Financial
Internet Quarterly

UNIVERSITY of INFORMATION
TECHNOLOGY and MANAGEMENT
in Rzeszow, POLAND

Financial
Internet Quarterly

Financial Internet Quarterly 2020, vol. 16 / no. 2

Financial Internet Quarterly Editorial Office
University of Information Technology and Management in Rzeszów
ul. Sucharskiego 2, Room 248, 35-225 Rzeszów
Telephone number: +48 017 866 11 85

*Cooperation with these scholars was made possible by the program "Reaching out to foreign reviewers" funded by the Ministry of Science and Higher Education to disseminate progress in science (based on agreement:725/P-DUN/2016).

Table of contents

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 1-13

DOI: 10.2478/fiqf-2020-0008

Financial Internet Quarterly

IMPACT OF OIL PRICES ON STOCK MARKET DEVELOPMENT IN SELECTED OIL EXPORTING SUB-SAHARAN AFRICAN COUNTRIES

Adewale T. Muritala[1], Adeniyi M. Ijaiya[2], Ahmed O. Adekunle[3], Ibraheem K. Nageri[4], A. Bolaji Yinus[5]

Abstract

This study examines the dynamic impacts of oil prices on stock market development in four oil exporting sub-Saharan African countries in the period of 1989-2015. The Arbitrage Pricing Theory (APT) is used as the theoretical framework where stock market prices are hypothesized to be fully reflective of all available information. Static panel data (Pooled OLS, panel Fixed Effect Model, panel Random Effect Model) and dynamic panel model of Generalized Method of Moments (GMM) were employed in the estimation. The estimation of the static panel model shows that oil prices, exchange rates, gross domestic product, inflation and the corruption index have a positive and significant impact on stock market development. However, there is a slight improvement from the estimation of the GMM dynamic panel model which confirmed that oil prices, exchange rates, gross domestic product, investment, inflation and the corruption index have a positive and significant impact on stock market development. The study therefore recommends that investors in selected the Sub-Sahara Africa (SSA) stock market need to be cognizant of the varying impacts of macroeconomic indicators, particularly those that have been found to exert strong influence on stock returns like oil prices, exchange rates, inflation and the corruption index.

JEL classification: Q43, G10, N27, C23, O55
Keywords: Oil Price, Stock Market Development, Panel Data, Africa

Received: 06.03.2020 Accepted: 06.05.2020

[1] Department of Accounting and Finance, Fountain University Osogbo, Nigeria, e-mail: muritaiwo237@gmail.com, ORCID: 0000-0002- 9946-0159.
[2] Department of Finance, University of Ilorin, Kwara State, Nigeria, ORCID: 0000-0002-6981-0924.
[3] Department of Accounting & Finance, Kwara State University, Molete, Kwara State, Nigeria, ORCID: 0000-0003-1603-6705.
[4] Department of Accounting& Finance, Al-Hikmah University, Kwara State, Nigeria, ORCID: 0000-0002-5569-2169.
[5] Department of Accounting, University of Ilorin, Kwara State, Nigeria, ORCID: 0000-0003-4266-4764.

Introduction

The increasing awareness of investors of the relationship between oil prices and stock market development in selected oil producing Sub Sahara African (SSA) countries has received considerable attention around the globe. The stock market on the one hand serves as a barometer ofa country's economic conditions. Hence, it is widely believed that the behavior of a stock market depends on both economic performance and the political environment of the country. On the other hand, oil is an important source of energy that is important for maintaining smooth economic performance of industries that depend on oil or oil products.

Recent oil price fluctuations (75.4% increase between 2001 and 2008 and a 17.8% decrease between 2008 and 2010 while there was an increase of 28.5% from 2010 to 2013 and a decrease of 41.2% from 2013 to 2019) have led this study to revisit and re-examine the impact of oil prices on stock market development in Sub-Sahara Africa (SSA). The African countries chosen for this study are the oil producing emerging economies which rely heavily on oil exports. While there is no general consensus in the empirical literature regarding the existence and nature of a relationship between oil prices and stock market development, many of these studies have indeed showed that oil price changes had significant effects on macroeconomic environments (Crunado & Garcia, 2005; Kilian, 2008; Cologne & Manera, 2008). However, not many studies have been done on the relationship between oil price changes and stock market development in general and especially in Sub-Saharan Africa countries. The very few studies that have examined the interaction between oil price changes and stock markets are mainly on a few industrialized net oil-importing countries such as the USA, UK and Japan (Jones & Kaul, 1996; Sadorsky, 1999). Moreover, there is also a possibility of unobservable macroeconomic and institutional factors that determine the nature of the relationship between oil prices and stock market development.

There are many reasons for examining the impact of oil prices on stock market development in Sub-Sahara Africa (SSA). First, the literature indicates both positive and negative impacts of oil prices on stock market development and this study attempts to reveal for policy makers whether the impacts are positive or negative in the Sub-Sahara African (SSA) region. Secondly, this is to the best of the authors' knowledge the first study to investigate the impact of oil prices on stock market development in Sub-Sahara Africa (SSA) by adopting a balanced panel of generalized method of moment (GMM) systems approach for four Sub-Sahara African (SSA)stock markets (Nigeria, South Africa, Egypt and Sudan) during the period 1989 - 2015. Secondly, most studies which have been done in the past on the same have focused on specific macroeconomic factors. The present study focuses on both the macroeconomic as well as institutional factors as determinants of stock market development. Finally, this study adds valuable knowledge about emerging economies in Africa that are also oil exporters. Hence, the need to provide further evidence on the impact of oil prices on stock market development in Sub-Sahara Africa (SSA) is of paramount interest to investors, regulators, academics, and the economy in general. The rest of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the methodology used in this study. Section 4 discusses the results. Finally, Section 5 gives the conclusion and policy recommendations.

Literature review

There are two main concepts underlying this study. The first is oil price fluctuation while the second is the concept of stock market development. Beginning with the latter, the stock market can be defined as the market in which shares of publicly held companies are issued and traded either through exchanges or over-the-counter markets (Yadirichukwu & Ogochukwu, 2014). The stock market is also a market which deals in long term loans (Jhingan, 2004). It supplies firms with fixed and working capital and finances medium term and long-term borrowings of the federal, state and local governments. Underlying this definition are two hypotheses: first, that price movements are not considered shocks unless they pass a relative threshold, and second, that only positive price movements matter.

The main theory underpinning this study is the Arbitrage Pricing Theory (APT) developed by Ross (1976) which is a general theory of asset pricing that holds that the expected return of a financial asset can be modeled as a linear function of various macro-economic factors and institutional factors, where sensitivity to changes in each factor is represented by a factor-specific beta coefficient. The APT begins with an assumption on the

return generating factors.

Previous research has worked on the relationship between oil and stock market prices for many countries around the world. This study aims to evaluate the impact of oil prices on stock market development in selected countries in Sub-Sahara Africa (SSA). The results from previous studies differ as a result of geographical factors. Some researches on one hand investigated the effects of oil prices on stock markets in developed countries [Jones & Kaul, (1996); Sadorsky, (1999); Papapetrou, (2001); Anoru & Mustafa, (2007), Miller & Ratti, (2009); Taheri, (2014)] while others explored the relationship between oil prices and stock prices in emerging and developing countries [Brasher, (2004); Maghyereh, (2004); Narayan & Narayan, (2010); Ramos & Veiga, (2010); Imarhiagbe, (2010); Muritala, Taiwo & Olowookere, (2012); Anthony, (2012); Aderamola, (2012); Asaolu & Ilo, (2012); Ogiri, Amadi, Uddin & Dubon, (2013); Itotenaan, Amadi, Moshfique & Dubon, (2013), Akinlo, (2014)].

Jones and Kaul (1996) studied the response of international stock markets to changes in the oil prices using quarterly data. The study focused on stock returns from the USA, Canada, the UK, and Japan, utilized simple regression models, and reported that the stock returns for all countries (except the UK) were negatively impacted by oil prices. Sadorsky (1999) used monthly data to probe the relationship between oil prices and stock returns for the USA from January 1947 to April 1996. The author applied variance decomposition. The findings suggested that oil prices and stock returns have a negative relationship in the short term, meaning higher oil prices lead to lower stock returns. Papapetrou (2001) applied vector error correction modeling to study the effect of oil prices on stock returns for Greece using daily data and the variance decomposition. The study suggested a negative oil price effect on stock returns that extended over four months.

Anoruo and Mustafa (2007) examined the relationship between oil and stock returns for the USA using daily data, Johansen Bivariate Cointegration, and error-correction approach. They found long-run relationship between oil and stock returns in the USA. The estimated Vector-Error-Correction Model (VECM) provided evidence of causality from stock market returns to oil market and not vice versa. Although the Johansen and Juselius estimation technique did not yield evidence of cointegration, the Gregory-Hansen cointegration tests provided evidence of both oil and stock markets being cointegrated. The authors stated that this result implied that both markets are integrated and not segmented. Consequently, the authors believed that diversifying in both markets will not create benefits for the investors holding the portfolio because of the integration of the markets, and that risk minimization through portfolio diversification are unattainable by holding assets in oil and stock markets.

The study by Miller and Ratti (2009) looked at the relationship between world prices of oil and international stock markets. The results of the analysis showed that stock market indices responded negatively to increases in oil prices in the long run. However, according to them, this pattern appeared to disintegrate from the beginning of 2000. Taheri (2014) investigated the impact of oil prices on the stock market of the UK, Canada, USA and France in the terms of real stock returns; the data used in this study was monthly data from 1990 to 2012 using ECM. Their result showed that the response of Canada as an oil producer to the increase of oil was positive and the impact was shown in the first month, the remaining countries which were oil consumers responded to this change negatively.

Brasher (2004) in his analysis on the effect of oil prices on stock market documents, found that all sectors are not affected equally, or at the same time. He found that when oil prices rise, cyclical stocks are the most negatively influenced, cyclical consumer goods are the next most negatively influenced, and lastly financials are the next most negatively influenced. According to the documentation cyclical stocks include general retailers, support services, leisure industries and hotels, entertainment and media. Cyclical consumer goods comprise household goods and textiles, automobiles and parts, while the financials are the investment companies, banks, especially, and other finance industries such as life assurance and insurance and real estate. Beyond this analysis, it is also obvious that stock prices are inversely related in the USA.

Maghyereh (2004) studied the dynamic linkage between oil prices and stock returns in 22 emerging economies using the unrestricted Vector Autoregressive (VAR) approach. The research investigated the effectiveness of innovations in the transmission from oil market to emerging equity markets, utilizing forecast error variance decomposition and impulse response analysis. According to the author, a plot of each emerging equity market response to a shock in the oil price suggested a gradual transmission with the equity market reacting to the shock two days afterwards. While the speed of adjustment slowly declined to zero on the fourth day in 16 countries,

the response continued to the seventh day in Argentina, Brazil, China, Czech Republic, Egypt, and Greece. The impulse response demonstrated gradual diffusion of innovations from the oil market into the emerging equity markets. Furthermore, the author postulated the slow adjustment to imply the presence of inefficiency in the emerging equity market transmission of innovations from the oil market. The variance decomposition revealed very weak evidence of cointegration between oil price shocks and stock market returns. In addition, the author stated that the oil market is an ineffective influence on the equity market because the sizes of responses are very small.

Narayan and Narayan (2010) assessed the relationship between oil prices and Vietnam's stock prices with a daily series from 2000 to 2008. Using the Johansen test, the findings provided evidence of oil prices, stock prices, and exchange rates for Vietnam sharing a long-run relationship. In addition, the study found both oil prices and exchange rates have a positive and statistically significant effect on Vietnam's stock prices in the long-run and not in the short-run. According to Ramos and Veiga (2010), there is no consistent evidence that can serve as a basis to assert a decisive influence on oil prices in world stock markets. They analyzed the exposure of a large sample of stock markets to oil price fluctuations. According to these authors, the strong fluctuations of these oil prices lead to a rising stock market. However, the drop in this price does not necessarily increase the performance of the stock market. The negative impact caused by oil prices in the stock market only applies to the developed nations but on the contrary, the stock markets of developing nations are not sensitive to the price changes.

Imarhiagbe (2010), analyzed the impact of oil prices on stock prices of selected major oil producing and consuming countries with nominal exchange rate as an additional determinant. Daily stock prices, oil prices, and exchange rates for six countries (Mexico, Russia, Saudi Arabia, India, China, and the USA) from January 26, 2000 to January 22, 2010, are modeled as a co-integrated system in Vector Autoregressive analysis. Variance decompositions and impulse responses are also estimated. Their results support unit root in all variables (except Saudi Arabia and the USA exchange rates that are stationary in levels and first difference). Evidence of one long-run relationship (Mexico inconclusive) in Saudi Arabia, India, China and the USA is supported, while Russia exhibits two long-run relationships. The results from the long-run exclusion test suggest all three variables cannot be eliminated from co-integrating space in all countries (except Mexico), while the weak exogeneity test reveals all variables to be responsive to deviation from long-run relationships (except China).

Muritala, Taiwo and Olowookere (2012) investigated the impact of crude oil price and stock price on some selected macroeconomic indicators in Nigeria using co-integration and error correction on time series data from 1980 to 2010. The findings reveal that crude oil price, stock price and exchange rate are significant in determining the growth of the Nigerian economy. Anthony (2012) examined the long-run and short-run dynamic effects of oil price on stock returns in Nigeria over 1985–2009 by using the Johansen co-integration tests. A bivariate model was specified and empirical results show a significant positive stock return to oil price shock in the short-run and a significant negative stock return to oil price shock in the long-run.

Aderamola (2012) examined the long-run and short-run dynamic effects of oil price on stock returns in Nigeria using the Johansen co-integration and granger causality tests on time series data from 1985 to 2009. The empirical results showed a significant positive stock return to oil price shock in the short-run and a significant negative stock return to oil price shock in the long-run while the granger causality test showed strong evidence that the causation runs from oil price shock to stock returns. Asaolu and Ilo (2012) investigated the relationship between the Nigerian stock market return and the world crude oil price which was analysed under the co-integration and vector error correction (VECM) framework from 1984 to 2007. They found that the Nigerian stock market return and oil price are co-integrated in the long run due to the dominance of the oil sector on the Nigerian economy.

Ogiri et al. (2013) examined the impact of oil price on stock market performance in Nigeria using (VECM), the result showed that oil price changes are an important factor in explaining the stock price movement. Itotenaan et al. (2013) investigated the relationship between oil prices and stock market performance in Nigeria using different empirical methods which include the Vector error correction model (VECM) and the Vector auto regression (VAR) model. Akinlo (2014) examined the relationship between changes in oil prices and stock market growth over the period 1981-2011 using the vector error correction modeling approach which suggested a long run relationship between oil price, exchange rate and stock market growth.

Methodology

The study used quantitative research design with a set of regression estimates in testing the impact of oil price on stock market development in Sub-Sahara Africa (SSA). Stock market development was proxied by market capitalization as a ratio of GDP (MKCAP). It serves as the dependent variable. The independent variables involve oil price (OILPR), exchange rate (EXCRT). Gross domestic product (GDP), investment (INVTM) inflation (INF), corruption index (COINDEX) and political instability (POSINDEX).The data were obtained from the World Development Indicator (WDI),National Bureau of Statistics (NBS) and International Financial Statistics (IFS) and Transparency International.

The study seeks to examine the impact of oil prices on stock market development in selected Sub-Sahara African (SSA) oil producing countries from 1989 to 2015. The choice of 1989 is informed by the choice of uniform years through which the selected Sub-Sahara African (SSA) countries under study had their stock markets expanded considerably after 1989 (Sebnet & Ochere, 2008). Hence, Nigeria, South Africa, Egypt and Sudanwere the countries who apart from having a well-developed stock market, were also oil producing and exporting countries and each of these countries represent different regions in Africa – West Africa, South Africa, North Africa and East Africa, respectively.

The methodology adopted in deriving the index for institutional quality for this study follows the line of thought in Akanbi (2012) when measuring governance. Given this, the worldwide governance indicators developed by Kaufmann et al (1999a) were utilised as a measure of institutional quality (Kraay & Nehru, 2006). Since the governance indicators series are only available from 1996 onwards and in order to capture policy and institutions for the missing values for 1995 backward, the Freedom House Index (FHI) is used to augment all unavailable values on the corruption perception index and political instability.

Model Specification

This study relies on the Arbitrage Pricing Theory (APT) which uses multiple risk factors to explain security returns of an asset as the theoretical framework. This theory predicts that any anticipated or unanticipated arrival of new information about oil prices, exchange rate, gross domestic product, inflation, investment, corruption index and political instability will alter stock prices/returns (Chinzara, 2011).

The APT formula is:

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + b_{j3}RP_3 + b_{j4}RP_4 + \\ + ... + b_{jn}RP_n \quad (1)$$

where:

$E(r_j)$ = the asset's expected rate of return,

r_f = the risk-free rate,

b_j = the sensitivity of the asset's return to the particular factor,

RP = the risk premium associated with the particular factor.

The general idea behind APT is that two things can explain the expected return on a financial asset: 1) macroeconomic/security-specific influences and 2) the asset's sensitivity to those influences. This relationship takes the form of the linear regression formula above. There are an infinite number of security-specific influences for any given security including oil price, exchange rate, gross domestic product, inflation, investment, corruption index and political instability.

This study modifies the model as:

$$MKCAP_{it} = \alpha + \beta_1 OILPR_{it} + \beta_2 EXCRT_{it} + \\ + \beta_3 GDP_{it} + \beta_4 INVTM_{it} + \beta_5 INF_{it} + \\ + \beta_6 COINDEX_{it} + \beta_7 POSINDEX_{it} + \varepsilon_t \quad (2)$$

Static and Dynamic Modeling

Estimations for the impact of oil price on stock market development were done using the following variables: MKCAP - stock market capitalization as ratio of GDP is taken to be the dependent variable, OILPR - oil price, EXCRT - exchange rate, GDP - gross domestic product, INVTM – investment, INF – inflation, COINDEX – Corruption index, POSINDEX – Political instability index. The study used a static model given as follows:

$$MKCAP_{it-1} = \alpha + \beta_1 OILPR_{it-1} + \beta_2 EXCRT_{it-1} + \beta_3 GDP_{it-1} + \\ + \beta_4 INVTM_{it-1} + \beta_5 INF_{it-1} + \beta_6 COINDEX_{it-1} + \\ + \beta_7 POSINDEX_{it-1} + \varepsilon_t \quad (3)$$

The study used also the dynamic model for comparison purposes with static model as follows:

$$MKCAP_{it-1} = \alpha + \beta_1 OILPR_{it-1} + \beta_2 EXCRT_{it-1} + \beta_3 GDP_{it-1} + \\ + \beta_4 INVTM_{it-1} + \beta_5 INF_{it-1} + \beta_6 COINDEX_{it-1} + \\ + \beta_7 POSINDEX_{it-1} + \varepsilon_t \quad (4)$$

In models (3) and (4) the coefficients are represented by β1 .....β8 and the value of one less the coefficients of the lagged dependent variables measures the speed of adjustment towards the desired level of oil price and stock market development. If the value is greater than zero then there will be transaction costs as countries adjust to the desired level.

Findings and discussion

Unit Root Test

The unit root tests for non-stationarity (that is, Levin, Lin & Chut; Im, Pesaran & Shin W-stat tests) as shown in Table 1 fail to reject the null hypothesis of stationarity at 5% level for all the variables in level terms. The unit root tests therefore show strong evidence that market capitalization, oil price, exchange rate, gross domestic product, investment, inflation rate, corruption index and political instability are stationary and are integrated of order one that is, I(1) for all periods at 5 percent level of significance.

Descriptive Statistics Results

As observed in Table 1, LOG (GDP) has the lowest mean value of 6.516483 and OILPR has the highest mean value of 47.99473 whereas the mean value of MKCAP, COINDEX, EXCRT, INF, INVTM and POSINDEX are 46.31525, 15.02926, 29.14658, 16.54894, 18.60061 and 10.63526 respectively. The standard deviation measures how concentrated the data are around the mean, hence it can be observed from the study that market capitalization is the largest while the gross domestic product is the lowest giving the implication that the values for the operational data values are further from the mean on averages. The measure of how asymmetric a distribution can be is called skewness. All the variables were positively skewed except gross domestic product and investment, meaning that the

Table 1: Unit Root Test

Variables	Level		Difference		Order in Integration
	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	
MKCAP	-0.90506	-0.30992	-3.68579**	-5.30224**	1(1)
OILPR	-0.20024	0.47531	-3.32908**	-1.79233**	1(1)
EXCRT	-0.11496	- 0.16082	-4.48394**	-4.26710**	1(1)
GDP	-0.36516	-0.68941	-1.24491**	-1.88584**	1(1)
INVTM	-1.79459	-2.65561	-5.48327**	-5.68072**	1(1)
INF	-1.09630	-0.97254	-6.09953**	-6.07030**	1(1)
COINDEX	-0.03578	-0.37069	-0.90020**	-6.03080**	1(1)
POSINDEX	-0.56592	- 0.97633	-2.52357**	-5.15637**	1(1)

Source: Own calculations

Table 2: Descriptive Statistics Results Test

	MKCAP	COINDEX	EXCRT	LOG(GDP)	INF	INVTM	OILPR	POSINDEX
Mean	46.31525	15.02926	29.14658	6.516483	16.54894	18.60061	47.99473	10.63526
Median	12.21662	0.000000	6.992597	6.345712	11.35000	18.93500	47.75082	0.000000
Maximum	276.6008	78.53658	192.4400	10.55557	158.9435	34.92000	104.0621	56.00000
Minimum	0.000000	0.000000	0.391304	0.506818	1.400000	0.000000	15.47572	0.000000
Std. Dev.	71.22131	21.86087	44.43748	1.720767	22.51067	7.186938	25.83019	15.89742
Skewness	1.708703	1.384102	1.721092	-0.903014	4.499751	-0.32774	0.707417	1.399253
Kurtosis	4.913084	3.697246	4.909508	6.561399	25.07393	3.440979	2.546040	3.612921
Jarque-Bera	104.8134	55.68557	105.8815	108.9596	3883.038	4.264959	15.08687	56.08327
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000143	0.000530	0.000000
Observations	164	164	164	164	164	164	164	164

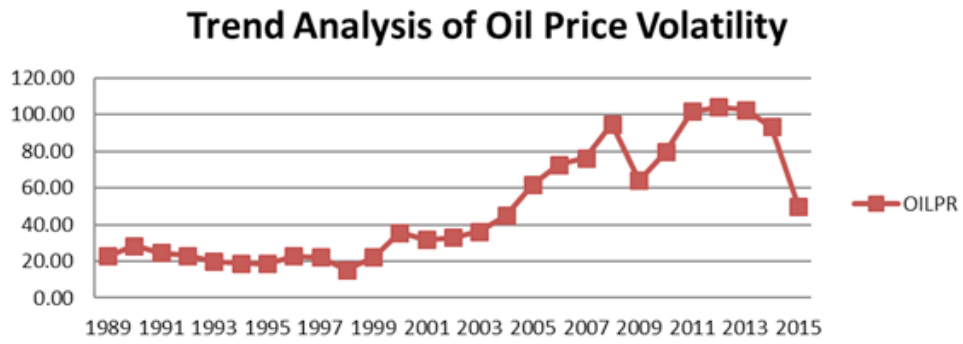
Source: Own calculations

mass of the distribution is concentrated on the right (that is, it is said to be left-skewed. The implication of this is that the skewness tends to say more on the mean value of the distribution being higher or lower than the median. Hence, a positively skewed value indicates a higher mean value over the median value. On the part of Kurtosis, all the variables used including the oil price present positive values which means that the distribution is leptokurtic (too tall).

Trend Analysis of Oil Trend Volatility in Nigeria, South Africa, Egypt and Sudan

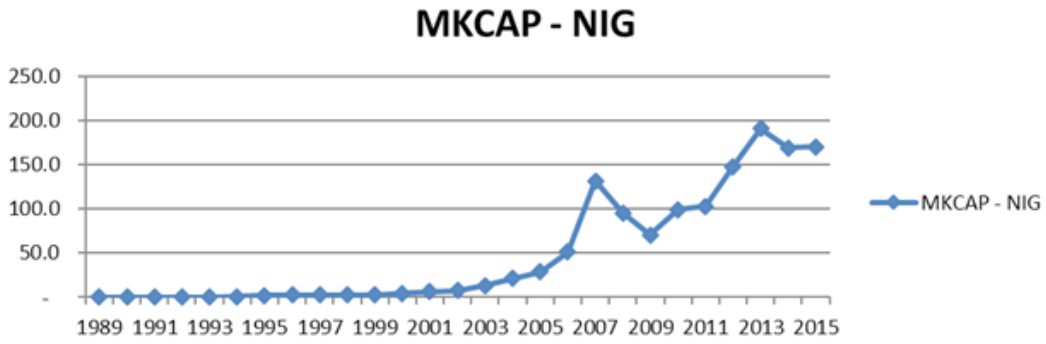
Between 1989 and 1992, there was a recorded 26% hike in oil prices from $22.88-$23.14 per barrel but thereafter, it fell sharply to $15.48 in 1999 due to the recovery of oil exporting and the gradual production increasing in Iraq, especially the strong impact of the Asian financial crisis on the world economy and oil demand in 1997. However, it recovered steadily and increased rapidly up to 2009 when it reached $94.95. This increment was due to the economic resurgence brought about by increasing of crude oil demand, which caused the international oil price to rise unceasingly and up to a record high price before dropping to $79.64 in 2010. The drop in oil price has contributed to an abrupt depreciation of currencies which makes the US dollar denominated debt more expensive and thereby leading to lower oil revenues (GDP). This may induce companies to reduce their investments and limit job creation thereby consequently harming economic growth. This tremendous event will lead to higher inflation and lower expenditure which could be a catalyst for social/political instability such as youth unemployment, with a high cost of living as considered as one of the issues that fuelled the uprising in Africa (Egypt and Nigeria - Boko Haram development). The volatility in oil prices during 2010 and 2013 mainly was due to the Arab Spring and events in Libya and conflict between Sudan and South Sudan. African economic growth rates were driven mainly by high oil prices. Thus, impact of increase in oil prices in Nigeria, South Africa, Egypt and Sudanhas led to higher budget revenues which have created room for lower tax receipts which in turn have boosted investment spending in other sectors and improvement of their balance of payments. Moreover, this increment did not last long before the price plunged back to $49.57 per barrel in 2015.

Figure 1: Trend Analysis of Oil Price Volatility in Nigeria, South Africa, Egypt and Sudan



Source: Own work

Figure 2: Trend Analysis of Nigeria Market Capitalization (1989 -2015)



Source: Own work

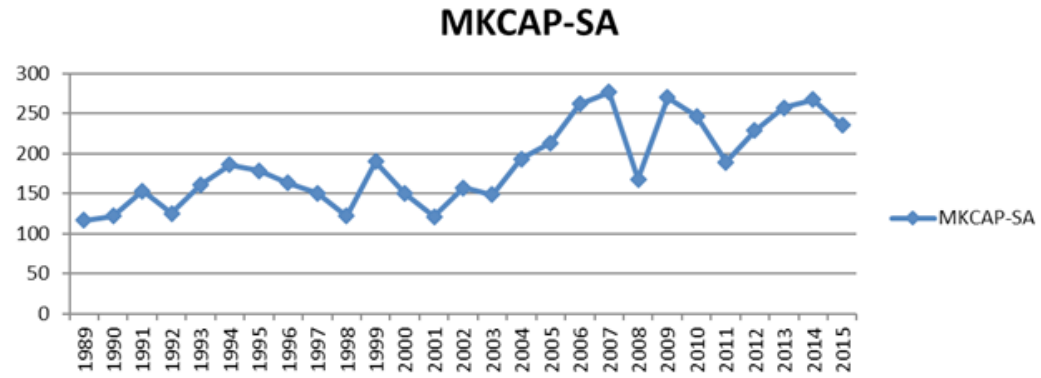
Trend Analysis of Nigeria Market Capitalization

The graph below shows a steady creeping growth between 1989 and 2002 before a recorded 124% hiked in market capitalization from 7.6 (2002) to 131.8 (2007), but thereafter, it had a sharp fall of 62% in 2009 due to the recovery of oil exporting and the gradual production increase in Iraq. However, it recovered steadily and increased rapidly up to 2013 when it reached 190.8. This increment was due to the economic resurgence brought about by increasing of crude oil demand, which caused the international oil prices to rise unceasingly before falling to 168.8 in 2015. The drop in the market capitalization was due to an abrupt depreciation of currencies which makes the US dollar denominated debt more expensive and thereby leading to lower oil revenues in Nigeria.

Trend Analysis of South Africa Market Capitalization

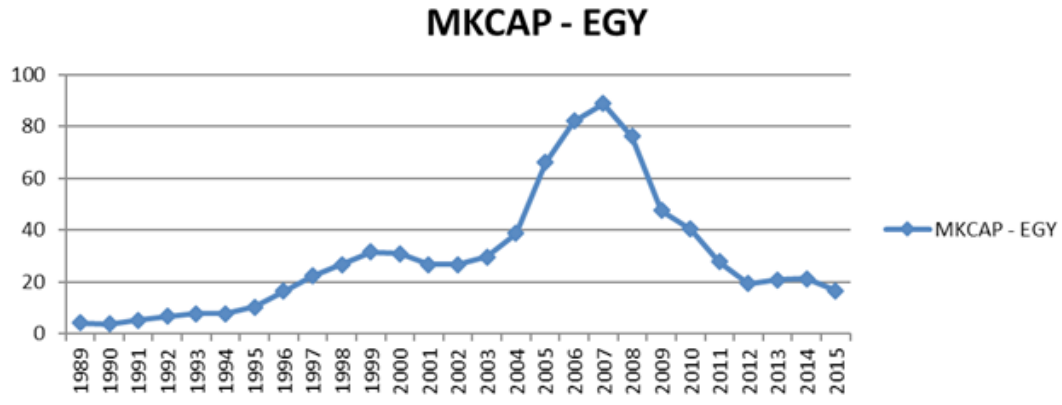
The stock market development in South Africa has shown a more or less upward trend from 1989. For example, throughout the period from 1989 to 2005, the annual stock market capitalization ratio recorded was over and above that of the 1980s. The stock market capitalization ratio increased from 116 in 1989 to 185 in 1994 and to 189 in 1995. The highest ratio was 199, which was recorded in 1999. Although the ratio subsided somewhat in 2002 to 121. It recorded a hike of 219% from 2003 to 2007, but thereafter, it had a sharp fall of 116% in 2008 due to the recovery of oil exporting and the gradual production increase in Iraq. However, it recovered steadily and increased rapidly from 2011 up to 2014 when it reached 266.93. This increment was due to the economic resurgence brought about by increasing of crude oil demand, which caused the international oil price to rise unceasingly and up to a record high price before falling to 235.28 in 2015.

Figure 3: Trend Analysis of South Africa Market Capitalization (1989 -2015)



Source: Own work

Figure 4: Trend Analysis of Egyptian Market Capitalization (1989 -2015)



Source: Own work

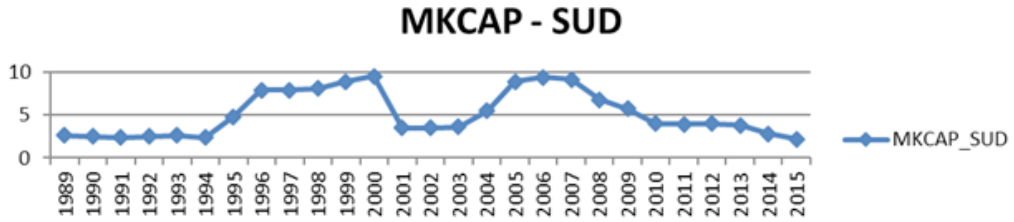
Trend Analysis of the Egyptian Market Capitalization

Between 1989 and 1994, the exchange rate was pegged to the U.S. dollar due to the rapid accumulation of foreign reserves and thereby leading to a steady creeping growth before a recorded 6% hike in market capitalization from 7.68 to 31.53. This hike can be attributed to the introduction of economic policy reforms, the responsiveness of the market to the accelerated privatization programme of the government, increasing interest of foreign financial institutions in the Egyptian market and the enhanced performance of the Egyptian companies, which was reflected in increased profit. But thereafter, it had a sudden fall of 2% in 2002. However, it recovered steadily and increased rapidly up to 2007 when it reached 88.73. This increment was due to the economic resurgence brought about by increasing of crude oil demand, which caused the international oil price to rise unceasingly and up to a record high price before falling to 16.8 in 2015. The drop in the market capitalization was due tothe post-global financial crisis between 2008 and 2015 made Egypt face the long term supply- and demand-side repercussions on the national economy. This even lead to socioeconomic political instability and popular revolution.

Trend Analysis of Sudanese Market Capitalization

Between 1989 and 1994, there was a steady creeping growth characterized by relatively high political instability and we witnessed two regime changes from military to democratic to military. As a result of this political instability, perceived risks of the economic environment increased especially during the early years of the 1989 military regime, which used extreme political repression, unheard of in the modern history of Sudan, as well as extreme predatory economic measuresafter which a recorded 75% hike in market capitalization from 2.4 to 9.49. This hike can be attributed to a positive growth spell in TFP due to the earlier phase of the inflow of foreign direct investment into the oil sector and the introduction of IMF/World Bank macroeconomic policy stabilization and structural adjustment reforms. But thereafter, it had a sudden fall of 35% in 2003. However, it recovered steadily and increased rapidly up to 2006 when it reached 9.4. This increment was due to the second military regime that decided to formulate and implement structural adjustment programmes with support from the International Monetary Fund (IMF) and the World Bank before falling to 2.2 in 2015.

Figure 5: Trend Analysis of Sudanese Market Capitalization



Source: Own work

Table 3: Results of Static Panel Data Analysis

Static Panel Estimates									
Variable	Pooled OLS			Fixed-Effects			Random-Effects		
	Coef.	Std. Error	P-Value	Coef.	Std. Error	P-Value	Coef.	Std. Error	P-Value
- C	-2534.6	1144.2	0.029	-6593.8	1314.5	0.000	-2534.6	1144.2	0.027
OILPR	13.809	7.933	0.085	16.27	7.848	0.041	13.809	7.93	0.082
EXCRT	40.539	6.312	0.000	41.21	6.929	0.000	40.539	6.31	0.000
GDP	0.912	0.058	0.119	0.147	0.0549	0.009	0.912	0.058	0.116
INVTM	-34.44	45.12	0.447	73.59	56.946	0.199	-34.44	45.12	0.445
INF	57.098	12.039	0.000	36.25	11.124	0.002	57.098	12.04	0.000
COINDEX	48.974	11.577	0.000	99.91	27.839	0.001	48.97	11.58	0.000
POSINDEX	-45.44	33.947	0.184	-22.22	1314.5	0.460	-45.44	33.94	0.181

R-Square	0.7895	0.7865	0.7509
Adj R-Square	0.7747	0.7737	0.7412
F-Stat	0.000	0.000	0.000

Source: Computed by the Researcher (2020)

Tabe 4: Tests on Panel Models

Test Statistics/P-values	Poolability Test	Test Statistics/P-values	Hausman Test
F-statistics	53.57 (0.000)	Chi-Square	374.99 (0.000)

Source: STATA Output

The pooled regressions results show that oil price, exchange rate, gross domestic product, inflation and corruption index are correctly signed based on theory and are in line with a-priori expectation while gross domestic product, investment and political instability are not in conformity with a-priori expectation. These varying impacts are in conformity with the earlier finding of Akinlo, (2014); Narayan and Narayan (2010); Muritala et al. (2012); Adaramola (2012). This justifies the fall in the value of the naira with respect to major international currencies in the world during the sampled period. The t-statistics show that crude oil price is significant at 10 percent, exchange rate at 1 percent inflation at 1 percent and corruption index at 1 percent while gross domestic product, investment and political instability are found to be insignificant. The R^2 and adjusted R^2 stand at 0.7895 and 0.7747 respectively and this indicates that approximately 77 percent variation in market capitalization is being jointly explained by the explanatory variables. The F-statistics of 0.000 also confirms the significance of the parameter estimates in the regression at 1 percent. The fixed effect results from table above show a similarity with the pooled data results, but with a moderate difference. Inflation rate, interest rate and exchange rate maintain their signs in line with theoretical expectation.

The explanatory variables including exchange rate, gross domestic product, inflation and corruption index are significant at 1 percent with the exception of oil price which is significant at 5 percent while investment and political instability are found to be insignificant. The R^2 within and between still confirms that 77 percent of variation in market capitalization is explained by the joint factors and F-value of 0.000 is found to be significant at 1 percent confirming the robustness of the overall regression parameters in the model. Therefore, based on the poolability test, it indicates that the fixed effect panel model is preferred to the pooled OLS model. The calculated F-statistics of 53.57 with a probability value of 0.000 is too large so that the null hypothesis is rejected at a high significant value of 1 percent.

However, the random effect outcomes by observation show no significant difference with the fixed effect results. All the variables almost maintain their outcomes. Oil price, exchange rate, gross domestic product, inflation and corruption index are correctly signed in line with theory and significant at the one percent level. This outcome is in agreement with Muritala et al. (2012); Adaramola (2012). Investment and political instability are not correctly signed but crude oil price, exchange rate, inflation and corruption index are significant at 10 percent, 1 percent, 1 percent and 1 percent while gross domestic product, investment and political instability remain insignificant at permissible levels. The R^2 still confirms that 75 percent of variation in the dependent variable is explained by the explanatory variables.

The Hausman test as propounded by Hausman (1978) is formulated to assist in making a choice between fixed and random effect approaches. The test compares the estimated (β) and variance (β) of fixed with random effects i.e. it compares the constant estimates and the standard errors of regression of both fixed and random effects to determine whether the difference is large. Hence, the test comparing the fixed-effect and random-effect model (the Hausman test) indicates that we cannot reject the null hypothesis that the preferred model is a random effect at the 1 percent level. The Hausman test, with a Chi-square distribution has a computed value of 374.99 with probability value of 0.000. Therefore, the random effect is more appropriate out of the three models.

