Book of Abstracts

V Wrocław Conference in Finance

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V Wrocław Conference in Finance

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Plenary Session I

Karsten Staehr, Magnus Piirits – Voluntary Pension Investment in a Three-Pillar System

Andrzej Sławiński – Lessons from TARGET2 imbalances: The case for the ECB being a lender of last resort

Marek Dietl - Key regulations affecting capital markets - MiFID I and MiFID II
Karsten Staehr, Magnus Piirits
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Voluntary Pension Investment in a Three-Pillar System

Andrzej Sławiński
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Lessons from TARGET2 imbalances:
The case for the ECB being a lender of last resort

Marek Dietl
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Key regulations affecting capital markets - MiFID I and MiFID II
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Łukasz Bielak</td>
<td>Market risk in mining &amp; metals industry</td>
<td>11</td>
</tr>
<tr>
<td>Michał Perlik</td>
<td>Addressing long-term trends in the company's strategy as an element of market risk management</td>
<td>11</td>
</tr>
<tr>
<td>Aleks Malenko</td>
<td>Are my technology controls good enough?</td>
<td>11</td>
</tr>
</tbody>
</table>
Łukasz Bielak  
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*Market risk in mining & metals industry*

Michał Perlik  
PKN Orlen, Poland  

*Addressing long-term trends in the company's strategy as an element of market risk management*

Aleks Malenko  
BY Mellon, Poland  

*Are my technology controls good enough?*
Plenary Session III

Lucjan Orlowski – Tail Risk in Financial Markets and Macroeconomic Variables ..................... 13
Hermann Locarek-Junge – A night at Warsaw Stock Exchange: Some anomalies in open and close prices in WIG20 and remarks on the other indices around the world .......................... 13
Lucjan Orlowski  
Sacred Heart University, United States of America  

*Tail Risk in Financial Markets and Macroeconomic Variables*

Hermann Locarek-Junge  
TU Dresden, Germany  

*A night at Warsaw Stock Exchange; Some anomalies in open and close prices in WIG20 and remarks on the other indices around the world*
Parallel Session

B: Banking

Ewa Łosiewicz-Dniestrzańska – Bank provisioning vs excess liquidity in banking sector ....... 15

Justyna Zabawa – Eco-banking in the relation to the financial performance of banking sector, The evidence from Poland ........................................................................................................ 16

Ewa Majerowska – Identification of the factors affecting the return rates of the banks listed on the Warsaw Stock Exchange ........................................................................................................ 18
Ewa Łosiewicz-Dniestrańska  
Wroclaw University of Economics, Poland

Bank provisioning vs excess liquidity in banking sector

The banking sector in Poland and in the world has been characterized by excess liquidity for years, the causes and effects of which are the area of research of many authors. Fearing the crisis, after 2008 also in Poland, commercial banks began to create more and more reserves, lowering the dynamics of loans. In the paper, the author will attempt to present the relationship between bank reserves and excess liquidity of banks and the banking sector.
Justyna Zabawa
Wroclaw University of Economics, Poland

**Eco-banking in the relation to the financial performance of banking sector.
The evidence from Poland**

The research has been possible to conduct thanks to the financial support of the National Science Centre, Poland, project number 2016/23/D/ HS4/02841, “Green banking versus economic efficiency of Polish banking sector in the context of implementation of the Directive UE 2014/95/UE”.

In the domestic and foreign literature (according to the Web of Science and Scopus database) can be observed a lot of papers connected with corporate social responsibility (CSR) and sustainable development (SD). There are a lot of scientific papers concerning topics: responsible business conduct, socially responsible investing, business responsibility, global business citizenship, community relations, corporate citizenship and others [Dahlsrud 2006; Murawski 2016; Zabawa 2019]. This publication places the focus on those areas of modern banking which bear direct associations with the protection of natural environment and the environmental effects of banks’ financial efficiency. It seems that the involvement of banking industry in pro-environmental projects and activities is not sufficiently presented in modern literature. Research carried out at paper supplements a significant gap in this area. In the domestic and foreign literature can encounter a small number of publications dealing with the subject of connections between the financial efficiency of an institution and the implementation of CSR activities in the banking sector in the world (based on Web of Science) [Dziawgo 2010; Soana 2011; Zabawa 2013c; Zabawa 2014b; Paulik et al. 2015; Huang, Duan, Zhu 2017; Waliszewski 2017; Zabawa 2019]. But there are no scientific papers and research concerning environmental responsibility of banking sector and its financial performance. The study was designed to provide a significant contribution in filling this important gap in modern research. It is the first study of this type to address the entire sector of commercial banking in the whole country. Research was carried out on the example of the Polish banking sector.

The main objectives of this study were defined as follows:
- measuring the level of Polish commercial banks’ involvement in pro-ecological activities, based on the postulated procedure,
- analysis the correlation between environmental engagement of banks and the financial ratios of banks e.g. ROA, ROE, CAR, IMR, C/I.

The development of research fields related to sustainable development and corporate social responsibility is also the effect of current EU law. The 2014/95/EU Directive concerns sharing non-financial information and information on diversity by some large entities and groups, and requires that the public interest entities, including banks, disclose information on, among other matters, their involvement in environment protection. The study was carried out based on data base: financial statements and non-financial reports of all commercial banks at the end of 2017, as a first year of implementation Directive 2014/95/UE to Polish law (Accounting Act, art. 49b and 55b).

**Keywords:** bank, banking sector, CSR, environmental protection, financial efficiency

**References:**


Identification of the factors affecting the return rates of the banks listed on the Warsaw Stock Exchange

Banks constitute a specific sector of stock-exchange-listed companies. The main factors affecting their rates of return are financial indicators. The aim of this paper is to identify these factors. Using annual data from 1998 to 2018, an unbalanced panel was created, covering 13 banks listed on the Warsaw Stock Exchange. The model proposed has been estimated for selected financial indicators. Next, factor analysis was used, by the means of which the latent factors were calculated. The results of the research allowed identification of the impact the latent factors have on the rates of return and showed that the main indicators determining the rate-of-return level were the operating profit margin, the return on equity, the equity ratio and the share of the operating expenses in the income on core operations.
Parallel Session

CF 1: Corporate Finance 1

Patrizia Gazzola, Stefano Amelio, Alessandro Figus – Risk management and CSR in the Healthcare sector: a financial evaluation .................................................................20

Bogna Kazmierska-Jozwiak, Nicolene Wesson – Share repurchases versus dividends: a comparison between Poland and South Africa .................................................................21

Julia Koralun-Bereźnicka – Are Corporate Financing Policies Different in Old and New EU Member States? ........................................................................................................... 22
Patrizia Gazzola  
Università Degli Studi Dell'Insubria, Italy  
Stefano Amelio  
University of Milano-Bicocca, Italy  
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M. Kozybayev North Kazakhstan University, Kazakhstan

**Risk management and CSR in the Healthcare sector: a financial evaluation**

The aim of the paper is to analyze how socially responsible behaviors can be considered as risk management tools. In particular, the underlying objective is to highlight the existence of a link between CSR and risk management within the healthcare sector of the Lombardy Region (Italy). The research is divided into two sections and the approach used combines both descriptive analysis and quantitative analysis methods: in the first part will be analyzed the concept of corporate social responsibility and risk management, describing the same concepts in the healthcare sector. In the second part, in order to highlight the CSR-risk management link, the paper analyses the web sites of the 8 health protection agencies of the Lombardy Region, created following the reform of the social and health system in Lombardy (Regional Law 23/2015). In our paper we demonstrate how a double bond (a double relationship) between CSR and RM exists. The first link classifies the CSR as an RM tool. At the same time, the RM can be considered a tool to demonstrate the social responsibility of the institution (or as a tool to prove that an institution is socially responsible).
Bogna Kazmierska-Jozwiak  
University of Lodz, Poland  
Nicolene Wesson  
University of Stellenbosch Business School, South Africa  

