-making and control powers (Act of 21 July 2006), which enable both exercising control over the content of the bank's statute and influencing the bank's governing bodies to make or remove relevant provisions.

The Polish financial market is subject to supervision by a national supervisor - Polish Financial Supervision Authority (KNF). The purpose of financial market supervision is, inter alia, to ensure the proper functioning of that market, its stability, safety and transparency, trust in the financial market, as well as to ensure the protection of the interests of financial market participants. KNF examines the compliance of banks' activities with legal regulations and may issue recommendations (banking law) concerning best practices of prudent and stable bank management. Recommendations require shaping the organisational structure, processes, and resources of the bank in a manner appropriate to the scale and complexity of its operations so as to effectively manage risks and enable effective risk management and control both at the level of a dedicated unit or risk management function, as well as at the le-

[1] Due to the nature of this document, it is limited to domestic legal acts, omitting, among others, regulations of the European Parliament and directives whose provisions have been implemented in the domestic legal system (e.g. the Banking Law Act, the Act on Macro-prudential Supervision of the Financial System and Crisis Management in the Financial System or the Regulation of the Minister of Development and Finance on the Risk Management System and the Internal Control System, Remuneration Policy and the Detailed Method of Assessment of Internal Capital in Banks).

vel of business units and their support. KNF's recommendations do not constitute legal regulations, however, they are an element of BION assessment (banking law) and in the process of control, it is required that banks comply with both the requirements resulting from legal regulations and supervisory recommendations issued by KNF (UKNF, 2019). The document complementing the above-mentioned legal acts and recommendations are corporate governance rules for supervised institutions (UKNF, 2014), which are a form of implementation of the obligation to take actions by the supervisory authority to ensure proper functioning of the financial market and educational and informational activities related to the functioning of the financial market.

The basic legal act applicable in cooperative banks is the cooperative law defining the governing bodies of a cooperative: general shareholders' meeting (the owner's body of the bank), supervisory board (the controlling body), bank management (the executive body) - constituting the basic elements of the bank's organisational structure and remaining outside the scope of modification of the cooperative.

Within the scope not regulated by the provisions of the Act, the following Acts shall apply to cooperative banks: Banking Law and the Act on the Functioning of Cooperative Banks. Due to the special type of activity, the Banking Law Act indicates that the bank's management board designs, implements and ensures the operation of the management system. The supervisory board of the bank supervises the introduction of the management system and assesses the adequacy and effectiveness of this system (which is included in the management system). To ensure the functioning of the internal control system, the bank is required to have an organisational structure adjusted to the size and profile of the risk incurred, which in practice results in the establishment of an appropriate organisational unit or functional separation of a position within a larger organisational unit. Other elements of the structure are shaped within the bank's organisational capabilities, and their detailed powers are usually specified in the statutes (competences are divided between the bank's board of directors and the management board) (Kudła, 2001).

The highest body of a cooperative bank is the general meeting (under Article 36 § 1 of the Act on Cooperative Law). All members – shareholders of the bank – have the right to participate in it, and thus make decisions on important matters. According to the idea of cooperative activity (expressed in Article 36 § 2 of the Act on Cooperative Law), each member has only one vote – regardless of the number of shares held. This means that the legislator grants all members of the cooperative bank equal rights to decide on the method of managing the assets of the cooperative bank. This is the so-called principle of democratic membership control, expressed in the phrase "one member – one vote", which makes cooperatives perceived as an important pillar of the social economy and an element of building civil society (Piechowski, 2013).