Table 5: Results of Dynamic Panel GMM

Dynamic Panel Estimates									
Variable	Differenced Dynamic			Systemic Dynamic			Linear Dynamic		
	Coef.	Std. Error	P-Value	Coef.	Std. Error	P-Value	Coef.	Std. Error	P-Value
- C	-27760.2	1056.92	0.009	-1717.8	705.04	0.015	-7782.4	933.27	0.000
OILPR	5.1033	5.506	0.354	5.288	4.702	0.252	15.78	5.319	0.000
EXCRT	16.63	5.414	0.002	21.57	4.326	0.000	44.181	5.048	0.000
GDP	0.480	0.389	0.217	0.0141	0.322	0.661	0.138	0.0272	0.000
INVTM	62.586	44.71	0.155	45.99	22.48	0.661	115.71	48.59	0.017
INF	11.044	7.994	0.167	17.87	7.011	0.011	36.76	7.56	0.000
COINDEX	36.52	20.688	0.077	15.08	9.120	0.098	113.87	18.57	0.000
POSINDEX	-17.113	20.49	0.404	-29.08	18.65	0.152	-26.005	20.32	0.201
Wald Chi Square	881.07			2204.98			2829.11		
F-Stat	0.000			0.000			0.000		

Source: Computed by the Researcher, (2020)

Dynamic Panel Model Results

The GMM estimation results in Table 5 present the GMM first difference estimator of Arellano and Bond (1991), as well as the GMM system estimator as developed by Arellano and Bover (1995) and Blundell and Bond (2000). The results are quite similar to the previous regressions of Pooled OLS, fixed and random effect. From the differenced dynamic panel test and the systemic dynamic panel test, it indicates that the systemic dynamic panel model is preferred to the differenced dynamic panel model. This is evident from the Wald Chi Square test value of 881.07 to 2204.98 with a probability value of 0.000.Therefore, from the systemic panel model result, onlyexchange rate and inflation are significant at 1 percent while oil price, gross domestic product, investment, corruption index and political instability remain insignificant at permissible levels.

Hence, the test comparing the systemic dynamic panel test and the linear dynamic panel test model (the Wald Chi Square test) indicates that we cannot reject the null hypothesis that the preferred model is linear dynamic panel test model at the 1 percent level. The Wald Chi Square test has a computed value of 2829.11 with probability value of 0.000. Therefore, the linear dynamic panel model is more appropriate out of the three GMM system estimators.

Interestingly, there are three important changes that emerge from the GMM results as shown in Table 6. Firstly, all the variables (oil price, exchange rate, gross domestic product, investment, inflation and corruption index) are now significant at 1 percent in the GMM estimator. Secondly, the political instability effect in the GMM differenced, dynamic model and system estimators is negatively insignificant respectively.

Conclusions and Policy Recommendations

The study concludes through the static panel model estimation that oil price, exchange rate, gross domestic product, inflation and corruption index are all positively and significantly related to stock market development while investment and political instability are not. However, there is a slight improvement from the estimation of the GMM dynamic panel model which confirmed that all the variables under consideration are positively and significantly related to stock market development except political instability.

Hence, to improve portfolio performance, investors inthe Sub-Sahara African (SSA) stock market need to be cognizant of the varying impacts of macroeconomic indicators particularly those that have been found to exert strong influence on stock returns like oil price, exchange rate, inflation and corruption index. The varying impacts of macroeconomic indicators on stock returns also signal that investors can diversify and shuffle their portfolio investment strategies through risk return trade off. In an economy like that of Nigeria, South Africa, Egypt

and Sudan that heavily depends on oil revenue, practical and urgent steps need to be taken to develop alternative sources of revenue. This is because a fall in world oil prices spells doom for these oil dependent economies.

Suggestion for further research

The findings of this study suggests further research on the relationship between oil price and stock market development of each Sub-Saharan country to be conducted separately since the relationship could be different from one country to another which could have important implications for the Sub-Saharan Africa countries' future economic policies and strategies. Also, it could be suggested that more methodologies like ARDL Bound testing; various GARCH families for volatility testing and causality testing between the variables all be further explored.

References

Adaramola, A.O. (2012). Oil Price Shocks and Stock Market Behaviour: The Nigerian experience. Journal of Economics, 3(1), 19-24.

Akanbi, O.A. (2012). Role of Governance in Explaining Domestic Investment in Nigeria. South African Journal of Economics, 81(4), 473–489.

Akinlo, O.O (2014). Oil Price and Stock Market: Empirical Evidence from Nigeria. European Journal of Sustainable Development, 3(2), 33-40.

Anoruo, E., Mustafa, M. (2007). An Empirical Investigation into the Relation of Oil to Stock Market Prices. North American Journal of Finance and Banking Research, 1(1), 22-36.

Arellano, M., Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. Review of Economic Studies, 58, 277–297.

Arellano, M., Bover, O. (1995). Another Look at Instrumental Variable Estimation of Error-components Models. Journal of Econometrics, 68, 29-51.

Asaolu, T.O, Ilo, B.M. (2012). The Nigerian Stock Market and Oil Price: A Cointegration Analysis. Kuwait Chapter of Arabian Journal of Business and Management Review, 1(5), 28-36.

Brasher, J. (2004). Oil's Effects on the Stock Market. Call Writter's Money Newsletter: 1-6.

Blundell, R., Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. Journal of Econometrics, 87, 115–143.

Chinzara, Z. (2011). Macroeconomic Uncertainty and Conditional Stock Market Volatility in South Africa. South African Journal of Economics, Economics Society of South Africa, 79(1), 27-49.

Hamilton, J.D. (1983). Oil and the Macroeconomy since World War II. Journal of Political 14 Economy 92, 228-248.

Hausman, J.A. (1978). Specification Tests in Econometrics. Econometrica, 46, 1251-1272.

Itotenaan, H.O., Amadi, S.N., Moshfique, M.U., Dubon, P. (2013). Oil Price and Stock Market Performance in Nigeria: An Empirical Analysis. American Journal of Social and Management Sciences, 4(1), 20-41.

Imarhiagbe, S. (2010). Impact of Oil Prices on Stock Markets: Empirical Evidence from Selected Major Oil Producing and Consuming Countries. Global Journal of Finance and Banking Issues, 4(4), 15-31.

Jhingan, M.L. (2004). The Economic of Development and Planning. New Delhi: Vrinda Publications Limited.

Jones, C.M., Kaul, G. (1996). Oil and the Stock Market. Journal of Finance, 51, 463- 491.

Kaufmann, D., Kraay, A., Zoido-Lobaton, P. (1999). Aggregating Governance Indicators. World Bank Working Paper, 2195.

Kraay, A., Nehru, V. (2006). When is External Debt Sustainable? World Bank Economic Review 20(3), 341–65.

Maghyereh, A. (2004). Oil Price Shock and Emerging Stock Markets: A Generalized VAR Approach. International Journal of Applied Econometrics and Quantitative Studies, 1, 27-40.

Miller, I.J., Ratti, A.R. (2009). Crude Oil and Stock Markets: Stability, Instability, and Bubbles. Energy Economics, 31(4), 559-568.

Muritala, T., Taiwo, A., Olowookere, D. (2012). Crude Oil Price, Stock Price and Some Selected Macroeconomic Indicators:

Implications on the Growth of Nigeria Economy. Research Journal of Finance and Accounting, 3(2).

Narayan, K.P., Narayan, S. (2010). Modeling the Impact of Oil Prices on Vietnam's Stock Prices. Applied Energy, 87, 356-361.

Ogiri, I.H., Amadi, S.N., Uddin, M.M., Dubon, P. (2013). Oil Price and Stock Market Performance in Nigeria: An Empirical Analysis. American Journal of Social and Management Sciences, 4(1), 20-41.

Papapetrou, E. (2001). Oil Price Shocks, Stock Market, Economic Activity and Employment in Greece. Energy Economics, 23(5), 511-532.

Ramos, S.B., Veiga, H. (2010). Asymmetric Effects of Oil Price Fluctuations In International Stock Markets. Working Paper 10-09. Statistics and Econometrics Series (04).

Ross, S.A. (1976). The Arbitrage Theory of Capital Asset Pricing. Journal of Economic Theory, 13, 341-60.

Sadorsky, P. (1999). Oil price shocks and stock market activity. Energy Economics 21, 449-469.

Taheri, N. (2014). The Impact of Oil Price on Stock Markets: Evidence from Developed Markets. Master Thesis Submitted to the Institute of Graduate Studies and Research, Eastern Mediterranean University.

Yadirichukwu, E., Ogochukwu, O.J. (2014). Evaluation of the Weak Form of Efficient Market Hypothesis: Empirical Evidence from Nigeria. International Journal of Development and Sustainability, 3(5), 1199-1244

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 14-23

DOI: 10.2478/fiqf-2020-0009

Financial Internet Quarterly

DIFFERENCES BETWEEN NEW IFRS AND US GAAP LEASE STANDARDS AND THEIR EFFECTS ON PUBLICLY LISTED COMPANIES

KAROLINA WINIARSKA[1]

Abstract

Leases are quite relevant to a large number of enterprises. Due to the fact that a lease reduces an entity's exposure to risks inherent in asset ownership, it is a widely used method of obtaining access to property, plant and equipment. At the beginning of this article sources of existence of various international accounting standards as well as primary incentives (estimation of unrecognized lease obligations) to change the previous widespread lease standards used by publicly listed companies are mentioned. The IASB and FASB aware of the importance of this issue, put forward new similar accounting solutions. Despite the joint effort, there are some discrepancies between promulgated IFRS 16 and ASC 842. In the article they are divided into three groups of differences (basic, accounting and other lease issues). The main objective of this article is to point out those differences between new lease standards, as well as their distinct effects on the reporting entities' financial statements and crucial financial metrics. In particular, the impact of operating lease capitalization on the Warsaw Stock Exchange entities' assets by sector indices, as well as on EBITDA by industries on the global scale are presented. The article involves research methods such as: analysis of literature, global accounting regulations and financial statements, as well as comparison and deduction methods. The new lease standards have significant impact on those reporting entities with a great number of previous off balance sheet leases. Therefore, Polish sectors such as WIG-ODZIEZ, WIG-TELKOM and WIG-MOTO as well as global industries such as retail, airline and health care are the most affected. This paper may be useful for many users of financial statements (e.g. potential investors), because it provides information about effects of changed lease standards on financial position and performance of the most affected reporting entities.

JEL classification: G32, M41, M48
Keywords: Leasing, Accounting, Financial Ratios, Financial Reporting Standards, GAAP

Received: 05.04.2020 Accepted: 26.05.2020

[1] Cracow University of Economics, College of Management Sciences and Quality, e-mail: karolina.winiarska@knro.uek.krakow.pl, ORCID: https://orcid.org/0000-0002-6890-9646.

Introduction

Every country has its own individual accounting system. There are significant differences between them. Walton, Haller and Raffournier (2003) pointed out specific economic, cultural and social environmental factors which constantly shapes them. As a consequence, there are various aims and primary principles of accounting throughout the world. They, in turn, result in different ways of measurement, disclosure of information, as well as perception and interpretation of financial statements.

There are many classifications of accounting systems in the literature. The most widespread are Continental and Anglo-Saxon models. They represent groups of countries whose accounting regulations are to some extent similar (Krasodomska, 2010). Another well-known classification based on the strength of capital markets and cultural factors was created by Nobes (1998). He believes that national accounting systems result from the specific source of financing of the business entities. Those systems are divided into two classes - strong capital markets (Class A- accounting for outside shareholders) as well as weak capital markets (Class B- accounting for taxes and creditors). As a consequence, financial statements in every country have been presented in different ways. The globalization process has highlighted considerable differences between those national accounting systems (Mućko, 2009) which have caused a lot of problems for international capital market participants who have to make investment decisions. Moreover, the consolidation of financial statements under various national accounting standards have been very expensive. Those factors have evoked the need for accounting harmonization in order to make foreign financial information comparative (Hołda, 2013).

Nowadays, there are a fair number of of high quality accounting standards around the world. The most widespread are the International Financial Reporting Standards - IFRS based in London (previously the International Accounting Standards - IAS). They are mandatory on over 80 national stock exchanges. US Generally Accepted Accounting Principles (US GAAP), which standardize accounting in the United States together with the US Securities and Exchange Commission (SEC) are equally significant. In general standards establish the main principles for recognition, measurement and then presentation of information in the financial statements, and their goal is to bring transparency and efficiency to capital markets.

The boards of both standards (International Accounting Standards Board and Financial Accounting Standards Board) have worked closely since 2002. Grabiński, Kędzior and Krasodomska (2013) pointed out the primary objective of cooperation, which relies on the full convergence of their accounting regulations. Their latest updated and promulgated standards concern the lease. This issue is essential due to the fact that leasing is a widely used method of obtaining access to property, plant and equipment for a large number of reporting entities. It provides the lesee with access to the use of assets without the need for large initial outlays. The other reason for the popularity of the lease (especially an operating lease) is its ability to transfer the risks inherent in asset ownership. Under the operating lease, the lessor is the legal as well as the economic owner of the leased asset. As a consequence, he bears the operating risks (e.g. residual asset risk and losses from technological obsolescence of the asset) while the lessee has the right to use the asset. In this way, the lessee reduces his exposure to the risks inherent in asset ownership during the operating lease.

New approach to leasing

The most significant incentive to change former standards was the disquieting result of estimation made by the US SEC in 2005. This institution estimated that public companies in the USA had approximately US$ 1.25 trillion of off balance sheet leases at the time. It was a consequence of the previous regulations. Former lease standards (IAS 17 and ASC 840) required a firm to identify an asset when a lease was economically similar to purchasing the leased asset (Osei, 2017, p. 3-5). In this case it was classified as a capital lease under US GAAP (or finance lease in superseded IAS 17 under IFRS). Expenses associated with this type of leasing included depreciation, as well as interest expense on the lease obligation. Only assets under finance lease were presented in enterprises' statements of financial position (balance sheets). The great number of all other lease activities was reported as an operating lease. They were the off balance sheet leases. Therefore, there were no requirements to recognize the assets or the liability on balance sheets. Instead, they were accounted for similarly to service contracts which was reported in the income statement (Bolea & Cosma, 2012). Typically, the amount of the rental expense was

the same in each period of the lease (straight-line lease expense). It did not provide users of financial statements with comprehensive information about the costs of property, plant, equipment and the sources of funding them. As a result, analysts and investors were not able to compare enterprises which borrow money to buy assets with enterprises that lease them (https://www.ifrs.org/projects/2016/ifrs-16-leases/#about). Users had to analyze data merely from lease-related disclosures and make adjustments. Only in that way could they compare companies' financial performance.

The importance of the missing information varied depending on industry, region and even company. However, for a large number of enterprises it was substantial. This lack of transparency of information about appropriate lease obligations raised particular concerns among regulators and the user community. In response to those misgivings, the FASB and IASB in 2008 initiated a joint project to develop new standards to account for leases. Not only did the boards focus on the most problematic lessee's accounting for operating leases, but also the lessor's accounting and concurrently a new proposal on revenue recognition was considered (Revenue from Contracts with Customers issued in 2014: ASC 606, as well as IFRS 15).

In early 2016 the new leases standards were published. ASC (Accounting Standard Codification) 842 became effective for most public companies that follow US GAAP for fiscal years beginning after December 15, 2018. It also included interim periods. However, an effective date for all other enterprises was deferred as it will begin after December 15, 2020 (https://www.fasb.org/jsp/FASB/Page/SectionPage&cid=1176156316498#2018). For the above enterprises there is a possibility of early adoption. All of the reporting entities under IFRS are required to apply IFRS 16 for reporting periods beginning on and after January 1, 2019. Particular companies could implement it before that date but only after the application of IFRS 15.

The boards have reached the identical conclusions in many areas of leasing. The most significant are the following joint aspects. The IASB and the FASB hold the common view that at the beginning of a lease transaction a lessee obtains the right to use a particular asset for a specific period of time. Moreover, a reporting company incurs a liability to make payments when they are made over time. As a consequence, they have agreed that a lessee should recognize assets and obligations which have arisen from those leases. Therefore, the new standards require a firm to present right-of use assets and lease liabilities in balance sheets. Also, the definition of the lease is the same under both standards. For instance in IFRS 16, paragraph B9 it is stated that: "a contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration" (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1986&from=PL). The appropriate lease liabilities are similarly measured too. Initially they are measured on a present value basis. The measurement includes two types of lease payments. Firstly, non-cancellable (including inflation-linked payments). Secondly, payments to be made in optional periods (when the lessee is almost certain to exercise an option to extend the lease, or not to execute an option to terminate the lease). Usually the initial value of the lease liability is equal to the lease asset (https://www.ifrs.org/issued-standards/list-of-standards/ifrs-16-leases/). In addition, the boards were consistent with the idea to carry forward the previous requirements of lessor accounting. This solution results in substantially unchanged lessor accounting requirements.

Basic differences

The IASB and the FASB began this project jointly. However, the boards did not elaborate on identical lease solutions. They diverged in some key areas, which resulted in occurrence of differences in their standards. The most noticeable distinction concerns classifications. The specific type of lease is determined by the terms of a lease arrangement (https://www.pwc.com/us/en/cfodirect/assets/pdf/accounting-guides/pwc-lease-accounting-guide.pdf). Lessor under ASC 842 (842-10-55-19) could identify them at the transaction commencement date as:

1) sales-type (effectively transfer control of the underlying asset to lessee),

2) direct financing (the above condition is not fulfilled, but lessor obtains a guarantee for the value of the asset),

3) operating (others).

Under IFRS 16 (par. 61) the lessor continues to classify leases as either operating or finance at the inception date. In general, a finance lease "transfers substantially all the risks and rewards incidental to ownership of an underlying asset" (par. 62). Otherwise, there is an operating lease that does not depend on the form of the

contract, but on the substance of the transaction. The other party of the contract (lessee) recognizes leases in a different way. Under US GAAP they could be classified at the commencement date as either finance or operating (dual model). Under US regulations the type of leasing is determined by whether the arrangement is an effective purchase. On the contrary, the IASB decided to apply a single model (Morales Díaz & Zamora-Ramírez, 2018), which is very similar to the finance lease presented in ASC 842.

Both standards provide useful criteria in order to classify the leases. They are based on specific clear lines, as well as numerous interpretations. Those contained in ASC 842-10-25-2 and ASC 842-10-25-3 (intended for the lessee and lessor) are similar to the criteria of IFRS 16 par. B63 (for lessor). Below are examples of criteria which would lead to a finance lease:

1) ownership transfer of the underlying asset to the lessee by the end of the lease,

2) term of lease is for the major part of the economic life of the asset,

3) specialised nature of the asset (only the lessee can use it without major modifications).

However, the standards require a different number of criteria that should be met. A lessor under US GAAP needs at least one single criterion in order to recognize for instance a sales-type lease, which means that each criterion is determinative. Under IFRS there is another solution that provides classification criteria (examples and indicators of situations) which could be considered individually or in combination. In this case meeting a single criterion could not result in finance lease recognition.

In addition to the criteria under US GAAP, the lessor has to assess collectability of the lease payments. It is required in order to determine whether a lease is classified as a direct financing or an operating lease (ASC 842-10-25-3). However, there is no explicit guidance for considering collectability of payments under IFRS.

In terms of sublease classification, there is one difference which affects the sublessor. This intermediate lessor classifies the transaction based on the underlying asset (instead of the right-of-use asset arising from the main lease) as described in ASC 842-10-25-6, while under IFRS 16 (par. B58) this phenomenon is classified by reference to the right-of-use asset that was recognized in the main lease.

There are also some distinctions in both standards. They have influence on the lease scope and measurement. Firstly, with refference to low-value assets, US GAAP does not provide any opportunity for exemption based on the value of the underlying asset, whereas under IFRS (par. 5-8) it is possible not to recognize leases the underlying asset of which has low value, e.g. US$ 5,000 or less when it is new (Liviu-Alexandru, 2018, p. 512). Secondly, taking into account intangible assets, all leases of this type of assets are completely excluded from the scope of ASC 842 (they are subject to ASC 350). IFRS 16 includes leases of intangible assets (par. 3); lessees could lease them, except for those under licensing agreements within the scope of IAS 38 (for example video recordings, patents and copyrights). Moreover, lessors have to apply this new standard in order to lease the intangible assets (without intellectual property contained in IFRS 15).

In general, initial direct costs are defined as incremental costs of a lease that would not have been incurred if the lease had not been executed. However, both standards contain different details. Under US GAAP (842-10-30-9 up to 30-10) lessor expenses of initial direct costs for sales-type leases (when at lease commencement date the fair value of the underlying asset is not the same value as its carrying amount), whereas in appendix A, which is the integral part of IFRS 16, those costs incurred by a producer or dealer lessor in connection with a finance lease are always expensed.

Under ASC 842 both parties of a lease contract determine the discount rate at the lease commencement date (IFRS 16 also recommends it for lessees), while the lessors determine the implicit rate at the lease inception date. In turn, US GAAP allows the lessee to consider an incremental borrowing rate taking into account the effect of lease term options (not included in the lease term). The IFRS does not determine if the lessee could consider these effects (e.g. purchase and renewal options).

Another important difference concerns a remeasurement of the lease liability. It results from changes in variable lease payments, which are based on an index or rate. In IFRS it occurs whenever there is a change in the cash flow, and according to ASC 842-20-35-4 when liability is remeasured for another reason.

Other differences

Apart from the lease differences mentioned above, there are additional ones. They refer to sale, leaseback and leveraged lease transactions, as well as some transition

Table 1: Accounting differences (ASC 842 vs IFRS 16)

Description	ASC 842	IFRS 16
Selling profit for direct financing leases (its assets are presented in statement of financial position as a receivable the amount of which is equal to the net investment in the lease)	Selling profit for direct financing leases is deferred at lease commencement date and amortized into income (during the whole lease term) - ASC 842-30-25-7.	There is no distinction between sales-type and direct financing (only finance leases). Lessor recognizes it at lease commencement (par. 71).
Separation of lease and non-lease components (lessors)	Lessor has the possibility not to separate lease and related non lease components (by class of underlying assets). For dominant non lease elements lessor should apply ASC 606.	No similar solution.
Allocating variable consideration that is not dependent on any index or rate (lessors)	Lessor recognizes allocated to the component payments as income (in profit and loss statement) in the period which contains the changes of variable payment.	No similar solution (it is in par. 73–90 of IFRS 15).
Collectibility of the lease payment (lessors)	In sales-type leases it is estimated for purposes of initial recognition and measurement, while in operating leases in order to determine the income recognition. Under US GAAP lessors are required to evaluate whether lease payments, plus any amount necessary to satisfy a residual value are likely to be collected (ASC 842-30-25-3).	No similar solution.
Purchase option in short-term lease (lessees)	If option is reasonably certain to be exercised by the lessee (a significant economic incentive should exist such as favorable price of the option compared to the expected fair value of leased asset) there is a possibility not to qualify the lease as a short-term (ASC 842 Glossary).	Only existence of a purchase option make it possible to not qualify the lease as short-term (Appendix A).
Change in term of short-term leases (lessees)	Lease could not be short-term when after the change, the remaining term extends more than 12 months (from the end of the previous determined term) or when lessee is reasonably certain to exercise a purchase option (purchase a leased asset).	In this case new lease occurs and it could not be qualified as short-term when its term is longer than 12 months.

Source: PwC Leases guide 2019 (https://www.pwc.com/us/en/cfodirect/assets/pdf/accounting-guides/pwc-lease-accounting-guide.pdf), International Financial Reporting Standard 16 Leases (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1986&from=PL)

aspects.

In general, in sale and leaseback transaction, the seller (lessee) sells and transfers an asset to another party (the buyer-lessor) and then leases it back (for all or part of the remaining economic life of this asset). There are different considerations under US GAAP and IFRS in order to assess whether the transfer of the asset is a sale or not (in a sale and leaseback transaction). The American standard instructs the parties of the transaction to consider if this transfer meets the sale criteria in ASC 606 and if this leaseback would be qualified as a sales-type (by the buyer-lessor) or a finance lease (by the seller-lessee). However, IFRS 16 (par. 99) recommends both parties of a transaction apply the requirements for determining when a performance obligation is satisfied in another standard (IFRS 15). In this type of transactions under US GAAP (ASC 842-40-25-4) the seller (lessee) recognizes immediately all gains or losses (adjusted for off-market terms), while under IFRS the seller (lessee) recognizes only that amount which is related to the rights transferred to the buyer-lessor. Additionally, ASC 842-40-25-5 says that each asset transfer not classified as sales must be accounted

for as a financing transaction by the seller (lessee) and lending transaction by the buyer-lessor. ASC 842 provides also useful information about adjusting the interest rate. Par. 103 in IFRS 16 says then the seller (lessee) should recognize the transferred asset and account for financial liability applying IFRS 9 and the buyer-lessor should not recognize this asset and account for the financial asset applying also IFRS 9.

The following difference refers to the possibility of leveraged lease accounting. According to ASC 842-10-65-1(z) the leveraged leases which were commenced prior to the effective date are exempted. Existing ones that are modified, as well as the new ones that are commenced on or after the effective date should be subject to the new rules, whereas under IFRS 16 leveraged leases are not even permitted.

Both standards use a retrospective approach during a transition of existing leases but they differ in adjusting comparative periods. ASC 842-10-65-1 has two options. The first one concerns adjustments of comparative periods (when an enterprise applies provisions as of the earliest comparative period shown in the reports). In the second one, adjustments are not permitted (the enterprise applies the transition provisions as of the effective date). However, in the whole appendix C about transition to IFRS 16 the comparative periods are not adjusted at all. Last but not least, ASC 842 provides information needed during transition of all leases types, while IFRS 16 is focused on transition of the lessees' operating leases (under previous IAS 17).

Effects of differences in financial statements and metrics

The IASB and the FASB require the reporting entities to present virtually the same leases in their statements of financial position (balance sheets). However, some accounting differences between the new standards (https://www.ifrs.org/-/media/project/leases/ifrs/published-documents/ifrs16-effects-analysis.pdf) could have the following effects.

Both new lease standards cause an increase in enterprise assets. The median percentage growth of total assets value of companies listed on the Warsaw Stock Exchange (WSE) is presented in Table 2. The vast majority of enterprises included in the sector indices have adopted the IFRS 16 using the modified retrospective approach from 1 January 2019. They have not restated the comparative financial statements for 2018 (specific transitional provisions have permitted it). In calculations almost 150 out of 198 reporting entities contained in sector indices have been taken into account. Some of them are excluded because they have taken advantage of the relief provided for lessees (IFRS 16, par. C3) or they have prepared their financial statements according to the Polish Accounting Act.

Table 2: Median increase of total assets value after applying IFRS 16

WSE sector indices	Growth (%)
WIG-ODZIEZ	27,34
WIG-TELKOM	8,09
WIG-MOTO	4,61
WIG-MEDIA	4,21
WIG-SPOZYW	3,69
WIG-CHEMIA	3,33
WIG-PALIWA	2,75
WIG-INFO	2,49
WIG-NRCHOM	1,97
WIG-BUDOW	1,44
WIG-GORNIC	1,39
WIG-LEKI	1,05
WIG-ENERG	0,79
WIG-BANKI	0,39

Source: Own elaboration based on financial statements of reporting entities included in sector indices on WSE (https://gpwbenchmark.pl/en-notowania)

As a consequence of disclosure of right-of-use assets, there is a noticeable percentage increase of value of total assets noted by enterprises included in the above indices. It has the most significant impact on the financial statements of WIG-ODZIEZ enterprises (the median percentage increase is 27,34). As part of their own operations, they are the parties to lease agreements for premises (stores) in which they sell, warehouse and have offices. Also, a relatively high increase is noticed in WIG-TELKOM (8,09%), WIG-MOTO (4,61%) and WIG-MEDIA (4,21%). However, these changes do not have significant impact on the financial position of companies contained in other sector indices. Compared to IFRS, the carrying amount of lease assets and equity in the entities which apply US GAAP requirements could be higher. Those effects would not be relevant for all companies that prepare the financial statements under American standards. Precisely, they are expected among enterprises with a large number of former off balance sheet leases (such as airlines and retailers).

The depreciation of the lease assets (arising especially from the off balance sheet leases) in the early years of leases under IFRS 16 is more rapid. It is a consequence of straight-line depreciation typically used for those assets instead of increasing depreciation used in ASC 842.

There are also different presentations of financial lease liabilities. Entities which apply IFRS 16 would report lease liabilities (referring to previous on and off balance sheet items) in different line items only if it is relevant to a general understanding of their financial positions, whereas under US GAAP it is required to make the above distinction.

The recognition of assets and liabilities that previously were not recognized has effects on enterprises financial metrics. Below there are examples of affected key ratios based on those changed amounts in statements of financial position:

1) asset turnover (Sales / Total assets) - the expected effect is decrease of this ratio.

2) current ratio (Current assets / Current liabilities) - decrease,

3) financial leverage (Liabilities / Equity) - increase.

The application of new lease standards results in the increase of profit before interest in the income statements, for instance EBITDA (earnings before interest, taxes, depreciation and amortization) which is frequently used by investors and analysts. Table 3 shows the median growth of EBITDA in the industries most affected by the new lease regulations under IFRS 16. The following data is the result of a global study conducted by PwC in collaboration with the Rotterdam School of Management from the Netherlands. They took into account a sample of 3,199 listed IFRS reporting entities across a range of industries and countries (without the USA). The transitional relief available upon adoption of the new standard on 1 January 2019 was not included in the study based on financial statements for 2014.

This study shows that the impact of the IFRS 16 differs significantly between industries. The largest median increase in EBITDA is expected in retail (41%). Moreover, median growth in airlines, health care, transport and

Table 3: Ten highest median increases in EBITDA by industry after applying IFRS 16

Industry	Median increase in EBITDA (%)
All reporting entities	**13**
Retail	41
Airlines	33
Health care	24
Transport and logistics	20
Textile and apparel	18
Wholesale	17
Entertainment	15
Professional services	15
Broadcasting	11
Lodging	9

Source: A study on the impact of lease capitalization, PwC. (https://www.pwc.com/gx/en/audit-services/publications/assets/a-study-on-the-impact-of-lease-capitalisation.pdf)

logistics would be at least 20%. As a result of differences between new lease standards, the US GAAP regulations do not have the same impact on the income statements. In general, the ASC 842 results in lower profit before interest (in enterprises that possess material off balance sheet leases) in comparison with the same amount presented according to IFRS 16. For instance, there is a smaller value of EBITDA, as well as operating profit (EBIT). This is due to the fact, that all previous off balance sheet lease payments in enterprises reporting under IFRS are divided. The implicit interest is included in the finance costs. Therefore, they are not included in the calculation of the above profit before interest, whereas the entire lease expense according to US GAAP is merely a part of operating costs.

The changes triggered by the new standards also influence the mentioned below financial ratios based on changed values from income statements, for example:

1) interest cover (EBITDA / Net finance costs) – the expected effect: depends on the lease portfolio. Additionally, this metric is expected to differentiate between IFRS and US GAAP. In most cases, the interest cover calculated according to American standards is expected to be higher than IFRS,

2) debt to EBITDA- US GAAP regulations cause a rather higher level of this ratio compared to IFRS.

3) EPS (Profit or loss / Number of shares in issue) - depends on the lease portfolio, as well as the effects on tax,

4) ROE (Profit or loss / Equity) - depends on the lease portfolio, but if there is no effect on profit or loss, this ratio will be higher.

5) ROCE (EBIT / Equity plus financial liabilities) - depends on the lease portfolio. As a result of lack of expectations concern changes of operating profit under US GAAP, this metric would be lower than under IFRS.

New standards do not cause differences in the total cash flows. However, there are some discrepancies in the cash flow statements prepared under IFRS and US GAAP. As a consequence of applying IFRS 16, the operating cash outflows are relatively reduced, and concurrently financing cash outflows are relatively increased compared to the amount reported under ASC 842. This is a result of presenting cash outflows on previous off balance sheet leases as financing activities, whereas the payments made by companies reporting under US GAAP are shown as operating activities.

There are also slight differences in notes to financial statements. For instance, they concern disclosure of expenses. According to IFRS 16, enterprises account for all leases included in statements in the same manner. However, under ASC 842 the reporting entities have to separate expenses for previous on and off balance sheet leases. In addition, US GAAP sets requirements for companies to disclose qualitative items when IFRS sets merely objectives (enterprises have to satisfy objectives on their own). As a consequence, differences are expected in the scope of information disclosure with reference to specific features (for instance conditions of lease extensions).

Conclusions

New IFRS and US GAAP lease regulations are the result of particular concerns raised because of the lack of transparency of information about appropriate lease obligations. The US SEC estimated that public companies in the USA had approximately US$ 1.25 trillion of off balance sheet leases in 2005. As a consequence, a joint project was initiated by the IASB and the FASB. In early 2016 the new standards were promulgated. The boards have reached identical conclusions in most aspects. They hold the common view that a lessee should recognize right-of-use assets and obligations which have arisen from this lease (lessee accounting was substantially changed). Moreover, the boards maintain largely unchanged lessor accounting. Despite joint efforts, there are also noticeable differences between IFRS 16 and ASC 842. They concern various areas of lease regulations. Firstly, they differ in lease classification, criteria, scope exemptions, and determination of used rates (discount rate and lessee's incremental borrowing rate). Secondly, the parties to the lease contract under both standards have some distinct accounting solutions. In lessor accounting they refer to selling profit (for direct financing leases), separation of components, variable consideration (not dependent on any index or rate) and collectability of the lease payments. In lessee accounting they concern short-term leases. Furthermore, there are differences in sale, leaseback and leveraged lease transactions, as well as in modified retrospective transition.

The application of IFRS 16 and ASC 842 produces

effects on financial statements and ratios. The main focus is on those effects that vary due to differences mentioned above. The new lease standards have significant impact merely on those reporting entities with a great number of previous off balance sheet leases. In a statement of financial position there is change (growth) in total assets. The highest median increase caused by IFRS 16 in the WSE sector indices is noticed in WIG-ODZIEZ (27,34%). This is due to the fact that enterprises included in this sector are the parties to lease agreements for a large number of premises (stores) in which they sell, warehouse and have offices. Moreover, WIG-TELKOM (8,09%), WIG-MOTO (4,61%) and WIG-MEDIA (4,21%) are characterized by quite high growth, whereas the carrying amount of lease assets reported under US GAAP is higher. The changes in standards do not have significant impact on the financial position of companies contained in other sector indices. In turn, the pace of depreciation in the early years of leases and manner of presentation of financial lease liabilities also differ. Under IFRS 16 the depreciation of assets arising from the off balance sheet leases is relatively more rapid because of the straight-line depreciation that is typically used (instead of increasing depreciation used in ASC 842).The recognition of assets as well as liabilities that previously were not recognized has effects on financial metrics. In particular key ratios based on those changed amounts in statements of financial position are e.g.: asset turnover, current ratio and financial leverage.

In the income statement the effect mainly concerns the increase of profit before interest. The most affected industry under IFRS 16 is retail. It has the largest median increase in EBITDA among other industries around the world. Moreover, industries such as airlines (33%), health care (24%), transport and logistics (20%) also have significant median increase in EBITDA. In comparison with the same amount of material off balance sheet leases presented according to IFRS 16, the ASC 842 results in relatively lower profit before interest. The smaller value of EBITDA is due to the fact that the entire lease expense under US GAAP is merely a part of operating costs, whereas under IFRS 16 it is divided into operating and finance costs. Moreover, the changed values in the income statements have influence on financial ratios which are based on them (e.g. interest cover, EPS, ROE and ROCE).

In the case of cash flow statement, there are some discrepancies in values of operating and financing cash outflows presented under IFRS and US GAAP. According to IASB regulations the operating cash outflows are relatively reduced, and concurrently financing cash outflows are relatively increased compared to the amount reported under ASC 842. However, the new standards do not cause differences in the total cash flows.

There are no significant differences in disclosure requirements in notes to financial statements. They are similar under both standards. However, slight differences are also noticeable in notes to the financial statements. They concern disclosure of lease expenses. US GAAP requires separate disclosure of expenses related to former on and off balance sheet leases, while the IFRS does not require it. Additionally, differences refer to some qualitative items (for instance terms and conditions of lease extension). ASC 842 sets requirements for enterprises to disclose the specific qualitative items, whereas IFRS sets merely objectives (companies have to satisfy objectives on their own).

The above analysis shows that a particular group of companies' financial metrics used by users of financial statements (especially investors when making investment decisions) is significantly changed. The enterprises' future credit ratings and borrowing costs could be also affected. Therefore, new studies could describe entity valuation models updated by analysts and various stakeholders.

References

Bolea, A., Cosma, R. (2015). Leasing as a Modern Form of Business Financing. *Progress in Economic Sciences, 2*, 299.

Grabiński, K., Kędzior, M., Krasodomska, J. (2013). *Globalne uwarunkowania rachunkowości. Systemy, procesy, zmiany.* Warszawa: Polskie Wydawnictwo Ekonomiczne.

Hołda, A. (2013). *MSR/MSSF w poskiej praktyce gospodarczej.* Warszawa: C.H. Beck.

IASB, (2014). *International Financial Reporting Standard 15* Revenue from Contracts with Customers. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016R1905&from=EN.

IASB, (2016). *IFRS 16 - Effects Analysis.* Retrieved from https://www.ifrs.org/-/media/project/leases/ifrs/published-

documents/ifrs16-effects-analysis.pdf.

IASB, (2016). *International Financial Reporting Standard 16* Leases. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1986&from=PL.

Krasodomska, J. (2010). Anglo-Saxon and Continental Accounting Model as Exemplified by Selected Countries. *Zeszyty Teoretyczne Rachunkowości, 2010*(55(111)), 119–138.