*Share repurchases versus dividends: a comparison between Poland and South Africa*

Corporate share repurchases grew strongly as a popular payout method first in the United States of America (US), then the United Kingdom (UK), and later in the continental Europe countries (Stonham, 2002). Although South Africa is a developing country with a dualistic economy, the country is characterized by sophisticated financial and industrial sectors within an underdeveloped economy (Wesson et al., 2018). The Johannesburg Stock Exchange (JSE) of South Africa has a current market capitalisation of USD 982.56 billion (as at 31 March 2019) (StockMarketClock, 2019). Poland was reclassified from emerging market to developed market status, effective as from 24 September 2018 (Emerging Europe, 2018) and the Warsaw Stock Exchange of Poland has a current market capitalisation of USD 162.98 billion (as at 31 March 2019) (StockMarketClock, 2019). The paper presents the first attempt of the research on dividends and share repurchases in Poland and South Africa. The main aim of the study is to compare share repurchases and dividends payout trends of non-financial listed companies in Poland and South Africa.
Julia Koralun-Bereźnicka  
University of Gdańsk, Poland

Are Corporate Financing Policies Different in Old and New EU Member States?

The research aim is to verify whether and how corporate capital structure and its determinants vary between the old and new EU member states. The empirical research based on the BACH-ESD database provided by the European Commission covers private firms from 12 countries in the period 2000–2017. Apart from considering the length of EU membership, a number of firm-specific determinants and industry features are captured in order to identify the main differences in corporate financing patterns. The methods employed include analysis of variance as well as panel data modelling performed on the two subgroups of countries. Findings reveal that although corporate financing patterns differ significantly across the compared groups, with companies in old member countries more heavily dependent on debt, the determinants of corporate financing choices are less varied and provide more support for the pecking order theory. The results also indicate that the relevant importance of the country, industry, and firm size effects depends on the length of EU membership.
Parallel Session

FM 1: Financial Market 1

Joanna Olbryś – Comparative Study of Market Tightness on the CEE-3 Stock Exchanges ....24
Harun Turker Kara, Nildag Basak Ceylan, Ayhan Kapusuzoglu – Global Economic Policy Uncertainty and its Effects on Selected Emerging Market Countries .............................................25
Agata Kliber, Barbara Będowska-Sójka, Tomasz Hinc – Causality between volatility and liquidity in cryptocurrency market .................................................................26
Comparative Study of Market Tightness on the CEE-3 Stock Exchanges

Dimensions of market liquidity, Market tightness, Daily data, Percentage relative spread, Rolling-window, CEE-3 stock markets

The nature of financial market liquidity is multidimensional. Majority of researchers consider the following three dimensions of market liquidity: (1) market depth, (2) market tightness, and (3) market resiliency. The goal of this paper is to explore market tightness as one of market liquidity dimensions on the major Central and Eastern European stock markets in Poland, the Czech Republic, and Hungary (the CEE-3). According to the literature, various versions of the bid/ask spread are proper measures for market tightness because they approximate the cost of an execution of a trade. In the study, percentage relative spread is employed as a proxy of daily market tightness on the CEE-3 stock exchanges. The research sample covers the period from January 2, 2012 to December 30, 2016. Moreover, to verify the stability of the obtained results, significance tests based on the rolling-window approach are provided. In general, the mean results of daily market tightness are quantitatively similar on the investigated markets, but they substantially differ among stocks and periods.
Global Economic Policy Uncertainty and its Effects on Selected Emerging Market Countries

Economic policy uncertainty is a widespread debate area in the modern management, economics and finance. In the management perspective, understanding of organizational environment is one of the key contributor to good governance. In addition to this, macroeconomist focus on some kind of uncertainties such as inflation uncertainty, exchange rate uncertainty and growth rate uncertainty on the way of sustainable growth. As for financial side, the finance – growth nexus cannot separable from uncertainties around the environment.

In recent years especially aftermath of global financial crisis, there has been a common search for novel measurement tool of economic policy uncertainty. Meanwhile, Global Economic Policy Uncertainty Index which is constructed by Baker, Bloom and Davis (2013) became a popular tool in order the grasp the impact of uncertainty both financial and real side of economy. Their method base upon text analysis via word searching from major newspapers of a selected country. The most prominent feature of the index is that its appearance in the media and academic papers. In addition to this, The Global Economic Policy Uncertainty Index provides high frequent and publicly available long span data. Therefore, there are other types of indices which use as a base of it.

Although, there are ample of works concentrate on the influence on economic policy uncertainty in the literature, we focus on emerging market side of these effects. With this regard, we use a Panel VAR model with a sample of twelve countries and their financial variables. According to the model results, economic policy uncertainty impacts stock markets negatively, flattens the yield curve and depreciates the nominal currency.
Causality between volatility and liquidity in cryptocurrency market

The relation between volatility and liquidity is thoroughly examined on the contemporary financial markets. Specifically, for the stock markets it is confirmed that liquidity tends to decrease when volatility increases. Still, very few papers examines such relationships within the cryptocurrency markets. This paper examines if volatility and liquidity of cryptocurrencies are related to each other and if there is any causality between these two. Our sample consists of 12 most popular cryptocurrencies. We consider both daily and weekly measures. We use asymmetric causality test to separate the influence of growths and declines of volatility to liquidity changes’ direction and in the opposite one. Our results show, inter alia, that most often high volatility causes high liquidity, which suggests that volatility attracts investors to the cryptocurrency market and improves liquidity.
Parallel Session

QM 1: Quantitative Methods 1

Ewa Dziwok, Martin Wirth – Fund Transfer Pricing mechanism - different approaches to the reference yield’s construction ........................................................................................................28

Pawel Milobedzki – Price clustering in stocks from the WIG 20 index ....................................................29

Aleksandra Wójcicka-Wójtowicz, Anna Łyczkowska-Hanćkowiak, Krzysztof Piasecki – The Application of SAW Method in Credit Risk Assessment ..........................................................30
Ewa Dziwok  
University of Economics in Katowice, Poland  
Martin Wirth  
University of Applied Sciences BFI Vienna, Austria

*Fund Transfer Pricing mechanism - different approaches to the reference yield’s construction*

The paper investigates different approaches to the construction of a term structure of interest rates – reference rates that are the base in Fund Transfer Pricing mechanism (FTP). While many positions in the literature focus on FTP mechanism as a part of asset liability management (ALM) process without any closer look at term structure construction, we identify features that let measure the behavior of the yield curve and detect the consequences of the model’s choice. The results show that the arbitrarily chosen model of the reference yield has significant consequences for risk management process of a financial institution. The study provides a twofold contribution to the literature describing FTP mechanism. First it introduces more complex approach to the reference rate modeling inside FTP mechanism and shows the consequences of the model’s choice for liquidity management. Moreover it focuses on the construction of the reference curve itself and shows two different approaches covering a parsimonious model as well as Smith-Wilson one.
Pawel Milobedzki
University of Gdansk, Poland

Price clustering in stocks from the WIG 20 index

Using transaction data on stocks included in the large cap Warsaw Stock Exchange index WIG 20 from May to September 2017 I find that their prices tend to cluster on certain final digits as 0, 5 and 00. The tendency for stock prices to cluster generally increases with increases in their spreads but not in traded volumes. Traders in less expensive stocks, contrary to those who trade in more expensive ones, submit larger in volume orders at round-numbered prices.
The Application of SAW Method in Credit Risk Assessment

Credit risk assessment usually is a complex process which consists of many successive steps and numerous criteria. Selection of good customers and rejection of potentially bad ones is vital as it directly and significantly affects the quality of bank’s credit portfolio. Also, ordering the decision alternatives is an important part of the whole decision-making analysis which takes place before making a final decision. The importance and complexity of the problem on one hand call for strictly analytical methods, however, on the other, also for a method which enables intuitive decision-making, imprecision and inaccurate linguistic ranks based on experts’ personal experience.

