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FACULTY OF ECONOMIC INFORMATICS



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a

dekana Fakulty hospodárskej informatiky
prof. Ing. Ivana Brezinu, CSc.

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Prof. Ing. Ivan Brezina, CSc.

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Plenárne rokovanie

Plenary Session



Analysis of National Reputation: Marquee Government Agencies in the US

Gerald Groshek

Abstract

Surveys of country image such as the Anholt-GfK Roper Nation Brands Index and models of its determinants (Zeugner-Roth, Diamantopoulos and Montesinos 2008) cite the importance of national reputation across a spectrum of a country's governmental and market relations with foreign partners. Given the significance of global perceptions of government competency for country image, this study explores a sample of US government agencies and the degree to which they contribute over time to the attractiveness of the US in terms of its market potential, production appeal, and institutional structure. In an extension of the literature, the motivation here is to operationalize the contributions to and consequences of country image by linking specific government actions—expressed in the commitment to a sample of marquee government agencies—with the subsequent impressions of these agencies' programs as articulated in the global media.

Keywords

National reputation, government actions, government agencies

**AHP model pro hodnocení výkonnosti pracovníků:
aplikace v mezinárodní konzultační firmě**

**AHP model for performance evaluation of employees:
An application in an international consulting company**

Josef Jablonský, Lucie Lidinská

Abstract

The article is focused on an application of the analytic hierarchy process (AHP) to the performance evaluation of employees of a management consulting company. Performance evaluation of employees is a complex task that must take into account various aspects and evaluation criteria. Each employee of the company participates during the period being considered in several projects and his/her overall performance is an aggregation of individual performances in particular projects. This aggregation is based on the weights of the projects that usually depend on man-days the employees participated in the projects or their financial contributions. AHP is a tool for structuring and analysis of complex decision making problems and seems to be an ideal tool for this task. The proposed AHP model combines relative and absolute measurement and allows deriving overall performance scores of the employees easily and quickly without the necessity to use any specialized software.

Key words

Analytic hierarchy process, Human resource management, Performance evaluation

European Standard of Actuarial Practice - Actuarial Function Report under Solvency II Directive 2009/138/EC

Mária Kamenárová, Katarína Sakálová

Abstract

The Actuarial Function Report is prepared by the Actuarial Function Holder to provide the opinion on the Underwriting Policy, the Reinsurance Arrangements that insurance company has in place. The assessment of the compliance of the implementation of the processes related to the Technical Provisions under the Solvency II regulation. The processes of Technical Provision fairly valuation includes assessment of the Sufficiency and Quality of Data, Methodologies and Models selection, end to end process evaluation and its being in compliance with the Delegated Acts for Solvency II, the Back Testing, the Movement Analyses, the Sensitivity Analyses. The Actuarial Function Holder has to provide the overall opinion and the advice for the future improvements. The content of the Actuarial Function Report is determined by the regulatory requirements under Directive 2009/138/EC but also by the professional body as the European Standard of Actuarial Practice. The standard has been adopted by the Slovak Society of Actuaries.

Key words

Insurance, Actuarial Function, European Standard of Actuarial Practice, Actuarial Function Report.

Analytické trendy v praxi
Analytics Trends in practise

Jana Kovařová

Abstract

We face a reality of exploding volumes of increasingly diverse data. Every individual, every executive, every organization – and now, with the Internet of Things (IoT), every object is on a digital journey. With big data, IoT and other high-visibility data initiatives, the need for analytics is moving from a small analytics team to a more broad-based effort that transcends boundaries and analytics has become extremely important to business.

Organizations are forecasting more frequently, with an eye toward capturing different versions of the future. The increased frequency of generating forecasts has led many organization to automate forecast and planning processes.

Descriptive analysis helps organization to achieve better hindsight, which led to forecasting and other predictions, which has finally ended in today's transformative step: advanced analytics. New trends in analytics are represented by big data, machine learning, deep learning, advanced visualization and visualization of big data, pattern recognition and using unstructured data for analysis.

Key words

Advanced analytics, prediction, data visualization, unstructured data, new trends in analytics

Využitie skupiny modelov pre nowcasting HDP**Using Multiple Models to Nowcast GDP**

Marek Mičúch

Abstract

Publication delay of official estimates of GDP after reference quarter adds importance to nowcasting process. To nowcast GDP of the Slovak economy opinion survey data together with hard data are considered. Nowcasted is quarterly (q-o-q) GDP growth. Input data has monthly frequency and nowcasting frequency is also monthly. Nowcasting is to shape expectations on GDP growth when the newest monthly data are available in the meantime between official publication dates of the GDP growth. Nowcasting output is also used in the macroeconomic projection exercise as one of the inputs. Monthly frequency data are taken into account as they have shown acceptable quality in nowcasting process. Data are processed using three approaches: factor models (DFM), OLS equations, and bridge equations. Final result is weighted average of the three approaches. Nowcasted GDP growth represents pure technical estimate as no prior assumptions or posterior judgements are considered. Outcome is published on the web site of the NBS at latest on the 20th of the current month and in the Monthly Bulletin of the NBS. Now-casting neither represents official projection of the Bank nor reflects the views of the members of the Board.