Liviu-Alexandru, T. (2018). The Advantages that IFRS 16 Brings to the Economic Environment. *"Ovidius" University Annals, Economic Sciences Series, 18*(1), 512.

Morales Díaz, J., Zamora Ramírez, C. (2018). IFRS 16 (leases) Implementation: Impact of Entities' Decisions on Financial Statements. *Aestimatio: The IEB International Journal of Finance, 17*, 67.

Mućko, P. (2009). *Systemy rachunkowości na świecie*. In K. Winiarska (Ed.), Rachunkowość międzynarodowa: Praca zbiorowa (pp. 37-40). Gdańsk: Ośrodek Doradztwa i Doskonalenia Kadr.

Nobes, C. (1998). Towards a General Model of the Reasons for International Differences in Financial Reporting. *Abacus, 34*(2), 162–187. DOI: https://doi.org/10.1111/1467-6281.00028.

Osai, E. (2017). The Financial Accounting Standards Board (FASB), and The International Accounting Standards Board (IASB) Sings Similar Tune: Comparing the Accounting Treatment of New IFRS 16 with the IAS 17, and the New FASB Model On Leases. *Journal of Theoretical Accounting Research*, *Fall 2017, 13*(1), 3-5.

PwC, (2016). A Study on the Impact of Lease Capitalization. Retrieved from https://www.pwc.com/gx/en/audit-services/publications/assets/a-study-on-the-impact-of-lease-capitalisation.pdf.

PwC, (2019). Leases Guide 2019. Retrieved from: https://www.pwc.com/us/en/cfodirect/assets/pdf/accounting-guides/pwc-lease-accounting-guide.pdf.

Walton, P., Haller, A., Raffournier, B. (2003). *International Accounting*. London: Thomson Learning.

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 24-36

DOI: 10.2478/fiqf-2020-0010

Financial Internet Quarterly

IS BIGGER BETTER? THE IMPACT OF THE SIZE OF BANKS ON CREDIT RATINGS

PATRYCJA CHODNICKA-JAWORSKA[1]

Abstract

The aim of the paper was to analyse the factors influencing European banks' credit ratings by taking into account the size of these institutions. A literature review onthe indicators that can impact bank notes has been made. As a result, the following hypotheses have beendrawn:banks' capital adequacy, profitability, liquidity and management quality have a significant influence on bank credit ratings. Bigger banks receive higher credit ratings than the smaller ones in similar financial conditions. To verify the presented hypotheses ordered logit panel data models have been used. The analysis has been prepared by using the quarterly data from the Thomson Reuters database for the period between 1998 to 2015. The European banks' long-term issuer credit ratings proposed by S&P, Fitch and Moody are used as dependent variables. The sample has been divided into subsamples according to the size of a bank andbanking sector and capitalization.

JEL classification: C23, G21, G24
Keywords: credit rating, logit panel data models, banking sector

Received: 01.09.2019 Accepted: 26.05.2020

[1] University of Warsaw, Faculty of Management, e-mail: pchodnicka@wz.uw.edu.pl, ORCID: https://orcid.org/0000-0001-7471-352X

Introduction

Credit rating agencies are responsible for the reduction of asymmetry of information between an investor and an issuer. One of the main users of credit ratings are banks. They take them into consideration when analyzing credit risk, default risk, investment decisions and the corresponding banking. They are also obliged to have notes, especially if they cooperate with financial institutions from other countries.

At the moment 47 credit rating agencies are registered in the European Union, but only three of them have got 90% of the market share. These institutions comprise Fitch, Standard & Poor's and Moody's. They are called the "Big Three". When analyzing default risk, they take into consideration the macroeconomic risk, the stability and quality of the financial market and the condition of the issuer.

Because banks are the main users of credit ratings, the following research question has been studied: which factors determine banks' credit ratings? As a result, the aim of the paper has been to analyze the factors influencing the European banks' credit ratings by taking into account the size of these institutions. Two hypotheses have been drawn. The first one seems as follows: banks' capital adequacy, profitability, liquidity and management quality have asignificant influence on the banks' credit ratings. The second one is: bigger banks receive higher credit ratings than the smaller ones in similar financial conditions. To verify these hypotheses ordered logit panel data models have been used. The analysis has been prepared by using the quarterly data for the period from 1998 to 2015 for European banks.

The paper has been organized as follows: Section 2 is a description of the previous research onthe factors that can influence banks' credit ratings by taking into consideration the size of the entities. Next the data description and the methodology used to verify the presented hypotheses have been presented. Section 4 is a presentation of the findings with conclusions.

Literature review

To verify the default risk of an issuer, credit rating agencies take into consideration financial and nonfinancial indicators. The most popular is research based on corporate credit ratings. There are only a few papers that notice banks' credit ratings indicators. This research usually takes the whole population of banks into consideration to estimate the default risk. In this section the previous research about this phenomenon will be explored.

The analysis about the determinants influencing banks' credit ratings has been prepared for different subsamples. In most cases banks from different countries have been studied (Shen et al., 2012; Bellotti et al., 2011a; Bellotti et al., 2011b; Chodnicka-Jaworska, 2017), but some study national banking sectors, i.e. Slovenia (Brezigar-Masten et al., 2015), Australia (McDonald & Eastwood, 2000), United States (Estrella et al., 2000; Bissoondoyal-Bheenick, Treepongkaruna, 2011), and United Kingdom (Bissoondoyal-Bheenick, Treepongkaruna, 2011) exists. Also, the period of time taken for the analysis (Shen et al. (2012) – 86 countries during 2002 – 2008; Bellotti et al. (2011a; 2011b) – countries in the period between2000 and 2007) have been distinguished.

In most of the presented research the goal of the analysis was to verify the factors influencing banks' notes, but there are also other objectives. For example, King et al. (2016) tried to prepare standalone credit ratings to verify banks' creditworthiness from a stakeholders' point of view. They look into logarithmized assets and securitization, common equity to total assets, liquidity ratio, ROA, and short-term funding as dependent factors.

The analysis has been made for different subsamples. The size of banks has been analyzed by King et al. (2016), but they did not prepare the research according to the size of the institution, as it was only one of the determinants to verify. Hau, Langfield and Marques-Ibanez (2012) found that larger and more leveraged banks receive systematically more favorable credit ratings, which amounts to an economically significant competitive distortion. Credit ratings during the moment of the financial crisis were examined by Brezigar-Masten et al. (2015). They suggest that during the financial crisis the predictive accuracy was lowest for domestically owned banks and, within this group, for small banks. These institutions had also the largest incentives to undervalue risk because their portfolios were more exposed to non-performing loans and had limited possibilities to raise additional capital. They also found that given that credit ratings are closely related to the rates of loan-loss provisions, an underestimation of credit risk served to inflate banks' books. Hau, Langfield and Marques-Ibanez (2012) found that credit ratings become more informative during a financial crisis. The type of credit ratings has been verified by Pagratis and Stringa

(2007). They divided samples according to investment and subinvestment grades. Another division was proposed by Packer and Taraschev (2011). They verified the reaction of banks' credit ratings during a crisis according to the size of the institution and the level of the countries' economic development. Shen et al. (2012) examined banks' credit ratings according to the asymmetry of information in particular countries. The results show that there is an impact of the asymmetry of information on banks' notes. One of the basic goals of countries that want to improve banks' ratings is to reduce this phenomenon. They also verified the influence of a country's development level, geographical location, industrial environment quality, bureaucracy, and corruption level.One of the most popular divisions is verification of factors influencing banks' notes depending on the agency. Laere et al. (2012) prepared an analysis for Moody's and S&P's and found that the one by Moody's is more sensitive to the condition of an economy. An analysis based on the level of the banking sector consolidation has been made by Poon, Lee and Gup (2007). They found that credit ratings of unconsolidated banks are higher. The same situation has been observed for unsolicited notes.

More popular are researchers taking into account the size of banks to verify their default and credit risk. For example, Jacobson et al. (2006) found that default risk is most likely not homogeneous within rating classes. Their findings suggest that there is a difference between the implied loss distributions of two banks with equal „regulatory" risk profiles. Such variation is likely to translate into different levels of the required economic capital. They also found that not only the design of a rating system itself, but also the portfolio's rating grade composition, the size of a bank, the preferred level of insolvency risk for a bank, and the forecast horizon influence significantly the probability of default.

The analysis has been prepared by using different indicators. Pagratis and Stringa (2007) take into consideration provisions, profitability, cost efficiency, liquidity, short-term interest rates and bank-size performance, as those which explain ratings well. The classification on investment and sub-investment credit ratings mentioned before resulted in differences in the obtained results. Tier 1 capital ratios appear to impact sub-investment ratings, but not of investment grade. They also identified an asymmetric effect of profitability on ratings, with negative shocks in bank profits having a larger impact on ratings than positive shocks of equal magnitude. Liquidity and ratings are nonmonotonically related, possibly due to endogeneity effects. The impact of profitability, liquidity, capital adequacy, efficiency and quality factors has been measured by Shen et al. (2012)[2] and Bissoondoyal-Bheenick et al. (2011)[3]. Poon et al (1999)[4] took into consideration 100 variables. These indicators have been classified according to profitability, efficiency, structure of assets, interests, leverage and risk. Chodnicka-Jaworska (2016)[5] analyzed the impact of CAMEL indicators. To verify the probability of default Estrella et al. (2000) took the following into consideration: total assets, risk weighted assets and gross revenues. They found that these three ratios are significant predictors of failure. The number of failed banks with ratings is very small, and the evidence in favor of ratings is somewhat mixed.In their analysis of the impact of financial indicators[6] on banks' notes Bellotti et al. (2011a) found that these react to the financial condition, the countries' risk and the timing of the rating assignment. The unimportance of countries' credit ratings has been emphasized by Poon et al. (1999).

[2] capital adequacy ratio, cost to income, loan loss provisions to net interest revenues, logarithm of total assets, net income to total assets, liquid assets to deposits, short-term funding.

[3] net income to total assets, liquid assets to deposits and short-term funding, capital adequacy ratio, cost to income, loan loss provisions to net interest revenues.

[4] net interest margin, net interest revenue to average total assets, pre-tax operating income to average total assets, return on average assets, return on average equity, dividend payout, cost to income ratio, loan loss reserves to gross loans, loan loss provisions to net interest revenue, loan loss reserves to non-performing loans, non-performing loans to gross loans, net charge off to average gross loans, net charge off to net income before loan loss provisions interbank ratio, loans to total assets, loans to customer and short-term funding, loans to total deposits and borrowings, liquid assets to customer and short-term funding, liquid assets to total deposits and borrowings, tier 1 capital ratio, capital adequacy ratio, equity to total assets, equity to loans, equity to customer and short-term funding, logarithm of book value of total assets, logarithm of book value of trading securities, year dummy, proportion of solicited ratings in the respective country of the year, no. of overseas exchanges on which the bank was listed, no. of overseas subsidiaries held by the issuer.

[5] Tier 1, leverage ratio, z-score ratio, loan loss provisions to average total loans, non – performing loans to total loans, efficiency ratio, securities to earnings assets, net interest income ratio, return on equity, return on assets, operating leverage, loan growth, deposit growth, loans to deposit, short-term borrowing to total liabilities, liquid assets to total assets, GDP growth, inflation, country's credit rating.

In their opinion loan loss provisions and profitability explain 63.1% of credit ratings. Macroeconomic factors and their importance have been analysed by Bissoondoyal-Bheenick and Treepongkaruna (2011). Hassan and Barrell (2013) suggest that only the bank size, liquidity, efficiency and profitability significantly influence the banks' notes (from 74% to 78% of the sample banks) from all analysed determinants[7]. The importance of the efficiency, profitability, and the proportion of loans in the assets have been distinguished by Öğüt et al. (2012).

The methods of verifying the significance of credit rating factors implemented in the research are: ordered probit (Bellotti et al., 2011a, 2011b, Bissoondoyal-Bheenick & Treepongkaruna (2011), panel data models (Ötker-Robe & Podpiera, 2010; Chodnicka – Jaworska, 2016), support vector machines (SVM) (Ogut et al. 2012, Bellotti et al., 2011a, 2011b), ordered logit models (Bellotti et al., 2011a, 2011b; Ogut et al. 2012; Hassan & Barrell, 2013), Artificial Neural Network, multiple discriminant analysis (Ogut et al. 2012). In this paper ordered probit panel data models, described in the next section, have been used.

The literature review indicates several research problems. The first one relies on the type of determinants that can be analysed to verify credit ratings. Particular studies treat different variables that can influence banks' credit ratings. In practice they are differentiated according to the sample that have been used in the analysis. Sometimes they are different for the same credit rating, published for the same agency. The next problem is strictly connected with the lack of the analysis of the impact of the size of bank on the credit ratings. It can be strictly connected with, for example, the possibility of financial support from government, when there may be problems with the solvency risk.

Methodology and data description

The analysis has been prepared for European banks from 24 countries[8]. Long-term issuer credit ratings for the period between 1998 and 2015 have been used as a dependent variable. The quarterly data collected from the Thomson Reuters Database and banks' financial statements have been used for the research. Notes proposed by the three biggest credit rating agencies: S&P's, Fitch and Moody's have been used for the analysis. Ratings have been decomposed linearly according to the methodology proposed by Ferri, Liu, Stiglitz (1999). The effects of the decomposition have been presented in Table 1.

The factors classified according to the CAMEL structure, i.e. capital adequacy, assets quality, management quality, earnings, liquidity, as well as market factors are used as independent variables. The list of independent factors has been presented in Table 2.

The analysis has been prepared for subsamples according to the size of institutions, the size of the banking sector, and the value of capitalization. This classification will help to provide information on whether any differences between the notes received by bigger and smaller banks have been observed. The size of the institution has been measured by the logarithm of assets. The division according to the size of the institution measured by the size of assets and the value of capitalization has been created by using the three-sigma rule of thumb which expresses a conventional heuristic that nearly all values are taken to lie within three standard deviations of the mean, and thus it is empirically useful to treat 99.7% probability as near certainty.

The analysis has been prepared by using the ordered probit panel data models. Probit is the probability unit which is then transformed into its cumulative probability value from a normal distribution. An ordered panel probit model is:

$$y_{it}^{*} = \beta F_{it}' + \gamma Z_{it} + \delta(F * Z)_{it} + \varepsilon_{it} \qquad (1)$$

[7] logarithm of total assets, total assets deflated by business volume, total long term funding minus total equity all deflated by total assets, interest-bearing liabilities to earning assets, net interest margin, net interest income less loan impairment charges all deflated by earning assets, cost to income, non-interest expenses to assets, net loans to total assets, loans to customer deposits, net charge off or the amount written-off from loan loss reserves less recoveries to gross loans, growth of gross loans of a bank deflated by total growth of gross loans of the sample banks, equity to total assets, subordinated borrowing to total assets.

[8] Albania, Armenia, Austria, Belarus, Belgium, Bosna and Herzegovina, Bulgaria, Croatia, Cyrus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

Table 1: Decomposition of Moody's, S&P's and Fitch long-term issuer credit ratings

Moody's Long-term Issuer Rating		S&P's Long-term Issuer Rating		Fitch Long-term Issuer Rating	
Rating	Code	Rating	Code	Rating	Code
Aaa	100	AAA	100	AAA	100
Aa1	95	AA+	95	AA+	94,74
Aa2	90	AA	90	AA	89,47
Aa3	85	AA-	85	AA-	84,21
A1	80	A+	80	A+	78,95
A2	75	A	75	A	73,68
A3	70	A-	70	A-	68,42
Baa1	65	BBB+	65	BBB+	63,16
Baa2	60	BBB	60	BBB	57,89
Baa3	55	BBB-	55	BBB-	52,63
Ba1	50	BB+	50	BB+	47,37
Ba2	45	BB	45	BB	42,11
Ba3	40	BB-	40	BB-	36,84
B1	35	B+	35	B+	31,58
B2	30	B	30	B	26,32
B3	25	B-	25	B-	21,05
Caa1	20	CCC+	20	CCC	15,79
Caa2	15	CCC	15	CC	10,53
Caa3	10	CCC-	10	C	5,26
Caa	5	CC	5	RD	-5
C	0	NR	0	D	-5
WR	-5	SD, D	-5	WD	-5
NULL	0	NULL	0		

Source: Own elaboration

Table 2: The list of independent variables

Name of variable	Direction	Abbreviations
Capital adequacy		
tier 1	+	$tier_{it}$
leverage ratio	+	lev_{it}
z-score	+	$score_{it}$
Assets quality		
loan loss provisions as a percentage of the average total loans	-	llp_{it}
non-performing loans to total loans	-	npl_{it}
Management quality		
efficiency ratio	-	ef_{it}
securities as a percentage of earnings on assets	-	sec_{it}
Earnings		
net interest income ratio	-/+	nii_{it}
return on equity	+	roe_{it}
return on assets	+	roa_{it}
operating leverage	+	opl_{it}

loan growth	-/+	lg_{it}
deposit growth	+	dg_{it}
Liquidity		
loan to deposit ratio	-	dep_{it}
short-term borrowing to total liabilities	-	sht_{it}
liquid assets to total assets	-	liq_{it}
Market		
effective GDP growth	+	gdp_{it}
inflation	-	inf_{it}
country's risk	+	cr_{it}

Source: Own elaboration

where y^*_{it} is an unobservable latent variable that measures long term issuer credit rating of banki in period t (Fitch Long-term Issuer Rating, S&P Long – Term Issuer Rating, Moody's Long -Term Issuer Rating);

F_{it} is a vector of explanatory variables, i.e.:

$$F_{it} = [tier_{it}, lev_{it}, score_{it}, llp_{it}, npl_{it}, ef_{it}, sec_{it}, nii_{it}, roe_{it}, roa_{it}, opl_{it}, lg_{it}, dg_{it}, dep_{it}, sht_{it}, liq_{it}, gdp_{it}, inf_{it}, cr_{it}, ass_{it}, assgdp_{it}, capgdp_{it}] \quad (2)$$

where: $tier_{it}$ is the Tier 1 ratio;

lev_{it} is the leverage ratio;

$score_{it}$ is the z-score ratio;

llp_{it} is the loan loss provisions as a percentage of average total loans;

npl_{it} is the non – performing loans to total loans;

ef_{it} is the efficiency ratio;

sec_{it} is the value of securities as a percentage of earnings assets;

nii_{it} is the net interest income ratio;

roe_{it} is the return on equity;

roa_{it} is the return on assets;

opl_{it} is the operating leverage;

lg_{it} is the loan growth;

dg_{it} is the deposit growth;

dep_{it} is the ratio of loans to deposit;

sht_{it} is the value of short-term borrowing to total liabilities,

liq_{it} is the value of liquid assets to total assets;

gdp_{it} is the GDP growth,

inf_{it} is the inflation;

cr_{it} is the country's credit rating given by a particular credit rating agency (Fitch Long-term Issuer Rating, S&P Long – Term Issuer Rating, Moody's Long -Term Issuer Rating);

cap_{it} is the logarithm of banks' capitalization;

$capgdp_{it}$ is the bank capitalization as a percentage of GDP,

ass_{it} is the logarithm of banks' assets;

$assgdp_{it}$ is the banks' assets as a percentage of GDP,

Z_{it} contains time invariant regressors that are generally dummy variables

ε_{it} is a random disturbance term.

Findings

The analysis of the factors influencing the European banks' credit ratings by taking into account the size of these institutions has been started for the summary statistic calculations. The results of the estimation have been presented in Table 3.

At first an analysis of the determinants of credit ratings proposed by Fitch was prepared. The results of the estimation have been presented in Table 4. Out of the capital adequacy indicators it is the tier 1 ratio which has got a significant impact. The leverage ratio has an insignificant influence on banks' notes in the sample of all banks. Taking into account the size of issuers analyzed as a logarithmized value of total assets, both of the variables are significant for bigger banks (bigger banks mean institutions that have got assets higher than 100 bln euros). The same situation has been observed for the division according to the value of capitalization (bigger banks mean institutions that have got capitalization higher than 6blneuros). For smaller issuers these

Table 3: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ass	7,101	1.22e+11	2.96e+11	1465207	2.51e+12
lab	7,046	1.17e+11	2.85e+11	121690.9	2.45e+12
nii	288	3.342993	2.062914	.496	14.697
ef	528	49.07732	80.3074	-1358.44	327.994
opl	6,18	2.084361	374.1404	-21059.2	10346.1
lev	6,769	15.84086	41.02734	-916.6667	1944.444
llp	5,408	.9790568	37.92086	-939.181	2524.49
npl	1,323	16.67219	62.07641	.000012	1431.78
tier1	3,133	11.85202	4.404751	1	52.3202
dep	6,108	33.89172	945.023	-.037852	59681.4
sec	6,07	20.37762	16.94761	0	129.026
roa	6,478	.1957794	3.072931	-94.7601	49.4816
roe	445	-.1839513	25.80748	-436.544	57.7226
liq	6,77	.2650961	.1632072	0	1.329167
lg	5,692	.0158678	.2428442	-6.955236	3.999034
dg	5,636	.021588	.3287204	-8.351819	8.321701
sht	6,216	1.261429	15.31838	-3.307692	382.3529
gdpg	18,438	2.292871	3.534638	-16.43029	13.8265
cpi	18,294	205.1854	630.3739	36.8	6739.645
cap	13,361	6.16e+09	1.54e+10	40032.35	1.66e+11
sp	5,138	67.35014	24.02872	-5	100
fitch	4,548	22.45441	37.65751	-5	94.7368
moody	1,405	78.58363	19.49562	-5	100
cr sp	17,316	74.7638	26.43566	-5	100
cr fitch	16,161	25.26581	42.54134	-5	100
cr moody	13,897	66.9542	28.35881	0	100

Source: Own calculations

variables are insignificant. If tier 1 ratio is higher by one percentage point, the credit ratings are lower by nearly 0.5 in the sample of bigger banks measured by the total assets and by 0.3 according to the value of capitalization. For the leverage ratio this relationship looks as follows: an increase by one percentage point of the leverage ratio causes a reduction of credit ratings by 0.05 and 0.03 respectively. The same relationship has been observed for Moody's and S&P's notes (Tables 5 and 6). For Moody's notes a stronger impact of the leverage ratio has been observed, but the relation is positive. An increase of this index by one percentage point causes a rise of the credit ratings given for big banks by 0.2. In the case of S&P the presented variable is significant for both bigger and smaller issuers, but the reaction is stronger for the first of this group (0.14 versus 0.05). Tier 1 ratio is significant for both subsamples, both for S&P's and Moody's credit ratings, but the impact is stronger for smaller issuers. This relationship can be connected with two situations. First of all, bigger banks that have got higher adequacy ratios may be treated as those with higher risk by taking into account the size of the probability of losses for the financial system in the case of a default. On the other hand, bigger banks are usually more stable than smaller financial institutions, so as a result, smaller issuers should have higher ratios.

From assets quality indicators the impact of loan loss provisions as a percentage of the average total loans on banks' credit ratings has been verified. The significance of this variable has been emphasized especially in the case of bigger banks, both measured by the value of total assets and market capitalization. If this indicator increases by one percentage point, the ratings are decreased by

2.6 for Fitch, 0.53 for Moody's and 0.22 for S&P's. This relationship can be connected with the quality of the banks' loans.

The next group of determinants taken into analysis are management quality indicators. The value of securities as percentage of earnings on assets has been used for the analysis. This indicator has been significant for Fitch ratings, for bigger banks (0.08 for the sample of bigger banks measured by the value of total assets and 0.05 according to the value of market capitalization). In the case of Moody's, the impact is also positively correlated with credit ratings. The reaction is stronger for smaller issuers. It can be connected with the type of investment.

The earnings factors analyzed include the return on assets, operating leverage, loan growth and deposit growth. The first is the return on assets. The relationship between this indicator and credit ratings is differentiated. The results for Fitch ratings suggest that if the rates of return rise by one percentage point, notes are lower by 5.7 and 3.23 in the case of big banks. It can be connected with the opinion that higher profits generated by banks can be an effect of risky investments. A different relationship has been noticed for Moody's and S&P's credit ratings. In the case of S&P's, an increase by one percentage point of this variable causes a rise of credit ratings by 3.01 when taking into account the size of assets, and 2.7 for the value of the capitalization market. The strongest reaction has been noticed for Moody's ratings (8.21 and 8.27). The relationship is positive for bigger banks, but for smaller institutions the impact is negative. The presented results suggest that smaller banks invest in a riskier way. The deposit growth is insignificant for the notes presented by Fitch and S&P's, both for smaller and bigger institutions. The Moody's notes react negatively to these changes (-4.1 and -3.8) for the sample of large entities. Increasing the deposit base can create additional interest costs, especially in the case of bigger banks. The described variable should be compared with loan growth. Extending loans is a source of additional interest income. The described relationship is especially significant for the notes presented for smaller banks by Fitch and S&P's, but the direction of the relationship is differentiated. In the case of Fitch ratings react positively to a loan growth (0.75 and 0.95). The relationship confirms the previous opinion. S&P's ratings are negatively correlated with this indicator (-0.94). Smaller banks can have a higher value of the performing loans in the credit portfolio, which can generate credit risk. The last variable that has been analyzed in the presented group of determinants is the operating leverage. It influences insignificantly the notes presented by Fitch and the coefficient equals nearly zero in the case of large banks that have been assessed by S&P's. The operating leverage influences negatively the notes received by large institutions (-0.1 and -0.1) and positively the smaller ones (0.02). The impact of the described variable is also minimal.

The last of the fundamental group of indicators are liquidity factors. This group comprises the loan to deposit ratio, the short-term borrowing to total liabilities ratio and the value of the liquid assets to total assets. The first indicator that has been taken into analysis is the loan to deposit ratio. The research confirms the previous assumption about the negative impact of this variable on credit ratings. The strongest reaction has been noticed for Fitch ratings. No differences between smaller and bigger banks have been observed taking into consideration the size of assets. In the case of the classification according to the value of the capitalization market, a higher negative impact has been noticed for larger institutions (-3.78 versus -2.60).A significant reaction in the case of smaller banks has also been noticed for S&P's ratings. A stronger reaction for larger issuers has been noticed for the Moody's sample. The relationship is strictly connected with the type of loans having particular banks in their credit portfolio. Bigger banks that have got a larger value of the described indicator can create additional systemic risk because their default can have an effect on the condition of the economy and other institutions. On the other hand, a "too big to fail" phenomenon can occur.

The value of liquid assets to total assets is the next indicator that has been analyzed. The direction of the impact confirms previous assumptions. The impact of this variable has been observed for Fitch notes, both for smaller and bigger banks. A stronger influence has been noticed for smaller institutions. The same situation has been noted for S&P's, but in this case a statistically significant impact has not been observed for larger banks. Moody's ratings are sensitive to the value of liquid assets to total assets only for the sample of bigger banks. This situation can be connected with the cost of maintaining a high liquidity. Smaller banks can have a higher value of this ratio. On the other hand, they may invest less money in securities. The last of this group of indicators is the short-term borrowing to total liabilities ratio. Fitch notes are positively correlated. A stronger relation has been observed for larger institutions than the smaller banks, in

Table 4: Estimation of determinants influencing Fitch banks' credit ratings by taking into consideration the size of banks and their capitalization

Variable	Fitch												big		small		big cap		small cap	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	
opl	.0063	0.128	.0064	0.123	.0077	0.091	.0063	0.181	.0064	0.112	.0097	0.092	.0104	0.205	.0051	0.365	.0079	0.261	.0057	0.381
lev	-.0150	0.528	-.0022	0.933	-.0255	0.317	-.0167	0.445	-.0152	0.551	.0248	0.485	-.0553	0.048	.0439	0.222	-.0398	0.190	.0546	0.193
llp	-2.5674	0.000	-2.6424	0.000	-2.8386	0.000	-2.4329	0.001	-2.6155	0.000	-2.0728	0.017	-2.612	0.000	-1.0808	0.205	-1.6014	0.000	-1.0867	0.300
tier1	-.3185	0.000	-.3199	0.000	-.4407	0.000	-.4148	0.000	-.3099	0.000	-.5099	0.000	-.4935	0.000	-.0656	0.485	-.3042	0.002	-.1445	0.302
dep	-1.5929	0.002	-1.2624	0.009	-1.9300	0.009	-2.2609	0.008	-1.8145	0.002	-3.6920	0.001	-2.7357	0.000	-2.7373	0.003	-3.7786	0.000	-2.5999	0.057
sec	.0475	0.005	.0581	0.003	.0563	0.001	.0463	0.014	.0495	0.005	.0903	0.014	.0816	0.000	.0694	0.198	.0514	0.002	-.0607	0.514
roa	-1.4837	0.226	-1.7345	0.170	-2.7469	0.040	-1.2969	0.336	-1.7988	0.176	-3.7786	0.015	-5.7653	0.001	-.6416	0.657	-3.2314	0.035	-.2082	0.936
liq	-6.2043	0.030	-5.8911	0.063	-8.3589	0.011	-7.4373	0.031	-7.5224	0.011	-15.855	0.001	-7.5116	0.001	-11.809	0.051	-8.9883	0.001	7.3487	0.408
lg	.6789	0.067	.6959	0.065	.6375	0.119	.6838	0.094	.6706	0.068	.5406	0.206	-.1771	0.937	.7497	0.073	.8561	0.421	.9496	0.041
dg	-.3917	0.702	-.1810	0.857	-.5739	0.591	-.6257	0.557	-.5706	0.586	-.6312	0.583	-1.1429	0.605	-1.3674	0.481	-1.2143	0.417	-1.2942	0.579
sht	4.6997	0.000	4.8405	0.000	5.2800	0.000	4.4972	0.000	4.8557	0.000	4.3255	0.006	3.2510	0.001	2.5028	0.085	3.9879	0.001	1.0623	0.551
gdpg	.4322	0.000	.4389	0.000	.31079	0.000	.5104	0.000	.4200	0.000	.2896	0.003	.3663	0.000	.3846	0.000	.3470	0.000	.5884	0.001
cr_fitch	.0497	0.000	.0483	0.000	.0480	0.000	.0484	0.000	.0503	0.000	.0401	0.000	.0487	0.000	.0382	0.000	.0449	0.000	.0455	0.000
ass			-.7491	0.016							-5.7569	0.000								
assgdp					.0735	0.000					.0828	0.000								
capgdp							.0298	0.009			.0720	0.000								
cap									.3067	0.307	4.7363	0.000								
/cut1	-1.3824	0.330	-19.460	0.012	-11.315	0.000	-5.121	0.014	5.184	0.432	-52.764	0.009	-7.507	0.001	.643	0.775	-7.379	0.001	4.593	0.166
/cut2	-1.1443	0.420	-19.210	0.013	-11.039	0.000	-4.869	0.019	5.426	0.411	-52.417	0.009	-7.171	0.002	1.198	0.595	-6.811	0.002	5.740	0.087
/cut3	-.5389	0.704	-18.606	0.016	-10.332	0.000	-4.229	0.041	6.020	0.362	-51.579	0.011	-6.368	0.005	2.359	0.299	-6.241	0.005	6.814	0.044
/cut4	-.1054	0.941	-18.166	0.018	-9.811	0.000	-3.773	0.068	6.456	0.328	-50.949	0.011	-5.109	0.023	2.479	0.275	-5.125	0.020	7.082	0.037
/cut5	1.659	0.241	-16.386	0.033	-7.831	0.001	-2.190	0.285	8.233	0.213	-48.807	0.015	-.328	0.885	6.538	0.004	-1.525	0.487	15.721	0.000
/cut6	5.0462	0.000	-12.998	0.090	-4.286	0.072	1.260	0.538	11.636	0.079	-44.809	0.025	.366	0.874	6.754	0.003	-.0129	0.995		
/cut7	6.5556	0.000	-11.488	0.135	-2.773	0.260	2.774	0.195	13.146	0.048	-43.199	0.031								
LR	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Wald	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
no obs	1276		1253		1144		1075		1254		1023		765		511		864		412	
no group	55		54		52		50		54		49		28		34		36		38	

Source: Own calculations

Table 5: Determinants influencing Moody's banks' credit ratings by taking into consideration the size of banks and their capitalization

Moody	Moody												big		small		big cap		small cap	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
opl	-.0077	0.027	-.0087	0.014	-.0109	0.002	-.0088	0.017	-.0076	0.031	-.0144	0.000	-.0109	0.006	.0203	0.076	-.0118	0.004	.0132	0.200
lev	.1552	0.000	.1558	0.000	.1468	0.000	.0849	0.000	.1557	0.000	.0781	0.002	.2072	0.000	.0008	0.989	.2028	0.000	.0463	0.314
llp	.4246	0.014	.4443	0.012	.5598	0.002	.4746	0.010	.4207	0.015	.6540	0.002	-.5371	0.006	-3.8534	0.587	-.5599	0.005	-6.1236	0.164
tier1	-.2072	0.000	-.2501	0.000	-.3017	0.000	-.5116	0.000	-.2089	0.000	-.6169	0.000	-.1659	0.000	-.5331	0.002	-.1661	0.000	-.5209	0.001
dep	-.0215	0.597	.0076	0.864	.0209	0.687	.0174	0.746	-.0207	0.614	.0721	0.229	-1.5029	0.004	.2114	0.063	-1.3148	0.015	.1849	0.030
sec	.0183	0.083	.0239	0.027	.0219	0.051	.0236	0.046	.0185	0.081	.0274	0.029	.0221	0.047	.2167	0.010	.0170	0.171	-.0363	0.210
roa	5.8345	0.000	6.9455	0.000	9.5726	0.000	5.9689	0.000	5.7723	0.000	10.4846	0.000	8.2147	0.000	-10.4479	0.027	8.5719	0.000	-6.1363	0.148
liq	-.4685	0.789	-2.1635	0.248	-2.2001	0.291	.2097	0.919	-.5568	0.757	-3.1498	0.212	-4.2871	0.036	-1.2253	0.870	-3.4023	0.106	7.1101	0.232
lg	-1.3526	0.430	-2.1287	0.228	-2.2076	0.290	-2.1841	0.274	-1.3911	0.420	-2.3417	0.279	1.2585	0.569	-2.8887	0.631	1.1058	0.634	-5.8982	0.151
dg	-.8482	0.330	-.4157	0.654	.4305	0.735	.2724	0.838	-.8361	0.339	1.1073	0.443	-4.1033	0.008	3.2973	0.274	-3.4877	0.032	2.3988	0.263
sht	1.4201	0.065	2.4522	0.006	.6622	0.465	.3029	0.744	1.4254	0.065	2.3198	0.040	1.7652	0.059	12.5519	0.001	1.5954	0.094	12.5484	0.001
gdpg	-.0493	0.150	-.0536	0.122	-.0970	0.012	-.2027	0.000	-.0525	0.162	-.1811	0.000	.0714	0.048	-.1674	0.319	-.0396	0.304	-.0898	0.530
cr_mo-ody	.2566	0.000	.2641	0.000	.2689	0.000	.2611	0.000	.2561	0.000	.2710	0.000	.2183	0.000	.5581	0.001	.2179	0.000	.4608	0.000
ass			1.5861	0.005							2.7308	0.000								
assgdp					.0104	0.224					.0087	0.373								
capgdp							.0374	0.001			.0429	0.001								
cap									.0540	0.839	1.4218	0.000								
/cut1	15.56	0.000	56.44	0.000	16.29	0.000	11.87	0.000	16.69	0.005	48.75	0.000	14.54	0.000	25.87	0.017	14.92	0.000	20.73	0.005
/cut2	16.02	0.000	56.92	0.000	16.85	0.000	12.45	0.000	17.16	0.004	49.32	0.000	17.68	0.000	26.76	0.015	18.05	0.000	21.49	0.004
/cut3	18.40	0.000	59.57	0.000	19.58	0.000	15.58	0.000	19.55	0.001	52.83	0.000	18.60	0.000	33.49	0.007	19.01	0.000	27.63	0.002
/cut4	19.82	0.000	61.12	0.000	20.67	0.000	16.98	0.000	20.98	0.000	54.25	0.000	20.50	0.000	36.34	0.007	20.91	0.000	29.62	0.002
/cut5	22.41	0.000	63.76	0.000	24.02	0.000	20.01	0.000	23.57	0.000	57.31	0.000	22.02	0.000	46.81	0.005	22.44	0.000	31.09	0.001
/cut6	23.24	0.000	64.61	0.000	24.60	0.000	20.70	0.000	24.39	0.000	58.05	0.000	24.42	0.000	50.57	0.002	24.89	0.000	37.87	0.001
/cut7	25.38	0.000	66.78	0.000	26.97	0.000	23.79	0.000	26.53	0.000	61.31	0.000	26.14	0.000	53.29	0.001	26.55	0.000	41.29	0.000
/cut8	27.12	0.000	68.56	0.000	28.84	0.000	25.59	0.000	28.28	0.000	63.09	0.000	32.26	0.000			32.67	0.000	43.60	0.000
/cut9	29.39	0.000	70.88	0.000	31.19	0.000	28.13	0.000	30.54	0.000	65.93	0.000							46.85	0.000
/cut10	31.10	0.000	72.64	0.000	32.89	0.000	29.95	0.000	32.25	0.000	67.87	0.000								
/cut11	36.90	0.000	78.58	0.000	38.99	0.000	36.01	0.000	38.05	0.000	74.74	0.000								
LR	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Wald	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
no obs	493		493		424		416		493		384		413		80		399		94	
no group	14		14		14		14		14		14		11		3		11		9	

Source: Own calculations

Table 6: Determinants influencing S&P's banks' credit ratings by taking into consideration the size of banks and their capitalization