The paper presents the utility of Simple Additive Weighting (SAW) method (which belongs to the multicriteria decision-making approach) in case of a credit risk assessment. The presented illustrative example bases on experts’ knowledge and their perception and evaluation of various linguistic, frequently imprecise criteria. Therefore, the order scale is described by ordered fuzzy numbers (OFN).
Parallel Session

CF 2: Corporate Finance 2

Anna Doś – Gender equality in leadership in Poland - the role of ownership structure, family and CEO characteristics .................................................................32

Dorika Jeremiah Mwantambulo – Board Characteristics and Performance of East Africa Companies .................................................................33

Beata Lubinska – Stock market reactions to negative ESG news: evidence from DAX companies ..................................................................................34
Anna Doś
Uniwersytet Ekonomiczny w Katowicach, Poland

Gender equality in leadership in Poland - the role of ownership structure, family and CEO characteristics

This study examines factors impacting gender equality in boards and top management in Poland through the lenses of resource based view and institutional theory with a reference to behavioral traits. The analysis of multi-level data on Polish listed non-financial companies for 2018 showed that women have to demonstrate rare competences in order to reach executive positions. The results support that capital ownership is important factor determining women representation in boards. Nordic equity holders institutionalize women presence in leadership while Western Europe equity holders as well as Polish owners institutionalize the dominance of men in leadership. The results show that family ownership favours the entry of women in boards. The CEO extraordinary cognitive capabilities were evidenced as an important factor driving positively female directors presence in board. Further research is necessary to understand the role of education in gender equality in business promotion.
Dorika Jeremiah Mwantambulo
Wroclaw University of Economics, Poland

*Board Characteristics and Performance of East Africa Companies*

In the management of agency problems, the board of director is a significant tool for monitoring the activities of the managers. The board has important characteristics associated with its effectiveness and efficiency and that is transformed into the general performance of the company. The aim of this study is to provide evidence regarding the characteristics possessed by the East Africa community companies’ boards and their relationship to the performances of these companies. Using simultaneously a system of equations and annual data from 16 companies for a period between 2003-2017 the study observed that the companies’ market performances factors to be highly influenced by the characteristics of the board such as board size, proportional of women, proportional of independent directors and proportional of foreign directors. On the other hand, the companies’ account performance factors were less influenced, and only ROE related more to the board characteristics as compared to ROA. During this period the market was more overwhelmed by new information regarding the board characteristics as compared to the accounts performance.
Anna Dziadkowiec  
Wrocław University of Economics, Poland

*Stock market reactions to negative ESG news: evidence from DAX companies*

Environmental, social and governance (ESG) performance has become an important topic on capital markets amid an increased interest in sustainable investing. The topic has also drawn attention of scientists who have examined the impact of corporate social performance on financial performance. This research investigates to what extend negative ESG news impact market valuations of firms listed in DAX. The research applies an event study methodology for stock price reactions to 231 negative ESG news in the years 2000-2019. The main findings show that investors’ perception of the news has changed over time as there are negative and significant cumulative average abnormal returns (CAARs) in the event study window for ESG news released after the year 2009, whereas before 2009 CAARs are insignificant. The results provide a guidance for listed companies on how their market value might be affected by social misconducts, and for investors who are still reluctant to incorporate ESG factors in the investment decision processes.
Parallel Session

FM 2: Financial Market 2

Edward Radosiński – Investments strategies on the stock exchange – theory and practice ........36
Ryszard Węgrzyn – Effectiveness of Dynamic Hedging Using Options on Wig20 in Current Market Conditions .................................................................37
Sabina Nowak – The accuracy of trade classification rules for the selected CEE stock exchanges ..............................................................38
Edward Radosiński
Politechnika Wrocławska, Poland

*Investments strategies on the stock exchange – theory and practice*
Ryszard Węgrzyn  
Cracow University of Economics, Poland  

Effectiveness of Dynamic Hedging Using Options on Wig20 in Current Market Conditions

Based on previous research on the deviations of the prices of options on WIG20 from certain restrictions and arbitrage features, it was found that the number and scale of these deviations clearly decreased, thus improving the quality of the arbitrage pricing of option. The purpose of this work in this context is to determine the effectiveness of dynamic hedging using options on WIG20 in current market conditions and to compare the results with the results of previously conducted research. The study was conducted using the historical scenario method based on data from 2017 - 2018 shared by the Warsaw Stock Exchange. To compare the effectiveness of dynamic hedging, the Value at Risk was used for unhedged and hedged portfolios with certain hedging methods. Based on the research, it can be concluded that among the delta, delta-gamma and delta-gamma-vega hedging analyzed, the most effective solution in the current market conditions is delta hedging. The research results point out that despite qualitative changes on the market that improve the option price relations the delta-gamma and delta-gamma-vega hedging are in practice worse solutions than delta hedging.
Sabina Nowak
Uniwersytet Gdański, Poland

*The accuracy of trade classification rules for the selected CEE stock exchanges*
Parallel Session
Per F: Personal Finance

Adam Grožák, Zuzana Stoličná – Indebtedness of the households and restriction on the credit market in Slovakia .................................................................40

Ewa Poprawska, Anna Jędrzychowska – Costs incurred by the mother as a result of childbirth and upbringing - changes in the career path.................................................................41

Patrycja Kowalczyk-Rólczyńska, Joanna Rutecka-Góra – Readability, transparency and efficiency of individual pension products - comparative analysis for the Polish market ...............42
Adam Grožák, Zuzana Stoličná  
Comenius University in Bratislava, Slovak Republic  

**Indebtedness of the households and restriction on the credit market in Slovakia**

The financial sector is considered stable when it performs its core functions even with negative phenomena in the external and domestic financial environment. The aim of the article will be to describe the state of the economy of the state, which contributes to the greater indebtedness of the population, which may ultimately pose a risk that will appear on the domestic market. The indebtedness of the Slovak population and businesses in relation to GDP has been growing almost continuously since 2012 and exceeds the average of Central and Eastern European countries. The development of the credit market is the result of low interest rates and stable economic growth. The Slovak Republic records the highest year-on-year growth in loans to the entire European Union. In 2018, the volume of loans almost doubled. Also, income growth and increasing credit availability have fueled debt. Continuing pressure on low interest rates and indebtedness of NBS principles has taken many measures to adjust the limits for credit scandals. These changes in lending conditions should mitigate the risk of excessive debt growth. The aim of this article is to bring readers closer to these financial market restrictions.
Ewa Poprawska, Anna Jędrzychowska
Wroclaw University of Economics, Poland

Costs incurred by the mother as a result of childbirth and upbringing
- changes in the career path

This article is a continuation of research conducted by a scientific team for several years, which concern the financial consequences of loss of health and life by members of households. This problem is important, among others, in the context of calculating the value of compensation for this loss (e.g., compensation from liability insurance). This part of the research is devoted to the problem related to the economic consequences of a child's death in a household.

