



EKONOMICKÁ UNIVERZITA V BRATISLAVE
FAKULTA HOSPODÁRSKEJ INFORMATIKY

UNIVERSITY OF ECONOMICS IN BRATISLAVA
FACULTY OF ECONOMIC INFORMATICS



ZBORNÍK ABSTRAKTOV

19. medzinárodná vedecká konferencia
„AIESA – BUDOVANIE SPOLOČNOSTI ZALOŽENEJ NA VEDOMOSTIACH“

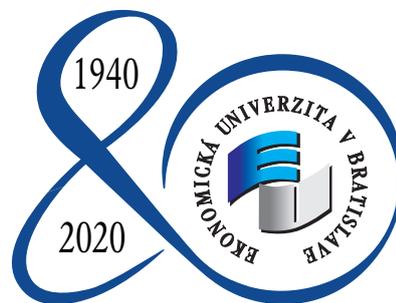
PROCEEDINGS (ABSTRACTS)

19th International Scientific Conference
„AIESA – BUILDING OF SOCIETY BASED ON KNOWLEDGE“

AIESA

Applied Informatics Econometrics Statistics Accounting

13. november 2020 | 13th november 2020 | BRATISLAVA





EKONOMICKÁ UNIVERZITA V BRATISLAVE
FAKULTA HOSPODÁRSKEJ INFORMATIKY

UNIVERSITY OF ECONOMICS IN BRATISLAVA
FACULTY OF ECONOMIC INFORMATICS



Appplied **I**nformatics **E**conometrics **S**tatistics **A**ccounting

ZBORNÍK ABSTRAKTOV

19. medzinárodná vedecká konferencia

„AIESA – BUDOVANIE SPOLOČNOSTI ZALOŽENEJ NA VEDOMOSTIACH“

organizovaná pod záštitou

rektora Ekonomickej univerzity v Bratislave
prof. Ing. Ferdinanda Daňa, PhD.

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

PROCEEDINGS (ABSTRACTS)

19th International Scientific Conference

„AIESA – BUILDING OF SOCIETY BASED ON KNOWLEDGE“

held under the umbrella

of the Rector of the University of Economics in Bratislava
Prof. Ing. Ferdinand Daňo, PhD.

and the Dean of the Faculty of Economic Informatics
Prof. Ing. Ivan Brezina, CSc.

13. november 2020 * November 13, 2020
Bratislava

INTERNATIONAL SCIENTIFIC COMMITTEE

Guarantor: Prof. Ing. Ferdinand Daňo, PhD.

Rector, University of Economic in Bratislava

Chairman: Prof. Ing. Ivan Brezina, CSc.

Dean, Faculty of Economic Informatics, University of Economic in Bratislava

Members: Prof. Dr. Ing. Dana Dluhošová

Faculty of Economics, VŠB – Technical University in Ostrava

Assoc. Prof. Ing. Václav Janeček, CSc.

Faculty of Informatics and Management, University in Hradec Králové

Prof. Dr. hab. Pawel Lula

Faculty of Management, Cracow University of Economics

Assoc. Prof. RNDr. Luboš Marek, CSc.

Faculty of Informatics and Statistics, University of Economics in Prague

Assoc. Prof. Ing. Ladislav Mejzlík, PhD.

Faculty of Finance and Accounting, University of Economics in Prague

Prof. Dr. hab. Józef Pocięcha

Faculty of Management, Cracow University of Economics

ZOSTAVOVATEĽ ZBORNÍKA ABSTRAKTOV / EDITOR:

Eva Čerteková

Všetky příspěvky boli pred publikovaním recenzované.

All published papers have been reviewed before publishing.

Zborník neprešiel jazykovou úpravou.

Za odbornú stránku príspevkov zodpovedajú autori.

The proceedings were not subject of language correction.

The authors are fully responsible for their conference papers

Fakulta hospodárskej informatiky EU v Bratislave

Dolnozemska cesta 1, 852 35 Bratislava

Vydavateľstvo / Publisher Letra Edu, Bratislave 2020

Tento zborník abstraktov je bez ISBN. Zborník príspevkov je dostupný

na CD aj online s ISBN 978-80-89962-69-3 (pdf)

This is a conference proceedings abstracts with no ISBN. The full proceedings are available

on CD and online with ISBN 978-80-89962-69-3 (pdf)

1. sekcia

1st Section

Informačné technológie a informačné systémy

Informatics technologies and information systems

Cloudové nástroje vo vzdelávaní

Cloud tools for Education

Igor Bandurič

Abstract

Many Cloud vendors offer some of their tools and services for Academia. The number of tools available is significant. The aim of this paper is to compare what are the differences between these offering. We have also used some tools in our education process. So, we will describe our experiences and feedback we have received.