Key words

GDP, factor models, OLS equations, bridge equations

The quality of life in Poland and Slovakia

Paweł Ulman

Abstract

Studying the quality of life in individual societies is a demanding task both in the sphere of theoretical considerations over the concept of this problem and in its measurement. It transfers further into the possibility of analyzing the variation in quality of life in the examined population what can ultimately be relevant for the developing of appropriate social policy in this area. Quality and quantity information is used to measure the quality of life. In the first case, we can simply ask the respondents for the level of satisfaction of life or happiness, while in the second the information about the different aspects of life that are assumed to be important for the quality of life are taken into consideration. In this context, the interesting research issue is the answer to the question of what is the quality of life in Poland and Slovakia. Statistical data from the EQLS (European Quality of Life Survey) can be used to achieve this aim. They contain information on the quality of life for various European countries. The paper presents the results of statistical comparative analysis of the quality of life of people in Poland and Slovakia using qualitative and quantitative data. The results of the analysis of the variation in quality of life assessment based on the answers to the question about the level of happiness and these obtained based on aggregate measure (considering various aspects of human life) will also be presented.

Key words

quality of life, aggregate measurement, comparative analysis

1. sekcia

1st Section

Informačné technológie a informačné systémy

Informatics technologies and information systems

Možnosti a prínosy virtualizácie v podnikovej informatike
Options and benefits of virtualization in business informatics

Pavol Jurík

Abstract

Virtualization is a term that is relatively often spoken in the world of information and communication technology. It is not a novelty as it first appeared in the 1960s as a term for a method, respectively a way for logically dividing computing resources of a mainframe computer among multiple applications. Since then, however, understanding of this term has shifted and, over time, many different types of virtualization have emerged, which is why the issue is still very up to date. The purpose of this article is to provide an overview of different types of virtualization that are applicable in business informatics together with comprehensible and precise explanations of their specifics and mutual differences.

Key words

Business informatics, virtualization, server, personal computer, data storage, business applications

Integrované vyučovanie ako nástroj na skvalitnenie vzdelávacieho procesu
Integrated learning as a tool for improving the learning process

Peter Schmidt

Abstract

Integrated teaching or Integrated schooling are concepts that are very frequently used in pedagogical circles. However, more teachers who deal with pedagogic paid less or more attention to integrated schooling as well, while several approaches and methods took better roots in practice and some of them failed absolutely. In general, the teachers who provide integrated teaching must invest more time and effort related to preparation of their lessons, than teachers teaching with the use of standardized or classical approaches and methods. In paper we point out the possibilities of applying integrated exercises to higher levels of education.

Key words

integrated learning, integrated teaching, integrated exercises, highly effective learning

Problematická bezpečnosť nastupujúceho internetu vecí
Problematic security of the oncoming Internet of Things

Pavol Sojka

Abstract

In past years there is a large boom in segment of devices, which facilitates the possibility to interconnect various devices across households and also interconnect them via the internet. Households in the near future and also entire houses will be connected to the internet directly with no need of interconnecting devices (routers). Recent years show us, that an intensive need of protecting these devices arises. Many security issues of these devices have been reported in past years a there is still negligent approach to strenghten their security, though material damages and also human casualties took place last years (autonomous or semiautonomous vehicles). In this abstract I want to have a closer look at some of the particular network devices connected or able to connect to the internet with wide variety of use and their security impact on our lives into the future.

Key words

network devices, internet of things, autonomous appliances, security

Analýza vplyvu marketingu na sociálnych sieťach
pomocou vybranej webovej analytiky

The analyzing impact of marketing on social networks
by using selected webanalytics

Mária Szivósová

Abstract

The paper deals with the promotion and marketing of the company on the social network. Web analytics serves to understand visitor behavior on the site and is the basis for an Internet marketing strategy. In a particular Google Analytics environment, we describe its importance, including explanation of its operation and setup options, which is the basis for analyzing the behavior of individuals on the market.

Key words

marketing, online-marketing, social networks, promotion on social networks, web analytics, Google Analytics

2. sekcia

2nd Section

**Aktuálne trendy vývoja
teórie a praxe účtovníctva a audítorstva**

**Current trends of development
of accounting and auditing theory and practise**

**Rozlišovanie fixnej a variabilnej zložky nákladov v hotelierstve s využitím
v precese ekonomického riadenia a rozhodovania****Differentiation of fixed and variable cost components in hotel management using
in the process of economic management and decision making**

Renáta Antalová

Abstract

Managerial accounting is a special area in companies' accounting information system. It has tools to analyze and process data on economic processes in the company to the form appropriate to management and decision-making needs. Provision of accommodation services is a specific area of business. It is characterized by high share of fixed costs, which represents either large potential and risks for entities operating in this area. Management accounting can be one of the tools to detect possible risk and the possibility of positive development in this area. Identification of the cost structure in terms of their reaction to the change in the volume of a certain referential value can serve as a basis for solving a number of decision-making tasks that management in the hotel industry has to deal with.