S&P	S&P										Big		Small		Big cap		Small cap	
	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z	Coef.	P>z
opl	-.0011	0.341	-.0012	0.304	-.0022983	0.086	-.0020167	0.164	-.0015629	0.250	-.0075228	0.006	-.0004711	0.797	-.0016682	0.430	-.0010483	0.602
lev	.0109	0.394	.0096	0.466	.0028474	0.833	-.002884	0.836	.0314963	0.044	.1437775	0.000	.0546198	0.006	.1194745	0.001	.0016187	0.918
llp	.2892	0.262	.3617	0.184	.5581274	0.071	.4110579	0.145	.4770655	0.069	-.2275096	0.802	.3957475	0.235	.1051124	0.895	.4211573	0.208
tier1	-.0029	0.895	-.0406	0.087	-.1097006	0.000	-.1739125	0.000	-.0627632	0.008	.0753221	0.019	-.2028102	0.000	.0642223	0.042	-.0908647	0.092
dep	-.2114	0.332	-.3547	0.115	-.6341966	0.214	1.205355	0.041	-.2808203	0.207	.4758758	0.346	-2.114972	0.010	.4388729	0.279	-1.647618	0.037
sec	.0034	0.684	.0033	0.686	.0005209	0.952	-.0059744	0.583	.0125072	0.142	.0027721	0.734	.0327805	0.367	.0021036	0.804	-.0277336	0.555
roa	.4169	0.196	.5934	0.088	1.016213	0.012	.6387635	0.067	.6552858	0.043	3.066742	0.002	-.1032372	0.792	2.701823	0.001	.038414	0.930
liq	-4.0189	0.004	-5.1172	0.000	-3.267952	0.052	-1.608852	0.402	-4.779798	0.001	-.0152748	0.993	-16.18952	0.000	-.9078932	0.600	-12.02762	0.005
lg	-.4161	0.070	-.3814	0.103	-.2360462	0.345	-1.071326	0.006	-.4436565	0.057	-.2373638	0.448	-.9358057	0.048	-.2127222	0.490	-.6672605	0.159
dg	.1482	0.797	.1492	0.798	-.3889058	0.568	.6904464	0.352	.0317135	0.956	.2162608	0.735	-.086887	0.959	.1876093	0.771	.1618562	0.929
sht	-.4325	0.370	-.4048	0.423	-.979002	0.086	-.7929196	0.137	-.7066758	0.149	-5.09349	0.104	-.0189888	0.977	-6.844685	0.003	-.2231756	0.738
gdpg	-.0227	0.310	.0009	0.966	.0688144	0.010	-.0166369	0.550	-.1142067	0.000	.0635774	0.054	-.0070447	0.867	.0622923	0.064	-.0250843	0.637
cr_sp	.4118	0.000	.4313	0.000	.4635708	0.000	.4591953	0.000	.4093846	0.000	.3284448	0.000	.5865789	0.000	.3752728	0.000	.4797129	0.000
ass			1.8309	0.000														
assgdp					.0438374	0.000												
capgdp							.0036753	0.609										
cap									1.47771	0.000								
/cut1	.02	0.986	45.13	0.000	16.33892	0.000	11.30103	0.000	30.31387	0.000	12.19142	0.000	-7.395893	0.003	12.16734	0.000	-3.793716	0.113
/cut2	.76	0.600	46.00	0.000	19.6391	0.000	14.85258	0.000	31.10137	0.000	15.93872	0.000	-6.639205	0.006	14.77298	0.000	-3.028689	0.190
/cut3	10.13	0.000	56.58	0.000	21.42435	0.000	16.90649	0.000	42.24099	0.000	17.1811	0.000	4.626542	0.042	15.28343	0.000	8.511317	0.000
/cut4	13.75	0.000	59.92	0.000	23.38698	0.000	19.11938	0.000	45.73506	0.000	18.16179	0.000	11.02529	0.000	16.25723	0.000	11.88081	0.000
/cut5	15.47	0.000	61.45	0.000	25.13854	0.000	20.98564	0.000	47.30091	0.000	22.95532	0.000	14.74076	0.000	19.02193	0.000	13.95483	0.000
/cut6	17.68	0.000	63.64	0.000	28.0696	0.000	23.93663	0.000	49.4931	0.000	25.42173	0.000	17.7281	0.000	22.37439	0.000	16.57182	0.000
/cut7	19.30	0.000	65.39	0.000	30.81243	0.000	26.77165	0.000	51.23907	0.000	27.65901	0.000	20.01661	0.000	25.5039	0.000	18.59462	0.000
/cut8	21.87	0.000	68.27	0.000	32.66941	0.000	28.82178	0.000	53.97501	0.000	30.11502	0.000	23.7758	0.000	28.09317	0.000	21.5798	0.000
/cut9	24.33	0.000	70.85	0.000	34.96563	0.000	31.44388	0.000	56.71268	0.000	31.77804	0.000	26.91632	0.000	32.63477	0.000	24.57727	0.000
/cut10	26.02	0.000	72.64	0.000	38.53721	0.000	35.31569	0.000	58.30647	0.000	34.93524	0.000	28.69834	0.000	34.75948	0.000	26.19962	0.000
/cut11	28.20	0.000	74.84	0.000	41.36256	0.000	37.63528	0.000	60.63161	0.000	37.20101	0.000	31.48634	0.000	38.25925	0.000	29.04224	0.000
/cut12	31.22	0.000	78.01	0.000	45.94832	0.000	42.53345	0.000	63.90079	0.000	42.26511	0.000	35.4728	0.000	40.60765	0.000	30.97585	0.000
/cut13	33.65	0.000	80.59	0.000	48.13131	0.000	44.61428	0.000	66.47061	0.000			40.95106	0.000	45.67255	0.000	34.95222	0.000
/cut14	37.71	0.000	84.84	0.000	52.62951	0.000	48.84156	0.000	70.65074	0.000			48.14793	0.000			40.88047	0.000
LR	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
Wald	0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000	
no obs	1072		1066		977		864		1061		647		425		748		324	
no group	49		49		47		46		48		27		29		35		33	

Source: Own calculations

contrast to the ratings assigned by Moody's. For Fitch, this variable is insignificant.

The analysis of the macroeconomic condition has been prepared by using the GDP growth and the countries' credit ratings. The strongest reaction to GDP growth has been observed in the case of the notes given by Fitch. The analysis suggests that for both bigger and smaller banks this determinant has been significant. A stronger reaction has been noticed in the case of all types of ratings, in the case of bigger banks. These institutions are one of the most significant investors in government securities. Their activity is also strictly connected with the stage of the

business cycle. In the current methodologies an opinion has been presented according to which a relationship between the countries' and the banks' ratings has been observed. On the other hand, during the analysis of the factors that influence countries' notes we can find a similar estimation method to those presented for banks. As a result, the "golden rule" can still exist. The research confirms it. Countries' notes influence statistically significantly banks' credit ratings, especially in relation to the smaller institutions. Bigger international financial institutions are usually independent from countries' credit ratings because their business is connected with the economic condition of various countries.

The next part of the analysis relies on the verification of the impact of the size of the banking sector, the size of banks, the capitalization of the financial market and banks' capitalization. If banks are bigger, credit ratings are higher, but it depends on the customer of credit rating agencies. Fitch in their portfolio estimates notes of smaller banks, and as a result this relationship has not been observed. A different situation was seen for Moody's and S&P's. Their main clients are large financial institutions, and as a result the impact is confirmed. The size of the banking sector has a positive impact on banks' notes for all analyzed credit rating agencies. The same situation has been noticed for market capitalization. Bank capitalization is also a significant determinant of banks' notes. The Fitch ratings are the notes most sensitive to these changes.

Conclusions

The aim of the paper was to analyze the factors influencing European banks' credit ratings by taking into account the size of the institutions. The following hypotheses have been drawn: banks' capital adequacy, profitability, liquidity and management quality have a significant influence on their credit ratings. Bigger banks receive higher credit ratings than the smaller ones in similar financial conditions.

The presented hypotheses have been confirmed. The analysis also helps to find differences between the impact of the group of factors on the banks' notes by considering the size of the estimated institutions. For Fitch, capital adequacy, asset quality and management indicators are significant for bigger banks. Earnings determinants are especially important for smaller institutions if we take into consideration the loan growth, and for the bigger ones – if we analyze the rates of return. Liquidity indicators are important for both groups, but the strength of impact is higher for smaller institutions. The macroeconomic indicators have a similar impact on the Fitch notes.

Moody's credit ratings put into consideration the capital adequacy indicators both for smaller and bigger banks (tier 1 is significant for both groups, the leverage ratio for large banks). The same situation has been observed for the management quality, earnings and liquidity indicators. The notes given to bigger banks are sensitive to the assets quality factors. The impact of the GDP growth is stronger for larger institutions, and countries' credit ratings – for the smaller ones.

Notes that are presented by S&P's for European banks are insensitive to assets quality and management quality indicators in both groups by taking into account the size of assets and the value of the capitalization market. The notes that are given to large banks are dependent on the earnings and capital adequacy factors, but those prepared for smaller institutions are correlated with the liquidity and capital adequacy indicators.

The presented results suggest that smaller banks are more sensitive to credit ratings than the bigger ones. As a result, in the next study the impact of the business cycle on banks' credit ratings, and the changes to these notes in the sample of bigger and smaller banks during the crisis will be analyzed. The analysis will be extended by the notes that are prepared not only by bigger but also by smaller credit rating agencies.

References

Bellotti, T., Matousek, R., Stewart, C. (2011a). A Note Comparing Support Vector Machines and Ordered Choice Models' Predictions of International Banks' Rating. *Decision Support Systems, 51*(3), 682-687.

Bellotti, T., Matousek, R., Stewart, C. (2011b). Are Rating Agencies' Assignments Opaque? Evidence from International Banks. *Expert Systems with Applications, 38*(4), 4206-4214.

Bissoondoyal-Bheenick, E., Treepongkaruna, S. (2011). An Analysis of the Determinants of bank ratings: comparison across ratings agencies. *Australian Journal of Management, 36*(3), 405 –424.

Brezigar-Masten, A.,Masten, I., Volk, M. (2015). Discretionary Credit Rating and Bank Stability in a Financial Crisis, *Eastern European Economics, 53*(5), 377-402.

Chodnicka – Jaworska, P. (2016). *Banks credit ratings – is the size of the credit rating agency important?.* Working paper.

Estrella, A., Park, S.,Peristiani, S. (2000). Capital Ratios as Predictors of Bank Failure. *FRBNY Economic Policy Review,* July, 33-52.

Ferri, G., Liu, L.G., Stiglitz, J.E. (1999). Are Credit Ratings Pro-cyclical? Evidence from East Asian Countries. *Economic Notes, 28*(3), 335–55.

Hassan, O.A.G, Barrell, R. (2013). Accounting for the Determinants of Banks' Credit Ratings. *Brunel University of London Economics and Finance Working Paper Series*, 13-02.

Hau, H., Langfield, S., Marques-Ibanez, D. (2012). Bank Ratings what Determines their Quality? *EBC Working Paper Series*,1484, October.

Jacobson, T., Lindé, J., Roszbach, K. (2006). Internal Ratings Systems, Implied Credit Risk and the Consistency of Banks' Risk Classification Policies. *Journal of Banking & Finance, 30*(7), 1899–1926

King, M.K., Ongena, S., Tarashev. N. (2016). Bank standalone creditratings. *BIS Working Papers*, 542, 1-62.

McDonald, A., Eastwood, G. (2000). Credit Risk Ratingat Australian Banks.*APRA Working Papers, 7*, December, 1-32.

Öğüt, H., Doğanay, M.M., Ceylan, N.B., Aktaş, R. (2012). Prediction of Bank Financial Strength Ratings: The Case of Turkey. *Economic Modelling, 29*, 632–640.

Ötker-Robe, I., Podpiera, J. (2010). The Fundamental Determinants of Credit Default Risk for European Large Complex Financial Institutions. *IMF Working Paper,* WP/10/153.

Packer, F., Taraschev, N. (2011). Rating Methodologies for Banks. *BIS Quarterly Review*, June.

Pagratis, S., Stringa, M. (2007). Modelling Bank Credit Ratings: A Structural Approach to Moody's Credit Risk Assessment. *Athens University of Business and Economics Working Paper.*

Poon, W.P.H., Firth, M., Fung, H. (1999). A Multivariate Analysis of The Determinants of Moody's Bank Financial Strength Ratings. *Journal of International Financial Markets, Institutions and Money, 9*(3), 267-283.

Poon, W., Lee, J., Gup, B.E. (2009). Do Solicitations Matter In Bank Credit Ratings? Results from a Study of 72 Countries. *Journal of Money, Credit and Banking, 41,* 285-314.

Shen, C., Huang, Y., Hasan, I. (2012). Asymmetric Benchmarking in Bank Credit Rating. *Journal of International Financial Markets, Institutions & Money, 22*, 171– 193.

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 37-48

DOI: 10.2478/fiqf-2020-0011

Financial Internet Quarterly

TRADE FAIR FEE AS A SOURCE OF INCOME FOR THE BUDGETS OF MUNICIPALITIES IN POLAND ON SELECTED EXAMPLES

Cezary Szydłowski[1]

Abstract

The public finance system in force in Poland provides for a trade fair fee (Polish - „opłata targowa") as part of municipalities' own revenues. The trade fair fee is collected from persons selling at marketplaces located in the municipality. It constitutes own income for the commune's budget and is an archaic form of public tribute. According to the legal regulations in force in Poland, communes may waive the collection of the exhibition fee, however, there are still many communes collecting it. The assessment of income to the commune budget from the trade fair fee was carried out on the basis of a survey of income to the budget of selected 10 coastal communes in Pomorskie Voivodeship. The selection of coastal municipalities was determined by their specificity in terms of retail trade on markets and squares. This is because the holiday season attracts many tourists and entrepreneurs who sell the goods they offer in the mode of direct retail trade carried out on local markets, streets or squares (often located near the entrance to local beaches). The analysis of income from the fair fee was carried out on the basis of reports on the implementation of the budgets of communes and reports on the income of communes Rb-27s published by commune authorities on the pages of the Public Information Bulletin of a given local government unit. Verification of the revenue of the selected 10 municipalities from the fair fee for 2016-2019 revealed a very low share of the fair fee in the total revenue to the municipalities' budgets (maximum 1.60% for the Łeba municipality in 2016). Moreover, the communes incur significant costs related to the collection of the trade fair fee, which are connected with the payment of commissions on the collected amounts up to 25% of the total income from the fee.

The results of the research indicate that it would be reasonable for the authorities of the analysed communes to consider abolishing the trade fair fee in their area, as the revenue is small compared to the costs incurred.

The liquidation of the market fee may attract more traders and improve the image of the commune as a facilitator of business activities involving trade in marketplaces.

JEL classification: H71, H83

Keywords: audit, budget revenues, local tax, public finance, local government, trade fair fee

Received: 01.05.2020 Accepted: 15.06.2020

[1] University of Łódź, Faculty of Economics and Sociology, Department of Finance and Accounting SME, e-mail: cezary.szydlowski@uni.lodz.pl; ORCID: 0000-0002-7454-2908

Introduction

The legal solutions adopted in Poland have granted municipalities the right to establish and collect local taxes and fees. Communes constitute a basic unit of local administration, which performs various tasks for the benefit of the local community. The system created for financing local government activities enables communes to collect appropriate public levies, which constitute sources of their own income. This includes a market fee, which is collected by the commune from legal and natural persons selling goods at marketplaces.

The trade fair fee is a very outdated form of public tribute imposed by municipalities. It was one of the sources of income in Poland during the 30 years of the local government's operation, starting from the beginning of the economic transformation in the early 1990s, when commercial activity was one of the basic manifestations of Polish entrepreneurship and focused on local marketplaces of particular towns and villages. The economic development of Poland resulted in very large structural changes in trade activity, mainly through limiting the scale of trade in marketplaces in favour of large-format stores. This process has been progressing dynamically in Poland since the turn of the 20th and 21st century. Through their expansion on the retail market, large stores of international retail chains have taken over a large share of customers who had previously purchased goods in smaller stores and markets. The expansion of retail chains has contributed to a change in the structure of trade, which has resulted in a decrease in the number of consumers willing to make purchases at local markets (Maciejewski, 2017). The reduction in the role of marketplaces, which have been replaced to a large extent by large-format shops, has resulted in a decrease in the revenue of municipalities from the market fee. Despite changes in the Polish trade structure and a limited number of sellers, communes still charge the market fee. The legal regulations allow the municipal authorities to abolish the market fee, which some local governments have implemented, e.g. the city of Gdańsk (Resolution No XV/398/15, 2015). Therefore, the establishment of the level of revenues to the municipalities' budget from the trade fair fee is an interesting research area. Additionally, the share of revenues from the trade fair fee in the total income of the municipality should also be determined. The tendency to decrease the total number of people selling at marketplaces means that the income to the commune budget is decreasing. Apart from the budgetary effects, the decrease in revenues from the market fee also indicates a decrease in the number of sellers and traders offering their goods at local community marketplaces.

In view of the above, the purpose of the research for the purposes of this publication was to obtain an answer to the question of what the municipalities' income from the trade fair fee is and what is its share in the municipalities' total income. In addition, the study of municipalities' revenues in the selected scope is an important research area in the area of public finance. However, the results of the conducted analysis may constitute interesting material for those interested in local taxes and fees in Poland.

The assessment of the municipalities' revenues from the local charge was decided on the basis of the financial reports on the implementation of the municipality budget for the year. The reports contain reliable financial data on the level of revenue to the municipalities' budgets from particular taxes and local fees for a given year. The analysis of income from the fair fee was carried out on the basis of 10 coastal municipalities from Pomorskie Voivodeship in Poland (urban and rural municipalities). The choice of coastal municipalities was due to the fact that during the holiday season the number of merchants selling goods to tourists spending their holidays in their area increases locally. The holiday period generates in coastal municipalities a large increase in the number of merchants at local marketplaces, which should contribute to significant revenues from the fair fee, which may justify the need to maintain them by local authorities. The structure of this publication includes: a presentation of the research method, the literature review, research results and conclusions and the summary.

Research methods

The article uses a case study, an analytical method, an inference method, a method of examining source documents and a literature review as research methods. The analysis of income of individual communes was carried out on the basis of data contained in reports on the implementation of commune budgets in a given year (for the years 2016 -2019) and reports Rb-27s on the income obtained by municipalities in the evaluated year, published in the Public Information Bulletins (on the websites) of the analysed municipalities.

The study covered the evaluation of total revenue to the commune budget and commune revenues on account of the fair fee in 10 selected coastal communes of Pomorskie Voivodeship in Poland, 7 municipalities (i.e. Gdynia, Jastarnia, Łeba, the City of Puck, Sopot, the City of Ustka, Władysławowo) and 3 rural municipalities (i.e. Krokowa, Stegna and Ustka Municipalities). The choice of the communes was determined by their location and availability of data for the survey. The surveyed time horizon covered the years 2016-2019. The first stage of the survey was the assessment of the overall income to the budgets of individual communes, then the share of receipts from the trade fair fee in the overall income of the communes was established. The analyses were the basis for a general assessment of the significance of revenues from the trade fair fee in the revenues of the budgets of the 10 municipalities under analysis. For the purposes of the analysis, nominal amounts of revenues to the budgets of individual 10 communes in 2016-2019 were taken into account.

Literature review

The purpose of this publication was to assess the level of communes' income from the fair fee and their share in the total income of communes.

Municipal governments in Poland finance their tasks from taxes and local fees. Ensuring an adequate system of financing the activities of communes is the basis for the independence of communal authorities in making decisions concerning the local community. No undertaking by a commune authority is possible without an adequate system of financing. The municipalities have their own budget, in the form of public levies and funds provided by the State from the central budget. Caring for the development of the municipality requires effective action to increase budget revenues. Increase of income to the commune budget translates into the possibility to carry out investments for the local community that improve the standard of living of the inhabitants and increase their investment or tourist attractiveness depending on the specificity of the municipality (Bahl & Linn, 1992).

Local government in Poland at the commune level performs most of the tasks that affect the life of each member of the local community. The realization of these tasks is possible only with an appropriate system of their financing, mainly by establishing a system of local taxes. Therefore, the Polish system of public finance defines a detailed catalogue of public levies that can be collected by particular local government units, including communes (Owsiak, 2002, pp. 126-128). The catalogue of public levies belonging to self-governments constituting own revenue is defined in the relevant provisions of Polish law (Law, 2003). In addition, Polish specific legislation has defined a catalogue of local taxes and charges that may be collected by municipalities as own revenue (Law, 1991). The need to carry out the tasks assigned to them requires the public authorities to ensure a level of government revenue adequate to expected expenditure. Financing of local government tasks from local taxes is a universal system solution applicable in many democratic countries around the world, including the United States of America (Stiglitz & Rosengard, 2015, pp. 832-833). It is worth emphasizing that the conducted analyses concerning the tax systems of individual European Union countries prove that local taxes function in many European countries, which is reflected in reports in this respect (Taxation Trends, 2019).

Appropriate organisation of the system of collecting public levies by local authorities is important for efficient execution of particular tasks financed from the commune budget. Providing public services to the commune inhabitants generates costs, which are financed with the income obtained for the commune budget (Bird, 2010). Financial management of the commune should be focused on obtaining the highest possible income in order to be able to carry out its mission and balance the budget of a given local government unit. Therefore, the budgetary policy of commune authorities should focus on maximising revenues, as stable finances constitute a pillar for efficient operation of each commune (Freire & Garzón, 2014).

Stabilising the municipal budget by balancing expenditure and revenue requires constant monitoring of revenue from individual taxes and local charges. It should also be remembered that raising funds for the budget should not generate significant costs of their collection for the commune. The cost of obtaining a public tribute, which is not commensurate with the amount of the collected tax or local charge, in practice means low efficiency of its collection by the commune. The above situation may occur when the collection of a given public tribute by the municipality requires payment of remuneration to a company or an individual for performing such an activity. In Poland, this situation concerns a number of taxes and local fees for collection of which a commission is set as a

percentage of the value of the public levy collected from the taxpayer.

In addition to revenue planning, the process of managing public finances of municipalities also requires an appropriate system of control over them. The process of controlling revenues generated by the municipality from individual taxes and local fees is supported by financial audits carried out by external or internal auditors (Copley, 1991). The ongoing and independent assessment of income to the municipal budget may also be commissioned by the municipal authorities to specialised organisational units, e.g. internal control or financial units. An internal audit, which examines the areas covered by the audit task, can be a useful tool for the municipality's management to assess budget revenues (Spencer Pickett, 2010). In addition, the municipalities should periodically carry out a financial audit in order to obtain objective information on the level of revenue to the municipalities' budget. The financial audit is a useful tool used by the municipalities to assess the financial economy.

The level of income to the budget of individual municipalities depends on many factors. The main factor influencing the budget revenues of communes is the social and economic development, the condition of technical infrastructure and the effectiveness of local authorities in collecting the due tributes (Podstawka, p. 112). The amount of income from local taxes also depends, among other things, on their location, natural resources, demography, economic activity, etc. Communes located in areas attractive for tourists attract mainly investments related to services serving tourists (accommodation, bars and restaurants, etc.). Moreover, in the areas of tourist communes during the holiday season, the share of retail trade increases significantly, which very often takes place outside permanent commercial outlets (shops) mainly in local markets and outside them. The holiday season in coastal municipalities contributes to a seasonal increase in the number of businesses operating in the area of these municipalities. A significant part of business entities operating in tourist communes during the summer season is not permanently connected with the commune where they conduct their seasonal business activity. This means that potentially the holiday season contributes to the increase of revenues of coastal communes from taxes and local charges.

The legal solutions in force in Poland make it possible for local governments to collect public levies in the form of taxes and local fees. This fee is of the nature of a compulsory monetary benefit collected by municipal authorities for public services (Parlińska, 2010, p. 310).

The fair fee is collected from persons offering goods at the marketplaces in accordance with the organisational solutions adopted in the given commune. According to the Act, a marketplace is any place where the sale of goods is carried out. (Law, 1991, art. 15). The fair fee is a form of payment by the sellers for the public service, which is the possibility of conducting sales in a specific space belonging to the municipality (Kwaśniewski & Wantoch-Rekowski, pp. 67-85). This means that the fees are collected from the sellers both on and off the designated communal marketplaces. In the case of places attractive for tourists located in the area of coastal municipalities, sales are very often made outside the marketplaces. Many sellers offer their goods in places located on main roads (pavements and street and roadsides) leading to entrances to beaches and places attractive for tourists or recreation. It should be emphasized that the trade fair fee is collected regardless of additional charges related to the use of the trade fair facilities and for other services provided by the trade fair manager (Law, 1991, art. 15).

The amount of the exhibition fee and the rules of collection shall be adopted by the competent Councils of Cities or Commune Councils, which have the right to determine the amount of the exhibition fee. The legislator in order to limit the amount of the trade fair fee charged, granted the Minister of Finance the power to determine the maximum rates of the trade fair fee for each day of trade which may be set by the municipality in a given year. The maximum rates of the daily exhibition fee set by the Minister of Finance for a given year in 2016-2019 are presented in Table 1.

Table 1: Maximum daily rates of the trade fair fee in 2016-2019

Name	Maximum daily rate of trade fair fee in a given year in PLN				Rate changes in % (year-on-year)		
Year	2016	2017	2018	2019	2017/2016	2018/2017	2019/2018
Fair fee in PLN	758,47	751,65	765,94	778,2	-0,90%	1,90%	1,60%

Source: Own study based on the announcements of the Minister of Finance and the Minister of Finance and Development on the upper limits of specific taxes and local fees in the years 2016, 2017, 2018, 2019 (M.P. from 2015, item 735, M.P. from 2016, item 779, M.P. from 2017, p item 800, M.P. from 2018 item 745).

The maximum daily exhibition fee rates for a given year indicate that its amount was reduced by 0.9% in 2017 as compared to 2016, while in the following years (2018 and 2019) it increased from 1.60% (2018) to 1.60% (2019) as compared to previous years.

When determining the amount of the fair fee, individual communes depend on various factors, such as e.g. the seasons, e.g. the Resolution of the Gdynia City Council, which specified higher fees in the summer season (Resolution No. XIII/250/15, 2015). Usually, the fair fee is collected by those appointed by the municipality, who receive remuneration for these activities representing a certain percentage of the amount collected from the seller. The collection of the trade fair fee is carried out by the municipalities and the income from it constitutes income for their budgets. In view of the above, it should be concluded that the trade fair fee is one of the revenue items for the commune's budget, the cost of collection of which may be inadequate to the revenue generated on this account. This means that the possible abandonment of its collection may not cause significant loss of revenue to the commune's budget.

Analysis of income to the municipalities' budget from the trade fair fee

The assessment of income to the municipalities' budgets from the trade fair fee begins with an analysis of its share in the total income to the municipality's budget. Table 2 presents a statement containing the share of income from the fair fee in the total income to the budgets of the 10 analysed communes of Pomorskie Voivodeship in Poland.

The income statement presented in Table 2 shows that the trade fair fee charged to vendors in particular communes in 2016-2019 constituted a small percentage share in total budget revenues. The highest share of the trade fair fee in the commune's income on this account was recorded by the Łeba commune in 2016 (the share was 1.60% of total budget income, nominal income of PLN 449,456). The lowest share of the exhibition fee in the income to the commune budget was recorded in Gdynia (share of 0.01% in 2018 and 2019, nominal income, in 2018 amounted to – PLN 217,218 and in 2019 – PLN 142,100).

The highest annual share of the fair fee in the income to the commune budget in 2016-2019 was obtained by the Łeba commune (1.60% in 2016, 1.50% in 2017, 1.33% in 2018 and 1.29% in 2019). The lowest share in revenues to the commune budget from the fair fee in the examined period had Gdynia (0.02% in 2016-2017 and 0.01% in two subsequent years 2018-2019).

It should be noted, however, that in the surveyed period, the city of Gdynia achieved a relatively high level of income to the total budget in comparison with other urban and rural communes covered by the analysis. Similarly, very low income to the municipal budget from the fair fee was established in Sopot (income at the level of 0.05% in 2016-2018 and 0.04% of income to the total budget in 2019).

The second commune among the surveyed, which in 2016-2019 received income to the budget from the fair fee at a level exceeding 1% was Jastarnia commune (1.33%) in 2016, 1.39%

in 2017, 1.32% in 2018 and 1.11% in 2019 of total budget revenue). Of the 3 rural communes covered by the survey, the lowest level of total income to the budget from the fair fee was obtained by the rural commune of Ustka (0.15% in 2016, 0.17% in 2017, 0.20% in 2018 and 0.18% in 2019 of total revenues to the budget). The list presented in Table 2 shows that the trade fair fee constitutes a small, even fractional share in total budget revenues in the communes under analysis. On the basis of the data set for the years 2016-2019, the following ranges of the share of the exhibition fee in total budget revenues in communes can be determined:

1) in 2016, revenues from the fair fee ranged from 0.02% share in total revenues (city

of Gdynia) to 1.60% share (city of Łeba),

2) in 2017, revenues from the fair fee ranged from 0.02% share in total revenues (city

of Gdynia) to 1.50% share (city of Łeba),

3) in 2018, income from the fair fee ranged from 0.01% share in total income (city of Gdynia) to 1.39% share (city of Łeba),

4) in 2019, income from the fair fee ranged from 0.01% of total income (city of Gdynia)

to 1.29% (city of Łeba).

Generally speaking, the results of the analysis of the general share of revenues to the budgets of municipalities from the trade fair fee prove that in 2016-2019 there was a downward trend in revenues from the trade fair fee. This

Table 2: Share of revenues from the trade fair fee in the total revenues of the analyzed municipalities in 2016-2019

Name of the municipality	Municipal status	Total budget revenues in the years in PLN				Revenue from the trade fair fee in 2016 — 2019				Share of the fair fee in the total income of the municipality in 2016 – 2019 in %			
		2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
Gdynia	urban	1 361 861 892	1 409 667 667	1 605 977 090	1 803 290 009	246 231	221 724	217 218	142 100	0,02%	0,02%	0,01%	0,01%
Jastarnia	urban	25 001 066	26 397 078	27 655 390	33 224 821	333 107	367 540	364 941	367 335	1,33%	1,39%	1,32%	1,11%
Łeba	urban	28 033 893	29 165 381	29 738 755	30 612 119	449 456	436 812	411 651	395 519	1,60%	1,50%	1,38%	1,29%
City of Puck	urban	50 606 379	55 524 472	61 153 228	64 982 579	177 748	122 169	87 071	41 604	0,35%	0,22%	0,14%	0,06%
Sopot	urban	299 516 562	294 965 739	329 271 246	380 025 764	145 258	146 773	157 494	149 993	0,05%	0,05%	0,05%	0,04%
Miasto Ustka	urban	69 993 683	82 652 109	92 562 661	86 641 187	255 296	210 841	166 920	105 618	0,36%	0,26%	0,18%	0,12%
Władysławowo	urban	81 167 785	90 660 191	98 907 833	107 860 328	692 743	638 706	630 924	787 504	0,85%	0,70%	0,64%	0,73%
Krokowa	rural	58 137 528	60 270 623	69 812 054	68 849 324	162 751	169 337	155 180	160 429	0,28%	0,28%	0,22%	0,23%
Stegna	rural	43 427 860	50 272 751	60 762 642	52 626 961	150 476	264 113	280 977	297 757	0,35%	0,53%	0,46%	0,57%
Communes of Ustka	rural	48 646 225	47 852 861	51 153 840	61 004 812	75 370	81 809	99 923	112 258	0,15%	0,17%	0,20%	0,18%

Source: Own study based on reports Rb-27s and reports on the implementation of the commune budget for 2016-2019 published in Public Information Bulletins by local governments

means that despite the insignificant share of the fee in the revenues in question, communes may potentially obtain less and less revenue to the budget with each year of this tribute. Such a situation may indicate that municipalities in Poland which would undertake in the future the decision to eliminate the trade fair fee as an own income to the municipality budget would not incur significant budget losses. However, one should be aware that every amount of income to the commune budget, regardless of the form of public tribute, supports the financing of planned expenses related to the performance of commune tasks, for example in the area of providing public services or making investments. Potential liquidation of the fair fee by the municipal authorities may result in problems in the coming years in ensuring the financial stability of a given local government unit. A serious decline in the economic development of countries around the world may contribute to it due to the economic crisis resulting from the global epidemic in 2020. Preliminary forecasts for global economic development clearly indicate a serious risk of a global economic crisis. This is evidenced by reports prepared, among others, by the International Monetary Fund (World Economic Outlook, IMF, April 2020). The economic crisis caused by the epidemic will contribute to large drops in income to the budgets of municipalities, and therefore it seems that it would be inappropriate for local authorities to give up collecting the fair fee. A separate issue is the high probability of low income from the trade fair fee for coastal municipalities. Planning of budget revenues for the following year is based on the financial results achieved in the previous year, increased by the projected price indices of consumer goods and services in the following year. Currently, the municipalities' forecasting of income levels is very difficult due to the progressing global economic crisis. The effects of the ongoing crisis caused by the epidemic are already being felt by global economies such as the United States, as evidenced by data on "The Consumer Price Index for All Urban Consumers declined 0.4 percent in march on a seasonally adjusted basis, the largest monthly decline

Table 3: Price indices of consumer goods and services in Poland in years 2016-2019

Yearly price indices of consumer goods and services in Poland in years 2016-2019 (Price index previous year = 100)				
Year	2016	2017	2018	2019
Price index	99.4	102.0	101.6	102.3

Source: https://stat.gov.pl/en/topics/prices-trade/price-indices/price-indices-of-consumer-goods-and-services/yearly-price-indices-of-consumer-goods-and-services-from-1950/

since January 2015" (CPI-U, 2020).

Summary of the evolution of the indicator Price indices of consumer goods and services in Poland) for the period 2016-2019 is shown in Table 3.

The next stage of the analysis of income from the fair fee is the assessment of the nominal level of decrease or income to the municipalities' budget from the fee in question, which is presented in Table 4.

The analysis of the nominal revenues of municipalities from the trade fair fee in 2016-2019 shows that the highest annual decrease was in 2019 in Puck (52% decrease compared to 2018). The City of Puck also recorded decreases in the remaining years covered by the assessment on an annual basis (a 17% decrease in 2017 compared to 2016 and a 29% decrease in 2018 compared to 2017). This clearly indicates that the City of Puck, when collecting a trade fair fee from sellers at its marketplaces, did not achieve the planned increase in budget revenues in a given year. The predicted difficult economic situation with a nominal decrease in income from the analysed tribute may result in difficulties in ensuring that the communes fulfill their tasks in this case, it may concern the Puck commune. Other communes which have recorded significant nominal drops in revenue from the fair fee on an annual basis were the cities of Ustka (the highest nominal drop in revenue from the fee by 37% in 2019 compared to 2018) and Gdynia (the highest nominal drop in revenue from the fee by 35% in 2019 compared to 2018). In the period under examination, the cities of Ustka and Gdynia recorded annual decreases in revenue to the budget from the fair fee.

Out of the 10 surveyed communes, only two - Stegna and the rural commune of Ustka - recorded annual increases in revenue to the budget from the trade fair fee. The highest 76% annual increase in nominal income to the budget from the trade fair fee was recorded in 2017 in Stegna municipality (compared to the income in 2016).

Table 5 presents a general overview of the dynamics of income from the trade fair fee in the surveyed communes in 2016-2019 in relation to the base year 2016.