Parents bear the costs of raising a child. Of course, these are various costs, which are spread over time - starting from the costs related to pregnancy, for the period of full care of the child and, related to this, suspension of work, to continuous maintenance and dedication of time for the period of residence a child in a household. Thus, these are financial costs (purchases for the child), as well as work for the child (doing homework with the child, bringing to school, etc.), as well as slowing down professional development.

The article broadly analyze one of the mentioned aspects, i.e., lost profits – the financial consequences that are mainly borne by the mother to birth and care for the child, which are connected to changes in the career development. Selected scenarios of career path development of a mother will be considered and an income gap (defined as a difference between the expected career path of a childless person and a person with a child) assessment model will be proposed.

It should be remembered that the child appears most often at the beginning of its mother's career. This is the time of the fastest increase in wages (according to CSO data for Poland). Therefore, taking into account the non-linear trend (close to the exponential one), one should analyze how the mother's career towards a childless person slowed down. In addition, it should be remembered that lower wages translate into lower pension contributions. Thus, there are also costs associated with lost basic capital for retirement. This is what we want to illustrate in the proposed article.

Although it is an international problem, it takes a different scale depending on the economic situation of the country, social policy, social security in a given country, as well as cultural differences resulting from tradition, mentality and the dominant family model, etc. The created model of the valuation of the income gap is universal, but, the numerical illustration will be based on the Polish reality.
Readability, transparency and efficiency of individual pension products
- comparative analysis for the Polish market

Reforms of old-age pension systems changed the architecture of both basic and supplementary pension schemes. Decreasing replacement rates from public systems resulted in paying more attention to voluntary pensions plans that should supplement the old-age income to adequate level.

Polish supplementary pension system consists of few elements: Individual Retirement Accounts (IKE), Individual Retirement Savings Accounts (IKZE) and Employees' Retirement Pension Scheme (PPE). Our paper focuses on two of them: IKE and IKZE. As this part of the pension market is voluntary, very complex and untransparent, potential and actual consumers may have immense problems with understanding the offered products, comparing their specific features and choosing the best option. Moreover, the situation may also result from either economic complexity of the products (sophisticated financial mechanisms) or the linguistic difficulty of these contracts (the type of language used and structure of the material).

The main goal of the paper is to evaluate and compare the transparency, readability and efficiency of individual pension contracts that are offered on Polish market by insurance companies, investment funds, banks and pension funds. Our analysis is to give an answer whether there exists any relation between the level of linguistic complexity (readability and transparency) costliness and investment efficiency of pension products. We verify the following research hypothesis: The more complex is the structure and the more difficult is language used in individual pension contracts, the worse is the efficiency of the product. In addition, we checked which IKE and IKZE products are similar to each other and which are significantly different.

The subject of the study were documents of contracts offered by financial institutions at the end of 2016. The analysis of readability of individual pension product was conducted with the use of the application 'JASNOPIS' created by Polish experts in linguistics (one of them works with us in the project). Moreover, all the contracts were given a level of transparency, according to our own scale, by expert in linguistics. The efficiency was measured by the average real rate of return for the period 2012-2016. We calculated it using the data from websites of financial institutions and Polish internet portal Analizy Online. We also assessed the costliness of each analysed product according to the structure and level of costs charged at the end of 2016.

To verify the research hypotheses we applied the correlation analysis to examine the statistical interdependences between readability, transparency, efficiency and costliness (total cost ratio) of various pension products. In the first step the Spearman's rank correlation coefficient was used. In the second step we use a nonparametric test to assess the significance of the Spearman's rank correlation coefficient.

To achieve the second purpose of our paper we use Ward’s method to classify the examined individual pension contracts. Ward’s method is one of the hierarchical methods used for clustering the objects according to their similarities and/or separation of them according to the differences. It belongs to hierarchical agglomerative methods.
We found statistically significant correlation between the readability and efficiency of products offered by banks. It means that the more readable the contract of a bank IKE/IKZE account is, the higher is the average 5-year interest rate it offered. In case of investment fund this relation was inverse. The less readable the contract of an IKE/IKZE account offered by investment fund is, the higher is the average 5-year interest rate of such a product. For insurance companies and voluntary pension funds relation between these variables was insignificant statistically.

The obtained grouping results showed that there are similarities between IKE and IKZE products regardless of the institution (insurance company, bank, investment fund, pension fund) that offers them. Although clusters are created mostly by the individual pension products offered by one type of providers, in every cluster there are products offered by more than one type of financial institutions. It means that irrespective of the type of financial provider individual pension products can be similar in terms of transparency, readability, costliness or efficiency.
Parallel Session

Pub F: Public Finance

Agnieszka Przybylska-Mazur – Fiscal rules in aspect of exceptional circumstances ............... 45
Agnieszka Wojtasiak-Terech – Regional competitiveness and local governments debt .......... 46
Sarhad Hamza Khdir, Anna Białek-Jaworska – The Impact of Infrastructure on FDI Inflow: Iraq as a Case Study ................................................................. 47
Agnieszka Przybylska-Mazur
University of Economics in Katowice, Poland

Fiscal rules in aspect of exceptional circumstances

The main objectives of fiscal policy are to achieve balanced budget over the business cycle and to achieve the stability of public finances: general government debt and general government deficit. One way of fiscal decision making is decision based on the numerical rule.

In this paper we analyze the fiscal rule taking into account exceptional circumstances. The basis of the analysis is the debt brake rule - the example of fiscal rule that was applied the first time in Switzerland. We present the results for Poland.
Agnieszka Wojtasiak-Terech
Wroclaw University of Economics, Poland

*Regional competitiveness and local governments debt*

The goal of the research is to investigate if there is a linear relationship between changes in selected measures of regional competitiveness and changes of municipalities debt. For the analysis author selected Lower Silesia region and municipalities located there. Data covers years 2005-2015. In the first section concept of regional competitiveness and approaches to measure it are presented. The main measure of regional competitiveness selected by author is regional GDP per capita. The additional measures are: labor productivity, employment rate, average monthly salary and business density. In the second part some theories and empirical studies concerning public debt and economic growth, measured by GDP changes are analyzed. Last part of the study shows results of the research and points on important factors which could influence findings.
Sarhad Hamza Khdir, Anna Białek-Jaworska
University of Warsaw, Poland

**The Impact of Infrastructure on FDI Inflow: Iraq as a Case Study**

This paper examines the impact of the infrastructure availability, particularly with respect to transportation, on the attractiveness of Foreign Direct Investment (FDI) inflow in Iraq in the period of 1970-2017. This study uses quantitative research methodology with time series analysis to address the problem of non-stationarity of the data. We use macroeconomic variable to indicate the impact of infrastructure on FDI inflow such as GDP, GDP-CAP, Natural resources, market size, labour cost, human capital, political stability, openness. The Augmented Dickey-Fuller test is used to perceive whether variables are stationary, then linear regression estimation with heteroskedasticity consistent standard errors and covariance is employed to evaluate the models. We find that the infrastructure has significant and positive effect on FDI inflow to Iraq economy. Therefore, natural resources, market size, labour cost, human capital, and political stability have a positive influence on FDI inflow. The result of this study suggests policymakers place more emphasis on the transportation system and policies to attract FDI inflow. Thus, the quality of the infrastructure can be improved with less harmful impact on economic growth.
Parallel Session