The General Meeting, as the highest authority of ownership, has the exclusive right to make the most important decisions (it adopts the directions of development of economic, social and cultural activities, examines the reports of the council, approves the annual and financial statements), in particular, it grants a vote of approval to the members of the management board and adopts resolutions on the distribution of the balance sheet surplus. While members of the management board are elected by the supervisory board (which controls and supervises the cooperative activity), and less frequently by the general meeting, the general meeting is solely responsible for approving the annual reports and financial statements and granting a vote of approval to the members of the management board. As indicated by the Supreme Court in the judgment of 26 March 2002, the resolution of the General Meeting of Shareholders on granting votes of approval to members of the management board does not have any civil law effects - it is a statement of knowledge based on recognition. It is also an instrument of supervision and control over the activity of bodies (council and board) by their owners. Moreover, this right cannot be excluded in any way or transferred to the competence of another authority. Under Polish law, the appointment of bank management board members (all of them) takes place with the consent of the KNF, which is requested by the supervisory board; only in the case of cooperative banks is simplification introduced – only the appointment of the bank management board president requires such consent.

Cooperative banks, apart from appropriate elements required by Polish law (general meeting, supervisory board, and management board), in the remaining scope, usually operating in the areas of communes or districts, shaped the structures in a functional way, distinguishing the credit department, cash and treasury department, accounting and settlements, as well as organisational and economic positions (Kudła, 2001). The cooperative law defines only the competences of the supervisory board in the scope of approving the organisa-

tional structure of the cooperative bank, while the banking law requires that the organisational structure be adjusted to the size and profile of the risk incurred by the bank. The previous regulations of the national law did not interfere with other organisational aspects. Only a form of supplementing supervisory functions was and still is the function of statutory vetting - already in 1920, the state started to withdraw from direct interference in independent and autonomous cooperatives, because it was recognised that the state would not perform these functions better than self-government and corporate cooperative supervision. A system consisting of the National Cooperative Council was created, together with the auditing unions. The purpose of vetting is to control the observance of the law, principles, and values of cooperatives and to verify whether the cooperative operates in the interest of its members.

Until the introduction of European regulations, national solutions regulated most areas of cooperative banks' corporate governance activities. The scope of the organisation and organisational structure, relations with shareholders of management bodies and the supervisory authority were regulated by the cooperative law and banking law. The areas such as e.g. promotional activities did not require separate regulations, as the essence of the establishment of cooperative banks was a bottom-up initiative to satisfy the needs of their founders, which also indirectly affected customer relations - mainly relations with bank owners.

In 2013, the 25th General Meeting of the ZBP adopted a set of principles defined by the Banking Ethics Commission of the Polish Banks Association - the Code of Banking Ethics (principles of good banking practice), which are adopted by banks on a voluntary basis, out of concern for the quality of their operations and transparency of relations with customers, shareholders and other financial market participants (Związek Banków Polskich, 2013).

4. European regulations

Poland's accession to the European Union brought a certain legal duality to the Polish agenda: in the subjective (legislative) aspect, in force, apart from the Polish law system, also the European Union law system. Under the provisions of Article 288 of the Lisbon Treaty, Poland undertook to adopt regulations, directives, decisions, recommendations and opinions to exercise the Union's competences. EU directives are binding on the Member States as regards the reference to the result to be achieved, leaving national authorities free to choose the form and means of redress. This means that directives must in principle be implemented in the legal order of the member states to talk about the legal effect they are to achieve. Such implementation was required by Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013. On the other hand, regulations are of general scope, binding in their entirety and directly applicable in all Member States, such as Regulation (EU) No. 575/2013 of the European Parliament and of the Council of 26 June 2013. It should be noted that recital 5 of the preamble to the aforementioned Regulation indicates that both documents should constitute the legal framework governing the conditions for the admission of credit institutions and investment firms to operate, the framework for their supervision and the "prudential" standards applicable to them. Therefore, the Regulation should be interpreted together with the above-mentioned Directive.