Table 4: Changes in income from the trade fair fee in the examined communes of the Pomeranian Province in Poland in 2016-2019

Name of the municipality	Municipal status	Revenue from the trade fair fee in 2016 – 2019				Nominal increase/decrease in trade fair fee income in PLN			Increase/decrease in the commune's income from the trade fair fee in %		
		2016	2017	2018	2019	2017/2016	2018/2017	2018/2019	2017/2016	2018/2017	2019/2018
Gdynia	**urban**	246 231	221 724	217 218	142 100	-24 507	-4 506	-75 118	-10%	-2%	-35%
Jastarnia	**urban**	333 107	367 540	364 941	367 335	34 433	-2 599	2 394	10%	-1%	1%
Łeba	**urban**	449 456	436 812	411 651	395 519	-12 644	-25 161	-16 132	-3%	-6%	-4%
City of Puck	**urban**	177 748	122 169	87 071	41 604	-55 579	-35 098	-45 467	-31%	-29%	-52%
Sopot	**urban**	145 258	146 773	157 494	149 993	1 515	10 721	-7 501	1%	7%	-5%
Miasto Ustka	**urban**	255 296	210 841	166 920	105 618	-44 455	-43 921	-61 302	-17%	-21%	-37%
Władysławowo	**urban**	692 743	638 706	630 924	787 504	-54 037	-7 782	156 580	-8%	-1%	25%
Krokowa	**rural**	162 751	169 337	155 180	160 429	6 587	-14 157	5 249	4%	-8%	3%
Stegna	**rural**	150 476	264 113	280 977	297 757	113 638	16 864	16 780	76%	6%	6%
Communes of Ustka	**rural**	75 370	81 809	99 923	112 258	6 439	18 114	12 335	9%	22%	12%

Source: Own study based on reports Rb-27s and reports on the implementation of the commune budget for 2016-2019 published in Public Information Bulletins by local governments

Table 5: The dynamics of revenues from the trade fair fee in 2016-2019 to the budgets of the surveyed municipalities

Name of the municipality	Municipal status	Revenue from the trade fair fee in 2016 – 2019				The dynamics of revenues from the trade fair fee in 2016-2019		
		2016	2017	2018	2019	2017/2016	2018/2016	2019/2016
Gdynia	urban	246 231	221 724	217 218	142 100	-10%	-12%	-42%
Jastarnia	urban	333 107	367 540	364 941	367 335	10%	10%	10%
Łeba	urban	449 456	436 812	411 651	395 519	-3%	-8%	-12%
City of Puck	urban	177 748	122 169	87 071	41 604	-31%	-51%	-77%
Sopot	urban	145 258	146 773	157 494	149 993	1%	8%	3%
Miasto Ustka	urban	255 296	210 841	166 920	105 618	-17%	-35%	-59%
Władysławowo	urban	692 743	638 706	630 924	787 504	-8%	-9%	14%
Krokowa	rural	162 751	169 337	155 180	160 429	4%	-5%	-1%
Stegna	rural	150 476	264 113	280 977	297 757	76%	87%	98%
Communes of Ustka	rural	75 370	81 809	99 923	112 258	9%	33%	49%

Source: Own study based on reports Rb-27s and reports on the implementation of the commune budget for 2016-2019 published in Public Information Bulletins by local governments

The summary contained in Table 5 data concerning the dynamics of income from the trade fair fee in 2016-2019, assuming that the base year is 2016, indicates that out of the 10 surveyed communes, 4 recorded increases in income. The highest income growth dynamics on the trade fair fee in subsequent years compared to the base year was recorded in Stegna municipality (98% increase in revenue to the municipality budget from the trade fair fee in 2019 compared to the base year 2016). Each year, the rural municipality of Ustka recorded an increase in revenue to the municipal budget from the trade fair fee compared to 2016, with the highest increase in 2019

Table 6: Rates of fees for trade fair fee collectors in the surveyed communes of Pomorskie Voivodeship in Poland in 2016-2019

Name of the municipality	Municipal status	Rates of fees for trade fair fee collectors in 2016 – 2019 in %				Comments
		2016	2017	2018	2019	
Gdynia	urban	20%	20%	20%	20%	Remuneration for the collection of fair fees at retail sales stands on and off designated markets
Gdynia	urban	15%	15%	15%	15%	Remuneration for the collection of trade fair fees on wholesale markets
Jastarnia	urban	25%	25%	25%	25%	
Łeba	urban	10%	10%	10%	10%	
City of Puck	urban	6%	6%	6%	6%	Amount of remuneration / commission in the period from 01.IV. to 31.X.
		10%	10%	10%	10%	Amount of commission in the period from 01.XI to 31.III
Sopot	urban	15%	15%	15%	15%	
Miasto Ustka	urban	12%	12%	12%	12%	
Władysławowo	urban	5%	5%	5%	7%	
Krokowa	rural	5%	5%	5%	5%	
Stegna	rural	20%	20%	20%	20%	
Communes of Ustka	rural	11%	11%	11%	11%	

Source: Own study based on the resolutions of the Municipal Councils and Commune Councils in the years 2015-2019 regarding the trade fair fee (http://edziennik.gdansk.uw.gov.pl/actbymonths)

being 49% compared to 2016. An interesting example of a steady annual growth rate of income from the trade fair fee is the city of Jastarnia, which annually increased its income from the trade fair fee at a level of 10% compared to the base year 2016. The highest rate of decrease in income from the trade fair fee compared to the base year was recorded by the city of Puck (77% decrease in income from the trade fair fee in 2019 compared to 2016). The city of Puck recorded every year a high dynamics of income decrease in comparison with the base year 2016 (31% decrease in income in 2017, 51% decrease in income in 2018 and 77% decrease in income in 2019). Another city affected by the high drop in revenues was the city of Ustka (59% drop in revenues compared to the base year 2016) and Gdynia (42% drop in revenues compared to the base year 2016).

Generally speaking, it can be seen that the dynamics of income from the trade fair fee is very different between the analysed communes.

Table 6 presents a summary of remuneration for those collecting fair fees in 2016-2019. The remuneration is expressed as a commission on the fair fees collected (percentage of the total nominal fee collected).

Conclusion

The assessment of income to the budgets of 10 selected communes from the trade fair fee indicates that in 2016-2019 it represented a small percentage share in total income. Maximum share of the trade fair fee in the total revenue to the budgets of municipalities was 1.60% (Łeba in 2016) and the lowest share of the exhibition fee in the total income of the commune was 0.01% (in Gdynia in 2018-2019). Moreover, the results of the analysis indicate a dynamic annual decrease in the nominal total income from the fair fee (in particular years) in 3 municipalities (Gdynia, Łeba, Ustka). The highest - 52% decrease in revenue from the exhibition fee on an annual basis was observed in Puck in 2019 as compared to 2018. Moreover, a general downward trend in revenue from the exhibition fee to the budgets of the analysed communes was noticed.

The small share of the fair fee in the municipalities' income and the decreasing nominal income from this tribute may be a justification for the individual municipalities to decide to liquidate it. Additionally, it should be emphasized that charging the exhibition fee generates significant costs due to the amount of the fee paid to persons for performing these collection activities for a given commune. The assessed communes paid the collectors a commission ranging from 5% to 25% of the amount of fees collected from marketplace vendors. Charging a fee from persons selling goods at marketplaces in addition to the low income to the budget limits to a certain extent, the freedom to exchange goods at marketplaces in the municipality. This is due to the fact that buyers have to bear the additional cost of selling the offered goods on a daily basis without receiving an actual public service from the municipality. A possible decision by the local authorities to waive the fair fee on their territory may improve the image of the commune in question and at the same time cause little loss to the commune budget. However, such a decision by the municipality should be preceded by financial analyses of the municipality budget.

In general, it should be noted that the studies carried out show that a decision by the public authorities to abolish the trade fair fee would not have the effect of reducing revenue to the commune's budget. On the contrary, it could be a factor in improving local trade development in the municipality.

References

Bahl, R., Linn, J. (1992). *Urban Public Finance in Developing Countries*. New York: Oxford University Press, The World Bank, Washington. Retrieved from: http://documents.worldbank.org/curated/en/963911468739534803/pdf/multi-page.pdf

Bird, R.M. (2010). *Subnational Taxation in Developing Countries: A Review of the Literature*. Policy Research Working Paper, Washington DC: The World Bank.

Copley, P.A. (1991). The Association between Municipal Disclosure Practices and audit quality. *Journal of Accounting and Public Policy, Volume 10, Issue 4*, Winter 1991, 245-266.

Freire, M.E., Garzón, H. (2014). *Managing Local Revenues.* In Farvacque-Vitkovic, C., Kopanyi, M. (eds.) *Municipal Finances. A Handbook for Local Governments* (pp. 147-213). Washington DC: International Bank for Reconstruction and Development, The World Bank.

Kwaśniewski, R., Wantoch-Rekowski, (2019). *The Right of Municipalities to Differentiate Market Charge Rates as an \Implementation of the Local Tax Policy in Poland.* Prawo Budżetowe Państwa i Samorządu, Vol 7, No 1 (pp. 67-85). Nicolaus Copernicus University in Toruń.

Owsiak, S. (2002). *Finanse publiczne. Teoria i praktyka*. Warsaw: PWN.

Maciejewski, G. (2017). Formaty handlu detalicznego w Polsce w ocenie konsumentów, *Studia Ekonomiczne. Scientific Journals of the University of Economics in Katowice*, No. 316 (pp. 136-146). Retrieved from: https://www.researchgate.net/profile/Grzegorz_Maciejewski2/publication/319448830_Formaty_handlu_detalicznego_w_Polsce_w_ocenie_konsumentow_Retailing_formats_in_Poland_in_consumers'_opinion/links/59aac08da6fdcce55a34bbdf/Formaty-handlu-detalicznego-w-Polsce-w-ocenie-konsumentow-Retailing-formats-in-Poland-in-consumers-opinion.pdf

Parlińska, A. (2010). *Parapodatkowe instrumenty finansowe*. Podstawka, M. (Ed.). *Finanse. Instytucje, Instrumenty, Podmioty, Rynki, Regulacje.* Warsaw: PWN, Warsaw 2010, (pp. 350-353).

Podstawka, M. (2011). *Podstawy finansów. Teoria i praktyka.* Warsaw: Warsaw University of Life Sciences (WULS – SGGW).

Spencer Pickett, K.H. (2010). *The Internal Auditing Handbook.* (3rd ed.), West Sussex, United Kingdom: John Wiley & Sons Ltd.

Stiglitz, J.E., Rosengard, Jay K. (2015). *Economics of the Public Sector* (4rd ed.). New York, London: W.W. Norton Company.

Taxation Trends in the European Union. Data for The EU member states, Iceland and Norway. 2019 edition, (2019). Luxembourg: Publications Office of the European Union. Retrieved from: https://ec.europa.eu/taxation_customs/sites/taxation/files/taxation_trends_report_2019.pdf

World Economic Outlook Reports, April 2020: Chapter 1. Retrieved from: https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020

Consumer Price Index – March 2020 in USA, U.S. Bureau of Labor Statistics. Retrieved from: https://www.bls.gov/news.release/pdf/cpi.pdf

Yearly price indices of consumer goods and services in years 2016-2019 in Poland. Retrieved from https://stat.gov.pl/en/topics/prices-trade/price-indices/price-indices-of-consumer-goods-and-services/yearly-price-indices-of-consumer-goods-and-services-from-1950/

Act of 13 November 2003 on the income of local government units (i.e. Journal of Laws of 2020, item 23).

The Act of 12 January 1991 on local taxes and fees (i.e., Journal of Laws of 2019, item 1170).

Announcements of the Minister of Finance and the Minister of Finance and Development on the upper limits of specific taxes and local fees in the years 2016, 2017, 2018, 2019 (M.P. from 2015, item 735, M.P. from 2016, item 779, M.P. form 2017, p item 800, M.P. from 2018 item 745).

Resolution of the Gdańsk City Council XV/398/15 of 29 October 2015 repealing Resolution No. LVIII/1396/14 of the Gdańsk City Council of 30 October 2014 on the fair fee.

Resolution No. XIII/250/15 of the Gdynia City Council of 28 October 2015 on defining the principles of determining and collecting the fair fee in the City of Gdynia, as well as its amount (Journal of Laws of the Pomeranian Voivodeship from 2015, item 3588).

Resolutions of the Gdynia City Council on the fair fee for the years 2016-2019. Retrieved from:
https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2016-roku,448/oplata-targowa-w-2016-roku,443138
https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2017-roku,6288/oplata-targowa-w-2017-roku,459663
https://bip.um.gdynia.pl/podatki-i-oplaty-loklane-w-2018-roku,7472/oplata-targowa-w-2018-roku,516069
https://bip.um.gdynia.pl/podatki-i-oplaty-lokalne-w-2019-roku,7977/oplata-targowa-w-2019-roku,532055

Resolutions of the individual communes covered by the analysis on fair fee cases in 2016-2019 published in Official Journals of Pomorskie Voivodeship in 2015-2019. Retrieved from: http://edziennik.gdansk.uw.gov.pl/actbymonths

Report on the implementation of the Gdynia budget for 2016-2019. Retrieved from:

https://bip.um.gdynia.pl/2016,336/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2016-rok,482556
https://bip.um.gdynia.pl/2017-3,6283/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2017-rok,519667
https://bip.um.gdynia.pl/2018-2,7389/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2018-rok,535901
https://bip.um.gdynia.pl/2019,7972/sprawozdanie-z-wykonania-budzetu-miasta-gdyni-za-2019-rok,548196

Report on the implementation of Jastarnia's budget for 2016-2019. Retrieved from:
http://bip.jastarnia.pl/dokumenty/4913
http://bip.jastarnia.pl/dokumenty/5508
http://bip.jastarnia.pl/dokumenty/6401
http://bip.jastarnia.pl/dokumenty/7266

Report on the implementation of the Łeba budget for 2016-2019. Retrieved from:
https://prawomiejscowe.pl/GminaMiejskaLeba/document/616721/Zarz%C4%85dzenie-38_2020
https://prawomiejscowe.pl/GminaMiejskaLeba/document/543727/Zarz%C4%85dzenie-45_2019
https://prawomiejscowe.pl/GminaMiejskaLeba/document/482486/Zarz%C4%85dzenie-56_2018
https://prawomiejscowe.pl/GminaMiejskaLeba/document/405097/Uchwa%C5%82a-XXIX_348_2017

Report on the implementation of the budget of Krokowa commune for the years 2016-2019. Retrieved from:
http://bip.krokowa.pl/dokumenty/3961
http://bip.krokowa.pl/dokumenty/3978
http://bip.krokowa.pl/dokumenty/4729
http://bip.krokowa.pl/dokumenty/5456

Report on the implementation of the Puck City budget for 2016-2019. Retrieved from::
http://bip.miastopuck.pl/dokumenty/3195
http://bip.miastopuck.pl/dokumenty/4237
http://bip.miastopuck.pl/dokumenty/5259
http://bip.miastopuck.pl/dokumenty/6029

Report on the implementation of the Sopot budget for 2016-2019. Retrieved from:
https://www.bip.sopot.pl/a,17340,budzet-sopotu-2016.html
https://www.bip.sopot.pl/a,17755,budzet-sopotu-2017.html
https://www.bip.sopot.pl/a,18346,budzet-sopotu-2018.html
https://www.bip.sopot.pl/a,18881,budzet-sopotu-2019.html

Report on the implementation of the budget of Stegna Municipality for 2016-2019. Retrieved from:
http://bip.stegna.pl/system/obj/2343_51_2017._Zarzadzenie.WYKONANIE_ZA_2016_do_wyslania.Kopia.pdf
http://bip.stegna.pl/system/obj/4562_49_2018_Zarzadzenie.WYKONANIE_ZA_2017.pdf
http://bip.stegna.pl/system/obj/7187_50_2019_Zarzadzenie_Sprawozdanie_opisowe.pdf
http://bip.stegna.pl/system/obj/8062_50_2020_zarz..pdf

Report on the implementation of the budget of the City of Ustka for 2016-2019. Retrieved from:
https://bip.um.ustka.pl/a,28484,iv-kwartal-2019.html
https://bip.um.ustka.pl/a,27349,iv-kwartal-2018-rok.html
https://bip.um.ustka.pl/a,26411,iv-kwartal-2017-rok.html
https://bip.um.ustka.pl/a,24903,iv-kwartal-2016-rok.html

Report on the implementation of the budget of the commune of Ustka for the years 2016-2019. Retrieved from:
http://bip.ustka.ug.gov.pl/a,24111,sprawozdania-budzetowe-za-iv-kwartal-2016.html
http://bip.ustka.ug.gov.pl/a,24780,zarzadzenie-nr-00505242018-wojta-gminy-ustka-z-dnia-26-marca-2018-roku-w-sprawie-przedstawienia-spra.html
http://bip.ustka.ug.gov.pl/a,26038,zarzadzenie-nr-0050712019-wojta-gminy-ustka-z-dnia-20-marca-2019-roku-w-sprawie-przedstawienia-spraw.html

Report on the implementation of the budget of Władysławowo City for 2016-2019. Retrieved from:
https://bip.wladyslawowo.pl/a,22492,rb-27s-sprawozdanie-z-wykonania-planu-dochodow-budzetowych-jednostki-samorzadu-terytorialnego-okres-.html

https://bip.wladyslawowo.pl/a,24250,rb-27s-sprawozdanie-z-wykonania-planu-dochodow-budzetowych-jednostki-samorzadu-terytorialnego-okres-.html
https://bip.wladyslawowo.pl/a,25915,rb-27s-sprawozdanie-z-wykonania-planu-dochodow-budzetowych-jednostki-samorzadu-terytorialnego-od-poc.html
https://bip.wladyslawowo.pl/a,27289,rb-27s-sprawozdanie-z-wykonania-planu-dochodow-budzetowych-jednostki-samorzadu-terytorialnego-od-poc.html
http://bip.ustka.ug.gov.pl/a,27137,sprawozdania-za-iv-kwartal.html

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 49-65

DOI: 10.2478/fiqf-2020-0012

Financial Internet Quarterly

A CRITIQUE OF BANGLADESHI ADOPTION OF BASEL TYPE CAPITAL REGULATION: AN INSTITUTIONAL VIEW

A K M Kamrul Hasan[1], Yasushi Suzuki[2]

Abstract

International concern on bank capital and minimum capital adequacy was first raised in 1980, in the G-10 countries governors meeting at the Bank for International Settlements (BIS) to respond to a series of bank failures and financial instability observed in Western developed economies. Later, the Basel Committee on Banking Supervision (BCBS) of the BIS proposed the Basel accord I, II and III in 1988, 2004 and 2010, respectively. Bangladesh Bank (BB) has introduced the 'capital to risk weighted assets'-based approach for assessing the capital adequacy of banks in 1996 and later formally introduced the Basel framework in the early 2000s for its regulated banks. However, during Basel accord II and III implementation period (2009-2018), the banking industry accumulated huge non-performing loans which eroded its profitability. This creates a skepticism regarding any loopholes within the institutions. This paper argues that the naïve and excess reliance on External Credit Assessment Institutions (ECAIs') credit rating in the process of adopting the Basel-type capital adequacy amounted to a risky strategy for the Bangladeshi banking industry in a sense that ECAIs allocate less efforts on accumulation of credit risk screening skills . We also document that the huge transaction cost and high coupon rate embedded within the debt instrument like the subordinated debt (sub-debt) issued by the regulated banks as Tier 2 capital might shrink the bank's profitability and its contribution to the national exchequer. Little in the existing literature has been addressed to investigate the adoption of Basel regulations in Bangladesh from the institutional lens. This paper critically reviewed the Bangladeshi ECAIs regulations and sub-debt regulations to fill this research gap.

JEL classification: E58, K20, K23
Keywords: BCBS, Basel accord, ECAIs regulation, Sub-debt regulation

Received: 20.04.2020 Accepted: 3.06.2020

[1] Fellow Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan, e-mail: akmkha17@apu.ac.jp, ORCID: https://orcid.org/0000-0002-5243-7824.

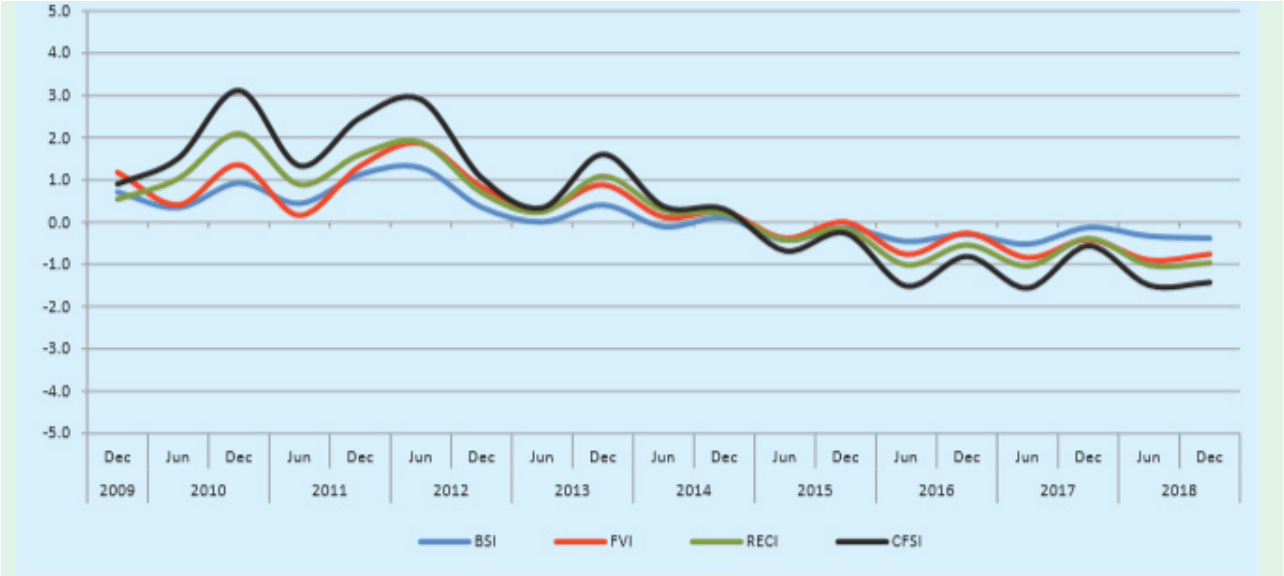
[2] Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University, Japan, email: szkya@apu.ac.jp, ORCID: https://orcid.org/0000-0002-3939-6917

Introduction

The Basel framework was first introduced in 1988 by the Bank for International Settlements (BIS) as a regulatory tool to respond to frequent bank failure in the western economies in the 1980s (Davis, 1995; Goodhart, 2011). On the other hand, to maintain the financial stability and to protect public interest, Bangladesh Bank (BB) has introduced several prudential banking regulations in recent decades. The Basel-type risk-based capital adequacy framework (hereafter, the Basel accord) was one of them. BB has introduced the 'capital to risk weighted assets' based approach for assessing the capital adequacy of banks, having abandoned the 'capital to liabilities' approach in 1996 (BB, 2002) whereas, Basel accord II and III were formally introduced in 2009 and 2015, respectively (BB, 2010, 2014). However, a significant deterioration of asset quality as well as overall fragility of the financial sector has created a 'lost decade' (2009-2018) in the banking sector. For instance, the country's non-performing loans (NPL) to total loans and advances ratio stood at 10.3 percent as of December 2018 whereas the shortfall of loan loss provisions was BDT 66.1 billion during the same period (BB, 2018)(see annex 1 for banking sector ROA, ROE and NPL in the past decade). The situation became worse in 2019; when the NPL ratio reached 11.99 percent which amounted to BDT 1.16 trillion in levels, and the shortfall of loans loss provisioning stood at BDT 81.3 billion (BB, 2019). Consequently, the share of the banking sector's contribution to the country's Gross Domestic Product (GDP) dropped to 7.38 per cent in FY 2018-19 from 12.98 percent in FY 2010-11 (see annex 2 showing financial sector inputs to GDP in the past decade).The vulnerability of the banking sector seems to adversely downgrade the country's financial stability. For instance, BB has prepared the overall financial stability index of the country considering three sub-indices (i) Banking Soundness Index (BSI), (ii) Financial Vulnerability Index (FVI), (iii) Regional Economic Climate Index (RECI) which are shown in Figure 1. We can see that the financial stability of the county deteriorating over the years. It is apparent that the resilience of the financial sector and its financial stability have deteriorated in this 'lost decade' despite adoption of the Basel accord.

Additionally, in November 2019, several newspapers reported that the 'High Court', the highest court of legal system of the country, ordered BB to form immediately a nine-member committee of experts of the banking sector to dig out the loopholes in the existing regulations to identify the reasons for the defaulted loans (H C Clears, 2019). In turn, the government has decided to form a state-owned asset management company (named 'Bangladesh Asset Management Corporation') for recovery and management of the financial sector's NPL (MoF, 2020). What is more, to blunt the recent coronavirus (COVID-19) shock in the economy, IMF Asia Pacific deputy director and prominent economist Anne-Marie Gulde-Wolf has commented that, "reforming the banking sector is one

Figure 1: Composite Financial Stability Index



Source: BB, 2018, pp.48-49

of the top priorities for the Bangladesh government to enhance the resilience of the economy. Efficient financial resource allocation with an effective banking sector would help accelerate the recovery from the COVID-19 shock, and restore the robust growth momentum" (Anas, 2020). Apparently, the poor performance of the banking sector becomes a major concern not only for the academics but also for the judicial service, policy makers and professional economists. Based on the above-mentioned realities of the Bangladeshi banking industry, the study raises the following research question: why have micro prudential regulation like the Basel accord failed to fix the banking sector malaise?

This study hypothesized that the Basel framework has given Bangladeshi banks an ill-incentive in their credit risk management, leading to the huge accumulation of NPL. This hypothesis is drawn from the contributions by the 'Regulation' school of economics including Freixas, Leven and Peydró (2015) analyzing the relationship between the systemic risk in banking and the micro-prudential regulations. Also, this study applies an institutional approach to understanding how the Basel regulations as formal institutions (rules) have been structured in the Bangladeshi banking sector leaving the ECAIs to allocate less resources on credit risk screening skills, consequently deteriorating the overall outcomes of the rules. Besides, we analyse the subordinated debt regulation from a transaction cost perspective to quantify the issuance cost of sub-debt and to locate the real opportunity cost of the issuance of sub-debt. Little in the academic debate has been addressed to shed an analytical light on the impact of Basel regulations on the Bangladeshi banking sector as one of the root causes of banking sector malaise.

The method adopted by the study is in-depth institutional analysis of the existing regulations. As the regulations on ECAIs and sub-debt are closely interrelated in the Basel accord implementation process in Bangladesh, we critically analyze those regulations from an institutional perspective. Specifically, how well the credit risk quantification is conducted in the Basel framework and how well the homogenization of credit risk screening works in Bangladesh as well as what is the institutional cost/transaction cost involved in the issuance of sub-debt.

The paper proceeds as follows. Section two discusses neo-institutional economists' view on the role of regulations to understand the role the Basel accord has in the banking sector. In section three, we discussed on the methodologies of the study. Section four describes the approaches which are used in computation of Risk-weighted assets(RWA) for credit risk under the Basel accord from a Bangladesh perspective and also discusses the main attributes of sub-debt regulations. Section five describes the institutional analysis of the regulations of ECAIs and sub-debt in Bangladesh. Section six contains concluding remarks and policy implications.

Literature review on regulation and sub-debt

Economic theory of regulation can be categorized from two perspectives: public interest view and private interest view (Peláez & Peláez, 2009). According to Peláez & Peláez (2009) public interest view governments should interfere in market regulation for the greater welfare of society whereas a private interest view shares doubts about the effectiveness of such initiatives on market power (p. 4). Some researchers advocate for regulation to reduce the effect of externalities (Coase, 1960). Some are favored to reduce 'information asymmetries' in the market. For instance, 'market for lemons' (Akerlof, 1970) and 'credit rationing' (Stiglitz & Weiss, 1978) are widely used terms to explain information asymmetries in the credit market. Scholars argue that three important disciplines underpin the regulation such as (a) a well-designed institution which promotes responsibility and accountability, (b) a fiduciary legal system and (c) behavioral aspects of economic systems (Davis, Lukomnik & Pitt-Watson, 2016). As the Basel framework is a micro prudential banking regulation, we summarize the neo-institutional economists' view on regulation to aid our discussion in upcoming sections.

Neo-institutional economists' view on regulation: institutional structure and transaction cost perspective

Langlois (1986a, b) categorized the contributions of neo-institutional economics into three main points: (a) transaction cost and property rights, inspired by Coase (1937) and further extended by Williamson (1979, 1985); North (1990) (b) shed light on commons, based on Hayek (1948) and further explained by Ostrom (2005) (c) analyzing innovation (Schumpeter, 1926, 1934, 1942) and the economic agent (Alchian, 1950) which is extended as evolutionary theory by Nelson & Winter (1982). In addition, Scott (2014) mentioned four influential neo-

institutional economic theories that contributed more to conceptualization of institutions in economics such as (a) transaction cost economics (b) game-theoretic approaches (c) evolutionary economics theory (4) resource-based theory. He (Scott, 2014), mentioned three pillars of institutions namely the regulative pillar, normative pillar and cultural-cognitive pillar; and put institutional economists' views of institutions on the 'regulatory pillar' (p.60). It is not possible here to discuss all the theories and approaches of neo-institutional economics, but we focus on Douglass North's view (as he analyses the institutions and institutional change in more coherent ways) to facilitate our analysis on 'institutional structure' of Basel regulation.

Prominent institutional economist and Noble laureate Douglass North stressed rules as systems and enforcement mechanisms in his analysis (Scott, 2014). For example, "institutions are a set of rules, compliance procedures, and moral and ethical behavioral norms designed to constrain the behavior of individuals in the interests of maximizing the wealth or utility of principals" (North, 1981, pp. 201-212). Terming the institution as "the rules of the game in a society" (North, 1990, p. 3); he specified that institutions provide the structure of cost of production which is the combination of transformation cost (typically land, labor and capital) and transaction cost (cost of property rights). Here he elaborates on the transaction cost concept of Williamson (1985). North (1990) further argued that institutions are made up of formal rules (for example political and judicial rules, economic rules and contract) and informal rules (for example, code of conduct, norms of behavior and conventions) (pp.36-47). Any changes in the formal rules should be compatible with the informal rules which exist in the society or organization and the incentives provided to enforce rules are essential to make an efficient institution (pp. 137-140). He argued, in the absence of such 'incentives for institutions'; the outcome of implementing any rules in the society is insignificant. As an economic historian, North (1981, 2005) opined that without developing effective institutions or existence of an adaptive society the regulation became ineffective. That is, 'institutional structure' is the prerequisite for optimum efficiency from institutions as North (2005) viewed it. Ostrom (1993); herself also a Noble laureate in economics in 2009, mentioned that the institutional arrangements and incentive can limit the rent seeking behavior of the civil servants and large landowners in host countries. However, such an approach of institutional analysis has some weaknesses and is criticized by contemporary economists. For instance, Suzuki (2011) while referring to the Knight (1992) discussion on 'cost minimization standard' in the transaction cost theory mentioned that such a style of institutional analysis is often misleading; and raises at least three factors as exception to the standards: (a) hidden benefits that are not readily apparent (b) formal external constraints (i.e. the interest of the state); and (c) uncertainty as a result of which economic agents may not create the least costly rules because they lack either the capacity or the knowledge to establish them (p.45).

The neo-institutional economists apply transaction cost theory to explain the institutions and institutional structure and argue that institutional change aims to reduce transaction cost. In this context the 'transaction cost analysis' concept is widely accepted by the neo-institutional economists. Williamson (1985) categorized transaction cost into two, ex ante and ex post. Ex ante costs are the costs of drafting, negotiating and safeguarding an agreement to avoid complexities and contingencies involved with a contract (Williamson, 1985, p. 20). These costs ensure the acceptance of a contract among related parties as Williamson (1985) mentioned, "Ex ante inter firm safeguards can sometimes be fashioned to signal credible commitments and restore integrity to a transaction" (p. 20). On the other hand ex post costs of a contract may arise from four corners such as (a) the mal adaptation cost incurred when transactions drift out of alignment, (b) the haggling cost that is incurred to correct ex post misalignments (c) setup and running costs associated with the governance structures to which disputes are referred and (d) the bonding cost of effecting secure commitments (p.21).

In summary, neo-institutional economic theory (according to North and Williamson) shows that institutional efficiency depends on 'institutional structure' and 'transaction cost' for institutions and organizations. While introducing institutions in the economic organization, we should take into consideration the 'institutional structure' and 'transaction cost' otherwise the expected result might not be obtained from adoption of institutions in the organization. In this study we chiefly analyses the Basel accord (from the context of Bangladesh) through these two institutional lenses.

Methodologies

This paper follows a descriptive methodology to investigate the research question. While involved in institutional analysis of the regulations, we take into consideration BB's guidelines on the Basel accord instead of the main text of the Basel framework[2]. We shall note that while in quantification of the credit risk of the banking exposure, BB has adopted the Basel accord[3] under standardised approach (SA) and under this approach, the Basel framework (BCBS, 2019) and BB (2010, 2014) acknowledged the external credit assessment institutions (ECAIs) rating notch while in computation of credit risk. Therefore, the methods include the discussion on the various provision in the ECAIs regulation to examine the ECAIs credit risk quantification structure and public disclosure of ECAIs to explore how ECAI regulations matter in banking sector performance. On the other hand, while in discussion on the regulations of subordinated debt we focus on transaction cost and coupon rate of debt. As was discussed earlier, transaction cost is one of the conventional dogmas in institutional analysis. Hence, our methodologies attempt to shed light on sub-debt regulations to investigate the actual transaction cost involved in issuance of sub-debt. In a nutshell, to explore the research question, we keep the ECAI regulations in one hand and sub-debt regulations in another as a methodology of this study.

Regulations under the Basel accord in Bangladesh

Regulations of external credit assessment institutions (ECAIs)

BCBS in assessment of credit risk under the SA in Basel II, Basel III advocates ECAIs rating for assigning risk weights under this approach (BCBS, 2006, 2017). BB has recognized ECAIs credit rating categories with BB's rating grade for computing capital requirements for credit risk (BB, 2010, 2014). Therefore, ECAIs are playing an important role of assessing credit risk of exposure in favor of BB which hopes to bring harmonization of credit risk among banks and finally the asset quality of the banking industry will be improved. This study hence assumes that ECAIs play the role of 'quasi regulator' while rating an entity/ loan exposure of a bank, as, the central bank has authorized ECAIs for exposure rating which is used for calculating a bank's overall RWA under the SA. While regulating the CRAs in Bangladesh, there are two legal institutions such as (a) CRC rule 1996[4] issued by Bangladesh Securities and Exchange Commission (BSEC) and (b) 'Guidelines for Recognition of Eligible ECAIs-2008' issued by BB). In fact, the BSEC first issued licenses to Credit Rating Companies (CRC) in 2002 under CRC rules 1996 and BB recognized the first ECAIs in April 2009. In the next sub-sections, we will briefly discuss the various attributes of these two institutions which aims to aid our discussion in section 5.

Attributes of credit rating companies (CRC) rules-1996

CRC rules consists of 16 Articles within the four chapters and we will focus on the key points of these rules which are related with computation of the Risk Based Capital Adequacy (RBCA) framework (Basel accord) to keep our discussion relevant and on track.

Chapter I describes the definition of the terms used in the rule and the date of adopting the rules. According to the rules, "Credit Rating Company" means an investment advisor company which intends to engage in or is so engaged primarily in the business of evaluation of credit or investment risk through a recognized and formal process of assigning a rating to present or proposed loan obligations or equity of any business enterprise" (BSEC, 1996, Article 2(d)). Chapter II presents the regulations of business. For example, it refers that to get registration as a Credit Rating Company (CRC),the CRC should be incorporated as a public limited company under the Companies Act, 1994 and must have a paid-up capital of at least five million (Article 4(b)). Regarding competence, the CRC has to be a joint venture technical collaboration with a reputed credit rating company (Article 4(c)). However, detailed of scope of business for such collaboration is not specified in the institutions which makes the article pointless. The minimum requirement of professional staff in a CRC is two persons with two years professional experience in credit

[2] See the full and latest version of the main text of Basel Framework of BCBS. https://www.bis.org/basel_framework/index.htm?m=3%7C14%7C697

[3] See the Basel accord II and III implementation related all guidelines and notifications of Bangladesh Bank https://www.bb.org.bd/mediaroom/baselii/baselII.php

[4] See the main text at theBangladesh Securities and Exchange Commission (BSEC) web portal.https://www.sec.gov.bd/home/lbookor https://www.sec.gov.bd/lbook/F-03_2015.pdf

Table 1: Key points of Article 9 in relevance to the Basel accord

Sl no.	Code of conduct	Relevant sub-clause
1	Quality of rating process	• Establish a rating methodology for each industry or each type of instrument and disclose it to the public website. Review of the methodologies and model at least once a year by Rating Committee of CRC. • There should be a Rating Committee (RC) of each CRC with five members including two senior analysts. RC is the final authority to assign the rating. •The Internal Review Committee (IRC) shall double check the documents and information on which the rating team made their rating. The rating team consists of at least two analysts.
2	Monitoring and updating	• There are two types of rating, initial rating and surveillance rating. For entity rating the surveillance rating must be for at least the next three years after the initial rating and for issue of instrument rating the surveillance rating must be for the lifetime of the instrument after the initial rating. However, if any part (either CRC or client) wants to terminate the contract, they need to get permission from the BSEC.
3	Integrity of rating process	• CRC should establish an ethical standard and code of conduct for its employees and disclose it on their website.
4	CRC independence and avoidance of conflict of interest	• Directors and shareholders should not interfere over the activities and decisions of RC. • CRC cannot rate any entity which has any relation with CRC or its director. • There is a required declaration by the directors of CRC and CEO and affidavit by employees of CRC to avoid conflict of interest and ensure independence.
5	CRC procedures and policies	• If any CRC's receive 10 percent or more of its annual revenue from a single entity or group, it should be publicly disclosed.
6	CRC analysts and employee independence	• Employees remuneration cannot be linked with the clients whom analysts' rate or CRCs shall not share any revenue with analysts except service benefits. Analysts are also prohibited from doing marketing, or receiving negotiation fees. • Any CRC or its employee cannot buy or sell or engage in any transaction with listed securities.
7	CRC responsibility to the investing public and issuers	• CRC shall publish the list of updated ratings on its website. • It should publish the historical default rate.
8	Disclosures of these rules	• CEO of the CRC should submit a declaration after every rating report that it has rated the entity while complying with all rules described in CRC rules 1996.

Source: BSEC,1996, Article 9

rating or investment advisory activities (Article 4(f)).

Chapter III, Article 9, describes the detailed operational procedures of CRC. There are eight broad code of conducts which are described in this clause and the CRC are asked to adopt, publish and follow these codes. We summarized the key points of each code in Table 1 for our further discussion in the rest of the chapter.

Finally, Chapter IV describes the inspection and investigation of a CRC by BSEC if deemed necessary.

Attributes of guidelines for recognition of eligible ECAIs 2008[5] (BB,2008)

[4] See the full text athttps://www.bb.org.bd/mediaroom/baselii/baselII.php

The Banking Regulation and Policy Department (BRPD) of BB issued its first circular on September 23, 2008 regarding "Guidelines for recognition of eligible External Credit Assessment Institutions (ECAIs)" which came into effect from January 2009. The guidelines (BB, 2008) referred to six general clauses while recognizing ECAIs and these are: (a) recognition criteria, (b) mapping process, (c) application process, (d) on-going recognition, (e) guidelines to banks regarding nomination of ECAIs and (f) general instruction.

(a) Recognition criteria

The guideline mentioned six major criteria such as objectivity, independence, international access/ transparency, disclosure, resources and credibility for determining the recognition of ECAIs. There are a number

Table 2: List of criteria for recognition as ECAI

Sl no.	Criteria	Sub-content of the criteria
1	Objectivity	(a) Manuscript of methodology
		(b) Internal process
		(c) Rating scale and their sensitivity
		(d) Validation system
		(e) Ongoing review
		(f) Data base management
		(g) System back testing
2	Independence	(a) Registration system with SEC
		(b) Ownership quality
		(c) Procedure to ensure independence
		(d) Board members influence on rating activities
		(e) Solvency of the company
		(f) Schedule of credit assessment fees
3	Transparency/International access	(a) International exposure
		(b) Accessibility of the ECAIs rating
		(c) Availability of assessment methodology
		(d) Nature of rating
4	Disclosure	(a) Definition of default rating category
		(b) Actual transition rate towards default rating
		(c) Disclosure of transition matrix
		(d) Code of conduct
5	Resources	(a) Capital structure and net worth
		(b) Hard and soft infrastructure
		(c) Number of professional staffs
		(d) Personal policy
		(e) Internal work relationship
		(f) Data warehousing
6	Credibility	(a) Degree of acceptance by the client
		(b) Market share of ECAI
		(c) Handling conflict of interest
		(d) Market penetration approach

Source: BB, 2008

of sub - content items in each criterion which are shown in Table 2.

