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Marzanna Lament[1]

QUALITY OF NON-FINANCIAL INFORMATION REPORTED BY FINANCIAL INSTITUTIONS. THE EXAMPLE OF POLAND AND GREECE

This paper aims is to analyse and verify the applicable principles of Corporate Social Responsibility (CSR) reporting in light of the regulations of Directive 2014/95/EU, as well as to evaluate quality of non-financial information presented in CSR reports of financial institutions in the Polish and in the Greek market. Two research hypotheses have been postulated in connection with this aim: (H1) – The Directive 2014/95/EU contains regulations that will contribute to improved comparability and usefulness of information presented in financial statements. (H2) – financial institutions in the Polish and in the Greek market draft their CSR reports in different ways, which obstructs their comparability. In order to verify hypothesis (H1), regulations of the Directive 2014/95/EU and specialist literature have been reviewed. In order to verify hypothesis (H2), the author has conducted research into a group of financial institutions in the Polish and in the Greek financial market by examining and analysing CSR reports compiled in 2010–2015 with regard to quality of the information, in particular, its usefulness and comparability. This assessment involved reviewing of: principles of publication and verification of the reports, frequency of their drafting, volume, scope and structure.
It must be concluded neither the existing regulations nor the reporting practices ensure the qualitative features in question. As a consequence, CSR reports are incomparable and unclear. Introduction of sectoral reporting standards in future should be considered, as it would help to improve clarity and comparability of the reports.

JEL Classification Codes: M14, M41.

Keywords: accounting, reporting, financial statement, Corporate Social Responsibility (CSR), financial institutions.

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Introduction

Non-financial reports are significant sources of information used in decision-making processes. It is therefore important that they meet appropriate qualitative criteria that ensure comparability and faithful presentation. Existing research points to qualitative deficiencies of CSR (*Corporate Social Responsibility*) reports with regard to comparability: Elkington, Spencer-Cooke (1997), Gray (2007), Adams (2008), DeSilva (2008), Horehăjovă, Marasovă (2008), Gray, Bebbington (2010), Lang, Lins, Maffett (2012), Martinčik, Polĭvka (2012), Szadziewska (2014), Ivanisevic, Stojanovic (2015), Lament (2015), Maraková, Lament, Wolak-Tuzimek (2015), Kristofik, Lament, Musa (2016), Lament (2017). The issue of insufficient transparency of non-financial information, caused both by the regulatory gap and by market imperfections, is one of the subjects addressed in research undertaken by the European Commission (*Report on Corporate Social Responsibility: promoting society's interest and a route to sustainable and inclusive recovery (2012/2097/INI). Report on Corporate Social Responsibility: accountable, transparent and responsible business behaviour and sustainable growth* (2012/2098/INI). The Directive 2014/95/EU, which lays down principles of compiling CSR reports, is a solution to these issues, although it applies only to large entities employing more than 500 staff. Its regulations can be expected, therefore, to affect only large businesses and to contribute to improved comparability of results and usefulness of the information.

Consequently, the subject can be treated as topical and requiring resolution by assessing the regulations of the Directive 2014/95/EU concerning improvement of comparability and usefulness of information presented in the reports, as well as assessment of quality of information published by financial institutions.

This paper aims to analyse and verify the applicable principles of CSR reporting in light of the regulations of Directive 2014/95/EU, as well as to evaluate quality of non-financial information presented in CSR reports of financial institutions in the Polish and in the Greek market.

Two research hypotheses have been postulated in connection with this aim:

(H1) – the Directive 2014/95/EU contains regulations that will contribute to improved comparability and usefulness of information presented in financial statements.

(H2) – financial institutions in the Polish and in the Greek market draft their CSR reports in different ways, which obstructs their comparability.

In order to verify hypothesis (H1), regulations of the Directive 2014/95/EU and specialist literature have been reviewed.

In order to verify hypothesis (H2), the author has conducted research into a group of financial institutions in the Polish and in the Greek financial market by examining and analysing CSR reports compiled in 2010–2015 with regard to quality of the information, in particular, its usefulness and comparability. This assessment involved reviewing of: principles of publication and verification of the reports, frequency of their drafting, volume, scope and structure.

Author is aware of the limited subjective scope which might lead to some restrictions when extrapolating the results onto all financial institutions operating in world. Examination a group of financial institutions in the Polish and in the Greek market by analysing quality their of CSR reports.

CSR reporting in financial institutions

The financial sector is a key industry to stakeholders, only apparently unconnected to sustainable development. This is demonstrated, inter alia, by the share of financial institutions reporting on CSR, more than 12%, coming top amongst the huge variety of sectoral reporting. Table 1 and Figure 1 show results concerning numbers of reports drafted by financial institutions globally and in Poland and in Greece, their significance in CSR reporting worldwide, as well as the share of financial institutions in the Polish and in the Greek market in CSR reporting.

Analysis of the results in Table 1 proves numbers of CSR reports compiled by financial institutions both globally and in Poland and Greece have been raising, evidence of a growing interest in Corporate Social Responsibility and a contribution to reducing the information asymmetry.

Evaluation of the level CSR reporting can be assessed not only based on the number CSR reports, prepared by financial institutions, but also by their reference to the number of financial institutions. This is show in Table 2.

Analysis of the results in Table 2 shows that the level of CSR reporting in financial institutions is greater in Greece, both for banks and insurance companies.

Table 1. CSR reports by financial institutions presented to GRI (Global Reporting Initiative) in 2010–2015

Specification	2015	2014	2013	2012	2011	2010
Number of reports by financial institutions – globally	690	669	621	513	468	324
Share of financial institutions in CSR reporting worldwide (%)	12.7	12.4	12.5	11.5	13.0	12.6
Number of reports by financial institutions – Poland	5	5	6	1	0	1
Share of Polish financial institutions in CSR reporting worldwide (%)	0.72	0.75	0.97	0.20	0.00	0.31
Number of reports by financial institutions – Greece	5	8	9	8	7	4
Share of Greek financial institutions in CSR reporting worldwide (%)	0.72	1.19	1.45	1.56	1.50	1.23

Source: The author's own compilation on the basis of: GRI Database.

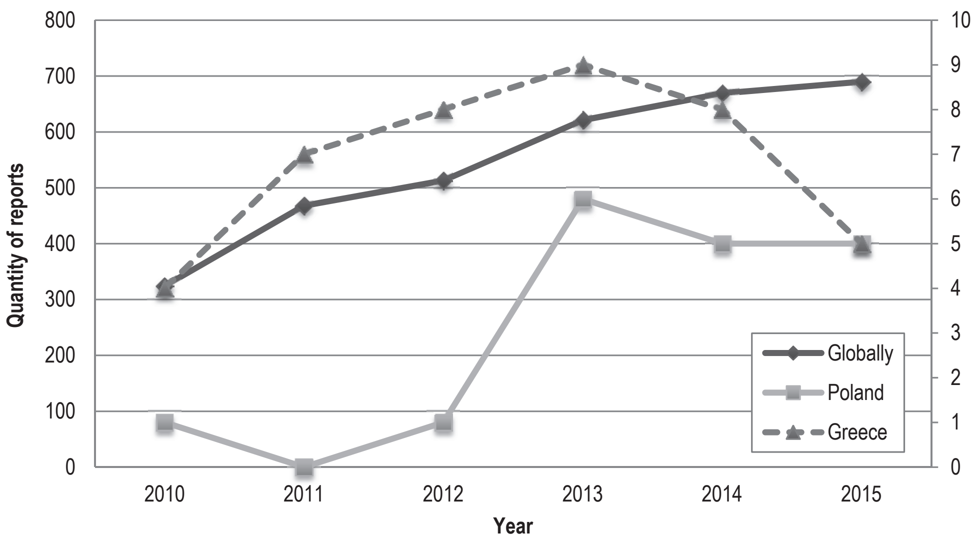

Figure 1. Quantity of CSR reports by financial institutions pressented to GRI in 2005-2015

Source: The author's own research on the basis of GRI.

Table 2. Level of CSR reporting in banks and insurance companies from the Polish and the Greek market in 2010–2015

Specification	Country	2015	2014	2013	2012	2011	2010
Number of banks	Poland	66	64	67	68	66	67
	Greece	39	37	36	53	53	62
Number of insurance companies	Poland	57	57	58	59	61	63
	Greece	40	65	66	69	69	73
Number of CSR reports (banks)	Poland	1	4	4	3	2	2
	Greece	0	4	6	7	6	5
Number of CSR reports (insurance companies)	Poland	0	1	0	1	0	1
	Greece	1	1	1	1	0	1
Level of CSR reporting in banks (%)	Poland	1.5	6.3	6.0	4.4	3.0	3.0
	Greece	0.0	10.8	16.7	13.2	11.3	8.1
Level of CSR reporting in insurance companies (%)	Poland	0.0	1.8	0.0	1.7	0.0	1.6
	Greece	2.5	1.5	1.5	1.4	0.0	1.4

Source: The author's own research.

Regulations of Directive 2014/95/EU and quality of non-financial information

The goal of Directive 2014/95/EU is to enhance cohesion and comparability of non-financial information disclosed by entities operating in the EU, especially as a majority of large organisations are active in more than one country. This should lead to presentation of a correct and full view of policies, results and risks of a given business. Thus, the Directive fills an existing regulatory gap and can be expected to contribute to improving comparability and transparency of CSR reporting.

Directive 2014/95/EU applies to large enterprises of public interest, i.e. quoted companies, insurance companies, banks and other organisations of public importance in view of their business profile and employing more than 500 staff on average in a financial year as at the balance closing date.

Pursuant to Article 1 section 1 item 1 of Directive 2014/95/EU, the organisations concerned shall include in their reports non-financial information, including information required to understand the development, results and position of the organisation and the impact of its operations in respect of environmental and social issues, respect for human rights, counteracting bribery and corruption, including:

– A brief description of the business model.

- A description of practices with regard to such issues, including due diligence processes in place.
- The outcomes of these practices.
- The chief risks associated with these issues and with the operations of the organisation,
- The key non-financial performance indicators relating to a given business.

Notably, reporting organisations:

- Must, as a minimum, provide explanations if they do not follow any policies in respect of the foregoing issues.
- By way of exception, may omit information about expected occurrences or matters subject to negotiations in progress if their disclosure might have a seriously adverse effect on commercial position of an organisation while having no impact on a correct and objective understanding of the development, performance and position of the organisation and the impacts of its activities.
- Can rely on national, EU or international framework principles. These should be specified in the circumstances.
- May be free from the duty to report non-financial information if they prepare a separate report which is published together with financial statements, or on the organisation's website, within six months of the balance closing date, and if financial statements contain a reference to such a report.

Analysis of the Directive's regulations shows:

1) Its scope covers only large entities; consequently, merely a narrow minority of businesses report,
2) Reporting standards may be selected from among certain specified international and EU norms of varying scopes of information. As a result, entities will report in accordance with different principles and guidelines.
3) An entity may not disclose its financials if it regards them as sensitive.
4) The compulsory verification applies only to the scope of non-financial information published and its compliance with the minimum. Non-financial information is not audited, therefore.

Methodology

This part of the paper aims to verify hypothesis (H2). To this end, the author has examined a group of financial institutions in the Polish and in the Greek market by analysing their CSR reports. The financial institutions that prepared CSR reports submitted to GRI (*Global Reporting Initiative*) in 2010–2015 were selected. The following issues were analysed and evaluated in particular:
– principles of reporting,
– report verification,
– reporting period,
– volume and scope of reports.

Examination subjects were 58 CSR reports (Greece – 37, Poland – 21), prepared in 2010–2015 by 18 financial institutions (Greece – 10, Poland – 8), including: 14 – banks, 2 – insurance companies, 2 – financial intermediaries. The group assessed are described in Table 3.

Table 3. Characteristics of the research group

Specification	2015	2014	2013	2012	2011	2010
Structure of CSR reports by country:						
– Poland	1 (50.0%)	6 (54.5%)	5 (38.5%)	4 (30.1%)	2 (22.0%)	3 (30.0%)
– Greece	1 (50.0%)	5 (45.5%)	8 (61.5%)	9 (69.9%)	7 (78.0%)	7 (70.0%)
Structure of CSR reports by financial institutions:						
– banks	1 (50.0%)	8 (72.7%)	10 (76.9%)	10 (76.9%)	8 (88.9%)	7 (70.0%)
– insurance companies	1 (50.0%)	2 (18.2%)	1 (7.7%)	2 (15.4%)	-	2 (20.0%)
– financial intermediaries	-	1 (9.1%)	2 (15.4%)	1 (7.7%)	1 (11.1%)	1 (10.0%)
Structure of CSR reports by financial institutions (Poland):						
– banks	1 (100%)	4 (67.0%)	4 (80.0%)	3 (75.0%)	2 (100%)	2 (67.0%)
– insurance companies	-	1 (16.5%)	-	1 (25.0%)	-	1 (33.0%)
– financial intermediaries	-	1 (16.5%)	1 (20.0%)	-	-	-
Structure of CSR reports by financial institutions (Greece):						
– banks	-	4 (80.0%)	6 (75.0%)	7 (77.8%)	6 (85.7%)	5 (71.4%)
– insurance companies	1 (100%)	1 (20.0%)	1 (12.5%)	1 (11.1%)	-	1 (14.3%)
– financial intermediaries	-	-	1 (12.5%)	1 (11.1%)	1 (14.3%)	1 (14.3%)

Source: The author's own research.

The data included in Table 3 shows that:
- CSR reporting is more popular in Greece than in Poland,
- most common reporting financial institutions are banks, both in Poland and in Greece.

Principles of non-financial information reporting in financial institutions from the Polish and the Greek market – results

The research implies:
1) The most widely the businesses examined drafted their reports in accordance with GRI guidelines, though using different versions as modified by GRI (GRI – G3 or GRI – G4) – Table 4.

Table 4. Structure of CSR reporting in financial institutions from the Polish and the Greek market in 2010–2015 by principles of reporting

Specification	2015	2014	2013	2012	2011	2010
All examined financial institutions::						
– GRI –G3	2 (100%)	7 (63.6%)	7 (53.8%)	10 (76.9%)	8 (88.9%)	7 (70.0%)
– GRI – G4	-	3 (27.3%)	4 (30.8%)	-	-	-
– Non GRI	-	1 (9.1%)	2 (15.4%)	3 (23.1%)	1 (11.1%)	3 (30.0%)
Poland:						
– GRI –G3	1 (100%)	6 (100%)	2 (40.0%)	4 (100%)	2 (100%)	3 (100%)
– GRI – G4	-	-	3 (60.0%)	-	-	-
– Non GRI	-	-	-	-	-	-
Greece:						
– GRI –G3	1 (100%)	1 (20.0%)	5 (62.5%)	6 (66.7%)	6 (85.7%)	4 (57.1%)
– GRI – G4	-	3 (60.0%)	1 (12.5%)	-	-	-
– Non GRI	-	1 (20.0%)	2 (25.0%)	3 (33.3%)	1 (14.3%)	3 (42.9%)

Source: The author's own compilation on the basis of: CSR reporting financial institutions.

2) The CSR reports were subject to external verification. 32 reports were not verified (Poland – 8, Greece – 24), which accounted for 55.2% of CSR reports (Poland – 38%, Greece – 64.9%). In individual years, the percentage of reports not were verified is as follows: (Table 5).

Table 5. Structure of CSR reporting in financial institutions from the Polish and the Greek market in 2010–2015 as per the verification criterion

Specification	2015	2014	2013	2012	2011	2010
All examined financial institutions::						
– verified reports	1 (50.0%)	7 (63.6%)	6 (46.2%)	5 (38.5%)	4 (44.4%)	3 (30.0%)
– unverified reports	1 (50.0%)	4 (36.4%)	7 (53.8%)	8 (61.5%)	5 (55.6%)	7 (70.0%)
Poland:						
– verified reports	1 (100%)	5 (80.0%)	3 (67.0%)	2 (50.0%)	1 (50.0%)	1 (33.0%)
– unverified reports	-	1 (20.0%)	2 (33.0%)	2 (50.0%)	1 (50.0%)	2 (67.0%)
Greece:						
– verified reports	-	2 (40.0%)	3 (37.5%)	3 (33.3%)6	3 (42.9%)	2 (28.6%)
– unverified reports	1 (100%)	3 (60.0%)	5 (62.5%)	(66.7%)	4 (57.1%)	5 (71.4%)

Source: The author's own compilation on the basis of: CSR reporting financial institutions.

3) Most businesses compiled their CSR reports for one year – 51 CSR reports, which accounted for 87.9% of all the reports (Poland – 16 CSR reports – 76.2%, Greece – 35 CSR reports – 94.6%). Bi-annual reporting was adopted in 7 cases (Poland – 5, Greece – 2), 12.1% of the total (Poland – 23.8%, Greece – 5.4%).
4) Volume of the CSR reports ranges from 25 to 146 pages. Structure of the CSR reports for financial institutions from the Polish and the Greek market according to their volume is presented in Figure 2 and Figure 3.

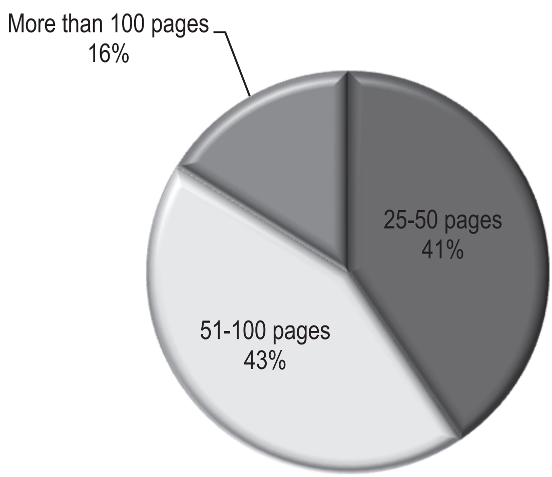

Figure 2. Structure of the CSR reports in financial institutions from the Greek market according to their volume

Source: The author's own compilation on the basis of: CSR reporting financial institutions.

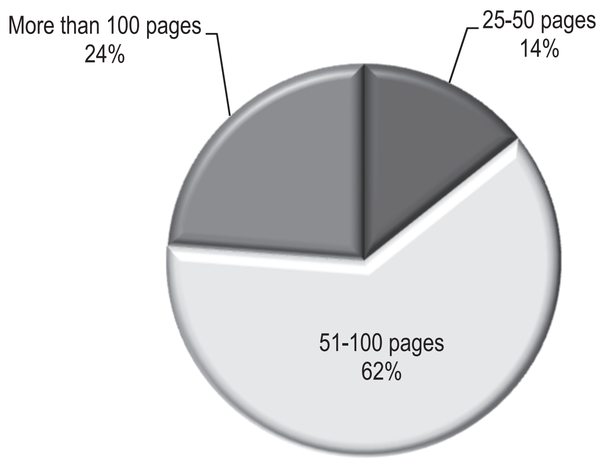

Figure 3. **Structure of the CSR reports in financial institutions from the Polish market according to their volume**

The author's own compilation on the basis of: CSR reporting financial institutions.