QM 2: Quantitative Methods 2

Alicja Wolny-Dominiak – **AUC-based analysis of the impact of specific input factors on the binary decision variable** ................................................................. 49

Marta Małecka – **Geometric Distribution as Means of Increasing Power in Backtesting VaR**  .. 50

Anna Łyczkowska-Hanćkowiak, Krzysztof Piasecki – **Treynor’s Ratio for oriented fuzzy discount factor – revised approach** ................................................................. 51
Alicja Wolny-Dominiak  
University of Economics in Katowice, Poland

AUC-based analysis of the impact of specific input factors on the binary decision variable

In the era of an extensive use of ML methods in business, the problem of the fall/pass binary decision variable prediction is often considered. A classic example of a real application is credit scoring. Bank clients (individual or business), are classified as “bad” or “good” for more profitable loan management. Such classification is typically made using logistic regression as the ML predictive model. One of the first steps in ML prediction is the selection of attributes that influence the binary decision variable. The article presents a application of the heuristic reduction algorithm using the AUC (area under curve) of ROC (receiver operating characteristic) accuracy measure to model the probability of bankruptcy (default) of the company. The modification of the stop criteria is proposed. The algorithm operation is illustrated using a dataset containing information about bankruptcies of companies on the Polish market in 2005.
Marta Małecka
University of Łódź, Poland

**Geometric Distribution as Means of Increasing Power in Backtesting VaR**

We explore properties of the geometric distribution as means of constructing conditional coverage VaR tests. We study properties of these tests using asymptotic convergence of the test statistics. In this way we replace Monte Carlo simulated distributions. We provide a unified framework that allows for effective comparison of various procedures. To achieve comparability we modify test statistics and adapt them to the conditional coverage hypothesis. We show that two tests that indirectly use properties of the geometric distribution – the test based on the General Method of Moments and the test based on the Gini coefficient – may be conveniently implemented with the use of known theoretical distributions. We argue that replacing Monte Carlo simulations with these distributions does not pose the risk of overrejecting correct risk models. We also demonstrate their efficiency at detecting incorrect models. We include practical guidelines about significance level and sample size that ensure accurate and efficient testing.
Treynor’s Ratio for oriented fuzzy discount factor – revised approach

In the article, the imprecise present value is evaluated by means of a trapezoidal ordered fuzzy number. Then expected discount factor is a trapezoidal ordered fuzzy number too. The imprecise value of this factor may be used as a decision premise in creating new investment strategies. Considered strategies are built based on a comparison of an ordered fuzzy profit index and the crisp value limit. In this way we obtain imprecise investment recommendation given as a fuzzy subset in the space of standardized investment advices. Financial equilibrium criteria result from the capital market theory as a special case of this comparison. Further in the paper, the Treynor’s Ratio criterion is generalized for the case when expected discount factor is given as ordered trapezoidal fuzzy number. Obtained results show that proposed theory can be used in investment applications. All theoretical considerations are illustrated by means of simple empirical case study.
Parallel Session
CF 3: Corporate Finance 3

Janusz Brzeszczyński, Jerzy Gajdka, Tomasz Schabek – Self-Regulation, Sustainability and Financial Performance in an Emerging Market. Evidence from the RESPECT Index Companies

Anna Białek-Jaworska, Dominika Gadowska-dos Santos, Robert Faff, Katarzyna Trzpiola – Determinants of lending money by non-financial firms

Tomasz Schabek – The financial performance of clean power producers in emerging markets

Rafał Siedlecki, Agnieszka Bem, Paweł Prędkiewicz – IT investment analysis in a non-profit hospital
Janusz Brzeszczyński  
Newcastle Business School (NBS), Northumbria University, Newcastle upon Tyne, United Kingdom; University of Łódź, Poland  
Jerzy Gajdka, Tomasz Schabek  
University of Łódź, Poland  

**Self-Regulation, Sustainability and Financial Performance in an Emerging Market. Evidence from the RESPECT Index Companies.**  

We provide novel empirical evidence about the performance of the socially responsible investment (SRI) companies from the new sustainability index in Poland called RESPECT. The profitability of investing in stocks from RESPECT index is investigated since its launch in 2009 until 2018.  

Overall, we conclude that financial market in Poland did not penalize the analysed companies for adopting their self-regulation practices. However, we also found very little evidence of indexing effect existence in the investigated data sample.  

We also discuss a research agenda regarding future investigations in the area of self-regulation, sustainability and financial performance using the emerging markets data.
Determinants of lending money by non-financial firms

People often say that they learn from mistakes and become better. Is this always true with the financial market? In our study, we find the answer by analyzing the Japan case based on overconfidence bias. We use overconfidence here to test the hypothesis that can crisis-experienced people learn crisis the hard way and become rational in their subsequent investment decisions? To derive the conclusion, we conduct the field experiment with two groups of Japanese people who lived in the 1980s: one group is severely affected by the real estate bubble in Japan in 1980s, and another group is not really suffered from it. We analyze their current investment decisions by using interval estimates for knowledge questions, and real financial time series to check if there is any difference in their overconfidence scores. We find out that even suffering from the tragedy like this crisis, these people who were overconfident in the bubble period cannot learn this lesson and avoid irrationality after that.
Tomasz Schabek  
University of Lodz  

*The financial performance of clean power producers in emerging markets*

Stricter government regulations and growing awareness of environmental issues worldwide have a significant impact on companies representing the power production sector. The use of renewable energy is becoming more common, and each year it constitutes a higher share of total energy consumption also in emerging markets (EM). Therefore, clean power producers are the subject of growing interest of financial analysts and investors. In this study, the determinants of the financial performance of power producers from emerging markets are analyzed using longitudinal data regressions with fixed and random cross-sectional effects. We acquire large dataset describing companies from 16 emerging markets in the period of 2000 to 2017, and differently from other studies we analyze both public and private firms. The study provide comprehensive results suggesting that return on equity of the renewable power producers is affected not only by debt and size, but also by the type of resources used (solar vs. wind) or legal form (private vs. public). Results are similar regarding return on assets, with one difference, i.e. the renewable energy penetration of the market also plays a significant role in explaining this variable. This study contribute to the existing literature by introducing into analysis variables linking the type of renewable resource with financial performance, studying private and public firms, analyzing large group of emerging markets, and providing overall comparison of financial performance of fossil fuel based vs renewable energy based power producers.
Rafał Siedlecki, Agnieszka Bem, Paweł Prędkiewicz
Wroclaw University of Economics, Poland

*IT investment analysis in a non-profit hospital*

This paper deals with a problem of IT investments’ analysis in the hospital industry. We pose a research question, whether the investments in IT bring additional value to a hospital as an enterprise. Based on that, we hypothesize that investment in IT creates important activity’s improvement, which effects should be incorporated in the financial analysis. As a result, investment in IT brings additional value to a company.
Parallel Session

CM: Commodity Market

Bogdan Włodarczyk, Alberto Burchi, Marek Szturo – Impact of Commodity Market Risk on Listed Companies .......................................................... 58

Krzysztof Piasecki, Michał Dominik Stasiak – Verification of the precious metals market effectiveness – gold and silver .......................................................... 59