Key words

hotel sector, decision-making, fixed and variable costs, break even point, operating leverage

Vplyv finančnej základne na finančnú situáciu účtovnej jednotky**The influence of the Financial Base on the Accounting Entity's Financial Position**

Miriama Blahušiaková

Abstract

The accounting entity obtains assets needed to providing its activity from various sources. These sources can be divided into equity and debts from the owners' point of view. Equity is represented by sources that accounting entity's owners put into the accounting entity or the accounting entity produced by its activities. Debts are coming from the external environment and are represented by various forms of liabilities. Assets and sources of assets create the financial basis of the accounting entity. In terms of proportion the sources participate on assets financing and in terms of proportion between internal and external sources of assets we can analyse the indebtedness and financial position of the accounting entity. The aim of the paper is to provide detailed indebtedness analysis of selected accounting entities and to analyse how the financial basis structure influence the accounting entity financial position from the rate of indebtedness point of view.

Key words

Assets, equity, liabilities, indebtedness

Materialita a jej úloha v audite účtovnej závierky
Materiality and Its Role in Audit of Financial Statements

Veronika Kňazková, Branislav Parajka

Abstract

This article deals with the issue of the materiality as an important part of the audit of financial statements. Materiality is considered to be the basic concept in the audit of financial statements. The Statutory Auditor applies the concept of materiality when planning and performing an audit of financial statements. Requirements of materiality are stated in International Standards on Auditing, specifically ISA 320 Materiality in planning and performing an audit of financial statements, and their application in the context of the standard in question may be very challenging. On the basis of experience, it can be assumed that the materiality of auditing financial statements is an area where improvements are possible. We think that materiality ultimately increases the trustworthiness of users of financial statements, they are compiled in accordance with the applicable financial reporting framework and do not contain significant incomprehensibility.

Key words

Materiality, Audit of financial statements, risk

Changes in unrealized production accounting in the Czech Republic and their consequences

Ivana Košťuríková

Abstract

The entry of the Czech Republic into the European Union resulted in many changes of law rules and regulations. These changes also affected a legislative amendment of the Accounting. The process of accounting reform is very closely related to the provision of reliable, comparable and comprehensible accounting information. The application of international accounting standards to national legislation and the creation of national accounting standards has become the basic trend in accounting. Changes were made by amendments to the Act on Accounting, which were followed by the issue of implementing regulations to the Act on Accounting and the Czech Accounting Standards in the past. Other changes to accounting legislation occurred in 2016, where the major changes included the valuation adjustment of inventory created by its own activities, making entries of transactions be connected with changes in inventories and their reporting. The aim of the paper is to evaluate the effect of changes in accounting of the unrealized production on the performance of companies in the manufacturing sector. Using the comparison of past and present methods of accounting for unrealized production will be an evaluation of observed changes and their impact on the profit and loss account and the selected financial indicators.

Key words

inventories, unrealized production, costs, revenues, profit and loss, profitability

**Výsledok hospodárenia v účtovníctve
rozpočtových organizácií a príspevkových organizácií**
**Profit or loss of the accounting entity in the accounting
of budgetary organizations and allowance organizations**

Antónia Kovalčíková

Abstract

Profit or loss of the accounting entity belongs to traditional but still relevant areas of research from various aspects within the scientific research and expert activities. The article will focus on the profit or loss of two traditional public sector subjects in Slovakia – budgetary organizations and allowance organizations. The article presents results of the analysis of profit or loss of these specific entities of public sector in accordance with accounting regulation and financial statements regulation in the Slovak republic valid from the year 2003 into present. Accounting of budgetary organizations and allowance organizations has developed as well in the area of profit or loss of the accounting entity during the analysed period. The analysis was focused on determination of the profit or loss of the accounting entity, its economic substance, accounting and presentation in the individual financial statements. Common characters and differences of the profit or loss of budgetary organizations and allowance organizations are described at the end on the scientific article.

Key words

Profit or loss of the accounting entity, Accrual basis, Accounting, Budgetary organization, Allowance organization

Nezávislosť audítora a jej vplyv na prijatie zákazky na audit účtovnej závierky
Independence of the auditor and its impact on acceptance of audit engagement

Petra Krišková, Ján Užík

Abstract

Independence of the auditor is a key requirement of the auditor's profession in the auditing of financial statements. Applying and adherence is important not only during the audit of the financial statements, but also during the acceptance of audit engagement. An auditor is required to consider any circumstances that might compromise his / her independence from the entity, management and financial statements that will be the subject of the audit.

Key words

Auditor, Audit, Independence, financial statements, audit engagement

Zdieľané informácie v oblasti účtovníctva**Internet of Things in Accounting**

Zuzana Kubaščíková

Abstract

The internet is regularly the most transformational technological development of the last century. In the hyper-connected world of technology another new frontier is emerging – the internet of things (IoT). Internet of things is basically a system of interconnected devices, machines, appliances which communicate with each other and exchange data using the internet, without any human intervention or interaction. It is clear that businesses can leverage the IoT to improve its products through a better understanding of its customers. But how can real-time information be used by accountants?

Key words

Accounting, Auditing, Internet of Things, Technology Blockchain

Vykazovanie finančných informácií ako súčasti informácií o spoločenskej zodpovednosti podnikov v Slovenskej republike**Reporting of financial information as part of information on corporate social responsibility in the Slovak Republic**

Kornélia Lovciová, Renáta Pakšiová

Abstract

Corporate social responsibility is one of the fundamental targets of the Europe 2020 strategy, and it contributes to meeting the objectives of the Treaty on the European Union concerning sustainable development. The Slovak Republic is also moving in the direction of the Europe 2020 strategy and regulates the legislative environment for corporate social responsibility. Through corporate social responsibility, enterprises are connected to the environment and can use the „idea“ of the corporate social responsibility to their advantage. Enterprises use the corporate social responsibility information published in annual reports in their decision – making and strategies with a view to fulfilling the economic, social, and environmental aspects that are part of their corporate social responsibility agenda. The objective of this paper is an analysis of the financial information that forms a part of the corporate social responsibility information reported in the 2015 annual reports of the largest enterprises in the Slovak Republic.