5) Shared element can be distinguished, however, arising from application of identical standards, e.g. social actions, natural environment, employees, action strategy, etc. Incomparability of CSR reporting concerns not only different entities but also periods of reporting by the same businesses. Scopes of the CSR reports vary, though they are drafted following the same guidelines.

Conclusion

The author's research discussed in this paper has helped to verify the working hypotheses:
(H1) – Directive 2014/95/EU contains regulations that will contribute to improved comparability and usefulness of information presented in financial statements.

Regretfully, provisions of the Directive do not solve the existing problems related to assuring adequate quality attributed of CSR reports. This is due both to the subjective scope of the Directive, covering solely large businesses, and its objective scope, as it offers freedom of choice of reporting principles, fails to impose the duty of verifying non-financial data, allows for omission of sensitive data, and fails to provide for sanctions.

Directive 2014/95/EU must be therefore assumed to fill a regulatory gap yet will contribute to improvement of CSR reports' quality to a limited extent, chiefly in respect of comparability and clarity.

(H2) – Financial institutions in the Polish and in the Greek market draft their CSR reports in different ways, which obstructs their comparability.

This is affirmed by the author's research, which indicates CSR reports vary with regard not only to entities but also to reporting periods by the same businesses. Major differences relate to: principles and areas of the reporting, frequency and volume of the reports, as well as their verification.

It must be concluded neither the existing regulations nor the reporting practices ensure the qualitative features in question. As a consequence, CSR reports are incomparable and unclear.

Introduction of sectoral reporting standards in future should be considered, as it would help to improve clarity and comparability of the reports.

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EVALUATION OF THE QUALITY OF BANKING SERVICES WITH THE USE OF THE SERVPERF METHOD

The purpose of this paper is to measure and evaluate the quality of banking services with the use of the SERVPERF method. The questionnaire method was applied in the study. The questionnaire was composed of two parts. The first part covered certificate questions specifying the customers of the bank and the second substantial part included the questions of the SERVPERF questionnaire. The author of this paper has studied merely the quality performance pursuant to the assumption of the SERVPERF method adopting the expectations of the customers at the maximum level.
The analysis of the results of the carried out study demonstrates that the biggest quality gap was observed for the dimension tangibles. The study of diversification showed that *tangibles*, *empathy* and *responsiveness* are diversified only by one factor. Education of the respondents was a variable that diversified the greatest number of dimensions.

JEL Classification Codes: C38, M31.
Keywords: quality, banking services, SERVPERF.

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Introduction

Development of today's global economy triggered by technological progress, liberalization of trade, reduction of costs of transportation and automation of production changes the operation model of numerous organizations. Today we are observing the evolution from traditional industries to service and innovative industries. One of the key phenomena is dematerialization of production. This leads to the expansion of the services sector (Ulbrych, 2016). In Poland the contribution of the services sector in the creation of the added value and the National Gross Product amounted to 67.3% in 2015 (MG, 2015), and in the entire European Union it exceeded 73.6% (Eurostat, 2015). However, at the same time, we may observe certain marginalization of the services issues present in the sphere of the theory (Dąbrowska, 2008; Rogoziński, 2003; Szymańska, 2015). Thus, these issues are worth discussing.

These days, the services sector is an area of the economy in which the entities are conducting their businesses within the area of the provision of services (PARP, 2005). This sector covers various industries and branches, the number of which changes together with its development. This makes the above described sector heterogeneous. The main characteristic feature of the services sector is the fact that its development, and at the same time, the participation in the economy, is increasing. Services, similar to the products, are the object of the turnover in the market. Their characteristic features determine their competitiveness among other sectors.

Banking services are specific, because they connect all of the participants of the trade exchange. In this particular case both product manufacturers and services providers are at the same time the customers of financial institutions.

Measurement and evaluation of the quality of services is not an easy task. It is proved by the increasing popularity of this subject in the global literature and the establishment of competing conceptual models (specifying the attributes of the quality and relations between them) and measurement models (suggesting the manners and tools used for the purposes of the measurement). In this study we applied the version of the method, which despite its imperfections, is a kind of a universal standard of the measurement and evaluation of the quality of services.

The purpose of this paper was to measure and evaluate the quality of banking services with the use of the SERVPERF method.

Characteristic of banking services

Provision of banking services is connected with the form assumed by the money and its function. A contemporary bank must meet the requirements of the economy based on the knowledge, in which the services play the dominant role. The symptoms of the satisfaction of these requirements are the modern market offers of the banks, individual customer service as well as advisory in skilful shaping of financial resources, whose aim is to provide satisfactory effectiveness of the activities taken up by an individual, as well as to contribute to the increase of the sense of security against the loss of the resources. The economic function of the banks in the market is a very crucial element driving the improvement of banking services which are no longer treated as the entities operating in the oligopolistic markets. There is a dominant conviction that they are functioning in highly competitive markets, where the battle for the customer is the most important issue (Korenik, 2006). Extra-economic aspects were also noticed. They are directly shaping the form of banking services such a technological progress of particular countries, culture and social stratification as well as political and legal decisions. The quality of modern banking services, the level of which depends on a number of factors, is a fundamental distinguishing feature of banks' competitiveness.

In the light of the theory of quality based management, the customer should always be in the centre of interest of banks and other organizations. It is even more important due to the fact that the characteristics of the provision of banking services is connected with the fact that they are not disposable or short-term, but the contact with the customer may last many years. Thus, every evaluation of their quality is based on the values worked out in a long-term perspective and so it may be subjective.

The subsequent element worth mentioning is the adjustment of the banks to the changes taking place in their external environment, among others the changes of customers preferences, places of residence, political decisions forcing the increase of the prices of the provision of banking services or the changes connected with the specificity of a given kind of services. For example, when a bank offers its customers the extension of the offer of the current and savings account and adds a special service connected with a vehicle or real estate insurance, a part of the customers will read it as the improvement of quality, but the other part will criticise the idea due to the fear for the increase of the costs of hitherto cooperation (Opolski, 2000).

Therefore subjectivity of evaluations connected with the approach to the customer presented by the bank cannot be entirely avoided.

It is also emphasized that the improvement of the quality of services contributes to the increase of profit. This phenomenon comprises of two stages. Firstly, the attachment of bank's customer by way of the efforts connected with the improvement of the services is a priority, what as a consequence results in the enhancement of customers' satisfaction, and at the same time the said attachment becomes stronger. The second stage consists in keeping the customer. To make this happen, the customer must be provided with the lowest level of quality so that transferring the account to the other bank is not seem to be lucrative (Zaleska, 2008). This strategy allows for the optimisation of the expenses for the quality, both in order to attract new customers, and to reduce the outflow of those that have already been acquired.

There is a number of determinants of the level of quality and it depends on the policy implemented by a given bank. However, the common denominator for all institutions belonging to this particular industry, is the conviction that a customer is the key for every decision and customer's loyalty determines the success of the bank.

Method of the studies

SERVPERF (*Service Performance*) is a method established in response to the criticism of the assumptions related to the SERVQUAL model, concerning the measurement of both quality performance and expectations of performance. The basis of the concept created by J. Cronin and S. Taylor is the understanding of quality in its traditional interpretation as a perfection of performance – ideal quality. Therefore the authors of the method recommend examining the quality of a provided service and then referring the said service to the ideal state (Cronin and Taylor, 1994). Therefore the measurement of the expectations of customers was eliminated in this concept due to the probability of existence of maximum expectations in relation to the analysed criteria.

In SERVPERF model, the measurement and evaluation of the quality of services may be realized on the basis of a set of factors covered by the SERVQUAL concept (Stoma, 2012). Pursuant to this concept the respondents aiming to take advantage of a given service for the first time should be selected, then asked to fill in a questionnaire of the evaluation of quality expected prior to taking advantage of a service and finally the respondents should be asked to answer questions concerning the quality after taking advantage of a given service.

A study carried out according to the guidelines established by J. Cronin and S. Taylor is at the same time less complicated and less time-consuming when compared to the SERVQUAL method study (Gilmore, 2003). Obtained results are much more restrictive and objective.

A study was carried out with the use of a questionnaire method. The questionnaire was composed of 28 positions. The first part included demographics questions which constituted a formal characteristic of respondents i.e. consumers in analysed industries. The second part, the substantial one, included 22 SERVQUAL questionnaire statements. However, merely the provision of quality was taken into consideration as pursuant to the assumptions of SERVPERF method, expectations should be adopted at the maximum level.

The selection of the sample was of purposive nature. The study covered hundred customers taking advantage of bank services. The number of the sample may be deemed as sufficient taking into account the fact that a great number of researchers in the quality and marketing area suggests the sufficiency of a total sample n=200 for even more complex measurement tools than the ones suggested in this paper (Ford, Walker and Churchil, 1975; Saxe and Weitz, 1982), including 40 respondents in each category of services (Parasuraman, Zeithaml and Berry, 1988).

The study was carried out in the period from 12th to 25th November 2016.

On account of demographic variables, a non-parametrical Kruskal-Wallis test was applied for the purposes of verification of statistical hypotheses concerning diversification of evaluations of particular quality dimensions between the distinguished groups. In this test, a zero hypothesis assumes that the samples originate from a population of the same Dispersion, while the alternative hypothesis states that they originate from different Dispersions. It may be described as follows:

H_0: Dispersion of a variable is the same for all codes of the grouping factor regarding the alternative hypothesis;

H_1: Dispersions of a variable for at least two codes of the grouping factor vary.

A consequence of the adoption of H_0 hypothesis, is the statement that the levels of the studied factor (groups) do not have any significant impact on the observed results. Similarly, a consequence of rejecting H_0 hypothesis is the statement that the levels of studied risk significantly influence the observed results. It is then stated that a given factor diversifies the results (Skrzypek (ed.), 2013). Kruskal-Wallis test is appropriate in the case, where at least 3 codes of a grouping variable are observed. In the case, where there are only 2 codes of the grouping variable, the U Mann-Whitney test is applied. In this case, zero hypothesis assumes that the averages are equal for both groups regarding the alternative hypothesis according to which the said averages vary.

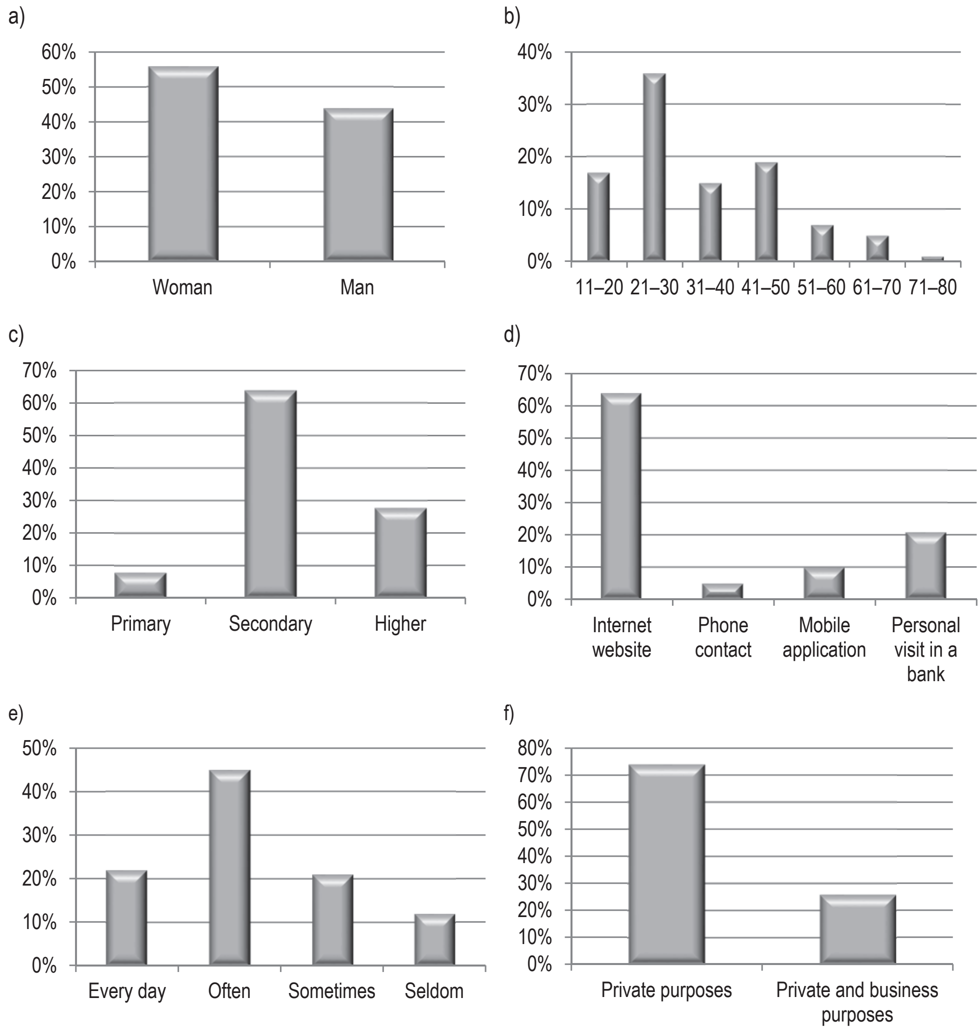

Figure 1. Layouts of sample characteristics: (a) sex, (b) age, (c) education, (d) manner of taking advantage of banking services, (e) frequency of taking advantage of banking services, (f) purpose of taking advantage of banking services.

Source: author's study.

Discussion on the results of the study

Figure 2 presents quality gaps identified in line with the assumptions of SERVPERF method.

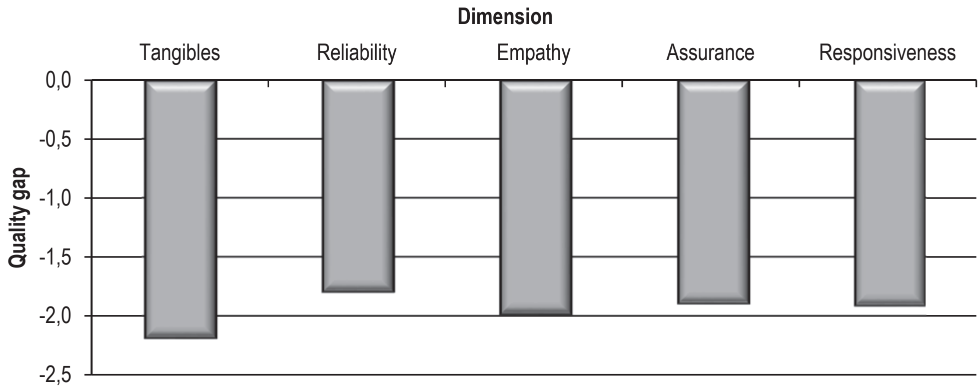

Figure 2. Values of quality gaps

Source: author's study.

Figure 2 demonstrates that the greatest discrepancy for researched dimensions between the quality level of a provided service and the ideal state has been noted for the dimension *tangibles* (average value of the gap amounted to -2.18), whereas the lowest value has been recorded for the dimension *reliability* (average value of the gap amounted to -1.79). It is worth remarking that for all dimensions, the indicated quality gap exceeded the value of 1.5 and this proves a relatively large discrepancy between the actual state of the quality of banking services and the level of their ideal quality.

Carried out study also proved that the recipients of banking services, evaluated the parameter of the quality of banking services representing the dimension – *empathy* at the highest level – individual treatment (5.32) and parameters within the scope of the dimension *reliability* – perfect registration of documents (5.28) and timeliness of service (5.27). All researched variables were found in the range <4.65; 5.32>. Variables within the scope of the elements of visual identification of an organization – attractiveness of buildings and surroundings (4.65), advertising materials connected with the provision of a service, were evaluated at the lowest level (4.7) (Lotko, Paździor, Nowak and Wójtowicz, 2017).

Table 1 presents a set of values of quality gaps for particular dimensions.

Table 1. Collective set of the values of quality gaps for particular dimensions

Variable	Value of the quality gap for particular dimensions				
	Tangibles	Reliability	Empathy	Assurance	Responsiveness
Sex of respondents					
Women	-2.14	-1.72	-2.00	-1.88	-2.06
Men	-2.23	-1.88	-1.95	-1.90	-1.72
Age of respondents (years)					
11-20	-1.69	-1.21	-1.67	-1.63	-1.99
21-30	-1.98	-1.51	-1.79	-1.60	-1.67
31-40	-2.77	-2.31	-2.43	-230	-2.12
41-50	-2.78	-2.48	-2.44	-2.51	-2.18
51-60	-2.04	-1.86	-1.80	-1.68	-2.29
61-70	-1.85	-1.84	-1.88	-1.75	-1.45
71-80	-0.50	0.00	-0.20	-1.00	-0.25
Education of respondents					
Primary	-1,53	-1.20	-0.73	-1.03	-0.88
Secondary	-2,04	-1.70	-1.98	-1.84	-2.01
Higher	-2,71	-2.16	-2.33	-2.25	-1.97
Ways of using banking services					
Internet Website	-2.19	-1.74	-1.98	-1.82	-1.84
Telephone contact	-2.40	-2.08	-2.32	-2.15	-2.15
Mobile application	-2.75	-2.54	-2.68	-2.93	-2.40
Personal visit in a bank	-1.85	-1.51	-1.55	-1.56	-1.83
Frequency of using banking services					
Every day	-2.17	-1.72	-2.28	-2.17	-1.97
Often	-2.36	-1.99	-2.09	-1.93	-2.05
Sometimes	-2.18	-1.63	-1.76	-1.80	-1.71
Seldom	-1.56	-1.47	-1.38	-1.40	-1.60
Purpose of using banking services					
Private purposes	-2.15	-1.77	-1.95	-1.87	-1.92
Private and business purposes	-2.28	-1.84	-2.06	-1.94	-1.88

Source: author's study.