Karolina Anna Siemaszkiewicz – Alternative investments in precious metals .................. 60

Dominik Krężołek – Selected measures of investment performance on the precious metals market .......................................................... 61
Impact of Commodity Market Risk on Listed Companies

Commodity market is one of the most important elements of the global economy as a global mechanism of valuation and distribution of goods, it has additionally become a kind of barometer of investor attitudes. This applies to companies whose operations are strongly related to the commodity market. The unfavourable impact of market risk from the raw material market on the value of a given company and its solvency is possible, especially if there is a correlation between the prices of raw materials and share prices of that company. These types of relationships are not yet fully understood. This is due to the complexity of the processes that shapes the relationship between commodity markets and listed companies. The purpose of this article is to present the impact of the risk of raw material markets on the credit risks of listed companies. Two stock exchange markets have been selected for this purpose: the Italian market with a mature and well-established position in the global capital trading system and the stock markets in Poland as representatives of developed markets characterized by different stages of institutional development. The risk associated with investments in the Italian and Polish markets is clearly correlated with the raw material market indices. The importance of such observation is linked to the issue of accepting the perspective of the raw materials market in the assessment of the profitability of sectoral investments in the economies of the studied countries.
Krzysztof Piasecki, Michał Dominik Stasiak
Poznan University of Economics, Poland

Verification of the precious metals market effectiveness – gold and silver

The requirement for using technical analysis and for constructing HFT system based on it, is the assumption about possible dependencies between historical data and the future direction of a rate change. Making this kind of assumption leads to rejecting the hypothesis of market effectiveness. In the article a verification method for the assumption is presented for the case of precious metals – gold and silver. The base of proposed method is statistical testing performed on the binary course representation, which is more precise than the candlestick representation. The article also presents an analysis of obtained results in terms of possible construction of HFT systems.
Karolina Anna Siemaszkiewicz  
Poznań University of Economics and Business, Poland

**Alternative investments in precious metals**

Alternative investments industry has become an important part of global economy and financial system. We can consider hedge funds, precious metals and other commodities or art investments. This paper analyses the potential benefits coming from adding precious metals (gold, silver, platinum) and also copper in portfolio investments from the perspective of investors from Czech Republic, Hungary, Poland, Slovakia and compared to developed Germany Stock Exchange. The PX, BUX, WIG, SAX and DAX indices were used to represent market. The analyses cover the years 2007 – 2018 to compare the different performance of stock exchange indices at that time. We compare our diversified portfolios using Sharpe, Treynor and Jensen coefficients and beta coefficient. The beta coefficient, in most considered periods, of precious metals are at a low positive or even negative level. This may show that precious metals can be considered as alternative investments. However, we have to remember that each of these metals is characterized by different investment characteristics such as return rate of risk or volatility.
Dominik Krężołek  
University of Economics in Katowice, Poland

**Selected measures of investment performance on the precious metals market**

All reflections on the possibility of modelling economic phenomena should be understood in the context of the performance of the market. Market performance is related to access to information on assets and the skillful use of this information. From the investment point of view, the issue of investment performance is related to the possibility of achieving above-average profits or limiting potential losses. Profit is a desirable situation, while loss is not. Both profits and losses are related to the need to bear risk. An important role is played by extreme risk, which may cause an abnormal result of the undertaken investment.

In this paper some performance measures based on VaR and its modification are discussed. In the study, selected theoretical probability distributions were used to calculate quantile risk measures. The analysis was carried out on the example of data from the precious metals market.
Parallel Session

FM 3: Financial Market 3

Lesław Markowski – Conditional relations of asset pricing in the classical and downside risk frameworks

Grzegorz Szczerbak – Media coverage impact on stock prices

Khang Pham_Quoc – Dimensions of Stock Market Liquidity: Empirical Evidence of a Frontier Market

Anna Grygiel-Tomaszewska – MiFID Directive in mitigating the agency problem in distribution of open-end investment funds in Poland
Leslaw Markowski  
University of Warmia and Mazury in Olsztyn, Poland

*Conditional relations of asset pricing in the classical and downside risk frameworks*

This study examined the cross-sectional relationships between realized returns and systematic risk measures using sub-sectoral indices quoted on Warsaw Stock Exchange. In addition to the classical beta, the aim of the study was also to check the impact of higher order co-moments on the sub-indices pricing. The unconditional risk-return relationships were estimated using classical and downside measures and conditional relations in terms of market condition. The downside risk premiums are significantly positive which means, that the downside risk is priced in Polish stock market. The downside risk measures outperform the classical ones. While the market condition is incorporated as the conditioning variable the risk factors acquire significance. Beta coefficient and co-kurtosis generate positive premiums in the up market and negative in the down market. Using the sub-sector indices returns no significant co-skewness pricing in the up market was found. The research show that measures of systematic risk such as the beta coefficient and higher order co-moments in conventional and downside approach are appropriate risk factors in asset pricing.
Grzegorz Szczerbak  
Uniwersytet Ekonomiczny w Katowicach, Poland

**Media coverage impact on stock prices**

The purpose of this paper is to analyse the relationship between media coverage and stock returns listed on the Warsaw Stock Exchange. Econometric analysis of gathered data was performed using GARCH models based on a daily data for a period of 18 years (2000-2018). Automated content analysis method was employed to analyse sentiment and emotionality and to identify news threads related to the analysed stock prices. The study showed that media information can affect both stock returns and volatility. Especially negative news have significant effects in all cases. The obtained results can be summarised as below: the prediction of stock price returns and volatility can be improved by including news factor.
Khang Pham Quoc
Wroclaw University of Economics, Poland

*Dimensions of Stock Market Liquidity: Empirical Evidence of a Frontier Market*

The paper presents a discussion of stock market liquidity in a frontier market after the financial crisis. The paper defines dimensions of stock market liquidity and indicates possible liquidity measures which could be applied to analyze liquidity on a stock exchange in Vietnam. The empirical result shows the aggregate liquidity, which captures various dimensions of liquidity through eight liquidity measures based on a daily basis during the period from 2011 to 2018. The analysis indicates the characteristics of liquidity in the Vietnamese stock market, the differences in liquidity among three market capitalization groups: small, medium, and large. It is evident that there are differences in three size companies, larger companies are found to have better liquidity.
Anna Grygiel-Tomaszewska
Warsaw School of Economics, Poland

MiFID Directive in mitigating the agency problem in distribution of open-end investment funds in Poland

In many dimensions, open-end investment funds in Poland became one of the most important elements of the capital market. Not only they participate in transferring of savings into sources of equity or debt financing, but primarily they are aimed at increasing the value of savings of investors by investing them in financial instruments. They allocate assets acquired via direct purchase of fund shares as well as indirectly, e.g. via retirement schemes such as Personal Retirement Account (pol. Indywidualne Konto Emerytalne, IKE), Personal Account for Retirement Provision (pol. Indywidualne Konto Zabezpieczenia Emerytalnego, IKZE), Employee Pension Fund (pol. Pracownicze Programy Emerytalne, PPE) or newly implemented – Employee Capital Plan (pol. Pracownicze Plany Kapitałowe, PPK).