Key words

Financial information, Corporate Social Responsibility, Sustainable Development, Annual report

**Audit účtovných zázvierok
(poznámky k rozsahu vzorky, jej výberu a vyhodnoteniu)**

**Audit of financial statements:
Notes to the sample size, the selection and evaluation**

František Maděra

Abstract

In this paper, we will focus on the practical aspects of the auditor's work with samples in substantive tests. We will describe selected methodological problems in testing sample of classes of transactions, account balances and disclosures in the financial statement, at two sampling methods, namely the systematic selection method and the monetary unit sampling method (MUS). We will present the practical problems of the non-statistical sampling method, which can achieve comparable results as in the statistical selection. We will focus on issues related to the preparation of the technique sample selection, sample size, audit sampling, and sample test evaluation.

Key words

detailed tests of substantive accuracy, sample, monetary unit sampling method, systematic selection method

**Predchádzanie a riešenie vstupu spoločnosti do krízy
Preventing and resolving the company's entry into the crisis**

Lucia Ondrušová

Abstract

In 2016, capital companies in the Slovak Republic have to find out whether they are or are not in crisis. The establishment of the crisis-management institute was a response to bankruptcy and restructuring problems in order to avoid bankruptcy and restructuring of creditors and to strengthen the corporate responsibility of individual venturers. A solution to prevent the company from entering the crisis is to provide additional resources to the company's shareholders, in particular by increasing equity, investing in other part of equity and creating different funds to cover liabilities to creditors. Partners should prefer deposits into individual equity before lending, borrowing, and similar payments so that the company does not get into the crisis and consequently do not create a better position in the event of liquidation and bankruptcy.

Key words

crisis, equity, loan, partner

Vplyv inflácie na vykazovanie stavu a zmeny stavu majetkovej podstaty
Impact of inflation to reporting of business property position and changes in position

Denisa Oriskóová, Renáta Pakšiová

Abstract

The business property as an indicator of business performance inform the entrepreneur about how the resources invested into entrepreneurship are managed. During doing business entrepreneur is taking certain risk for purpose of earning profit. Information about profit or loss are recorded by accounting and presented in financial statements. Financial statements are resources for investigation of business property, but itself do not provide comprehensive view.

Business property preserve is influenced by factors from internal environment such as from external environment for example by inflation. Above all inflation has impact on reported value of assets, equity, liabilities and height of distributable profit. The aim of the paper is to create a formula for calculation of profit after tax taking into account inflation. For business property preserve is key the determination of profit or loss amount after taxes taking into account inflation for setting the amount of distributable profit.

Key words

Business Property, Inflation, Profit or Loss, Balance Sheet, Profit and Loss Statement

Rozsah účetnictví municipálních příspěvkových organizací
The Extent of Accounting Municipal-Semi Budgetary Organizations

Iris Šimíková

Abstract

The aim of the contribution is to consider the impact of a state accounting reform on the extent of accounting record keeping of municipal semi-budgetary organizations founded by a region. These organizations manage funds from the public budget and also funds created by their main and supplementary activity. The declared goal of the state accounting reform was obtaining correct, complete and timely information about the economic activities of organizations connected to public budgets on the accrual principle. Since 2004, semi-budgetary organizations have been allowed to keep simplified-extent accounting records with the founder's permission. Full-extent accounting is rightfully regarded as an optimal, conclusive indicator of the economic situation of an accounting entity. The contribution focuses on the extent of accounting of organizations which are founded by the Moravian-Silesian Region. It examines the extent of their accounting in the year when the reform began and the extent in the current accounting period.

Key words

Municipal Semi-budgetary Organization, Full-extent Accounting, Simplified-extent Accounting

Významnosť ako atribút užitočných informácií z účtovníctva pre používateľov**Materiality as the attribute of useful accounting information for users**

Anna Šlosárová

Abstract

Information presented in the financial statements should be useful for the user. The usefulness of accounting information is considered from the materiality point of view. Information is considered material if the failure to present it in the financial statements or its misrepresentation in the financial statements may influence the user's judgment or decision. In this context the materiality as qualitative characteristics of financial statements information overlaps with materiality as the accounting principle. In the paper we analyse the materiality as the attribute of useful accounting information for users from the users' requirements point of view. Then we analyse materiality as the attribute of useful information for users from the preparer of financial statements point of view (as the accounting principle). By comparison we identify the concept intersection of materiality as the qualitative characteristic and as the accounting principle. In the conclusion we state that the inconsistency of terminology and its practical application influences the different interpretation of materiality as attribute of useful accounting information for users.