The analysis of data included in table 2 proves that the highest (-2.77) value of the gap for the dimension *tangibles* was indicated by the respondents at 31-40 years of age, whereas the oldest age group indicated the smallest gap (-0.5). When observing the results for the dimension *reliability*, it should be marked that the greatest discrepancy between the obtained value and the ideal level of quality was indicated by the users taking advantage of banking services via a mobile application (-2.54). For the respondents of the youngest and the oldest age group, we proved the lack of discrepancies between the ideal level of quality and real quality – quality gap for this dimension was the lowest one. Within the area of *empathy*, it is stated that the highest value of the gap was indicated by the persons using banking services by way of mobile applications (-2.68) and at 41-50 years of age (-2.44), whereas the smallest gap was recorded in the opinion of the oldest group of respondents (-0.2) taking advantage of the services rarely (-1.38) and those, who prefer personal contact in the headquarters of the bank (-1.55). In the dimension *assurance*, the greatest gap was detected, similar as in the dimension *empathy*, among the users of banking applications (-2.93). The smallest gaps within this scope was indicated by the oldest respondents and persons who completed primary education, The highest value of the gap (-2.40) for the dimension *responsiveness* was stated among the respondents using banking services through mobile application and smallest gap (-0.25) among the oldest group of respondents and with an average level of education (-0.88).

Table 2 presents statistically significant diversification of the evaluation of quality dimensions in respect of particular certificate variables.

Table 2. Statistically significat diversifications of the evaluation of quality dimension in respect of particular certificate variables

Diversifying factor*	Quality dimension				
	Tangibles	Reliability	Empathy	Assurance	Responsiveness
Sex	0.8161	0.7865	0.6922	0.5072	0.0795
Age	0.1744	0.1685	0.6103	0.2031	0.5136
Education	0.0297*	0.2077	0.0013*	0.0741	0.0237*
Way of using banking services	0.3298	0.3868	0.1964	0.1690	0.7255
Frequency of using banking services	0.2269	0.7233	0.1408	0.4752	0.6947
Purpose of using banking services	0.5414	0.6423	0.8687	0.8161	0.9591

* at the level of significance $\alpha = 0{,}05$.
Source: author's study.

The analysis of table 2 demonstrates that merely the education of respondents was a variable that diversified three dimensions: *responsiveness*, *empathy* and *tangibles*.

Summary

The analysis of data based on the profile of customers using banking services provides a statement that the highest value (-2.78) of the gap was indicated by the respondents at 41-50 years of age. This results reflects the requirements in respect of the dimension *tangibles*.

No positive value of the quality gap was observed. The only zero value of the gap was recorded for the dimension *reliability*. This means that the level of the obtained quality of banking services for the oldest group of respondents was equal to the level of ideal quality.

Women evaluated the dimension *reliability* at the highest level (-1.72), whereas men opted for responsiveness (-1.72). In the opinion of the oldest group of respondents, the smallest quality gaps were recorded within the scope of all studied dimensions. While the group of respondents at 41-50 years of age indicated the highest values of quality gaps.

Persons who completed primary education evaluated the provided banking services at the highest rates. It is evidenced by the lowest values of recorded quality gaps within the scope of all dimensions in this particular group of respondents.

A personal visit in a bank is one of the ways of using banking services. According to the opinion of respondents, the quality level of such a personal visit proved to be very close to the ideal quality – the smallest gap for the dimension *reliability* (-1.51). On the other hand, due to the frequency of using banking services, the respondents who use such services rarely, recorded the lowest values of quality gaps in all measured dimensions. The recipients of banking services for personal and business purposes indicated the largest quality gap for the dimension *tangibles* (-2.28), whereas the smallest gap between the obtained value and the ideal value was observed for the respondents using banking services merely for private purposes for the dimension *reliability* (-1.77).

A factor which significantly diversified three criteria was the education of the recipients of baking services. A diversification may be spread among the entire population only for this particular factor.

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SOURCES OF FINANCING FOR INNOVATIVE BUSINESS ACTIVITIES IN POLAND

Financing of innovative business activities at early stages of their development is an extremely important condition of their growth. Start-ups, facing limited access to the formal capital market, look for an alternative. This is the informal market of capital investors, venture capital funds, and increasingly popular crowdfunding. It is the objective of this paper to analyse and evaluate sources of financing for innovative start-ups.

JEL Classification Codes: L210, L260.

Keywords: start-ups, business angels, venture capital, crowdfunding.

Introduction

Financing of new-formed innovative undertakings involves securing funds for projects whose capital requirements are (in most cases) greater than assets held by an entrepreneur/owner. Obtaining financing consists in proving business plans are promising and their realisation is viable and run by competent management. Start-up enterprises, a major source of innovativeness in a national economy, are analysed. Most start-ups are micro and small enterprises that begin their operations on the basis of an innovative idea. As their access to the formal capital market is limited, start-ups look for alternatives, including informal investors, high risk, mainly venture capital funds, and increasingly common crowdfunding.

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It is the objective of this paper to assess and analyse sources of financing for innovative activities of start-up enterprises. To this end, the following research hypotheses have been adopted:
H1: Innovative enterprises at initial stages of their development need specific sources of financing;
H2: Equity is the key source of capital for start-ups;
H3: Informal investors are a major source of capital for new, innovative business initiatives.

For the purposes of achieving the objective and demonstrating the hypotheses, data and information are analysed. provided by Polish and international institutions and organisations of the formal and informal financial markets.

Specific forms of financing for start-up enterprises

Private equity (PE) and venture capital (VC) funds are instruments investing in private, unquoted enterprises, usually in the medium to long terms. Private equity encompasses a broader swathe of the financial market, including segments like: venture capital, buyout capital, mezzanine and property funds. Their different interpretations arise from specific features of each market. VC capital is invested in other than public entities at early stages of their development.

The venture capital market is divided into its formal and informal parts. The former is primarily represented by venture capital funds, the latter by business angels.

High-risk funds – Venture Capital

Venture capital funds are closed-end, with a group of investors outlaying their capital on development of enterprises in early phases of development, characterised by a high risk but capable of high returns. ‘Venture capital is equity external investors bring for a limited time to small and medium-sized enterprises that have products, production methods or services that pose a great risk of investment failure but, if the undertaking supported by investors succeeds, provide a substantial growth in value of invested capital, realised by way of selling shares’ (Węcławski, 1997, s.17).

VC funds commonly invest in innovative projects based on state-of-the-art technologies. The possibility of financing risky projects that would not otherwise find classic sources of funding like bank credit is the advantage of this type of investments. Extensive knowledge and management qualifications (employed in the process of project development) are additional strengths of such funds. Venture capital investments boost credibility of a firm in the eyes of other funds and institutions (e.g. banks). Their principal drawbacks comprise lower valuation than in a public offering and impossibility of a specialist transfer of know-how (in the case of a sectoral investor).

Private investors, banks, large enterprises, pension funds, insurance companies, public institutions are primary providers of capital.

Venture capital funds invest in enterprises at various stages of development, therefore, several phases of investing are distinguished:
- Seed financing,
- Start-up financing,
- Later stage financing,
- Growth financing,
- Financing of buyout operations.

Financing for the initial stages of enterprise development (seed and start-up) is the greatest challenge to investors in organisational, specialist and financial terms; added to all that, these stages are liable to above-average risks. In the seed phase, capital is spent to build prototype products, conduct market research or prepare a business plan. At the start-up stage, the risk capital is allocated to establishing a business or launching of a product. At the time of growth and expansion, the capital is used to finance considerable investment requirements or roll out a distribution network by means of co-financing or capitalisation (limited share issue). Buyout financing consists in financing of share acquisition by existing management from owners or share acquisition by an external management team who will take over at the firm.

The figures published by the European Equity and Venture Capital Association (EVCA) suggest value of such investments in Poland amounted to approx. € 800m in 2015, more than triple that in the preceding year (€251m). With regard to numbers of investments, venture capital funds accounted for 61% of all private equity (PE) transactions. In respect of value, investments into growth and buyout phases prevailed, constituting 98% of the overall value of the PE transactions.

Analysis of shares of the particular investment stages in venture capital financing in Poland shows investments in start-ups are the most important in terms of both numbers and values (Fig. 1).

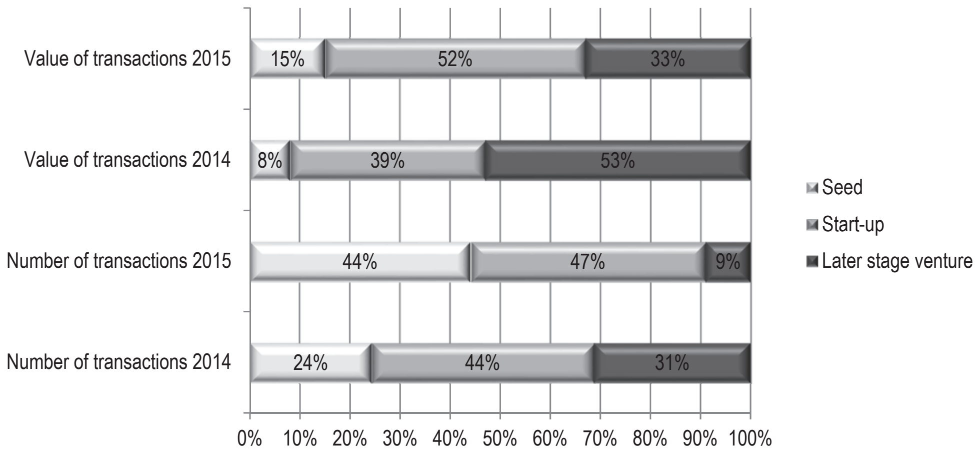

Figure 1. Shares of the particular investment stages in venture capital investments in Poland

Source: *Rynek private equity w Polsce. Trendy i szanse rozwoju*, Raport KPMG, Warszawa 2016, s. 18.

In 2015, VC investments in start-ups accounted for 47% of transaction volumes, 13% more than a year before. They constituted 52% of the total value of transactions involving these funds. The growing significance of financing for seed investments is especially notable. Value of these transactions is low, yet clearly tends to rise. Prior to 2012, seed investments were rare, yet growing ranks and specialisation of venture capital funds have raised the numbers and values of the transactions. As a result, they accounted for a quarter of all VC transactions in 2014 and more than 40% a year later.

Private equity in 2015 was invested in firms operating in sectors of computers and consumer electronics (23%), business services (16%), IT technologies, media and communications (11%), medicine and pharmaceuticals (10%). The large share of consumer electronics in PE investments is a result of the high incidence of venture capital investments in this sector.

Business Angels (BA)

Informal private investors, referred to as business angels, increasingly often fill the market gap arising from capital deficits. These denote individuals who allocate their own financial resources to new, most frequently innovative business undertakings. Aside from financial support, they offer specialist assistance, know-how, qualifications, market knowledge and business contacts. BAs are people who have been successful in the market, therefore, they know the market and understand risk and are thus able to effectively help entrepreneurs to create and manage a firm and construct its development strategy. In return, business angels expect to share in profits. 'Business angels are entrepreneurs and business people of substantial professional experience, whose work has generated substantial private assets, investing their savings at arm's length for a few years in shares of small and medium-sized enterprises which are not quoted in the public market, normally at early stages of development and displaying high potential of value growth' (Tamowicz, 2007, p. 7). Thus, the role of business angels is not limited to that of key capital providers. They fulfil essential functions in supporting innovativeness and building of competitive advantage.

National and international sources characterise business angels as males aged over 40, most often with education in economics, successful in the market and willing to invest their funds in new, innovative, high-risk business undertakings, expecting high returns on their invested capitals.

In the process of making decisions to accept or reject a project, business angels normally analyse the following factors (Mirowska, 2002, p. 85):
– Financial condition of an enterprise,
– Innovativeness of a product or service,
– Industry, sector and standing of a given market in the economy,
– Competences, experience and commitment of management staff,
– Possibility of active involvement in the enterprise's operations,
– Risk of an undertaking, very high in the case of investments financed by business angels,
– Location of the enterprise – 'angels' prefer close and frequent contacts with management and insights into progress of an undertaking.

Increasingly often, however, 'those relating to entrepreneurs and enterprise teams are the key group of factors influencing the angels' decision. In this way, investors appreciate the value of human capital while cutting their agency costs. Criteria connected to the nature of an enterprise opportunity, such as features of a product, market or financial prospects, are somewhat less important. To use a metaphor applied in research into the interface of the capital market and entrepreneurship, business angels may be said to invest in jockeys rather than horses, therefore'(Morawczyński, 2014, p. 302).

Private investors are normally reluctant to show off the monies they are willing to invest. They treasure their anonymity as a rule. To facilitate contacts between investors, enterprises and entrepreneurs, the so-called business angel networks are built to coordinate information flows between investors and entrepreneurs. Angels are provided with access to investment propositions and entrepreneurs with access to external financing. This is the entire coordinating role of the networks. Both the parties, i.e. investors and entrepreneurs, make their investment decision on their own and at their own risk. Angels prefer local investments (geographical vicinity), that is, close distance and possibilities of quick contact, as well as knowledge of a sector are major factors in selection of projects. As a business angel shows genuine interest in a young innovator and their project, they are supplied with documents to conduct the due diligence process of a company or a young investor (analysis of business plan, talks with their originator and directors, verification of references and histories of the entrepreneur and potential management, telephone interviews with current and potential clients of the enterprise, talks with strategic partners and lawyers, discussion of the undertaking with potential cooperating firms, expert consultations regarding potential of a given product). If, in effect of the due diligence procedure, a business angel is still willing to invest in the firm, or even the innovator, terms and conditions of an agreement are negotiated, including sums of capital to be committed and ownership structure. Business angel's exit from the investment matters as well. 'Disinvestments from 40% of enterprises are carried out by generating financial losses. In 26% of the projects, a business angel sells their shares to a strategic (sectoral) investor, 16% of business angels sell their shares to other investors, including to external investors in 10% of the projects. As a consequence, disinvestment by floatation or management buyout is carried through in merely 8% of the cases (Dąbkowski, 2015, p. 25).

Business angel networks are currently estimated at 470 organisations in Europe and 340 in the U S. EBAN – European Business Angels Network – is the largest organisation of this type in Europe. POLBAN – Polish Business Angels Network, linked with Polish Private Equity and Venture Capital Association (SIK) – operates in Poland. EBAN is a platform for sharing experience among the European Union countries, with POLBAN a member of the network. Business angels are currently active in all European countries and number 300 000 individuals. They invested a record €6.1bn, or 71% of total investments in innovative undertakings, in 2015.[2]

EBAN data show 411 informal investors were active in Poland in 2015, who invested € 12.35m in 32 investments (Table 1). The Polish business angel market is developing, as demonstrated with rising numbers of investors and overall value of their investments, as well as the network's expansion.

[2] Figures sourced from: www.eban.com [accessed on 27.05.2017].

Table 1. Business angels' investments in Poland (after EBAN)

Specification	2014	2015	YoY
No. BANs	4	5	↑25%
No.Bas	160	411	↑156%
No.Investments	38	32	↓15%
Total BA Investment 2015 (€ m)	9.5	12.35	↑23%
Average Investment per BA (€ K)	41 125	30 049	↓27%
Average Investment per BAN (€ m)	1.6	2.4	↑56%
Average Investment per Company	173 158	-	-
Jobs created	233	-	-

Source: The author's own compilation on the basis of EBAN data, www.eban.com [accessed: 27.05.2017].

Examples of business angel investments are Google, Amazon and Uber, firms that, in their creativity and innovativeness, have come up with previously unheard-of services. Until they emerged, markets of Internet advertising (Google), online sales (Amazon) or genuine competition for taxis (Uber) had been virtually non-existent. Business angels are also visible in the domestic market, for instance:[3]

- *Polidea* – specialising in development of applications and transfer of content to mobile equipment. The business was established in mid-2009 following investments by two business angels: Tomasz Grzybowski and Krzysztof Gawrysiak, who invested less than PLN 100,000. In return, they acquired 40% shares. Owing to their contacts and commitment of the management team, Polidea signed a big contract with a foreign client as early as in the first weeks of its operation. After eighteen months, they employed 30 people and worked for global and domestic market leaders like Allegro or Onet. They have built a unique publishing platform for mobile devices – Pixblish. It is used by *Polityka* weekly, introducing its contents to tablets.
- *W biegu cafe* – a chain of cafes opened in major cities (Warsaw, Łódź, Kraków, Wrocław, Sopot, Gdańsk), a total of 18 at the moment, most located in city centres or big malls. Its CEO, Maciej Adamaszek, declares he wants to open 7–10 new outlets a year. He started the business with his savings in 2005. That was only enough for the first two cafes – one in Kraków and Warsaw each. He sought financing for further development

[3] Sourced from: www.pi.gov.pl [accessed on 27.05.2017].

with banks and VC funds. He managed to find it, via Lewiatan Business Angels, with Piotr Pośnik, who decided to invest several million zlotys (acquiring 50% shares in return).

Community financing (crowdfunding)

Venture capital funds and business angels have been increasingly active at financing new, innovative investment undertakings since early 1990s. Market requirements exceed these finance capacities, however. Development of web sites (the so-called Web 2.0) and the possibility of micro-payments, both domestic and international transfers, have paved the way for a new source of financing for business ideas. This is community financing, referred to as crowdfunding. It may compete with alternative capital funds in future. Contrary to other forms of business financing, it can also be used for other than business purposes (e.g. charity, sports).

Crowdfunding is a method of collecting capital form the Internet community in order to finance a new project in return for a pre-arranged consideration (e.g. share in profits). Any business, scientific, cultural or social undertaking may be funded. In respect of business, it can be establishment of a new firm, launching of a new product/ service, for instance. High numbers of investors (donors) paying minor sums is characteristic for this way of financing. The collection is carried out on specific, specialised Web platforms. '*Crowdfunding is a type of collecting and allocation of capital to develop a specific undertaking in return for agreed-upon performances which involves a broad range of capital providers, uses IT technologies and has lower entry barriers and better terms of transactions than those generally available in the market*" (Król,2013).

Future sharing of profits or co-ownership of a project are some forms of consideration for a community financing a given project. This is the so-called equity crowdfunding, used to finance new business projects, or start-ups. Material prizes, bonuses or other items may serve as consideration. With regard to forms of consideration for financial support, three types of crowdfunding are distinguished (Boniewicz, 2015, p. 58):

1) Equity – in exchange for financial support, investors receive shares in a project or other property rights like bonds. In effect, this form is dedicated to enterprises pursuing business projects;

2) Loan-based – an auction system on the micro scale. A borrower, usually a private individual, may obtain a loan for a goal of their choice by means of a specialised platform. Each loan is funded by a group of people;
3) Donation-based – reward-based and the so-called sponsorship. The former is pure charity and no considerations other than possible expressions of gratitude are expected. Projects as part of this model are realised for the public good, that is, not for profit, and are commonly initiatives of foundations or organisations, though private individuals may be their ultimate beneficiaries as well. As part of the sponsorship model, a project originator clearly determines the way a donor will be rewarded depending on the sums in question. A reward is obligatory in this case. The sponsorship model is most often taken advantage of by private persons, with projects either commercial or non-profit.