Key words

Cloud, Academy, Education

Vplyv dátovej štruktúry použitej pre ukladanie dát grafu na exekučnú efektívnosť metód hľadajúcich v ňom najkratšie cesty pomocou Dijkstrovho algoritmu

An Influence of the Data Structure Used for Storing Graph Data on the Execution Efficiency of Methods Finding the Shortest Paths in a Graph Using Dijkstra's Algorithm

Igor Košťál

Abstract

Dijkstra's algorithm is used in various applications finding the shortest paths, e.g. when packets are routed by individual routers in computer networks represented by directed weighted graphs. An application method that implements Dijkstra's algorithm must store the data of the graph being processed, its processed and unprocessed vertices with their weights, found the shortest paths to the processed vertices, etc., into any data structure while finding the shortest path in the graph. The choice of this data structure affects the execution efficiency of such a method. In this paper we deal with the influence of two different data structures, dynamic arrays and a priority queue, on the execution efficiency of methods that use these data structures during finding the shortest paths in the same directed weighted graphs using Dijkstra's algorithm.

Key words

directed weighted graph, shortest paths in a graph, dynamic array, priority queue, Dijkstra's algorithm

Aktivity proti násiliu na deťoch na internete

Activities against violence against children on the Internet

Anna Ondrejková

Abstract

Today, the Internet is not only used by the adult population in work and private life, but is increasingly used by children, with digital technologies increasingly affecting their lives and the future. The impact of digital technologies has both positive and negative aspects. The digital media world brings many opportunities, but it also has significant risk potential such as illegal content, age-appropriate content, inappropriate contacts, inappropriate behaviour. The contribution maps activities against violence against children from the point of view of the National Concept of Child Protection in the Digital Space, from the point of view of the institutions in the Slovak Republic dealing with the current issue and also in terms of important international documents. Parents, teachers, educators and youth workers must learn themselves and then teach children to perceive the media with understanding, to acquire media competences that would help children to use media content responsibly, safely, critically and creatively, with an emphasis on respect for human rights, moral context and age appropriateness.

Key words

Internet, social networks, violence against children, cyberbullying, child protection

Podobné vlastnosti expertných systémov a vysvetľujúcej umelej inteligencie

A similar features of Expert systems and Explainable Artificial Intelligence

Eva Rakovská

Abstract

The end of the last century was the era of Expert systems (ES) in practice. An expert system is a solitaire system for solving many tasks, which need nontrivial solutions. Expert systems are often based on qualitative knowledge of experts known as "the rules of thumb", which use rule-based knowledge representation or frame-based knowledge representation (called also case-based systems). One of the main features of ES is the existence of an explanation module. It is an important module for users, which is able to explain the solving process "in human language". The similar feature, based on AI techniques is called Explainable AI (XAI), which is necessary for understanding the machine learning processes by solving tasks. Machine learning solutions are often as a black-box no understandable for users. The paper focuses on comparison the AI techniques used in ES and XAI and show difference between ES and XAI.

Key words

Expert system, architecture of Expert system, Artificial Intelligence, XAI, machine learning

Gamifikácia v online prostredí, v pandemickom období

Gamification in the online environment, in the pandemic period

Peter Schmidt, Jaroslav Kultán

Abstract

Game is a basic learning tool not only in humans but also in the animal kingdom. Thanks to this game, learning new things is fun and not tiring. At different stages of the development of civilization, play had different strengths in teaching, e.g. in the Middle Ages it was almost completely suppressed. In modern education, the use of toys is not very common, because the amount of material downloaded is so large that there is no room for innovative forms of education and this leads to memorization. At a time of pandemic, when most school facilities have switched to some form of online education, gamification is even more important. Maintaining a student's attention during class is not easy, even in a normal class. In online teaching, this is difficult for the teacher due to the lack of eye contact between teacher and student. In such circumstances, the involvement of play elements in the teaching process can help maintain the student's attention and interest.

Key words

Gamification, informatics, internet, education

Napredovanie online marketingu

Advancing online marketing

Mária Szivósová

Abstract

All companies that care about their future have been forced into the digital space due to the pandemic. Today, a large part of the population prefers convenient and risk-free shopping over the Internet, from which individual companies can also benefit. They can attract customers by clever marketing in a digital environment. The use of modern online tools in marketing is now a necessity for companies. The paper will focus on tools that can help businesses expand their customer base, support sales, improve competitiveness and reach out to customers by improving relationships with them. Sales tools also allow customers to shop and automate the sales process from anywhere, anytime.