Both regulations have also introduced quality requirements to the existing formal requirements of Polish law. Particular emphasis was placed on the area of professionalism and ethics of the members of the organs. The level of customer relations and confidence-building was extended beyond the bank's scope to the entire financial market, and obligations to take care of the customer and provide reliable information about the services and products offered were introduced in a way that was understandable to the customer. It also introduced obligations regarding the application of the remuneration policy (in the context of the security-development element), the system for detecting irregularities and elements for protecting the rights and development of employees (to build the value and reputation of the bank's institution). While the cooperative law left some freedom to the owners' and supervisory authorities to appoint the management board, and the provision on the powers of the authorities was added to the banking law only in 2015, recital 59 of the above-mentioned Directive (of 2013) indicates the need to assess the knowledge, qualifications, and skills necessary to ensure sound and prudent management of a given institution. The Directive introduces (recital 60) indirectly an obligation to diversify the composition of management bodies (in terms of age, gender, geographical origin, education and professional experience of members) to ensure a broad spectrum of views and experience. The importance of gender balance as a factor in ensuring adequate representation of society is being raised. The observations made on the example of selected banks in Podlaskie Voivodeship (Table 1) show that while on average women make

up 52% of all members of bank boards (their number ranges from 0% to 100% - full composition of the board), the number of women on supervisory boards is much lower, as on average it is only 13% (from 0% to 2/3 of the board).

The impact on gender parity in the current legal landscape of the Polish banking system was beyond the competence of the KNF. It was only after the EUNB issued the guidelines in 2012 (EUNB, 2012), that cooperative banks (similarly to other Polish banks) were obliged to implement by 22.05.2013 the procedures for assessing the qualifications of members of the management body and persons performing the most important functions. It should also be noted that Article 91 of the Directive indicates additional (in addition to qualifications) requirements for the management body, such as the criterion of reputation, having sufficient time to perform functions in the institution or limiting the number of functions performed at the same time. It should also be emphasised that Article 91(8) of the Directive provides that members of the management board shall act honestly and ethically and shall maintain their independence of judgment (the paragraph also applies to the supervisory authority).

Table 1: The composition of management boards and supervisory boards of selected banks of Podlaskie Voivodeship in 2019

No.	Cooperative bank	Number of members of the Management Board	including women	Number of members of the Board	including women
1.	Spółdzielczy Bank Rozwoju	4	1	9	1
2.	HEXA Bank Spółdzielczy	3	1	11	1
3.	Podlasko-Mazurski Bank Spółdzielczy w Zabłudowie	4	1	7	1
4.	Bank Spółdzielczy w Mońkach	3	1	9	1
5.	Bank Spółdzielczy w Bielsku Podlaskim	3	1	7	2
6.	Bank Spółdzielczy w Olecku	3	0	10	1
7.	LIMES Bank Spółdzielczy	3	3	9	0
8.	Bank Spółdzielczy w Ełku	3	3	9	3
9.	Podlaski Bank Spółdzielczy w Knyszynie	3	2	8	0
10.	Bank Spółdzielczy w Narwi	4	4	5	1
	Medium	**3.3**	**1.7 (52%)**	**8.4**	**1.1 (13%)**

Source: own elaboration based on information from banks' websites.

The national laws defining only the most important bodies of a cooperative bank have been supplemented by European regulations and ZŁK. In § 1 of ZŁK (Corporate Governance), KNF orders to reflect its organisation in the organisational structure of the bank, and the structure itself (organigram) should be disclosed by placing it at least on the website. The disclosure of the organisational structure should also be reflected in the Bank's internal regulations. The organisational structure of the bank should be transparent and adequate to the scale and nature of the bank's operations and risk-taking. Professional subordination, tasks, responsibilities and scope of duties and responsibilities should be assigned and appropriately divided. They should cover and reflect the entire business area of the bank, including management bodies and other organisational units.

At the same time, it is required that the organisational structure should clearly define the scope of tasks and responsibilities and that there should be no overlapping duties and responsibilities between organisational units. The Directive 2013/36/EU of the European Parliament and the Council states that the organisational structure should be part of a sound governance framework and should be characterised by clear and consistent lines of responsibility. Therefore, the correct application of corporate governance principles in organisational practice should result in a clear separation of all three decision-making levels, i.e. general meeting, supervisory board and management board, which are complementary and at the same time none of them has an advantage over the others.