Key words

materiality of accounting information, usefulness of accounting information, qualitative characteristics of accounting information, accounting principles

Stručný názor na aktuálnu účtovnú závierku v Srbskej republike**A brief overview of current financial statements in the Republic of Serbia**

Vladimír Surový, Pavlović Vladan, Goranka Knežević

Abstract

The article deals with describe of form and contents of components of Financial statements: Balance sheet, Income statement, Report of the others results, Cash flow and Notes of Financial statements. Current form and contents will be compare along with form and contents prescribed Financial statements from 2006 year, which was in force until 2013 year. In addition to in the article is comment to what extent is current Financial statements in Republic of Serbia in according with International Financial Reporting Statements and the New Decree of European Union of accounting.

Key words

Financial statements, Republic of Serbia, International Financial Reporting Statements, New Decree of European Union of accounting

3. sekcia

3rd Section

**Aplikácia štatistických a aktuárskych vied
v sociálno-ekonomickej oblasti**

**Application of statistical and actuarial sciences
in social-economic area**

**Maticové funkcie a niektoré ich aplikácie v stochastických procesoch
s podporou open source programu wxMaxima****Matrix functions and some of their applications in stochastic processes
with support of the wxMaxima open source programe**

Jozef Fecenko

Abstract

The paper describes the basic theory of matrix functions, which is presented by diagonalizing matrices, respectively using Jordan matrix decomposition. It shows the possibilities of realizing these calculations in the open source program wxMaxima. At the end of the paper are presented the possibilities of using matrix functions in solving some problems from stochastic processes and Markov chains.

Key words

matrix series, matrix functions, matrix exponential, stochastic processes, Markov strings

Analýza počtu vzniknutých podnikov na Slovensku v rokoch 2008-2014**Analysis of the number of birth enterprises in Slovakia in years 2008-2014**

Ľubica Hurbánková

Abstract

We analyze selected indicator of business demography – the number of birth enterprises. The aim of the paper is to analyze the trend and structure of the number of birth enterprises in Slovakia in years 2008 – 2014. Analyzed is the trend and structure of indicator by region. For the trend analysis are used selected characteristics of time series. We use the contribution method to find out which region the most contributed to the increase in the total number of birth enterprises in Slovakia. Changes in structure are analyzed by rates of structural similarity - Suslov coefficient, Gallagher index, Monroe index, Gatev index, Ryabtes index and Szalai index. We use these rates to find out whether the structure of the number of birth enterprises in individual regions of Slovakia has changed in observed period.

Keywords

number of birth enterprises, contribution method, similarity of structures

Medzinárodné štandardy aktuárskej praxe

International Standards of the Actuarial Practice

Mária Kamenárová, Katarína Sakálová

Abstract

The goal of the International Standards of Actuarial Practice is to provide the model standards and thus provides the unification of the methods and implementation in practice from the global perspective. The result of this mechanism achieves the professionalism and the quality of the outcome and defines the level playing field for the final reports, that are produced by the qualified actuaries during providing the actuarial services. In Slovakia till end of 2016 there are adopted four International Standards of the Actuarial Practice. The most important ones are actuarial standards linked to the current Insurance Act including the requirements of professional actuarial practice: ISAP1 General Actuarial Practice and ESAP2 Actuarial Function Report under Directive 2009/138/EC. In the article is described the content of these standards.

Key words

Insurance, Actuarial Studies, International Standard of Actuarial Practice, Actuarial Function Report, General Actuarial Practice.

Súčasný vývoj rómskej menšiny na Slovensku

The current development of the Roma minority in Slovakia

Daniela Sivašová, Ján Bolgáč

Abstract

Slovakia ranks among the countries of Europe where the proportion of the Roma population is one of the highest in the total population. Therefore, it is important to address this issue with systematic attention and solution. The submitted contribution deals only with a part of this wide-ranging issue. The biggest issue of Roma research is the problem of obtaining complex data on the Roma population. Population census provides information only on voluntarily identified persons. Smaller research focuses only on certain Roma areas. Extensive research (the Atlas of Roma Communities) maps most of the Roma community, but they do not think of fully integrated Roma. It was for this reason that it was necessary to cooperate with all the available data and qualified estimates. The contribution points to the demographic evolution of selected indicators. Unshared and full-fledged data can greatly help Roma population to integrate in Slovakia.

Key words

Migration, Ethnicity, Roma population, Standard of living, Segregation

Morálny hazard, základné riziko a zaistenie v sekuritizácii

Moral hazard, basis risk and reinsurance in securitization

Lenka Smažáková, Ľudovít Pinda

Abstract

An area where risk management innovations have been particularly dramatic is the reinsurance and securitization of natural catastrophe risks. Insurance of catastrophe risk has always been problematic because insurance companies can not easily diversify this risk transferred from insurers. As protection against this non-competitive risk, insurers traditionally use the market of reinsurance, in which they come into contact with moral hazard, credit and basis risks. This paper specifically analyses their interdependence in relation to reinsurance. Moral hazard is represented by a mitigation factor, which constitutes indirect costs for the insurer. Basis risk rate is expressed by the correlation between the loss incurred and the indemnification. The position of reinsurance depending on basis and credit risks in the presence of moral hazard is demonstrated in the form of a graph. There is also a substantiation for the dependence of other catastrophic instruments such as: CAT options, CAT bonds and indexed CAT bonds from basis risk, credit risk and moral hazard.