(b) Mapping process

BB will evaluate and bring harmony among the ECAIs rating notch through numerals one to six Cumulative Default Rate (CDR) and the short term rating is used for short term lending whereas, the long term rating is used for long term lending (BB, 2008). BB considers CDR as a quantitative factor to evaluate an ECAIs' rating category. The transition of an individual notch towards the default category observed in a particular ECAI category will be compared to the standards available domestically/ regionally/internationally (BB, 2008). On the other hand, the qualitative factors are not disclosed in the guidelines and it is stated that it will be set by BB's working group.

(c) Application process

To become an eligible ECAI, the CRC must be registered under CRC Rule, 1996 of BSEC. This means that any credit rating company either domestic or international must get a license from BSEC.

(d) Ongoing recognition

This clause mention that the BB is responsible for the monitoring and supervision of ECAIs. The recognition of the BB will be reviewed annually, and BB can derecognize any ECAI if it seems necessary. However, the author confirmed with the BB's public disclosure that so far, no ECAI has been derecognized/delisted by BB since 2009.

(e) Guidelines to Banks

Banks can nominate the ECAIs for credit rating of banking book exposures and notify the BB regarding their nomination of ECAIs and banks can use the ratings of nominated ECAIs for a reasonable period (p.5).

(f) Compliance instruction to ECAIs

Three general compliance instructions are referred to in the guidelines for the ECAIs. These are: (a) ECAIs should submit their quarterly rating report to the BB, (b) there should be a unique pricing system among ECAIs and (c) all ECAIs will follow the IOSCO/BSEC code of conduct for CRC (p. 5).

In section 5, we critically evaluate the abovementioned provisions in the ECAIs' regulations to explore our main research question.

Regulations of sub-debt in Bangladesh

Before starting our main discussion on sub-debt regulations in Bangladesh, we should note that sub-debt was first used as regulatory capital (RC) by US commercial banks when the capital adequacy ratio of major US banks were dropping sharply in the 1960s (see Goodhart, 2011) and it is recognized as a constituent of RC by BCBS in the Basel accord in 1988 (BCBS, 1988). In academic circles there is contemporary debate on the role of sub-debt in capital regulation. Scholars advocate for inclusion of sub-debt as RC, hoping that the debt yield could bring 'direct market discipline' (see Evanoff, 1994; Evanoff & Wall, 2000, 2001, 2002; Evanoff et al., 2011; Garten, 1986). Their point is that a distressed bank needs to collect costly debt instruments (like sub-debt) with a high risk premium from the market, hence market force will control bank managers' risk appetite. In addition, it is expected that sub-debt yield could provide a signal to the regulators regarding a bank's capital requirement and resilience of the capital which apparently enhances the off-site supervision of the banking authority (Ahmed, 2009). However, such a 'direct and indirect' market discipline thesis (see BCBS, 2003) was challenged by other contemporary scholars and views that sub-debt yield couldn't control banks' risk taking behavior (see Brown, Evangelou & Stix, 2017; Götz & Tröger, 2016; Rixtel, González & Yang, 2015). Besides, some have argued that sub-debt yield provides a weak signal to the regulator (Miller, Olson & Yeager, 2015). On top of that, the regulatory uses of sub-debt could tap the regulated banks into the 'sub-debt trap' and could create a neo-systemic risk in the entire financial system (Hasan, 2020). The logic is when Common Equity Tier 1 capital (CET 1) is not sufficient to maintain minimum capital-to-risk weighted assets ratio (CRAR), the capital-deficient banks(banks having inadequate capital) will rely on issuance of sub-debt (as Tier 2 capital) to maintain the regulatory capital and; if most of the banks in the industry are adopting such a strategy, it creates a bubble and neo-systemic risk (Hasan, 2020). However, to keep our discussion on track, we focus our discussion on institutional analysis of sub-debt regulations from the transaction cost perspective.

In principle, there are two legal documents in Bangladesh that banks need to follow while issuing sub-debt as Tier 2 capital under the Basel framework. These are (a) Guidelines on Subordinated Debt (BRPD circular no. 13, dated October 14, 2009) and (b) Securities and Exchange Commission (Private Placement of Debt Securities) Rules, 2012 (SEC notification October 29, 2012). Below we summarize the key features in both legal documents to aid the critical institutional analysis in Section 5.

BB's guidelines on sub-debt (BB, 2009, 2014)

Bangladesh Bank recognized sub-debt as Tier 2 and Tier 3 capital components (see BB, 2002, 2009, 2010) whereas, it is considered as Tier 2 capital components under Basel III guidelines and a few amendments made in the existing guidelines on subordinated debt 2009 (BB, 2014, pp. 85-93). A debt instrument which has no maturity date and redemption period (i.e. perpetual subordinated debt), is considered to be Additional Tier 1 (AT 1) and which has fixed maturity date and redemption period (i.e. not perpetual in nature) is considered as Tier 2 capital (BB, 2014). At the time of writing (June 2020), there is only one (1) debt instrument which has been considered as AT 1 among all sub-debts issued by banks and in this study sub-debt refers to the debt instruments which are considered as Tier 2 capital under the Basel accord III guideline. We shall note that when issuing sub-debt, banks firstly need BSEC consent, then the application documents along with

the consent of BSEC have to be submitted to BB for final consent. The key features of the guidelines for sub-debt are as follows.

a) "Subordinated debt will be referred to the debt instrument which will be subordinated to deposits and other liabilities of the bank. It implies that the claims of the subordinated debt holders will be junior to the claims of the depositors and the other creditors" (BB, 2014, p. 88). "In the event of liquidation or winding up of the issuers business and distribution of return on investment, the bondholders will be ranked after claims of the depositors and other creditors i.e. it will be ranked immediately ahead of ordinary shareholders" (BB, 2014, p. 89).

b) The tenure of the debt is at least 5 years and the amortization of the debt will be 20 percent annually during the last five years of the bond's life. In general, the majority of sub-debt is 7 years.

c) As it is not a deposit in nature, it is hence not included in the deposit insurance scheme.

d) Sub-debt will be unsecured but supported by an 'agreement of trust'/trust deed.

e) The maximum ceiling of subordinate debt was 30 percent of the amount of Tier 1 capital (BB, 2009), however it is again stated that Tier 2 capital should be 4 percent of the total RWA or 88.89 percent of CET 1, whichever is higher (BB, 2014, p. 9, 88).

f) The amortization of the debt will be 20 annually during the last five years.

g) There should be an agreement with managers to the issue/lead arranger and underwriter of the issue (BB, 2014, p. 90).

h) While in application for issuing the debt, banks should submit a copy of the subordinated note format and agreement and amortization schedule along with all salient features of the debt (BB, 2009, 2014).

Securities and exchange commission (private placement of debt securities) rules, 2012[6] (bsec, 2012)

BSEC has adopted the rules in 2012 for the interest of the capital market and it applies for issuance of debt securities through private placement. As the sub-debt is offered through private placement the rules are considered a bible for issuance of sub-debt. We summarize below the key points of the rules that are related to subordinated debt.

(a) Definition

BB (2009) mentioned that subordinated debt would be 'unsecured' and the term is explained by the rules in the following way, "unsecured debt instrument means debt securities, in which the issuer owes the holders an indebtedness and which is secured by claims over all present and future assets of the issuer subsequent to all secured lenders/eligible investors" (Article 1(t)).

(b) Role of CRC

The issue needs to be rated initially by any credit rating company (CRC) and its periodical surveillance rating shall be done by the said rating company till the full and final redemption or conversion of the debt instrument (Article 3(3)).

(c) Role of Trustee

Article 9 of the regulation provides that there should be a trustee (registered trustee by BSEC) of the issue which is appointed by the issuer and a registered 'Deed of Trust' (as per schedule C of the rules) should be executed between trustee and issuer which explain the rights and obligations of both parties. The details of trustee registration, duties and responsibilities of trustee are described in Article 9. In addition, duties of the trustee in case of default of the issue are described in Article 12. What is more, the trustee annually reports to the BSEC regarding the instrument, interest payment and other relevant information. BSEC has rights to change the trustee in the event of securities holders claim or in the public interest, if suitable (Article 9 (5)(i)).

(d) Fees

BSEC consent fees @ 0.10 percent of the face value of the securities have to be paid by the issuer within 15 days of issuance of a consent letter (Article 7 (1)) and annual maximum trustee fee is 0.25 percent of the outstanding amount of the securities to be paid by the issuer (Article 9 (10)). This cost can be considered a transaction cost.

(e) Information Memorandum (IM)

Article 4 (o) recognized that the IM of the issue that is prepared by the issuer should contain all relevant information about the issuer, issue and the trustee. Format and contents of such an IM are described in the schedule B of the rules. However, the missing point is that there is no obligation to publish the IM to the general public or shareholders although they are the stakeholders of the

[6] Full text available at https://www.sec.gov.bd/home/laws

sub-debt issued under the Basel framework.

Therefore, from the above discussion, it is evident that sub-debt is intended to be issued to strengthen regulatory capital, needs both BSEC and BB consent, and the trustee plays a vital role in this context. A reasonable question which might arise in the reader's mind (from the literature review in Section 2) by both rules is, how costly is the sub-debt? What is the opportunity cost of issuance of sub-debt? In the next section, we discuss these issues.

Critical views on regulations of Basel framework in Bangladesh

Critical review on ECAIs regulations

From the previous discussion in Section 4, it is evident that the main lacuna in CRC rules 1996 is that the rules do not explain the specific punitive measures against a CRC, rather, Article 16 states that under the SEC ordinance, 1969, the commission can take appropriate action based on the inspection or investigation report. What is 'appropriate' is really a subjective matter. Interestingly, the BB guidelines mentioned criteria for ECAIs recognition but don't put any ceiling on the minimum or disclosed any standard against these criteria. For example, regarding the ECAIs internal process, the rules mentioned that ECAIs must disclose their analysis team, rating committee and internal verification system while filing for recognition but not disclose the minimum requirement or any benchmark regarding those yardsticks. Although the 'transparency' and 'disclosure' parts are incredibly significant issues for ECAIs, in the mentioned rules there are no specific instructions which creates some room for ECAIs to skip the quality disclosure. The author, while checking the websites of the eight credit rating agencies of the country at the time of writing, found there is little disclosure on the default rating and transition matrix. Additionally, in the 'Resources' and 'Credibility' sections, there is no specific requirement or standard requirement prescribed by BB. As a result, whatever is written in the rules, the recognition process seems unclear and ambiguous to the general public and academics. It seems that there is a gap in the 'rules in books' and the 'rules in practice'.

In short, we critically assess the ECAIs regulation to investigate the following two issues in the institutions: (a) how well do the institutions clarify the accumulation of credit risk screening skills of ECAIs for exposure rating (b) is the disclosure of an ECAI sufficient to ensure its credit risk screening skills?

ECAIs accumulation of credit screening skills

We examine ECAIs regulations in how it dictates the ECAIs to accumulate credit screening skill i.e. how well institutions put pressure on the ECAIs to allocate resources to accumulating credit risk screening skills. Firstly, although there is no specific regulation described in the rules for the internal rating procedure of ECAIs, each ECAI has developed their own rating procedure under the rules (BSEC, 1996, Article 9; BB 2014, p.126). Based on the methodologies disclosed on the public websites regarding rating bank exposure, it has been observed that the process of the bank exposure rating has six steps such as initial rating agreement, collecting information through rating analysts, preparation of a draft report and getting feedback from firms, placing the rating reports before the rating committee, assigning a final rating and conducting an annual surveillance rating. Therefore, to prepare a quality report ECAIs must put enough effort (in terms of sufficient time and skilled analysts) into the accumulation of credit screening skills. However, only two professional employees are mandatory to run a CRC (BSEC 1996, Article 4(f)) and BB in its ECAIs recognition guideline has instructed all ECAIs to follow a 'uniform pricing policy'(BB, 2014, Section 3.1 (b)). As a result, there is no option to charge high prices for any individual ECAIs which demotivates them from employing skilled and experienced analysts for rating purposes. Besides, there is cutthroat competition (Bangladesh has eight ECAIs) among ECAIs which discourages them from allocating resources to accumulate credit risk screening skills. This seemingly is a 'convoy' system by BB while controlling the remuneration of ECAI rating, however, it distorts the capacity (as ECAI has no option to increase revenue by pricing strategy) of ECAIs to hire more professionals in credit analysis, resulting in lowering the overall quality of credit ratings. Surprisingly, BB in the same guidelines, has placed all ECAI's ratings in the same category in the sense that there is no grading based on an ECAI's 'reputation' or 'quality of rating'. As a result, ECAIs have lost another incentive to employ a highly paid analyst to confirm a perfect rating and hence competition couldn't help them to build 'reputational capital'. The 'convoy system' by BB in incubating ECAIs in the same pace and direction may have created an ill-incentive, rather we may say, a moral

hazard effect for ECAIs to shirk monitoring, resulting in free-riding on the protected profit margin without making an effort to build their reputational capital. To conclude, we presume that thinner profit margins under severe competition may discourage ECAIs from improving the quality of credit information and market forces cannot correct the ECAI's rating quality. Such loopholes in the ECAIs institutional structure distort their incentive for accumulation of credit risk screening skills.

Secondly, under CRC rules 1996, a CRC is a public limited company and hence will follow the Companies Act 1994 while appointing directors. However, as a CRC is not a listed public limited company, it need not follow the corporate governance code that BSEC published in 2006 (latest amendment in 2018) while appointing a board of directors. Hence all the directors on the board of CRCs are shareholders and directors, no independent directors are appointed as board members. The total number of members on the board of directors and RC of each CRC is shown in annex3. Annex 3 shows that one CRA doesn't disclose its board of directors' names whereas forty percent of CRAs don't disclose their RC members number and the details of RC members expertise on the public website. In short, we can say that ECAI's governance do not have to follow the corporate governance code of BSEC and hence do not publish their full internal governance structure to the public. It is mentioned in the rules that a "credit rating shall be assigned by rating committee and not by any individual analysts" (BSEC, 1996, Article 9 (1)). The serious missing point in the said rules is that there are no specific requirements, responsibility or remuneration system described explicitly for external members of a rating committee. These issues are not addressed in the BB guidelines either. Therefore, this undisclosed and un-explained information by both regulatory bodies and CRAs, is creating ambiguity or making a 'rating process black box' (Cifuentes, 2008) for understanding the true governance structure of an ECAI. In a word, from an institutional perspective ECAIs feel no pressure to follow corporate governance codes and they maintain a weak governance structure which adversely affects their accumulation of credit information skills in a transparent and accountable way.

Insufficient public disclosure of ECAI

It is apparent that the disclosure requirement that is obligatory in the ECAIs regulation is not enough to protect public interest or enhance the resilience of the banking system. To illustrate, under CRC Rules 1996, there are two types of disclosures that a CRC must publish. One is a disclosure within the rating deed (between CRC and a firm) and another is a public disclosure on several issues on their website. In order to make the rating agreement free from potential biases, the rules suggest disclosing the compensation arrangement with rating clients (BSEC, 1996, Article 9,(5)(b), p.113)). In the case of a public disclosure the CRC shall disclose the entity or group identity if it receives a significant percentage (10 percent or more) of revenue from a single group/entity and in addition, its director's shareholding position of listed securities on a half yearly basis (Article 9). The rules also made it compulsory to publish the updated rating of entities and the methodologies of the rating, as well as the historical default rating. At the time of writing, we checked on all the ECAI official web portals regarding this public disclosure; we did not find the public disclosures in full as these rules prescribed. As BSEC provides the license to CRAs for public interest (BSEC,1996), it is the responsibility of BSEC to monitor the CRAs compliance to protect public interest. Whereas in BB guidelines, only the pricing system of ECAIs needs to be disclosed to the public and, the minimum methodology for rating corporate clients are described with five risk and sub-risk categories such as financial risk, business/industry risk, management risk, security risk and relationship risk. But there is no specific weight on each risk assigned by central bank guidelines. As a result, there is no disclosure from ECAIs regarding how they assigned the rating to a specific exposure based on this risk. Therefore, both general investors and banks are simply knowing the rating notch of an exposure without its full disclosure.

Therefore, it is evident that the existing regulations for ECAIs in Bangladesh are providing a legal scope to skip the material disclosure. Although BSEC and BB acknowledged the existing institutional lapses in their recent reports, neither supervisor took any visible initiative to resolve them. In our view, such insufficient disclosure creates a grey zone for banks, researchers, and all other stakeholders to put trust in ECAI's exposure ratings and it is a supervisory responsibility to clear such grey zones from the ECAI's disclosure.

Critical review of sub-debt regulation from an institutional cost perspective

From the previous discussions in Section 4 we have observed that there are two types of costs involved with sub-debt such as (a) transaction cost/issue cost of sub-debt (b) coupon rate of sub-debt. Below we analyse such costs with empirical illustrations.

Transaction cost/issuance cost of sub-debt

As sub-debt is a financial contract, are there any transaction costs for sub-debt from an institutional perspective? If so, what are they? Chowdhury (2019) identified several transaction costs for bond issuance in Bangladesh such as bond registration fees (consent fees of BSEC), stamp duties, annual trustee fees, and ancillary charges. However, based on the definition of transaction cost by Williamson (1985) and the mentioned issue of the cost of sub-debt in the said two legal documents, we identified some potential transaction costs of sub-debt which are shown in Table 3.

From Table 3, it seems that some ex ante costs such as consent fees and trustee fees are fixed by regulators and some costs such as mandated lead arranger (MLA) fees, legal fees and other costs may be dependent on the bank's negotiation strategy. However, ex post costs such as administrative costs seem to be variable costs. We shall note that all sub-debts are subscribed through private placement and not listed in the bourses (except MPB of IBBL). Hence there is a scarcity of publicly available IM. However, we have collected three information memorandums of sub-debt that were issued in 2014

Table 3: Transaction cost/ issuance cost of sub-debt in Bangladesh

Sl no.	Ex ante cost	Ex post cost
1	Consent fees to BSEC which are 0.10 percent of the total face value (BSEC, 2012, Article 7).	-
2	Initial trustee fee which is 0.25 percent of the outstanding amount of the debt securities (BSEC, 2012, Article 9).	Annual trustee fee
3	Issue manager/Mandated Lead arranger fee (it depends on the agreement).	Any other administrative cost related with post-issue matters.
4	Legal counsel fee.	-
5	Initial rating fees paid to credit rating agencies.	Surveillance rating fee throughout the life of the instrument.
6	Printing and advertisement cost or any other expenses.	

Source: see BB, 2009, 2010,2014; BSEC, 2012

Table 4: Ex-ante transaction cost and coupon rate of three sub-debts issued in 2014 (Amount in BDT million)

Sl no.	Details	ABBL*	MBL*	SIBL*
1	Total issue amount	2,500	3,000	3,000
2	Rate of return/Coupon rate	11 percent-13 percent	6-month FDR rate + margin 3 percent	120 percent of 180 days MTD rate
3	Consent fees to BSEC (0.10 percent of the total face value)	2.5	3.0	3.0
4	Trustee fee, rating fees, arrangement fees, legal counsel fees, stamp fees, etc.	37.91	30.47	21.21
5	Total transaction cost (ex ante) (sl no. 3+4)	40.41	33.47	24.21
6	Percentage(%) to total issue amount(sl. no 5÷1)	1.62	1.12	0.81

Source: Information Memorandum of the related SD, excerpts of IM attached in the annexure

Table 5: Total ex ante transaction cost for subordinated debt issued for capital adequacy purposes (amount in USD million)

Year	Amount of sub-debt issue**	Ex-ante cost (@1.00 percent)
2009*	123	1.2
2010	98	1.0
2011	44	0.4
2012	45	0.5
2013	98	1.0
2014	315	3.2
2015	243	2.4
2016	474	4.7
2017	676	6.8
2018	904	9.0
Total	**3,020**	**30.2**

*Note: *2009 data included the MPB of IBBL, ** as per average exchange rate shown in annex 4*

by three different banks. Based on the information memorandums, the ex ante transaction cost of each issue is presented in Table 4.

Table 4 shows that ex ante costs are on average, 1.18 percent for three issues. On the other hand, the ex post transaction costs are trustee fees which are around 0.05 percent of the face value of the issue and the surveillance rating fees which are BDT 0.3 million per year (it depends on the outstanding amount of the debt). As information memorandums of other banks are not available to the public, the author cannot compute the transaction costs of individual banks. Anyway, if we consider the transaction cost (ex ante) is one(1) percent on average of the sub-debt issued by the banks, we can compute the real amount of transaction cost of sub-debt. In Table 5 we estimate the total ex ante transaction cost of sub-debt since 2009 that banks have had to incur to issue sub-debt as Tier 2 capital.

Table 5 shows that total ex ante transaction cost for issuance of sub-debt over the last 10 years is approximately USD 30 million. In addition, fixed annual trustee fees, rating fees and other administrative expenses have to be paid by issuer banks as ex post transaction costs during the tenure of the bond. It also evident that BSEC had earned USD 3.02 million (i.e. 3,022 X 0.1 %) during the period 2009 to 2018 from the banks while providing consent to issue sub-debt which is exclusively used only for bank's capital adequacy purposes.

In fact, the real cost of issuance of sub-debt is much higher than our estimated figures as BB in its report mentioned that "issuing costs (trustee fee, arranger fee, legal counseling fee, credit rating fee, consent fee, trust deed registration cost, issue management/corporate advisory fee, stamp duty and post issue management fee) and secondary transaction costs (annual depository/ listing fee, transaction fee, new issue fee) that amount to nearly 6 percent of issue size" (BB, 2019b; p.28). The crux question here is: who had finally paid such high transaction costs? In fact, banks recorded the sub-debt related costs under the headings of 'operating expenses' in the financial statements. We presume that bank operating profit has adversely impacted such costs and the national exchequer has finally paid the price for the transaction cost. Hence, we view that this institutional cost of issuance of sub-debt is a by-product of ill-designed regulations by Bangladeshi regulators.

Coupon rate of sub-debt

Table 4 shows that the offer rate of the return/coupon rate is higher than the 6-month fixed deposit rate. The reader may ask, why do banks offer such a high coupon rate against the sub-debt? We presume that there are two reasons that motivate banks to collect high cost bearing debt instruments such as sub-debt from the market. First, when banks keenly need sub-debt to maintain their capital ratio, there is competition among banks to offer high interest rates to sell their debts. It is rational that issuers obviously want to sell their debt in the full amount and offer a lucrative interest rate to the institutional investors which is higher than the other deposit products on the market. Second, as the debt is unsecured, not included in the deposit insurance scheme and not unlisted in the

burses, issuers provide some 'risk premium' to the debt holders. In practice, the coupon rate is calculated based on the weighted average fixed deposit rate in the market (for 180 days) plus a fixed risk premium offered by individual banks.

The missing point in the aforementioned rules (BB, 2009, 2014; BSEC, 2012) is that it has neither offered any fixed ceiling on coupon rate of the sub-debt nor any methodology offered by the central bank while fixing a coupon rate which creates an opportunity for the banks to offer a high rate to sell their debt instrument. In addition, we have searched all bank's published annual reports to seek the 'interest paid against subordinated debt' however, the data is not shown separately, rather most of the banks are merging their 'interest paid on subordinate debt' with 'interest paid on deposits and borrowing' in the published financial statement. As a result, we presume that the general shareholders/investors are not aware of the real 'coupon rate' of sub-debt issued by their banks which erode the profitability of the bank. In our view this is the opportunity cost of sub-debt which is overlooked in the existing regulations.

Concluding remarks and policy implications

In the beginning of this paper, we raised the research question as to why the Basel framework has failed to fix the banking sector malaise in Bangladesh. We discussed the ECAIs regulation and sub-debt regulation in detail to answer the question. We argued that the standardized approach of the Basel accord advocates the reliance on ECAIs rating for credit risk. However, homogenization of credit risk while relying on ECAIs credit information has not had a positive impact on asset quality in Bangladesh. As evidence, we examined the ECAIs regulations in Bangladesh and found that within the 'institutional structure' there are no 'incentives' for ECAIs while accumulation of credit risk screening skills and the provision in the regulations on disclosure is not sufficient to ensure reliance on ECAI credit rating methodology. Second, there is no incentive-based regulation introduced by the supervisors when regulating ECAIs (i.e. there is no 'rating over ECAIs rating' by regulators which evaluate the rating quality on one hand and ECAIs remuneration control by BB on the other hand). In turn ECAIs have accumulated less credit screening skills which makes futile the adoption of SA by the central bank. Regarding sub-debt regulations, we observed that national supervisors (BB and BSEC) have issued two important regulations regarding issuance of sub-debt as Tier 2 capital and despite high transaction cost/issue cost and coupon rate, banks are frequently issuing sub-debt chiefly to maintain minimum CRAR. We have found evidence that there is a huge cost embedded with sub-debt which is initially incurred by the issuing bank and finally the shareholders and the national exchequer have to pay the price. However, the existing regulations failed to well address these issues.

Our findings have at least two policy implications. First and foremost, we have found that ECAIs lack of effort on credit screening skills, poor internal governance structure, and lack of incentive-based regulation contribute to lower quality of ECAIs credit information and ultimately distort the objective of the Basel accord. Although quantifying of the credit risk is the main responsibility of ECAIs under the standardized approach of the Basel accord, to check the efficiency of the 'institutional structure' is the prime responsibility of the regulator (BB, 2014). Thus, our results are suggestive of an immediate institutional reform in the ECAIs institution to ensure that they allocate their resources on credit risk screening skills which hopefully would have positive impact while improving asset quality of the banks. Side by side, bank managers cannot forgo their credit risk management responsibility as banks exists in society as an expert in credit risk screening and monitoring. If only ECAIs are doing this job, then the bank becomes a redundant economic institution. The authors hope that the central bank will consider this issue more prudently and consider introducing some room for IRB side by side with SA.

Second, our analyses reinforce the arguments that naïvely relying on sub-debt (despite their high transaction cost and coupon rate) shrinks bank profitability as well as the national exchequer stake on bank profit. Hence, either the policy makers fix the transaction cost (by necessary amendments in the institutions of sub-debt) and put a rate cap on sub-debt (otherwise ask the bank to collect the sub-debt subscription through a public offering instead of private placement)or impose restriction on cash dividends for shareholders and bonuses for managers aiming to build up retained earnings as well as CET 1 capital.

References

Ahmed, M.K. (2009). The Role of an Explicit Subordinated Debt Policy in the Smooth Transition to Basel II: Developing Economy Perspective. *Journal of Banking Regulation, 10*(3), 221-233.

Akerlof, G.A. (1970). The Market for „Lemons": Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics, 84*(3), 488-500.

Alchian, A.A. (1950). Uncertainty, Evolution, and Economic Theory. *Journal of Political Economy, 58*(3), 211-221.

Anas, A.Z.M. (2020, April 20). Fixing Banking Sector Key to Blunting Coronavirus Shock: IMF Asia Pacific deputy chief tells FE. *The Financial Express*, p. 8,7. Retrieved from: https://today.thefinancialexpress.com.bd/last-page/fixing-banking-sector-key-to-blunting-coronavirus-shock-1587318407.

Bangladesh Bank (BB), (2002). *Master Circular on Capital Adequacy of Banks* (BRPD circular no. 10, 24 November 2002). Dhaka, Bangladesh: Banking Regulation and Policy Department, Bangladesh Bank.

Bangladesh Bank (BB), (2008). *Guidelines for Recognition of Eligible External Credit Assessment Institutions* (ECAIs) (BRPD circular no. 7, September 23, 2008). Dhaka, Bangladesh: Banking Regulation and Policy Department, Bangladesh Bank.

Bangladesh Bank (BB), (2010). *Revised Guidelines on Risk Based Capital Adequacy (RBCA) for Banks*(BRPD circular no. 24, August 3, 2010). Dhaka, Bangladesh: Banking Regulation and Policy Department, Bangladesh Bank.

Bangladesh Bank (BB), (2014). *Guidelines on Risk Based Capital Adequacy* (Revised Regulatory Capital Framework for banks in line with Basel III) (BRPD circular no. 18, December 21, 2014). Dhaka, Bangladesh: Banking Regulation and Policy Department, Bangladesh Bank.

Bangladesh Bank (BB), (2018). *Financial Stability Report, 2018, Issue 9*. Dhaka, Bangladesh: Financial Stability Department, Bangladesh Bank. https://www.bb.org.bd/pub/index.php.

Bangladesh Bank (BB), (2019). *Bangladesh Bank Quarterly, July-September 2019, Volume XVII*, No.1. Dhaka, Bangladesh: Bangladesh Bank.

Bangladesh Bank (BB), (2019b). *Comprehensive Framework on the Development of the Bond Market in Bangladesh.* Dhaka, Bangladesh: Bangladesh Bank. Retrieved from: https://www.bb.org.bd/pub/publictn.php.

Bangladesh Securities and Exchange Commission (BSEC), (1996). *Credit rating Companies Rules. 1996.* Dhaka, Bangladesh: BSEC. Retrieved from: https://www.sec.gov.bd/home/lbook.

Bangladesh Securities and Exchange Commission (BSEC). (2012). *Securities and Exchange Commission (Private Placement of Debt Securities) Rules, 2012*. Dhaka, Bangladesh: BSEC. Retrieved from: https://www.sec.gov.bd/home/laws

Basel Committee on Banking Supervision (BCBS) (1988). *International Convergence of Capital Measurement and Capital Standards.* Basle, Switzerland: Bank for International Settlements. Retrieved from: https://www.bis.org/publ/bcbs04a.htm

Basel Committee on Banking Supervision (BCBS), (2003). *Markets for Bank Subordinated Debt and Equity in Basel Committee Member Countries*. Basel, Switzerland: Bank for International Settlements.

Basel Committee on Banking Supervision (BCBS), (2006). *International Convergence of Capital Measurement and Capital Standards A Revised Framework Comprehensive Version*. Basel, Switzerland: Bank for International Settlements. Retrieved from: https://www.bis.org/publ/bcbs128.htm

Basel Committee on Banking Supervision (BCBS), (2017). *Basel III: Finalising post-crisis reforms.* Basel, Switzerland: Bank for International Settlements. Retrieved from: https://www.bis.org/bcbs/publ/d424.pdf

Basel Committee on Banking Supervision (BCBS), (2019). *The Basel Framework*. Basel, Switzerland: Bank for International Settlements.

Brown, M., Evangelou, I., Stix, H. (2017). *Banking Crises, Bail-ins and Money Holdings* (working paper no.2017-2). Cyprus: Central Bank of Cyprus. Retrieved from: https://www.centralbank.cy/en/publications/working-papers.

Chowdhury, S.K. (2019, July 3). Long-term Finance and Bond Market Development in Bangladesh. *The Daily Financial Express*, p. 4.

Coase, R.H. (1937). The Nature of the Firm. *Economica, 4*(16), 386-405.

Coase, R.H. (1960). The Problem of Social Cost. *Journal of Law and Economics, 3*(October), 1- 44.

Davis, E.P. (1995). *Debt Financial Fragility and Systemic Risk*. Oxford: Oxford University Press.

Davis, S., Lukomnik, J., Pitt-Watson, D. (2016). *What They Do With Your Money.* New Heaven and London: Yale University Press.

Evanoff, D.D. (1994). *Capital Requirements and Bank Regulatory Reforms*. In C. A. Stone & A. Zissu (Eds.), *Global Risk \Based Capital Regulation Volume 1: Capital Adequacy.* New York: Irwin Professional Publishing.

Evanoff, D.D., Jagtiani, J.A., Nakata, T. (2011). Enhancing Market Discipline in Banking: The role of Subordinated Debt in Financial Regulatory Reform. *Journal of Economics and Business, 63*, 1-22.

Evanoff. D.D., Wall, L.D. (2000). *Subordinated Debt as Bank Capital: A Proposal for Regulatory Reform* (WP 2000-07). Chicago: Federal Reserve Bank of Chicago.

Evanoff, D.D., Wall, L.D. (2001). Sub-debt Yields Spreads as Bank Risk Measures. Subordinated Debt as Bank Capital: A Proposal for Regulatory Reform. *Journal of Financial Services Research, 20*(2/3), 121-145.

Evanoff. D.D., Wall, L.D. (2002). Measures of the Riskiness of Banking Organizations: Subordinated Debt Yields, Risk-based Capital, and Examination Ratings. *Journal of Banking & Finance, 26*, 989–1009.

Freixas, X., Leven, L., Peydró, J-L. (2015). *Systemic Risk, Crises, and Macroprudential Regulation*. Cambridge, MA: The MIT Press.

Garten, H.A. (1986). Banking on the Market: Relying on Depositors to Control Bank Risks. *Yale Journal on Regulation, 4*(1), 129-172.

Goodhart, C. (2011). *The Basel Committee on banking Supervision: A History of the Early Years 1974-1997.*Central Bank and the Financial System. Cambridge, England: Cambridge University Press.

Götz, M.R., Tröger, T.H. (2016). *Should the Marketing of Subordinated Debt be Restricted/different in One Way or the Other? What to do in the Case of Mis-selling?* Brussels, Belgium: Economic and Monetary Affairs Committee, European Union.

Hasan, A.K.M.K. (2020). *An Institutional Approach to Understanding the Impact of Capital Regulation (The Basel Framework) on Bangladeshi Banking Industry: A Critique of Multiple Institutional Failures* (Doctoral dissertation, Ritsumeikan Asia Pacific University, Oita, Japan). Retrieved from: http://en.apu.ac.jp/media/library/thesis/index.html/ (will be publicly available on 2021)

Hayek, F.A. (1948). *Individualism and Economic Order.* Chicago, USA: University of Chicago Press.

HC clears (2019, November 4). HC Clears BB's Spl Facility for Defaulters. *The Financial Express, p*(s).1,3.

Defaulters get more times to reschedule loans with 2% down payment. *Dhaka Tribune*, p.1.

Defaulters must make 15 pc down payment. *The Daily Star,* p(s).1,11.

Knight, J. (1992). *Institutions and Social Conflict.* Cambridge, UK: Cambridge University Press.

Langlois, R.N. (1986a). *The New Institutional Economics: an Introductory essay*. In Langlois, R. (Ed.), *Economics as a Process: Essays in the New Institutional Economics* (pp.1-25). New York: Cambridge University Press.

Langlois, R.N. (1986b). *Rationality, Institutions, and Explanation*. In Langlois, R. (Ed.), *Economics as a Process: Essays in the New Institutional Economics* (pp. 225-255). New York: Cambridge University Press.

Millers, S., Olson, E., Yeager, T.J. (2015). The Relative Contributions of Equity and Subordinated Debt Signals as Predictors of Bank Distress During the Financial Crisis. *Journal of Financial Stability, 16*, 118-137.

Ministry of Finance (MoF), (2020). *Draft BAMCO Act 2020*. Dhaka, Bangladesh: Financial Institutions Division, Ministry of Finance, Government of the people's Republic of Bangladesh. Retrieved from: https://fid.gov.bd/site/view/draft_law.

Nelson, R.R., Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*. Cambridge, MA: Belknap Press.

North, D.C. (1981). *Structure and Change in Economic History.* New York, NY: W.W. Norton & Company, Inc.

North, D.C. (1990). *Institutions, Institutional Change and Economic Performance.* Cambridge, UK: Cambridge University Press.

North, D. C. (2005). *Understanding the Process of Economic Change.* Princeton, NJ, USA: Princeton University Press.

Ostrom, E. (2005). *Understanding Institutional Diversity.* Princeton, NJ, USA: Princeton University Press.

Peláez, C.M., Peláez, C.A. (2009). *Regulation of Banks and Finance: Theory and Policy after the Credit Crisis*. Hampshire, England: Palgrave Macmillan.

Rixtel, A.V., González, L.R., Yang, J. (2015). The Determinants of Long-term Debt Issuance by European Banks: Evidence of Two Crises (BIS working papers No. 513). Basel, Switzerland: Bank for International Settlements.

Schumpeter, J.A. (1926). *Theorie der wirtschaftlichen Entwicklung* (2nd Ed.) München und Leipzig: Duncker & Humblot.

Schumpeter, J.A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle.* Cambridge, MA: Harvard University Press.

Schumpeter, J.A. (1942). *Capitalism, Socialism and Democracy*. London: Allen & Unwin.

Scott, W.R. (2014). *Institutions and Organizations: Ideas, Interests and Identities* (4th Ed.). CA, USA: SAGE Publications.

Stiglitz, J.E., Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information, *American Economic Review, 71*(3), 393-410.

Suzuki, Y. (2011). *Japan's Financial Slump: Collapse of the Monitoring System under Institutional and Transitional Failures.* Hampshire, England: Palgrave Macmillan.

Williamson, O.E. (1979). Transaction-Cost Economics: The Governance of Contractual Relations. *Journal of Law and Economics, 22*(2), 233-261.

Williamson, O.E. (1985). *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting.* New York, N.Y.: The Free Press.