A new quality not yet found in the domestic legal order is the obligation to make public information about banks' corporate governance mechanisms (the publication of an approved statement assuring the public that the mechanisms in place are appropriate and effective). Based on the analysis of statements (Table 2) of management boards of cooperative banks regarding the scope of application of corpora-

te governance rules for KNF supervised institutions (ZŁK), it can be concluded that all the banks surveyed departed from the rule specified in § 8 section 4, i.e. from applying facilitation of participation of all shareholders in the meeting of the governing body, inter alia, by ensuring the possibility of electronic active participation in meetings of the governing body. This is a consequence of the high costs of implementing such solutions, as well as its questionable purpose since each shareholder is informed about the meetings of the body and can participate in them.

Table 1: The composition of management boards and supervisory boards of selected banks of Podlaskie Voivodeship in 2019

No.	Cooperative bank	§ 8 section 4	§ 22	Chapter 9	§ 6	§ 11	§ 16
1.	Spółdzielczy Bank Rozwoju	N	N	ND			
2.	HEXA Bank Spółdzielczy	N	N	ND	N		
3.	Podlasko-Mazurski Bank Spółdzielczy w Zabłudowie	N		ND			
4.	Bank Spółdzielczy w Mońkach	N		ND		N	
5.	Bank Spółdzielczy w Bielsku Podlaskim	N		ND		N	
6.	Bank Spółdzielczy w Olecku	-	-	-	-	-	-
7.	LIMES Bank Spółdzielczy	N		ND			
8.	Bank Spółdzielczy w Ełku	N		ND		N	
9.	Podlaski Bank Spółdzielczy w Knyszynie	N	N	ND		N	N
10.	Bank Spółdzielczy w Narwi	N	N	ND	N	N	

T – the bank applies the principle, N – the bank does not apply the principle, ND – not applicable, "-"– lack of data
Source: own elaboration based on information from banks' websites.

Four out of ten banks surveyed made a declaration of non-compliance with the principle of independence of members of the supervisory authority (§ 22 ZŁK), justifying this with the specificity of the cooperative entity, in which members of the authorities may be elected only from among the shareholders of the bank. The management boards of all banks stated that they did not apply the provisions of Chapter 9 because they did not exercise their rights from assets acquired at the customer's risk. Two banks stated that they had not introduced rules for an anonymous way of informing the management or supervisory body about abuses (whistleblowing). Half of the surveyed banks stated that they did not apply the rules specified in § 11 ZŁK, i.e. concerning transactions with a related entity – as a rule, the predominant clients of cooperative banks are their shareholders. One of the banks does not apply the rule specified in § 16 ZŁK – concerning the conduct of meetings of authorities and documenting their provisions in the Polish language, while the obligation to use the Polish language in cooperative banks results from the provisions of § 27 of the Constitution of the Republic of Poland and the Act on the Polish language.

5. Conclusions

Since the introduction of cooperative law and banking law in Poland, most areas of cooperative banks' corporate governance activities have been regulated by these two basic legal acts. However, taking into account the development of the financial services sector, the aftermath of the financial crisis in 2008 and the fall in confidence in financial institutions, it became necessary to specify this area. The existing national regulations complemented the principles of corporate governance for KNF supervised institutions and the regulations of the European Parliament. In total, the regulations, although in some areas they duplicate the solutions already existing on the domestic legal grounds, are part of the general policy and practice of developing financial sector regulations, unifying requirements for financial institutions and raising standards in the area of corporate governance. However, in the case of cooperative banks, doubts arise as to whether, being different entities from commercial banks, implementing solutions (including those of the European Parliament) under pressure from the regulator, the results obtained will prove to be adequate to the specificity of the entities covered by it.