Due to the fact, that functioning of investment funds is based on the idea of delegating investment and operational processes to external, professional entities under remuneration, there are several areas of agency problem identified. One of these areas is the distribution of fund shares. There are specific regulations that are biding on the area of European Union, designed to mitigate risks resulting from this problem. The article discusses Markets in Financial Instruments Directive (MiFID) regulations and their influence on distribution process.
Parallel Session

I: Insurance

Michał Popielas, Ilona Kwiecień, Patrycja Kowalczyk-Rólczyńska – Pay as you live and new technologies in life insurance underwriting in the context of generations characteristic and attitudes - evidence for Poland .................................................................68

Magdalena Chmielowiec-Lewczuk – Cost-Management Strategies Applied by Insurance Companies in Poland in the Years 2016 – 2018; Empirical Research .................................................................69

Joanna Głód, Lyubov Klapkiv, Anna Białek-Jaworska, Krzysztof Opolski – Solvency of insurance companies under the Solvency II Directive .................................................................70
Michał Popielas, Ilona Kwiecień, Patrycja Kowalczyk-Rólczyńska
Uniwersytet Ekonomiczny we Wrocławiu, Poland

*Pay as you live and new technologies in life insurance underwriting in the context of generations characteristic and attitudes - evidence for Poland*

The lifestyle has always been analyzed in the underwriting process in life insurance. The classic approach, however, was based on an interview with the party seeking the protection (insured).

The digitalization, social media and the use of mobile devices and applications give new opportunities for risk assessment in life insurance.

Researches show, however, that the use of new technologies - in general and, for example, in retail online purchases depends on the characteristics and attitudes of the generations.

At work, the authors initiate the study of these features and attitudes in the context of the possibility of using the new technologies in the underwriting process in life insurance.

The aim of the paper is to evaluate the possibility of the use of new technologies in underwriting in life insurance depending on the acceptance and attitudes of potential buyers.

We hypothesize that buyers’ approach depend on generation (age). To achieve the aim of the paper the preliminary surveys were conducted in a group of 304 Poles in the period of June - August 2019. The results of the survey were analyzed using appropriate statistical methods, including the tests of independence. In the article, first, the ‘pay as you live’ model using mobile applications in life products was presented. Next - based on literature, industrial reports and surveys the authors examine differences between identified generation groups, regarding the use of new technologies in the life insurance underwriting process, such as: lifestyle behaviors, application usage and readiness to share information with the insurer.
The purpose of this paper is to present the findings concerning the use of cost strategies by insurance companies which run business activity in Poland. The work includes a theoretical outline of the issues presented here, in which a definition of the term “cost strategy” will be proposed, that has been formulated on the basis of analysis of relevant literature. The present paper will also contain a discussion of cost strategies that can be implemented in the insurance company and present and elaborate more extensively on the findings regarding the use of the cost strategies by insurance companies in Poland in the years 2016-2018. Summing up the findings we can formulate the following conclusions: insurance companies in Poland pursue some cost strategies or other – for the whole of the insurance companies in the last year of the study, i.e. 2018 they made up ¼ of all the insurers (14 entities altogether in all the groups); the group of insurance companies in which information on pursuing cost strategies appeared most frequently are life insurance companies, operating as joint-stock companies; and the most popular cost strategies pursued by insurance companies in Poland are strategies aiming at cost reduction (for example in 2018 12, out of 14 business entities altogether, provided information indicating the use of a cost strategy whose objective was to reduce costs).
Joanna Glód  
University of Warsaw, Poland  
Lyubov Klapkiv  
UMCS, Poland  
Anna Białek-Jaworska, Krzysztof Opolski  
University of Warsaw, Poland

**Solvency of insurance companies under the Solvency II Directive**

The aim of the article is to discuss the impact of capital requirements set out in the Solvency II Directive on the amount of dividends paid by life insurance companies. The study was conducted with the use of an estimator of random effects of panel data of 24 insurance companies from Solvency and Financial Condition Reports for the years 2016-2018. Life insurance companies are required to apply a number of legal regulations that determine the amount of dividend paid. However, simultaneously they are exposed to numerous risks which are not covered by capital requirements. The results of the analysis indicate that the amount of dividend is strongly correlated with the capital requirements. Capital requirements determine the level of profits earned in life insurance companies. There is a negative correlation between the capital retention (outflow) and the financial position of the life insurance company.
Parallel Session

F: Finance

Arkadiusz Kret – Accuracy of valuation performed using the pairwise comparison method – a case from the Wroclaw housing market

Syed Javeed – The Growth of Real Estate Sector with FinTech in India

Anna Magdalena Korzeniowska, Agnieszka Huterska – Financial inclusion analysis in the EU countries with the usage of Hellwig’s synthetic measure of development
Arkadiusz Kret  
Wrocław University of Economics, Poland  

Accuracy of valuation performed using the pairwise comparison method – a case from the Wrocław housing market

The outcome of the property valuation process is an estimate, and therefore it is not accurate and, to some extent, erroneous. The accuracy of valuation may be affected, among other factors, by the quality of available property market data, selection of the valuation method and assumptions made by the property valuer. In the context of deliberations on the accuracy of valuation, the author of the article has carried out a study consisting in multiple valuations of a single property using several valuation models and randomly selected samples of comparables. The aim of the study was, on the one hand, to determine how the accuracy of a single valuation may be affected by a decrease in market activity and, on the other hand, to confront opposing approaches promoted in the environment of valuation scholars and practitioners concerning the criterion of similarity of comparable properties. The analysis of results of the study found, among others, that models based on the principle of maximizing similarity of comparables carried a higher risk, and their application was associated with more significant valuation errors.
Syed Javeed
Wroclaw University of Economics, India

*The Growth of Real Estate Sector with FinTech in India*

The trend of digitalization has influenced many industries to adopt new technologies, the residential real estate industry being one of them. Not as forward as the residential industry is the commercial real estate office industry, which in recent years has started to become interested in the new marketing technologies that are available. Even though the interests towards these technologies seem to be high, the adoption has been limited. It is also believed that the new technologies will impact the industry and the organizations within, possibly altering the way business is conducted. Therefore, the purpose of this article is to investigate the growth factors that affect the adoption of new technology in the Indian real estate industry.
Anna Magdalena Korzeniowska
Maria Curie-Skłodowska University in Lublin, Poland
Agnieszka Huterska
Nicolaus Copernicus University in Toruń, Poland

Financial inclusion analysis in the EU countries
with the usage of Hellwig's synthetic measure of development
Parallel Session
FM 4: Financial Market 4

Monika Wieczorek-Kosmala, Joanna Blach – The accessibility of funds for socially responsible companies

Iryna Shkura – Assessment of Ukrainian potential for socially responsible investment development based on cultural values

Agata Gluzicka – The Effect of the Day and the Risk Diversification on the WSE
Monika Wieczorek-Kosmala, Joanna Błach
University of Economics in Katowice, Poland

The accessibility of funds for socially responsible companies
Iryna Shkura  
Alfred Nobel University, Ukraine

*Assessment of Ukrainian potential for socially responsible investment development based on cultural values*

The aim of the paper is to demonstrate the impact of the culture dimension on the size of SRI and assess the Ukrainian potential for socially responsible investment development based on cultural values.

SRI regional development differs by the volume and dynamics of the regional SRI market, structure of investors and assets, structure of investors. The scope of influencing factors is within the following dimensions: demographic, economic, financial, institutional and cultural. The article considers indicators of the cultural dimension of SRI markets. These indicators are taken for SRI markets in Europe, the USA, Canada, and Japan. The analysis is based on the data from the Global Sustainable Investment Alliance (GSIA) and databases of the Hofstede’s 6D framework. It can be concluded that indicators of individualism, masculinity and uncertainty avoidance can be linked with the regional SRI market development.