Development of crowdfunding is in fact connected with emergence of the Web platform Kickstarter.com in 2009, though the idea itself goes back a far longer time. Kickstarter is the best recognisable crowdfunding platform globally. It reaches to entities seeking capital in a variety of fields, mostly in creative industries. Until 2015, 13 million people had supported its projects with a total of $3.1bn, successfully financing 125 352 projects (35% o all submitted)[4].

The US crowdfunding market totalled $4bn and the UK market GBP 1.74bn in 2014. The global market in 2015 is estimated at 7–8 billion dollars. The World Bank forecasts its value will reach $93bn in 2025 (Mazurek, 2014). The Polish community financing market is small, with several donation (e.g. Polakpotrafi.pl, Siepomaga.pl), loan-based (e.g. Finansowo.pl, Kokos.pl) and two equity funds (Beesfund.pl and Crowdangels.pl). Polakpotrafi.pl is the first and one of the largest crowdfunding portals in Poland. It was established following the model of the American Kickstarter at the Poznań University of Technology in 2011. It is based on the donation model and features prizes. Till 2017, 186 255 users paid more than PLN 17,732m. 1400 out of 3001 projects submitted (that is, 47%) have been successful. The largest project attracted PLN 385,600 from 3688 users[5].

Crowdfunding is the latest form of obtaining finance for often unconventional, innovative projects. Creators submitting their projects to a platform gain not only monies but also a variety of non-financial benefits, including:

[4] Sourced from: www.kickstarter.com [accessed 20.05.2017]

[5] Sourced from: www.polakpotrafi.pl [accessed 20.05.2017]

verification of the project, marketing tools and extensive access to the Internet community. Beside the undoubted advantages, a number of shortcomings of crowdfunding are indicated, such as lack of legal regulation in Poland, absence of consulting and monitoring of undertakings, and of security guarantees for investors, as they are not stipulated by law.

Financing of start-ups in Poland

Searching for new sources of financing for new enterprises is a major challenge to their owners. It decides survival and development of these firms in the market.

Studies of Polish start-ups indicate half of them rely exclusively on their own resources. As far as external sources are concerned, European Union funding (24% of enterprises examined), venture capital funds (22%) and business angels (17%) are selected most frequently. Bank crediting was utilised by a mere 6% of the firms. Crowdfunding finances investments in 2% of Polish start-ups (Skala, Kruczkowska, 2016, p. 32)

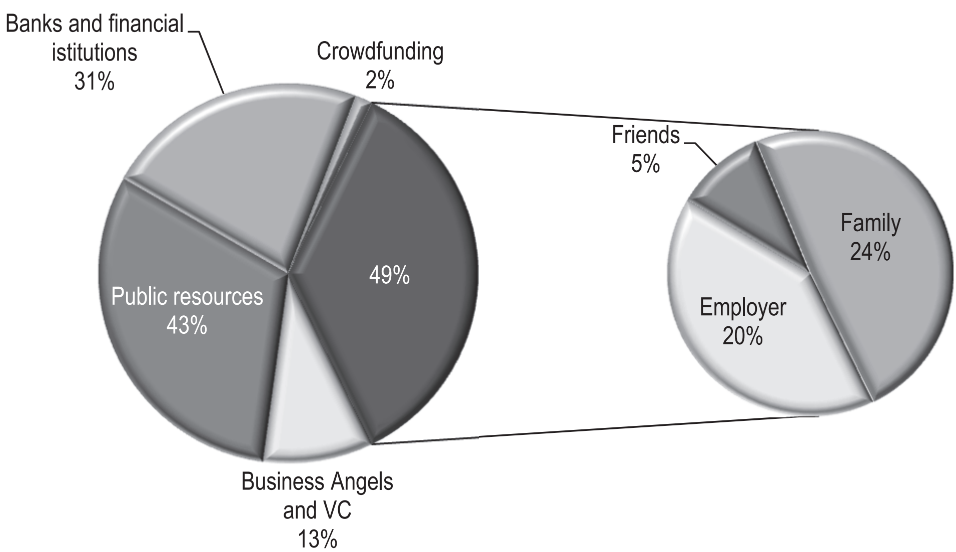

Figure 2. External sources of financing for new businesses in Poland in 2015 (multiple choice)

Source: The author's own compilation on the basis of: A. Tarnawa, D. Węcławska, P. Zadura-Lichota, P. Zbierowski, *Raport z badania – Global Entrepreneurship Monitor. Polska 2015*, PARP, Warszawa 2016, p. 65.

PARP's survey as part of GEM shows similar tendencies. Public monies were the chief source of financing at early stages of development (43%), while 31% of the entities reviewed resorted to support from banks and financial institutions. Nearly a half took advantage of capital from informal investors, namely, family, friends or employers. 13% of the firms asked utilised venture capital and business angel funding. Start-ups gained a minimum of financing from crowdfunding, mainly because it is novel in the domestic market (Fig. 2).

GEM (Tarnawa, Węcławska, 2016) reports a starting enterprise had an average of PLN 100,000 in 2015. A half spent no more than PLN 42,000, though. PLN 58,000 were their own funds. Half of the enterprises spent less than PLN 30,000 to begin their operations.

Conclusion

Start-ups are micro or small firms that offer innovative products or services, have been in the market for a short time and run above-average risks. An efficient environment, the so-called ecosystem, is required for such undertakings to develop. Financing is one of its parts.

Financing of start-ups in the Polish ecosystem is relatively under-developed, due to low savings in the economy and poor network of institutional support, including business angels and venture capital funds, as well as tax incentives to invest in start-ups, inter alia. Analysis of literature and statistics suggests the following conclusions:

1. Own funds are the key source of financing early stages of business (50%);
2. Capital of informal investors (family, friends, employers) and public resources (chiefly European Union funding) are the most commonly used external sources of financing: 49% and 43%, respectively;
3. The Polish business angel market is developing, as proven with rising numbers of investors, the expanding network and growing total value of the investments, related to wealth of society and availability of financial surpluses;
4. Both own capital and funding by informal investors are assigned to investments liable to lower risks, proof of the essential role of higher-risk capitals;
5. In 2015, PE investments in Poland totalled € 803.5m, with a prevalence of venture capital investments (above 60%);

6. In 2015, VC investments in start-ups accounted for 47% of the transaction volumes, 13% more than a year before. They constituted 52% of all transactions by these funds in Poland;
7. Crowdfunding is the latest way of securing finance for often unconventional, innovative projects. Crowdfunding accounted for investments in approx. 2% of Polish start-ups in 2015.

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THE ECONOMIC CRISIS – ITS CAUSES AND RESULTS AND THE LIMITING VENTURES (SELECTED ASPECTS)

Economic crisis, which took place in the years 2008–2009, was one of the biggest crises, which affected the world's economy. It began in the United States, and then it moved through most countries in the world, especially the highly developed, and the effects of this crisis have been very painful for the entire global economy. It should be stressed that the framework of the economic crisis include the period 2008–2010, although its roots go back to an earlier period than 2008, and its consequences – according to the authors – will be felt for many years. In the wide range, the financial crisis referred to the economic collapse, caused by making the wrong decisions by the monetary authorities of individual countries, unskilful actions of speculators and recession on the course of business cycle. Undoubtedly it was globalisation which contributed to such state, which has led to a great openness of economies, which in turn resulted in the transfer between all economic phenomena, both the positive and the negative. Moreover, globalisation caused the fact that crisis phenomena are growing strong, more and more noticeable and faster and faster move between individual countries. Trade and financial relations, and (perhaps most importantly) the panic in the markets, are responsible for this process.

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Introduction

A characteristic feature of each country's economy is its cyclicity and consecutive economic growths and declines, which are connected with the periodicity and which are its integral part. Modern world economy is an economy of very strict relationships among individual countries, and the economic fluctuations of one country affect other countries.

Globalization has led to very open economies, which results in the transfer between them of any economic phenomena, both positive and negative. Moreover, it caused the crisis phenomena to be stronger, more noticeable and to transfer faster between individual countries. Business and financial relations, as well as (or perhaps most importantly) the panic on the markets, are responsible for this process. History shows that it is not the lack of synchronization between the economic cycles is the biggest threat to the countries, but their imprudent policy, lack of appropriate financial supervision and speculations.

Modern economic crisis, which took place in the years 2008–2009, was one of the biggest crises which hit the world economy. The crisis began in the United States of America, and then it passed through most of world's countries, especially well-developed. The effects of the crisis were very severe for the whole world's economy (Adamczyk, 2012, p. 13) and it is considered to be the most extensive in the post-war period.

It should be mentioned that identifying modern crisis with recession – periodic reduction in the absolute level of production (Kołodko, 2010, p. 82) – is both intellectually and politically incorrect simplification.

The aim of the following article is the analysis of the influence of the economic crisis (The United States, Poland) on the consumers' behaviours on the banking products market in the context of the credit policy of commercial banks.

Economic crisis in the United States and in Europe

As a result of dynamic economic development in the years 2003–2006, especially of the emerging markets (*emerging economies*), the first indications of the overheating of the economy appeared in the United States (2007), which was manifested through: inadequate production capacity in relation to demand, limitation in the availability of qualified workforce, inflationary pressure, as well as growing trade deficit (Adamiec, Russel, 2009, p. 7).

In case of normal economic cycle in such conditions the slowdown of economic development takes place, followed by the return to the dynamics adequate to the economic potential. However, a serious imbalance on the real estate market, which appeared in that period of time, destabilized the process. Among the main factors which led to the spread of global economic crisis, excessive risk appetite is mentioned, which was connected with the successive FED interest rate cut, as well as the desire to maximize profits by investors.

Low and falling interest rates in the United States since 2001, caused the increase of the number of mortgage loans granted by banks for the purchase of a residential real estate, and thus they led to dynamic growth in their prices. What is more, the growth of the demand for the above mentioned real estate was boosted by the relaxation of the assessment criteria on the part of the lenders, which means that the loans were granted to people of with poor or unsatisfactory credit history, which was associated with a high risk. In addition, taking mortgage loans was encouraged by the low initial interest rates, which increased dynamically upon the expiry of the preliminary period, making them attractive for borrowers establishing a new mortgage. Therefore, there was an intensive growth of the market of subprime loans, which initiated the phenomenon of securitization (Owsiak, 2003, p. 744)[3] of mortgage loans, which is a process based on the transfer of liability of credit risk from the lender to the investor.

The increase of the interest rates in the years 2006–2007 in the United States with the simultaneous fall of the prices of residential properties caused the inability of a significant group of the higher risk borrowers to repay their loans in case of increased interests. The higher risk borrowers had particular problems with the settlement of the raised loan liabilities as they were overwhelmed by the interests (Prosser, 2008).

The speculative bubble on the mortgage credit markets began to burst in the second half of 2007 when the bubbles started to inform about the incurred losses, as well as the threat of bankruptcy. By the end of 2007 tens of financial institutions announced their insolvency. Simultaneously worsening

[3] Securitization is a modern financial operation which enables businesses, financial institutions and banks to raise capital. The name of the operations is derived from the word securities. It is a conversion of liabilities into securities. It is used when within the framework of creditordebtor relations the operators decide to substitute the assets e.g. in the form of liabilities, into securities (shares) or debt (commercial papers, bonds), but those that are more easily transferable than e.g. the classic receivables.

economic situation led FED to lower the interest rates drastically – to 2% in 2007, as well as to grant to commercial banks loans amounting to the total sum of 41 billion of USD (Rymarczyk, 2010, p. 17–19).

The toughest moments for the financial markets took place in 2008 when Bear Stearns bank collapsed in March and Merrill Lynch, Goldman Sachs, Morgan Stanley, Lehman Brothers and Citigroup banks were considered potentially at risk of bankruptcy and thus they were recapitalized by the State. Despite this support, Lehman Brothers and Merrill Lynch declared insolvent, and the biggest insurance firm AIG as well as financial institutions of insurance market of the USA, Fannie Mae and Freddie Mac, were taken over by the State.

As a result of dynamic spread of the crisis, the American government decided to make further interventions. In October 2008, a so called Paulson's plan[4] was adopted, the aim of which was to recapitalize financial sector for 700 billion USD. In the wake of bankruptcy of several important banks, as well as the growing risk of bankruptcy of another banks, there was a serious crisis of confidence in the interbank market.

Decreasing liquidity on the interbank market, but also declining level of consumption and production, growth of unemployment and the level of indebtedness caused the fact that FED decided (in December 2008) to reduce the level of interest rates to historically low level of -0.25%.

Another negative consequence of the limited supply of loans by banks was the fall of car sale. In 2009 the American government, in order to protect motor magnates Chrysler and General Motors from bankruptcy, decided to recapitalize these corporation for the amount of over a dozen billion USD.

Both in the banking and motor sector there were drastic job cuts. Only in 2008, 2.6 million people lost their jobs and it has been the worst result since the Second World War and the unemployment rate was 7% at that time. At the end of September 2008, the perturbations of the economy plunged in crisis caused sharp decline in American stock index, Dow Jones Industrial Average, which dropped during one session by about 7%. Standards & Poor's and NASDAQ indexes declined by about 9% and it was the biggest single-session drop in 21 years. Due to the decline in GDP growth in most countries

[4] Paulson's Plan – Emergency Economic Stabilization Act of 2008 (EESA) – rescue package for the US financial sector, proposed during the financial crisis in the US in 2008 by Henry Paulson, Treasury Secretary in the office of George W. Bush. The main objective of this plan was the buyout of bad debts from the market which were granted by banks to customers who were not able to repay them.

of the world in 2008 and unfavorable forecasts for the future there was a decline in commodity prices, especially crude oil and copper. The prices of oil dropped from over 140 USD per barrel to less than 40 USD, whereas the price of copper dropped from over 9 thousands to nearly 3 thousand USD per ton (Rymarczyk, 2010, p. 17–19).

According to the estimates of International Monetary Fund by October 2008 the losses caused by the crises in the USA amounted to 1.4 billion USD (which is approx. 10% GDP), of which 750 billion were mortgage loans, and 650 billion USD were other „toxic papers". However, the losses were probably smaller, as these estimates referred to the then market value of loans, rather than to actual losses.

One of the reasons for the deepening of the crisis in the USA in September and October of 2008 was the deterioration of the foreign investors' trust to the American market, and their decision to make investments in other regions of the world. However, as it soon turned out other world markets, although a bit later, also had turbulence, the consequence of which was the return of foreign capital to the USA at the end of 2008 and slight relaxation of still deteriorating economic situation (Małkiewicz, 2010, p. 98).

After a moderate pickup in the first half of the year (by 0.9% in the first quarter and by 2.8% in the second quarter) national income (GDP) of the Unites States decreased in the third quarter of 2008 by 0.5%, and in the fourth quarter by 6.3%, which was the biggest quarterly decline in GDP recorded in the US economy since 1982. As a consequence the national income of the US increased in 2008 only by 1.1%, which was much less than in 2007 -2.0% and in 2006 -2.8% (Firlej 2011, no. 4, p. 184–185).

In 2009 in connection to the unsatisfactory effects of corrective actions initiated in the previous year by the administration of President Bush, the new administration of President Obama, along with the Fed, decided to take further initiatives aimed at stimulating the US economy. In February 2009 the American Recovery and Reinvestment Act, so called ARRA, was adopted for the amount of 787 billion USD.

The program included the implementation of tax credits and benefits and to finance by the State the investment programs, inter alia: in terms of health, education and modernization of energy infrastructure. The US government also took endeavours which aimed to support homeowners having problems with the repayment of their loans. Help was based on the alleviation of the conditions of repayment of loans, as well as the reduction of the auctions of houses seized by banks for unpaid loans.

The amount of monthly rate was limited to the level of 31% of the owner's income and the repayment of the remaining part of the loan was rescheduled. In 2009 there was the decrease in consumption by the Americans which was connected with the employment reduction, as well as their serious personal debts. Due to the difficult financial situation, households tended more towards savings than spending. In 2009 only part of ambitious goals of ARRA were managed to implement. One of them was the stimulation of economy, which increased in the third quarter. In the first quarter of 2009 the fall in GDP in the US was still big (-5.5%), however in the second quarter it decreased significantly to -0.7%. In the third quarter of 2009 there was a growth by 2.2%, and in the fourth quarter – in comparison to the third quarter – by 5.79%. On the other hand, the situation on the labour market worsened. The unemployment was gradually increasing in the following months of the year so that in the last quarter of 2009 it amounted to 10% (Firlej 2011, no. 4, pp. 184–185).

In the initial stages of the financial crisis in the United States, the economic situation of countries of Western Europe seemed to be relatively favourable, but over time it was changing. With the development of the crisis in the United States, some countries in Western Europe increasingly felt its significant impact.

European banks, in comparison to their American counterparts, led in the past a bit more responsible policy, thanks to which they survived the hardest phase of the crisis with relatively small losses, though not without a few bankruptcies. The biggest bankrupts one can include: Belgian-Dutch Fortis, British Royal Bank of Scotland, Irish Anglo-Irish Bank. Iceland had very big problems, as the entire banking system collapsed there. In Great Britain the Northern Rock bank, which – as it turned out – invested too much in American mortgage bonds, was nationalized. British government also decided to lend to banks in a difficult financial situation and took a share of some of them. In Germany a rescue package for Hypo Real Estate bank was established. The governments of many Western European countries decided to support the financial sector. Rescue packages prepared by Britain, Germany, France, Austria, Italy and Portugal provided for assistance in the amount of EUR 1.85 trillion in the form of guarantees, loans and recapitalization for banks (Rymarczyk, 2010, p. 18).

The most serious effects of the crisis reflected themselves in the real economy. GDP of UE in 2008 amounted only 0.3% and a year later it fell to the level of -4.3%. Particularly acute decline in GDP was recorded in Ireland, whose economy shrank in 2008 and 2009 respectively by -3.5% and -7.6%.

The decline in GDP of Germany, which is the engine of the EU economy, was alarming. German economy shrank in 2009 by -4.7%. Among the EFTA countries most acute decline in domestic production was recorded in Iceland, where it was -6.8%. Individual countries were affected by the crisis in a varying ways, and often the biggest problems reached the countries which were flourishing in the pre-crisis period of time. In relation to the crisis, which was quickly spreading to the whole economy, the industrial production, export and retail were dropping and the unemployment increased (Małkiewicz, 2010, p. 101–102).

Of all the countries of Western Europe the most drastic consequences of the financial crisis hit: Greece, Spain, Ireland and Iceland. The crisis of reek economy of the recent years is connected with excessive public finances deficit. At the time of accession of Greece to the euro zone it was noted, that this country does not fulfil the convergence criteria, however strenuous efforts of the political authorities and the concealment of the true state of the Greek state finances meant that ultimately Greece joined the euro zone (*Sytuacja gospodarcza* ..., p. 1 and next).