References

Associate and Corporate Relations Department of Bank BPS S.A. (2018). *Economic and Financial Situation of Associated Cooperative Banks in the Cooperative Banking Sector as at 31 December 2017*, Warsaw.

Act of 16 September 1982 - Cooperative Law (Journal of Laws of 2018, item 1285).

Act of 7 December 2000 on the functioning of cooperative banks, their association and affiliating banks (Journal of Laws of 2018, item 613).

Banking Law of 29 August 1997 (Journal of Laws of 2017, item 1876, as amended).

Act of 21 July 2006 on supervision over the financial market (i.e. Journal of Laws of 2018, item 621, as amended).

Judgment of the Supreme Court of 26 March 2002, III CKN 989/00.

EUNB. (2012). Guidelines for assessing the qualifications of members of the Management Body and key function holders, EBA/GL/2012/06, 22 November 2012.

Act of 7 October 1999 on the Polish language (Journal of Laws of 2018, item 931, as amended).

Bank Polskiej Spółdzielczości S.A., https://www.bankbps.pl/o-grupie-bps/o-grupie, 31.12.2018 r.

Bank Spółdzielczy w Bielsku Podlaskim, https://www.bsbielsk.pl/45,informacje-podstawowe, 15.04.2019 r., https://www.bsbielsk.pl/plik,52,oswiadczenie-o-stosowaniu-zasad-ladu-korporacyjnego.pdf, 22.04.2019 r.

Bank Spółdzielczy w Ełku, https://www.bselk.pl/o-banku/wladze-banku/, 15.04.2019 r., https://www.bselk.pl/o-banku/zasady-ladu-korporacyjnego/, 22.04.2019 r.

Bank Spółdzielczy w Mońkach, http://www.bsmonki.pl/wladze.php, 15.04.2019 r., http://www.bsmonki.pl/oswiadczenie_zlk.pdf, 22.04.2019 r.

Bank Spółdzielczy w Narwi, http://bsnarew.pl/index.php/licencja-joomla/zarzad, 15.04.2019 r., http://bsnarew.pl/images/banners/owiadczeniezn.pdf, 22.04.2019 r.

Bank Spółdzielczy w Olecku, https://www.bsolecko.pl/o-banku/organy-banku, 15.04.2019 r., https://www.bsolecko.pl/o-banku/lad-korporacyjny, 22.04.2019 r.

Cadbury, A. (1992). The Report of the Committee on the financial aspects of Corporate Governance. London: The Committee on the Financial Aspects of Corporate Governance and Gee and Co. Ltd.

Capital Requirements Directive IV - Dyrektywa Parlamentu Europejskiego i Rady 2013/36/UE z dnia 26 czerwca 2013 r. w sprawie warunków dopuszczenia instytucji kredytowych do działalności oraz nadzoru ostrożnościowego nad instytucjami kredytowymi i firmami inwestycyjnymi, zmieniająca dyrektywę 2002/87/WE i uchylająca dyrektywy 2006/48/WE oraz 2006/49/WE.

Departament Relacji Zrzeszeniowych i Korporacyjnych Banku BPS S.A. (2018). *Sytuacja ekonomiczno-finansowa zrzeszonych banków spółdzielczych na tle sektora bankowości spółdzielczej według stanu na 31 grudnia 2017 r.*, Warszawa.

Griffin, R., W. (1998). *Podstawy zarządzania organizacjami*, Warszawa: Wydawnictwo PWN.

HEXA Bank Spółdzielczy, http://hexabank.pl/o-nas/wladze-banku, 15.04.2019 r., http://hexabank.pl/o-nas/zasady-ladu-korporacyjnego, 22.04.2019 r.

http://limesbank.pl/wp-content/uploads/2019/01/oswiadczenie_Zarzadu_ZLK.pdf, 22.04.2019

http://www.sbrbank.pl/s,zasady_ladu_korporacyjnego,402.html,22.04.2019 r.

https://www.pmbank.pl/__data/assets/pdf_file/0018/319302/Oswiadczenie-o-stos.-ZlK-dla-inst.nadzorowanych.pdf, 22.04.2019 r.