Ukraine is on the preliminary stage of SRI-market development: corporate socially responsible companies exist, they are becoming more and more public and open, and their activity is becoming much sounder, the willingness to avoid risk and uncertainty is very high, and the desire to receive income from the investment into financial tools does also exist. The high level of power distance, low level of individualism could be as restraining factor for the Ukrainian SRI –market formation, but the low level of masculinity could give advantage to the Ukrainian potential for the further SRI development.
Agata Gluzicka  
University of Economics in Katowice, Poland

**The Effect of the Day and the Risk Diversification on the WSE**

The article presents the results of empirical research on the occurrence of the effect of the day on the Warsaw Stock Exchange. The analysis was carried out for the daily rates of return of selected stock exchange indices in the period 2010-2018. In addition, the effect of the day for well-diversified portfolios such as Rao’s Quadratic Entropy Portfolios and the Most Diversified Portfolios, was also analyzed. One of the goals of the research was to establish whether the determined effect of the day is reflected in the level of diversification of the constructed portfolios.

On the basis of the conducted research, it was determined that the day effect on the WSE occurs only in specific (annual) periods. This dependence was determined both for the rates of return of stocks as well as for the rates of return of portfolios. The occurrence of the effect of the day for a group of indices does not always translate into similar regularities for rates of return of portfolios or for the level of diversification of investment portfolios.
Parallel Session

QM 3: Quantitative Methods 3

Zuzanna Olszewska – Theoretical basis for applying the Datar-Mathews method for FinTech projects’ valuation .................................................................80

Albert Gardoń – Jumps in the Freight Rate Process in Container Shipping .................................................81

Grzegorz Tratkowski – Verification of investment strategies for WIG20, DAX and Stoxx600 with Machine Learning algorithms .........................................................82
Zuzanna Olszewska
Poznan University of Economics and Business, Poland

Theoretical basis for applying the Datar-Mathews method for FinTech projects’ valuation

The aim of the article is to present possible approach to FinTech projects’ valuation with accurate explanation of the basics of its use. Since 2008 the amount of startups active in financial technology has increased significantly. Solutions offered by them can help with reducing costs, risk or providing new or improved products with use of innovative technologies. But to make profits from innovative services, certain costs have to be borne. Value of FinTech project depends not only on costs of work or resources – one of the most important thing affecting the whole project’s valuation is risk. Risk in those projects is result of dynamically changing technology and business environment and also the character of innovation. Risk management in IT projects is one of the most important activities. It has to be calculated properly and monitored. Active management of the implemented project can help with avoiding obstacles and preparing contingency plans. In those situation the valuation with Real Option Approach seems to be appropriate and reasonable. Among ROA’s methods the application of Datar-Mathews simulation method could be notably beneficial. The Author explains significance of FinTech sector for financial services and presents arguments for use of Datar-Mathews method for valuation of projects from that sector.
Albert Gardoń  
Wroclaw University of Economics, Poland

**Jumps in the Freight Rate Process in Container Shipping**

As it was checked out in our previous investigations a weekly average net freight in container shipping may be modeled by means of the jump-diffusive process with homogeneous Poissonian jumps. So far, the relative jump size was generated from the empirical distribution which is asymmetrical and does not seem to be one of typical distributions. Generally, upward jumps appear more often, whereas relative drops are more concentrated around their mean. In this paper we try to fit to the jump data a mixture of two distributions, taking into account negative and positive jumps separately. The jump-diffusive model is mainly used for the evaluation of a derivative net premium, e.g. the European Call option for the net freight. The knowledge of the theoretical jump-size distribution may lead to the analytical formula for the option premium which will make the calculations faster and more exact.
Grzegorz Tratkowski
Wrocław University of Economics, Poland

Verification of investment strategies
for WIG20, DAX and Stoxx600 with Machine Learning algorithms

Machine learning provides powerful tools for data analysis, especially in regression and classification problems. Stock’s indices like WIG20, DAX, and Stoxx600 could be treated as composite indicators for the current economic situation in countries or regions and therefore analyzing them can deliver proper knowledge to create investment strategies. This work concentrates on time series analysis of stock’s indices with chosen Machine Learning algorithms to create investment strategies based on future probabilities of declines and upswings. Taking into account some macroeconomic, technical indicators and consensus estimates the models are trained to provide a buy signal if the output probability is above a specific threshold and sell signal in case of the opposite situation. The examination of the strategies efficiency indicates the differences in determinants among chosen stock’s indices.
Parallel Session

RA: Risk Analysis

Ewa Dziwok, Marta Karaś, Witold Szczepaniak – Application of the Systemic Turbulence Measure for the Selected European Countries

Marta Karaś, Witold Szczepaniak – Between Systemic Fragility and Systemic Contagion: a Case of the Central Europe

Anna Rutkowska-Ziarko – Profitability ratios in risk analysis
Application of the Systemic Turbulence Measure for the Selected European Countries

Systemic risk has three major areas of concern: systemic liquidity, systemic fragility and risk spill-over (contagion). In the recent years there were many measures of systemic risk proposed in the literature, however, as can be shown after literature investigation and proven from their theoretical properties, none of these measures truly reflects all three mentioned characteristics of systemic risk. The paper provides a comparative analysis of these characteristics based on empirical data for selected CEE countries spanning from the year 2006 to 2018, encompassing the global financial crisis and the European sovereign debt crisis, and proposes a method of combining them into one aggregated measurement, using the concept of Mahalanobis distance, following the concept of financial turbulence measure proposed by Kritzman and Li (Financ Anal J 66:30–41, 2010). The aggregation procedure leads to postulation of a new systemic risk measurement method, called by the authors Systemic Turbulence Measure (STM) (Karaś, Szczepaniak in: Contemporary Trends and Challenges in Finance 4/19:11-23, 2019)
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Between Systemic Fragility and Systemic Contagion: a Case of the Central Europe

The aim of the paper is to present the analysis of the predominance of one of the two investigated systemic risk aspects for selected CEE countries. Thus the study answers the question whether systemic fragility or systemic contagion was responsible for the spreading of the financial crisis in each of the investigated countries. The span of the study includes years 2006 to 2018 while the set of countries includes Bulgaria, Romania, Croatia, Slovakia, Hungary, Czech Republic, Poland, Latvia, Lithuania and Estonia, and Germany - as a benchmark. Measures used in the analysis include CoVaR, SRISK, MES and Systemic VaR.
Market and accounting risk measures were considered. Measures of systematic risk such as market betas and accounting betas were calculated. The risk in context of total variability and semi-variability was also under investigation. A study was conducted of 62 stocks quoted on Warsaw Stock Exchange. The sample period for quarterly returns starts from January 2010 to December 2017. The sample includes companies from WIG20, mWIG40 and sWIG80. The profitability of companies was measured by return on assets (ROA) and return on equity (ROE). The aim of the study was to examine correlation between accounting profitability of the company and its rate of return on the capital market. Also, betas and accounting betas were compared. Additionally, the correlation between total variability and semi-variability of profitability ratios and rates of return was under investigation. A positive correlation between the average value of the profitability ratios (ROA and ROE) and the average quarterly rates of return on the Warsaw stock exchange was identified. Similarly, companies with higher volatility and semi-volatility of profitability ratios were simultaneously characterized by larger fluctuations in rates of return on the stock market. Correlation between market betas and accounting betas was significant only in downside approach.