Key words

digital marketing, online marketing tools, social networks, sale

2. sekcia

2nd Section

Aktuálne trendy vývoja teórie a praxe účtovníctva a audítorstva

Current trends of development of accounting and auditing theory and practise

Tvorba a čerpanie rezerv súvisiacich s pandémiou COVID-19

Creation and drawing of provisions related to the COVID-19 pandemic

Renáta Antalová, Katarína Máziková

Abstract

The future of the economic environment in which companies in a market economy operate is always characterized by a certain degree of uncertainty. In 2020, the risk for companies is associated with the uncertainty posed by the global COVID-19 pandemic. In context with the pandemic, a number of problems appeared which related to the settlement of receivables and payables in the accounting entities, as the activities of most companies were significantly reduced. Many businesses finished their activities and closed their operations. Others survived only due to operational changes in the structure of manufactured products or services provided. At present, we can talk about the onset of the second wave of the pandemic. The aim of the paper is to review the area of creating and drawing provisions as one of the options to take into account future risk in terms of tools and methodological resources that companies have available within the accounting information system.

Key words

uncertainty, risks, provisions, conservatism principle, COVID-19

Vplyv uzavretia ekonomiky v rámci 1. vlny epidémie COVID-19 na ekonomickú situáciu subjektov v Slovenskej republike

The Impact of Economic Lockdown within the 1st Wave of Epidemics COVID-19 on the Economic Situation of Subjects in the Slovak Republic

Miriama Blahušiaková

In March 2020, when the first COVID-19 positive patient appeared in the Slovak Republic, the government adopted several restriction measures; services, schools, borders were closed, and movement of persons was limited, and the economic and social life was attenuated. The lockdown of the economics had impact on every subject of economic life. The aim of the paper is to analyse the impact of the economic lockdown on the financial position of entities in Slovakia and the detection of how the government remedies influenced these entities. The analysis is based also on our own questionnaire survey realized in the second half of May 2020.

Key words

COVID-19, lockdown of economics, financial position, economic subject, restriction measures

**Vplyv vymedzenia subjektov verejného záujmu v SR a v EÚ
na zostavovanie a overovanie účtovnej závierky**

**The impact of the definition of public interest entities in the
Slovak Republic and in the EU on the preparation
and audit of financial statements**

Milan Gedeon

Abstract

In general, public-interest entities are entities which are more visible and significant from the economic point of view in, and therefore the statutory audit of their annual or consolidated financial statements is subject to more stringent requirements under audit legislation. The accounting legislation also lays down some special requirements related to the financial statements of public interest entities. There is a discrepancy between the relevant legislation in the definition of public interest entities, which also has an impact on the number of entities subject to more stringent requirements, although European legislation provides for the same range of entities in both accounting and auditing area. The contribution will deal with the impact of the definition of public interest entities in the Slovak Republic and in the European Union on the preparation and audit of financial statements.

Key words

Public interest entities, Accounting legislation, Audit legislation

Vybrané nástroje daňovej politiky na podporu vedy a výskumu podnikov v Slovenskej republike

Selectet tools of tax policy to support science and research of companies in the Slovak Republic

Lea Jančíčková, Renáta Pakšiová

Abstract

Science and research are currently a society-wide preferred area in the business sphere, due to their unquestionable contribution to sustainability in both the national and transnational dimensions. Tax relief ("super-deduction") supporting the development of business science and research is a tool of tax policy that has an incentive effect. The aim of the paper is to analyze the possibilities of applying tax policy instruments in support of science and research of companies operating in the Slovak Republic. Within the research, we will focus on the theoretical analysis of the requirements for the possibilities of optimizing the tax liability of the company in connection with the performance of science and research activities. As part of quantitative research, we evaluate the development of the number of business entities with applied analyzed tax policy instruments in the Slovak Republic for all years when it is possible to apply a "super-deduction". From the analysis, we found a growing trend over time, but it reaches low numbers.

Key words

research, development, tax instruments, business entity, super deduction

Dôležitosť audítorských dôkazov pre závery audítora v čase globálneho vývoja

The Importance of Audit Evidence for Auditor's Conclusions in a Time of Global Development

Veronika Kňážková

Abstract

Constant development in today's digitized world leads to the growing use of technology in audit with a focus on data analysis. Using automated tools and techniques, the auditor can effectively obtain audit evidence. From the above, the purpose of this article is to clarify the importance of the evidence obtained by the auditor in the audit of the financial statements, which will enable the auditor to reach reasonable conclusions on which to base his opinion. In obtaining audit evidence, the auditor proceeds in the context of International Auditing Standard ISA 500. Audit evidence that the IAASB wishes to revise to provide updated information about the progress of work and potential issues that are considered in performing the audit in the context of ISA 500. ISA 500 is therefore under review, which contributes to obtaining sufficient appropriate audit evidence at a global level. In the introductory part, I present the theoretical basis of the issue and the institutions that are primarily responsible for reviewing and amending international audit evidence. In the procedural part, I focus on the analysis of ISA 500, presenting important areas of the standard and finally evaluating the revision process.