Keywords

Moral hazard, Credit risk, Basis risk

Vplyv trhu na určovanie cien poisťného produktu

The impact of the market on the pricing of the insurance product

Anna Strešňáková, Mária Bilíková

Abstract

The process of calculating the prices of goods and services on the market is difficult, and there is not only one key factors in the process of calculating the prices. Pricing depends on the product demand, the prices of competing products, and for special products sometimes the duration of the contract, the estimate of future profits, etc. In this paper, we focus on possibility of determining the price of an insurance product on the market first by elasticity and then by a strategy dependent on the behavior of the policyholder and competing insurers.

Key words

price elasticity, price of the insurance products, sensitivity

Modely zdravotného poistenia**The models of sickness insurance**

Lea Škrovánková, Zsolt Simonka

Abstract

The aim of this paper is to describe the possibility of applying actuarial mathematics in sickness insurance. The paper contains some conceptions needed for the construction of the stochastic model by Markov processes. It analyses the forms of valuating of Markov processes by system's modeling, too. The paper defines the matrix of probabilities of transition. It is necessary for insurance company to know the probabilities of transition are, e.g. if the insurant will be healthy, ill or dead. Therefore we are interested in the probabilities distribution state of system, in concrete model AIDS illness. Then we determined chain: vector of initial probabilities and matrix of transition.

Key words

Sickness insurance, Multistate models, Markov processes, Probability of transition, Matrix of transition

Oceňovanie nového obchodu životnej poisťovne podľa MCEV princípov**Valuation of the new business of the life insurance under MCEV principles**

Tatiana Šoltéssová

Abstract

The life insurance companies conclude insurance contracts for a longer period of time and therefore the data on the value of the insurance company obtained from the accounting may not largely reflect the real financial situation of the company.

For this reason, insurance companies have introduced the calculation of Embedded Value, e. g. the value which reflects the value of future profits of insurance companies arising from the existing insurance portfolio. The introduction of Embedded Value and the subsequent transition to the Market-Consistent Embedded Value (MCEV) mean the significant progress in determining the value of the life insurance companies, in the financial reporting and in comparing insurance companies in the EU and in the context of Solvency II.

In the contribution we will define the parameters of the insurance product and we will calculate the profitability indicators of the new business value according to the MCEV principles.

Key words

Market-Consistent Embedded value, life insurance, value of new business, new business margin, sensitivity analysis

4. sekcia

4th Section

**Aplikácia modelov a metód operačného výskumu
a ekonometrie v ekonomickom rozhodovaní**

**Application of operation research and econometric
models and methods in economic decision making**

Podmienená konvergenca a regresia rastu medzi krajinami v Európe Conditional Convergence and Cross-Country Growth Regressions in Europe

Michaela Blaško

Abstract

The convergence denotes the converging of homogenous economic units. The average GDP growth rate in Europe from 1996 is approximately 1.9% per year. Developed units do not have the same GDP growth as transitional, less developed units. For 30 Europeans countries, there is a clear evidence of declining variance of GDP from 1996 to 2015, with oscillations in 2009 and 2010. Base on previous results and publications is the hypothesis of σ -convergence accepted only from 1996 to 2008 and the hypothesis of β -convergence, when poor economic units tend to grow faster than rich ones from 1996 to 2005. The main objective of an article is testing of cross-country growth regression from 1996 to 2016 between selected European countries by ordinary least squares method. The regression is explained by dependency between the year growth rate of real GDP per capita in Purchasing Power Parity and set of explanatory variables. The calculated year growth rate of GDP is 0.335% and depends on list of used explanatory variables and length of the observed interval.

Key words

Conditional convergence, β -convergence, σ -convergence, Real per capita GDP in Purchasing Power Parity, Ordinary least squares method.

Okružná úloha s minimalizáciou emisií s časovými oknami a heterogénnym parkom vozidiel

Emission Vehicle Routing Problem with Time Windows and Vehicle Classes

Ivan Brezina, Gabriela Sedláková

Abstract

The aim of the present paper is modelling of transport with reducing fuel consumption by minimizing emissions model with time windows and vehicle classes. Unlike the classical model of capacitated vehicle routing problem in which the total distance travelled is minimized, this model minimizes fuel consumption estimated depending on the vehicle category and its payload.. The final model is further extended by the time window constraints.

Key words

vehicle routing problem, time windows, EVRP-VC, EVRPTW-VC

Možnosti redukcie matice platieb v systéme Matlab

Payoff Matrix Reduction in Matlab

Zuzana Čičková, Allan Jose Sequeira Lopez

Abstract

The game theory is a discipline of applied mathematics focused on decision making situations involving several subjects (players). The game includes any conflict situation between entities. Bimatrix games are the simplest type of two-player games where payouts of both players can be easily characterized in a matrix form. The paper is focused on the possibilities of matrix reduction to simplify the solution of the respective game presenting an iterative procedure of matrix reduction in Matlab environment. The aim of the paper is to demonstrate the use of software and software toolboxes in Matlab for the solution of bimatrix games based on the theoretical knowledge of working with matrices.

Key words

bimatrix games, Matrix reduction, Game Theory, Matlab

Využitie maticových hier v oblasti sieťovej bezpečnosti

The Use of Matrix Games in the Field of Network Security

Zuzana Čičková, Matej Zagiba

Abstract

In essence network security deals with securing networks and connected devices. This includes prevention and control of unauthorized access to network, devices and data. A behavior of rational subjects can be predicted using mathematical models from the game theory field. In our paper we will concentrate on matrix games and their possible usage in the internet security domain. By the term game we mean a strategic battle over network control. We will formulate a generalized problem where one attacker (representing all attackers) and one defender (a generalized term for all entities such as system administrators and security personnel, with the same goal of network defense) are playing in the game and point out the possibilities of finding a equilibrium of the system.