The reason for the current economic difficulties in Greece is a progressive decline in the country's competitiveness in the international arena, as well as the excessive wage growth in the pre-crisis period. In order to create a semblance that it is possible to bring the country's deficit below 3% of GDP, Greece falsified statistics for the needs of the EU institutions. It is estimated that in 2010 the public debt of Greece amounted to 120 billion EUR. Whereas the foreign debt in March 2010 amounted to 391 billion EUR, and so 163% of GDP (*Sytuacja gospodarcza* ..., p. 1 and next).

It should be noted that the Greek economy has functioned in the recent years over its possibilities, financing needs mainly from foreign loans. Money from this source was mainly used to increase wages in the public sector. Some salaries have increased over the last five years by up to 100%, and the additional destructive factor for the Greek economy was the fact that the government was tolerating tax evasion by citizens. The outbreak of the global financial crisis in 2008 totally surprised the Greek economy, which was unprepared to resist, which led to the cumulation of the country’s problems.

Financial problems of Spanish economy, as opposed to Greece, were not connected with expenditure, but with revenue. More than 50% of the proceeds to the Spanish budget from taxes was associated with the real estate market, which in the recent years has been very similar to the real estate market in the United States. The total value of investments in real estate in

2006–2007 in Spain amounted to one third of GDP, which means that the Spaniards then built more real estate than the French and Germans together.

Since the bubble burst, on the real estate market in 2007 there was a decline in property prices by approx. 15–20%, which resulted in the cessation of new investment, dynamic increase of unemployment and drop in tax revenue to the budget. Ireland, on the other hand, was the country from euro zone which was absorbed by the financial crisis. The main reason for this state of affairs was mainly the external financing of the investments in a very powerful construction sector, which was the flywheel to the Irish economy; there was a rapid increase in property prices, and Ireland's GDP growth was based largely on the so-called real estate bubble.

As a result of the world's financial crisis, there were staff cuts in enterprises and the redundant workers lost their ability to repay their loans. Due to the growth of unemployment there was a drop of State's tax revenue, which in turn caused the decrease of GDP and economic crisis.

Iceland, whose population is only 320 thousand people, for many years was considered an oasis of prosperity, one of the richest countries in the world highly valued by foreign investors. Iceland's GDP was increasing by approx. 5–7% a year, and the base of the Icelandic economy was fishing, tourism and processing of aluminium. An important role was also played by the banks, which developed activities abroad and their foreign assets exceeded ten times the GDP, what became the key reason for the country's problems. At the end of 2008 – when the crisis was claiming the losses – it turned out that it plunged also Icelandic financial institutions, which were too large for such a small scale country. Icelandic banks were not able to continue its activities, which led to a strong weakening of the Icelandic krona, as well as has prompted the Icelandic government to nationalize those institutions (*Sytuacja gospodarcza* ..., p. 1 and next).

Economic crisis in Poland

The global economic crisis relatively quickly arrived to the countries of Central and Eastern Europe, causing a rapid suppression of growth of GDP and widespread recession. The return of economic growth was not possible without making a number of important reforms, which aim at raising the investment attractiveness and competitive strength of countries in the region. Prolonged recession or economic stagnation in Western Europe in a simple manner resulted in a period of economic troubles of Poland manifested by an increase in unemployment and a slowdown in wage and income dynamics, and the fall of imports by 28% and of exports by more than 26% in 2009 was not unique neither in the world nor in the region (*Rocznik Statystyczny Handlu* ..., p. 41–50).

Polish economy experienced during the crisis some of the best economic performance in the region. Despite the decline in exports, domestic demand grew, but at a much slower pace than before the crisis. The degree of dependence on exports of Polish economy was much smaller than the average level among Central European countries. This is because, inter alia, Poland is – next to Russia – the only country in the region with a large internal market.

In comparison to the majority of the countries of the region, Polish economy is characterized by relatively moderate degree of dependency from external financing. It is the result of relatively low investment rates, with moderate savings rates. These factors contribute to the fact that in spite of certain threats to the macroeconomic stability, which appeared in the first months of 2009, the situation of Polish economy looked rather preferably (*Polska wobec* ..., p. 18 and next).

In response to the progressive crisis, Polish state institutions carried out the intervention tasks according to the following division of roles (*Polski rynek* ..., p. 14 and next).

1) Office of the Financial Supervision Authority (FSA) led efforts to provide liquidity to Polish banks, in particular, to prevent the possible outflow of funds from the „subsidiaries" to „parent companies" in the framework of international capital groups, as well as to strengthen their capital base,
2) The National Bank of Poland (NBP), apart from standard instruments of implementing monetary policy, introduced mechanisms of temporary substitution of market, which could be critical if the action indicated above did not provide liquidity to banks,
3) The Ministry of Finance prepared instruments to support financial institutions which were at risk with the use of public funds, which could be used, if previously applied stabilizers turned out to be insufficient.

Relative financial stability and the high creditworthiness of Poland (rating A – with stable outlook according to the classification of Standard&Poor's) allowed for relatively safe financing of the borrowing needs. This meant a moderate risk of external instability during the peak of the crisis, additionally reduced by the IMF flexible credit line (open credit line amounting to 20 billion USD, which Poland can use in case of problems with financial stability).

Table 1. Actions important because of the crisis on the domestic market

FSA and its Office	National Bank of Poland	Ministry of Finance
– limitation of the dynamics of foreign-currency indexed credit portfolio, – passing the liquidity act, – monitoring of intragroup transactions, – tightening concentration limits for banks, – limitation of the risks of concentration of investments of insurance companies, – retention of profit in banks (also selectively in insurance), – limiting the role of subordinated loans in the capital of banks, – introduction of a mechanism of including bonds to banks' capital, – estimation of total position and pricing of option, – tightening of recommendations for banks using derivatives.	– Implementation of the "Confidence Package": – repo transactions, – currency swaps, – easier access to the Lombard loan, – earlier redemption of bonds, – reduction of reserve requirement rate, – Implementation of the "Pact for development of lending": – discount credit, – preparation of reports relating to the stability of the banking system.	– Announcement of "Stability and Development Plan": – increasing the level of bank deposit guarantees, – creation of a mechanism to support financial institutions, – introduction of the mechanism of decapitalisation of threatened financial institutions, – extension of the government guarantees system.

Source: own analysis based on: *Polski rynek finansowy w obliczu kryzysu finansowego w latach 2008–2009*, UKNF, Warszawa May 2010, p. 15–16.

In 2009 recession appeared in Euroland. During this period Poland directed 70% of its exports there, so it had to affect the Polish trade deficit. In July 2008 it amounted to 2 billion EUR, and in 2009 – 20 billion EUR. Foreign investments in Poland decreased by 16%, and domestic investments – by 15%. Inflation in Poland at the end of 2008 was maintained at 5%. While the public debt of the Treasury in August 2008 increased to 529 billion PLN and its service in 2009 alone cost 33 billion PLN.

Banks in Poland reached very high profits, as they applied strict lending standards in the lending business. Besides, they did not grant subprime loans. These factors contributed particularly strongly to the protection of Polish from the drastic effects of the crisis (*Polski rynek* ..., p. 14 and next).

In the period from August 2008 to March 2009, PLN's exchange rate fell by about 40%. This had important consequences for the Polish slowing economy, including, inter alia: for the economic-financial condition of exporters and importers and the economic operators which were indebted in foreign currencies (*Program konwergencji* ..., p. 10).

In October 2008, the NBP launched a package of confidence, which aimed at, in particular, reduction of the liquidity risk of banks and their currency risk. Then, in order to stimulate economic activity, Monetary Policy Council eased significantly the monetary policy, lowering the basic interest rates of the NBP (*Polska wobec* ..., p. 38–45). In view of the deteriorating macroeconomic situation on April 27th 2009 the *Conditions of the implementation of the next stages of the Roadmap for Euro Adoption in Poland*. This document presents the conditions for safe participation in ERM II. First of all, the level of fixed parity should be consistent with macroeconomic situation of Poland (*Uwarunkowania* ...).

Secondly: the period of participation in ERM II[5] should be short, which would move towards the moment of adoption of the common currency and would increase the credibility of the current level of parity as a reference point for the final exchange rate of the PLN to the EUR.

Thirdly: when assessing readiness for euro adoption, Poland should meet all the formal conditions for membership in the euro area.

Lastly: it was necessary to reach a political agreement on the issue of conducting the necessary formal adjustments to adopt the euro.

The actions heading to restore the public finances were presented in January 2010; at that time, the *Plan for Development and Consolidation of Finances 2010–2011* (Program konwergencji ..., p. 13–14).

As you can see, the room for manoeuvre of economic policy in Poland has been greatly reduced. It was the effect of cumulating the fiscal imbalance, which was not predicted in the previous years. That is why the package of

[5] *Exchange Rate Mechanism*, ERM – the mechanism for the mutual stabilization of the currencies of the Member States of the European Economic Community. ERM II is a system that combines the euro currency with the currencies of EU countries outside the euro area. The purpose of ERM II is to allow the smooth operation of the Internal Market by maintaining the stability of exchange rates of the Member States, since large fluctuations would lead to the fact that the products of one of the countries would become more competitive only because of the changes in exchange rate.

anticrisis measures in Poland was much more economical in financial terms than in many other economies. However, there were also voices that the government, in which the neoliberals had a strong position, did not use all the existing possibilities, in order to stimulate the demand and as a result decrease the negative effects of the global financial and economic crisis.

The main element of anticrisis measures in Poland was the *Plan of Stability and Development – strengthening the Polish economy against the global financial crisis*, which was introduced by the government of November 30th 2008. Its aim was to strengthen Polish economy against the global financial crisis and to stabilize the banking system. It must be stressed that in the second case, the actions taken were of clearly preventive nature.

As part of the above mentioned plan, inter alia, the following actions were taken (*Program konwergencji* ..., p. 12–13):

1) the guarantee of the solvency of bank deposits of Poles was increased to 50 thousand EUR;
2) there were savings made in the State budget;
3) the guarantee limit and Treasury guarantees were increased to 40 billion PLN, and then to 55 billion PLN;
4) subsidized housing loans were launched for people who due to job loss were not able to repay loans taken to buy their own homes;
5) The Bank Gospodarstwa Krajowego was recapitalized with the amount of 3.7 billion PLN, thus the system of guarantees for small and medium enterprises was strengthened;
6) a higher investment allowance (up to 100 thousand. EUR) for start-ups was introduced;
7) the restrictions on obtaining advances, inter alia, for companies applying for EU subsidies were abolished;
8) the rate of growth in energy prices was stopped;
9) including spending on research to the tax costs was allowed.

The value of planned anti-crisis measures amounted to 91.3 billion PLN.

The normative solution set out as a remedy for the crisis was the Act of 1 July 2009 on mitigating the effects of the economic crisis for employees and entrepreneurs (Journal of Laws of 2009, no. 125, item 1035 as amended). The anticrisis act introduced changes in:

1) the Act of 26th of July 1991 on income tax from individuals (Journal of Laws of 2016, item 2032 as amended);
2) the Act of 15th of February 1992 on corporation tax (Journal of Laws of 2016, item 1888 as amended);

3) the Act of 20th of April 2004 on employment promotion and labour market institutions (Journal of Laws of 2008, No 69, item 415 as amended);
4) the Act of 13th of July 2006 on the protection of workers' claims in the event of insolvency of their employer (Journal of Laws No 158, item 1121 as amended).

The law – at the time of its application – introduces changes in existing principles of working time account, primarily by extending the settlement period, extending the applicability of individual working time schedule – also by reducing the basis of employment, it limits the possibility of employment under fixed-term contracts, not by their number and the interval between successive agreements, but for a limited in time combined period of their duration. Regulates the granting, payment and reimbursement of benefits from the Guaranteed Employee Benefits Fund and of means for subsidize training costs, payment of scholarships for workers from the Labor Fund.

As indicated in the explanatory memorandum to the act due to changes in the organization of working time by entrepreneurs in companies affected by the economic crisis and due to benefits granted to employees for subsidized employment:
– labour costs may be reduced, and thus the financial situation of businesses can be improved during the economic downturn,
– employment levels, and therefore readiness to take up the activities for the improvement of the economic situation, will be maintained and
– competitiveness of business will be maintained.

The idea was to allow the use of payment period for the adjustment of business to the changing market conditions.

Other actions that strengthen the Polish economy and improve the condition of public finances, included:
1) the implementation of bridging pension reform,
2) privatization,
3) The amendment to the Public Finance Act, ordering its structure.

Apart from that, in May 2009 Poland signed the agreement with IMF on the availability of flexible credit line. Based on the agreement with the IMF for one year Poland gained access to approx. 20.5 billion USD, supplying foreign exchange reserves of the central bank. These measures could be used in case of changes threatening the stability of the banking system.

The cost of giving Poland the access to flexible credit line by the IMF burdened the result of central bank. Although Poland did not use the granted funds, the government repeatedly declared, that the extension of the agreement with the IMF would be advisable due to the continuing uncertainty in the markets. For its part, National Bank of Poland, which had to accept a request to update the agreement with the IMF, said that reapplying by Poland for access to the flexible credit line would not be justified.

NBP then pointed out that the current state of foreign exchange reserves is sufficient security buffer for the banking system in Poland. He noted, however, that if the Minister of Finance found it reasonable to obtain Poland's access to the credit line in connection with the occurrence of fiscal factors, which may affect the balance of payments, the National Bank of Poland would be prepared to support the government's efforts in this respect (Brzeziński, 2010).

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HUMAN CAPITAL AS THE GROWTH FACTOR IN REGIONAL COMPETITIVENESS

In the recent years, the world economy has undergone an enormous transformation. It can be noted that it is not only based on industry, but also on knowledge. Achieving a competitive advantage by regions is further focused on investing in fixed assets, but, what is also important, in human capital. At present, a factor that is increasingly important in achieving competitiveness is the ability to use intangible resources.
Expenditures on education and research, investing in people, their knowledge and skills are an essential precondition of raising competitiveness. In the case of a highly qualified staff, it allows the efficient introduction of new technologies and the creation of new directions for its development. The competitiveness of the regions is influenced, inter alia, by human talents, knowledge, entrepreneurship, initiative and own resources to improve living conditions. Human capital is thus a key determinant of the competitiveness of regions in Poland.
Therefore, the priority of this article is to analyze the impact of selected components of human capital on the competitiveness of regions in Poland in the years 2007-2014. The article is both theoretical and empirical. The first part reviews the literature closely related to the topic of the work. The second part includes a statistical analysis and a construction of a panel model estimated by the method of least squares. GRETL program was used for calculations.

JEL Classification Codes: C40, O15, R15.

Keywords: human capital, regional competitiveness, regional development, method of least squares.

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Introduction

Regions are currently one of the most interesting subjects of research. They are also an object of analysis of many disciplines, ranging from geography, economics, sociology and legal science. The regional theme is strictly interdisciplinary and can be analyzed from different perspectives (Golejewska, 2012).

Regional development is a continuous improvement of the competitiveness of economic entities, the standard of living of the inhabitants and the economic potential of the regions, which is related to the development of the whole country. Many scholars claim that there is a link between material resources and the economic development of the region in the resource category. However, such development is made to a certain extent when material assets are already insufficient. Then the regional development is focused solely on intellectual property. It has a great impact on the competitiveness of regions (Marakova, Dyr, Wolak-Tuzimek, 2016).

The core challenge for regions was to build a knowledge-based economy where human capital plays a key role. In this system, it is not work, raw materials or material capital that is the basic resource, but a knowledge that will enable achieving competitiveness and a high level of development. Human capital is recognized as the medium of this knowledge (Bartnik, 2016).

Human capital constitutes a key factor shaping the competitiveness of regions, which is also related to the development of a knowledge-based economy. Its value and quality must remain high, so that the process of knowledge creation and transfer is seamless. Human capital is an important factor for regional development in the European Union countries. This is reflected in the objectives of the European regional policy. On the microeconomic level, the human capital influences the level of wages and incomes, however at the macroeconomic level it stimulates production, affects the location of business activity, determines the implementation of innovative processes and adaptability of technologies created and used abroad (Golejewska, 2012).

The main aim of the article is to analyze the impact of human capital on the competitiveness of regions in Poland in the years 2007-2014. The paper examines the relationship between GDP of Polish voivodeships and the selected components of human capital. GRETL program was used for calculations.

Theoretical analysis of human capital

In the literature on the subject it is often noted that human resources, intangible assets or human capital are used interchangeably. However, in the Polish or foreign literature there is no clear definition of these concepts and the differences between them. Some authors claim that the changes in the aforementioned terms are much deeper than in the linguistic sphere. Others do not see the difference in these terms and use them as synonyms (Samul, 2013).

The concept of human capital, shaped for good in the 60s of the 20th century, has then begun to be linked to investments that people make in themselves through education, skills acquisition or other activities that will result in higher labor productivity and higher incomes in the future. It is also worth mentioning that at the turn of the 50s and 60s of the 20th century in the Western European countries emerged a theory of human capital, according to which people were recognized as the most valuable resource of enterprises (Butkiewicz-Schodowska, 2015).

The definitions of human capital "change along with the cultural context, fashion, paradigms, metaphors, customs and linguistic practices of a given author and his time. The existing differences allow a more comprehensive discovery of the complex structure of the phenomenon, but at the same time considerably complicate the practical application of the concept" (Król, Ludwiczyński, 2006). The most important cognitive problems of the concept of human capital are:

- various levels of consideration of human capital;
- fuzzy and highly diversified definitions;
- the lack of researchers' consent for the structural elements of human capital;
- development in the management of human capital concepts such as knowledgemanagement, talent management, competence management;
- different approaches taken from different disciplines of social, economic, sociological, humanist and technical disciplines (Samul, 2013).

Human capital is also one of the components of intellectual capital. Sometimes these two concepts are used interchangeably (Dyr, Ziółkowska, 2017). This is due to the fact that the human capital is regarded as the most important component of intellectual capital. Nevertheless, it is important to remember not to confuse these two concepts and not to use them interchangeably (Adamowicz, Apelska, 2013).

Intellectual capital is a kind of a pillar on which the regions, businesses or society operate. It is also treated as the ability of these three levels to qualitatively combine new competencies in order to create new values (Edvinsson, Malone, 2001).

One of the stated definitions is that the human capital is a source of knowledge and skills, the acquired learning and professional practice as well as a resource of health and vital energy. The other one treats human capital as the whole of the specific qualities that are embodied in employees who have a certain value and are a source of future income for the employee who owns human capital and for the organization that benefits from that capital under certain conditions (Samul, 2012).

While making a theoretical analysis of the human capital, it is also worth mentioning its constituent elements that appear in the given definitions. Table 1 presents the selected elements of human capital structure according to I. Miciuła.