Keywords

audit evidence, audit procedures, professional skepticism, revision

Výnosy a náklady v účtovníctve neziskových účtovných jednotiek

Income and expenses in the accounting of non-profit accounting entities

Alena Kordošová

Abstract

Income and expenses in the accounting of non-profit accounting entities in the Slovak Republic have their particularities. The paper is focused on examining the particularities of income and expenses in the conditions of non-profit accounting entities in the Slovak Republic. Income shall be defined as an increase in economic benefits and expenses shall be defined as a decrease in economic benefits during the accounting period of non-profit accounting entities and can be measured reliably. The result of the examination of individual income and expenses in the accounting of non-profit accounting entities is to point out specific items of income and expenses, their position and the importance in the conditions of non-profit accounting entities in the Slovak Republic.

Key words

income, expenses, non-profit accounting entities, accounting

Analýza flexibility účtovného obdobia v Slovenskej republike za obdobie 2011-2018

Analysis of Flexibility of Accounting Period in the Slovak Republic for Years 2011-2018

Zuzana Kubaščíková, Zuzana Juhászová, Miloš Tumpach

Abstract

Entities use the option to change the accounting period to a financial year because such a change usually has a rational basis, usually in the specific type of business of a particular entity. These are therefore entities that have the seasonal nature of their economic activity. As part of the analysis of the use of the alternative of the accounting period by Slovak accounting entities, in addition to the number of accounting entities, we also state their area of business to substantiate the reasons that saw the entity to change the accounting period and verify in the case of seasonal entities whether they used the alternative elections of the accounting period in the period 2011-2018.

Key words

accounting period, accounting unit, calendar year, seasonality

Analysis of the difference between anticipated income tax and paid income tax at the level of business entities

Anton Marci, Katarína Sigetová

Abstract

Tax rate for an income tax in any country is probably one of the most important information which is used by potential investors in decision making. Tax rate is also often used by probusiness governmental bodies to attract the investments from abroad and locally, but in reality the difference between what is an anticipated or expected income tax and the tax which the business entity needs to pay can be surprising. The reason for this differences could be find in more subtle rules used for calculating the income tax, the usage of different set of accounting and tax calculating rules often by multinational corporations and the aim of the paper is to focus on calculation of the differences between the tax which can be anticipated by measuring businesses revenues and costs and the tax really paid. Correlation and differences could lead us to stating the more accurate value of the tax rate with regard to the reality of doing business.

Key words

Income tax, business entity, accounting

Zmeny v ekonomickom prostredí na Slovensku vyvolané COVID-19

The changes in the economic environment caused by COVID-19 in Slovakia

Jitka Meluchová, Martina Mateášová

Abstract

The changes adopted by Slovakia in relation to COVID-19 concern all areas such as accounting, taxes, personal data protection, labor law, social security and health insurance. Many changes were influenced by European legislation and several adopted by the current government of the Slovak Republic. The paper aims to provide an overview of the most significant changes that affect the business environment in the Slovak Republic in 2020. The paper examines the impact of measures and legislative changes on the implementation of business activities and labor law, which is significantly affected by the pandemic situation in the world.

Key words

COVID-19, economic environment, legislative changes, accounting, taxes

Účtovné špecifiká európskej spoločnosti, európskeho družstva alebo európskeho zoskupenia hospodárskych záujmov so sídlom v SR

Accounting Specifics of a Societas Europaea, Societas Cooperativa Europaea or European Economic Interest Grouping Based in the Slovak Republic

Branislav Parajka

Abstract

Within the European Union, it is possible to use legal forms of business, the legislation of which is the same in all EU Member States, based on EU legal acts. With the use of the mentioned legal forms of business in the Slovak Republic, there are certain specifics that are specified in the legal regulation of accounting in the Slovak Republic. This article deals with the use of these legal forms of business based in the Slovak Republic, examines their frequency and possible application of International Financial Reporting Standards (IFRS).

Key words

Societas Europaea, Societas Cooperativa Europaea, European Economic Interest Grouping, IFRS

Kúpa podniku alebo jeho časti v Slovenskej republike **Purchase of a business or its part in the Slovak Republic**

Martina Podmanická

Abstract

The purchase of a business or its part are relatively frequent types of business combinations. As part of a broader issue of certain types of undertakings joining into larger economic or legal units, a significant space in the relevant legislation and in the specialist literature is devoted to this issue. The aim of this paper is to present and analyse the issue of the purchase of a business or its part in the Slovak Republic from a legal, accounting and tax point of view. The paper clarifies the purchase of a business transaction as one of the possible business combinations, explains the relationship between the seller and the buyer, explains the transfer of things, rights and property values forming a business in accordance with the Commercial Code. The paper also analyses the accounting and tax solution to this issue from the buyer's point of view in accordance with the currently valid accounting and tax legislation.