Key words

Network security, Game theory, Matrix games

**Podmienky optimálnosti v úlohe cenovej regulácie
na báze Averchovho - Jonesovho modelu**

**Optimality Conditions in the Price Regulation Problem
on the Base of the Averch – Jones Model**

Michal Fendek

Abstract

In relation with objectification and increases in nationwide operation effectiveness of natural monopolies in network industries on the market the role of regulation mechanisms is increasing. Its aim is the closest approximation of proportions between price and level of network industry products supply to the situation which would occur in the conditions of market competition. The objective of regulation mechanisms is to find an appropriate proportion between price and product supply of network industry under assumption of the existence competitive market. With regard to analysis of equilibrium in network industries models it is important to point out that except for competition policy protection the state fulfils another specific task – regulation of network industries. The conditions for equilibrium of network industries and methods of their regulations will be examined in the paper. The stress will be laid on the regulation on the base of returns – Rate of Return Regulation. For the optimization problems we will formulate the Kuhn-Tucker optimality conditions and we will study their interpretation options.

Key words

Network industries, regulation mechanisms, reasonable profit in regulated industries, rate of return regulation, Averch-Johnson model, Kuhn-Tucker optimality conditions

Aukce a lineární programování

Auctions and linear programming

Petr Fiala

Abstract

Auctions are important market mechanisms for the allocation of products and services. Auctions provide a mechanism for negotiation between buyers and sellers. Auctions are becoming more and more important with the increasing volume of electronic auctions and applications in a variety of areas. An auction mechanism is the process that transforms the bids placed into the allocation, i.e. the auctioning of the auctioned objects to the winning participants and the determination of the payment to be paid by the buyer and accepted by the seller. Auction analysis is often based on a game theory model. The paper aims to show a significant correlation between the theory of auctions and the solving of dually associated linear programming problems. The linear programming approach is extended in the paper for so-called combinatorial auctions in which bidders can bid on a combination of objects.

Key words

Auctions, Auction mechanism, Linear programming

Kooperatívna okružná úloha **Cooperative vehicle routing problem**

Dana Figurová, Zuzana Čičková

Abstract

The problem of distribution is a highly-discussed issue of logistics. Different types of distribution can be categorized as a part of vehicle routing problems, which main purpose is to find the cheapest routing way of distribution the commodities. A special type of vehicle routing problem is a multi depot vehicle problem, in which we optimize the distribution by using multiple vehicles located in multiple central depots. The article is focused on the possibilities of cooperation in this type of distribution. Individual depots can be considered as a player, whose interest is to cooperate with other players to minimize their transportation costs. This assumption of routing allows using standard methods of game theory. We will also quantify the benefits of cooperation, resulting from merging the transport requirements of individual players.

Key words

vehicle routing problem, multi depot, game theory, cooperation

Problémy použitia ADD-metódy a DROP-metódy v lokačných problémoch **Problems of using ADD-method and DROP-method for plant locations problem**

Pavel Gežík

Abstract

The location problems solve the choice of the location of the selected device/s or plant by optimization. This optimization most often depends on the appropriate location of facility or plant based on the distance to production or to consumers. The ADD-method and DROP-method are basic heuristic methods which can be used for this optimization. These methods are relatively simple to apply in small-scale cases but they do not always provide the optimal solution. There are a lot of problems and inconveniences associated with the application and solution this kind of location problems.

The paper illustrates the use of these methods in a specific example and it points to the base of the example as well as the way of solution. These heuristic methods have a specific solution approach and often the algorithms of them lead to illogical results. The suitability of their use depends radically on the form, specificity and difficulty of a task. These methods are different in the basic selection principle and especially in the use, respectively in the expected results.

Key words

ADD-method, DROP-method, potential areas of facilities

Teoretické východiská analýzy niektorých problémov hospodárskeho rastu**Background analysis of some problems in economic growth**

Marián Goga

Abstract

The paper is divided into three parts. The first one deals with some important problems related to growths of the economy and the indicators of its measurement. In the second part are some of the contradictions that are related to economic growth and the choice of suitable for analysis of economic indicators. The third part contains reflections on the economic background of some of the problems of economic growth. Looking for answers to three basic questions: if there is a balanced the rate of economic growth over a long period of time, which would ensure the economy; if there is, what are the characteristics of this growth and its equilibrium and if this balance is stable or unstable.

Keywords

Economic growth, economic indicators, equilibrium and disequilibrium, stability and unstability, feedbacks.

Analýza mzdových disparít v okresoch Slovenska v období 2001-2015**Analysis of wage disparities across Slovak districts during 2001-2015**

Michaela Chocholatá

Abstract

This paper deals with the analysis of wage disparities across 79 Slovak districts during the period 2001-2015 based on instruments of spatial data analysis. The differences in wages were confirmed both from the spatial aspect as well as from the time aspect. The values of the global Moran's I statistics confirm the existence of the statistically significant positive spatial autocorrelation. Furthermore, the analysis has proved the persistence of wage disparities during the analysed time period.