Kast, F., E., Rosenzweig, J., E. (1970), in: *Zarządzanie. Teoria i praktyka*, Koźmiński, A., K., ed., (2002). Warszawa: Wydawnictwo PWN.

Konstytucja Rzeczypospolitej Polskiej z dnia 2 kwietnia 1997 r. (Dz. U. Nr 78, poz. 483 z późn. zm.).

Kożuch B., *Zarządzanie. Podstawowe zasady*. Wyd. Akademickie, Warszawa 2001.

Kudła, J. (2001). *Struktury organizacyjne banków komercyjnych*. Warszawa: Wydawnictwo Twigger.

LIMES Bank Spółdzielczy, http://limesbank.pl/zarzad-i-rada-nadzorcza/, 15.04.2019 r.,

Piechowski, A. (2013). Wartości i zasady spółdzielcze a społeczeństwo obywatelskie i gospodarka społeczna. *Ekonomia Społeczna*, Nr 1.

Podlaski Bank Spółdzielczy w Knyszynie, http://www.pbsknyszyn.pl/?id=2&id2=2, 15.04.2019 r., http://www.pbsknyszyn.pl/?id=2&id2=36, 22.04.2019 r.

Podlasko-Mazurski Bank Spółdzielczy w Zabłudowie, https://www.pmbank.pl/o-banku/zarzad, 15.04.2019 r.,

Potocki, W. (1996), *Polska spółdzielczość bankowa w okresie 135-lecia (1861-1996)*. Warszawa: BGŻ S.A.

Rozporządzenie Parlamentu Europejskiego i Rady (UE) nr 575/2013 z dnia 26 czerwca 2013 r. w sprawie wymogów ostrożnościowych dla instytucji kredytowych i firm inwestycyjnych (Dz. UE. L. 176/1).

Spółdzielcza Grupa Bankowa, https://www.sgb.pl/grupa-sgb/, 31.12.2018 r.

Spółdzielczy Bank Rozwoju, http://www.sbrbank.pl/s,zarzad,64.html, 15.04.2019 r.,

UKNF (2014). *Zasady ładu korporacyjnego dla instytucji nadzorowanych* Warszawa.

UKNF (2019). *Metodyka badania i oceny nadzorczej banków komercyjnych, zrzeszających oraz spółdzielczych (metodyka BION)*. Warszawa.

Ustawa z dnia 16 września 1982 r. Prawo spółdzielcze (Dz. U. z 2018 r. poz. 1285).

Ustawa z dnia 21 lipca 2006 r. o nadzorze nad rynkiem finansowym (t.j. Dz. U. z 2018 r. poz. 621 z późn. zm.).

Ustawa z dnia 29 sierpnia 1997 r. Prawo bankowe (Dz. U. z 2017 r. poz. 1876 z późn. zm.).

Ustawa z dnia 7 grudnia 2000 r. o funkcjonowaniu banków spółdzielczych, ich zrzeszaniu się i bankach zrzeszających (Dz. U. z 2018 r. poz. 613).

Ustawa z dnia 7 października 1999 r. o języku polskim (t.j. Dz. U. z 2018 r. poz. 931 z późn. zm.).

Wyrok Sądu Najwyższego z dnia 26 marca 2002 r. III CKN 989/00.

Wytyczne EUNB w sprawie oceny kwalifikacji członków organu zarządzającego i osób pełniących najważniejsze funkcje, EBA/GL/2012/06, 22 listopada 2012 r.

Zieleniewski, J. (1978). *Organizacja zespołów ludzkich*. Warszawa: Wydawnictwo PWN.

Związek Banków Polskich (2013). *Kodeks etyki bankowej ZBP*. Warszawa.