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 66-72

DOI: 10.2478/fiqf-2020-0013

Financial Internet Quarterly

REGIONAL POLICY FINANCIAL INSTRUMENTS IN THE SZCZECIN METROPOLITAN AREA

Elżbieta Ociepa-Kicińska[1]

Abstract

The progressing "metropolisation" of the economy is connected with the intensive development of some cities considered to be metropolises or potential metropolises. One of the prerequisites needed to achieve a good rate of development is providing support to enterprises in the form of financial instruments constructed in such a way that their implementation will contribute to stimulation of the economy within a given area. The aim of this paper is to review and systematise the concept of regional policy financial instruments operating in the Szczecin Metropolitan Area (SMA). In the academic literature on the subject, the concept is rarely addressed, and it accounts for only some areas of financing or focuses on selected sources of finance. On that basis, an analysis was made along with a selection of regional policy financial instruments that are in place in the SMA. The specific entities functioning within the business environment institutions in the SMA are discussed along with the kinds of financial instruments offered by them.The analysis resulted in identifying 11 institutions whose range of operations include offering regional policy financial instruments to entrepreneurs.

JEL classification: R11, G21, G23
Keywords: metropolitan area, regional policy; business environment institutions

Received: 30.03.2020 Accepted: 3.06.2020

[1] University of Szczecin, e-mail: elzbieta.ociepa-kicinska@usz.edu.pl, ORCID: 0000-0002-2879-6923

Introduction

The world economy is metropolised and in the knowledge-based global economy, metropolises are decisive for the developmental potential of a given country. On the one hand, metropolises are considered to be the highest form of spatial organisation in the network society, on the other hand, due to the multitude of definitions and criteria applied in classifying any specific areas as metropolitan, it is difficult to indicate exactly how many metropolitan areas are now found in Poland. However, it is undeniable that in terms of the national and international definitions quoted in this article, the city of Szczecin together with the adjacent areas qualify as a developing metropolitan area.

Development relies first and foremost on supporting entrepreneurial growth within a given area. On the regional level, it is possible to distinguish the following kinds of support: hard support in the form of infrastructural instruments, soft support based on training and advisory measures, and financial support. This paper focuses on regional policy financial instruments, understood in a broad sense, which are dedicated to entities running their business activity in the Szczecin Metropolitan Area. The concept is rarely addressed and it accounts for only some areas of financing or focuses on selected sources of finance. The definition of metropolitan areas and the characteristics of the Szczecin Metropolitan Area are discussed, and then specific entities are identified and discussed regarding their functioning within the business environment institutions in the SMA with the kinds of financial instruments offered by them.

The paper also attempts at reviewing the definitions of the concept of regional policy financial instruments, whereas its empirical part analyses some specific financial entities that operate in the SMA, and identifies particular financial instruments offered by them.

Metropolitan areas in Poland

The concept of a metropolis is one of the most characteristic, though indistinct concepts in regional and spacial sciences (Śleszyński & Komornicki, 2008, p. 2). In many regions in the world, especially where a high urbanisation rate has been achieved, the economy has progressed to the post-industrial phase and to an information society, and consequently the city development has attained a qualitative nature. In a relatively small group of cities, there are functions related to society management on a scale exceeding the region, or even the country, and to development of a knowledge-based information economy. It is considered to be the most important feature of "metropolisation" which in this context should be understood as (Lendzion et al., 2004, pp. 4-5):

1) emergence, on the basis of some big cities, of metropolises being a network of centres exerting a dominating influence on major processes of the contemporary civilisation development, fulfilling the flow management functions on a global or (sub)continental scale, which are interconnected with a network of contacts and flows, partially independent from the regional environment,

2) significant diversification of the regional space within the impact range of the centres, including emergence, within the close range (of up to ca. 30 – 40 km), of metropolitan areas composed of towns and settlements, and a very selective, often dominantly negative impact on their distant regional hinterland.

OECD defines metropolitan areas as functional urban areas covering urban centres of high population density (at least 1,500 inhabitants per square kilometre) and adjacent municipalities that are provided with a good transport infrastructure enabling commutation of employees from the surrounding areas to the urban centres). The minimum population threshold for functional urban areas is 50,000[2]. (OECD, 2018, p. 13). Polish law still lacks legal regulations regarding metropolises. As per the Act of 9 October 2015 on metropolitan associations, repealed in 2017, a metropolitan area is defined as a spatially coherent zone of impact of a city which is the seat of a voivodeship governor or a voivodeship council, characterised by existence of strong functional connections and advanced urbanisation processes, inhabited by at least 500,000 residents. Kaczmarek (2019) defines metropolitan areas as complex settlement, administrative and economic structures characterised by the following features:

1) big-city settlement network consisting of a big central city (or several central cities), a suburban

[2] The purpose of this approach to functional urban areas is developing a methodology which may be applied throughout the OECD, thus increasing the comparability across the countries, as opposed to the definitions and methodologies developed in any individual countries.

zone and a functional zone connected with the urban agglomeration,

2) administrative fragmentation, i.e. complexity of territorial management structure, comprising cities and municipalities, as well as subregional territorial units (poviats, districts, counties, departments, provinces),

3) network of infrastructural, transport as well as spatial and functional interconnections, characterised by intensive flows of goods, people, capital and information.

In the National Spatial Development Concept 2030 (NSDC 2030) adopted by the Polish government in 2011, which is the top level national strategic document regarding the country's spatial management, metropolitan centres were determined according to the following criteria[3]:

1) population of a metropolitan centre: above 300,000 residents,

2) employment in the market service sector (financial agency services and services rendered to companies and in relation to real properties): above 40,000,

3) number of tertiary students studying in the given city in the academic year 2007/2008: above 60,000,

4) cooperation of R&D institutions in the EU 5th and 6th Framework Programme,

5) an airport serving passenger traffic,

6) four- and five-star hotels,

7) international exhibitions in exhibition facilities in 2006-2008.

At the time of adopting the NSDC, the criteria were met by the following cities: Warsaw, Upper Silesia Agglomeration (main centre: Katowice), Kraków, Łódź, Trójmiasto (Tricity), Poznań, Wrocław, duopolis of Bydgoszcz & Toruń, and Szczecin. Lublin met the criteria required to qualify as a metropolis with the exception of having a passenger airport. Nevertheless, due to its importance for development, e.g. in the area of academic potential and concentration of business activity, and due to its contacts with the countries located east of Poland, Lublin was listed as a metropolitan centre.

Under the ESPON project[4] no. 1.4.3. Study on Urban Function, Functional Urban Areas (FUA) were identified, within the framework of which Metropolitan European Growth Areas (MEGA) were determined. Among MEGAs, four categories of metropolises were distinguished, and they included 8 centres in Poland. The criteria for a European potential MEGA (rank III) were met only by Warsaw. The other centres were qualified as weak MEGAs (rank IV): Kraków, Katowice (Upper Silesia Conurbation), Tricity (Gdańsk–Gdynia–Sopot), Poznań, Wrocław, Łódź, Szczecin (ESPON, 2007). In turn, the following 12 major Polish cities cooperate within the framework of the Union of Polish Metropolises foundation: Białystok, Bydgoszcz, Gdańsk, Katowice, Kraków, Lublin, Łódź, Poznań, Rzeszów, Szczecin, Warsaw and Wrocław, which describe themselves as major cities of future metropolises and which, despite having merely local competences, step by step develop good practices, also on a supralocal scale, thus building the metropolises from scratch (UMP, 2012).

Development of metropolitan areas is affected by both governmental policies, including first and foremost the regional and industrial policies, as well as by particular actions focused on development of a knowledge-based economy, transport and European networks, sustainable growth and life quality. On the other hand, focusing the growth around metropolitan areas entails the risk of depopulating some regions as a result of intensified migration towards several major cities and local brain drain (emigration of young, active and educated inhabitants). To attain sustainable growth and at the same time to utilise the potential connected with metropolitan area development, the issue of key importance is an ability of efficient co-management of such an area in a mutually advantageous manner by all stakeholders within the area. A regional policy that strives to constrain spatial fragmentation, thus attempting to reconcile metropolitan areas management with the processes currently taking place, should play the key role in this process (Lendzion et al., 2004, p. 36).

The tools to support regional development do not include any special instruments dedicated to metropolitan areas – they make use of instruments dedicated to particular regions where they operate. Naturally, the potential of metropolitan areas combined with the use of regional support instruments make the metropolitan areas the main centres of research, development and implementation of innovations. They host industries with considerable added value, in particular services for enterprises. Metropolitan centres are seats of global

[3] As per 2009 data.

[4] ESPON(European Observation Network for Territorial Development and Cohesion) – a research program regarding Europe's spatial development.

corporations, and become decision-making centres on an international and global scale. Simultaneously, metropolises are home not only to technological innovations, but also new cultural ideas, lifestyles and values. Thus, metropolitan areas play a significant role in enhancing the European social model (Smętkowski, Jałowiecki & Gorzelak, 2009, p. 1).

The Szczecin metropolitan area

The Szczecin Metropolitan Area is one of the major elements of the Polish and European settlement system. In the ESPON classification, it is described as a metropolitan area showing a growth trend, in its initial phase, which constitutes a good basis for attaining sustainable growth and increasing competitiveness in the European Union. It consists of the central city – Szczecin, the capital city of the West Pomeranian Voivodeship – and the adjacent areas that are functionally interconnected with it. The following municipalities are considered to be the most strongly connected with Szczecin: Dobra (Szczecińska), Goleniów, Gryfino, Kobylanka, Kołbaskowo, Nowe Warpno, Stepnica, Police, Stare Czarnowo, Stargard, and also the towns of Stargard and Świnoujście (SOM, p.3). SMA is a metropolitan centre with a unique location at the German border, it is also situated within the impact range of major foreign metropolises . The location of the SMA also determines its significance in the development of Euroregion Pomerania as well as the cross- and transborder cooperation in the Baltic Sea Region (SOM, pp. 3 –4).

The integrated development of the SMA is predicated on: coherent and attractive space, modern and competitive economy, educated and identity-aware community, as well as availability of high quality public services. (SOM, p. 6). The SMA mission assumes: achieving the development goals by way of in-depth cooperation between the SMA members, their social and economic partners, and civil society representatives, on the regional, national and international platform. (SOM, p. 7).

[5] A particularly strong impact is the one exerted by Berlin (the German capital metropolis) and the transborder Swedish-Danish Øresund / Copenhagen region (the Baltic metropolis).

Regional policy financial instruments in the Szczecin metropolitan area

Financial instruments are one of the elements of regional development policy implementation (Pietrowski, 2018, p. 66), in accordance with the assumptions of the EU Cohesion Policy for 2014 – 2020, apart from the obvious benefits resulting from the recirculation of funds in the long run, financial instruments help mobilise additional public or private co-investments aimed at filling the market gaps, pursuant to the priorities of the Europe 2020 strategy[6], providing support for investments in the form of loans, guarantees, capital and other mechanisms subject to a higher risk. Moreover, the instruments offer various incentive elements aimed at achieving better results[7] (Europejskie fundusze strukturalne i inwestycyjne na lata 2014–2020, 2015). The current framework also contains some clearly defined principles so as to enable more efficient combinations of financial instruments with other forms of assistance, especially grants (Instrumenty finansowe w polityce spójności na lata 2014–2020, 2014). From the perspective of the region, financial instruments constitute one of the tools to support the social and economic development of the region and to transfer the support provided under the Regional Operational Programme (ROP) (Serwis RPO WZ).

Apart from the means offered by EU funds, regional policy financial instruments also include other kinds of financial assistance dedicated to entities operating in the particular region, implemented mainly in the form of appropriately constructed loans, guarantees and suretyships, public aid e.g. in the form of tax relief and preferential treatment with regard to local taxes, preferential rates of municipal charges, subsidising employee training or financial assistance for start-ups (e.g. incubation programmes). Some of the tools are typical for the activities of special economic zones (SEZ)[8], whose aim

[6] Their implementation structures require additional specialist knowledge and know-how, which helps to increase the efficiency and effectiveness of the assigned public resources.

[7] The principles introduced in the 2014 – 2020 programming period are aimed at supporting the application of those instruments and inviting use of them as a more effective and sustainable alternative to complement the traditional financing in the form of grants.

[8] SEZ cover non-residential areas of the country, where business activity may be run on preferential terms, and they constitute one of the state's economic policy instruments.

is to stimulate the regional growth via i.a. attracting new investments, increasing exports and creating new jobs. In view of the subject of this article, the next section will address the financial instruments implemented within the West Pomeranian Voivodeship which comprises the SMA.

In the SMA, there are ca. 30 business environment institutions in operation (Ociepa-Kicińska (2019), and they are described as non-profit institutions having a material and technical base, human resources and competences necessary for providing services for the SME sector (Burdecka, 2004, p. 5). Płoszaj (2013) defines them as a heterogeneous group of entities forming formal networks of organizations supporting innovation and technology transfer, according to Matusiak (2011) business support institutions are the key link in modern systems of economic development support covering an organizationally diverse group of non-commercial institutions, active in the area of supporting entrepreneurship and self-employment, technology transfer and commercialization, and improving the competitiveness of small and medium-sized enterprises (SMEs), based on the need to seek safe and sustainable foundations for development within regions, making extensive use of the involvement of local communities. Some of them focus mainly on training or consulting activities, or knowledge and technology transfers. Based on the analysis of the areas of activity of individual entities, 11 of them were selected. They may be qualified as entities offering regional policy financial instruments to facilitate the SMA development. These include[9]:

1) Zachodniopomorska Agencja Rozwoju Regionalnego SA. (West Pomeranian Regional Development Agency) which i.a. fulfils the function of the Regional Financing Institution (RFI)[10] which implements financial instruments for micro-, small and medium enterprises, using the repayable funds under the ROP for the West Pomeranian Voivodeship. It also offers: assistance to start-ups, reguarantees offered under the West Pomeranian Development Fund (loans intended for investment financing, creating new jobs, implementing new technical or technological solutions, purchasing the equipment, etc.), development services (increasing employee qualifications), loans granted within the framework of the West Pomeranian Entrepreneurship Support Fund.

2) Goleniowski Park Przemysłowy (Goleniów Industrial Park) offers 405 ha of areas available for investment, fully provided with utilities, including offices for rent. A part of it (35 ha) has the SEZ status, under which public aid is available: up to 35% of investment outlays and local tax relief for 5 years with regard to the property tax (i.e. tax on buildings and structures).

3) The Regional Park in Gryfino comprises 160 ha of industrial grounds fully provided with utilities and necessary technical infrastructure. A part of the area has the SEZ status which entitles any investors to use regional assistance in the form of the CIT relief on account of incurred investment outlays or creating new jobs. Additionally, the municipality of Gryfino offers regional assistance in the form of property tax relief.

4) Stargardzki Park Przemysłowy (Stargard Industrial Park) comprises more than 150 ha of attractive grounds prepared for new investments. It offers i.a. local tax relief for entrepreneurs implementing new investment projects and providing new jobs.

5) The incubation programme offered by Technopark Pomerania offers a consulting service package totalling PLN 20,000 per year (it includes i.a. meetings with business management consultants, meetings with experts in the area of: PR, marketing, obtaining external financing, law, EU funds, business management, unlimited access to IT expert network) as well as preferential prices for office space rental.

6) Stargardzka Agencja Rozwoju Lokalnego Sp. z o.o., (Stargard Agency for Local Development) offers competent and comprehensive assistance to investors at any stage of the investment process, including loans (as a financial intermediary under the JEREMIE 2 initiative)[11] and guarantees (of loans, bid bonds and leases).

7) Polska Fundacja Przedsiębiorczości (Polish Entrepreneurs Foundation) operating in the West

[9] Information obtained from websites of the individual entities.

[10] RFI are regional partners of the Polish Agency for Enterprise Development (PARP), which cooperate in implementing programmes addressed to the micro-, small and medium enterprises sector. Their basic function is to enhance competitiveness of microenterprises as well as small and medium enterprises via: providing information on available subsidy programmes and conditions of participation in those programmes, administrative handling of the implemented programmes, cooperation with PARP with regard to factual and financial monitoring of the implemented programmes, preparing factual and financial reports, maintaining the database of the programme participants.

Pomeranian Voivodeship offers financial assistance as well as training and consulting under i.a. the following programmes: Jeremie 2 Initiative, Loan Guarantee Programme, Training & Consulting Programme, Capital Investments, Innovation and Investment Fund Pomeranus, EU Programmes, Loan for a Start – Microloan Fund KLON, POMERANUS SEED – Seed Capital Fund, Re:start Project (enhancing the efficiency of measures taken to keep restarters on the labour market).

8) Fundusz Pomerania Sp. z o.o. is involved in providing guarantees for loans, leases and bid bonds. It also offers guarantees under the West Pomeranian Development Fund (in the form of de minimis assistance).

9) Szczeciński Fundusz Pożyczkowy Sp. z o.o. (Szczecin Loan Fund) is a financial intermediary operating under the JEREMIE 2 initiative, offering loans to communities and non-governmental organisations, as well as guarantees.

10) Agencja Rozwoju Metropolii Szczecińskiej Sp. z o.o. (SMA Development Agency) grants guarantees to secure credits/loans contracted by micro-, small and medium enterprises registered and/or running their business activity in the city of Szczecin and the municipalities directly neighbouring the municipality of Szczecin.

11) Fundusz Poręczeń Kredytowych w Stargardzie Sp. z o.o. (Loan Guarantee Fund in Stargard) offers guarantees and loans for micro-, small and medium enterprises, it also runs the Regional Loan Fund POMERANUS.

The above-mentioned business environment institutions are characterised by a diversity of offered financial services, both in terms of their form and financing sources. Many a time these entities also provide aid based on infrastructural instruments and/or training and consulting services. In their offers, they clearly define the conditions to be met by any entities to be granted assistance; one of the key criteria is the specific area of running the business activity (e.g. a specific poviat).

Conclusion

The aim of this paper is to review and systematise the concept of regional policy financial instruments operating in the Szczecin Metropolitan Area. The specific aspect connected with development of metropolitan areas is related to the global processes and the country's areas of development, in the light of which Szczecin is considered a potential metropolis. Regional policy financial instruments tend to take the form of support measures offered under EU programmes. On the other hand, at the local level entrepreneurs are offered particular (also financial) incentives in order to make a given area an attractive place for investing and running a business activity.

The wide range of support instruments offered by the Business Environment Institutions in the Szczecin Metropolitan Area determines the development of entrepreneurship and achievement of success by local entrepreneurs, and in the long run influences the improvement of the quality of life and meeting the needs of residents (e.g. by limiting the unemployment level or by increasing the income of municipalities from local taxes).

The paper applies the definition of regional policy financial instruments covering all the major forms of financial assistance dedicated to the entities functioning in a specified region. Further analysis included the entities operating in the SMA and offering the above defined instruments to entrepreneurs. The analysis resulted in identifying 11 institutions whose range of operations included offering regional policy financial instruments to entrepreneurs, specifically, these include financial products constructed on the basis of preferential treatment, which makes them more accessible and less costly in relation to the market offer. Based on the prepared set of instruments, in the next stages of scientific work it is possible to analyse the amount of financial support and its impact on the development of SMA.

[11] JEREMIE 2 is a project implemented under the Regional Operational Programmes as the continuation of the JEREMIE initiative implemented in the years 2007 – 2013, which focuses on providing repayable assistance. Financial means provided to entrepreneurs in the form of: capital entries, guarantees, microloans, investment and working capital loans, investment loans, microloans for starting a company and for creating additional new jobs.

References

Burdecka, W. (2004). *Instytucje otoczenia biznesu.* Warszawa: PARP, Instytut Technologi i Eksploatacji, p. 5.

ESPON project 1.4.3 Study on Urban Functions, Final Report, March 2007. Retrieved from: https://www.espon.eu/programme/projects/espon-2006/studies-and-scientific-support-projects/study-urban-functions.

Europejskie fundusze strukturalne i inwestycyjne na lata 2014-2020, (2015).Retrieved from: https://ec.europa.eu/regional_policy/sources/docgener/guides/blue_book/blueguide_pl.pdf.

Instrumenty finansowe w polityce spójności na lata 2014-2020, (2014). Retrieved from: https://ec.europa.eu/regional_policy/sources/docgener/informat/2014/financial_instruments_pl.pdf,

Kaczmarek, T. (2019). Obszary metropolitalne, przesłanki i formy integracji zarządzania. *Przegląd Planisty,* nr 3, 4-6.

Koncepcja Przestrzennego Zagospodarowania Kraju 2030. Uchwała Nr 239 Rady Ministrów z dnia 13 grudnia 2011 r. w sprawie przyjęcia Koncepcji Przestrzennego Zagospodarowania Kraju 2030.

Lendzion, J., Sołtys, J., Toczyski, W. (2004). *Znaczenie obszarów metropolitalnych i ich otoczenia oraz współczesnych procesów metropolizacyjnych w kształtowaniu polityki regionalnej Państwa.* Ekspertyza przygotowana na zamówienie Departamentu Polityki Regionalnej Ministerstwa Gospodarki i Pracy, p. 4, 5, 36.

Matusiak, K.B. (2011). *Innowacje i transfer technologii Słownik pojęć.* Polska Agencja Rozwoju Przedsiębiorczości, p. 126-128.

Ociepa-Kicińska, E. (2019). *Instytucje otoczenia biznesu w Szczecińskim Obszarze Metropolitalnym*. In Brzozowska, K. (ed.), Społeczno-gospodarcze otoczenie rozwoju lokalnego i regionalnego, pp. 117-130.

OECD Regions and Cities at a Glance 2018 (2018). OECD Publishing, Paris, p. 13. Retrieved from: https://doi.org/10.1787/reg_cit_glance-2018-en.

Pietrowski, W. (2018). *Finansowe instrumenty polityki regionalnej w Polsce.* Toruń: Wydawnictwo Adam Marszałek, p. 66.

Płoszaj, A. (2013). *Sieci instytucji otoczenia biznesu.* Warszawa: Wydawnictwo Naukowe Scholar, p. 11.

Serwis RPO WZ, *Instrumenty finansowe.* Retrieved from: http://www.rpo.wzp.pl/instrumenty-finasowe).

Smętkowski, M., Jałowiecki, B., Gorzelak, G., (2009). Obszary metropolitalne w Polsce – diagnoza i rekomendacje. *Studia Regionalne i Lokalne,* Nr 1(35)/2009. Retrieved from: http://studreg.uw.edu.pl/pdf/2009_1_smetkowski_jalowiecki_gorzelak.pdf.

SOM. Strategia rozwoju 2020, p. 3,4,6,7. Retrieved from: http://obserwatorium.miasta.pl/wp-content/uploads/2016/08/SzOM-2020.pdf.

Śleszyński, P., Komornicki, T. (2008). *Metropolie a konkurencyjność regionów.* Warszawa, Samorząd Województwa Mazowieckiego. Retrieved from: https://www.igipz.pan.pl/tl_files/igipz/ZGMiL/osoby/sleszynski/011_Sleszynski_METROPOLIE.pdf.

UMP, Retrieved from: https://www.metropolie.pl/wp-content/uploads/2012/07/deklaracja.pdf..

Ustawa z dnia 9 października 2015 r. o związkach metropolitalnych Dz. U. z 2015 r. poz. 1890, z 2016 r. poz. 2260.

sciendo

Financial Internet Quarterly 2020, vol. 16 / no. 2, p. 73-86

DOI: 10.2478/fiqf-2020-0014

Financial Internet Quarterly

REGIONAL DIFFERENTIATION FOR LIFE QUALITY OF THE POPULATION IN UKRAINE UNDER INNOVATIVE GROWTH

Natalia Burkina[1], Taras Furman[2], Janusz Soboń[3], Kostiantyn Sapun[4],

Abstract

The article focuses on the analysis of economic growth of Ukraine and its regions, using the proposed by the authors indicators of quality and indicators of the population living standards under innovation growth. The main purpose of the research is developing a method of multi-factor assessment and regional classification of population`s life quality. Moving to the results literature review showed that many approaches to assessing the quality of life of the population have been developed in the statistical theory and practice. However, still, there are many discussions about the question of a single aggregate indicator of living standards and the methodology of regional differentiation by this criterion. So, it has not been found a rational way to combine indicators of the level and quality of life to obtain a comprehensive index that reflects objectively, reliably and verifiable the population`s level and quality of life. The main discovered disadvantage of existing methods is the use of the expert estimation method, which does not allow guaranteeing validity the weight of the criteria for estimation the quality of life indicator. Nevertheless, all authors admitted that today the role of the state rises in solving the most important social and economic problems, therefore, the task to increase the efficiency of the regions` functioning based on innovation activity becomes of key importance. The analysis of regional activity`s effectiveness considering the innovation component is the most important part of national administration. In the article the research of the question of multi-factor assessment and regional classification the quality of the country population`s life is carried out in the following logical sequence: theoretical analysis of categories of living standards and quality of life; development of the statistical indicators system at the regional level for assessing the quality of life of the population; distribution of the entire system of indicators for certain economic categories; receiving indexes for each region by each category; realization of regional clustering with the received system of indexes. The methodical tools of the research were general scientific methods: analysis (conducted analysis of definitions for concepts of the standard of living and quality of life); synthesis (combination of separate research methods into a unified methodology of regional differentiation by the quality of life); deduction (initially it is analyzed all the proposed systems of indicators in general, and then they are divided into economic categories); abstraction (separation of a significant indicators system for the implementation of regional differentiation in terms of innovation development of the living standard of the population from the entire statistical information), specification (revealing specific characteristics of the received categories and clusters); comparison (comparison of regions according to the indicators of the population`s life quality level), classification (grouping of individual indicators into economic categories); generalization (with the help of which conclusions were drawn). There were also used some special methods: cluster methods (the tree clustering method and k-means clustering of the regions of Ukraine by the basic indicators of population`s living standards), the method of the main components (for the development of regional indexes for each category). The research was carried out for the data of 2017 year as the last year, for which statistical information is available with most indicators in a regional context. The object of the study is Ukraine and its 24 regions. The city of Kyiv was highlighted as the capital.

The article presents the results of the empirical analysis of the level and quality of population`s life indicators, which allowed to allocate five clusters and a set of indicators for regional differentiation. The study empirically confirms the presence of regional clusters in the category of living standards and theoretically proposes a methodology for its implementation in conditions of innovative development. The results of the study can be useful for analyzing various scenarios for the implementation of social policy aimed at financial and economic protection of the population ensuring. It was shown that for certain regions the quality of population`s life should be considered as a task of their innovative growth.

JEL classification: A1, C1, C5, C6, C8

Keywords: innovative growth, innovation development, living standards of the population, quality of population`s life, regional differentiation, regional clusterization

Received: 20.05.2020 Accepted: 25.06.2020

[1] Donetsk National University after VasylStus, Faculty of Economics, Ukraine, ORCID: 0000-0003-2993-5128.

[2] Donetsk National University after VasylStus, Faculty of Economics, Ukraine, ORCID: 0000-0002-8515-6674.

[3] Academia JS w Gorzowie Wielkopolskim, Poland, ORCID: 0000-0001-9161-6967.

[4] Varna Free Univeristy, Bulgaria, ORCID: 0000-0002-5966-5125.

Introduction

The modern concept of human development, which covers the most important problems of society`s development (economic growth, employment, distribution of benefits, social protection, etc.), places a person at the center of the potential and strategic development of the state. At the same time, man is a decisive component of national wealth. In recent years, the concept of human development has substantially meaningfully enriched and transformed into a real basis for the long-term strategy of socio-economic development of most countries. At the same time, the level of socio-economic development of the country is largely determined by the quality of its population`s life. The concept of „quality of life" covers all spheres of human existence and society`s, considers both objective and subjective factors of living conditions.

Raising the population`s living standard is the main goal of every progressive society. In modern conditions, quality of life becomes the main strategy of socio-economic policy of the country, a criterion for the successful work of all spheres and levels of government, and its consistent improvement in many countries is a national idea. The main strategy in many countries is to increase the expenses for human development. The quality of life is determined by a system of indicators that characterize the general welfare of people, satisfying their vital needs. Indicators of the quality of life and development of person are increasingly becoming the criterion for decision-making in the field of economic and social policy. At the same time, by these indicators Ukraine is progressively lagging the rest of the developed countries.

The quality of life influences both the essential circumstances of human life and the level of production and technology development. While formulating the requirements for the quality of life, one can stimulate the development of the economy towards more complete satisfaction of the corresponding human needs. Proceeding from the modern society`s growing need in knowledge, which is both a component of quality of life and a condition for economic development, it is logical to conclude that the vital importance of improving the measures of life quality for innovative development of the economy, and quality of life regarded as an instrument of innovation development.

Questions of the quality of life assessment arise when solving various socio-economic problems. Most often such tasks are comparing socio-economic development of certain territories or groups of population, assessing the effectiveness of the state`s socio-economic policy, developing indicators for such policies, etc.

Literature review

It is believed that the term „quality of life" was first applied in 1920 by A. Pigu in the „Economic Theory of Welfare". The widespread use of this term is associated with the name of the American economist J. Gelbright, who published in 1958 the book „Society of Abundance" and although the category „quality of life of the population" develops under the influence of the supporters` views of the theory of well-being, the sociologists have no less importance in the elaboration of this category (Galbraith, 1998). Due to sociological works, this category was disclosed as a social concept. At the same time, the subjective aspect of people's assessment of the level and quality of their own lives was the methodological basis for determining the content and the next quantification.

The quality of life is a complex category, in contrast to the concept of „quality", which is described in international ISO standards. Despite the long history of studying this problem, both in foreign and domestic literature, it has still not been possible to concretize the very concept of „quality of life" and thereby effectively use its indicators in the practice of state statistics. The category „quality of life" is synthetic, combines various aspects of human life and human perception of life. In addition, this category is latent, not directly measurable. The breadth of this concept goes beyond the limits of the partial concept of „standard of living", or other partial concepts that are associated with the assessment of human development. The quality of life reflects a variety of living conditions, and the standard of living is only one of the most important components of the quality of life.

With all the richness of the concepts of quality of life, there is no single universal definition of this category. The concept of „quality of life" in the modern scientific sphere is used by various sciences: philosophy, economics, sociology, political science, social ecology, geography, medicine, etc. In the paper „Analysis of the quality and lifestyle of the population" (Ayvazyan, 2012) highlights four basic concepts of quality of life. The first is the concept of economic well-being and considers quality of life as a wealth. This concept is rather narrow and limited in the

modern sense. The second is Utilitarian and it defines the quality of life through the concept of usefulness acquired by human throughout life. This concept is used within the limits of subjectivist measurement of life quality. The third is the expansion of human capabilities and it examines the process of human development and improving the quality of life as an extension of people's ability to choose areas of activity, ways of self-realization, access to knowledge, etc., such a concept is most recognized and demanded today in the practical and scientific spheres. The fourth is pragmatic and it evaluates the quality of life as depending on the level on which a person at Maslow's hierarchy of behavioral motivation is and depending on the specific application of life quality indicators.

Thus, quality of life is a complex, multicomponent phenomenon, which depends both on objective and subjective factors that reflect the basic preconditions and the level of realization of human development, the degree of priority of human development in the civilization process, as well as the self-perception of man, one's self-identification and state of the environment (Prystupa & Keurysh, 2010).

Although the problem of assessing the life quality was posed from ancient times, various subjects offer measuring means for life quality only several decades. The modern tool for measuring the quality of life is very wide and solves different tasks. The lack of a single interpretation of the „quality of life" is significantly reflected both in the allocation of indicators and parameters, and on the methods of its evaluation. In practice, it is manifested in the fact that some scientists determine the quality of life from the standpoint of the objective nature its indicators (Forrester, 1978; Bell, 1999), or through subjective people`s feelings (Michel, Logottegi & Cantor). Many researchers use both objective and subjective indicators to evaluate both. We are impressed with the idea expressed by Ayvazyan S.A., who proposes to allocate: macro-approach (objectivist), which is based on the analysis of statistical indicators characterizing conglomerates of the population in this synthetic category (empirically based on macroeconomic data); and a micro-approach (subjectivist) that is based on the analysis and processing of the results of special questionnaire surveys of population aimed at researching the synthetic category (empirically based on microeconomic data) (Libanova et al., 2013).

The current world experience of life quality measuring includes such an arsenal of methods based on the analysis of statistical macroeconomic indicators: income-based indicators; indicators based on anthropometric indicators of children; „Green pure national product"; the index of true progress (development); index of economic prosperity; index of physical quality of life; human development index; social health index; Johnston's (1988) Quality of Life Index; international index of living conditions; integral social index of Michalis; Social progress index of Estes. In addition, it is possible to distinguish such methods of evaluation that are based on the analysis of microeconomic data: assessment of life quality after Ferrens and Powers; Eurobarometer; Swedish ULF system; analysis of the state`s population life quality; consumer`s index of confidence; quality of life, based on health assessment; Quality of life index by the World Health Organization; Philippine analysis of the social climate. There are also methods that cover these two approaches: the indicator of the magazine „Money Magazine"; Myers Trend Indicator; basic and improved quality indicators of Diner life; Cummins` comprehensive indicator of the life quality; Ruth Wehenhoven indicator of the happily lived life; German system of social indicators; Dutch index of living conditions.

There are different approaches of assessing the population life`s quality in the statistical theory and practice, but still the question of building a single aggregate indicator of living standards continues to be controversial. A rational way of combining indicators of the level and quality of life to obtain a comprehensive generalization index that objectively, reliably and realistic reflects the level and quality of population`s life hasn`t been found yet.

We propose a method, based on an objectivist approach to indicator analysis for assessing the quality of life in terms of regions. The advantages of this method are saving resources for conducting primary statistical observations, which is associated with the use of official statistics. This method also has several disadvantages that are mainly related with questions of trust for the official statistics data.

Previously unresolved issues as a part of the general problem to which this article is devoted: An analysis of the existing theoretical ideas about the nature and assessment of the life`s quality made it possible to conclude that despite the waking researcher`s interest in this problem, the unambiguous category and methodology that would be accepted by all definitions for life`s quality evaluation has not been formulated yet. It is very important to know which indicators quality and standard of living depend on,

therefore the necessity of identifying and analyzing the components of the population`s life quality determines the relevance of this research and its practical significance.

The article's purpose: The aim of the study is to develop a multi-factor assessment method and a regional classification of the population's living standards.

In accordance with this goal, the following research objectives were set:

1) to study the quality of life of the population as the most important form of expression of economic growth in modern conditions of innovative development;

2) to identify the main theoretical approaches to the study of the categories of „standard of living" and „quality of life";

3) to form a system of indicators of quality of life for its use in conditions of innovative development;

4) to analyze the state of the regions and carry out regional differentiation according to the proposed system of indicators of quality of life.

Methodology and research methods: To study the living standards in Ukraine and conduct regional comparisons, we will define the terminological basis of the study. It is necessary to emphasize several features, while characterizing the quality of life as a socio-economic category. The category „standard of living" is defined in a narrow and broad sense: in the narrow sense through the characteristics of the level of consumption of the population and the degree of satisfaction of needs (measuring income, expenses and consumption of goods and services); in the broad sense through the characterization of the level of human development (health and ability to supply needs) and living conditions of the population (the state of the environment and safety).

Thus, in the narrow sense of the word, the standard of living is expressed as the ratio of income level to the cost of living. In a broader sense, the standard of living is no longer limited to its value estimates but is closer to the concepts of „lifestyle" and „quality of life". The study and synthesis of existing theoretical approaches to the study of the quality of life as an economic category has allowed substantiating the conclusion that the system-forming basis of them „living standard" concept are different human`s needs which arise and which are realized in the sphere of consumption. The limitation of the research`s field in the sphere of consumption represents an important constructive difference with the definition of „quality of life" as a category of higher order. Quality of life is the most important social category that characterizes the structure of human needs and the ability to meet them.

Some researchers focus their attention on the economic side, material security of population`s life while determining the concept of „quality of life". There is also the opposite view, according to which quality of life is the most integrated social indicator. Level and quality of life are used by researchers to develop mechanisms for state regulation of population`s life. So, O. Melnichenko (Melnychenko, 2008) and V. Mandybura (Mandybura, 1999) offered their mechanisms which are based on the conducted analysis of these concepts and their main components.

At present, there are many methods for assessing the quality of population`s life. But the main disadvantage of existing methods is the use of the expert estimation method, which does not allow guaranteeing the validity of the weight of the criteria based on which the quality of life is calculated. Thus, attention should be paid to the method of assessing the quality of the population`s life, which does not use the expert estimation method.

We analyzed different foreign researches to people differentiation and found out some approaches. The methodology of the Canadian Index of Wellbeing is represented by the set of eight indicators, the researcher Erikson R. describes the Swedish Approach to Welfare (Erikson, 1993). European Foundation for the Improvement of Living and Working Conditions propose the methodology used for monitoring quality of life in Europe, the UK Government developed the strategy with the local quality of life indicators, supporting local communities to become sustainable (QofL, 2005). We need to underline that foreign methodologies can be applied for Ukraine only in particular cases because of the difference in the set of indicators, which are available on the state level.

Some regional aspects of the life quality were considered by different researches. Among them A. Vlasuk (Vlasyuk & Yacenko, 2005), Z. Herasimchuk (Herasimchuk, 2002), I. Gukalova (Gukalova, 2007), L. Petkova (2006), N. Kelley-Gillespie (Kelley-Gillespie, 2009) and others. They research different factors of influence on the quality of life in the regions, regional inequality of the level of life, tools of Realization of Regional Strategic Development, but they are not concerned the regional classification methodology of the population`s quality of life under innovation development.

In this study, we propose to combine the disparate indicators of the level and quality of life using the method of factor analysis. The set of factor analysis methods is quite large: the method of the main components, simple methods of factor analysis, approximating methods of factor analysis. The method of the main components has some advantage over the simple methods of factor analysis that is the ability to identify sufficient characteristic factors in the analysis of life quality. The advantage of using the method of the main components before the group method is that it does not require the prior selection of elementary group characteristics, which allows making the analysis easier.

The method of the main components detects k-component factors, which explain the entire variance of output k random variables; at the same time components are being built in order of decreasing the proportion of the total output quantities` dispersion that often allows extending several first components. The first main component of F1 defines such a direction in the space of the outgoing attributes, according to which the set of objects has the largest variance.