Keywords

business, seller, buyer, fair value, goodwill

Komparácia aplikácie IFRS 7 v poznámkach individuálnej a konsolidovanej účtovnej zvierky vybraných podnikov **Comparison of the application of IFRS 7 in the notes of the individual and consolidated financial statements of selected companies**

Katarína Sigetová, Lenka Užíková

Abstract

The application of IFRS 7 Financial Instruments: Disclosures is generally a major challenge for accounting entities, particularly in terms of ensuring that notes of the financial statements include all the required facts. Standard IFRS 7 requires accounting entities to provide information in their financial statements that enables users to evaluate the significance of financial instruments for the accounting entity's financial position and performance, as well as the nature and extent of risks arising from financial instruments. Accounting entities have to pay attention in their consolidated financial statements the changes caused by the consolidation adjustments that affect the individual financial statements of the entities included in the consolidated group. The purpose of paper is to analyze the application of IFRS 7 in the notes to the individual and consolidated financial statements of several large accounting entities operating in the Slovak Republic.

Key words

financial statements, notes, IFRS 7, financial instruments

3. sekcia

3rd Section

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

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

Volatilita výnosových kriviek

Volatility of the Yield Curves

Ivana Faybíková

Abstract

In general a volatility is measure which shows variable movements from the mean value. Volatility in insurance companies represents a degree of uncertainty, especially in the area of financial risk, as it may include, among other risks, significant monetary losses and also significant fluctuations in the most important financial indicators, based on which important business decisions are made by both internal and external entities. In addition to introducing the concept of volatility we will specify concepts of interest rate, spot rate, yield and yield curve. The main purpose of the paper is to explain to the reader the volatility of yield curves within insurance companies, estimation methods and the impact of the occurrence of the given volatility on the economic situation of insurance companies.

Key words

Volatility, Interest Rate, Yield Curve, Insurance Company

Hodnotenie vplyvu vybraných faktorov na ohrozenie slovenských domácností materiálnou depriváciou

Selected factors impact assessment in relation to the risk of material deprivation of the Slovak households

Helena Glaser–Opitzová

Abstract

Poverty is a comprehensive, complicated phenomenon which is currently considered to be one of the most serious problems throughout the world. Just as there is no a definition of poverty generally accepted, in the same way there is not the only one generally accepted method of its measuring. Within the EU, poverty is measured mainly via "at-risk-of-poverty or social exclusion" indicator, which combines the concept of income poverty with two other dimensions - material deprivation and exclusion from the labour market. The paper analyzes the model of logistic regression of sub indicator - the rate of severe material deprivation. In the presented analysis, there is assessed the impact of selected factors that were observed in the sample survey on household income and living conditions (EU-SILC 2018) in relation to the jeopardy that the household will be exposed to the risk of severe material deprivation.

Key words

poverty, severe material deprivation, logistic regression, EU-SILC 2018

Štatistická analýza výdavkov na výskum a vývoj v krajinách Európskej únie

Statistical analysis of expenditures on research and development in European Union countries

Lubica Hurbánková

Abstract

Paper deals with the analysis of expenditures on research and development in European Union countries in years 2009 - 2018 in million Euro. The aim of the paper is to find out in which countries expenditures per capita increased the most during the observed period and in which it decreased, what was the average annual growth rate of this indicator. Contribution method will help to analyze how the total expenditures on research and development in 27 European Union countries has changed, what was the share of each country in this expenditure, which countries contributed the most to this change and which the least. Expenditures on research and development capita increased average annually between 2009 and 2018 in all analyzed countries, except Luxembourg and Finland, where it decreased. The highest average annual growth was recorded in Poland (12.48%), Latvia (10.50%), Slovakia (10.47%) and Bulgaria (10.38%). Total expenditures on research and development increased in 2018 compared to 2009 by 41.65%, Germany (18.11%) and France (4.29%) contributed the most to this increase.

Key words

expenditures on research and development, European Union countries, contribution method

Dopad koronavírusu na slovenskú ekonomiku. Rýchly odhad HDP

Impact of coronavirus on Slovak economy. Short term forecast of GDP

Silvia Komara

Abstract

The outbreak of coronavirus paralyzed both the Slovak and global economies. The world economies have entered a recession and the repeated return and onset of the second wave will deepen it even more. Therefore, short-term forecasts of economic development are important for the subsequent reactions of politicians in making the necessary measures and economic policy.

We will assess the economic growth of the Slovak Republic using the basic macroeconomic indicator - the gross domestic product (GDP) and we will use the concept of ARIMA models as a model apparatus for creating short term GDP estimates.

Key words

ARIMA model, GDP, Covid-19, forecast

**Aplikácia všeobecných lineárnych modelov
pri analýze ekvivalentného disponibilného príjmu slovenských domácností**
**Application of general linear models
in analysis of equivalised disposable income of Slovak households**

Martina Košíková, Erik Šoltés

Abstract

The aim of the article is to quantify the effect of relevant factors on the amount of equivalised disposable household income in the Slovak Republic in 2018 using general linear models. We performed the analysis in the statistical analytical software SAS Enterprise Guide and on data from the statistical survey EU-SILC 2018. The presented results provide an overview of the economic situation of Slovak households and the procedure for the analysis of least squares means using CONTRAST and ESTIMATE statements.