Key words

disparities, wage, spatial analysis, districts, Slovakia

Simulácia kritických hodnôt rozšíreného Dickeyho-Fullerovho testu **Simulation of Critical Values Used in Augmented Dickey-Fuller Test**

Martin Lukáčik

Abstract

Testing of stationarity is important in many analysis, because significantly affects the choice of tools and methods that are used. The most applied test is augmented Dickey-Fuller (ADF) test. Lukáčik (2017) presents a simple program to support sequential ADF testing in EViews. In this program, all statistics are computed for the specified variable, but no critical values are simulated. The critical values of the joint Φ hypothesis are even taken from the tables for the rounded number of observations. The aim of this paper is to present a program to simulate all critical values. We also compare the simulated values with the values used in the tables.

Key words

Augmented Dickey-Fuller unit root test, Sequential testing, EViews, Hypotheses, Simulation

Funkcie reakcie na impulz pri VAR modeloch v programe EViews **Impulse Response Functions of VAR Models in EViews**

Adriana Lukáčiková

Abstract

Dynamic models in econometrics represent an important and preferred type of model for analysing real economic relationships. Impulse response function is an important tool for dynamic models. They help us evaluate the dynamic properties of the analysed relationships by examining the response to the shock over time, whereby we see the whole process of adapting to the original or new equilibrium. In this paper, we discuss the possibilities offered by econometric program EViews in this area.

Key words

Vector Autoregression Models, Impulse Response Function, EViews, Choleski Decomposition

**Optimalizácia sekvenčných modelov s nadväzujúcim operáciami
použitím MS Excelu**

**Optimization of Sequence Models with Precedence Constraints
using MS Excel**

Juraj Pekár

Abstract

Sequence models are mainly used to solve logistics problems in manufacturing. The essence of sequence models is to determine the schedule in order to perform individual operations on one or more service objects. In the present paper, we will introduce an approach to solving these problems using MS Excel. A prerequisite of the task is to perform an operation on a single service facility, and the execution of individual operations may be conditional upon performing other operations.

Key words

Sequence models, optimization, MS Excel

**Akumulácia ľudského kapitálu a jej význam
v kontexte vplyvu na ekonomický rast**

**Accumulation of human capital and its importance
in the context of the impact on economic growth**

Kvetoslava Surmanová, Reiff Marian, Zlatica Ivaničová

Abstract

Human capital is a production factor that has an irreplaceable place in production function. The article analyzes more in detail the impact of human capital on economic growth, the core of which is the structure of the population according to the achieved level of education and the level of wages, depending on the age structure. The annual data for the period 1998 - 2015 are used to analyze the impact of the achieved level of education. The empirical part is based on two known functional relations, the Minzer equation and the Cobb-Douglas function, both of which are modified. The results of the analysis pointed to the need to increase the proportion of the part of the population who only receives primary education.

Key words

Human capital, economic growth, education, wage, econometric model

Príbeh konvergenzie slovenskej ekonomiky**A Story of Slovak Economy Convergence**

Karol Szomolányi

Abstract

A giant growth of the Slovak economy can be explained with the convergence theory of neoclassical growth model. The convergence process has been continuing, nevertheless it is not accompanied with so huge economic growth. It follows from the quantification of theoretical differences of economic growth rates between Slovak economy and the chosen European economies using the growth determinants' model available from the literature and corresponding with the neoclassical theory.

Key words

neoclassical theory, convergence, Slovak economy

Zoznam účastníkov¹ / Content of participants

Plenárne rokovanie / Plenary session

Groshek Gerald, Prof., PhD.
Jablonský Josef, prof. Ing., CSc.
Kamenárová Mária, Ing.
Koval'ová Jana, Mgr.

Lidinská Lucie, Ing.
Mičúch Marek, Ing., PhD.
Sakálová, Katarína, prof. RNDr., CSc.
Ulman Paweł, Prof. UEK dr hab.

1. sekcia / 1st section

Informačné technológie a informačné systémy

Information technologies and information systems

Jurík Pavol, Ing., PhD.
Schmidt Peter, Ing. Mgr., PhD.

Sojka Pavol, Ing.
Szivósová Mária, Ing., PhD.

2. sekcia / 2nd section

Aktuálne trendy vývoja teórie a praxe účtovníctva a audítorstva

Current trends of development of accounting and auditing theories and practise

Antalová Renáta, Ing. Mgr., PhD.
Blahušiaková Míriama, Ing., PhD.
Knežević Goranka, Prof. dr
Kňazková Veronika, Ing., PhD.
Košťuríková Ivana, Ing. PhD.
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Surový Vladimír, Ing., PhD.
Šimíková Iris, Ing. PhD.
Šlosárová Anna, prof. Ing., PhD.
Užík Ján, Ing., PhD.

3. sekcia / 3rd section

Aplikácia štatistických a aktuárskych vied v sociálno-ekonomickej oblasti

Application of statistics and actuarial sciences in social-economic areas

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¹ Kontaktné údaje autorov príspevkov sú na CD.

4. sekcia / 4th section

Aplikácia modelov a metód operačného výskumu a ekonometrie v ekonomickom rozhodovaní

Application of operational research and econometrics models and methods in economic decision making

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