The second main component F2 is constructed so, that its direction is orthogonal to the direction F1 and it explains the residual dispersion as much as possible, and so on, to the K`s main component of Fk. Since the selection of the main components occurs in a descending order in terms of the dispersion, so the features included in the first major component with large coefficients have the maximum effect on the differentiation of the objects under study. Since it has been absent the consistent presumptive indicator which characterizes the population`s standard of living, several statistical indicators reflecting different sides of this category are calculated for its analysis. As a result of the study the content of the life quality, were proposed a system of criteria and indicators, which were grouped into blocks.

The block of indicators that are related to environmental protection is one of the factors of people`s comfortable life. The health and well-being of the population depend at first on the state of the environment in which it lives. For Ukraine, as well as for many other countries, major problems are that ones, which are related to environmental pollution. Therefore, while characterizing the quality of population`s life authors could not ignore such aspects of environmental state`s analysis, which is associated with indicators of health, and indicators of comfort of life, and with other aspects of human development. It is known that absolute indicators characterize the phenomena less qualitatively than relative ones. Because I-IV hazard grade waste products are usually generated by industrial enterprises, it was decided to calculate the above figures for 1 million UAH of industrial output sold in order to obtain the final coefficients of environmental protection in the regions. This unit includes the following indicators:

X_{11} - expenses for protection of the environment for 1 million UAH of industrial products sold;

X_{12} - the volume of waste of I-IV classes of danger for 1 million UAH of sold industrial products.

The social situation is largely determined by the possibility of the population in meeting the requirements including health. Health indicators can also characterize the social situation, which is a complex and multicomponent concept. I propose the following indicators of this block:

X_{21} - number of hospitals;

X_{22} - the number of hospital beds per 10 000 of population;

X_{23} - the number of doctors of all specialties per 10 000 of population;

X_{24} - number of medical staffs per 10 000 of population;

X_{25} - the number of newly registered cases of diseases per 100 000 of population.

The block of indicators of education reflects the indicators that demonstrate the sustainable development of human potential. It is education of a corresponding level that prepares a person for the realization of professional and social ambitions, provides freedom of choice the alternatives and confrontation with the challenges of life. The indicators t was proposed to be included to this block cover all levels of education, except for preschool, namely:

X_{31} - the number of students of colleges, technical schools, schools per 10,000 people;

X_{32} - number of students of universities, academies, institutes per 10,000 of population;

X_{33} - the number of students of general education institutions per 10,000 of population;

X_{34} - the number of students of vocational education institutions per 10,000 of population.

The unit of indicators of well-being reflects the material basis of society's development. The significance of the indicators of this unit follows from the fact that welfare

is a factor in the life expectancy, level of education, the realization of labor activity and various human ambitions. Gross regional product is one of the most important indicators of the region's economic development, it is also an economic basis for raising the level of incomes and accordingly for improving its level of well-being. Population`s income reflects the material basis of welfare and human development. Expenses - indicate the volume of needs satisfaction (material and spiritual). The following indicators are displayed in this block:

X_{41} - money income (average per month per household, UAH);

X_{42} - non-monetary income (average per month per household, UAH);

X_{43} - consumer cash expenditures (on average per month per household, UAH);

X_{44} - non-consumer money expenses (average per month per household, UAH);

X_{45} – GRP per capita (UAH).

Innovation is the commissioning of any new or significantly improved product or process, a new marketing method or a new organizational method in the enterprise, organization of workplaces or external relations. Indicators of the number of postgraduate students and doctoral students reflect the intellectual potential of scientific and innovative development. The volume of innovative products that were sold shows the result of innovation activity. Indicators of expenses for research and innovation activities reflect the material basis for the development of innovation. The section of innovative development indicators includes:

X_{51} - the number of post-graduate students per 10,000 of population;

X_{52} - the number of doctoral students per 10,000 of population;

X_{53} - internal running costs for research and development on 10,000 people;

X_{54} - total expenditures on innovative activities per 10,000 of population;

X_{55} - the volume of innovative products that were realized per 10,000 of population.

The population is the main driving force of social development. In this case, the birth rate accumulates the influence of a wide range of factors: socio-psychological, economic, socio-cultural, and others. Indicators of mortality and life expectancy accumulate the influence of the state of medical and social well-being, working conditions, ecological situation, etc. To the block of indicators on population reproduction, it was proposed to include the following indicators:

X_{61} - average life expectancy aborning (indicator of health status, living conditions and work of the population);

X_{62} - the total fertility rate (indicator of the level of childbearing activity and the process of replacement of generations);

X_{63} - total mortality rate;

X_{64} - the total coefficient of population growth.

Employment, as the main form of realization of economic activity of the population and a means to ensure its welfare, is one of the main characteristics of human development in the region. The level of employment characterizes the degree of use of working population in the field of socially useful labor and serves as an indicator of incentives for human development in the workplace. The unemployment rate of the population (according to the ILO methodology) is calculated as the ratio of the number of unemployed people aged 15-70 to the economically active population of the specified age. It characterizes the possibilities of satisfying the supply of labor, points to the level of implementation of labor potential and the degree of the inclusion problem in employment relations. This indicator can be an indicator of negative processes in the labor market and in the socio-economic field. The block of labor indicators contains two indicators:

X_{71} - employment level, %;

X_{72} - unemployment rate, %.

The block of indicators of crime can speak for the social tensions in society, which often appears because of decrease of people`s economic well-being. This block is represented by indicators:

X_{81} - number of detected crimes;

X_{82} -number of convicted on proofs that came into force.

It should be admitted that the data indicators of the blocks are interrelated.

In order to calculate the quality criteria for each group, here were considered the statistical indicators provided by the State Statistics Service in 2017, all indicators were processed in the application package of Statistics Enterprise 10.0 (Yankovoi, 2002).The purpose of the analysis was to identify clusters of Ukraine regions, as

the most significant features based on a complete sample, which includes all 24 regions of Ukraine and the capital (Kyivcity).

It was identified the main components on the ground of the component analysis of selected 29 indicators` system that characterize the quality of population`s life. Received numbers (Eigenvalue) served for criterion for selecting the size of main components. Those components that had an actual number of more than 1 were selected for further analysis. There were seven of such components. Together they provide almost 85% variations of all 29 variables. Their factor coordinates based on correlations are shown in Table 1.

The most significant factors that have an impact on the components were identified for each integrant. They are highlighted in the table as a bold. It can also be admitted that the last component despite having its own number more than one, does not contain a very significant coefficient of influence for all factors. The maximum coefficient for the seventh factor is 0.34 <0.5. Therefore, the last integrant is not essential for regional differentiation. The analysis of the obtained integrants and their main components made it possible to conclude that not all the proposed factors are included in the structure of at least one integrant. This made it possible to remove some of the factors for further research. These were the

Table 1: Weights of the main components of 29 quality of population`s life factors

Factor	F1	F2	F3	F4	F5	F6	F7
X_{11}	-0.15	-0.32	0.47	0.13	0.30	-0.27	0.00
X_{12}	0.08	-0.30	-0.10	-0.23	-0.29	**0.72**	0.10
X_{21}	-0.73	-0.26	0.08	0.05	-0.35	-0.05	0.38
X_{22}	-0.66	-0.33	-0.47	0.10	-0.14	0.10	-0.09
X_{23}	-0.82	0.29	-0.23	0.21	-0.08	-0.10	0.17
X_{24}	-0.18	0.43	**-0.66**	0.12	-0.24	0.02	-0.33
X_{25}	0.39	0.55	0.15	0.06	-0.35	0.03	0.32
X_{31}	-0.25	0.33	-0.16	**-0.68**	-0.14	0.05	-0.11
X_{32}	**-0.96**	0.09	-0.10	-0.08	-0.01	-0.07	-0.12
X_{33}	-0.08	0,50	0.31	**-0.73**	0.10	-0.01	-0.04
X_{34}	0.17	0.29	-0.14	**-0.77**	-0.02	0.11	0.03
X_{41}	-0.60	**0.59**	0.17	0.07	0.11	0.08	0.25
X_{42}	0.43	**0.61**	-0.47	-0.05	-0.07	-0.22	-0.04
X_{43}	-0.45	**0.69**	-0.12	-0.01	0.11	0.00	0.33
X_{44}	0.25	0.08	**-0.67**	-0.06	0.35	-0.09	0.30
X_{45}	**-0.88**	-0.15	0.00	-0.08	-0.02	0.02	-0.23
X_{51}	**-0.96**	0.08	-0.07	0.02	0.00	-0.03	-0.18
X_{52}	**-0.96**	0.04	-0.12	0.04	0.06	-0.04	-0.19
X_{53}	**-0.94**	-0.18	-0.02	-0.02	0.04	0.06	-0.06
X_{54}	-0.54	-0.45	-0.26	-0.20	0.37	0.36	0.07
X_{55}	-0.19	-0.43	-0.20	-0.05	**0.66**	0.16	0.24
X_{61}	-0.46	**0.59**	-0.47	0.19	-0.04	-0.19	0.19
X_{62}	-0.29	**0.68**	0.52	0.15	0.11	0.22	-0.21
X_{63}	0.48	**-0.76**	-0.26	-0.17	-0.09	-0.16	-0.09
X_{64}	-0.41	**0.76**	0.39	0.16	0.10	0.19	-0.04
X_{71}	-0.44	**-0.67**	0.12	-0.23	-0.09	-0.40	-0.01
X_{72}	0.56	0.00	-0.24	**0.55**	0.06	0.42	-0.20
X_{81}	**-0.87**	-0.36	0.13	0.03	-0.07	0.09	-0.02
X_{82}	-0.37	**-0.61**	0.16	0.06	-0.37	0.13	0.34

Source: Calculated by the authors

three indicators of health care - the number of hospitals (X21), the number of hospital beds per 10,000 population (X22), the number of doctors of all specialties per 10 000 population (X23) and the indicator of innovations - the total expenditures for innovation activities (X54). In fact, another indicator is also in this category, which is not very significant - the cost of environmental protection for 1 million UAH sold industrial products, but it was decided to leave a minimum of 2 indicators in each category for consideration of each category from different sides.

Thus, the system of indicators left 25 factors for which the factor analysis was repeatedly carried out using the principal component method, which allowed the identification of 6 main components, which given in Table 2.

The first component is mainly characterized by indicators of innovation activity: the number of postgraduate students per 10,000 of population, the number of doctoral students per 10,000 of population, the internal running costs for research and development, and the educational indicator - the number of university students: universities, academies, institutions per 10,000 of population and the indicator of well-being – GRP per capita. Therefore, this first and most important component can be considered as innovative and educational. That emphasizes again the importance of innovations in improving the quality of population`s life.

As appears from the obtained data about weighted coefficients, the second main component characterizes the integral demographic indicators - the average life expectancy at birth and the overall fertility, mortality and natural growth rates; welfare indicators - non-cash income and consumer cash expenditures, as well as the level of employment and the number of sentenced convicts of the

Table 2: Weights of the main components of 25 factors of quality of life of the population

Factor	F1	F2	F3	F4	F5	F6
X_{11}	0.13	-0.38	0.46	-0.02	**0.44**	-0.15
X_{12}	-0.16	-0.23	-0.06	0.22	**-0.66**	0.38
X_{24}	0.18	0.45	**-0.58**	-0.27	-0.26	-0.30
X_{25}	-0.30	0.59	0.23	0.04	-0.20	-0.13
X_{31}	0.30	0.30	-0.35	**0.61**	-0.17	0.06
X_{32}	**0.96**	-0.06	-0.22	0.00	-0.02	-0.06
X_{33}	0.21	0.47	0.14	**0.76**	0.14	0.05
X_{34}	-0.12	0.36	-0.27	**0.70**	-0.05	0.07
X_{41}	0.69	0.49	0.18	-0.06	0.09	0.22
X_{42}	-0.38	**0.70**	-0.40	-0.04	0.11	-0.25
X_{43}	0.54	**0.63**	-0.10	-0.06	0.15	0.22
X_{44}	-0.29	0.17	**-0.62**	-0.12	0.32	0.35
X_{45}	**0.85**	-0.29	-0.12	0.03	-0.10	-0.08
X_{51}	**0.96**	-0.07	-0.16	-0.09	-0.05	-0.08
X_{52}	**0.95**	-0.10	-0.20	-0.13	-0.01	-0.04
X_{53}	**0.89**	-0.32	-0.11	-0.04	-0.07	0.05
X_{55}	0.10	-0.42	-0.21	-0.07	0.37	**0.61**
X_{61}	0.48	**0.54**	-0.43	-0.31	0.10	-0.09
X_{62}	0.45	**0.58**	**0.57**	-0.05	-0.07	0.05
X_{63}	-0.60	**-0.67**	-0.31	0.13	0.02	-0.12
X_{64}	0.55	**0.66**	0.44	-0.10	-0.04	0.09
X_{71}	0.36	**-0.75**	-0.09	0.25	0.18	-0.27
X_{72}	-0.57	0.10	-0.01	**-0.59**	-0.30	0.22
X_{81}	0.83	-0.49	0.03	-0.04	-0.15	0.06
X_{82}	0.25	**-0.66**	0.09	0.00	-0.32	0.06

Source: Calculated by the authors

legally enforceable courts. Thus, the second component corresponds to socio-demographic indicators.

The third component is characterized by the allocation a greater number of less significant factors. Nevertheless, the categories of positive and negative significant indicators are substantially determined. Negative indicators are the number of average medical personnel per 10 000 of population and non-expendable costs, and positive - the total fertility and natural growth rates, as well as the environmental expenses. This indicator is called the indicator of demographic health.

The fourth component corresponds to the indicators of education and labor and includes the sign plus the factors for higher education: the number of students in colleges, technical schools, schools per 10,000 of population, the number of students in general education institutions per 10,000 of population and the number of students of vocational training schools per 10,000 of population, which are set to a negative indicator - the unemployment rate. The subcomponents of this component are responsible for the level of intellectual capital growth. Therefore, let's call it intellectual.

The fifth component combines the main factors of environmental protection, with the costs for environmental protection for 1 million UAH of sold industrial products is included in the component with a minus sign, and the volume of I-IV classes hazard waste for 1 million UAH of realized industrial products - with a plus sign. Let's consider this component as ecological.

The sixth component, that is the last, emphasizes once again the importance of innovations in improving the quality of population`s life and contains the volume of realized innovative products per 10,000 of population as the main influencing factor. Therefore, let's call this component an innovative one.

Thus, the number of indicators was reduced from 29 factors to 6 main components, which characterize the quality of the Ukrainian population`s life. Region`s factor coordinates are based on correlations that are given in table 3.

The obtained indicators are characterized by apparent heterogeneity in the regions of Ukraine and show it clearly that the regions are significantly notable for quality of life and for terms of innovative activity. It was carried out regional differentiation and break down the regions of the world into groups in order to determine their characteristics and to identify more homogeneous groups of regions in terms of living standards for the further study and modeling of factors influencing the country's economic development. For realizing this purpose, it was used methods of cluster analysis. To determine the optimal number of homogeneous groups for the selected set of factors it was used the cluster method joining with the Euclidean metric by the Ward's method and it was built a tree clustering, that is given in Fig. 1. The received dendrogram confirms the presence of regional groups in terms of quality of life and clearly distinguishes five optimal homogeneous groups.

As a result of the cluster analysis using the k-medium algorithm, the regions of the country were divided into five homogeneous clusters with the characteristics that are presented in Fig. 2

Representatives of clusters among the regions were distributed as the following:

Cluster 1 represents individually the capital of Ukraine - Kyiv city.

Cluster 2 combines the following regions: Vinnytsya, Donetsk, Zhitomir, Kirovograd, Lugansk, Poltava, Khmelnitsky, Cherkassy, and Chernihiv.

Cluster 3 includes Volyn, Transcarpathian, and Rivne regions.

Cluster 4 is Ivano-Frankivsk, Lviv, Ternopil, Chernivtsi regions.

Cluster 5 is formed with Dnipropetrovsk, Zaporizhya, Kyiv, Mykolaiv, Odessa, Kharkiv, Kherson regions.

Results: The Cluster 1, represented by the city of Kyiv, distinguishes itself significantly after the main innovation and educational indicator. It is of extremely importance in comparison with the other areas. As Table 3 shows, F1 (Kyiv) = 11.84, while in other regions this indicator varies from 1.83 in the Donetsk region to 2.49 in Kharkiv. Indeed, in 2017, in Kyiv were 31.78 postgraduate students per 10,000 of people (the closest to it is the Kharkiv region with 11.81, and all other regions from 0.6 in Donetsk region to 8.12 in Lviv region). The situation is similar with the doctoral students: Kyiv has 2.23 per 10,000 of population, Kharkiv - 0.79, all the others from 0.05 - Donetsk to 0.53 - Lviv). The internal running costs for the implementation of researches and development are also significantly different in Kyiv (Internal current expenditure for R & D).Thus, it was amounted to 18395.35 thousand UAH in Kyiv in 2017, Kharkiv region cashed up 8093.04 thousand UAH, Dnipropetrovsk – 6902.17 thousand

Table 3: Factor coordinates of regions based on correlations

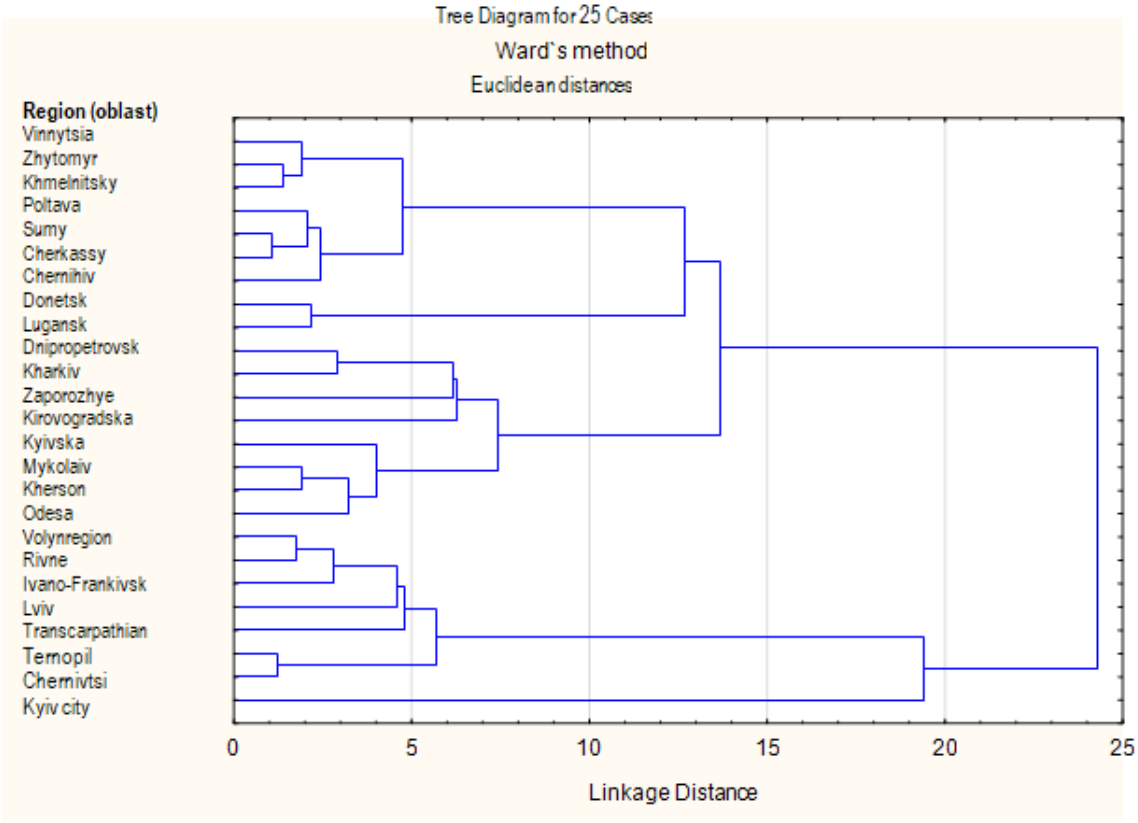
Region	F1	F2	F3	F4	F5	F6
Vinnytsia	-0.88	0.99	-1,19	0.47	-0.14	-0.16
Volyn region	-0.68	3.27	0.47	0.48	-0.45	0.10
Dnipropetrovsk	0.90	-3.24	0.61	1.47	-1,80	0.32
Donetsk	-1.83	-1.63	1.31	-3.82	-1.18	0.66
Zhytomyr	-1.70	0.05	-0.55	1.07	-0.82	-0.93
Transcarpathian	0.42	3.10	3.16	-0.67	1.05	1.58
Zaporozhye	0.35	-3.03	-1,60	-0.16	2.09	3.17
Ivano-Frankivsk	0.22	4.04	-0.07	-0.45	0.51	-0.63
Kyivska	-0.12	-2.92	2.88	0.99	2.19	-1.21
Kirovogradska	-2.23	-1.45	-0.46	1.30	-3.07	1.91
Lugansk	-2.91	-1.18	1.03	-4.56	-0.19	-0.66
Lviv	2.26	1.48	-0.31	0.76	0.11	-0.14
Mykolaiv	-0.64	-1.55	1.22	1.35	1.36	0.47
Odesa	1.68	-0.87	2.27	1.13	0.22	-0.08
Poltava	-0.80	-1.30	-1.00	-0.05	-0.80	-0.51
Rivne	-0.67	3.47	1.88	0.83	-1,19	-0.50
Sumy	-1.31	-0.76	-2.16	0.07	0.65	-1.25
Ternopil	-0.30	3.42	-2.17	-0.33	0.32	0.77
Kharkiv	2.49	-3.17	-0.51	0.77	-0.01	-0.74
Kherson	-0.86	-0.71	1.00	1.10	-0.25	0.09
Khmelnitsky	-1.30	0.61	-0.05	0.30	-0.16	-1.32
Cherkassy	-1.25	-0.69	-1.24	-0.05	0.45	-0.77
Chernivtsi	-0.38	3.79	-1.33	0.32	0.77	0.79
Chernihiv	-2.29	-1.58	-2.43	-0.64	1.03	-0.65
Kyiv city	11.84	-0.13	-0.77	-1.67	-0.69	-0.30

Source: Calculated by the authors

UAH, Zaporizhzhya– 4947.14 thousand UAH, Mykolaiv – 2867.07 thousand UAH, and all other regions from 31.43 thousand UAH (Donetsk) to 1615.06 thousand UAH in Kyiv region. It is logical that the educational component which corresponds to the number of students in institutions of higher education, universities, academies and institutes per 10,000 of population has been added to the innovation component. In the year 2017 in Kyiv studied 1217.79 students per 10,000 of population. Kharkiv region has this indicator at the level of 574.87 and all other regions from 57.82 in Donetsk to 432.65 in Lviv region.

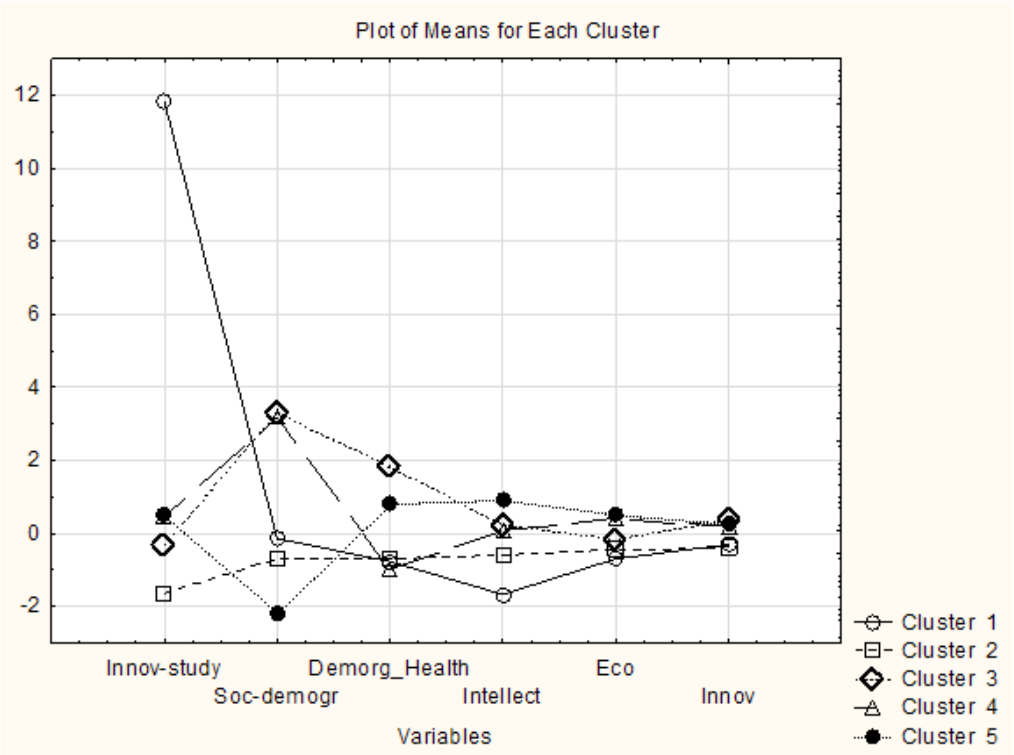
Thus, Kyiv distinguishes with an extremely powerful potential in innovation sphere and has a very large, almost inaccessible innovation and educational index. However, according to Fig. 2 all other indicators in the first cluster, unfortunately, do not have the same large range. It is very interesting that the last component F6, which also characterizes the innovative component of living standards for the first cluster, has the least value with the second cluster. This component mainly analyzes the impact of the realized innovative products volume per 10,000 of population. According to Table 3, F6 (Kyiv) = - 0.3. The negative value of the obtained indicator underlines the ineffectiveness of the current extremely powerful scientific and innovative potential implementation, which was identified in the main component F1, relative to the volume of realized innovative products per 10,000 of population. Indeed, in the year 2017 in Kyiv it was sold innovation products in the amount of 3530.64 thousand UAH per 10,000 of population. As a comparison, Kharkiv region had this indicator at the level of 4874.34 thousand UAH. The Donetsk region, which had the lowest rates for all the potential factors of the first cluster, had implemented innovation product in the amount of 5338.77 thousand

Figure 1: Dendrogram of regional differentiation in Ukraine upon the indicators of the population`s life quality (2017)



Source: Calculated by the authors

Figure 2: The living standards clusters of Ukrainian population



Source: Calculated by the authors

UAH per 10,000 of population. Zaporizhia region is the leader in branch with the value of 21947.21 thousand UAH per 10,000 of population.

The second cluster is characterized by low values for all selected components, and for some of them it even has the lowest values. This is particularly clearly seen in the indicators of innovation. The first major innovation and educational component for the second cluster is very low towards to the values for the other clusters. However, the effectiveness of the innovation potential for the second cluster is the highest unlike the first cluster, which is clearly confirmed in Fig.2, there is a growing curve from the first to the sixth component for the second cluster. The most characteristic for this cluster is Donetsk region, which was characterized by the innovative components earlier. Thus, the second cluster includes areas that have not very strong innovative and educational potential.

The third cluster included regions characterized by the highest indicators for the second and third main components. The second socio-demographic component on the background of a rather low level of crime and employment, emphasizes rather high demographic indicators and well-being indicators. The third main component of demographic health emphasizes once again the important high demographic indicators for this cluster against the background of the normal (middle level) ecology, but less significant values of welfare indicators (with a focus on non-consumer costs) and partially indicators of education and innovation. It includes three regions: Volyn, Transcarpathian and Rivne.

The fourth and fifth clusters are similar in many respects: high innovation indicators, (except of those in Kyiv city), the best ratio for the first and sixth innovative components in comparison with the ratio in Kyiv city, so with the best innovative performance in terms of the implemented innovation products` volume per 10,000 of population. The fifth and fourth main components are high environmental and intellectual indicators, but they significantly differ in terms of socio-demographic components and components of demographic health.

The fourth cluster is characterized by high indicators for the second, but low values for the third main integrants. The second socio-demographic component, as well as for the third cluster, highlights the rather high demographic indicators and indicators of well-being on the background of a rather low level of crime and employment. The third main component of demographic health emphasizes once again the importance of sufficiently high demographic indicators for this cluster but compares them to even higher welfare index and to the indicators of education and innovation. Thus, there is a good demographic situation for the regions of the fourth cluster, which includes Ivano-Frankivsk, Lviv, Ternopil, and Chernivtsi regions, on the background of even better financial climate of well-being, supported by high-quality educational and innovative environment.

The fifth cluster formed Dnipropetrovsk, Zaporizhzya, Kyiv, Mykolayiv, Odessa, Kharkiv and Kherson regions. Unlike the fourth cluster, these regions are characterized by a low range of the second main integrant and by the high value of the third main integrant. The second component is characterized by a poor demographic situation, but also by a favorable situation on the labor market. And there are relatively slight values of well-being indicators for the third integrant. However, regions of these clusters differ by the fourth intellectual component. According to Fig.2, the second cluster has the highest values for this indicator. Indeed, these regions have a low level of unemployment and enough children who have a high level of education: students of colleges, technical colleges, students of general educational institutions, students of vocational training schools for 10,000 of population.

Conclusions from this study and prospects for further development of this area: In this research the authors used statistical and mathematical methods part way through constructing a system of „quality of life" indicators. To assess the quality of life in the region, authors propose a method that is based on an objectivistic approach to indicators analysis - to combine the disparate indicators of the level and quality of life it was used the method of factor analysis. Quality of life is considered as a dynamic, integrated concept that reflects the subjective and objective satisfaction degree of the entire complex of human vital requirements (indicators of environmental protection, health, education, welfare, innovation, demographic indicators, labor and crime indicators). It is carried out the component analysis of indicators, including data about available resources, with considering the indicators of Ukrainian population`s quality of life. It is discovered the structure of the Ukrainian regions` clusters, which characterize the state of society as a whole and socio-economic relations that take place in it.

The studied summation of regions was divided into quite distinct groups - five major clusters. An analysis of

the main trends in the level and quality of life, which is based on the system-information approach, allowed us not only to give a general description of the quality of life, but also to identify the main trends in the studied area.

It is important to note that the result, which was obtained with the cluster analysis is one of the possible results. This result should be compared with similar results obtained with using other metric combinations, union-find algorithms, etc., as well as with the results of the other data analysis methods.

Author Contributions: idea, T. F.; conceptualization N. B.; methodology, T. F. and N. B.; writing, N. B., T. F., J. S. and K. S.; theoretical research, T. F.; the development of a system of statistical indicators at the regional level for assessing the quality of life of the population, T. F.; statistical data, T. F.; statistical analysis, T. F., J. S.; mathematical analysis, N. B., K. S.; visualization, N.B., T. F., R. S. and K. S.; review and editing, N.B., J. S. and K. S.; methodology, N.B. and T. F.; software, N. B. and K. S.

References

Ayvazyan, S.A. (2012). *Analysis of the Quality and Life Style of the Population.* Central Economics and Mathematical Institute of the Russian Academy of Sciences. Moscow: Nauka [in Russian].

Bell, D. (1999). *Gryadushhee postyndustryalnoe obshhestvo. Opitsocyalnogo prognozyrovany. [The emerging post - industrial society. The Experience of Social Forecasting. Moscow:* Academia. [In Russian]

Canadian Index of Wellbeing. https://uwaterloo.ca/canadian-index-wellbeing. Retrieved from: https://uwaterloo.ca/canadian-index-wellbeing/our-products/domains

Erikson, R. (1993). *Descriptions of Inequality: The Swedish Approach to Welfare Research.* In: M.Nussbaum, A.Sen (eds.), 1993.

Fahey, T., Nolan, B. & Whelan, C. (2003). *Monitoring quality of life in Europe, European Foundation for the Improvement of Living and Working Conditions,* Publications of the European Communities, Luxembourg.

Forrester, J. (1978). *Myrovaya dynamyka.[World dynamics]*. Moscow: Progress [In Russian].

Galbraith, J.K. (1998). *The Affluent Society.* Rev .ed. Boston: Houghton Mifflin.

Gukalova, I.V. (2007). Potencial faktoriv vplyvunaumovy zhyttya i stannaselennya v regionax Ukrayiny. [Potential factors of influence on the conditions of life and status of the population in the regions of Ukraine].Chasopys socialno-ekonomichnoy I geografiyi – *Journal of Social and Economic Geography.* Kharkov, 3, 176-184 [In Ukrainian].

Herasymchuk, Z.V. (2002). *Organizacijno-ekonomichnyj mexanizm formuvannyata realizaciyi strategiy i rozvytku regionu: Monografiya [Organizational and Economic Mechanism for the Formation and Implementation of the Regional Development Strategy: Monograph].* Lutsk: LDUU. [In Ukrainian].

Karmazina, O.O. (2018). Dovkillya Ukrayiny za 2017 rik. Statystychnyj zbirnyk [Environment in Ukraine for the 2017 year. Statistical Compilation]. Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_du2017.pdf) [In Ukrainian].

Karmazina, O.O. (2018). *Zaklady okhorony zdorovya tazakhvoryuvanistna selennya Ukrayiny` u 2017 roci. Statystychny zbirnyk. [Agencies of health care and population diseases in Ukraine in 2017 year. Statistical Collection].*Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/06/zb_zoz_17.pdf) [In Ukrainian].

Karmazina, O.O. (2018). *Vyshhaosvita v Ukrayini u 2017 roci. Statystychny zbirnyk.[Higher education in Ukraine in 2017 year. Statistical Collection].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny [In Ukrainian].

Karmazina, O.O. (2018). *Zagalnoosvitnita profesijno-tekhnichninavchalni zaklady Ukrayiny. Statystychnyj zbirnyk. [Secondary and vocational training establishments of Ukraine. Statistical Collection].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny [In Ukrainian].

Karmazina O.O. (2018). *Naukovata innovacijna diyalnist Ukrayiny. Statystychnyj zbirnyk [Scientifi can dinnovative activity of Ukraine].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/09/zb_nauka_2017.pdf [In Ukrainian].

Kelley-Gillespie, N. (2009). An Integrated Conceptual model of Quality of Life for Older Adults Based on a Synthesis of the

Literature. *Applied Research Quality Life.* Vol. 3, 259–282.

Libanova, E.M., Gladun O.M. &Lisogor L.S. (2013).Measuring the quality of life in Ukraine, Analytical report. Kyiv.

Local quality of life indicators – supporting local communities to become sustainable. A guide to local monitoring to complement the indicators in the UK.

Government Sustainable Development Strategy. http://www.auditcommission.gov.uk/Retrieved from: http://www.auditcommission.gov.uk/

Mandybura, V.O. (1999). *Rivenzhyt tyanaselen nyata mexanizmyj ogoregulyuvannya.[The level of life of the population and the mechanisms of its regulation]*. Extended abstract of Doctor's thesis. Kyiv: NAS of Ukraine. [in Ukrainian]

Melnychenko, O.A. (2008). *Pidvyshhennya rivny atayakosti zhytty anaselennya: mexanizm derzhavnogo regulyuvannya: monografiya [Improving the Level and Quality of Life of the Population: the Mechanism of State Regulation: a monograph].* Kharkiv: KRI NAPA „Magister". [In Ukrainian]

Osypova, I.I. (2018). *Vytraty i resursy domogospodarstv Ukrayiny u 2017 roci. Statystychnyj zbirnyk. [The Costs and Resources of Households of Ukraine in 2017 year. Statistical Compilation]*. Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_vrdu2017_pdf.pdf [In Ukrainian].

Petkova, L.O. (2006). *Teoretyko-metodologichni zasady ekonomichnogo zrostannya v Ukrayini: regionalni aspekty [Theoretical and Methodological Principles of Economic Growth in Ukraine: Regional Aspects].* Extended abstract of Doctor's thesis. Kyiv [In Ukrainian]

Prystupa, Ye, Keurysh, N. (2010). *Yakist `zhytty alyudyny: kategoriyi, komponenty tayihvy miryuvannya [Quality of Life of Humans, Category, Ingredients and their Measurement].* Fizychna aktyvnist, zdorov'ya i sport # 2 –Physical activity, health and sport No. 2) (pp. 54-63) [In Ukrainian].

Senyk, I.V. (2018). *Ekonomichna aktyvnist naselennya Ukrayiny 2017.Statystychnyj zbirnyk [Economic Activity of the Population of Ukraine for 2017 year]*. Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from:http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/07/zb_EAN_2017.pdf[In Ukrainian].

Timonina, M.B. (2018). *Naselennya Ukrayinyza 2017 rik. Demografichnyj shhorichnyk [Population of Ukraine in 2017 year].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_dy_2017.pdf [In Ukrainian].

Vernera, I.Ye. (2018). *Statystychnyj shhorichnyk Ukrayiny za 2017 rik. [Statistical Yearbook of Ukraine for 2017 year].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_seu2017_u.pdf [In Ukrainian].

Vernera, I.Ye. (2018). *Statystychnyj zbirnyk «Regiony`Ukrayiny». Chastyna I [Statistical collection "Regions of Ukraine". Part 1].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_ru1ch2018.pdf [In Ukrainian].

Vernera, I. Ye. (2018). *Statystychnyj zbirnyk «Regiony Ukrayiny». Chastyna II [Statistical collection "Regions of Ukraine". Part 2].* Kyiv: Derzhavna sluzhba statystyky Ukrayiny. Retrieved from: http://www.ukrstat.gov.ua/druk/publicat/kat_u/2018/zb/11/zb_ru2ch2018.pdf [In Ukrainian].

Vlasyuk, A.S., Yacenko L.D (2005). Regyonal noeneraven stvourovnya zhyzny [Regional Inequality in the Level of Life]. Teorya I praktyka upravlenyya – *Theory and Practice of Management,* 5, 7-13 [In Russian].

Yankovoi, A.G. (2002). *Multivariate analysis in STATISTICA.* Odessa: Optimum, Issue 2.

Zherebyn, V.M. (2012). *Indykatoryka chestva zhyznina selenya. [Indicators of quality of life of the population].*Voprosy statistiki # 3 – Questions of statistics #3 [In Russian].