Key words

general linear model, main effects, crossed effects, multivariate analysis of variance, analysis of least squares means

Zhluková analýza európskeho poisťného trhu
Cluster analysis of the European insurance market

Jana Kútiková

Abstract

The contribution is focused on application of cluster analysis in the insurance industry for 27 European countries that are part of the European Federation of insurance and reinsurance companies in order to assess the relevance and level of insurance in these countries through indicator of the paid claims per capita in the sectors of the life, non-life and health insurance.

Key words

Cluster analysis, Pearson correlation coefficients, Ward's method, K-means method, insurance

Zadlženie domácností na Slovensku Households' Indebtedness in Slovakia

Viera Labudová

Abstract

This article analyses the mortgage debt of Slovak households using data from the EU SILC survey (European Union Statistics on Income and Living Conditions). The aim was to find out which variables affect the household's mortgage debt. A chi-square test of the independence, Cramer V and the uncertainty coefficient was used in the analysis to measure the strength of this dependence. Finally, we compared the results of these analyses with the results of the decision tree.

Key words

household indebtedness, mortgage, EU SILC, chi-square test of independence

Kalkulácia hodnoty nového obchodu v životnom poistení Calculation of value of new business in life insurance

Patrik Mihalech

Abstract

Methods based on discounting of cash-flows belong among core techniques used for calculation of expected value of underwritten insurance contracts in life insurance. Before calculation, it is important to determine assumptions correctly. Assumptions can be, in principle, divided into economic and non-economic. Both groups have significant impact on final outcome. Calculation can be divided into valuation of present value of all insurance contracts and valuation of present value of newly underwritten contracts solely, which represent new business of an insurance company. In this paper we will focus on economic and non-economic assumptions used for calculation of new business and their application on concrete type of insurance.

Key words

value of new business, economic and non-economic assumptions, discounted cash flows, best estimate liabilities

Využitie simulácií diskretných nehomogénnych Markovových reťazcov v jazyku R v životnom poistení

Usage of discrete time non-homogeneous Markov chains simulations in R in life insurance

Vladimír Mucha

Abstract

The aim of the paper is to show the possibility of using simulations of discrete non-homogeneous Markov chains in the insurance area for the long-term care (LTC insurance) insurance product. The subject of the research is a one-way model with three states, specifically so-called permanent disability model. We are considering insurance with regular benefits payment to the policyholder in case if he or she becomes terminally ill. The R software can be used to generate Markov chain trajectories and their graphical presentation. Based on the statistical processing of data obtained from simulations, an insurance company obtains information which can be used for effective calculation of premiums. For presentation of these techniques we will use the data available in the Markovchain package in the R software.

Key words

insurance, permanent disability model, Markov chains, simulations, Markovchain package

Blackov-Littermanov model v teórii a praxi

Black-Litterman model in theory and practice

Ludovít Pinda

Abstract

The paper theoretically describes the Black-Litterman model, the use of which we will show in the construction of a portfolio of stocks selected from the DAX30 stock index. Based on subjective observations, we will show that the portfolio we create has a higher return than the return of the DAX30 index in the buy & hold strategy and an even higher return when considering the short position of selected stocks.

Key words

Black-Litterman model, stock index DAX30, buy&hold strategy, short position

Využitie fuzzy logiky pri rozhodovacích procesoch v oblasti aktuárstva

Use of fuzzy logic in decision-making processes in actuarial field

Katarína Sakálová, Anna Strešňáková

Abstract

Fuzzy sets provide unlimited possibilities in decision-making processes. They are not focused on strict Boolean belongings to sets - it is a member of a set / it is not a member of a set. In decision-making processes, it allows the use of linguistic expressions such as appropriate, very appropriate, sufficient, sufficient and the like. In our article, we will focus on demonstrating the possibilities of using fuzzy sets in the field of insurance in determining the suitability of a person as a possible insured with respect to his health indicators.

Key words

fuzzy sets, insurance, operator

Prehĺbenie polarizácie spoločnosti: analýza posunu v strednej časti rozdelení príjmov zamestnancov na Slovensku v rokoch 2005 až 2017

Deepening the polarization of the society: analysis of the shift in the middle part of the income distribution of employees in Slovakia from 2005 to 2017

Ľubica Sipková

Abstract

In the current crisis development of society, we can observe a relatively strong polarization of revenues, which is occurring worldwide. A characteristic feature of the polarization process is the sharp increase in the incomes of the rich and the gradual decline in incomes in the middle class of society, with a significant part of the population falling into poverty. The aim of the paper was to compare with adequate graphic presentation to assess the extent of the shift to lower incomes in the middle part of income distributions in Slovakia over the past decade. Based on the presented results, we conclude that the middle part of income distributions has experienced a proportional shift to lower incomes in the Slovak Republic over the last decade.

