

# ARGUMENTA OECONOMICA

2 (49) • 2022

Recommended papers

*Bálint Zsolt Nagy, Tünde Dezméri*

A SIX-FACTOR EXTENSION  
OF THE FAMA-FRENCH ASSET PRICING MODEL –  
THE CASE OF THE POLISH STOCK MARKET

*Michele Mininni, Giuseppe Orlando, Giovanni Tagliatela*

A GENERALIZED DERIVATION  
OF THE BLACK-SCHOLES IMPLIED VOLATILITY  
THROUGH HYPERBOLIC TANGENTS

*Nada Trivić, Bojana Todić*

A DECOMPOSITION OF THE TOTAL PRODUCTIVITY  
FACTOR INTO TECHNICAL PROGRESS  
AND TECHNOLOGICAL EFFICIENCY –  
METHODOLOGICAL POSSIBILITIES

ISSN 1233-5835  
e-ISSN 2720-5088



Publishing House of Wrocław University of Economics and Business

---

---

Wroclaw University of Economics and Business  
Argumenta Oeconomica – Editorial Office:  
Komandorska 118/120, 53-345 Wrocław

### Editorial Committee:

Editor-in-Chief: Krzysztof Jajuga  
Phone: +48 71 36 80 340

Andrzej Bąk  
Phone: +48 75 75 38 380

Katarzyna Kuziak  
Phone: +48 71 36 80 401

Maria Piotrowska  
Phone: +48 71 36 80 187

Czesław Zajac  
Phone: +48 71 36 80 412

Statistical Editor: Krzysztof Piontek  
Phone: +48 71 36 80 401

### International Scientific Council:

Giuseppe Calzoni (Università degli Studi di Perugia, Italy)

Joergen Drud Hansen (Odense Universitet, Denmark)

Robert L. King (University of Richmond, USA)

Michael M. Kostecki (Université de Neuchâtel, Switzerland)

Leszek Maciaszek (Macquarie University, Australia)

Richard B. McKenzie (Graduate School of Management, University of California, USA)

Mike Morley (University of Limerick, Ireland)

Lucjan T. Orłowski (Sacred Heart University, USA)

---

---

---

---

# ARGUMENTA OECONOMICA

---

---

2 (49) • 2022



Publishing House of Wrocław University of Economics and Business  
Wrocław 2022

Editors  
Ewa Knichnicka  
Anita Makowska

Verified by  
Elżbieta Macauley, Tim Macauley and Ewa Kania

Graphic design  
Maciej Szłapka

Argumenta Oeconomica is covered in **Clarivate Analytics** services:

Social Sciences Citation Index®  
Social Scisearch®  
Journal Citation Reports/ Social Sciences Edition  
and in **Elsevier** service Scopus



This work is licensed under the Creative Commons Attribution-ShareAlike 4.0  
International License.

To view a copy of this license, visit <http://creativecommons.org/licenses/by-sa/4.0/>

---

---

## TABLE OF CONTENTS

---

---

*Bálint Zsolt Nagy, Tünde Dezméri*

A SIX-FACTOR EXTENSION OF THE FAMA-FRENCH ASSET PRICING MODEL – THE CASE OF THE POLISH STOCK MARKET ..... 5

*Michele Mininni, Giuseppe Orlando, Giovanni Tagliatalata*

A GENERALIZED DERIVATION OF THE BLACK-SCHOLES IMPLIED VOLATILITY THROUGH HYPERBOLIC TANGENTS..... 23

*Nada Trivić, Bojana Todić*

A DECOMPOSITION OF THE TOTAL PRODUCTIVITY FACTOR INTO TECHNICAL PROGRESS AND TECHNOLOGICAL EFFICIENCY – METHODOLOGICAL POSSIBILITIES ..... 59

*Zubaria Andlib, Mudassira Sarfraz, Muhammad Kamran*

DOES THE GENDER OF THE HEAD OF THE HOUSEHOLD AFFECT THE LABOUR MARKET OUTCOMES FOR FEMALES? AN EMPIRICAL ANALYSIS FOR PAKISTAN BASED ON LABOUR FORCE SURVEY (LFS 2017-2018) ..... 71

*Agnieszka Rossa*

MODIFICATION OF THE LEE-CARTER MORTALITY MODEL AND ITS APPLICATION IN THE PENSION SCHEME ..... 93

*Marcin Lupiński*

FORECASTING THE INSTABILITY OF POLISH BANKS..... 115

*Li Sheng, Yechang Yin, Anning Zhang, Jiwei Wu*

MODELLING ECONOMIC STRUCTURE: THE PERSPECTIVE OF TOURIST CITIES ..... 135

*Jerzy Kaźmierczyk, Gulnara F. Romashkina, Vladimir A. Davydenko*

COLLECTIVE TRUST AND STRESS AT WORK. EVIDENCE FROM THE BANKING SECTOR..... 151

<i>Chi-Wei Su, Xi Yuan, Ran Tao, Muhammad Umar, Shi-Wen Huang</i>	
DOES A TRADE SURPLUS RAISE THE EXCHANGE RATE EXPOSURE? A PERSPECTIVE ON SINO-US RELATIONS .....	173
<i>Chuen-Ping Chang, Shi Chen, Jyh-Jiuan Lin</i>	
SHADOW BANKING AND LIFE INSURANCE POLICYHOLDER PROTECTION .....	199
<i>Ivan F. Gorlov, Marina I. Slozhenkina, Oleg A. Kholodov, Marina A. Kholodova, Olga P. Shakhbazova, Daria A. Mosolova, Mohammadreza Poorghasemi, Alireza Seidavi</i>	
A NOVEL METHOD TO DETERMINE THE GROWTH POTENTIAL OF AGRICULTURAL ENTERPRISES IN VARIOUS BUSINESS PLANS .....	219