Table 1. Elements of human capital structure of selected authors

Human capital			
Qualifications		Social competences	Attitudes and practices
Knowledge	Abilities	Interpersonal skills, cooperative abilities, communication, abilities	Motivation, commitment, goal orientation, attitudes and behavior towards the organization, identification with an organization
Education, theoretical knowledge	Experience, practical skills		

Source: Miciuła, Miciuła, 2015.

In conclusion, human capital is a driving force for the development that encompasses enormous motivational opportunities which are only revealed when a company, a region or society is effectively managed (Juchnowicz, 2004). Human capital is permanently linked to the area in which it occurs, with its mission, vision and purpose. It is characterized by the ability of cooperation, creativity and qualifications. It is a force without which it is impossible to develop further and a factor that determines the differences between organizations and constitutes a real basis of competitive advantage.

Human capital and competitiveness of the regions

Today, human capital is treated as a new factor of production that increases the productivity of other resources. Its importance is determined, among other things, by the fact that knowledge-based economy is not only the access to knowledge, but above all the ability to use it, i.e. a skill that a man possesses. The higher the level of human capital is, the faster the dissemination of innovation and its implementation take place. The resources of this capital in a region allow the import and application of innovations from the far more developed regions (Tomaszewska, 2010).

Therefore, the human capital constitutes the primary source of competitive advantage, because the remaining assets of an enterprise or a region are measurable and thus, easier to standardize and become fully comparable. Human resources are the key strategic resources of an organization and they determine its dominance over the competition (Adamowicz, Apelska, 2013).

Model

When analyzing the impact of human capital components on the competitiveness of regions (voivodeships) in Poland, the econometric analysis was used based on the classic method of least squares. The study was conducted on a panel data, i.e. those, that are observed in at least two dimensions (Kufel, 2013). The proposed article also examines the Gross Domestic Product for 16 Polish voivodeships in the years 2007-2014. Assuming that the index i = 1, 2, ..., N denotes consecutive areas (voivodeships) and the index t = 1, 2, ..., T units of time, the constructed model has the form:

$$GDP_{it} = \alpha_{it} + PhD_{it} + U_{it} + RD_{it} + MSc_{it} + v_{it} \quad (1)$$

where:
GDP_{it} – dependent variable: Gross Domestic Product in million PLN (in current prices),
explanatory variables:
PhD_{it} – the total of PhD students (persons),
U_{it} – theregistered unemployed for more than 1 year in total (persons),
RD_{it} – the total of the R & D employment (persons),
MSc_{it} – the graduates of master's degree studies (persons),
α_{it} – structural parameter of a model,
v_{it} – total random error (consisting of a purely random part ε_{it} and the individual effect u_i, so $v_{it} = \varepsilon_{it} + u_i$) (Kufel, 2013).

In the empirical research, the statistics from the Local Data Bank (www.bdl.stat.gov.pl) was used. The absence of some data (at the level of 1.56%) caused the model to be an unbalanced panel (Brożek, Kogut, 2016). The results of the model described above are shown in the following tables and chart, and the results of the most important and also the necessary tests are provided beneath.

The results of model estimation

The results of the model described above are presented in the tables below and in the graph. The results of the tests can be found below.

It should be mentioned here that the estimation using the classical method of least squares (KMNK) is considered acceptable if the individual effect is absent and the panel is treated as a cross sectional dataset (Kufel, 2013). The situation is described in the examined model.

Using the GRETL econometric program, the estimation is obtained and presented in Table 2. It contains the numbers characterizing and describing the results of the least squares panel estimation (see Brożek, Kogut, 2017).

Table 2. **Model 1: Panel OLS estimation using 126 observations 16 cross-sectional data units are included. Time series length: minimum 7, maximum 8. The dependent variable (Y): PKB_{it}**

	Factor	Standard error	Student's t-	p-value	
const	5450.71	6313.95	0.8633	0.3897	
PhD_i_t	−7.09344	3.61328	−1.9632	0.0519	*
U_i_t	0.201487	0.157528	1.2791	0.2033	
RD_i_t	8.68749	1.20872	7.1873	<0.0001	***
MSc_i_t	3.73408	0.710899	5.2526	<0.0001	***
The arithmetic mean of the dependent variable		93461.86	The standard deviation of the dependent variable		75581.29
The sum of squared residuals		6.29e+10	The standard error of the residues		22800.06
Coefficient of determination R-square		0.911912	Adjusted R-squared		0.909000
F(3, 156)		313.1551	P-value of F test		8.26e-63
Log-likelihood		−1440.585	Akaike information criterion		2891.169
Schwarz Bayesian Criterion		2905.351	Hannan-Quinn Criterion		2896.931
Autocorrelation of residues – rho1		0.921014	Durbin-Watson status		0.135704

Source: based on the program GRETL.

Based on the conducted studieswe can assume that two out of the four variables such as the R&D staff (RD_{it}) andthe graduates of master's degree studies (MSc_{it}) are very good stimulants of the Gross Domestic Product in the voivodships. This is demonstrated by their significance level of 0.01. As for a variable, such as the PhD students (PhD_{it}), it is also a good contributor to GDP (significance level is 0.1). As far as the registered unemployed (U_{it}) are concerned, this is the only explanatory variable that is not a driving force for a given variable.

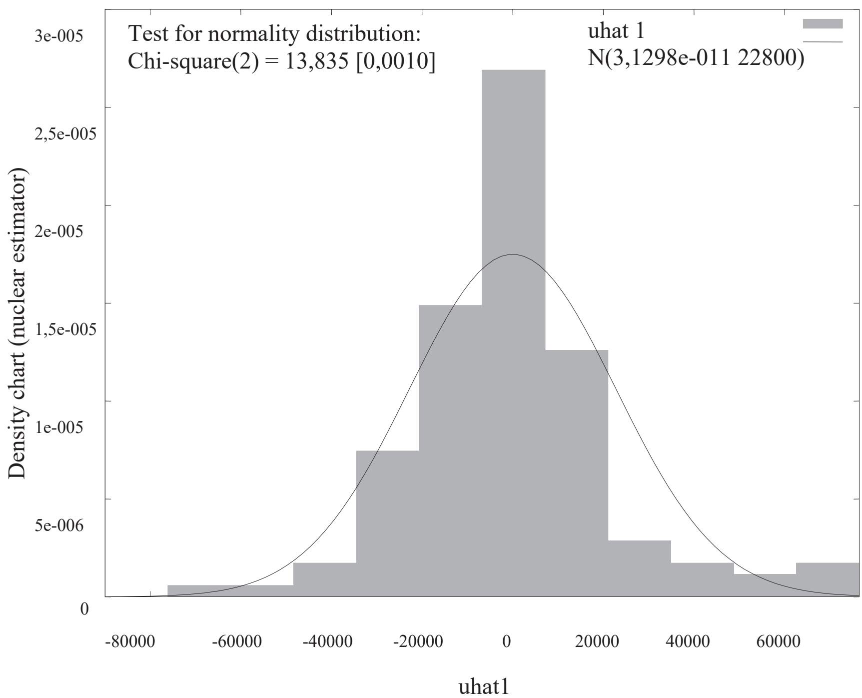

Figure 1. Test for normality distribution

Source: based on the program GRETL.

The frequency distribution for uhat1, observations 1-128. The number of intervals = 11, mean = 3.12982e-011, standard deviation = 22800.1.

Table 3. The frequency distribution

Intervals	Mean	Number	Frequency	Cumulative	
< -62198	-69 132	1	0.79%	0.79%	
-62198 - -48328	-55 263	1	0.79%	1.59%	
-48328 - -34459	-41 394	3	2.38%	3.97%	
-34459 - -20590	-2 752	13	10.32%	14.29%	***
-20590 - -6720.4	-13 655	26	20.63%	34.92%	*******
-6720.4 - 7148.9	214.26	47	37.30%	72.22%	*************
7148.9 - 21018	14 084	22	17.46%	89.68%	******
21018 - 34887	27 953	5	3.97%	93.65%	*
34887 - 48757	41 822	3	2.38%	96.03%	
48757 - 62626.	55 691	2	1.59%	97.62%	
>= 62626	69 561	3	2.38%	100.00%	

Source: The author's own research.

Missing observations = 2 (1.56%)
Null hypothesis: the empirical distribution function has a normal distribution. The Doornik-Hansen test (1994) – transformed skewness and kurtosis. Chi-square(2) = 13.835 with a p-value of 0.00099

Collinearity rating VIF (j) – variance inflation factor:
VIF (Variance Inflation Factors) - the minimum possible value = 1.0.
Values > 10.0 may indicate a problem of collinearity - inflation of the variance.
PhD_{it} 20.557
U_{it} 2.686
RD_{it} 14.141
MSc_{it} 9.594

VIF(j) = 1/(1 - R(j)^2), where R(j) is a coefficient of multiple correlation between the variable 'j' and the other independent variables of the model.
The results indicate that in the studied model there is a problem of collinearity in the variables PhD_{it} and RD_{it}. With the other two variables the values are less than 10, so there is no variance.

The properties of the matrix X'X:
1-norm = 4.2979366 e + 011.
Determine = 9.3744697e + 038.
The matrix index of the CN = 3.0331474e-011.

Table 4. Estimated fixed effects allow for a unit-specific component to the error term

const:	54207	(9766.2)	[0.00000]
PhD_{it}:	26.22	(2.3678)	[0.00000]
U_{it}:	-0.13614	(0.090792)	[0.13673]
RD_{it}:	2.5171	(1.0316)	[0.01635]
MSc_{it}:	-2.3267	(0.61152)	[0.00024]

Source: based on the program GRETL.

16 medium groups including data:
Residual variance: 5.76696e + 009 / (126 - 20) = 5.44053e + 007

The total significance of inequality of the group medium:
F (15, 106) = 70.0103 with p-value of 7.28345e-048
(Low p-value means the rejection of H0 hypothesis that OLS panel model is correct, to the H1 hypothesis that the fixed effects model is more appropriate.)

Breusch-Pagan test statistics:
LM = 155.626 with p = prob (chi-squared (1)> 155.626) = 1.02198e-035
(Low p-value means the rejection of H0 hypothesis that OLS panel model is correct, to the H1 hypothesis that the random effects model is more appropriate.)

Variance estimators:
between = 2.28676e+008
within = 5.44053e+007
Panel is unbalanced: theta varies across units.

Table 5. Estimated random effects allows for a unit-specific component to the error term

const:	37 085	(7841.9)	[0.00001]
PhD_{it}:	22.762	(2.5989)	[0.00000]
U_{it}:	-0.049837	(0.10159)	[0.62462]
RD_{it}:	3.8074	(1.0603)	[0.00048]
MSc_{it}:	-1.2213	(0.49621)	[0.01526]

Source: based on the program GRETL.

Hausmann's test statistics:
H = 51.5796 with p = prob (chi-square (4)> 51.5796) = 1.68885e-010
(The low value of p denotes the null hypothesis of the model with random effects versus the alternative hypothesis of the model with fixed effects.)

Joint test on named regressors:
Test statistic: F (4, 106) = 108.952 with p = P (F (4, 106)> 108.952) = 1.22221e-036.

Test for the variation of absolute term in groups:
Hypothesis: Groups share a common absolute term.
Test statistic: F (15, 106) = 70.0103 with p = P (F (15, 106)> 70.0103) = 7.28345e-048.

Table 6. **Model 2: Fixed Effects estimation, using 126 observations, 16 units of cross-sectional were included. Time series length: minimum 7, maximum 8. Dependent variable (Y): PKB_{it}**

	Factor	Standard error	Student's t-	p-value	
const	54 206.7	9766.16	5.5505	<0.0001	***
PhD_{it}	26.2205	2.36776	11.0740	<0.0001	***
U_{it}	0.136136	0.0907916	1.4994	0.1367	
RD_{it}	2.51706	1.03157	2.4400	0.0163	**
MSc_{it}	2.32671	0.611524	3.8048	0.0002	***
The arithmetic mean of the dependent variable		93 461.86	The standard deviation of the dependent variable		75 581.29
The sum of squared residuals		5.77e+09	The standard error of the residues		7 375.995
Coefficient of determination R-square		0.991924	Adjusted R-squared		0.804359
F(3. 156)		685.2075	P-value of F test		8.8e-102
Log-likelihood		1 290.051	Akaike information criterion		2 620.103
Schwarz Bayesian Criterion		2 676.828	Hannan-Quinn Criterion		2 643.149
Autocorrelation of residues - rho1		0.692616	Durbin-Watson status		0.423360

Source: based on the program GRETL.

Table 7. Random Effects estimation (GLS), using 126 observations. Nerlove's transformation was used 16 units of cross-sectional were included. Time series length: minimum 7, maximum 8. Dependent variable (Y): PKB_{it}

	Factor	Standard error	Student's t-	p-value	
const	46 956.5	11887.6	3.9500	0.0001	***
PhD_{it}	25.6055	2.30721	11.0980	<0.0001	***
U_{it}	0.117296	0.088798	1.3209	0.1890	
RD_{it}	2.92877	0.979518	2.9900	0.0034	***
MSc_{it}	1.90875	0.525907	3.6295	0.0004	***
Arithm. mean of depend. variable		93461.86	Stand. deviation of depend. variable		75581.29
The sum of squared residuals		1.21e+11	The standard error of the residues		31452.87
Log-likelihood		1481.641	Akaike information criterion		2973.282
Schwarz Bayesian Criterion		2987.463	Hannan-Quinn Criterion		2979.043

Source: based on the program GRETL.

Variance 'Within' = 4.57695e+007
Variance 'Between' = 2.28676e+008.
Breusch-Pagan test on:
The null hypothesis: The variance of the error in the unit = 0.
Asymptotic test statistic:
Chi-square(1) = 155.626with a value of p = 1.02198e-035.
Hausmann's test shows that the estimator (GLS) is compatible for the null hypothesis UMNK. Asymptotic test statistic: Chi-square(4) = 11,3412with a p-value = 0.0229856.

Conclusions and recommendations

The aim of the study was to analyze the relationship between the doctoral students, the registered unemployed and the persons unemployed for longer than 1 year, the employed in R&D and the graduates of master's degree studies on Gross Domestic Product in the years 2007–2014.

The model was given on the estimation using the classical method of least squares with GRETL program. The results of the estimation and analysis presented in the paper allow formulating the following conclusions:

- The least squares estimation is a useful solution for analyzing problems related to the study of the impact of the human capital components on Gross Domestic Product of the Polish Provinces;

- Variables such as: the PhD students, the R&D graduates and the master's degree graduates are important components of the human capital influencing the competitiveness of the Polish voivodeships (Gross Domestic Product). As a consequence, the increase of the level of these variables positively influences the increase of the competitive advantage;
- The volatility of GDP data of regions influences three out of four examined variables in a statistically significant way. These are: the PhD students (0.1), the R&D staff (0.01) and the graduate students (0.01).

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Zbigniew Śleszyński[1]

COUPLE OF THOUGHTS ON THE CONSEQUENCES OF CHANGES IN THE PENSION SYSTEM IN POLAND IN 2017

The article presents the rules of retirement in selected European countries and the consequences of lowering the retirement age in Poland from October 2017 for the finances, the labor market and pension level. In particular, examples of pension calculations are given with different initial capital levels and different retirement periods. According to the author, it will be necessary to raise the retirement age in the future, but it would require great political courage.

JEL Classification Codes: E240, E600, G220, H550, H690, J260.

Keywords: reduced retirement age, pension level, Social Insurance Fund, minimal pension.

Introduction

On the 1st of October 2017 the law from 16th November 2016 on the changes in the Law on retirement and other pensions provided by the Social Insurance Fund and some other laws (Journal of Laws 2017, item 38) comes into force in Poland. The most crucial is change in article 24, paragraph 1 of the Law from 17th December 1998 on retirement and other pensions from the Social Insurance Fund (Journal of Laws 1998, No. 162, item 1118), introducing a reduced retirement age. According to the new article insured people born after 31st December 1948 are entitled to retire after reaching a retirement age of at least 60 years for women and at least 65 years for

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men. It actually means coming back to the previous retirement age, which was gradually increased from 1st January 2013 (Journal of Laws 2012, item 637). This rise was criticized by part of the society (Zieleniecki, 2015), mainly because of lack of sufficient public consultations. It was probably one of the important reasons of losing the elections by PO and PSL in 2015. During the election campaign the opposition accused government of being arrogant and focusing only on economic aspects, but ignoring social consequences (Tkaczuk, 2014).

It is worth noting that reduction of the retirement age was the fulfillment of 2015 election promise given by PIS (currently governing in Poland). Significant influence on the decision to lower the retirement age had NSZZ 'Solidarność', whereas organizations of economists and employers (such as the WiseEurope, Association of Polish Economist) were protesting against the downturn (2016). In turn, A. Sieroń (2017), from the Ludwig von Mises Institute of Economics pointed out that reduction in retirement age would negatively affect the labor market, GDP, public finances and pension level (especially for women). The European Commission suggested similar effect, recommending in May 2017 professional activation of women, low-skilled and older people combined with raising the retirement age. Taking into account an additional 330 thousands of retired people at the end of 2017, the government is also wondering how to make the largest part of them remaining in the labor market. All the ideas considered so far to solve this situation are not satisfying. For example, the idea of adding 5 thousand PLN to the retirement account for every extra year of work is completely absurd for people who earn much below the national average, as they will receive minimum pension anyway.

M. Haponiuk (2016) in his analysis notes that:

- Introduced changes completely do not take into account financial situation of Poland, including the condition of Social Insurance Fund from which pensions are paid,
- The change will especially influence woman as their shorter professional experience means less accumulated pension contributions and longer pension period, resulting in lower pensions,
- The number of employees will be reduced and the number of inactive people will increase, thus fewer workers will have to maintain a larger group of retired people,
- The expected effect of reducing the retirement age which weakens the labor market in Poland, will be the growth of the shadow economy,

– Lowering the retirement age will lead to an increase in the number of people receiving minimal pensions even twice.

Malec and Tyrowicz (2017) also point out the negative effects of lowering the retirement age. The authors emphasize that the lower retirement age means lower retirement pensions, especially among women, which will result in higher fiscal burdens and will also lead to a decrease in national income.

The article attempts to draw attention to selected aspects of lowering the retirement age.

Retirement age in some European countries

To begin with, Table 1 presents retirement age in different European countries and the changes in it.