Key words

Income distribution, Gross wages, Employees, Quantiles, Probability distribution function

Charakteristika osobnosti majiteľov automobilov z hľadiska modelu „Veľkej päťky“ (The Big Five personality traits) s využitím korešpondenčnej analýzy

Personality traits of car owners in terms of the Big Five personality traits using correspondence analysis

Romana Šípoldová

Abstract

The automotive industry is one of the industries in which there is a constant competition between individual car manufacturers. Manufacturers compete with each other, trying to gain new customers and advertise intensively to retain existing customers in the future. Brands try to differentiate themselves by using different forms of advertising, which can give them an advantage over competitors. Convince a customer to become loyal or stay loyal to a particular brand or car model is challenging. Therefore, the creation of a customer profile is one of the key elements. This paper includes an analysis of the relationship between a selected car brand and the factors of the "Big Five personality traits" (or the OCEAN model), which are used to describe a person's personality in psychology, using the method of correspondence analysis.

Key words

The Big Five personality traits, car brand, Brand Preference

Odhad parametrov CoDe modelu úmrtnosti pre populáciu Slovenska

Estimation of CoDe mortality model parameters for the population of Slovakia

Tatiana Šoltéssová

Abstract

The aim of the paper is to introduce and apply the CoDe model of mortality to modelling of male and female mortality in Slovakia in 2018. The mortality model is analysed as the regression model. We are looking at the mortality model as a statistical (stochastic) model for which it is necessary to estimate the parameters of the nonlinear regression function based on empirical data of age specific mortality rates (separately for men and women). The parameters of the selected mortality model will be estimated by iterative methods of nonlinear regression analysis in the SAS software, through its application SAS Enterprise Guide.

Key words

mortality, law of mortality, CoDe model, iterative method, regression 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**

Optimalizácia portfólia s využitím evolučného algoritmu v jazyku R Portfolio optimization using evolutionary algorithm in R language

Ivan Brezina, Juraj Pekár

Abstract

The issue of selecting an asset composition is a fundamental task of the investor. There are a number of models supported by the relevant theory to support investor decision-making. This task is called the task of portfolio selection, with the investor setting a decision-making criterion in its construction. One possible criteria is portfolio performance measure. In our case, the chosen performance measure was identified as an omega function. On the basis of the above mentioned degree, the contribution constructs a model, the solution of which was implemented in R language.

Key words

optimization, evolutionary algorithms, R language

Nekooperatívna viackriteriálna hra

Non-cooperative multicriteria game

Zuzana Čičková, Patrícia Holzerová

Abstract

Decision-making situations are characterized by a conflict nature. If the situation is influenced by several subjects in their mutual interaction, it belongs to game theory by the model. However, the conflict may arise not only from the different goals of the players, but also from the fact that each player may consider several conflicting criteria when making decisions. This paper is focused on the formulation of a non-cooperative multicriteria game of two players, where we will consider a vector evaluation of the results of the decision-making situation for both of them. We will focus on the mathematical formulation of this type of game, point out the differences compared to games with scalar evaluation of results and we will also outline the possibilities of solving multicriteria games.

Key words

Game theory, non-cooperative game, multicriteria game

Aplikácia genetického algoritmu a ostrovného genetického algoritmu na problém obchodného cestujúceho s časovými oknami

Application of genetic algorithm and island genetic algorithm for solving traveling salesman problem with time windows

Mário Pčolár

Abstract

The traveling salesman problem with time windows belongs to the class of NP-hard problems. They are used exact methods as well as heuristic and metaheuristic methods to solving TSPTW. The aim of this paper is to explore the possibility of applying a genetic algorithm and an island genetic algorithm to solve the traveling salesman problem with time windows. The paper deals with the formulation of the genetic and island genetic algorithm and by testing programmed formulations by standardized problems. The achieved results for selected test problems are at a level comparable to the best known solutions from the literature. Both formulations of the genetic algorithm provide consistent convergence to qualitatively "good" solutions in a "reasonable" time.

Key words

traveling salesman problem with time windows, genetic algorithm, island genetic algorithm

Odhad pravdepodobnostného rozdelenie času nákupu

Shopping time probability distribution estimation

Marian Reiff, Pavel Gežík

Abstract

The paper provides a specific view of the data from the retail customer counter and their use to predict the need for open cash registers. The counter provides data on the number of customers entering and the number of performers of the retail operation. By comparing these two time series, it is possible to estimate the time of purchase of customers and thus determine the amount of cash registers at the time when customers will approximately come to the cash registers due to their arrival in service. The analysis is carried out using the methodology of hidden Markov models, since the duration of purchase is not directly measured but hidden in customer arrival and departure data. Based on the fact that the time of purchase varies at different intervals during the opening hours of operation, the contribution analyzes these changes, change intervals, probability distributions and estimates of the individual parameters of these probability distributions.