Table 1. Retirement age for men and women in chosen European countires

No	State	Retirement age
1	Austria	Men: 65 years, Women: 60 years. Progressive increase of age limit for women until the same retirement age as for men will have been reached between the years 2024 and 2033.
2	Belgium	65 years.
3	Bulgaria	Men: 64 years of age and 38 years and 4 months of insurance; Women: 61 years of age and 35 years and 4 months of insurance. From 1/1/2017 the retirement age is being increased as follows: for women: by 2 months per calendar year until 31/12/2029 and by 3 months from 1/1/2030 until it reaches 65; for men: by 2 months per calendar year until 31/12/2017 and by 1 month from 01/01/2018 until it reaches 65. After 31/12/2037 the retirement age will be linked to the life expectancy. From 1/1/2017, the required period of insurance is being increased by 2 months per calendar year until it reaches 37 years for women and 40 years for men.
4	Croatia	Men: 65 years, Women: 61 years and 9 months in 2017 Men and women long-insured persons with 41 years of insurance or more: 60 years. The pensionable age for women is being gradually increased by 3 months per calendar year from 1 November 2010 onwards, to reach 65 in 2030. The pensionable age for both women and men will be gradually increased by 3 months per calendar year from 2031 onwards, to reach 67 in 2038.
5	Cyprus	65 years for men and women; 63 years for miners. Pensionable age will be revised every 5 years, starting from 2023 according to the change in life expectancy during 2018-2023.

Table 1. Continuation

No	State	Retirement age
6	Czech Republic	Men: 63 years and 2 months. Women: depends upon the number of children raised: no children: 62 years and 8 months, 1 child: 61 years and 8 months, 2 children: 60 years and 4 months, 3 or 4 children: 59 years and 8 months, 5 or more children: 58 years and 8 months. The legal retirement age for men is gradually increasing by 2 months each year. The legal retirement age for women is increasing by 4 months each year (6 months from 2018) until it equals that of men. After that, the increase will also be 2 months per year. There is no ceiling on the pensionable age increase.
7	Denmark	The pensionable age is 65 in 2016 and will be gradually increased from 65 to 67 in 2019-22 and to 68 in 2030. The pensionable age is linked to developments in life-expectancy at age 60. It is adjusted every 5 years (next adjustment will be in 2020 and will be effective 15 years, i.e. till 2035). Supplementary pension (arbejdsmarkedets tillægspension, ATP): 65 years.
8	Estonia	Men: 63 years Women: 63 years. From 2017 the gradual increase of the pensionable age will be continued and pensionable age will be 65 for men and women by 2026.
9	Finland	Statutory earnings-related pension (Työeläke): Old-age pension to one's own choice between the ages of 63 to 68. In the public sector there are lower individual retirement ages. National pension (Kansaneläke) and guarantee pension (Takuueläke): 65 years.
10	France	General pension scheme for employees (Régime général d'assurance vieillesse des travailleurs salariés, RGAVTS): if minimum period of affiliation completed: 60 years for people born before 1st of July 1951. Increase of 5 months per year of birth to reach 62 years for those born starting from 1955. If minimum period of affiliation not completed: 65 years for people born before 1st of July 1951. Increase of 5 months per year of birth to reach 67 years for those born starting from 1955. Supplementary pension schemes for employees (ARRCO) and executives (AGIRC): Between 65 and 67 or upon receipt of the basic pension at a full rate.
11	Greece	67 years (if 15 years of insurance). 62 years (if 40 years of insurance).
12	Spain	65 years (with 36 years of contributions). 65 years and four months (with less than 36 years of contributions). Progressive increase until 2027: 65 years (with 38 years and 6 months of contributions); 67 years (with less than 38 years and 6 months of contributions). Increase of the legal age (in case of insufficient contributions) of one month per year until 2018 and 2 months per year from then on.
13	The Netherlands	65 years and three months in 2015. As of 2013, the legal retirement age will be gradually increased to 66 in 2018 and 67 in 2021. As of 2022, the legal retirement age will be linked to life expectancy
14	Ireland	State pension age for all at 66 years. State pension age will increase further to 67 in 2021 and 68 in 2028.
15	Iceland	National pension (lífeyrir almannatrygginga): 67 years. Employment pension (lögbundnir lífeyrissjóðir): 65-70 years.
16	Liechtenstein	Women and men: 64 years old.

Table 1. Continuation

No	State	Retirement age
17	Lithuania	Men: 63 years and 4 months. Women: 61 years and 8 months. From 2012 onwards, the retirement age increases annually by 4 months for women and by 2 months for men until it reaches 65 for both women and men in 2026.
18	Luxembourg	65 years
19	Latvia	62 years and 9 months. The legal retirement age is gradually increased by 3 months per year until reaching 65 years in 2025.
20	Malta	For those born before 1952: Men: 61; Women: 60; Women have the option of retiring at 61 if they wish. For men and women born: in the years1952 to 1955: 62; in 1956-1958: 63; in 1959-1962: 64; in 1962 and subsequent years: 65.
21	Germany	67 years (standard retirement age). The standard retirement age will be gradually increased to 67 years from 2012 to 2029, starting with those born in 1947. The first increase amounts to one month per year (65 to 66) and the following to two months per year (66 to 67). For all those born after 1963, the standard retirement age of 67 years shall apply.
22	Norway	The retirement age is flexible between 62 and 75. In order to draw an old-age pension before reaching the age of 67, special provisions apply, i.e. the person must be entitled to at least the minimum pension for persons with an insurance period of 40 years, when they reach 67.
23	Poland	From October 2017 65 years for men and 60 for women.
24	Portugal	66 years and 2 months for men and women in 2016 (after 2015, the normal age for access to a pension varies depending on the average life expectancy at the age of 65. 65 years for beneficiaries legally prevented from working beyond that age (e.g., pilots, drivers of heavy vehicles). When the beneficiary reaches the age of 65, the normal pensionable age is reduced by four months for each calendar year after the contribution period of 40 years, with a 65-year threshold.
25	Romania	Men: 65 years. Women: 60 years and 4 months on 1 July 2016, gradually increasing to 63 years by 1 January 2030.
26	Slovakia	62 years for all population groups (except for women with multiple children, for whom this retirement age will be reached in 2023). From 2017 onwards the legal retirement age will gradually increase depending on the increase in average life expectancy in the reference age (common for both men and women).
27	Slovenia	65 years.
28	Switzerland	Men: 65 years Women: 64 year.
29	Sweden	Flexible retirement age from 61 for earnings-related pensions and from 65 years for Guaranteed pension.
30	Hungary	Retirement age is increased by 6 months for each age cohort, from 62 for those born before 1952 to 65 for those born in 1957 and after (i.e. for those born in 1952, it is 62 plus 6 months, for those born in 1953, 63 and so on).

Table 1. Continuation

No	State	Retirement age
31	Great Britain	Men: 65 years Women: 60 years (up until 5 April 2010). From 6 April 2010 women's State Pension age is gradually rising until it reaches age 65 in November 2018. From December 2018 the State Pension age for both men and women will start to increase to reach 66 by October 2020. The government is planning further increases, which will raise the state pension age from 66 to 67 between 2026 and 2028. They will then review it every five years in line with life expectancy.
32	Italy	Male employees of the private sector, self-employed and para-subordinate workers: 66 years and 7 months; Male and female civil servants: 66 years and 7 months; Female employees of the private sector: 65 years and 7 months; Female self-employed and para-subordinate workers: 66 years and 1 month (see Annex on the social protection of the self-employed). The retirement age is being gradually increased according to the increase in life expectancy. As of January 2021, the retirement age cannot be lower than 67 (it will reach 69 and 9 months by the year 2050). The pension payment deferment scheme no longer applies except for certain duly certified categories of hard jobs to which the previous "Quota system" still applies. Such categories include: miners, workers engaged in asbestos removal, night-shift workers, public transport heavy-vehicles' drivers, etc.

Source: own work based on MISSOC, data from 2016 r., (http://www.missoc.org/INFORMATIONBASE/informationBase.jsp. Retrieved May 28, 2017).

Information presented in Table 1 shows that practically Poland has the lowest retirement age among European countries and there is no algorithm for its gradual increase after withdrawing reform from early 2013. The retirement age of women was significantly decreased, while in Europe the general trend is to make the retirement age of women and men equal. It is worth noting that European Commission suggests that retirement age in European Union should be gradually raised to 70 years of age.

Lowering retirement age and Burden on workers

Decreasing retirement age in Poland may be surprising, especially if we compare it with data from recent years on average life length and the indicator of economic burden - the ratio of number of pre-working (0-17) and post-working (60/65 +) people to the number of people in production age (18-59 / 64). Table 2 contains the numbers:

Table 2. Indicator of economic Burden and average life length in Poland

Year	2000	2010	2011	2012	2013	2014	2015	2016
Indicator of economic burden in percent	64	55	56	57	58	59	60	62
Average length of life – men and women together in years	73.7	76.2	76.5	76.7	77.0	77.6	77.6	77.9

Source: http://stat.gov.pl/wskazniki-makroekonomiczne/. Retrieved July 23, 2017.

The data presented in Table 2 show that in the last few years, on the one hand, the economic burden was rising steadily (in 2016 there were 6.2 people in non-production age for every 10 people in production age) and on the other hand, the average life length is steadily increasing. Taking into account the fact that Polish pension system is participative - in the long term it must lead to increased tax burden on the working population. Even more pessimistic are forecasts until year 2060 published by the Social Insurance Institution (ZUS), which are presented in Table 3.

Table 3. Population of Poland forecasts – data after lowering retirement age

Year	2015	2020	2030	2040	2050	2060
Total population (in thousands):	38 490	38 346	37 403	36 108	34 696	33 126
In this:						
In pre-production age	6 959	6 954	6 223	5 561	5 499	5 230
In production age	24 020	22 818	21 569	19 976	17 427	16 029
In post-production age	7 511	8 573	9 610	10 570	11 769	11 867
Indicator of economic burden in percent	60.2	68.0	73.4	80.8	99.1	106.7

Source: Forecast of receipts and expenses… (2016): p. 13.

Table 3 presents the forecasts of Polish population by economic category by 2060. Practically in 2050 year there will be one unemployed per worker. At the same time, it doesn't seem that 500+ program significantly changed the proportions. Some action is needed to radically change the situation, as it can lead to break down of public finances. If the increase in retirement age was not reversed, the data would look as in Table 4.

Table 4. Population of Poland forecasts– data before lowering retirement age

Year	2015	2020	2030	2040	2050	2060
Total population (in thousands):	38 490	38 346	37 403	36 108	34 696	33 126
In this:						
In pre-production age	6 959	6 954	6 223	5 561	5 499	5 230
In production age	24 414	23 843	22 926	22 385	19 834	17 759
In post-production age	7 117	7 584	8 253	8 162	9 362	10 137
Indicator of economic burden in percent	57.7	61.0	63.1	61.3	74.9	86.5

Source: Forecast of receipts and expenses... (2016): p. 13.

According to data in Table 4 at least till 2040 the situation seems to be stable. Unfortunately, fulfillment of some electoral promises, although gives some short-term benefits to the government, in the long term might kill the economy and the working people. It will be necessary in the coming years to raise the retirement age again, but it will be a very difficult political decision and at the moment there is no party that could do it.

Financial implications of lowering retirement age

The financial implication of lowering retirement age is mainly additional expense of around 55 billion PLN between 2017 and 2021, as shown in Table 5, plus an additional 714 thousands retirees.

Table 5. Model 1: Panel OLS estimation using 126 observations 16 cross-sectional data units are included. Time series length: minimum 7, maximum 8. The dependent variable (Y): PKB_{it}

Year	2017	2018	2019	2020	2021	Suma
Revenue (in thousand PLN)	1 377 800	985 500	-640 100	-1 707 200	-2 715 200	-2 69 9200
Costs (in thousand PLN)	2 182 400	10 448 000	11 798 200	13 457 200	14 313 300	52 199 100
Total (in thousand PLN)	-804 600	-9 462 500	-12 438 400	-15 164 000	-17 028 500	-54 898 000
Additional potential retirees (in thousands of people)	330	148	90	92	54	714

Source: ZUS data

It is possible that forecasts presented in Table 5 are somewhat too pessimistic, especially on the side of revenue. It might be higher due to increased employment of foreigners and positive migration rate.

Lowering retirement age will worsen the balance of Social Insurance Fund, as illustrated by the next two tables. Table 6 is based on forecasts for a higher retirement age, and Table 7 illustrates forecasts after the retirement age was lowered in October 2017. Those two tables include three scenarios: basic, pessimistic and optimistic.

Table 6. **Social Insurance Fund balance in 3 variants of forecasts of receipts and expenditures for years 2017–2021**

Specification	2017	2018	2019	2020	2021
Variant number 1 (basic)					
Balance in billion PLN	-56.5	-58.5	-61.5	-64	-68.5
Balance in % GDP	-2.82%	-2.75%	-2.71%	-2.67%	-2.68%
Variant number 2 (pessimistic)					
Balance in billion PLN	-65	-71	-78	-83	-90.5
Balance in % GDP	-3.32%	-3.44%	-3.56%	-3.67%	-3.84%
Variant number 3 (optimistic)					
Balance in billion PLN	-50	-50	-49	-49	-50.5
Balance in % GDP	-2.48%	-2.30%	-2.10%	-1.95%	-1.89%

Source: Forecast of receipts and expenses… (2015): pp. 19–30.

Table 7. **Social Insurance Fund balance in 3 variants of forecasts of receipts and expenditures for years 2018–2022**

Specification	2018	2019	2020	2021	2022
Variant number 1 (basic)					
Balance in billion PLN	-56.5	-60	-63.5	-68.5	-73.5
Balance in % GDP	-2.72%	-2.72%	-2.71%	-2.75%	-2.77%
Variant number 2 (pessimistic)					
Balance in billion PLN	-65	-72	-79.5	-88.5	-96.5
Balance in % GDP	-3.22%	-3.39%	-3.56%	-3.76%	-3.93%
Variant number 3 (optimistic)					
Balance in billion PLN	-48.5	-49.5	-51	-53	-55.5
Balance in % GDP	-2.28%	-2.17%	-2.08%	-2.03%	-1.98%

Source: Forecast of receipts and expenses… (2015): pp. 16–27.

It seems that the most likely scenario is the basic one, but it should be noted that it assumes ambitious indicators (eg annual real GDP growth of 3.6-3.9% and unemployment at the end of 2022 at 6%). In a short term, the situation presented in both tables are not significantly different, but in all variants the deficit of the Social Insurance Fund is significantly increasing in 2022. We can suppose that situation will deteriorate in the following years.

Impact of lowering retirement age on level of pension

According to GUS data - in 2015 year 1.357 million people employed in the national economy received gross wages not higher than the minimum wage (1750 PLN), which was about 13% of the total number of employed people (similarly as in previous years). We should assume that this number will not change significantly in subsequent years. If we assume that the minimum wage worker will work for 35 years (from 26 to 60 years), receiving a minimum wage of 2000 PLN (year 2017) and not taking into account the change in the value of money over time, we can calculate that when retiring he will have fund of PLN 163,968, giving pension PLN 643 – so the minimum one. If such a person retires at the age of 67 – calculated number slightly exceeds the amount of the minimum pension (PLN 1000). It means that the recipients of the minimum wage should retire as early as possible, since the transition time will not affect the amount of benefits received. Therefore, people who receive the lowest wages will not lose on lowering their retirement age. Their retirement benefits, despite early retirement, will not change. The vast majority will therefore use this opportunity which might also rise the temptation to continue work in the shadow economy. This is the result of a jump increase in the minimum pension in March 2017 to PLN 1000. Ratio between the lowest pension and the minimum and average wage in the years 2002–2017 is illustrated in Table 8, which shows a sharp improvement in the ratios in 2017.

The age of retirement will affect pension level if the worker salary exceeds about 1.5 minimum wage in the period of employment (in 2017 – 3 000 PLN). In such case each additional year of work means an increase in pension level by about 8%. Approximate level of future pension, depending on the retirement age, the amount of revalued initial capital and updated contributions to the Social Insurance Fund at the end of 2017, and annual contribution in various variants is presented in Table 9. For the calculations, it was assumed that future annual revaluation index is equal to 3%. It was also assumed that employee will have 60 years on June 1, 2018.

Table 8. Ratio between the lowest pension to minimum and average wage during 2002–2017 in Poland

Year	The lowest pension	Minimum wage	Ratio between the lowest pension and minimum wage	Average wage	Ratio between the lowest pension and average wage	Ratio between minimum and average wage
2002	532.91	760	70.12%	2 133.71	24.98%	35.62%
2003	552.63	800	69.08%	2 201.47	25.10%	36.34%
2004	562.58	824	68.27%	2 289.57	24.57%	35.99%
2005	562.58	849	66.26%	2 380.29	23.63%	35.67%
2006	597.46	899.1	66.45%	2 477.23	24.12%	36.29%
2007	597.46	936	63.83%	2 691.03	22.20%	34.78%
2008	636.29	1 126	56.51%	2 943.88	21.61%	38.25%
2009	675.10	1 276	52.91%	3 102.96	21.76%	41.12%
2010	706.29	1 317	53.63%	3 224.94	21.90%	40.84%
2011	728.18	1 386	52.54%	3 399.52	21.42%	40.77%
2012	799.18	1 500	53.28%	3 521.67	22.69%	42.59%
2013	831.15	1 600	51.95%	3 650.06	22.77%	43.83%
2014	844.45	1 680	50.26%	3 783.43	22.32%	44.40%
2015	880.45	1 750	50.31%	3 899.78	22.58%	44.87%
2016	882.56	1 850	47.71%	4 060,00	21.67%	45.57%
2017	1 000.00	2 000	50.00%	4 263,00	23.52%	46.92%

Source: Review of the pension system, Information of the Council of Ministers for the Polish Parliament about the effects of the Law from 11 May 2012 on the changes in Law on pensions from the Social Insurance Fund (Journal of Laws, No. 637), together with proposals for amendments. P. 78, Warsaw 2017.

It should be emphasized that these are approximate calculations, assuming for example the life expectancies published by GUS on March 24, 2017. Those indicators will be changed in 2018 (like each year). The annual premium contribution of PLN 4 685 corresponds to the minimum wage, whereas PLN 6 000 is the effect of monthly wage of PLN 2 560, similarly the contribution of PLN 9 000 is the wage PLN 3840, the contribution of PLN 12000 – the wage PLN 5 123 and contribution PLN 15 000 – the wage PLN 6 404.

Table 9. **Approximate level of future pension, depending on the retirement age, the amount of revalued initial capital and contributions to the Social Insurance Fund**

Retirement age		60	61	62	63	64	65	66	67	68	69	70
Life expectancies		**255**	246.1	237.3	228.8	220.3	**212**	203.7	**195.6**	187.6	179.6	171.8
Revalued initial capital and updated contributions (on 31 XII 2017)	annual contribution (in PLN)	Pension level (in PLN)										
283 253 zł	4685.0	**1118.5**	1212.5	1314.6	1424.6	1545.0	**1675.4**	1818.7	**1974.5**	2145.1	2333.7	2539.7
	9000.0	**1125.5**	1237.3	1359.1	1490.8	1635.1	**1792.0**	1964.6	**2152.7**	2359.3	2587.8	2838.1
	12000.0	**1130.4**	1254.6	1390.1	1536.8	1697.7	**1873.0**	2066.0	**2276.7**	2508.1	2764.4	3045.6
	15000.0	**1135.3**	1271.8	1421.0	1582.7	1760.4	**1954.0**	2167.4	**2400.6**	2657.0	2941.1	3253.1
450 000 zł	6000.0	**1774.5**	1917.9	2073.7	2241.1	2424.3	**2622.8**	2840.6	**3077.3**	3336.4	3622.5	3935.1
	9000.0	**1779.4**	1935.2	2104.6	2287.1	2487.0	**2703.8**	2942.0	**3201.2**	3485.2	3799.2	4142.5
	12000.0	**1784.3**	1952.5	2135.5	2333.1	2549.6	**2784.8**	3043.4	**3325.1**	3634.1	3975.8	4350.0
	15000.0	**1789.2**	1969.7	2166.5	2379.1	2612.3	**2865.9**	3144.8	**3449.0**	3783.0	4152.5	4557.5
500 000 zł	6000.0	**1970.6**	2127.2	2297.2	2479.9	2679.8	**2896.2**	3133.7	**3391.7**	3674.0	3985.8	4326.2
	9000.0	**1975.5**	2144.5	2328.2	2525.9	2742.4	**2977.2**	3235.1	**3515.6**	3822.8	4162.4	4533.7
	12000.0	**1980.4**	2161.7	2359.1	2571.9	2805.1	**3058.2**	3336.5	**3639.5**	3971.7	4339.1	4741.1
	15000.0	**1985.3**	2179.0	2390.0	2617.9	2867.7	**3139.3**	3437.9	**3763.4**	4120.6	4515.7	4948.6
550 000 zł	6000.0	**2166.7**	2336.4	2520.8	2718.7	2935.2	**3169.6**	3426.8	**3706.1**	4011.6	4349.0	4717.3
	9000.0	**2171.6**	2353.7	2551.7	2764.7	2997.9	**3250.6**	3528.2	**3830.0**	4160.5	4525.7	4924.8
	12000.0	**2176.5**	2371.0	2582.6	2810.7	3060.5	**3331.7**	3629.6	**3953.9**	4309.3	4702.3	5132.3
	15000.0	**2181.4**	2388.3	2613.5	2856.7	3123.2	**3412.7**	3731.0	**4077.8**	4458.2	4879.0	5339.7
600 000 zł	6000.0	**2362.7**	2545.7	2744.3	2957.5	3190.7	**3443.0**	3719.9	**4020.4**	4349.2	4712.2	5108.5
	9000.0	**2367.6**	2563.0	2775.2	3003.5	3253.3	**3524.0**	3821.3	**4144.4**	4498.1	4888.9	5315.9
	12000.0	**2372.5**	2580.3	2806.2	3049.5	3316.0	**3605.1**	3922.7	**4268.3**	4647.0	5065.6	5523.4
	15000.0	**2377.5**	2597.5	2837.1	3095.5	3378.6	**3686.1**	4024.1	**4392.2**	4795.8	5242.2	5730.8
650 000 zł	6000.0	**2558.8**	2755.0	2967.8	3196.3	3446.1	**3716.4**	4013.0	**4334.8**	4686.9	5075.5	5499.6
	9000.0	**2563.7**	2772.2	2998.8	3242.3	3508.8	**3797.5**	4114.4	**4458.7**	4835.7	5252.1	5707.0
	12000.0	**2568.6**	2789.5	3029.7	3288.3	3571.4	**3878.5**	4215.8	**4582.7**	4984.6	5428.8	5914.5
	15000.0	**2573.5**	2806.8	3060.6	3334.3	3634.1	**3959.5**	4317.2	**4706.6**	5133.5	5605.5	6122.0
700 000 zł	6000.0	**2754.9**	2964.2	3191.4	3435.1	3701.6	**3989.8**	4306.1	**4649.2**	5024.5	5438.7	5890.7
	9000.0	**2759.8**	2981.5	3222.3	3481.1	3764.2	**4070.9**	4407.5	**4773.1**	5173.3	5615.4	6098.2
	12000.0	**2764.7**	2998.8	3253.2	3527.1	3826.9	**4151.9**	4508.9	**4897.0**	5322.2	5792.0	6305.6
	15000.0	**2769.6**	3016.1	3284.2	3573.1	3889.5	**4232.9**	4610.3	**5021.0**	5471.1	5968.7	6513.1

Source: Own computations.

Table 10. Percent growth in the pension level while retiring in specific age comparing to the age of 60

Retirement age		60	61	62	63	64	65	66	67	68	69	70
Revalued initial capital (in PLN)	Yearly contribution	Pension level	Percent growth in the pension level while retiring in specific age comparing to the age of 60									
283 253	4 685	1118.5	8.4	17.5	27.4	38.1	**49.8**	62.6	**76.5**	91.8	108.6	127.1
	9 000	1125.5	9.9	20.8	32.5	45.3	**59.2**	74.6	**91.3**	109.6	129.9	152.2
	12 000	1130.4	11.0	23.0	36.0	50.2	**65.7**	82.8	**101.4**	121.9	144.6	169.4
	15 000	1135.3	12.0	25.2	39.4	55.1	**72.1**	90.9	**111.5**	134.0	159.1	186.5
450 000	6 000	1774.5	8.1	16.9	26.3	36.6	**47.8**	60.1	**73.4**	88.0	104.1	121.8
	9 000	1779.4	8.8	18.3	28.5	39.8	**52.0**	65.3	**79.9**	95.9	113.5	132.8
	12 000	1784.3	9.4	19.7	30.8	42.9	**56.1**	70.6	**86.4**	103.7	122.8	143.8
	15 000	1789.2	10.1	21.1	33.0	46.0	**60.2**	75.8	**92.8**	111.4	132.1	154.7
500 000	6 000	1970.6	7.9	16.6	25.8	36.0	**47.0**	59.0	**72.1**	86.4	102.3	119.5
	9 000	1975.5	8.6	17.9	27.9	38.8	**50.7**	63.8	**78.0**	93.5	110.7	129.5
	12 000	1980.4	9.2	19.1	29.9	41.6	**54.4**	68.5	**83.8**	100.6	119.1	139.4
	15 000	1985.3	9.8	20.4	31.9	44.4	**58.1**	73.2	**89.6**	107.6	127.5	149.3
550 000	6 000	2166.7	7.8	16.3	25.5	35.5	**46.3**	58.2	**71.0**	85.1	100.7	117.7
	9 000	2171.6	8.4	17.5	27.3	38.1	**49.7**	62.5	**76.4**	91.6	108.4	126.8
	12 000	2176.5	8.9	18.7	29.1	40.6	**53.1**	66.8	**81.7**	98.0	116.0	135.8
	15 000	2181.4	9.5	19.8	31.0	43.2	**56.4**	71.0	**86.9**	104.4	123.7	144.8
600 000	6 000	2362.7	7.7	16.2	25.2	35.0	**45.7**	57.4	**70.2**	84.1	99.4	116.2
	9 000	2367.6	8.3	17.2	26.9	37.4	**48.8**	61.4	**75.0**	90.0	106.5	124.5
	12 000	2372.5	8.8	18.3	28.5	39.8	**52.0**	65.3	**79.9**	95.9	113.5	132.8
	15 000	2377.5	9.3	19.3	30.2	42.1	**55.0**	69.3	**84.7**	101.7	120.5	141.0
650 000	6 000	2558.8	7.7	16.0	24.9	34.7	**45.2**	56.8	**69.4**	83.2	98.4	114.9
	9 000	2563.7	8.1	17.0	26.5	36.9	**48.1**	60.5	**73.9**	88.6	104.9	122.6
	12 000	2568.6	8.6	18.0	28.0	39.0	**51.0**	64.1	**78.4**	94.1	111.4	130.3
	15 000	2573.5	9.1	18.9	29.6	41.2	**53.9**	67.8	**82.9**	99.5	117.8	137.9
700 000	6 000	2754.9	7.6	15.8	24.7	34.4	**44.8**	56.3	**68.8**	82.4	97.4	113.8
	9 000	2759.8	8.0	16.8	26.1	36.4	**47.5**	59.7	**73.0**	87.5	103.5	121.0
	12 000	2764.7	8.5	17.7	27.6	38.4	**50.2**	63.1	**77.1**	92.5	109.5	128.1
	15 000	2769.6	8.9	18.6	29.0	40.4	**52.8**	66.5	**81.3**	97.5	115.5	135.2

Source: Own computations based on table 9.

Based on calculation from table 10 it is clear that decision to retire at the age of 65 instead of 60 results in an increase in the pension level for more than 50%. If we retire at the age of 67 (instead of 60), the average pension will increase by more than 75%. From this point of view, the employee should decide at the latest retirement, it especially refer to women. Let's notice that their pensions will be very low and will range between 18 and 45% of the last wage. It means that retiring at the minimum age would lead to very low pension.

Conclusions

Analyzing the data presented in the article, both about the level of future pensions and the situation of the Polish Security Fund it is hard to see any positive effect of lowering the retirement age, except the benefit for the least earners – they will not lose on the early retirement because they would still receive a minimum pension. It is therefore hard to disagree with M. Szczepanski's conclusions (2016): „It seems that in the longer term it will be necessary to extend the retirement age, because of demographics and economic calculations, which in social policy will sooner or later pave the way.”. The retirement benefits for miners, uniformed services should be reduced, while the opposite trend is observed. It was recently expanded to customs officers and border guards. It is worth noting that the political situation in upcoming years (including upcoming local and parliamentary elections) will definitely not be help in resolving this issue. Attempts to block future changes in the retirement age, by for example resolving this issue in a referendum without necessary educational action, should be treated as irresponsible and calculated only for immediate political purposes. About the probable need of future increase of the retirement age mentions even ZUS in the White Paper (2016). It is however hard today to pinpoint any party that could decide to do this, no matter on the political costs.

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Filip Springer
Miasto archipelag. Polska mniejszych miast
(The archipelago city. Poland of smaller cities)
Karakter Publishing house, Cracow 2016, p. 320.

Ten years after implementation of the 'coordinate system' in 1965[1] Edward Gierek quite spontaneously has divided Poland into forty nine provinces what was a surprise for the all. The archipelago city is a documentary project based on which the publication has been created. All the inhabitants of the 31 archipelago cities joined to the surveys. The note located on the cover of the book by the publisher respectively introduces in content of the publication so I will quote it: 'Thirty one cities, dozens interesting interviews. Almost three million Poles lived in them. The author travelled through the whole country starting from Slupsk to Krosno and from Suwalki to Walbrzych to see how nowadays people live in the cities which in 1989 lost status of capital of the voivodships. He met their history and he was talking with the inhabitants, as well he met with the entrepreneurs, artists, activists and teachers. He was visiting local workshops and cafes, fallen factories and dynamically developing companies, stations and McDonald's restorations. He was asking the people what are they proud of in their cities, what are they happy about and what they would like to 'change'.

The structure of the review consists of two sections. In the first section there were presented generalizations concerning the analysed archipelago cities, in the second one there are problems related to functioning of the individual cities before and after the reform in 1989.

History of the cities can be considered in different ways: in terms of their economic, utility and communication values, it means everything what is measurable in economic categories. They can be studied in terms of sociological issues. The city can be also analysed as a historical phenomenon

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[1] In the system the territory of Poland was divided into five reproducing zones wherein the basis to secrete the zones were boundaries of the administrative divisions. The zones have different size and nonsense of basing their boundaries on the administrative divisions appeared already in 1975 when there was introduced a new administrative division into 49 voivodships. It turned out then that some of the voivodships were in two or even three reproducing zones. *Coordinate system*, 1965 https//wikipedia.org (access 25th May 2017)

following changes taking place in its organization, management structure and form of government.

The author notes that it is more difficult to observe the transition in a large city while in a small city it is easier. For example when a citizen has something to do in a city, he or she leaves a car, goes on foot and looks around the road. It makes that he or she sees better passage of the time and knows what changed.

Districts needing a rescue as a result of the passage of the time and the destruction are priceless for the city, they save its history. This is just purpose of the revitalization. Act of the revitalization dated 9th October 2015, Acts Journal dated 2017, position 1023 provides that an area of commune being in a crisis can be a subject of the revitalizations activities. The concept is abused as a name of different renovations, adaptations and modernizations. Meanwhile, the concept refers to actions taken in a large scale (districts, parts of cities) and in relation to many functioning areas of urban space such as architectural, social, economic, cultural, etc.

A city is the most important structure as a place of people's residence and aggregation of all other important buildings; the most important in the whole architecture besides circuit of walls are good sections and design of streets, squares, areas along the fortifications and all other space and areas inside the city. The famous Italian architect Averlino wrote: 'the city should be beautiful, good and eternal (as Rome, note W.S.) to make this happen it cannot be cheap'.

The archipelago cities care their misfortunes. All of the cities were burning usually several times. In every one where rivers flow it was carefully marked level of water from the times of great flood. There was once passing some war front through each of the cities.

In the archipelago cities the modernization's urge mainly had to rely on:
1) Building of housing estates (Slupsk, Zamosc, Ostroleka, Leszno).
2) Complete reconstruction of downtowns (Ciechanow, Lomza, Wloclawek).
3) Formation of supermarkets and also shopping malls as a next civilization step of development of medium-sized cities (Bielsko-Biala, Kalisz, Konin).
4) Formation of educational objects like High Pedagogical College in Czestochowa, Teachers Study in Piotrkow Trybunalski, hotel in Chelm (there was not it previously), court building in Skierniewice, House of Technology in Radom, etc. The only fulfilled promise in relation to the archipelago cities after the reform in 1989 there was formation of High Vocational Schools.

In the middle of the eighties of the last century started to appear changes and everything began from the fact, that in 1985 Michail Gorbachev took power in the Soviet Union. The Perestroika has begun. Poland was already struggling at the time with chronic deficiency of basic goods. It became clear that without changes neither socialism nor the political party has a chance to survive. It was necessary to transform the socialism into free-market economy. As an experimental training ground there was selected Slupsk city which is one of the most political party oriented cities in Poland, (the Slupsk experiment). The idea was to transfer some parts of the local economy to private entities. Slupsk and the whole voivodship became in two years a leader in the country in building of detached houses. The political party's authorities were proud of Slupsk's successes. Still in December 1988 there was carried out a reconstruction of the political party's leadership by advancing the ones who supported the free-market reforms and political party's pluralism. In February of the next year started the proceedings of the Round Table and in June there were organized elections to the contract parliament. The victory of Robert Biedron in 2014 in local elections was a shock for the politicians in Slupsk.

The author notices the fact, that today's Poland is first of all Warsaw, although it is not covered by the publication. All major central offices are located in the capital what influences on imbalance in development of the other regions. Meanwhile, it does not need to be like that as evidenced by the de-glomeration patterns among others in Germany, Sweden and Switzerland, where various central offices are located outside the capitals of the listed countries.

The archipelago cities according to the Author can be divided in terms of migration to:

1) Permanent Easter-Christmas migration (what should be explained that a person who is connected with the city visits it usually on the occasion of Easter and Christmas and also during a vacation leave).
2) Weekend cities located close to large resorts where there is possible to come back every weekend to home but it is also enough far away that daily commuting is not taken into consideration because it would be too inconvenient and at the same time costly.
3) Daily cities which are a supply base for larger cities and their 'bedrooms', for example Skierniewice (commute to work to Lodz or to Warsaw), hence the unemployment rate is at the level of about 6%.

Now we will focus on presentation of problems in the chosen archipelago cities.

According to many researchers of Zamosc the greatest merit of Zamoyski chancellor was that he managed to create an ideal city, however not foreign but Polish measure. Historians will point out after many years that although the individual buildings were arranged by Italian architect, each corner of the funded city is all Polish.

In 1974 the Polish government decided to start the housing construction program under the name PR-5. Its initiators meant to check the pioneer solutions before starting of global building of Polish settlements using the 'large panel'. There were chosen four cities where prototypical settlements had to be created. They were: Warsaw, Tychy, Cracow and Zamosc. The program was realised only in Zamosc. It is worth to notice that the present Government takes care of the problem proposing the society the 'apartment plus' program.

The archipelago is jerked by two emotions. They are sense of harm and longing for what has passed. The best piano factory in Poland Calisia fell in 2007. In turn, Bielsko-Biala as well as other industrial cities had also its collapse which touched mainly the textile industry just like Lodz. The Lake District located north of Konin collapses in alarming speed. It is the price which is paid by the city for the opencast mining of coal in the past.

In turn, Lomza is the only city in the archipelago which has not railway connection with the rest of Poland while there are four trains daily which depart from Suwalki. The transport has a decisive influence on development of the city that is why after the seventies there was noticed the second important inflow of financial resources on the communication infrastructure after the entry of Poland to the European Union.

There was no other city like Radom in the archipelago which did not go through such violent and painful deindustrialization. Today in the city the largest employers are local government institutions, the police headquarter, hospitals and the university. The list of collapsed companies includes among others: Radoskor, the Phones Factory and 'Lucznik' Metal Factories. The image troubles of the city started in 1976 when workers from the Radom factories decided to protest against planned by the government increase of food prices. Then there were riots. Two people were killed and almost 200 were injured, a thousand more lost their jobs. The riots shook the authority of the Gierek's team. Since the time Radom is a 'black sheep' among Polish cities. Significantly, the only one finished financial investment from the state's budget since then in the city was a prison.

In the conclusion of the study the Author forms causes that affect two possible scenarios of development of the cities in the next thirty years.

They are:

- retreat from the coal economy for renewable energy sources,
- aging of the society,
- shrinking of the cities,
- the technological progress,
- spreading of remote forms of work,
- decentralization of the power.

Influence of these factors can cause that we will have an optimistic scenario of 'flourishing city' or a pessimistic scenario of 'fallen city'.

Due to the limited volume of such type of publications the attention was paid only to the selected cities of the archipelago. The rest ones are equally interesting. Therefore, I encourage all the ones who deal with the city both scientifically and practically in action to get acquainted with the reviewed book, especially taking into account the fact, that permanently it is spoken and written about reforming of our public life.

At the end I will use the quotation of C. Dikens, *'A story about two cities': 'It was the best and the worst of the eras, the age of mind and the age of madness, the time of faith and the time of doubt, the period of light and the period of darkness, spring of beautiful hopes and winter of desperations. Everything was in front of us and we did not have anything in front of us'*.

Wojciech Sońta