Key words

shopping time, Markov switching model, probability distribution model

Teória hier a evolučne stabilná stratégia

Game Theory and Evolutionarily Stable Strategy

Allan Jose Sequeira Lopez

Abstract

Classical game theory provides a mathematical framework for describing and analyzing strategic interactions between rational individuals and assumes that the interacting decision makers are rational, i.e., they act so as to maximize their payoffs. But if the players are inexperienced and the games complex, then this assumption is often violated. It is also unreasonable to assume that the players will always behave rationally. In this paper we introduce the topic of evolutionary game theory. We revisit the concepts from classical game theory and discuss them in the light of Darwinian evolution. We describe the central concept of an evolutionarily stable strategy (ESS), and its relationship to the idea of Nash equilibrium from classical game theory.

Key words

Population, Evolutionary Game Theory, Evolutionarily Stable Strategy, Dynamics

Odhad elasticity substitúcie vstupov pre rôzne krajiny sveta

Estimation of Elasticity of Substitution in Different World Economies

Karol Szomolányi, Martin Lukáčik, Adriana Lukáčiková

Abstract

The paper estimates the elasticity of substitution in various world economies. Econometric specifications resulting from the first-order conditions of the profit-maximizing firm are used for estimation. To filter out cyclical effects, the time series are adjusted by a frequency filter. The specifications are estimated by the least squares method and as systems of two equations with correlated random terms. The estimated values of the elasticity of substitution are usually less than 1, which confirms the current empirical results questioning the relevance of the production function in the Cobb-Douglas form. According to the analysis, here is not a relationship between the values of elasticity of substitution and various characteristics of countries such as growth, development, openness, and size is examined.

Key words

elasticity of substitution, capital and labour demand, frequency filters

Zoznam účastníkov / Content of participants

1. sekcia / 1st section

Informačné technológie a informačné systémy Information technologies and information systems

Ing. Igor Bandurič, PhD.
Ing. Igor Košťál, PhD.
Ing. Jaroslav Kultán, PhD.
Ing. Anna Ondrejková, PhD.

RNDr. Eva Rakovská, PhD.
Ing. Mgr. Peter Schmidt, PhD.
Ing. Mária Szivósová, 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

Ing. Mgr. Renáta Antalová, PhD.
Ing. Miriama Blahušiaková, PhD.
Ing. Milan Gedeon
Ing. Lea Jančíčková
doc. Ing. Mgr. Zuzana Juhászová, PhD.
Ing. Veronika Kňazková, PhD.
Ing. Alena Kordošová, PhD.
Ing. Zuzana Kubaščíková, PhD.
Ing. Anton Marci, PhD.

Ing. Martina Mateášová, PhD.
doc. Ing. Katarína Máziková, PhD.
doc. Ing. Jitka Meluchová, PhD.
doc. Ing. Mgr. Renáta Pakšiová, PhD.
Ing. Branislav Parajka, PhD.
Ing. Martina Podmanická, PhD.
Ing. Katarína Sigetová
prof. Ing. Miloš Tumpach, PhD.
Ing. Lenka Užíková

3. sekcia / 3rd section

Aplikácia štatistických a aktuárskych vied v sociálno-ekonomickej oblasti Application of statistics and actuarial sciences in social-economic areas

Ing. Ivana Faybíková
Ing. Helena Glaser-Opitzová
Ing. Ľubica Hurbánková, PhD.
Ing. Silvia Komara, PhD.
Ing. Martina Košíková
Ing. Jana Kútiková
doc. RNDr. Viera Labudová, PhD.
Ing. Patrik Mihalech

doc. Mgr. Vladimír Mucha, PhD.
prof. RNDr. Ľudovít Pinda, CSc.
prof. RNDr. Katarína Sakálová, CSc.
RNDr. Anna Strešňáková, PhD.
doc. Ing. Ľubica Šipková, PhD.
Ing. Romana Šipoldová
doc. Mgr. Tatiana Šoltéssová, PhD.
doc. Mgr. Erik Šoltés, PhD.

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

prof. Ing. Ivan Brezina, CSc.
doc. Ing. Zuzana Čičková, PhD.
Ing. Pavel Gežík, PhD.
Ing. Patrícia Holzerová
doc. Ing. Martin Lukáčik, PhD.
Ing. Adriana Lukáčiková, PhD.

prof. Mgr. Juraj Pekár, PhD.
Ing. Mário Pčolár
doc. Ing. Marian Reiff, PhD.
Ing. Allan Jose Sequeira Lopez
doc. Ing. Karol Szomolányi, PhD.

KONFERENCIU AIESA 2020 PODPORILI



**Fakulta hospodárskej informatiky
Ekonomická univerzita v Bratislave**

Dolnozemska cesta 1/b, 852 35 Bratislava
tel.: +421 2 6729 5723, e-mail:veda.fhi@euba.sk



VYDAVATEĽSTVO:

