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EDITORIAL

Four original scientific papers and two review papers, together with the Acknowledgment to the reviewers of the manuscripts submitted to the Editorial Board of the Journal in 2021 are published in Issue 2 Volume 24 Year 2022 of the *Economic Horizons* scientific journal.

Considering the quantitative aspects of economic growth, namely its dynamics, the coauthors *Mirjana Gligoric Matic* and *Biljana Jovanovic Gavrilovic* point to the fact that fluctuations in growth rates are neglected. Pursuant to that, growth intensity and its stability are analyzed on a sample of the European countries, including the Republic of Serbia, based on which components the coauthors construed the growth dynamics indicator and an adjusted growth rate. Based on the construed indicators, the analysis of the position of each country included in the sample indicates the importance of the approach like this while analyzing and comparing the economic growth of individual countries in both the mid and the long term. The authors conclude that, due to resilience to different shocks and uncertainties, the mentioned approach enables more realistic estimations of the effects on future economic growth and wellbeing.

Concerning the research in the influence of the energy-generating product prices on macroeconomic stability, the coauthors *Aleksandra Prascevic* and *Milutin Jesic* highlight the fact that the prices of energy-generating products cause significant shocks of the offer, which is one of the important generators of cyclical fluctuations and inflation. Based on the research conducted in the countries of the former Socialist Federal Republic of Yugoslavia and the Visegrad Group member states, the coauthors point to the fact that economic policymakers are faced with a complex task so as to minimize the effects of these shocks. The research done in this paper is especially significant due to the current fluctuations on global energy markets, where the prices of energy-generating products are reaching historically high levels, on the one hand, and the tendency to preserve macroeconomic stability, on the other. According to the authors, the key role is played by the Central Bank, whose certain monetary policy instruments may help partly mitigate the intensity of these shocks.

Estimating the influence of human resource accounting on the profitability of companies – conglomerates listed on the Nigerian Stock Exchange on the basis of the data obtained from the audited annual reports of the six companies listed on the Nigerian Stock Exchange in the period from 2010 to 2019, the coauthors *Khadijat Adenola Yahaya, Ramat Titilayo Salman, Abubakar Kolapo Abdulsalam* and *Adesanmi Timothy Adegbayibi* conclude that the costs of employee training and development, changes in the amount of the salaries earned by employees and the benefits received upon employment termination positively influence the profitability of the companies. They conclude that human resource accounting positively contributes to companies' profitability, based on which a recommendation is given to Nigerian companies to invest more in their employee training and development.

Starting from the need to identify the controlling and controller positions in the conditions of intensive digitalization in the practice of enterprises in the Republic of Serbia, the coauthors *Mirjana Todorovic* and *Dragana Parc* conducted a research study on a sample of 35 enterprises. Based upon the results of research study, the coauthors point to the fact that controlling is understood multidimensionally, most frequently as a

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professional support to management. They emphasize the fact that the controller's expertise and competence are the key factors of the success of this significant accounting function, whereas the budget, deviation analysis and the short-term calculation of results are the most significant tools in the implementation of controlling. Due to the importance of the controlling function, controllers are becoming partners and associates of and advisors to the company management.

Based on the research in the extent to which rationality exerts an influence on the consumer when they are to make a decision, the coauthors *Huai-Chun Lo, Ming Jing Yang, Cheng-Tsu Huang* and *Ching-Yuan Chien* conclude that the empirical findings show that income has a positive influence on customers when they are making a choice. Studying customer behavior when they are making a choice of leisure parks, the coauthors conclude that customers make their consumer decisions rationally, not for the purpose of making an optimal decision, but primarily in order to satisfy their own needs instead.

The coauthors *Vladimir Dzenopoljac, Oualid Abidi, Abdul Rauf* and *Ahmed Bani-Mustafa* investigated potential relationships between the contribution made by managers in sealing cross-border merger and acquisition deals, on the one hand, and tacit knowledge transfer, on the other. They tested the hypothesis on the existence of the probability that those managers would be exposed to significant tacit knowledge transfer while taking part in negotiations, the realization of merger-and-acquisition transactions and monitoring them. Taking into account the two dimensions of mergers and acquisitions, namely the number of the merger-and-acquisition transactions coordinated or executed by the manager and the value of those transactions, the coauthors established the fact that the manager's cultural intelligence would probably mitigate the relationship between the number/volume of cross-border mergers and acquisitions and the manager's tacit knowledge transfer. Pursuant to said, organizational culture might determine the intensity of tacit knowledge transfer for managers in the context of cross-border mergers and acquisitions.

On behalf of the Editorial Board of the Journal and on my own behalf, I hereby express my gratitude to the authors of the contributions published in this Issue of the Journal, as well as the reviewers whose critical comments and suggestions given to the authors have significantly contributed to the improvement of the submitted manuscripts.

Issue 2 Volume 24 Year 2022 also contains the *Acknowledgement to the Reviewers* of the manuscripts submitted to the Editorial Board of the Journal in 2021, of which those that had been rated positively in the double-blind peer review process were published as original scientific and review articles in the Issues 1, 2 and 3 Volume 23 Year 2021 of the Journal.

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Editor-in-Chief
Vlastimir Lekovic

Vlastimir Lekovic is a full professor at the Faculty of Economics of the University of Kragujevac in retirement. He earned his Ph.D. from the Faculty of Economics of the University of Kragujevac in the scientific field of general economics and economic development. He teaches the teaching disciplines of institutional economics (in the master's studies) and the scientific research methodology and the market regulation policy (in the doctoral studies). The key fields of his scientific-research interest are the economic system, the economic policy and institutional economics.

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THE MEASUREMENT AND ANALYSIS OF ECONOMIC GROWTH DYNAMICS IN EUROPEAN COUNTRIES

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In this paper, the quantitative aspect of economic growth, i.e. its dynamics, is dealt with. Although it is common to observe the growth rate (intensity) when analyzing the growth dynamics of countries while neglecting growth variability, the fact that covering fluctuations in growth rates has clear motivation and practical significance is presented. On a sample of European countries, including Serbia, growth intensity and stability are analyzed in the paper in order to construct a growth dynamics indicator and an adjusted growth rate based upon these two components. Based upon the two constructed indicators, the position of each country in the sample and in the region (Western and Eastern Europe) which they belong to is analyzed. The detailed analysis and results indicate the importance of this approach when analyzing and comparing the economic growth of individual countries in the medium term and in the long term and when assessing effects on future economic growth and wellbeing.

Keywords: growth intensity, growth stability, growth dynamics, West Europe, East Europe, Serbia

JEL Classification: C10, O40, O52

INTRODUCTION

Economic growth is a complex and long-term process which can be observed from a quantitative aspect and a qualitative aspect. Both sides of economic growth are equally important and closely interlinked. The quantitative side of economic growth is most often reduced to the production increase rate, i.e. growth intensity expressed through an appropriate growth rate, which is motivated by data availability and the ease of analysis. However, this indicator is deficient and does not properly reflect the quantitative dimension of growth. In addition to the growth rate, its stability over time, i.e. its resistance to various shocks and uncertainty, is also important for understanding the quantitative side of economic growth. Together, these two components - growth intensity and stability - fully and comprehensively characterize the quantitative side of economic growth and are denoted by the term growth dynamics[1].

In this research study, the economic growth of individual countries is monitored using the Gross Domestic Product growth rates (growth intensity). The study also goes one step further to include growth variability or its opposite - growth stability. The goal

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pursued in this paper implies the demonstration of the importance of the inclusion of the growth rate variability (i.e. stability) when analyzing and assessing the growth dynamics of different countries. The idea behind the calculations made in the paper is that it is certainly important for an economy to record an increase in production in a certain period of time. If, however, this increase is without major oscillations (i.e. if it is stable) in a longer period of time, it may lead to many other beneficial effects, and *vice versa*.

Economic fluctuations adversely affect the wellbeing of the population and in particular represent a significant source of risk to the poor. In fact, variability in production and income affects the consumption growth rate. In doing so, particularly affected are the poor strata of society (Barlevy, 2004; Malik & Temple, 2009), who are unable to maintain balanced consumption due to a lack of liquidity (wealth or access to credit). The uncertainty associated with short–term variations in the output may also be replicated in smaller domestic and foreign investments in the country, thus leading to future lower economic growth as a source of increasing household welfare.

In comparison with the conventional approach that favors growth pace, i.e. growth intensity, monitoring growth dynamics enables a direct comparison of economic growth, i.e. its quantitative side, between the countries of the different levels of development, which is another advantage of such monitoring, which will be shown in the paper. A relatively higher growth rate in the countries with lower development levels is not an automatic indicator of their relative success in achieving economic growth. It is known that it is easier to achieve higher growth rates at a lower starting base, so the inclusion of another important component - growth stability - in considering this process is both desirable and useful, especially when considering that, as a rule, more developed economies have a greater potential for more stable growth. The intersection of the two components that determine the quantitative side of economic growth (the one being "more inclined" to less developed countries, and the other inclining to more developed economies) creates the necessary balance in the assessment of the growth performance of individual countries.

In the paper, a survey is conducted on a sample of a total of 30 European countries, including Serbia. The European countries significantly differ in the level of their economic development. In order to assess and compare their economic growth from the quantitative aspect, growth intensity (which shows growth strength, i.e. the rate of an increase in production), growth stability[2] (which reflects the continuity of the growth process) and growth dynamics (which combine growth intensity and growth stability) are used. In this way, the position of each country in the sample and also in the region (Western and Eastern Europe) which they belong to is analyzed. Finally, the original growth rates are adjusted at the end of the paper taking into account their variability, so that the original growth rates are reduced in the countries with higher growth variability (lower growth stability), on the one hand, or increased in case a country is characterized by stable growth, on the other. The empirical analysis is therefore conducted so as to quantitatively assess the growth dynamics of the European countries, which are based upon stability and growth intensity, and to obtain a more complete picture of growth performance in Europe based upon the adjusted growth rates.

The following research methods are used in the paper: the descriptive method, the comparative method, the method of analysis and synthesis and the statistical method (the creation of a composite index using the min-max method, the calculation of adjusted growth rates and correlation method).

Methodologically[3], the first step involves the calculation of the growth dynamics indicators based upon the appropriate indicators of growth intensity and growth stability. The first component (growth intensity) is measured by the average annual growth rate, whereas the growth stability component is inversely proportional to the growth rate variability during the period of observation, i.e. the same represents the reciprocal of the standard growth deviation. Growth intensity and growth stability are standardized in order to calculate the growth dynamics indicator based upon them. In fact, growth dynamics are obtained as a linear combination of growth intensity and growth stability, varying the weights having been assigned to them. Also, the

calculated values are used for the purpose of further calculation, i.e. for the construction of a customized growth rate value, where the original growth rate is increased or decreased by the variability level. Based upon such an adjusted growth rate, the extent to which the image of Europe changes when a new growth indicator is used instead of the usual real growth rate can be noticed.

In this paper, the importance of the applied approach is pointed out and the picture of Europe is presented from a different, somewhat changed perspective compared to the usual one. In our opinion, using the indicators of growth dynamics and the adjusted growth rates might improve the analysis of the quantitative side of economic growth. The idea presented in detail and the calculation performed in the paper open the way for understanding, calculating, monitoring and comparing the values of these indicators. The obtained indicators meet the basic requirements, which are valid for the broadly accepted indicators of economic growth (and development), namely to present reality as realistically as possible, to allow comparisons between individual countries and not to be particularly complex to calculate.

The following basic hypotheses are tested further in the paper:

H1: Growth dynamics and adjusted growth rates better reflect the quantitative side of economic growth than growth intensity (the level of economic growth rates), because they incorporate information on growth stability as an important component of the quantity of economic growth.

H2: The less developed European countries have relatively high growth intensity (rate), but low stability, whereas the European countries at a higher level of development are characterized by lower growth intensity (rate), yet relatively stable growth.

In the following Section 2, an overview of the literature is presented. In Section 3, the process of determining growth dynamics and their components (growth intensity and growth stability) is explained and the results for the European countries are presented. A detailed analysis of the obtained results for the European countries is performed and shown, together with a special overview of the growth dynamics of the countries included in the sample and classified into the two groups (Western and Eastern Europe) for the entire time period and into subperiods. Here, the importance of adequately considering the growth dynamics of individual economies is emphasized as the key approach to analyzing the growth rate of the European countries. Section 4 presents the concluding remarks, where the results of the conducted research study are summarized, their implications for the economic policy are referenced and possible future lines of research in this area are indicated.

LITERATURE REVIEW

The starting point of this empirical research study is the papers by R. Ginevičius, D. Gedvilaitė, A. Stasiukynas and J. Šliogerienė (2018) and R. Remeikienė, J. Belas, T. Kliestik and L. Smrcka (2020), but the approach presented and used in this study is fundamentally different from theirs. The mentioned authors use the term growth dynamics, which unites in itself both growth intensity and growth stability. However, they calculate growth intensity as a ratio of the GDP *per capita* at the end and at the beginning of the period of observation (the within-country approach) or by dividing each country's GDP *per capita* value at the end of the period by the minimum level of the GDP *per capita* of the countries included in the sample in the initial year of the period of observation (the so-called between-countries approach), with R. Remeikienė *et al* (2020) using standard values (from 0 to 1). Growth stability is calculated using the MDD (*Measuring of the Dynamics of Development*) method, essentially focused on the ratio of the values expressed as the total duration of the period under consideration according to the actual total length of the economic development path. Growth dynamics are obtained by having these indicators multiplied or as a linear combination of growth intensity and growth stability with the weights of 0.7 and 0.3, respectively (Ginevičius *et al*, 2018, alternatively using the weights of 0.6 and 0.4, respectively, and showing the obtained results).

The idea in this paper closely resembles the approach applied by A. Berg, J. D. Ostry, C. G. Tsangarides and Y. Yakhshilikov (2012), who pioneered research in growth sustainability and provided a detailed analysis of the determinants of sustained growth. A similar approach was used by M. J. D. Ostry, A. Berg and M. C. G Tsangarides (2014) and A. Berg *et al* (2018) to analyze the relationship between inequality and growth. S. Kar, L. Pritchett, S. Raihan and K. Sen (2013) presented the growth dynamics of 125 countries, emphasizing the fact that economic growth is dynamic and episodic, and that many countries had gone through very different growth phases. They underlined the fact that only focusing on one single growth rate for a particular country leads to neglecting the importance of changes in *per capita* income growth. The need to look beyond the current approaches to growth is not new and can be found in many relevant papers in the field (Helpman, 2004; Aguiar & Gopinath, 2007; Keola, Andersson & Hall, 2015).

Previous research in this topic shows that developing countries are characterized greater production instability. The following factors are the reason for this (Ploeg & Poelhekke, 2009)[4]:

- high dependence on natural resources,
- the instability of trade relations due to highly concentrated exports, which are largely primary products, and
- poorly developed financial systems.

Also, F. C. P. Cavalcanti, A. F. Galvao Jr, R. F. A. Gomes and P. S. de Abreu (2010) and S. H. K. Tang (2002) found a link between technical progress and production volatility reduction, which speaks in favor of the assumption expressed in this paper of ours that countries at a higher level of development also have lower production volatility.

Starting from the existing literature (Berg, Ostry & Zettelmeyer, 2012; Ginevičius *et al*, 2018; Remeikienė *et al*, 2020) on the example of European countries, there is an obvious relationship between growth intensity and growth volatility (stability).

In relation to previous research studies, the added value of this paper reflects in the applied methodology for calculating the growth dynamics composite index and the adjusted growth rate which are then applied to a sample of European countries.

METHODOLOGY AND RESULTS

At the beginning of this section, growth intensity and growth stability are first defined, these two indicators are calculated for the European countries in different periods. The focus then shifts to studying the connection between them, i.e. to the identification of possible interdependence in the observed sample. Furthermore, based upon the growth intensity and growth stability indicators, growth dynamics are calculated as a new indicator for the mutual comparison of the European countries. In the end, a "step back" is taken, i.e. the original growth rate is adjusted and the European countries are analyzed based upon a new, adjusted rate according to the growth dynamics value. This section is concluded by pointing out the practical importance of capturing growth volatility simultaneously considering its intensity. The conclusion reads that the implemented approach provides us with a more realistic assessment of economic growth and the position of each country in Europe, and that it should have a broader use in the empirical research that monitors the quantitative side of economic growth.

The methodology and data

When selecting the given sample, a decision was made that the EU countries, Serbia and the surrounding countries for which there are available, consistent data series at the Gross Domestic Product level which are used in further calculations in this paper will be referred to. The sample consists of 30 European countries[5], the 26 of which are EU members, whereas the remaining four are candidate countries: Serbia, Bosnia and Herzegovina, Northern Macedonia and Montenegro[6].

Eurostat (2021) is the data source and the data represent the real gross domestic product (GDP) denominated in the national currency[7].

The period from 2000 to 2019 is the subject matter of reference in this paper. Due to the COVID-19 pandemic effect on the level of the economic activity, the nonstandard years 2020 and 2021 may disrupt the long-term regularities and may lead to wrong conclusions. Also, the year 2009 was excluded in the analysis of the subperiods, which means that the variables of the second subperiod were calculated starting from the year 2010 (instead of 2009), taking the year 2009 (instead of 2008) as the base year. The reason for that lies in the fact that, in 2008, only few European countries had negative GDP growth rates, whereas all the countries included in the sample experienced a recession in 2009 due to the global financial crisis (except for Poland, which did not go through a recession induced by the crisis).

The countries included in the sample were observed throughout mentioned period from 2000 to 2019, as well as throughout the three subperiods. The division into these three subperiods is "natural", given the fact that the first subperiod represents an episode of rapid growth before the global economic crisis outbreak, the second subperiod is marked by stagnation, i.e. recovery from the crisis, whereas the third subperiod is characterized by return to growth. This is considered as an adequate division for reaching conclusions based upon the research conducted herein. Also, all the countries included in the sample are first subjected to observation, after which they are divided into the two European regions, namely Western Europe and Eastern Europe[8], all in order to analyze the position of the countries throughout the sample, as well as amongst the countries of the corresponding region. The division of the countries into Western European and Eastern European countries is shown in the appendix (Appendix, Table A1).

Growth intensity for the whole period and for the three mentioned subperiods was first calculated at the level of each country. This indicator represents the average annual GDP growth rate in the reference (sub)periods for the country *j*:

$$r_{Qjt} = \sqrt[t]{\frac{Q_{jt}}{Q_{j0}}} - 1 \tag{1}$$

where Q_{jt} is the level of the GDP at the end of the observed interval of the country *j*, Q_{j0} is the level of the GDP in the base year of the country *j*, *j* = Belgium, Bulgaria, Czech Republic, *t* = 19 for the period from 2001 to 2019 (the base year 2000), *t* = 8 for the subperiod from 2001 to 2008 (the base year 2000), *t* = 5 for the subperiod from 2010 to 2014 (the base year 2009), and *t* = 5 for the subperiod from 2015 to 2019 (the base year 2014).

Unlike the first and third observed subperiods, the second subperiod is specific, which will be confirmed later when analyzing the results. After the global economic crisis (in the second subperiod), some European countries had been recording a decline in the GDP for a long time (Greece, Croatia, Italy, Spain, Portugal), others went through another recession (the Czech Republic, Slovenia, Hungary, Serbia, Finland, Montenegro), and there were also those that achieved growth at somewhat more modest rates, and for them real recovery from the crisis only began in the third subperiod - when they returned to the usual growth path. In the second subperiod (2010-2014), the data indicate that the six European countries (Greece, Spain, Croatia, Italy, Cyprus, Portugal) even recorded negative average annual growth rates.

In the next step, the calculated average annual growth rates are normalized to the values ranging between 0 and 1, using the so-called min-max approach, i.e. by applying the following formula:

$$I_{jt} = \frac{r_{Qjt} - \min_j r_{Qt}}{\max_j r_{Qt} - \min_j r_{Qt}} \tag{2}$$

Our standardization is based upon the maximum and minimum values that were registered as the threshold values for the countries included in the sample in the reference periods. In equation (2), r_{Qjt} is the average annual growth rate obtained for the country *j* based upon the equation (1) for the time interval *t*, $min_j r_{Qt}$ and $max_j r_{Qt}$ are the minimum and maximum average annual growth rates of the countries included in the sample in each observed interval *t*.

In the entire period of observation, the fastest growth (4.1%) was recorded in Lithuania, and the slowest was registered in Greece (0.1%). In the first subperiod

(2001-2008), the highest average annual growth rate was that of Lithuania (7.4%) and the lowest was found in Italy (0.9%); in the second subperiod (2010-2014), the highest rate was recorded in the case of Malta (4.6%), whereas the largest decline was noticed in the case of Greece (-5.0%); in the third subperiod (2015-2019), Malta also had the fastest growth (6.5%) and Greece's was the slowest (0.8%).

Applying the formula (2), the growth intensity indicator with the values of the average annual growth rate ranging from 0 (min) to 1 (max) was calculated.

When the countries were classified as per their affiliation to the region of either Western or Eastern Europe, it became obvious that the Western European countries had on average lower growth intensity than the countries belonging to the Eastern European region (Table 1). This was to be expected as the Eastern European group of countries consist of the EU transition countries (especially the countries that became members of the European Union after 2000) and the Western Balkans' countries, which are at a lower level of development and characterized by rapid growth, thanks to which they have strongly converged at the income level towards the old EU members (Petrović and Gligorić Matić, 2021)[9]. On the other hand, the Western European group consist mainly of the countries with a higher development level characterized by relatively slower growth.

Table 1 The average values of the growth intensity indicators for the Western European and Eastern European countries for the entire period and for each of the subperiods

European Region	2001-2019	2001-2008	2010-2014	2015-2019
Western Europe	0.38	0.22	0.59	0.31
Eastern Europe	0.77	0.68	0.69	0.49

Note: The indicator values are reduced to a range between 0 and 1.

Source: Authors

The variability of the growth rate, i.e. its reciprocal value - growth stability, was calculated for the entire period and the selected subperiods as well. In fact, the standard deviation was taken as the variability measure, so that the measure of growth stability as the reciprocal value of the standard deviation[10] was obtained:

$$\frac{1}{\sigma_t} = \frac{1}{\frac{1}{N-1} \times \sum_{j=1}^{N} (r_{Qjt} - \overline{r_{Qt}})^2} \tag{3}$$

where N is the number of the countries included in the sample, r_{Qjt} the average annual growth rate obtained based upon the equation (1) for the country j, for time interval t, and $\overline{r_{Qt}}$ the arithmetic mean of the average annual growth rates in each observed interval t.

Based upon the calculated values, the maximum and minimum values of this measure were determined. A higher value indicates greater stability (lesser variability), whereas a lower value indicates lesser stability (greater variability).

Throughout the period, Belgium was the country with the most stable growth, and observed by the first, second and third subperiods, those were Cyprus, Denmark and Belgium, respectively. In contrast, Latvia recorded the most pronounced growth variations, i.e. the lowest stability in the observed period, whereas Latvia, Greece and Malta, exactly in said order, had the lowest stability during the three subperiods.

Also, the growth stability indicator was calculated using the min-max approach, reducing the actual values to the 0-to-1 range:

$$S_{jt} = \frac{\frac{1}{\sigma_{jt}} - \min_j \frac{1}{\sigma_t}}{\max_j \frac{1}{\sigma_t} - \min_j \frac{1}{\sigma_t}} \tag{4}$$

where $\frac{1}{\sigma_{jt}}$ is the reciprocal value of the standard deviation of the country j, calculated based upon the

equation (3) in a given time interval *t*, $\min_j \frac{1}{\sigma_t}$ and $\max_j \frac{1}{\sigma_t}$ are the minimum and maximum reciprocal values of the standard deviations of the countries included in the sample in each observed interval *t*.

The data (Table 2) indicate a regularity that the Western European countries had on average greater growth stability (lesser growth variability) than the countries belonging to the Eastern European regions, which is characteristic of both the whole of the period and the subperiods and is especially pronounced in the first (precrisis) subperiod and throughout the period.

Table 2 The average values of growth stability for the Western European and Eastern European countries throughout the period and for each of the subperiods

European Region	2001-2019	2001-2008	2010-2014	2015-2019
Western Europe	0.51	0.60	0.32	0.35
Eastern Europe	0.25	0.34	0.27	0.27

Note: The indicator values are reduced to a range between 0 and 1.

Source: Authors

The regularity (Table 1 and Table 2) reading that the Western European countries are characterized by lower growth intensity and lower variability and that the Eastern European countries are characterized

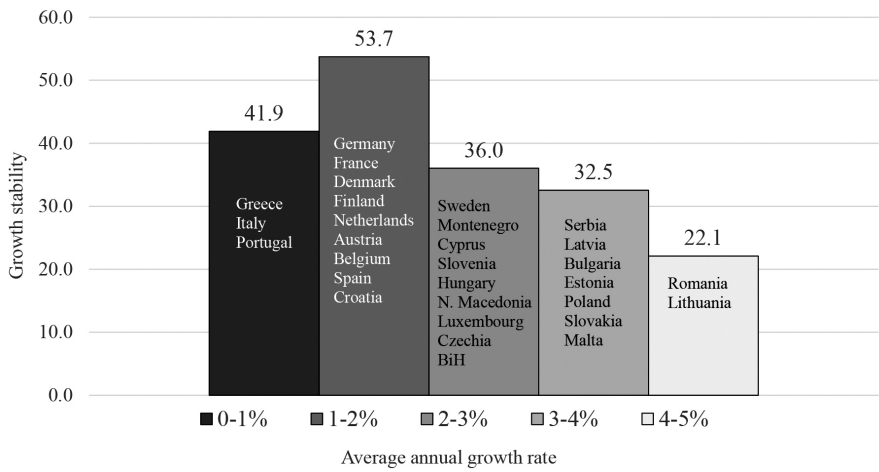

Figure 1 The average growth intensity and growth stability of the European countries, 2001-2019

Note:

a) on the y-axis, there are the values of the reciprocal values of the standard deviation before the normalization of the values

b) the x-axis shows the intervals of the average annual growth rates before the normalization of values

c) each rectangle lists the countries that recorded an average annual growth rate in the given range (0-1, 1-2, 2-3, 3-4, 4-5%)

d) growth stability represents the arithmetic mean of the reciprocal level of the standard deviation (growth stability) for the European countries that had an average annual growth rate in a certain range of 0-1, 1-2, 2-3, 3-4, 4-5%

e) for Montenegro, the average annual growth rate for the period 2008-2019 given the data availability

Source: Authors

by higher growth intensity and higher variability further leads to studying in more detail the strength of the relationship between these two indicators. In addition, another review of the whole period (Figure 1) suggests that the countries with a higher average annual growth rate in the period of observation (2001-2019) had lower stability (a lower reciprocal value of variability), with the exception of the countries that had average annual growth of 0-1%, and which belong to the group of specific countries - Greece, Italy and Portugal (Petrović and Gligorić Matić, 2021). A clear regularity between growth intensity and growth stability can be observed - as growth intensity increases, growth stability decreases, which is especially pronounced for the countries that had an average annual growth rate above 1%. The strength of the connection throughout the period and by the subperiods is measured below.

The value of the correlation coefficient throughout the period, as well as in the subperiods, indicates a weak to medium-strong linear interdependence of the growth intensity and growth stability of the European countries. The correlation coefficient (Table 3) confirms the fact that there is a negative relationship between growth intensity and growth stability, i.e. higher growth rates mean lesser stability (greater variability) and *vice versa* lower growth rates mean greater stability (lesser variability). The exception is the second period, in which the correlation coefficient indicates that, immediately after the global economic crisis, there is no interdependence between growth intensity and growth stability. This result can be related to the fact that the second period is specific, because it represents an interval immediately following the global economic crisis, when many countries recorded a way out and recovery from the recession.

Additionally, when all the six countries that recorded negative average annual growth in this period are excluded from the sample (i.e. when the min-max transformation of growth intensity and growth stability is performed without those six countries), the correlation coefficient totals -0.36.

Table 3 The correlation coefficient between the growth intensity and growth stability of the European countries

The correlation coefficient between growth intensity and growth stability	2001-2019	2001-2008	2010-2014	2015-2019
	-0.46	-0.51	0.04	-0.41

Source: Authors

The growth dynamics indicator

The growth dynamics index was calculated as follows:

$$D_{jt} = w_{it} \times I_{jt} + w_{st} \times S_{jt} \quad (5)$$

where I_{jt} represents the growth intensity index obtained based upon the equation (2), and S_{jt} the growth stability index calculated based upon the equation (4), whereas w_{it} and w_{st} are the corresponding weights attributed to growth intensity and growth stability, respectively. The values were calculated for each particular country j included in the sample in each of the observed time intervals *t*.

Two different indicators of growth dynamics (D_{jt}, D_{jt}') were calculated based upon the given formula by varying the weights. The indicator D_{jt} represents the growth dynamics index obtained when the weights in the equation (5) are equal: w_{it} = 0.5, w_{st} = 0.5 (i.e. when the simple arithmetic mean of growth intensity and growth stability was applied). The symbol D_{jt}' denotes the growth dynamics index obtained in the case when different weights were attributed to growth intensity and growth stability, in favor of the growth intensity in the equation (5): w_{it} = 0.7, w_{st} = 0.3. The results for the indicator of growth intensity, growth stability and for both variants of the growth dynamics indicator in the observed subperiods are given in the appendix (Appendix, Table A2). Table A2 provides a comprehensive insight into the differences present in

the relative position of the countries when its growth dynamics and growth stability are concerned and shows whether these values change by subperiods.

The standard approach assumes that an equal weight belongs to growth intensity and growth stability. This means that the growth dynamics are obtained as the simple arithmetic mean of its components, in this case growth intensity and growth stability. Many complex composite indices are often calculated as the simple arithmetic mean of individual components. For example, this approach was being used for a long time in the calculation of the Human Development Index (HDI), all up until 2010, since when the geometric mean of the individual components has been used to calculate the HDI. According to expert research, growth intensity should however be assigned a greater weight in relation to growth stability. There are authors who claim that the importance of the economic growth intensity of a country is 70 percent, and that of its economic growth stability is 30 percent in this equation[11]. A greater weight is given to growth intensity, which as a rule produces significant long-term effects on the overall economy and society as a whole. Therefore, if pursuing it in the long run, which is usually the case when researching the economic growth process, growth intensity deserves a greater weight than growth stability.

In the first and third subperiods, an interesting result is obtained when growth intensity is subtracted from growth dynamics (Appendix, Table A3). In the Western European countries, the growth dynamics index is generally higher than the growth intensity index, which means the GDP growth stability is greater in these countries although they had a relatively more modest increase in the GDP. The opposite is in the case of the Eastern European countries, where growth dynamics are lower than growth intensity due to greater growth variability (lower stability). In the second subperiod, the growth dynamics index is lower in the largest number of all the countries included in the sample than the growth intensity index, which indicates the fact that the years immediately following the crisis were characterized by lower growth stability throughout Europe. This once again confirms the specificity of the second observed subperiod, characterized by the countries' recovery from the recession having been caused by the global economic crisis - and greater growth instability.

The results for the whole period show that all the Eastern European countries and some Western European countries (Finland, Sweden, Cyprus, Luxembourg and Malta) are characterized by lesser dynamics than growth intensity. In fact, a detailed look at the results for the whole period clearly suggests that all the European countries that had an average annual growth equal to or greater than 1.9% (including Finland, which recorded the growth of 1.4%), were characterized by higher growth variability (Table 4). The only exception in this group of countries with a relatively higher average annual growth rate was Finland, which had a specific development path. In the precrisis period, this country had recorded the very high growth rates of *per capita* income and was considered to be an extremely successful economy. After the outbreak of the world economic crisis, a large drop in income and a very slow recovery were registered in this country. As a result of those trends, Finland achieved a relatively low and volatile growth rate throughout the period under review.

For the entire period of observation, it is also possible to classify the economies of the observed countries into the three categories according to the growth dynamics index level: the countries with the highest growth dynamics (the growth dynamics index being between 0.61 and 1), the countries with medium growth dynamics (the index being between 0.41 and 0.6), and the countries with lower growth dynamics (the index being between 0 and 0.4). It can be noticed that only four countries (Belgium, France, Malta and Poland) are rank as more dynamic economies if, when calculating their growth dynamics, equal weights are used for growth intensity and growth stability. However, if a greater emphasis is placed on growth intensity than on growth stability, this category includes a significantly larger number of countries (B&H, Bulgaria, Denmark, Estonia, Latvia, Lithuania, Malta, Poland, Romania, Serbia and Slovakia; Appendix, Table A4).

Table 4 The results for growth intensity, growth stability, growth dynamics and the difference in growth dynamics and growth intensity, 2001-2019

Country	Average annual growth rate	I_{jt}	S_{jt}	D_{jt}	D_{jt}'	D_{jt}-I_{jt}	D_{jt}'-I_{jt}	Region
Greece	0.1%	0.00	0.10	0.05	0.03	0.05	0.03	Western Europe
Italy	0.2%	0.04	0.60	0.32	0.21	0.28	0.17	Western Europe
Portugal	0.7%	0.17	0.52	0.34	0.27	0.18	0.11	Western Europe
Germany	1.2%	0.30	0.47	0.38	0.35	0.09	0.05	Western Europe
France	1.3%	0.31	1.00	0.65	0.52	0.34	0.21	Western Europe
Denmark	1.3%	0.32	0.57	0.44	0.39	0.13	0.08	Western Europe
Finland	1.4%	0.33	0.29	0.31	0.32	(0.02)	(0.01)	Western Europe
Netherlands	1.4%	0.34	0.66	0.50	0.43	0.16	0.10	Western Europe
Austria	1.5%	0.37	0.72	0.54	0.47	0.18	0.11	Western Europe
Belgium	1.6%	0.38	1.00	0.69	0.57	0.31	0.19	Western Europe
Spain	1.6%	0.40	0.41	0.40	0.40	0.01	0.00	Western Europe
Croatia	1.9%	0.47	0.22	0.35	0.39	(0.12)	(0.07)	Eastern Europe
Sweden	2.2%	0.53	0.44	0.49	0.50	(0.04)	(0.03)	Western Europe
Montenegro	2.3%	0.56	0.18	0.37	0.45	(0.19)	(0.12)	Eastern Europe
Cyprus	2.3%	0.56	0.20	0.38	0.45	(0.18)	(0.11)	Western Europe
Slovenia	2.3%	0.57	0.23	0.40	0.47	(0.17)	(0.10)	Eastern Europe
Hungary	2.5%	0.61	0.29	0.45	0.52	(0.16)	(0.10)	Eastern Europe
N. Macedonia	2.7%	0.67	0.43	0.55	0.60	(0.12)	(0.07)	Eastern Europe
Luxembourg	2.8%	0.68	0.33	0.51	0.58	(0.18)	(0.11)	Western Europe
Czechia	2.8%	0.69	0.32	0.50	0.58	(0.18)	(0.11)	Eastern Europe
BiH	2.9%	0.71	0.41	0.56	0.62	(0.15)	(0.09)	Eastern Europe
R. Serbia	3.4%	0.84	0.26	0.55	0.67	(0.29)	(0.17)	Eastern Europe
Latvia	3.5%	0.87	0.00	0.43	0.61	(0.43)	(0.26)	Eastern Europe
Bulgaria	3.6%	0.87	0.32	0.59	0.70	(0.28)	(0.17)	Eastern Europe
Estonia	3.6%	0.89	0.03	0.46	0.63	(0.43)	(0.26)	Eastern Europe
Poland	3.8%	0.93	0.72	0.82	0.86	(0.10)	(0.06)	Eastern Europe
Slovakia	3.9%	0.95	0.22	0.58	0.73	(0.37)	(0.22)	Eastern Europe
Malta	3.9%	0.96	0.27	0.62	0.75	(0.34)	(0.20)	Western Europe
Romania	4.1%	0.99	0.15	0.57	0.74	(0.42)	(0.25)	Eastern Europe
Lithuania	4.1%	1.00	0.04	0.52	0.71	(0.48)	(0.29)	Eastern Europe

Note:

a) negative numbers in parentheses

b) the GDP for Montenegro has been available since 2007, so the indices were calculated for the 2008-2019 period.

c) I_{jt} is the growth intensity indicator, S_{jt} is the growth stability indicator, D_{jt} is the growth dynamics indicator when equal weights (0.5) are assigned to growth intensity and growth stability, D_{jt}' is the growth dynamics indicator, when different weights (0.7 and 0.3, respectively) are assigned to growth intensity and growth stability.

Source: Authors

The picture of Europe with the adjusted growth rates

Finally, the calculated growth dynamics values were used and the existing average annual growth rate was corrected so that the newly calculated rate contained the "information" about growth stability. In fact, "reverse" standardization was applied as follows:

$$r'_{Qjt}=D_{jt} \times (\max_j r_{Qt} - \min_j r_{Qt}) + \min_j r_{Qt} \quad (6)$$

$$r''_{Qjt}=D'_{jt} \times (\max_j r_{Qt} - \min_j r_{Qt}) + \min_j r_{Qt} \quad (7)$$

where r_{Qjt} is the original (recorded) growth rate obtained from the equation (1), r'_{Qjt} is the adjusted average annual growth rate when equal weights (0.5) are assigned to growth intensity and growth stability when calculating the growth dynamics D_{jt} in the equation (5) and r''_{Qjt} the adjusted average annual growth rate when different weights (0.7 and 0.3, respectively) are assigned to growth intensity and growth stability when calculating the growth dynamics D'_{jt} in the equation (5). The values were calculated for each individual country from the sample j in each of the observed time intervals t.

The average annual growth rates and their "adjusted" levels are given (Table 5) for the entire period of observation (for the subperiods, those rates are contained in the Appendix, Table A5):

Based on the data, it can be seen that some relatively stable countries, such as Germany, had a higher adjusted growth rate than the original rate. From 2001 to 2019, Germany recorded the GDP growth at an average annual rate of 1.24%. If the fact that this

Table 5 The average annual growth rates of the European countries and their values adjusted for growth stability. 2001-2019

Western Europe				Eastern Europe			
Country	r_{Qjt}	r'_{Qjt}	r''_{Qjt}	Country	r_{Qjt}	r'_{Qjt}	r''_{Qjt}
Greece	0.05%	0.26%	0.18%	Croatia	1.93%	1.44%	1.64%
Italy	0.20%	1.34%	0.88%	Montenegro	2.32%	1.54%	1.85%
Portugal	0.73%	1.44%	1.15%	Slovenia	2.35%	1.66%	1.94%
Germany	1.24%	1.60%	1.45%	Hungary	2.52%	1.87%	2.13%
France	1.30%	2.68%	2.13%	N. Macedonia	2.73%	2.26%	2.45%
Denmark	1.33%	1.84%	1.64%	Czechia	2.82%	2.08%	2.38%
Finland	1.40%	1.32%	1.35%	BiH	2.91%	2.31%	2.55%
Netherlands	1.41%	2.07%	1.80%	R. Serbia	3.43%	2.26%	2.73%
Austria	1.53%	2.25%	1.96%	Latvia	3.55%	1.80%	2.50%
Belgium	1.58%	2.83%	2.33%	Bulgaria	3.55%	2.44%	2.88%
Spain	1.65%	1.67%	1.66%	Estonia	3.63%	1.89%	2.59%
Sweden	2.18%	2.01%	2.08%	Poland	3.78%	3.36%	3.53%
Cyprus	2.33%	1.59%	1.88%	Slovakia	3.88%	2.40%	2.99%
Luxembourg	2.79%	2.09%	2.37%	Romania	4.06%	2.35%	3.03%
Malta	3.90%	2.53%	3.08%	Lithuania	4.08%	2.15%	2.92%

Note:

a) r_{Qjt} is the original (recorded) growth rate in the reference period 2001-2019; r'_{Qjt} is the adjusted average annual growth rate when equal weights (0.5) are assigned to growth intensity and growth stability, r''_{Qjt} is the adjusted average annual growth rate when different weights (0.7 and 0.3, respectively) are assigned to growth intensity and growth stability.

b) The GDP for Montenegro has been available since 2007, so the data for the period 2008-2019 were calculated.

Source: Authors

Figure 2 The map of Europe after the "correction" of economic growth intensity for growth stability
Source: Authors

growth was relatively stable is taken into account, that will mean that Germany actually experienced growth at an average annual rate of 1.6% (or 1.45%, if a greater weight is assigned to growth intensity relative to growth stability). Certainly, this is an important piece of information not only for Germany's economic policymakers, but also for a comparative view of the progress of other economies compared to Germany's.

The Serbian economy grew on average by 3.43% annually from 2001 to 2019. When the observed fluctuations in that growth are taken into account, the growth rate should be adjusted downwards, and should be 2.26% (or 2.73%, if a greater weight is attributed to growth intensity). This means that, in addition to achieving high growth rates in order to bring the economy closer to more developed European economies, economic policymakers should focus their attention to growth stability. Stable growth further sheds light on its quantitative side and indicates the possibility of the continuous improvement of the population's welfare as the ultimate goal of economic growth and development. Serbia is not the only country with such a result. The situation is similar in other European countries, especially in the latest EU members and the neighboring countries, so achieving the uniformity of growth in order to generate long-term prosperity is imperative for them as well.

The use of the recalculated values of the growth rates for the period from 2001 to 2019 revealed the changes made in the map of Europe when growth stability is also taken into consideration in addition to the average annual growth rate. An important result is that the countries belonging to the Western European region are those with more stable growth, and their growth rates after the adjustment are above the original rate. Thus, some countries such as Greece, Italy, Spain, Portugal, Germany, France, Denmark, the Netherlands, Austria and Belgium (Figure 2) appear to have a higher adjusted growth rate than the original one after taking into account the fact that the same recorded stable growth. There are the Eastern European countries and the remaining Western

European countries (Finland, Croatia, Sweden, Montenegro, Cyprus, Slovenia, Hungary, North Macedonia, Luxembourg, Czech Republic, B&H, Serbia, Latvia, Bulgaria, Estonia, Poland, Slovakia, Malta, Romania and Lithuania) on the other side characterized by relatively high, but unstable growth (the only exception being Finland, which attention has already been drawn to). Due to higher oscillations in growth, these countries have a lower adjusted growth rate than the original rate.

Based upon the obtained results, the justification for calculating growth dynamics and the adjusted growth rate incorporating the information about growth stability is subjected to consideration. As has already been pointed out in the paper, the fluctuations in the GDP movement undermine the potential for future growth and adversely affect the wellbeing of the population, posing a particular threat to the poorest sections of society.

Therefore, the offered measures for growth dynamics and the adjusted growth rates can be of exceptional practical importance in creating an economic policy, especially so when making a development policy.

CONCLUSION

The paper draws attention to the insufficiency of the growth rate as an indicator of growth dynamics and introduces the growth stability indicator in the analysis, that indicator indicating the steadiness of the growth process. A complex growth dynamics indicator was constructed, and the adjusted growth rate taking into account the fluctuations in the GDP trends was derived. Based upon the calculation of the growth intensity and growth stability indicators, as well as the growth dynamics index, an additional and improved perspective of the position of the European countries in terms of the economic activity growth is given. Comparing the original growth rates of different countries is useful, yet insufficient to express the quantitative side of economic growth. When these growth rates are modified (the so-called "adjusted" growth rate is calculated) so that growth stability is included in a certain time interval, the picture of Europe changes and more realistic and comprehensive findings are obtained. This supports the first hypothesis of the paper.

The results of the empirical analysis reveal that the less developed European countries have (a) relatively high growth intensity (rate), and high growth variability (low growth stability), whereas the European countries at a higher development level are characterized by a lower growth rate, yet relatively stable growth, which confirms the second hypothesis of the paper.

The new growth dynamics measuring indicator and the adjusted growth rate are the relatively simple indicators based upon which it is possible to compare countries characterized by different development levels. There is no justification for a direct comparison of growth rates in such cases because, due to their lower starting positions, less developed countries can achieve higher growth rates more easily.

The use of growth dynamics indicators and adjusted growth rates in the analysis of the growth process at the national level is both useful and desirable, which points to possible economic policy directions intended to improve growth dynamics, i.e. growth intensity and growth stability, and opens perspectives for the country's economic prosperity, simultaneously continuously improving the population's welfare. For less developed economies, in addition to growth-favoring policies, it is especially important that an emphasis should be put on managing fluctuations in the GDP movements in order to ensure sustainable and stable growth rates.

The current methodological limitation is arbitrariness in the choice of the weights attributed to the growth dynamics index components (namely growth intensity and growth stability), which is the common objective limitation that the authors have encountered when constructing composite indices.

The idea and the calculation presented in detail in the paper pertaining to growth dynamics and the adjusted growth rate can serve as the starting point for their application to the other countries outside the European space and for more complete research at the national level as well. This paper can be referred to as

the first step towards constructing a composite index that would include not only the quantitative side, but also the qualitative side of economic growth.

ENDNOTES

1 The term growth dynamics is used by R. Ginevičius *et al* (2018), as well as R. Remeikienė *et al* (2020) in a similar context.

2 In the literature, the following terms are alternatively used for growth stability: homogeneity, persistence, uniformity, continuity, growth consistency.

3 R. Ginevičius *et al* (2018), R. Remeikienė *et al* (2020), M. Lisiński *et al* (2020) are the starting point of this research study.

4 M. M. Mlachila and M. M. Martinez (2013), 6

5 Of the EU countries, Ireland was/is not included in light of the data inconsistency due to change in the methodologz since 2015.

6 No data are available for Albania.

7 Chain-linked volumes (2010).

8 The countries included in the sample are/were divided into the Western European (WE) and the Eastern European (EE) countries based upon the report by the Legatum Institute (2020).

9 Convergence in prosperity is also confirmed in Europe, where prosperity is measured by the Legatum prosperity index (LPI), with different convergence speed regarding the LPI and its segments for the total sample of the countries, as well as the Eastern and Western European countries, M. Gligorić Matić, B. Jovanović Gavrilović i N. Stanišić (2020).

10 Also, P. Collier and J. Dehn (2001), and J. Cariolle, M. Goujon and P. Guillaumont (2016).

11 The growth intensity weight of 0.7 and the growth stability weight of 0.3 were taken from R. Ginevičius *et al* (2018) and R. Remeikienė *et al* (2020).

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APPENDIX

Table A1 The European countries classified by regions

Western Europe	Eastern Europe
Belgium	Bulgaria
Denmark	Czechia
Germany	Estonia
Greece	Croatia
Spain	Latvia
France	Lithuania
Italy	Hungary
Cyprus	Poland
Luxembourg	Romania
Malta	Slovenia
Netherlands	Slovakia
Austria	Montenegro
Portugal	North Macedonia
Finland	R. Serbia
Sweden	Bosnia and Herzegovina

Source: Legatum Institut

Table A2 The values of the growth intensity, growth stability and growth dynamics indicators for the European countries by the subperiods

	2001-2008				2010-2014				2015-2019			
	Growth intensity	Growth stability	Growth dynamics, w_{it}=0.5, w_{st}=0.5	Growth dynamics, w_{it}=0.7, w_{st}=0.3	Growth intensity	Growth stability	Growth dynamics, w_{it}=0.5, w_{st}=0.5	Growth dynamics, w_{it}=0.7, w_{st}=0.3	Growth intensity	Growth stability	Growth dynamics, w_{it}=0.5, w_{st}=0.5	Growth dynamics, w_{it}=0.7, w_{st}=0.3
Belgium	0.18	0.67	0.43	0.33	0.67	0.63	0.65	0.66	0.16	1.00	0.58	0.41
Bulgaria	0.79	0.77	0.78	0.78	0.63	0.62	0.63	0.63	0.50	0.81	0.65	0.59
Czechia	0.53	0.33	0.43	0.47	0.64	0.34	0.49	0.55	0.51	0.09	0.30	0.39
Denmark	0.08	0.50	0.29	0.21	0.64	1.00	0.82	0.75	0.34	0.62	0.48	0.42
Germany	0.07	0.48	0.27	0.19	0.75	0.24	0.49	0.60	0.15	0.27	0.21	0.19
Estonia	0.79	0.00	0.40	0.55	0.88	0.15	0.52	0.66	0.56	0.09	0.32	0.42
Greece	0.40	0.24	0.32	0.36	0.00	0.00	0.00	0.00	0.00	0.16	0.08	0.05
Spain	0.35	0.81	0.58	0.49	0.44	0.28	0.36	0.40	0.36	0.32	0.34	0.35
France	0.13	0.96	0.54	0.38	0.64	0.73	0.69	0.67	0.15	0.49	0.32	0.25
Croatia	0.53	0.57	0.55	0.54	0.42	0.64	0.53	0.49	0.39	0.58	0.49	0.45
Italy	0.00	0.84	0.42	0.25	0.47	0.22	0.34	0.39	0.04	0.49	0.26	0.17
Cyprus	0.51	1.00	0.76	0.66	0.32	0.04	0.18	0.24	0.67	0.09	0.38	0.50
Latvia	1.00	0.00	0.50	0.70	0.72	0.00	0.36	0.50	0.41	0.22	0.32	0.36
Lithuania	1.00	0.18	0.59	0.75	0.91	0.31	0.61	0.73	0.46	0.17	0.32	0.37
Luxembourg	0.38	0.16	0.27	0.31	0.83	0.19	0.51	0.64	0.43	0.14	0.28	0.34
Hungary	0.39	0.38	0.39	0.39	0.68	0.20	0.44	0.53	0.57	0.13	0.35	0.44
Malta	0.25	0.30	0.27	0.26	1.00	0.10	0.55	0.73	1.00	0.00	0.50	0.70
Netherlands	0.18	0.59	0.38	0.30	0.59	0.48	0.53	0.55	0.26	0.69	0.48	0.39
Austria	0.20	0.80	0.50	0.38	0.65	0.48	0.56	0.60	0.20	0.36	0.28	0.24
Poland	0.49	0.32	0.41	0.44	0.82	0.30	0.56	0.66	0.64	0.25	0.45	0.53
Portugal	0.04	0.75	0.39	0.25	0.43	0.15	0.29	0.35	0.31	0.34	0.33	0.32
Romania	0.88	0.18	0.53	0.67	0.67	0.06	0.37	0.49	0.69	0.07	0.38	0.50
Slovenia	0.52	0.53	0.53	0.52	0.55	0.18	0.36	0.44	0.49	0.18	0.33	0.39
Slovakia	0.82	0.22	0.52	0.64	0.81	0.21	0.51	0.63	0.43	0.17	0.30	0.35
Finland	0.31	0.50	0.41	0.37	0.58	0.18	0.38	0.46	0.19	0.16	0.17	0.18
Sweden	0.27	0.42	0.34	0.31	0.78	0.13	0.45	0.58	0.32	0.17	0.25	0.28
Montenegro	-	-	-	-	0.70	0.11	0.40	0.52	0.57	0.18	0.38	0.45
N. Macedonia	0.38	0.12	0.25	0.30	0.76	0.28	0.52	0.62	0.35	0.18	0.27	0.30
R. Serbia	0.81	0.53	0.67	0.73	0.59	0.23	0.41	0.48	0.42	0.13	0.28	0.34
B&H	0.60	0.60	0.60	0.60	0.61	0.49	0.55	0.58	0.42	0.84	0.63	0.55

Source: Authors

Table A3 The difference between growth dynamics and growth intensity

Country	Region	2001-2008		2010-2014		2015-2019	
		$D_{jt} - I_{jt}$	$D'_{jt} - I_{jt}$	$D_{jt} - I_{jt}$	$D'_{jt} - I_{jt}$	$D_{jt} - I_{jt}$	$D'_{jt} - I_{jt}$
Belgium	Western Europe	0.24	0.15	(0.02)	(0.01)	0.42	0.25
Denmark	Western Europe	0.21	0.13	0.18	0.11	0.14	0.09
Germany	Western Europe	0.21	0.12	(0.26)	(0.15)	0.06	0.04
Greece	Western Europe	(0.08)	(0.05)	0.00	0.00	0.08	0.05
Spain	Western Europe	0.23	0.14	(0.08)	(0.05)	(0.02)	(0.01)
France	Western Europe	0.42	0.25	0.04	0.03	0.17	0.10
Italy	Western Europe	0.42	0.25	(0.13)	(0.08)	0.22	0.13
Cyprus	Western Europe	0.24	0.15	(0.14)	(0.08)	(0.29)	(0.17)
Luxembourg	Western Europe	(0.11)	(0.07)	(0.32)	(0.19)	(0.15)	(0.09)
Malta	Western Europe	0.02	0.01	(0.45)	(0.27)	(0.50)	(0.30)
Netherlands	Western Europe	0.21	0.12	(0.05)	(0.03)	0.21	0.13
Austria	Western Europe	0.30	0.18	(0.08)	(0.05)	0.08	0.05
Portugal	Western Europe	0.35	0.21	(0.14)	(0.08)	0.02	0.01
Finland	Western Europe	0.09	0.06	(0.20)	(0.12)	(0.01)	(0.01)
Sweden	Western Europe	0.08	0.05	(0.32)	(0.19)	(0.08)	(0.05)
Bulgaria	Eastern Europe	(0.01)	(0.00)	(0.01)	(0.01)	0.15	0.09
Czechia	Eastern Europe	(0.10)	(0.06)	(0.15)	(0.09)	(0.21)	(0.13)
Estonia	Eastern Europe	(0.39)	(0.24)	(0.37)	(0.22)	(0.23)	(0.14)
Croatia	Eastern Europe	0.02	0.01	0.11	0.07	0.10	0.06
Latvia	Eastern Europe	(0.50)	(0.30)	(0.36)	(0.21)	(0.10)	(0.06)
Lithuania	Eastern Europe	(0.41)	(0.25)	(0.30)	(0.18)	(0.15)	(0.09)
Hungary	Eastern Europe	(0.00)	(0.00)	(0.24)	(0.15)	(0.22)	(0.13)
Poland	Eastern Europe	(0.09)	(0.05)	(0.26)	(0.16)	(0.19)	(0.12)
Romania	Eastern Europe	(0.35)	(0.21)	(0.31)	(0.18)	(0.31)	(0.18)
Slovenia	Eastern Europe	0.01	0.00	(0.18)	(0.11)	(0.15)	(0.09)
Slovakia	Eastern Europe	(0.30)	(0.18)	(0.30)	(0.18)	(0.13)	(0.08)
Montenegro	Eastern Europe	-	-	(0.29)	(0.17)	(0.19)	(0.12)
N. Macedonia	Eastern Europe	(0.13)	(0.08)	(0.24)	(0.15)	(0.08)	(0.05)
R. Serbia	Eastern Europe	(0.14)	(0.08)	(0.18)	(0.11)	(0.14)	(0.09)
B&H	Eastern Europe	(0.00)	(0.00)	(0.06)	(0.04)	0.21	0.12

Note:

a) negative numbers in parentheses

b) the GDP for Montenegro has been available since 2007, so the indices were not calculated for the first subperiod

c) I_{jt} is the growth intensity indicator, D_{jt} is the growth dynamics indicator when equal weights (0.5) are assigned to growth intensity and growth stability, D'_{jt} is the growth dynamics indicator when different weights (0.7 and 0.3, respectively) are assigned to growth intensity and growth stability.

Source: Authors

Table A4 The European countries classified as per growth dynamics, 2001-2019

Growth dynamics index D_{jt}			Growth dynamics index D'_{jt}		
Countries with the highest growth dynamics	Countries with medium growth dynamics	Countries with lower growth dynamics	Countries with the highest growth dynamics	Countries with medium growth dynamics	Countries with lower growth dynamics
0.61-1	0.41-0.6	0-0.4	0.61-1	0.41-0.6	0-0.4
Belgium	Austria	Croatia	B&H	Austria	Croatia
France	B&H	Cyprus	Bulgaria	Belgium	Denmark
Malta	Bulgaria	Finland	Denmark	Cyprus	Finland
Poland	Czechia	Germany	Estonia	Czechia	Germany
	Denmark	Greece	Latvia	France	Greece
	Estonia	Italy	Lithuania	Hungary	Italy
	Hungary	Montenegro	Malta	Luxembourg	Portugal
	Latvia	Portugal	Poland	Montenegro	Spain
	Lithuania	Slovenia	Romania	N. Macedonia	
	Luxembourg	Spain	R. Serbia	Netherlands	
	N. Macedonia		Slovakia	Slovenia	
	Netherlands			Sweden	
	Romania				
	Serbia				
	Slovakia				
	Sweden				

Note: The GDP for Montenegro has been available since 2007, so the indices were calculated for the 2008-2019 period.

Source: Authors

Table A5 The average annual growth rates in the European countries and their adjusted values for growth stability by subperiods

Country	2001-2008			2010-2014			2015-2019		
	r_{Qjt}	r'_{Qjt}	r''_{Qjt}	r_{Qjt}	r'_{Qjt}	r''_{Qjt}	r_{Qjt}	r'_{Qjt}	r''_{Qjt}
Belgium	2.0%	3.6%	3.0%	1.5%	1.2%	1.3%	1.7%	4.1%	3.1%
Bulgaria	6.0%	5.9%	6.0%	1.1%	1.0%	1.0%	3.6%	4.5%	4.2%
Czechia	4.3%	3.7%	3.9%	1.1%	-0.3%	0.3%	3.7%	2.5%	3.0%
Denmark	1.4%	2.8%	2.2%	1.2%	2.9%	2.2%	2.7%	3.5%	3.2%
Germany	1.3%	2.6%	2.1%	2.2%	-0.3%	0.7%	1.6%	2.0%	1.8%
Estonia	6.0%	3.4%	4.5%	3.5%	-0.1%	1.4%	4.0%	2.6%	3.2%
Greece	3.5%	3.0%	3.2%	-5.0%	-5.0%	-5.0%	0.8%	1.2%	1.0%
Spain	3.1%	4.6%	4.0%	-0.7%	-1.5%	-1.2%	2.8%	2.7%	2.8%
France	1.7%	4.4%	3.3%	1.2%	1.6%	1.4%	1.6%	2.6%	2.2%
Croatia	4.3%	4.5%	4.4%	-0.9%	0.1%	-0.3%	3.0%	3.6%	3.3%
Italy	0.9%	3.6%	2.5%	-0.5%	-1.7%	-1.2%	1.0%	2.3%	1.8%
Cyprus	4.2%	5.8%	5.2%	-1.9%	-3.3%	-2.7%	4.6%	3.0%	3.6%
Latvia	7.4%	4.1%	5.4%	1.9%	-1.6%	-0.2%	3.1%	2.6%	2.8%
Lithuania	7.4%	4.7%	5.8%	3.7%	0.8%	2.0%	3.4%	2.6%	2.9%
Luxembourg	3.3%	2.6%	2.9%	3.0%	-0.1%	1.1%	3.2%	2.4%	2.7%
Hungary	3.4%	3.4%	3.4%	1.5%	-0.8%	0.1%	4.1%	2.8%	3.3%
Malta	2.5%	2.6%	2.6%	4.6%	0.3%	2.0%	6.5%	3.6%	4.8%
Netherlands	2.0%	3.3%	2.8%	0.6%	0.1%	0.3%	2.3%	3.5%	3.0%
Austria	2.2%	4.1%	3.4%	1.2%	0.4%	0.7%	1.9%	2.4%	2.2%
Poland	4.1%	3.5%	3.7%	2.9%	0.4%	1.4%	4.5%	3.3%	3.8%
Portugal	1.1%	3.4%	2.5%	-0.8%	-2.2%	-1.7%	2.5%	2.6%	2.6%
Romania	6.6%	4.3%	5.2%	1.4%	-1.5%	-0.3%	4.7%	2.9%	3.6%
Slovenia	4.3%	4.3%	4.3%	0.2%	-1.5%	-0.8%	3.5%	2.7%	3.0%
Slovakia	6.2%	4.3%	5.1%	2.8%	-0.1%	1.0%	3.2%	2.5%	2.8%
Finland	2.9%	3.5%	3.3%	0.6%	-1.3%	-0.6%	1.8%	1.7%	1.8%
Sweden	2.6%	3.1%	2.9%	2.5%	-0.7%	0.6%	2.6%	2.2%	2.3%
Montenegro	-	-	-	1.7%	-1.1%	0.0%	4.0%	2.9%	3.4%
N. Macedonia	3.3%	2.5%	2.8%	2.3%	0.0%	0.9%	2.8%	2.3%	2.5%
R. Serbia	6.2%	5.3%	5.6%	0.7%	-1.1%	-0.4%	3.2%	2.4%	2.7%
B&H	4.8%	4.8%	4.8%	0.9%	0.3%	0.5%	3.2%	4.4%	3.9%

Note:

a) r_{Qjt} is the original (recorded) growth rate in the reference subperiods; r'_{Qjt} is the adjusted average annual growth rate when equal weights (0.5) are assigned to growth intensity and growth stability, r''_{Qjt} is the adjusted average annual growth rate when different weights (0.7 and 0.3, respectively) are assigned to growth intensity and growth stability.

b) The GDP for Montenegro has been available since 2007, so the data for the first subperiod were not calculated.

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ENERGY PRICES AS SIGNIFICANT SUPPLY-SIDE SHOCKS: THE CASE OF THE FORMER SFRY AND VIŠEGRAD GROUP MEMBER COUNTRIES

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The influence of energy prices on macroeconomic stability is analyzed in this paper. Energy prices represent significant supply-side shocks, which have been leading cyclical fluctuation triggers through economic history. The analysis includes the countries that were the members of the former SFRY, as well as the countries the members of the Višegrad Group. The indicators under observation are presented for the EU27 for the purposes of comparison. In accordance with economic theory, the main conclusion of the paper is that supply-side shocks can be a significant source of cyclical fluctuations and an inflation trigger. Therefore, policymakers have a complex task to minimize the effects of these shocks. Nowadays, when energy prices are reaching historically high levels, the scientific contribution of supply-side shocks can be found in the deep analysis and well-grounded estimations of the role of those shocks in the preservation of macroeconomic stability and the economic policy measures necessary for the minimization of their negative effects.

Keywords: supply-side shocks, energy prices, business cycles, macroeconomic spillovers, former SFRY countries, Višegrad Group member countries

JEL Classification: E31, Q41, Q43

INTRODUCTION

Market economies are recording cyclical fluctuations in the form of the business cycles immanent in market-based economies and profit-oriented enterprises. Regardless of the fact that certain periods of long-term stability indicated that business cycles had become shorter, with the smaller amplitudes of the declining economic activity, i.e. with shorter and weaker economic recessions, the topic of business cycles has never been more relevant in macroeconomics as it is today. Again, the current issues are the key sources of cyclical fluctuations and whether it is possible that the economic policy will mitigate or overcome them or not.

An interest in cyclical fluctuations, especially so in economic recessions, was renewed during the Great Recession of 2007-2009, with the start of the COVID-19

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pandemic early in 2020 and it started gaining in importance. Today, it has gained a new momentum due to the obvious dramatic changes in energy prices, which can be considered the most important negative shocks that affect the aggregate supply side. While, in the recent past, there have mostly been financial shocks through the financial crises that have spread to the real sector of the economy, the new unknown disease COVID-19, which soon spread causing a pandemic, has left economists and policymakers with many dilemmas about the nature of the shock, more precisely said the shocks, caused by the pandemic itself, its impact and effects, and the responses of the economic policy as well. During the past two years, especially in 2020, the pandemic acted as a negative shock both on the side of aggregate demand and on the side of aggregate supply until the appearance of vaccines. The governments of the largest number of countries responded to it by implementing significant packages of fiscal assistance to the economy and the population, compensating for temporarily reduced aggregate demand. The fiscal expansion was accompanied by the monetary expansion. The impact of the pandemic on aggregate supply meant the interruptions of supply chains and value creation flows, the cessation of production and the like. What the pandemic had also produced was growing uncertainty about future economic developments, especially economic recovery. The decline in the economic activity was dramatic in 2020, whereas during 2021, the economy began to recover. However, it was impossible to predict with certainty how strong the recovery would be and whether the significant blows to aggregate demand generated by the continuation of the pandemic could be expected in the future. As a result, there was an imbalance between supply and demand in many markets, as demand recovered relatively quickly, supply being unable to keep pace with it. That resulted in an increase in the prices of certain products and inputs in production (e.g. metals), including energy prices.

Rising prices, i.e. rising inflation, appeared during 2021 as one of the relatively forgotten macroeconomic problems dating back in the 1980s. Although inflation has been in the background for decades, today's fear of steady and rising inflation is justified and generally present both in economic research done by scientists, in economic policymakers' plans and in the plans made by businesspeople and the general public as well.

During 2021, especially during the second half of that year, the rising energy prices issue came to the fore, primarily caused by their insufficient supply on world markets, which was partly due to the unexpectedly rapid global economic recovery that had generated growth in demand for energy. Rising energy prices are the input for the growth of all other prices and the emergence of the so-called cost inflation. In addition to this category of inflation generated by rising production costs, the current rise in global inflation is a consequence of the obvious growth of aggregate demand due to significant government intervention in the form of large aid packages to the economy and the population. All said indicates the need for economic policymakers to have to pay more attention to curbing inflation in the forthcoming period, which will almost certainly have recessionary effects. Therefore, the question rightly arises as to whether the current rise in energy prices will be introduction to a new economic recession just as it has been the case several times in the past (of the last seven recessions in the US, as many as five have led to the growth of energy prices - primarily oil) or not.

The impact of rising energy prices in post-transition economies, as well as the question whether and to what extent recessionary effects can be expected or not and whether economic policy measures can help avoid inflation in this context to prevent a recession or not are a particularly interesting area of the analysis. Therefore, the research conducted in this paper is aimed at analyzing the influence of energy prices as the shocks that act from aggregate supply, with a special reference to the countries that were the members of the former SFRY and the Višegrad Group member states, and carrying out a comparative analysis with the EU27 as a whole. These countries have a lot in common, although simultaneously there are the differences visible in energy strategies.

Accordingly, the hypotheses that will be investigated in the paper read as follows:

H1: Energy price shocks appear as the sources of economic recessions, i.e. they precede recessions, and these shocks are the cause of other macroeconomic instabilities.

H2: The monetary authorities' response to the growth of energy prices is of great importance in generating a recession, because that response can encourage the emergence of a recession.

H3: Causing a shock on both the aggregate supply side and the aggregate demand side, the COVID-19 pandemic disrupted both the balance of supply of and demand for energy, generating fluctuations in their prices.

These hypotheses can be confirmed by analyzing the major recessions of the past, as well as the current macroeconomic developments. The theoretical and methodological tools applied in the research process consist of general analytical methods, comparative analysis, and descriptive analysis.

The paper is formulated so that the Introduction is followed by the presentation of the theoretical basis of the effects of shocks as the source of cyclical fluctuations. The second part of the paper provides a brief overview of the dominant contemporary theories of cyclical fluctuations, focusing on supply shocks. The third part is dedicated to the theoretical analysis of the impact of energy shocks on the generation of unfavorable macroeconomic trends (inflation and recession). In the fourth part of the paper, the tendencies in the movement of energy prices are presented, the focus being on the electricity, oil and natural gas market. The fifth part discusses the impact on macroeconomic developments and the spillover effects of recent energy price growth shocks. The last part of the paper is devoted to the concluding remarks.

SHOCKS AS SOURCES OF CYCLICAL FLUCTUATIONS

The sources of cyclical economic fluctuations are paid great attention to in economics, so that there are almost no questions in macroeconomics that have been asked and considered in different ways than those related to the sources and nature of the shocks that affect economies and the role of the state and its economic policies in causing or overcoming shocks as well. In general, the shocks affecting an economy can be categorized into those acting on the aggregate demand side and those acting on the aggregate supply side. It is also possible to distinguish monetary shocks from the real shocks that hit an economy, thus causing cyclical fluctuations. The impact of these shocks on the economy can of course be stimulating or limiting, in which case we can talk about either the positive or negative shocks that affect aggregate demand or supply. These issues are the subject matter of the extensive literature dealing with business cycles both from a theoretical perspective and from an empirical perspective, and from the perspective of the economic policy, too.

Monetary shocks and the importance of the monetary policy

The monetary shocks that act on the aggregate demand side in the form of money supply growth and lowering interest rates, which has a stimulating effect on the economic activity through aggregate demand growth, investment and consumption growth, are amongst the best-known and the most common sources of cyclical fluctuations. The economic expansion caused in this way is considered as artificial in some theories (in K. Wicksell's theory or the Austrian school) and is inevitably accompanied by the monetary contraction that causes unpleasant economic recessions. This view of the source of cyclical fluctuations was the basis of the modern theories offered by monetarists and the representatives of new classical macroeconomics who focused on the monetary sources of the cycle, placing them in a dynamic economic environment and providing evidence for their insistence that the monetary policy was not used to stimulate the economic activity or mitigate cyclical fluctuations, simultaneously advocating rules in its creation. The different concepts of expectations were an important element of the cyclical fluctuations monetary theories.

The monetaristic explanation of cyclical fluctuations arose in the state of high unemployment, with burdensome and persistent inflation, which was increasingly becoming the primary economic problem. According to monetarists, changes in the money supply appear as the sources, not consequences, of recessions, which implies the potency of the monetary policy, not its inefficiency. Money supply should grow at a fixed rate in line with the output growth in order to maintain long-term price stability. However, the eighth decade of the twentieth century would follow, during which the leading market economies would be faced with the significant supply shocks generating an economic recession, which the monetary authorities would respond to with an inadequate monetary policy that would further deepen the rising and persistent inflation issue. The decade that began with Nixon's expansive economic policies with the slogan "prosperity without war" in response to the weak recovery of the American economy after a short recession in 1969 ended with the far-reaching changes that occurred in the period from 1978 to 1980, which marked the final rise and transition to neoliberal politics.

Starting from the monetarist assumptions that the economic system is stable, the shocks that affect it are exogenous and in the form of changes in money supply which increase the fluctuations of the economic activity, whereas in the long run, it is only high inflation rates that are generated. According to M. Friedman, two factors are key to the transmission of business cycles:

- the existence of price rigidity, and
- delays in adjustment.

That is why monetarists strongly oppose any use of the monetary policy for countercyclical purposes, because the economy should be left to itself to overcome shocks. Monetarists explain this attitude towards state intervention by the incompetence of economic policymakers, long delays, as well as the stability of demand for money.

After monetarists, the macroeconomic scene was entered and dominated by the representatives of new classical macroeconomics (NCM), who further explained cyclical fluctuations, insisting on the classical foundations of the Valrasian general equilibrium. They noticed that the existence of business cycles could be the key unsolved problem of their theory. For that reason, they developed several models so as to explain serially correlated economic fluctuations, the mechanisms of the action of the sources of these fluctuations on trends in the economy. In the first phase of NCM development, the explanation of business cycles was based on a monetary surprise, the so-called "monetary shock", which generated the short-term deviations of the economic variables from their long-term trend even in the conditions of rational expectations and continuous market clearing. Thus, because of being unannounced, the monetary surprise could lead to real effects on the economic activity (Lucas, 1972). Starting from that fact, the mitigation of cyclical fluctuations meant changes in the way how the monetary policy was created and conducted, which led to results in mitigating and shortening economic recessions in the last decades of the 20th century following real macroeconomic trends.

In the next phase of NCM development that started in the 1980s, monetary shocks were abandoned as a source of cyclical fluctuations and real shocks acting on the aggregate supply side had already been introduced. This phase, the so-called "schools of real business cycles" dominated until the Global Recession of 2007-09 and covered the period of the longest economic prosperity. However, although the focus was on aggregate supply and real shocks as primarily technological shocks changing the production function and relative prices influencing economic entities' decisions, the introduction of the Global Recession yet turned out to be partially initialized by the monetary policy and the mistakes having been made in connection with it. Therefore, in order to explain the beginning of the recession, the moves of the monetary authorities that may lead to a recession still need to be carefully analyzed, regardless of the fact that they may be preceded by supply shocks. The monetary policy often inadequately responds to these shocks, generating a cyclical decline in the economic activity.

Further in this paper, this problem is analyzed by focusing on the supply shock caused by energy prices during the pandemic functioning of the global economy.

Supply shocks as the sources of cyclical fluctuations

It has already been pointed out that supply shocks appeared as the sources of cyclical fluctuations in the past. They affected aggregate supply, either positively, primarily through the positive technological shocks affecting the production function and generating economic expansion, or negatively, primarily through the energy (oil) shocks that generated rising product prices and declining aggregate supply, thus causing economic recessions.

The very idea of the importance of the real factors for explaining business cycles is not new and can be seen in the pre-Keynesian economy. In this context, it is necessary to emphasize the importance of D. Robertson's (1915) work pointing to the importance of technological changes for the economic fluctuations that occur as a result of excessive investment in certain periods causing later economic recessions, as well as J. A. Schumpeter's theory (1939) presented in his book entitled Business Cycles. According to J. A. Schumpeter's analysis, short-term instability and long-term, dynamic development depend on technological changes and their spread through the economy.

The most important modern cycle theory that focuses on real shocks on the aggregate supply side was that formulated by the New Classics in their second phase of development since the 1980s. This phase of the equilibrium business cycles theory development began with the papers F. E. Kydland and E. C. Prescott (1982); J. B. Long and C. I. Plosser (1983). The empirical data on the movement of the social product, employment, industrial production and many other important aggregates of the US economy directly pointed to the conclusion that real shocks were more important than monetary shocks in order to explain the movement of the aggregate product (Nelson & Plosser, 1982).

It was the paper by C. Nelson and C. I. Plosser (1982) that ended the dominance of the settings that defined business cycles as short-term fluctuations, because they couldn't exclusively be viewed as temporary events, without noticeable long-term consequences. The movements of the macroeconomic variables except for the unemployment rate proved to partially represent permanent changes. Economic developments indicated that business cycles represented fluctuations in the trend itself, whereas fluctuations around the trend were very small. Based on that fact, the real business cycles theory concluded that the real factors affected both economic growth and the fluctuations that made up business cycles. That inevitably led to a change in the perception of the role and importance of the economic policy for generating and overcoming cyclical fluctuations. According to the real business cycles school, economic expansion is a consequence of positive technological shocks, whereas economic downturns are a consequence of the absence of significant technological progress in the form of positive technological shocks.

In addition to the technological changes that focus real business cycles theories as the sources of cyclical fluctuations, it is possible to determine other factors, i.e. the shocks that affect aggregate supply. Thus, the economic trends during the 1970s were primarily the result of the shocks on the aggregate supply side, namely the rise in food and energy derivatives - oil. The recession of the period 1973-75 had permanent negative effects on the movement of the gross domestic product of developed countries; so, during the 1980s and the 1990s, the gross domestic product remained below the level of the trend that would have been reached if the growth rate had continued the growth trend of the period preceding the year 1973, i.e. the no-recession period. This means that the recession of this period had permanent effects on the slowdown in the economic activity in the decades that followed.

Shocks on the aggregate supply side represent much more difficult and much more complex challenges

for economic policymakers than aggregate demand shocks. Namely, if the growth of the world oil price increases the costs of production thus the prices of products as well causing inflation, then the monetary authorities are faced with a choice between a policy to fight the inflation that will have recessionary effects and an expansive policy to fight recession itself.

Even more complex problems arose in a situation when, in addition to supply shocks in the form of rising energy and food prices, there were other shocks in the form of the supply or production chain disruptions that occurred during the first waves of the 2020 COVID-19 pandemic. It should be added that there was a negative shock of aggregate demand during those first waves due to the locking measures (the quarantine and the closure of countries). Governments around the world responded to that shock by taking expansionary fiscal and monetary policy measures to help the population and the economy, which recovered aggregate demand. Such increased aggregate demand faced with insufficiently recovered aggregate supply led to a global rise in inflation and facing a choice between further boosting the economy and the population in a situation where the pandemic was continuing, on the one hand, and easing the inflationary pressures that could lead to inflationary expectations increased uncertainty and risks, thereby limiting post-pandemic economic recovery and growth, on the other.

These shocks refer to the most important events during the last two years of the pandemic, during which economies were the subject matter of sudden and unanticipated shocks both on the supply side and on the demand side. They brought back into focus the once important issues that were considered to have already been overcome, such as a rising inflation and the way the monetary policy was conducted. Only a few years ago, the use of "helicopter money" would have been completely unacceptable as a way of conducting the monetary policy. Today, however, we are being faced with its inflationary consequences, as well as the consequences of the strong shocks of aggregate supply in the form of rising energy prices. These issues are focused on further in this paper on the example of the countries of the group of the Višegrad Group and former SFRY member countries.

ENERGY PRICES AS SIGNIFICANT SUPPLY-SIDE SHOCKS

As has already been pointed out in the paper, the significant growth of energy prices and drastic falls in the supply of energy, primarily oil[1], on world markets caused cyclical declines in the economic activity in the past. In economic terms, oil is at the heart of industrialized economies. Gasoline is the most important product from crude oil. The other important products are heating oil, diesel fuel, kerosene and others. In economic terms, oil is of great importance for the global economy because it affects the functioning of the entire economy as one of the main energy sources, which has been the case since the invention of the internal combustion engine that caused the technological revolution also marking the oil industry development.

The theoretical foundations of the influence

For the USA postwar economy, it is clearly noticeable that jumps in oil prices preceded economic recessions, which was the case with as many as five postwar American recessions. This became especially evident during the 1970s, which were marked by recessions in the United States, and by oil shocks as well (Praščević, 2013, 41). The extensive literature focused on that influence (Hamilton, 1985; Bjørnland, 2000; Barsky & Kilian, 2004; Nordhaus, 2007; Engemann, Kliesen & Owyang, 2011; Kilian & Vigfusson, 2017). Those changes were primarily the supply shocks whose performance in the standard AS-AD model is represented by a shift to the left of the SAS curve (short-term aggregate supply) corresponding to a higher general price level (i.e. the inflation rate) due to the rising production costs due to the rising energy prices included in the prices of all the other products (Figure 1).

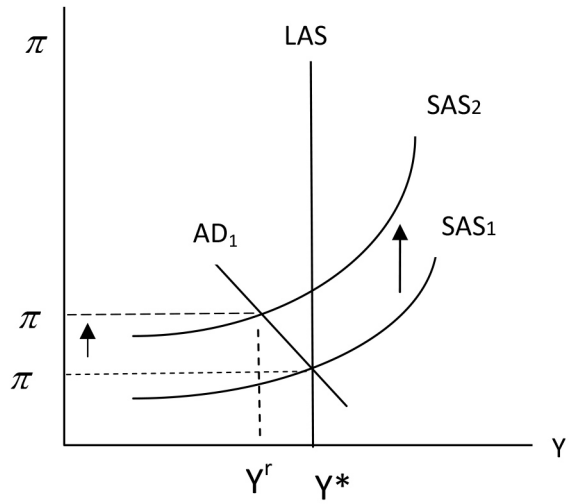


Figure 1 The negative supply shock due to the rising energy prices (oil)

Source: Authors

The oil price growth, as well as the growth of the price of the other energy sources, primarily gas, negatively affects the economy in several ways, affecting:

- an increase in transport costs,
- an increase in heating costs,
- an increase in production costs,
- an increase in risk and uncertainty leading to further price increases,
- increasing risk and uncertainty affecting investment and spending decisions,
- changes in the allocation of labor and capital between energy-intensive sectors and those that are not.

In addition to the effects on spending and investment decisions, these effects have a negative impact on aggregate supply, of which the impact on the reallocation of labor and capital between individual economic sectors has long-term effects on economic growth.

Short-term changes in oil prices show that demand for oil is more determined by changes in income than by changes in oil prices. That is the reason why demand for oil has steadily been following the income growth in the past decades, regardless of the significant fluctuations in the oil price. Income elasticity is close to unity, especially in fast-growing economies, while it is somewhat lower in developed economies. On the other hand, the price elasticity of demand is very low with the trend of further decreasing compared to the period of the 1970s (Hamilton, 2009). The recent global recession has, however, shown that this can change and that the oil price can affect demand for it if the conditions of the recession affect a significant reduction in disposable income, so that a significant segment of the population cannot afford earlier quantities.

Oil shocks and economic recessions in the past

Oil shocks negatively affect the economic activity, causing an economic recession. This was exactly the case with the 1973-75 recession, which was generated by a fourfold increase in oil prices due to a decision made by the Arab exporting countries (AOPEC) in the autumn of 1973, causing stepping into a long period of an economic slowdown and decline, which lasted until the mid-1990s, with short interruptions. During

this period, there was a drastic decline in investment growth rates and productivity growth rates, which slowed wage growth with the emergence of significant unemployment. The economy tried to respond to the decline in profits that had been recorded since 1965 and at the significantly higher rates of decline than in the G-7 economies by reducing direct and indirect labor costs and redistributing income to the detriment of labor, in favor of capital (Praščević, 2008, 14).

Unlike the previous ones, the recession of the 1973-75 period was not accompanied by deflation, but by inflation, which is the reason why the Keynesian recommendations for economic contraction overcoming could not have been applied[2]. Significant financial crises were recorded during this period, some of which can be compared to those of the 1930s. In the early 1980s, there were again sharp recessions. This time, they were attributed to fighting inflation by central banks in most countries, and to a new oil shock following the Iran revolution and later the Iraq-Iran war in October 1980 as well. After the period of recovery in the early 1990s, like most European economies, the US economy contracted again, this time after the event that had disrupted global oil supplies due to the Gulf War (August 1990). During the first half of the 1990s, economic growth was slower than in the 1980s, which was already significantly slower than that in the 1970s, especially so compared to the 1960s. For the cyclical economic fluctuations that occurred during the 1970s, 1980s and 1990s (Table 1), it is characteristic that the contractions of the economic activity occurred simultaneously in European countries and Japan, as well as in the USA, due to the integration and globalization of the international economy. Therefore, there has been a significant diffusion of cyclical fluctuations worldwide, which can be seen together with the recessions of the 21st century.

Historically, the oil price has become particularly volatile since the 1970s. The fact that it was for the first time during the Suez Crisis in 1956 that the Arab countries limited oil supplies which preceded the recession in USA that began a few months later (in August 1957) should be noted. This could be seen as the test of what would happen a decade after the Organization of the Petroleum Exporting Countries

Table 1 Oil shocks and the recession in USA

Oil shock	Causes	Recession
The first oil shock (1973-74)	The Yom Kippur War and the suspension of supplies to Western economies, as well as the quadrupling of oil prices (1973-75)	November 1973-March 1975
The second oil shock (1978-80)	The Iranian Revolution (the autumn of 1978) and the doubling of oil prices, the Iraq-Iran conflict (started in September 1980)	Two recessions in the period from 1980-1982 (January 1980-July 198; July 1981-November 1982)
The third oil shock (1990)	The Iraqi Invasion of Kuwait (August 1990)	July 1990-March 1991
"Half-shock" (2001)	The attack on the Twin Towers in New York (September 11, 2001) and intervention in Iraq	March 2001-November 2001
The fourth oil shock (2007-2008)	The causes are different compared to the previous shocks - a significant increase in global demand with stagnant supply	December 2007-June 2009

Source: Authors

(OPEC) had been founded in 1960 to manipulate the price and quantity of the oil they supplied to the world for political reasons[3].

Given the fact that the fluctuations in oil prices, as well as the restrictions on its supply, had been significant, the International Energy Agency (IEA) was established in 1974. It takes the central place in global dialogue when energy is concerned, especially with the aim to regulate the oil market and the market of other energy sources, too. The world oil market structure is determined by the relationship between supply and demand, with a significant influence of political and economic, as well as technological, factors.

Empirical research shows that the growth of oil prices in a similar recessionary way affected the economies of the other developed economies (the G7 countries), not only the US. It is estimated for developed countries that 10% of external disruptions in oil supply have an impact of an about 2% reduction in real income growth from one to two years after the shock (Killian, 2005). Although rising oil prices affect other prices as well, the impact on inflation is not as clear as the impact on real income and real growth. In some economies, it causes stagflation, whereas in others it does not. Therefore, it can be concluded that the general increase in the oil prices did not have a strong inflationary effect. However, it is important to point out the fact that a deeper analysis has to take into account any economic policy measures taken in response to a particular oil shock, which may have consequences for both the recession and inflation.

In addition to the political factors that influenced the disturbances on energy markets, especially so in oil markets, the growth of these prices was strongly influenced by the growth of the world demand due to the economic growth of certain economies (the BRICS countries and other Asian economies). Thus, the oil price is affected by the level of the global economic activity and its growth due to economic expansion, or a decline due to recessionary pressures. Also, the growth of the living standard of populous countries affects the growth of consumption of and demand for energy, especially oil. It is these influences that have determined the movements on the oil market since 1999, characterized by rising oil prices during the first two decades of the 21st century, yet with temporary and occasional declines, primarily due to the slowdown in the global economy. Between 1999 and 2006, real oil prices tripled without visible effects on the leading economies' economic growth. The fourth oil shock followed in the period 2007-08, which coincided with the Global Recession.

The causes and dynamics of the fourth shock differed significantly from the previous shocks. Instead of reducing supply, which was the case with the previous shocks, supply stagnated now, yet facing drastic growth in oil demand, which resulted in rising prices. By mid-2007, oil prices had tripled compared to 2001, followed by a drastic rise that lasted until July 2008, after which the prices fell equally dramatically. This growth in demand was a consequence of the accelerated global economic development in the previous years, especially the economic growth recorded by China. High economic growth rates in China also meant a significant increase in oil consumption in that country (Yuxian, Xiaoling & Songke, 2014). From the country that had been a net exporter of oil until 1992, it had become the third largest importer of oil by 2007, which had a decisive influence on the world market trends, which was due to the growth of oil consumption by an average of 7% per year in China during the previous two decades. Due to supply stagnation, it was necessary to reduce the consumption of other large oil consumers such as the United States, Europe and Japan, which happened in the period 2006-08 (Wong, 2016). Having reached an extremely high level of oil prices, they significantly fell in the second half of 2008, so that they were lower than they had been in 2005 in December 2008, which was certainly a consequence of the economic recession which economies around the world entered in 2008 and 2009. In addition to economic contraction, however, such dramatic fluctuations in oil prices were also a consequence of the speculative activities of buying oil as commodity futures.

TENDENCIES IN ENERGY PRICE MOVEMENTS

In the past, energy prices have caused cyclical fluctuations in the economic activity on the world markets as has been pointed out above in the paper. This was especially the case with changes in oil prices. Due to strong correlation in price movements, however, electricity and gas prices also significantly contributed to these fluctuations. For that reason, a global analysis of the impact of the COVID-19 pandemic on energy prices is presented in the next part of the paper, followed by an overview of electricity, oil and gas prices for the former SFRY, Višegrad Group member states and the EU27 as a whole for the purpose of comparison.

The impact of the COVID-19 pandemic on energy prices

The last big challenge to the functioning of the energy market was imposed by the COVID-19 pandemic, which began in early 2020 and which has hit the global economy in several waves ever since, both on the side of aggregate demand and on the side of aggregate supply. In the first months of the COVID-19 pandemic already, it was clear that there would be an economic recession. The impact of the pandemic caused a drop in aggregate supply due to a reduction in the economic activity because of locking countries and applying quarantine measures. Production and logistics chains were interrupted. The delivery of semi-finished products or components was suspended because products were difficult to move across borders. At the same time, aggregate demand decreased because there was a decrease in all its components - personal consumption, investment, government expenditures (except those intended for healthcare) and net exports. The shocks that had hit the economy were unique in modern economic history. The largest number of countries' economic policies responded to that in a similar fashion: easing the position of households and the economy and maintaining financial stability. Due to that fact, huge packages of fiscal assistance were being applied along with the monetary expansion carried out through applying unconventional measures because the monetary policy became inefficient due to the low interest rate in the previous decade. Given those measures, aggregate demand quickly recovered, which was contributed to by the dynamics of the pandemic, as well as the relatively rapid discovery of the vaccines whose application led to the relatively rapid overcoming of the most severe forms of the disease, thus to the weakening of the epidemiological measures that had threatened aggregate demand and supply (Praščević, 2020; Praščević, 2021).

Figure 2 shows that, after the negative shocks of aggregate supply (shift to the left of the SAS curve) and aggregate demand (the shifting of the AD line to the left) due to the pandemic in its early stages, the economy shifted into recession. After that, the recovery of aggregate demand (moving the AD line to the right to AD3) was accompanied by a rise in prices (inflation rates) with income recovery. The rise in the prices that unexpectedly followed the pandemic was a consequence of the increase in aggregate demand due to the expansive fiscal and monetary policy, as well as the rise in energy prices, which put additional pressure on the prices due to rising production costs.

The presented dynamics of the pandemic trends had a significant impact on the energy market, namely electricity, oil and gas. The first phases of the pandemic during which there was a decline in aggregate demand and aggregate supply resulted in a decline in demand for energy as global production declined. During that period, oil companies reduced their activity with operating losses in the first half of 2020 and reduced investments. The pandemic thus became an additional challenge for the oil sector and the entire energy sector as well, which was under pressure for long because there were climate and energy policy measures aimed at reducing oil consumption, especially in more developed countries. As a result, there was a dizzying drop in the oil price in early March 2020 ($ 24 per one barrel of Brent oil). However, that was only partly a consequence of the pandemic and partly a consequence of the "oil war" between Saudi Arabia and Russia, which refused to reduce production. That led to Saudi Arabia bringing down the oil price, "punishing" Russia in that way.

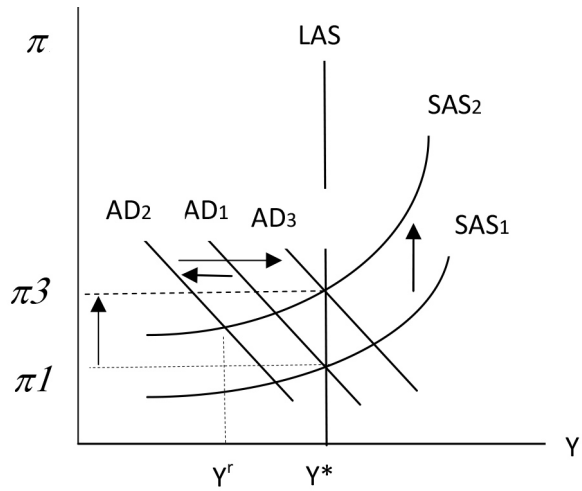


Figure 2 The impact of the COVID-19 pandemic on macroeconomic dynamics

Source: Authors

The oil price continued to fall and was at a record low in April 2020.

Even with the first signs of economic recovery, however, demand for energy increased. It faced insufficient energy (oil and gas) supply in the second half of 2021, thought, which was not only a consequence of the COVID-19 pandemic shock, but also a consequence of the geopolitical tensions and the application of the green economy standards and pollution reduction, too, by switching to the renewable energy sources whose use was limited by the technical and technological conditions of exploitation (e.g. wind energy, etc.). In general, the green economy reduced energy supply while demand remained unchanged, which led to an increase in energy prices. Therefore, the world was faced with rising energy prices and their shortage in the second half of 2021. The oil price recovered during 2021, with occasional declines mainly with the emergence of the new strains of coronavirus that led to increased uncertainty about the future economic activity.

The price of gas as another important energy source was also influenced by pandemic movements in a similar way as oil. In this case, however, geopolitical tensions also had a great impact, culminating at the beginning of 2022. The gas prices in Europe in December 2021 and early in 2022 exceeded all the records (more than $ 2,000 for 1,000 cubic meters of gas). Those changes in the gas price were accompanied by a drastic increase in electricity prices. All that had negative consequences on production, as well as prices (already rising inflation). The tensions between Russia and the EU and the United States are certainly contributing to this, due to the Ukrainian crisis (delaying the release of the Nord Stream, which would provide an alternative route for gas supply and bypass Ukraine). This puts the European economies importers of gas from Russia in a particularly difficult position. In the next part of the paper, the foregoing trends are presented in more detail.

The electrical energy market

The analysis of the price trends on the electricity market is complex as this market is specific on several grounds. First of all, electricity as a commodity has certain technical characteristics that condition the functioning of the market itself. In addition, certain activities in the electricity sector are regulated in many countries.

When speaking about the regulatory aspects of certain activities in the electricity system, economic theory

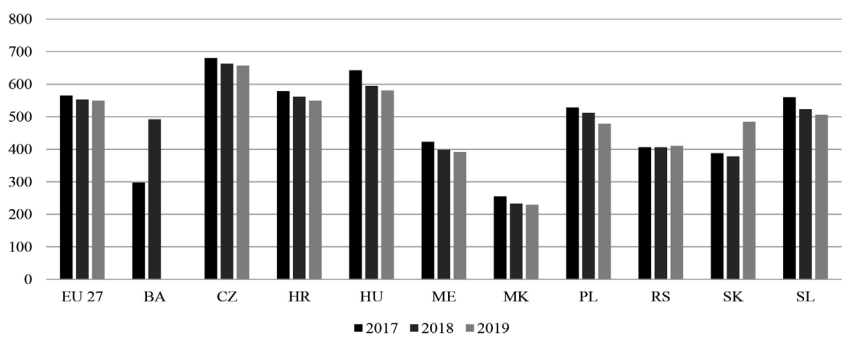
advocates that regulated activities remain those in which the economic preconditions of a natural monopoly are applied. In addition to the economies of scale, it is essential that there is cost-subadditivity. In R. Serbia, for example, transmission and distribution prices are regulated for all system users, as well as the prices of certain ancillary services. In addition to the above-mentioned, the electricity prices for guaranteed supply and the prices of the lease of power reserves for the system services of secondary and tertiary regulation can be regulated (Agencija za energetiku).

Therefore, the electricity price for final consumers is partly a derivative of meeting the supply of and demand for electricity on the market itself, often much more, and other determinants such as regulatory restrictions, the government policy, international factors, and so forth. Electricity prices are considered as one of the instruments of the income policy and the redistributive policy by which countries, especially those developing, strive to achieve certain economic, social and broader social goals (Jakšić and Ješić, 2021). The electricity price is a significant factor in demand for electricity although, generally speaking, this demand is quite price-inelastic. The rigidity of the supply of and demand for electricity is one of the key features of the electricity industry (Filipović and Tanić, 2010, 10). Electricity consumption, however, varies a lot not only in one single day but also seasonally during a year, which requires that the installed capacities should follow that demand so that it could be satisfied even at the peak load.

For a partial understanding of the electricity demand determinants, it is useful to note the differences between the countries under observation in their *per capita* household energy consumption. It significantly oscillates between the observation units. In some countries, such as the Czech Republic or Hungary, energy consumption *per capita* is sometimes more than twice as high as consumption in e.g. North Macedonia (Figure 3).

Table 2 provides a comparative overview of the electricity prices for households in the first half of 2021 for the consumers consuming between 2500 and 5000 kWh per year (medium consumers, according to the Eurostat methodology). In addition to that, the overview of the basic price components: the network costs, the fees and charges, VAT and the sustainability fees are given.

According to Table 2, the electricity prices measured in EUR significantly differ between the observed countries. The households in North Macedonia, Serbia, and Bosnia and Herzegovina pay the lowest price, whereas the highest price is paid in the Czech Republic and Slovenia. The prices measured by the purchasing power parity reveal that the lowest electricity price is paid by the households in Hungary and Serbia, whereas the highest price is paid by the households in the Czech Republic and Poland.



Note: The data for Bosnia and Herzegovina for 2019 are not available.

Figure 3 The final energy consumption in households *per capita* (in kg of oil equivalent)

Source: Eurostat

Table 2 The electricity prices for households (per kWh)

	Final price 2021 (January-June)		Price components in 2020			
	EUR	PPS	Network costs	Charges and fees	VAT	Sustainability fees
EU 27	0.2192	0.2194	0.0600	0.0900	0.0300	0.0300
BA	0.0875	0.1723	0.0367	0.0152	0.0129	0.0024
CZ	0.1802	0.2460	0.0464	0.0500	0.0300	0.0188
HR	0.1291	0.2029	0.0448	0.0292	0.0152	0.0139
HU	0.1003	0.1619	0.0442	0.0214	0.0214	0.0000
ME	0.0980	0.1997	0.0426	0.0176	0.0183	0.0037
MK	0.0841	0.1839	0.0192	0.0123	0.0123	0.0000
PL	0.1548	0.2634	0.0489	0.0571	0.0289	0.0066
RS	0.0791	0.1510	0.0306	0.0177	0.0131	0.0000
SK	0.1668	0.2115	0.0440	0.0618	0.0287	0.0182
SL	0.1662	0.1994	0.0468	0.0434	0.0276	0.0126

Notes: The prices are in EUR and the PPS (the purchasing power parity). The prices are shown with all the taxes and fees. The price components are the average values for all the consumption ranges.

Source: Eurostat

When taxes are in question, some countries have not introduced sustainability tariffs. In addition to that, some fees are not shown in the table because they were introduced by a small number of the observed countries. Slovakia, for example, has nuclear energy fees.

A similar analysis was conducted for the enterprise sector also in the first half of 2021, and it was carried out for the consumers consuming between 500 MWh and 2000 MWh of electricity per year (Table 3). In addition, the overview of the basic price components: the network costs, the fees and charges, VAT and the sustainability fees is presented below.

Based on Table 3, a conclusion can be drawn that the companies operating in the countries under observation have different total expenditures for one unit of the electricity consumed, sometimes more than double (e.g. in North Macedonia, it is 0.1346 EUR, and in Slovakia 0.2999 EUR), which each can affect the profitability of the company. In addition, it should be noted that the companies pay a lower total electricity price in all the countries under observation, except Slovakia, in comparison with the EU27 average.

Besides, based on the data about the electricity market trends, it can be seen that the prices measured by the purchasing power parity are often not small compared to the observed countries with developed countries regardless of the fact that electricity prices differ from one country to another. This is especially true for the prices for the economy, which can be a significant generator of fluctuations in the economic activity.

The oil market

The world market Brent oil price has recently significantly been raised (Figure 4). This shock leaves significant consequences for macroeconomic stability as oil is the main input in a large number of industries.

This trend on the global market partially spills over into the final price for consumers (Figure 5), which depends on many factors, just like the electricity market. When regulation on the oil and oil derivatives market is concerned, the situation differs from one country to another. In Serbia, improved competition in the oil, oil derivatives, biofuels and compressed natural gas sectors (Službeni glasnik Republike Srbije,

Table 3 The electricity prices for companies (per kWh)

	Final price 2021 (January-June)		Price components in 2020			
	EUR	PPS	Network costs	Charges and fees	VAT	Sustainability fees
EU 27	0.1573	0.1620	0.0272	0.0628	0.0224	0.0226
BA	0.0874	0.1722	0.0318	0.0323	0.0207	0.0105
CZ	0.1069	0.1458	0.0254	0.0156	0.0133	0.0023
HR	0.1158	0.1820	0.0319	0.0266	0.0136	0.0130
HU	0.1143	0.1846	0.0240	0.0335	0.0211	0.0090
ME	0.1043	0.2125	0.0234	0.0209	0.0146	0.0058
MK	0.0888	0.1942	0.0182	0.0138	0.0138	0.0000
PL	0.1343	0.2284	0.0267	0.0518	0.0244	0.0063
RS	0.0954	0.1823	0.0179	0.0208	0.0153	0.0000
SK	0.1530	0.1940	0.0413	0.0609	0.0265	0.0182
SL	0.1123	0.1347	0.0178	0.0313	0.0194	0.0095

Notes: The prices are expressed in EUR and the PPS (the purchasing power parity). The prices are shown inclusive of all the taxes and fees. The price components are the average values for all the consumption ranges.

Source: Eurostat

2014). The regulated prices in this sector are only determined for the natural monopoly activities of oil transport through oil pipelines, i.e. the transport of oil derivatives through product pipelines.

Given the fact that, according to the Eurostat data in the consumer price index of the observed countries, the fuel prices participate with a share usually ranging from 2% to 3%, it is clear that any change in fuel prices significantly affects inflation. In addition, as a shock from the supply side, these changes can cause fluctuations in the economic activity.

The natural gas market

In addition to the electricity and fuel prices, gas prices can have a significant impact on macroeconomic stability. In EU's developed countries, a large

Figure 4 The Brent oil price (in $/barrel)

Source: Federal Reserve Economic Data

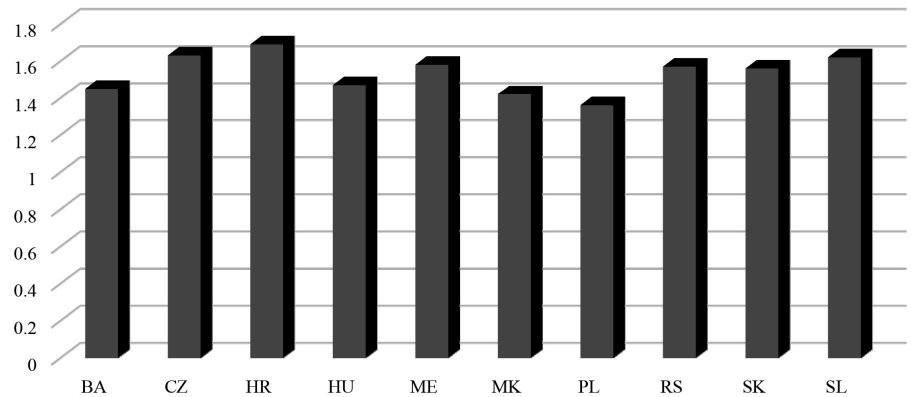


Figure 5 The fuel prices for the final consumers (in $/liter) in February 2022

Source: Trading Economics

segment of industry uses gas as the main input. Natural gas prices have recorded record levels on the world stock exchanges in recent months (Figure 6). In Serbia, the prices of access to the natural gas transportation system, the price of access to the natural gas distribution system, the price of access to the natural gas storage, and the price of natural gas for public supply (households and small customers) are regulated.

As natural gas is one of the main inputs in many industries, it is certain that the latest developments on this market will leave significant macroeconomic consequences.

When the natural gas price as per the observed countries is in question, Table 4 allows us to conclude that most of them have more favorable prices compared to the EU27 average for households, and that this applies to the price without taxes and levies. On the other hand, the companies in the largest number of the observed countries pay a lower gas price than the EU27 average, but when the taxes and levies are excluded, the price is higher in most countries than the EU27 average. This shows that the state policy in the observed countries tries to depreciate a slightly higher gas price with lower taxes and levies than the EU27 average.

THE IMPACT OF THE LAST SUPPLY SHOCKS IN THE ENERGY SECTOR ON THE MACROECONOMIC STABILITY

Energy prices have significantly risen in the last two quarters. If a part of the market is regulated, such a shock as a rule is first felt by the participants on the unregulated market, but it is just a matter of time when exactly it will overflow onto the regulated market. Such a supply shock often leads to restrictions in quantities, not only to rising prices.

The latest supply shocks in the energy sector have different roots that can trigger turbulence on these markets. They stand out economically and geopolitically. Rising energy prices, for example, were not the only cause of the rising inflation in this area, but also a consequence of the rising taxes and fees in some countries (ECB, 2021). As has already been pointed out in the previous part of the paper, economic theory suggests that, in the short run, rising energy prices will lead to rising domestic prices and a falling GDP. Rising energy prices have a negative impact on consumption, investment and employment. The impact of rising energy prices on the GDP components primarily depends on the two factors:

- the strength of the effects on consumption, and
- the strength of the effects on inflation.

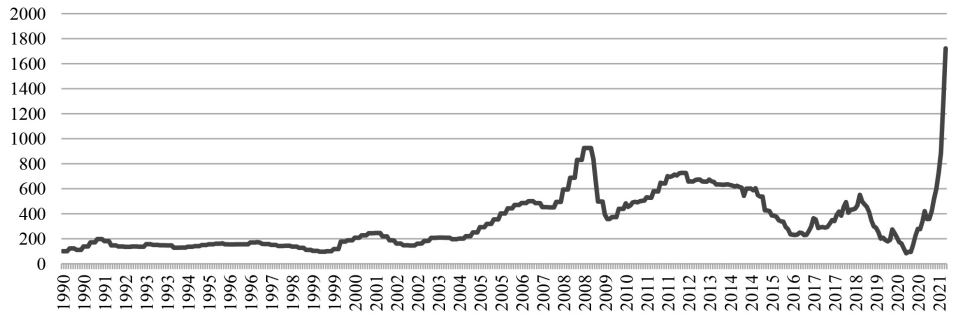


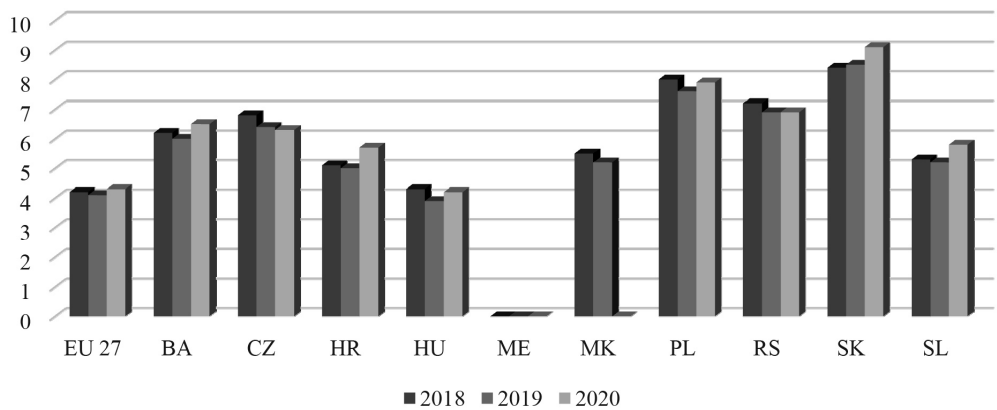
Figure 6 The global price of natural gas (the index 1990M1 = 100)

Source: Federal Reserve Economic Data

Consumption is affected by the effect of rising prices on disposable income. The negative effect is also present in the investment field. When speaking about employment, if prices rise over a long period of time, it can affect change in the production structure and can have an impact on unemployment (Lescaroux & Mignon, 2008).

In the context of the effects on the consumption generated by the growth of energy prices, the share of the expenditures for electricity and other energy sources in the total consumption should be analyzed. If the expenditures of the households among the observed countries are compared, significant differences can be noticed according to Figure 7. In some countries, such as Slovakia, Poland and Serbia, the households have on average significantly higher electricity expenditures. energy and energy from others. These shares are often twice the EU27 average. It follows that they are more sensitive to changes in energy prices, because the effects of price changes on macroeconomic aggregates will be greater in absolute terms.

The impact of the changes in the energy prices on inflation is more obvious. It happens in two phases



Note: The data for Montenegro and North Macedonia (for 2020) are not available.

Figure 7 The final expenditures made by the households for electrical energy, gas and other fuels (as a percentage of the total amount)

Source: Eurostat

(Figure 8) and direct effects are dominant. The direct effects are visible through the impact on the consumer and producer prices, while the indirect effect, the so-called second-round effect, is the agents' reaction primarily in the form of wages and profits adjustment. The second-round effect depends a lot on nominal and real rigidities. If rigidities are higher, the effect on the price changes is smaller, and vice versa. While there is little the monetary policy can do about the first-round effects, on the one hand, it can do much more in terms of strengthening credibility and influencing expectations and consequently macroeconomic stability in the event of such supply shocks, on the other. Besides, the monetary policy can influence additional channels, such as the economic activity and financial markets. By their very nature, shocks in energy prices have significant effects on the macroeconomic stability of a country through spillover effects, irrespective of how immanent the monetary regime is. However, inflation-targeting central banks appear to be struggling to overcome supply shocks. Bearing in mind the fact that the largest number of the central banks that apply this monetary regime de facto apply the so-called flexible inflation targeting, the unfavorable circumstance of

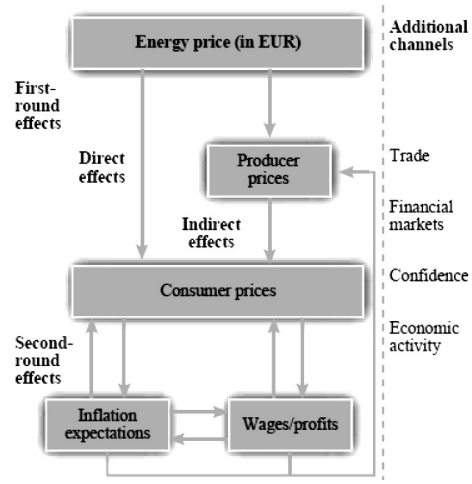


Figure 8 The transmission channels of the impact of energy prices on inflation

Source: ECB, 2010

the supply shocks of this type is that prices and the GDP are moving in opposite directions, so a central bank must make a certain trade-off, simultaneously minimizing the loss function. In other words, supply shocks are more demanding to neutralize or

Table 4 The natural gas prices for households and companies (per kWh)

	Households		Companies	
	Excluding taxes and levies	All taxes and levies included	Excluding taxes and levies	All taxes and levies included
EU 27	0.0411	0.0638	0.0238	0.0365
BA	0.0274	0.0321	0.0354	0.0414
CZ	0.0463	0.0562	0.0238	0.0304
HR	0.0300	0.0374	0.0275	0.0367
HU	0.0241	0.0307	0.0208	0.0284
ME	/	/	/	/
MK	0.0414	0.0488	0.0236	0.0279
PL	0.0301	0.0376	0.0271	0.0346
RS	0.0305	0.0337	0.0285	0.0313
SK	0.0342	0.0411	0.0261	0.0329
SL	0.0382	0.0547	0.0254	0.0378

Notes: The data for Montenegro are not available. The prices are in EUR. The prices are for the households consuming between 20 GJ and 200 GJ. The prices are for the companies consuming between 10000 GJ and 100000 GJ.

Source: Eurostat

reduce the negative effects of the economic policy instruments than demand shocks.

How great an effect the inflation of energy prices will have on the overall inflation also depends on how inflation is measured, i.e. on the importance of individual components in the price index itself that is being monitored. For the EU countries, Eurostat publishes weights in the Harmonized Index of Consumer Prices (HICP), but for some other countries, data on this weight can be found in their respective price index - most often the Consumer Price Index (CPI). Based on the data for the observed countries, Table 5 shows that again this weight is higher for almost all the countries than for example the Eurozone as a whole, which speaks of the greater "vulnerability" of the observed countries to these shocks. This is the case when a weight is only observed for electrical energy and when the scope is extended to gas and other fuels as well.

Table 5 The HICP weights and the corresponding price indices

	Electrical energy, gas and other fuels	Electrical energy
Eurozone	5.891	2.875
BA	/	/
CZ	8.939	4.52
HR	8.919	5.176
HU	5.101	1.814
ME	/	/
MK	6.613	4.001
PL	8.349	2.864
RS	8.745	4.645
SK	11.24	4.108
SL	6.416	3.251

Note: The data for Bosnia and Herzegovina and Montenegro are not available.

Source: Eurostat

To sum up, the effects of the recent shocks on energy markets will have significant consequences for the macroeconomic stability. Economic history teaches us that these types of shocks should not be viewed as transitory, and that economic policymakers will have to find a way to mitigate the negative effects of these shocks on the key macroeconomic aggregates. Their neutralization is difficult and almost impossible, so economic policymakers will be faced with a choice among the priorities in the range of economic goals.

CONCLUSION

Shocks on the aggregate supply side represent a special challenge for economic policymakers in neutralization and are much more difficult and much more complex than aggregate demand shocks. A rise in energy prices is one of the most significant supply shocks. Significant increases in energy prices and drastic declines in energy supply, primarily in oil supply, on the world markets have caused cyclical declines in the economic activity in the past. Today, when electricity and gas are important inputs in industrial activities, in addition to oil, the movement of the prices of all these energy sources (often correlated) is in the focus of economic policymakers' interest. The impact of rising energy prices on the GDP components primarily depends on the two factors: the influence of the effects on consumption and the influence of the effects on inflation. The key scientific contribution of the supply-side shock analysis can be found in the in-depth analysis and sound assessment of the role of these shocks in preserving macroeconomic stability, as well as economic policy measures necessary to minimize their negative effects. The research confirmed the research hypotheses and proved that energy price shocks can be sources of economic recessions and other macroeconomic instabilities, too. In addition, the importance of the monetary authorities' response to rising energy prices in generating a recession has been demonstrated as well. Finally, the COVID-19 pandemic has proven to disrupt the balance of the supply of and demand for energy, generating fluctuations in their prices.

Rising inflation appeared during 2021 as one of relatively forgotten macroeconomic problems. During that year, especially so during the second half of that year, the rising energy prices issue came to the fore and was primarily caused by their insufficient supply

on the world markets partly due to the unexpectedly rapid global economic recovery that generated growth in demand for energy. The last big challenge to the functioning of the energy market was imposed by the COVID-19 pandemic and geopolitical tensions as well.

The complexity of the analysis of these supply shocks is reinforced by the fact that certain activities in the energy sector in the process from production to the final consumption are regulated, whereas some are left to the free market. It depends on the country and the type of energy source, too. Together with their economic characteristics, the most often regulated activities have met the conditions for the existence of a natural monopoly.

On the electricity market, the electricity price for final consumers is partly a derivative of meeting the supply of and demand for electricity on the market itself, frequently much more than the other determinants such as regulatory restrictions, the state policy, international factors, and so on. Among the set of the observed countries, there are differences in energy consumption in households per capita. In the Czech Republic and Hungary, energy consumption *per capita* is sometimes more than twice as high as consumption in, for example, North Macedonia. Electricity prices also significantly vary from one country to another. Households in North Macedonia, Serbia and Bosnia and Herzegovina pay the lowest price, while in the Czech Republic and Slovenia the highest price is paid.

On the oil and oil derivatives market, price spikes have also recently been recorded. Economic history has shown that this shock has very big consequences for macroeconomic stability. In the consumer price index of the observed countries, the fuel prices participate with a significant share, which imposes the conclusion that any change in fuel prices significantly affects inflation, for the reason of which fact these shocks have to be under special monitoring of the central bank.

In addition to electricity and fuel prices, gas prices can have a significant impact on supply macroeconomic stability. In EU developed countries, a large segment of industry uses gas as the main input, since this fuel has the status of an ecological fuel, and the effects of its use on the natural environment are significantly of a smaller size than those of other fuels. The largest number of the observed countries have more favorable gas prices compared to the EU27 average for households, which is the case with companies when the final price is observed.

The effects of the recent shocks on energy markets will certainly have significant consequences for macroeconomic stability. Their nature, the macroeconomic environment in which they take place, the accumulated macroeconomic problems that have been "under the radar" lately with the help of unconventional policies will be a challenging problem to solve. The problem caused by these shocks is that their complete neutralization is almost impossible, so economic policymakers will be given a choice among the priorities in a wide range of economic goals. In the macroeconomic policy field, the central bank plays the key role, which may partly mitigate the intensity of these shocks with certain monetary policy instruments. The key limitations of the research study relate to uncertainty in the movement of energy prices, which is a consequence of global trends, as well as the differences in the regulatory aspect of the energy market in the observed countries. Possible directions of future research refer to a broader analysis of the possibilities available to economic policymakers in the conditions of supply shocks.

ENDNOTES

1 In the total world energy consumption, the share of oil is about 37%.

2 Inflation in the United States, as well as all European countries, except Germany, recorded the double-digit rates that remained present even after the 1975 recovery.

3 The OPEC countries have 2/3 of the total oil reserves, producing about 40% of the total oil production, covering ½ of the world oil exports.

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HUMAN RESOURCE ACCOUNTING CONTRIBUTION TO THE PROFITABILITY OF NIGERIAN PUBLICLY TRADED CONGLOMERATE COMPANIES

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This study is aimed at evaluating the impact of human resource accounting for the profitability of Nigerian listed conglomerate companies. The secondary data used in the study were collected from the audited annual reports of the six conglomerate companies quoted on the Nigerian Stock Exchange in the period from the year 2010 to 2019. The panel regression technique was adapted for the purpose of the analysis of the collected data. The results show that the cost of staff training and staff development, changes in employees' salaries and post-employment benefits have a positive significant impact on the profitability of the Nigerian conglomerate companies. The study then concludes that human resource accounting positively contributes to the profitability of Nigerian conglomerate companies and provides the recommendations reading that Nigerian companies should invest more in their employee training and development.

Keywords: human resource accounting, training and development, salary, benefit, profitability

JEL Classification: E24, H83

INTRODUCTION

The widespread interest in globalization comes with a remarkable impact on the global competitive business environment. Every business organization has the aim to be a market leader, which comes together with being equipped in every single aspect of the modern-day business trend. The globalization of a company has to do with meeting the current standard of trends or patterns of business operations. Unless companies are capable of inventing these trends, they have to be fast in adopting them or otherwise they will be playing catch-up, simultaneously losing their market share. Currently, there is a shift in the business trend and every organization is trying to fit in in the trend. Perhaps the most challenging aspect of this business trend is the fact that, in today's corporate climate, value creation drivers have shifted from physical and monetary resources to human resources (Cuganesan, 2006). As a result of this shift, there is a present need for data about these drivers, as well as the evolution

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of human resource accounting (HRA) to have these needs met (Bokhari, Qureshi, Bashir & Hijzi, 2012).

Human resources have always been at the helm of entities' affairs. Resource planning, organization and coordination have always been the job performed by man. Every business decision on what to produce, who to produce for and how to produce something has to be made by a human. Therefore, there is always the need to have the best in class of human resources because every other business resource depends on the quality of the human input that is to be optimally utilized. To be the best requires both education and training, the experience that leads to development, and motivation in terms of remuneration and post-employment benefits. More recently, there has been an increased interest in information relating to the quality of the human resources of an organization. Hence the need for human resource accounting.

Both internal and external accounting information users can benefit from human resource accounting. The information HRA provides assists internal users, such as management, in deciding on human resource utilization, employment, and in promulgating decisions on training, promotion, transfers, and human capital retrenchment. It provides the basis to the physical resource planning in relation to human resources (HR) and surveilling the costs incurred for exerting an influence on worker's further schooling, training, and improvement and the advantages gained (in the form of productivity) by the organization, among other things. HRA also provides valuable information to external users (e.g. potential investors) for investment decision-making. HRA could be seen as an information system that provides users with financial information pertaining to the cost incurred in enhancing the quality of human resources and to how such quality relates with the company's other resources so as to improve the overall productivity and profitability in order to attain organizational goals.

HRA is beneficial in achieving the management's economic goals and could form the basis for the essential information for external users, such as investors, to make investment-related decisions. The incorporation of suitable human asset information in distributed fiscal statements would presumably offer monetary expressions more significant in anticipating future performance, which is the investor's major concern (Lal, 2019). However, human capital value to the company denotes the current value of all the future services expected the company's employees throughout their employment tenure (Flamholtz, 2012).

Although human capital valuation is gaining in popularity in contemporary time and although theories and techniques have been formulated for this sake, the largest number of companies in developing countries, such as Nigeria, still need to fit in in the trend. Most companies are only catching up with the trend investing in human resources and devising ways how to keep their employees motivated to increase their own productivity. These companies, however, have not fully realized the benefits of the trend. The conglomerate sector of the Nigerian Exchange Group is one of the largest sectors in terms of capitalization and one of the biggest employers of human resources in Nigeria. Therefore, there is the need to assess how companies have keyed into the global trend of human resource accounting and how it has influenced their performance. Nigeria is one of the leading economies in Africa and a likely world competitor. Therefore, it is necessary to evaluate how Nigerian companies are faring in global trends.

Despite companies' huge investments in human resources in recent times, the expected benefits have not been produced, though. These investments are taking away companies' capital and funds, thus causing a significant adverse effect on their profitability. Training and development results have for the most part not been transferred to companies' productivity, thereby leading to the waste of resources and a poor financial effect. Experience has shown that engaging the same and fewer workers to produce the same number of outputs or to meet certain productivity levels often leads to the stressing of the existing human resources, thereby leading to low productivity and a reduction in the financial result (Lal, 2019).

Moreover, it is quite unfortunate that most organizations have reduced their contributions to the defined employee benefit in favor of the defined contribution account, which lowers the benefits received by employees after their service period, thereby hindering the staff's morale by discouraging them from using their full strength towards production, thus leading to low productivity and low sales, and consequently leading to a poor financial result (Okwudili, 2015).

Relatively, there are a bulk of prior studies on the subject matter that are either extant or focused on some other sectors of the Nigerian market different from the conglomerate sector. Apart from this, their findings are inconclusive, which is because there are studies that found a positive impact, there are studies that found a negative impact, and there are, however, studies that found no significant impact at all. Therefore, there is the need to evaluate the aforementioned problem from the perspective of the conglomerate sector of the Nigerian stock market. The question of how the cost of staff training and development and the cost of change in employees' salaries and post-employment benefits affect the profitability of publicly traded conglomerate companies in Nigeria is yet to be answered. Hence the motivation for this research study.

Generally, this study is aimed at assessing the impact exerted by HRA on the profitability of Nigerian publicly traded conglomerate firms. However, the specific objectives are to:

- determine the extent of the influence of the cost of staff training and development on the profitability of the listed Nigerian conglomerates,
- assess the influence of the cost of salary change on the profitability of the listed conglomerates in Nigeria, and
- evaluate the impact of the cost of post-employment benefits on the profitability of the listed conglomerate firms in Nigeria.

Based on the foregoing research objectives, the following research hypotheses were formulated, reading:

H1: The cost of staff training and development significantly affects the profitability of the listed Nigerian conglomerates.

H2: The cost of salary change has a significant effect on the profitability of the publicly traded conglomerates in Nigeria.

H3: The cost of post-employment benefits significantly influences the profitability of the Nigerian listed conglomerate firms.

The impact of HRA on the profitability of the publicly traded conglomerate entities in Nigeria is examined in the study. This sector was chosen due to the greater strength the staff of the sector possesses and the sector's contribution to economic growth. The conglomerate sector of the Nigerian stock market is one of the biggest in terms of capitalization. For the reason of that fact, it is more likely to spend hugely on human resources because it needs them. The study covers the period from 2010 to 2019 due to the high volume of retrenchment recorded in different sectors of the Nigerian economy during said period.

The remainder of this study is divided into three parts in addition to the Introduction. The literature review is covered in Section Two. The methodology is explained in Section Three. Section Four is dedicated to data analysis, the discussion of the findings, the conclusion and the recommendation.

LITERATURE REVIEW

Human resource accounting and profitability

Human resources (HR) are the fundamental resources accessible to any business. This is the motivation behind the statement reading "our greatest assets are our people", recognized in the annual reports prepared by the largest number of companies (Enofe, Mgbame, Otuya & Ovie, 2013). S. Fajana (2016) focused on the way how HR had been perceived as one of the significant wellsprings of the upper hand according to the performance of many companies

in the contemporary economy. The private sector companies especially broadly differ and have zeroed in on human resources as having particular vital significance for the growth of the company. According to M. M. Kirfi and A. Abdullahi (2012), estimating the value of human resources helps management keep up with changes in the quantity and quality so that a balance can be achieved between required assets and available human resources.

Human resource accounting is becoming one of more essential aspects in an organization's success and the efficacy of its managers. As a result, it is critical that organizational reports should accurately provide the evidence that the entirety of the resources are so employed and produced to help the company achieve its goals. In L. Divinney, G. Richard, W. Yip and C. Johnson (2008) opinion, the following aspects of organizational outcomes are included financial (profits, ROA, and ROI), market performance (sales, a market share), and shareholder return (the total shareholder return, economic value added). In academics, whoever wants to learn more about any aspect of management should pay close attention to organizational performance. Results measuring is the concern of accounting. Customer satisfaction and a market share are the primary concerns of marketing. Productivity and the cost of operations are the main concerns of operations management. Personnel satisfaction and structural efficiency are the key concerns in organizational behavior. An MBA is concerned with organizational performance.

According to E. A. Odhong', S. Were and J. Omolo (2014), profitability refers to a company's ability to make a profit from all of its operations. They further add the fact that profitability refers to the money by which an entity's management setting may profitably use all of the company's and market's resources to maximize the profit. According to L. Harward and S. Upton (2012), profitability is the gauge of management efficiency that may be used to push firms towards better efficiency by presenting it as a major yardstick for assessing management efficiency.

In order to evaluate whether the standard level of performance has been met or not, the basic performance level can be examined by a variety of methods. In this study, a profit margin (PM) was employed to assess performance. These figures represent a firm's efficiency in employing its total assets, simultaneously maintaining the company's financial policy. It also provides information about the company's value added, which leads to better results. However, none of the studies has examined the employed profit margin to assess a conglomerate firm's performance. As a result, this research study includes a profit margin as a metric for measuring performance in order to improve the existing literature. A low net profit margin indicates that management is unable to effectively manage its activities. A higher ratio is preferable. A profit multiplied by 100 divided by sales equals a net profit margin.

The Cost of Training and Development and Performance

The expense on training and development improves employees' skills and the company's performance (Solkhe & Chaudhary, 2011). According to J. Rajashekharaiah (2014), training and development are also fascinating since they help to build and reequip a diversified workforce which helps to provide the numerous skills needed to maintain and improve the company's performance. I. H. S. Chow (2005) asserts that training and development are the most important aspects of human resource accounting. Formal training is a component of the training and development activities that help employees improve their skills and expand their knowledge beyond their current employment.

According to T. O. John (2016), training and development are the human resource skills that encompass both formal and informal knowledge outside the present positions for current employees. Employee performance is affected by the cost of training and development, which improves their skills, knowledge, behaviors, and dedication, as well as their decision-making when carrying out their

responsibilities (Moghaddam, Kakhaki & Pakdelan, 2014). In I. Shaira's (2012) opinion, country-specific differences influence keeping records of the cost of training and development, as well as anticipated differences and similarities in their magnitude. Adhering to R. Roslender, J. Stevenson and H. Kahn's (20006) opinion, it is a company's critical duty to offer an environment in which employees may complete their training.

Changes in Salary and Performance

Organizations have to identify the variables that motivate people to perform at their best. Employees are expected to be motivated by compensation increases in the form of annual bonuses on their basic income (Baughman, DiNardi & Holtz-Eakin, 2012). High earnings, the job status and working conditions, job security, promotion, and decent working circumstances should all be top motivators for employees. Organizational performance is frequently thought to have a positive impact on employees' emotional states as a result of compensation increases (Kelvin & Chin, 2018). Every firm must be able to determine the amount of the compensation provided to its employees in such a way that the lowest salary possibly meets their needs (Kanzunnudin, 2007). B. E. Okwudili (2015) advocated for the relevance of changes in wages in Nigeria, stating that compensation changes should not only be adequate, but they should also demonstrate some element of equity, which is especially true from the employees' point of view.

In a country like Nigeria, anything short of a good relationship and a fair wage can swiftly enrage employees. Wages and a pay are extremely important to many Nigerian workers. They are crucial because a worker's life and the life of their families become highly precarious without the sufficient amounts of such wages and pays. Changes in pays are the most stressed direct cash benefits by employees, for the reason of which fact the same take the central position in the scheme of things when labor rewards are taken into consideration (Falola, Ibidunni & Olokundun, 2014)

The Cost of Post-Employment Benefits and Performance

Most companies have shifted their defined benefit plans to defined contribution accounts, essentially transferring the financial risk of the post-employment benefits such as retirement to individual workers. Even when employees receive such benefits, the contributions paid by employers have grown increasingly limited, while employees' share of the cost has risen (Özutku, 2012). Employee benefits refer to any form of compensation provided by a company in exchange for the services provided by its employees (IAS 19). According to the source, the benefit is divided into a short-term employee benefit, the post-employment benefit for the termination of the employment contract, and equity participation as a type of compensation (Luchak & Gellatly, 2002). According to A. A. Luchak and I. R. Gellatly (2002), benefits are a diverse program that offers employees a variety of rewards in addition to their income or salaries. The post-employment perk has the potential to help the company's growth and profitability.

THEORETICAL BACKGROUND

Resource-Based Theory

This theory was proposed by Penrose in 1959. The resource-based theory of firms combines the strategic management concept and the organizational economics concept. A resource is a type of the production factor that is available to a firm, implying that it is managed by the firm despite the fact that the firm has no property rights to it. Firms earned a competitive edge by developing a value-creating and sustaining strategy that is difficult to copy and has no immediately substitutable alternatives (Barney, 1991). To achieve a competitive advantage, two requirements must be met. First, a company's resources have to be interchangeable with those of its competitors, and second, these resources have to be protected, i.e. they have to be difficult to obtain. Both independent and dependent variables are captured by this theory. As

an alternative, resource-based theory provides a way for a firm to examine its competitive advantages as a result of the resources it has at its disposal. A firm is conceptualized as a unique bundle of the productive resources used by managers in the firm's resource-based theory (Lockett & Wild, 2014). This theory's central premise implies that businesses can succeed if they can achieve and retain a competitive edge (Porter, 1985).

Human resource theory is relevant to this subject matter since it explains the necessity of staff training and development, employee growth moderation, and post-employment benefits for the development of an organization.

Empirical review

The effect of the HRM functions on the performance of the power-and-lighting firms of Nairobi's western region was investigated by A. E. Rose, A. Were and J. Omolo (2016). The research relies on the original data sources. The results reveal that the human resource recruitment and performance functions have a major impact on organizational performance, as seen in a reduction in power outages, higher revenue levels, and the expanded customer base of a power-and-lighting company in Nairobi's western region. The study also discovers that the human resource hourly functions rely on return-on-capital-employed (ROCE) and have a beneficial impact on the performance of the firms in order to ensure a consistent performance increment.

F. Batista Fontana and C. B. Macagnan (2013) also conducted a study on the Brazilian capital market, concluding that the insufficient reporting of human resource accounting information in financial statements would result in misrepresenting financial statements. Their findings also suggested that the HRA data could be crucial in making internal managerial decisions. Its metrics are useful in demonstrating the fact that investing in a business's human resources may pay off in a distance future.

Using a simple regression model, A. O. Akindehinde, P. E. Enyi and A. O. Olutokunbo (2016) explore the impact of human asset accounting on the performance of 18 publicly traded banks in Nigeria. The study's findings reveal that human asset accounting has a substantial impact on bank performance.

I. O. Ikpefan (2017) investigated the link between human capital accounting and microfinance bank performance in Nigeria. The information was gathered from a secondary source. Human capital development has a favorable and significant impact on the overall performance of Nigerian microfinance banks in terms of the salary, wages, staff training and development, indicating that it has a good and significant influence on the microfinance banks' survival and their overall performance.

U. L. Onyekwelu, B. C. Osisioma and U. B. Ugwuanyi (2015) evaluate the impact of HRA on the financial performance and market valuation of the four quoted banks in Nigeria. The data were analyzed using the percentage and chi-square statistical tests. The result shows that, when investments in human capital are treated as assets and capitalized, there is a significant increase in the bank's net worth, as against the current practice where investments in human resources are dealt with as ordinary revenue expenses, thereby leading to the gross undervaluation of banks' income statements and financial position statements.

M. Slavkovic, G. Pavlovic and M. Simic (2018) examined employee recruitment and its relationship with employee satisfaction and verifying the mediating role of the employer brand. Their survey covered as many as 180 companies. The result showed that there was a significant relationship established between human resource management activities and employee satisfaction.

In the republic of Serbia, B. Bogicevic Milikic (2020) focused on the conceptual framework for designing the human resource management architecture. She highlighted the application of new models to both intra- and inter-organizational designs, the use of six design elements in the human resource management construction and the importance of knowledge management.

Research gaps

Using the cost of training and development, salary changes, and post-employment benefit costs as proxies for human resource accounting and the profit margin as a proxy for profitability, the review of the literature revealed a lack of the comprehensive empirical literature that could highlight the impact of human resource accounting on organizational performance of the publicly traded conglomerate companies of Nigeria. This research study fills the vacuum in the current literature on human resources by combining the aforementioned HRA proxies as the variables in order to make contributions to the literature and the empirical evidence on the impact of human resource accounting on organizational performance in the period from 2010 to 2019.

This research study is focused on Nigerian conglomerate corporations. Furthermore, the study periods of the prior studies do not span five years. The current study employed a period of 10 years from 2010 to 2019, the data of which provided conclusive empirical evidence on the influence of HRA on the performance of publicly traded companies in Nigeria.

METHODOLOGY

Model Specification and Research Design

This study evaluates the nexus between HRA and the Nigerian quoted conglomerate companies' performance. I. O. Ikpefan's (2017) model was adopted and modified. The model was presented as follows:

$$S = a_0 + a_{ih} + U \quad (1)$$

The model of this study is I. O. Ikpefan's (2017) modified and extended model as the model did not incorporate some of the variables used in the present model.

The model of this study is written as:

$$PFT = f(HRA) \quad (2)$$

The model can be re-written as:

$$PFT = f(TDC, CSE, PEB) \quad (3)$$

The model can be written in an explicit form as:

$$PFT_{it} = \beta_0 + \beta_1 TDC_{it} + \beta_2 CSE_{it} + \beta_3 PEB_{it} + \varepsilon_{it} \quad (4)$$

where:

PFT = the profitability proxy with (*a* profit margin (PM)).

HRA = the human resource accounting proxy with (the cost of staff training and development (*TDC*), changes in employees' salaries (*CSE*), and a post-employment benefit (*PEB*).

α = the intercept of the models (the value assumed by the proxies for profitability when all the independent variables equal zero)

β_1 - β_3 = the parameters of the model to be estimated; they represent the slope of the model and measure the amount of change in the dependent variable caused by each independent variable.

$\mu_{it} = \varepsilon_{it} + \lambda_i$

ε_{it} = the stochastic error term

λ_i = the cross-sectional individual difference (the composite error)

The decision rule: the null hypothesis should be rejected if the P-value is at $a < 5\%$ significance level; otherwise, the same should be accepted.

The *a priori* expectation of this study is that β_1, β_2, and $\beta_3 > 0$.

Ex post facto research design is used in this study. Because the event has already occurred and the data have already been collected, it was impossible to either change or control them. The quantitative approach is employed in the study.

The conglomerate companies listed on the Nigerian Stock Exchange floor as of December 31, 2019, make up the study population. As of that date, the Nigerian Stock Exchange floor had six conglomerate

corporations listed. The population of the target sector is tiny. Hence the study uses the census sampling technique, making use of all the enterprises in the sector. As a result, the sample size for the study consists of all the six listed conglomerate businesses on the main board of the Nigerian Exchange Group as of December 31, 2019. The conglomerates include Chellarams PLC, John Holt PLC, SCOA Nigeria PLC, Transnational Corporation of Nigeria PLC, UACN PLC and Leventis Nigeria PLC.

Data Collection Procedure

The main data source for the study was the audited published annual financial statements of all the companies in the population. The secondary source of data was used because the data for all of the variables were found in the companies' audited annual reports and financial statements.

Data Analysis

For a systematic analysis of the data collected, both the descriptive and inferential statistical tools of analysis were employed. Panel regression analysis was the inferential statistics used. To estimate the specified models, this study employed the Fixed Effect Model (FEM) and Random Effect Model (REM) (i.e. the Error Composite Model) estimation techniques using the Hausman test. This was performed by doing a probability Breusch and Pagan Lagrangian multiplier test.

There are two variables in the study: the explained (dependent) variable and the explanatory (independent) variable. The dependent variable is the profitability represented by the profit margin of the firms included in the sample. The profit margin was measured as:

$$PM = \frac{Net\ Profit}{Turnover} \times 100$$

The independent variables, the human resource accounting proxy with (the cost of staff training and development (TDC), changes in employees' salaries (CSE) and the post-employment benefit (PEB)) were measured by the unit naira cost as follows:

$$TDC = \frac{Net\ Profit}{Turnover} \times 100$$

$$CSE = \frac{Net\ Profit}{Turnover} \times 100$$

$$PEB = \frac{Net\ Profit}{Turnover} \times 100$$

DATA PRESENTATION, INTERPRETATION AND ANALYSIS

Preliminary Analyses

The descriptive statistics (the means, the standard deviations, the maximum and the lowest values) of the explained and explanatory variables are presented in Table 1.

Table 1 The descriptive Statistics

Variables	N	Mean	Std Dev	Mini	Max
PM	60	0.1620	0.0847	-2.1242	1.3953
TDC	60	41698	23189	2900.0	460339
PEB	60	85523	12243	8774.0	563981
CSE	60	25147	12954	-49723	411478

Source: Authors

The dependent variable is the profitability proxy with the net profit margin (PM), whereas the independent variable is the human resource accounting proxy with the following variables: the costs of training and development (TDC), changes in employees' salaries (CSE), and the post-employment benefit (PEB) for the Nigerian conglomerate companies in the period from 2010 to 2019.

The table shows that the average value of the financial performance measured through the net profit margin is 0.1620, showing the result of the standard deviation

0.0847. The maximum and minimum values are 1.3953 and -2.1242, respectively, which implies that the standard deviation 0.0847 means a broad dispersion of the data from the mean value, showing moderate mean variations.

The average value of the cost of training and development of the companies included in the sample is ₦41698, with the minimum and maximum values ₦21698 and ₦460339, respectively, whereas the standard deviation is 23189, which reveals the presence of a moderate variation across the sampled firms. The average value of changes in the sampled firms' employees' salaries is ₦25147, with the minimum and maximum values ₦49723 and ₦411478, respectively, whereas the standard deviation is 12954 variations from the average value, which also reflects the presence of a moderate variation across the sampled firms. The average value of the post-employment benefit of the sampled companies is ₦85523, with the minimum and maximum values ₦8774 and ₦563981, respectively, whereas the standard deviation is 12243, which reflects the presence of a moderate variation across the sampled firms.

Table 2 accounts for the multicollinearity variance inflation factor for detecting a possible strong relationship between the independent variables, which violates the assumption estimation techniques.

Table 2 The multicollinearity test - the variance inflation factors

Variables	VIF
PEB	1.15
TDC	1.12
CSE	1.03

Source: Authors

The VIF shows which standard error is inflated due to the relationship between the dependent variables. As a general rule of thumb, the greater the value of the VIF, the more likely the occurrence of the multicollinearity problem. On the other hand, a VIF exceeding 5 calls for more examination. If a VIF exceeds 10, it suggests serious multicollinearity requiring correlation. D. N. Gujurati (2004) noted that the closer the inverse value of the VIF to zero, the higher the multicollinearity problem degree. The closer to 1, the higher the sign that the regressors are ha no multicollinearity problem. The result, however, shows that the value of the independent variables exceeds 1, for the reason of which fact it can be concluded that there is no multicollinearity (Table 3). In place of this, there is no multicollinearity issue among the explanatory variables within this model as all the VIFs are lower than 10. The VIF is inversely related to tolerance. The VIF represents a measure of the amount of multicollinearity in a multiple regression framework. Tolerance measures the scale of the predictability of the specified variable unexplained by the other predicted variables in the model.

Table 3 The Breusch-Pagan/Cook-Weisberg heteroscedasticity test

Variable	Chi^2	P-value
Model	1.74	0.2527

Source: Authors

If the error term variance of the different conservations differs in a model, it is said to be heteroskedastic. The Breusch-Pagan test was used in this study to see if there were any heteroskedasticity problems in the model. The null hypothesis reads that error variances are equal, as opposed to the alternative that the error variance is the multiplication function of one or more variables, as determined by the Breusch-Pagan test. The null hypothesis was rejected since the P-value (0.2527) was greater than the 5% significance level. As a result, there is no concern with heteroskedasticity in these models. This means that the differences between the independent variables are quite minor.

Hypotheses Testing: Regression Results

Table 4 shows the linear relationship between human resource accounting and the profitability of the Nigerian conglomerate firms. The table uses

Table 4 Human resource accounting and profitability

Variables	Net Profit Margin		
	Pooled OLS Model	Fixed-effect Model	Random-effect Model
Constant	0.6881 (0.539)	2.8467* (0.073)	0.6291 (0.537)
TDC	0.1894*** (0.000)	0.1550*** (0.000)	0.1984** (0.000)
CSE	0.1324*** (0.007)	0.0159** (0.041)	0.1324** (0.041)
PEB	0.0701** (0.014)	0.0497** (0.017)	0.0702** (0.019)
LEV	0.0444 (0.842)	0.1505 (0.509)	0.0881 (0.682)
F-stat	14.14*** (0.0000)	12.21*** (0.0000)	
Wald X^2			13.42*** (0.0037)
R-Square (R2)	0.5706	0.5695	0.5706
Error term (S.E)	0.0479	0.3659	0.4362
Hausman Test		26.55 (0.0000)	

Breusch and Pagan Lagrangian Multiplier Test

*, **, ***: denotes significance at the 10%, 5% and 1% levels, respectively

Brackets: denotes the P-value, while the value denotes the coefficients

Source: Authors

panel regression analysis to show the results of the pool OLS fixed-effect and random-effect models, as well as the results of the Breusch and Pagan Lagrangian multiplier test (the poolability test) and the Hausman test. The Hausman test was also used to determine which model was the best between the fixed-effect model and the random-effect model. The results obtained show that the fixed-effect model is the best, with the P-value (0.0000) lesser than the 5% significance threshold. Because a fixed effect is appropriate, there is no need to compute the Breusch and Pagan Lagrangian multiplier test.

The model's overall R-square (R2) determination coefficient suggests that the equation is appropriate with the independent variables accounting for 57% of the systematic variance in the net profit margin.

The study's first goal was to determine the signs and quantity of the cost of training and development (TDC) that had a positive and significant impact on the profitability of the Nigerian conglomerate enterprises, which is shown by the coefficient (0.1550) and the P-value (0.000), both being lower than the 5% significance level. The hypothesis one (H1) reading that the cost of staff training and development has a significant impact on the profitability of the Nigerian listed conglomerate companies is confirmed, which means that a 1% increase in the cost of training and development will result in a 15.5% increase in the profitability of the conglomerate firms in Nigeria.

Furthermore, the study's second goal, which was to determine the signs and amounts of changes in employees' salaries (CSE), was also accomplished, which means that it has a favorable and significant impact on the profitability of the Nigerian

conglomerate enterprises, which is evidenced by the coefficient (0.0159) and the P-value (0.041), both of which are lower than the 5% significance level. The hypothesis two (H2) that reads that change in the salary affects the profitability of the listed conglomerate companies in Nigeria is also confirmed, which means that a 1.59% increase in the profitability of the conglomerate companies in Nigeria will be made if there is a 1% increase in employees' salaries.

The study's third goal was also achieved by determining the signs and degree of the post-employment benefit (PEB), which has a favorable and significant impact on the profitability of the Nigerian conglomerate enterprises, which is accounted for by the coefficient (0.4497) and the P-value (0.017), both of which are lower than the 5% significance level. The hypothesis three (H3) reading that the post-employment benefit cost has a significant impact on the profitability of the listed conglomerate companies in Nigeria is confirmed.

Overall, the F-stat (12.21) with the P-value (0.0000) at the 5% significance level indicates that human resource accounting in the Nigerian conglomerates has a considerable impact on those conglomerates' profitability.

Findings Discussion

The findings reveal that the cost of training and development has a positive significant impact on the profitability of the Nigerian conglomerate firms, thus being similar to the finding obtained by I. Mohammed (2011); L. C. Micah, C. O. Ofurum and J. U. Ihendinihu (2012); A. O. Enofe *et al* (2013); R. G. Ahangar (2014); E. W. Ifurueze, E. Odesa and J. E. Ifurueze (2014); F. I. Suliat, S. A. Mahayam and P. Chander (2014); P. O. Okpako, E. N. Atube and O. H. Olufawoye (2014); I. O. Ikpefan (2017); and M. Slavkovic *et al* (2018), who all found a positive and significant relationship, on the one hand, but differing from that obtained by N. Bontis, N. Dragonetti, K. Jacobsen and G. Roos (2015), on the other. According to G. O. Ijeoma and K. Aionu (2013), the study shows no statistically significant relationship between the factors.

The data also reveal that changes in employees' salaries have a positive significant impact on the profitability of the Nigerian conglomerate firms, the result being similar to the finding obtained by R. G. Ahangar (2011); I. Mohammed (2011); L. C. Micah *et al* (2012); A. O. Enofe *et al* (2013); E. W. Ifurueze *et al* (2014); F. I. Suliat *et al* (2014); P. O. Okpako *et al* (2014) and I. O. Ikpefan (2017), and, who all found a positive and significant relationship, on the one hand, but differing from that obtained by N. Bontis *et al* (2015), on the other. According to G. O. Ijeoma and K. Aionu (2013), the study shows no statistically significant relationship between the factors. Behavioral theory, human capital theory, and resource-based theory are all supported by the findings.

Furthermore, it demonstrates the fact that post-employment benefits have a big favorable impact on the profitability of the Nigerian conglomerate enterprises, the result being similar to that obtained by R. G. Ahangar (2011); I. Mohammed (2011); L. C. Micah *et al* (2012); A. O. Enofe *et al* (2013); E. W. Ifurueze *et al* (2014); F. I. Sulait *et al* (2014); P. O. Okpako *et al* (2014) and I. O. Ikpefan (2017), who all found a positive and significant relationship, on the one hand, yet differing from that obtained by N. Bontis *et al* (2015), on the other. According to G. O. Ijeoma and K. Aionu (2013), the study shows no statistically significant relationship between the factors. Behavioral theory, human capital theory, and resource-based theory are all supported by the findings.

In general, the findings demonstrate that human resource accounting has a beneficial impact on the profitability of the Nigerian conglomerate enterprises, which is supported by D. I. Maditinos, A. A. Mandilas, T. Gstraunthaler and A. P. Alonso (2009); R. G. Ahangar (2011); I Mohammed (2011); L. C. Micah *et al* (2012); A. O. Enofe *et al* (2013); F. Batista Fontana and C. B. Macagnan (2013); F. I. Sulait *et al* (2014); P. O. Okpako *et al* (2014); E. W. Ifurueze *et al* (2014); G. O. Edom, E. U. Inah and E. S. Adanma (2015); U. L. Onyekwelu *et al* (2015); S. Saeed, S. Z. A. Rasid and R. Basiruddin (2016); A. O. Akindehinde *et al* (2016); I. O. Ikpefan (2017) and B. Bogicevic Milikic (2020), but not supported by G. O. Ijeoma and K. Aionu (2013), or N. Bontis *et al* (2015). The findings are also consistent with resource-based theories.

CONCLUSION

According to the research study, human resource accounting adds favorably to the profitability of the Nigerian conglomerate organizations. When the separate components of human resources (namely the cost of training and development, changes in employees' salaries/wages, and the post-employment benefit) are evaluated, it can be concluded that all the variables positively and significantly contribute to performance.

In terms of the coefficient sign denoting the impact of human resource accounting on the profitability of the Nigerian conglomerate companies, the result is positive, implying that all the variables are in agreement with the *a priori* expectations, further implying that there is a direct relationship between the dependent variables and the performance variables. The study's objectives were met by the sign and size of the coefficient of each single variable. The second objective highlighted in the study was also achieved. which shows that an increase in the profitability of the conglomerate companies in Nigeria will arise from an increase in employees' salaries. The result for the third objective reveals that an increase in the post-employment benefit will result in an increase in the profitability of Nigeria's conglomerate companies.

Behavioral theory, human capital theory, and resource-based theory are all supported by the findings. The study has contributed to the importance of investing in human resources through employee training, providing motivational incentives, improving salary packages and employee pension schemes. Overall, the three hypotheses (H1, H2, and H3) have all been confirmed.

The following recommendations were made based on the findings of this study:

- The Nigerian conglomerate enterprises should invest more in employee training and development, namely in seminars, workshops, and other events, so as to improve the quality of their workforce, which will boost those firms' productivity.
- The Nigerian conglomerate corporations should support upward salary reviews in order to boost employee morale and improve staff productivity, which will lead to increased profitability.
- To raise employee morale, the Nigerian conglomerate firms should make substantial contributions to their pension benefit schemes, which on its part will lead to increased staff productivity and increased profitability.

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SUCCESS FACTORS, TOOLS AND CONTROLLERS' TASKS IN CONDITIONS OF INTENSIVE DIGITALIZATION

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The main goal set by this paper is to identify the position of controlling and controllers in the practice of companies operating in the Republic of Serbia in the conditions of intensive digitalization. This research study is focused on understanding and the critical success factors of controlling, tools and the controller's tasks. The research study was conducted on a sample of 35 companies, and the respondents were employed in various controlling positions. In methodological terms, the analysis of the collected data included descriptive statistics, measuring the reliability and internal consistency of the variables (*Cronbach's alpha coefficient*) and conducting a nonparametric test (*Mann-Whitney's U test*). The results of the research study show that controlling is understood as multidimensional, most often professional support to management; that the controlling key success factor is the controller's expertise and competence; that the most important controlling tools are the budget, variance analysis and the short-term calculation of the results, and finally that one of the controller's basic tasks is reporting to management. The nonparametric test enabled the identification of statistically significant differences in the respondents' attitudes.

Keywords: controlling, management accounting, controller, digitalization

JEL Classification: M41, M49

INTRODUCTION

Emphasizing the importance of quality financial and nonfinancial reporting, as well as financial management, arises as a result of dynamic changes in the environment, globalization, global crises, digitalization and the other factors that complicate company management and make it complex. At the same time, directly and indirectly, there is increasing pressure on accountants, management accountants and controllers as the experts whose primary goal is to contribute to the achievement and maintenance of the results desired to be achieved by the company based on the "accounting understanding of the world" (Král & Šoljaková, 2014, 313). As early as in the 1980s, it became clear that those experts' positions and roles were changing. At the beginning of the XXIst century, changes are becoming even more intense. This is supported by research done in this area, which is gaining in breadth and depth, i.e. which includes some completely new dimensions, such as new technologies, new trends and the like

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(Burns & Baldvinsdottir, 2005; Järvenpää, 2007; Jack & Kholeif, 2008; Hyvönen, Järvinen & Pellinen, 2015). At the very beginnings of this progressive line of development, accountants predominantly perform traditional and routine tasks. They need to have the basic and traditional types of knowledge, skills and competencies in the accounting and finance fields. This basic knowledge has been constant throughout the development period, and there are the views that it is becoming even more important in the times of corporate scandals and crises (Scapens, Baldvinsdottir, Burns & Nørreklit, 2009). The demands of time and change have conditioned their constant upgrading, with the simultaneous change in accountants' positions, roles and tasks. As a result, the current moment indicates the fact that accountants on that line of development appear in the role of "business partners" (Vaivio & Kokko, 2006).

The emergence of business partners represents a completely new stage in the development of experts in the accounting, management accounting, controlling and financial management fields. The term *poslovni partneri* is the translation of the English term business partners. In order to avoid terminological and essential ambiguities, the fact that these are not a company's business partners in the traditional and literal meaning of the word should be noted. It is actually the term that indicates the new roles assigned to experts in the fields of accounting, management accounting, controlling and financial management. This new role implies that they become partners, associates and management advisors (business and management support associates). Therefore, the focus is on the new roles and partnership of accounting and financial experts with company management.

Understood in the above way, business partners' responsibilities include providing support to operations and strategic management (CIMA 2009; Burns, Warren & Oliveira, 2013), creating strategic information, actively participating in the decision-making process (Lambert & Sponem, 2012; Graham, Davey-Evans & Toon, 2012) and exerting an influence on the way management will use the created information (Weber, 2011). They deal with problem-solving, management control, future-oriented reporting, advising and assisting in the decision-making process (Roman, Roman, & Meier, 2014). Although not generally accepted, the mentioned and similar roles attributed to business partners are performed by management accountants or controllers (Král & Šoljaková, 2014). Although the term *kontroler* is not the happiest solution when the translation of the English term *controller* is concerned, it is very common in practice and in the literature. It should be noted that, in addition to the term *controller,* there are the following similar terms used in practice, namely a planner, analyst, financial analyst, advisor, sparring partner, and so on. That is the person responsible for planning, control and information (Roman *et al*, 2014).

The last and seemingly the strongest impulse to the evolution of these experts was given by the development of information and communication technologies (ICTs), i.e. by the digitalization process. As early as in 2003, an emphasis was placed on management accountants' new, far broader and future-oriented roles resulting from the ERP application (Scapens & Jazayeri, 2003). The ERP software automates routine accounting tasks and allows shifting the focus towards more demanding financial management (Newman & Westrup, 2005, 269). The ERP implementation causes changes in the structure of the time required for the performance of various tasks of management accounting and also allows the application of various advanced techniques and tools. The accountant's role in the controlling domain is becoming stronger and stronger, while the time required for the performance of routine tasks is being reduced (Malinić & Todorović, 2012). Digitization has reached incredible proportions, making the otherwise specific context of development even more complex.

In such a context, accompanied by the imbalance of theory and practice and a lack of relevant theoretical and empirical research, the question of the true essence of controlling and the controller's role as business partners arises. The whole situation is complicated by terminological specifics (controlling associates with control), the existence of the different definitions and concepts of controlling, the number and variety of tasks performed by controllers that evolve over

time, as well as the different organizational solutions of controlling in practice (Todorović & Jovanović, 2020). Bearing all the foregoing in mind, the main goal set in this paper implies the identification of the position of controlling and controllers in corporate practice in the Republic of Serbia in the conditions of intensive digitalization. The research study is focused on understanding and the critical success factors of controlling, tools and the controller's tasks. The research study was conducted on a sample of 35 companies, and the respondents were employed in various controlling positions.

The key contribution made by this research study reflects in the dissemination and supplementation of the knowledge of modern trends in the development of controlling (management accounting) and financial management, and the better understanding of the role of controlling in the digitalization context. The results of the empirical research study enable us to gain an insight into the development of modern controlling practice, i.e. into the controller's tasks and responsibilities, and the operational and strategic tools used by controllers. The research results concerning the key success factors of controlling can also be useful to practitioners in the controlling function implementation and improvement processes.

In addition to the Introduction and Conclusion, the paper is structured into the four sections. The first section presents the results of previous research studies. The second section refers to the questionnaire design, and the third section is dedicated to the explanation of the research methodology. The fourth section includes the analysis and discussion of the research results.

LITERATURE REVIEW

Controlling is the function that collects and analyzes business data, which are then made available to management in the form of various reports and serve as the decision-making basis. Thanks to their expertise in management accounting and financial management, controllers provide support and assistance in creating, analyzing, understanding and interpreting the information necessary for different levels of management (Burns *et al*, 2013). However, the role of controlling has evolved from information-oriented to management-oriented. Controllers are becoming advisors to, associates and partners of management in the implementation of numerous activities. Managers expect controllers to determine whether something is good or bad for the company, identify the problems that are a priority, and help them solve those problems (Breuer, Frumuşanu & Manciu, 2013).

Unlike the traditional management accountants who were primarily engaged in routine work, today's management accountants are acquiring new roles. The study entitled *Evolving Role of the Controller*, which included 567 respondents, of which 82% were controllers and 18% were accounting professionals, confirmed significant change in their roles over time (IMA, 2013). Controllers appear in the roles of business lawyers, business analysts, financial analysts and business partners who should add value to the decision-making process and be more management-oriented (Yazdifar & Tsamenyi, 2005; IMA, 2013). They represent internal consultants, advisors, and management partners (Scott & Irwin, 2009; Goretzki, Strauss & Weber, 2013, 49). As business partners, controllers (advanced management accountants) represent experts in the preparation, interpretation and use of a broad spectrum of information. Their task is to integrate information on different bases and from different perspectives and interpret the interrelationship between financial and nonfinancial performance measures as well. The information created by business partners is more direct, strategic, relevant, concise, focused, selectively selected, qualitative and quantitative, and integrated (financial and nonfinancial); as such, they are the basis of sound management decisions (Todorović and Janjić, 2021). The controller's focus shifts to the analysis and interpretation of information, the more intensive communication of company goals and potential ways to have those goals achieved with the departments involved in achieving goals and making decisions on the future business direction (Král & Šoljaková, 2014, 314). In addition to the focus on operational activities

and information, business partners need to be future-oriented and strategically important (Burns *et al*, 2014).

If the information described in this way represents outputs, then the question of inputs and the processes controllers need to implement logically arises. Making strides beyond the traditional framework of jobs, responsibilities, skills and tools is the key prerequisite for controllers to contribute to creating value for the organization (IMA & Deloitte's Center for Controllership, 2018). The realization of new roles and the provision of necessary information requires from the controller expertise, new knowledge and the application of various operational and strategic tools, such as the Balanced Scorecard (BSC) and Rolling Forecasting (IMA, 2013). One study found that more than 80% of the respondents believed that there were more pronounced requirements for controllers to apply strategic, forward thinking and strategic tools (IMA, 2013). Some of the tools of strategic management accounting, such as competitive accounting, strategic cost analysis, and strategic pricing as well, are gaining in importance (Guilding, Cravens & Tayles, 2000).

Analyses show that the controller's knowledge, skills and competencies evolve over time and that it is a continuous process. Professional controllers are essential and the controlling key success factor. Controlling success factors need to be identified and analyzed because the success of controlling depends on the successful management of those factors. In addition to the controller's expertise, the controlling success factors are also the management who are ready for change, the highly developed accounting function with the professional staff, as well as adequate solutions in the information and communication technologies (ICT) field (Očko & Švigir, 2009). One study identified the following factors which the improvement of controlling and the controller's position depends on: the controller's strategic orientation development, the use of modern ICTs, a better definition of the controller job description, understanding the importance of the accounting standards and overall accounting regulations, training and knowledge improvement (IMA & Deloitte's Center for Controllership, 2018).

How the said function is organizationally positioned can also be mentioned as a success factor. Although there are no universal solutions, the predominant attitude is that controlling should be positioned outside the existing hierarchy (management-executive functions) in the company (Očko & Švigir, 2009, 25; Král & Šoljaková, 2014, 317). Controlling should be viewed as an independent function positioned at the level of the company's central functions, directly next to the highest decision-making bodies and directly subordinate to the management of the company. Such an organizational solution ensures the uninterrupted flow of information throughout the organization and avoiding the problems caused by hierarchical relationships (Očko & Švigir, 2009, 25). In that case, the collection, processing and presentation of information are performed evenly and in a coordinated manner throughout the organization and towards all its hierarchical levels (Todorović and Janjić, 2021), which is a prerequisite for successful controlling.

Numerous studies (IMA, 2013) also deal with the quality of the information system and applied ICT tools as a precondition for the controller's successful work. An analysis of the responses of 800 accounting and finance experts suggests that the digital revolution is significantly affecting their jobs and tasks (IMA & Deloitte's Center for Controllership, 2018). Accelerated digitization is leading to the fundamental transformation of the accounting profession. Routine accounting is being automated, thanks to which fact accountants are absolved of routine work and data processing. In contrast, the activities that require experience, intuition, creativity and multidisciplinarity in execution are gaining in importance and, according to certain studies, they will become primary on the labor market (IGC, 2020). The application of integrated information systems (*Enterprise Resource Planning* - ERP), real-time data analysis and Business Intelligence (BI) is becoming commonplace in the controller's work. Industry 4.0, including the Internet of Things (IoT), the Internet of Services (IoS), Machine Learning, Robotics and Augmented Reality are also becoming a reality in the controller's work. Research has increasingly become focused on big data analytics and cloud computing (Zecevic, Radovic-Stojanovic & Cudan, 2019). The IGC

conducted a study indicating the application of the RPA applications (*Robotic Process Automation* - RPA) (IGC, 2020). In the literature, the term *number crunchers* is increasingly being associated with the controller, which in fact indicates a person, a professional whose job is to process a large amount of data and conduct various calculations. This is not possible without an appropriate ICT support. The fact is that digitalization is a new reality. Digital technologies should be seen as a factor of creating added value for organizations in a dynamic and uncertain business environment. However, ICT without qualified human resources and a supporting infrastructure is an investment loss (Stankic, Jovanovic-Gavrilovic & Soldic Aleksic, 2018). Hence, accounting and finance experts need to embrace digital technologies and improve their IT knowledge and competencies (SAIPA, 2019, 11; Demko-Rihter, 2021).

Concerning the controller's task, the fact that they are numerous, diverse and quite broad should be pointed out. J. Očko and A. Švigir (2009, 35) highlight the fact that the controller's key tasks include the preparation of information for decision-making, the monitoring and control of the implementation of decisions, counseling, encouragement and motivation, the coordination of management activities and so forth. The controller's tasks include support for the planning, control and information processes; cooperation in defining goals; support for the budget development and implementation; cost accounting and cost calculation; reporting and interpreting results; support for the operational and strategic planning processes; various forms of counseling; the identification of problems and problem solving, and so on (Osmanagić-Bedenik, 2007, 85; Todorović and Ljubisavljević, 2022).

The results of a research show that management accountants in the Republic of Serbia mostly carry out the following activities: performance analysis, the preparation of monthly reports and consulting. The activities of financial planning, performance control and continuous improvement are also significant (Parč, 2021). The results of this do not deviate from the results of similar studies (Wadan, Teuteberg, Bensberg & Buscher, 2019). Research in the development of controlling in the USA included 800 accounting professionals, and the results showed that the controllers had spent 69% of their working time on traditional tasks, such as the preparation of financial reports, the harmonization of reporting systems, closing processes on a weekly, monthly and annual bases, and so on. The rest of the working time was dedicated to solving the company's strategic problems (IMA & Deloitte's Center for Controllership, 2018).

According to a research study conducted in the Czech Republic, the controller's job is to provide information, budgeting at the strategic, tactical and operational levels, create forecasts, assessments and expectations (Král & Šoljaková, 2014). The authors of this research study point out the fact that controllers are coordinators (they implement the activities related to the company's goals and their implementation), expert planners (they prepare future scenarios for management), methodologists (they are responsible for determining the product cost and sales prices, costing, budgeting and the development of management accounting) and communicators (they are responsible for the transfer and dissemination of results to all management levels and other stakeholders as well) (Král & Šoljaková, 2014). It is clear that the controller's daily activities are a combination of traditional and strategy-oriented tasks (IMA & Deloitte's Center for Controllership, 2018). A balance needs to be established and maintained between them, which may be a challenge.

QUESTIONNAIRE DESIGN, DATA COLLECTION AND METHODOLOGY

In the organizational-methodological sense, the research included the creation of a research framework, the creation of the questionnaires and data collection, the analysis of the obtained data and drawing the conclusions of the paper (Figure 1).

Based on the analysis of the results presented in the previous research, a research framework was constructed, and a questionnaire was created. The questionnaire consisted of three groups of questions. The first group of questions was aimed at identifying the position of controlling in specific

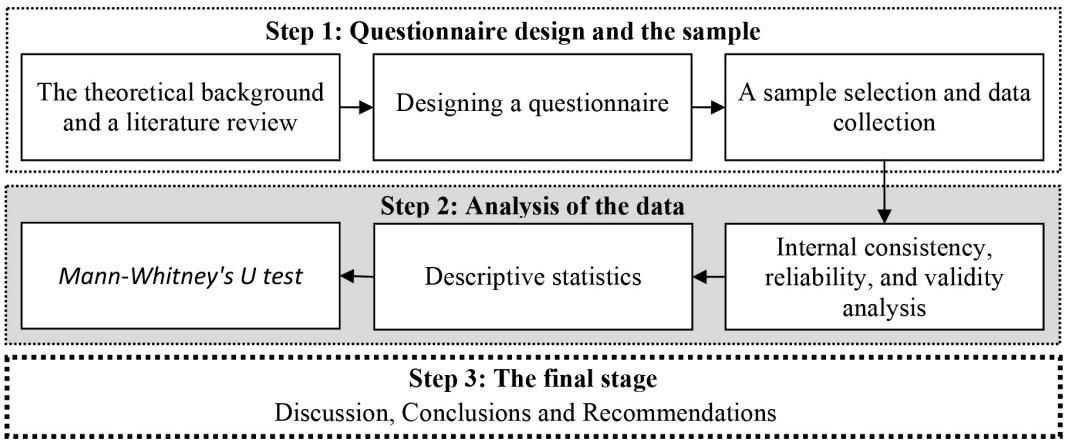

Figure 1 Research conducting

Source: Authors

companies, in which sense the following questions were asked, namely whether there was an organized controlling function or not, how long that function had been in place, how many employees there were, who was responsible for controlling, how it was organizationally positioned, how controlling was perceived in a particular company, and which IT tools the controllers used. The second group of questions referred to the identification of the respondents' attitudes towards controlling its essence (7 statements), success factors (8 statements), tools and responsibilities (9 statements) and the controller's tasks (14 statements). A five-point Likert scale was used (Jamieson, 2004). The respondents were offered responses ranging from 1 - strongly disagree to 5 - strongly agree. The third group of questions referred to the data about the respondents.

The data collection process was based on the questionnaire survey, directly, via email communication and on the basis of the web survey (*Google forms*). The target group were the companies of all sizes and of all legal forms that had organized controlling in their organizational structures in any organizational format (a department, a service, a function, etc.). The controllers, i.e. the persons who performed tasks in the controlling process, were interviewed. A total of 35 questionnaires were collected.

The data obtained from the questionnaire were analyzed in the Statistical Package for Social Sciences (SPSS, Version 20.0). The reliability and internal consistency of the variables were measured using Cronbach's alpha coefficient. Cronbach's alpha coefficient was 0.707. That result showed a relatively high level of internal consistency, and the good reliability and internal consistency of the measurement scale (Hair, Black, Babin & Anderson, 2009). The generally agreed lower limit for Cronbach's Alpha was 0.70, although it might fall to 0.60 in exploratory research (DeVellis, 2003).

Descriptive statistics were used to measure the central tendency (the arithmetic mean, the mode, the median) and variability (the standard deviation). Nonparametric Mann-Whitney's U test was also used with the aim of comparing the respondents' attitudes and the magnitude of the influence according to the Cohen criterion was analyzed (Gravatter & Wallnau, 2004).

THE SAMPLE

As has already been pointed out, a total of 35 questionnaires were collected, i.e. the questionnaires were filled out by the 35 persons (from 35 companies) employed in controlling. In 32 (or 91.40%) of the 35

companies having been subjected to analysis, there is an organized controlling function, service or department (hereinafter referred to as the function). In the companies that do not have an organized controlling function, the tasks in the controlling field are performed by the employees engaged in accounting and finance or, but in one case, by an external consultant. When the length of the controlling function in the analyzed companies is concerned, it is a relatively juvenile function, since it has only been in place for an average of 6.49 years. The sample included the companies with the controlling function that had been in place for only 1 year, and those with that function having been in place for almost two decades already. In as many as 57.14% of the cases (20 companies), the Head of Controlling is responsible for the controlling function; in 31.43% of the cases (11 companies) the Finance Head or the Finance Director is he who is responsible for that function, and in 8.57% of the cases there is a shared or joint responsibility of the person in charge for accounting or finance (Head of Accounting or Finance), and only in one case an external consultant is responsible.

The next question related to the organizational positioning of controlling. In 42.85% of the cases, the controlling function was positioned at the central level of the company, whereas in the remaining 57.14% of the cases different solutions were applied (decentralized organization, line organization, within a sector, etc.). The adequate organizational positioning of controlling is one of the prerequisites for its success (Král & Šoljaková, 2014, 317). This research indicated the fact that the positioning of controlling at the level of the central company functions was not significantly in place. Since controlling success had not been monitored or measured, it was not possible to say with certainty what the effects of the selected organizational solutions were. Future research should have this interdependence in focus. The analysis also shows that the average number of the controlling employees is 5.20; at least 1 and no more than 30 (at the level of one company group). Based on the prior analysis, it can be concluded that, there is an organized controlling function in the companies under observation, in about 42% of the cases this function is positioned at the company's central level, it is a relatively young function (about 6 years on average) with a relatively small number of employees (about 5 on average); in almost 60% of the cases, the responsibility of the Control Head for this function is defined.

Regarding how controlling is perceived and observed in a certain company, the respondents were offered 7 statements. The results of this analysis are shown in Figure 2. The respondents were allowed to choose one or more than one options.

As can be seen from Figure 2, the respondents consider that controlling is Professional support to management in 85.71% of the cases. This answer was not only chosen by 5 respondents. In the case of these five respondents, their first answer is Information support to management. A total of 54.28% of the respondents opted for this answer. It is important to point out the fact that 85.71% of the respondents

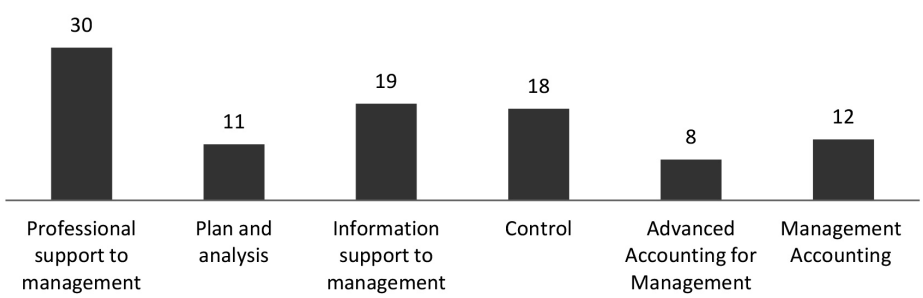

Figure 2 Understanding controlling in the analyzed companies

Source: Authors

opted for two or more answers. Only 5 respondents opted for one answer and in all the five cases it was the answer Professional support to management. The results show that the essence of controlling reflects in the various forms of support to management. The analysis also clearly shows that the respondents view controlling in a multidimensional way.

The last question was about the ICT tools used in controlling. The results of the answers to this question are shown in Figure 3. As the previous research has shown (IMA, 2013; IMA & Deloitte's Center for Controllership, 2018; IGC, 2020; Demko-Rihter, 2021), the use of different ICT tools is implied in controlling.

Most respondents opted for Excel and the ERP (Figure 3). The ERP has emerged as an answer to the continuously growing information needs of management (Malinić & Todorović, 2012). The ERP provided a rapid information flow, the minimum time of response to the requirements made by buyers and suppliers, better interactions with business partners, a higher quality of provided services, and an increased satisfaction of clients. The ERP provided better decision-making at all the levels, especially at the lower levels, an efficient control of the basic business functions, as well as strategic action planning. According to the respondents, the most commonly used ERP pieces of software are SAP, JAT (Oracle) and BAAN. Given the fact that not much information can be obtained directly from the ERP, it is necessary that Excel, BI and other tools should be used. The results of this research study are similar to those obtained in the previous research (Malinić & Todorović, 2012). About 45.71% of the respondents indicated that they used the mentioned tools. In a small number of the cases, the application of the *Bridge, Corporate Planner, SAP Analytic Cloud* and *Business Navigator* tools was identified.

At the end of the first group of questions, there were the questions about the respondents themselves. Concerning the age structure, 77.1% of the respondents are between 26 and 45 years of age, 14.3% are between 18 and 25 years of age, whereas only 8.6% of the respondents are over 46 years of age. Regarding the qualification structure, 32 respondents, i.e. 91.43% have higher education, 2 respondents have a college diploma, and 1 respondent has a secondary-school diploma. All the respondents are economists. The respondents' average work experience is 9.5 years. The results of the analysis show that the respondents are employed in the following positions: a financial controller, a controller, a controlling associate, a controlling director, a chief financial officer, a finance director and a deputy finance director, the head of the controlling department, the head of controlling, a sales controller, a senior controller, a financial analyst, the planning and controlling team leader and a project controller. Bearing in mind the respondents' age and qualification structure, the dimension of their experience, i.e. the length of their work experience, as well as the description of the jobs they perform (as indicated by their work positions), the sample (although smaller) can be considered as relevant from the point of view of the research objectives.

RESEARCH RESULTS ANALYSIS AND DISCUSSION

The central part of the research study related to the examination of the attitudes towards controlling, its essence (7 statements), success factors (8 statements), tools and the controller's responsibilities (9 statements) and the controller's tasks (14 statements). The questionnaire used to collect the primary data included as many as 38 statements. The respondents expressed a certain degree of agreement on the five-point Likert scale (1 - strongly disagree to 5 - strongly agree). Table 1 shows the descriptive analysis of the respondents' attitudes towards understanding controlling.

In Table 1, a total of the 7 statements sorted by the average level of the respondents' agreement with each of them are presented. The highest average score of 4.74 is given to the statement The controller should turn the accounting language into information usable and understandable to management. Also, the statement The controller is the right-hand man/woman of management with an average score of 4.69 highly ranks. The previous research also indicates

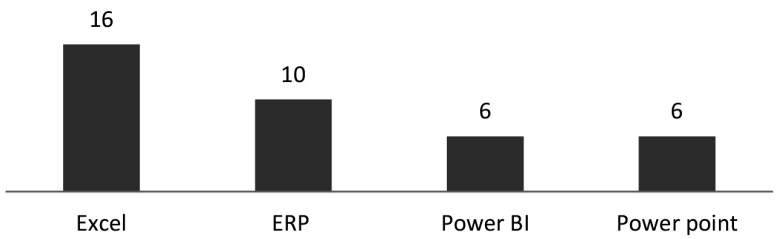

Figure 3 ICT controller tools

Source: Authors

the fact that the controller's key role is accounting information interpretation and decryption (Očko & Švigir, 2009, 12; Luković and Lebefromm, 2009, 29). Controllers should assist management in that they help management use accounting information. In fact, controllers should enable the establishment of a better connection between accounting and management. Therefore, it is not uncommon to find the view that controlling is the marketing of accounting (Blazek, Dehhle & Eiselmayer, 2014, 12).

The lowest average score of 3.46 is given to the statement The company's success primarily depends on the controlling implementation degree in the management process. When elaborating the results of the descriptive statistics, the values of the median and the mode should be taken into account. The value of the median in all the statements is either 4 or 5, while the most common score is 5; so, it can be concluded that the respondents attributed high importance to all the foregoing statements.

Table 2 shows the 8 statements that reflect some of the assumptions (factors) of controlling and controller success. The statements are sorted by the average level of the respondents' agreement with each of them. The highest average score of 4.74 is given to the statement The controller's expertise and competence are the assumptions of controlling and controller success The results of the other research also show the importance

Table 1 The descriptive analysis - the respondents' perceptions of controlling

Statements	Mean	Med.	Mod.	SD
The controller needs to turn the accounting language into information usable and understandable to management.	4.74	5	5	0.505
The controller is the "right-hand" man/woman of management.	4.69	5	5	0.583
The controlling processes are oriented towards the accomplishment of the goals, profit making, they are future-oriented and ensure long-term success.	4.57	5	5	0.815
Controlling includes planning, decentralization, defining responsibilities and the control of implementation.	4.43	5	5	0.778
Controlling is a subsystem of the management system.	4.37	4	5	0.731
Controlling should be viewed as an independent function at the level of the company's central functions.	4.20	4	5	0.933
The company's success primarily depends on the controlling implementation degree in the management process.	3.46	4	4	1.039

Note: Each statement was answered by 35 respondents.

Source: Authors

of hiring experts, continuous training and improving the controller's knowledge as the controlling success factor (Očko & Švigir, 2009; IMA & Deloitte's Center for Controllership, 2018).

The next most important is the statement The highly developed accounting function is the assumption of controlling and controller success, with a score of 4.71. Such a highly ranked statement on the importance of the accounting function is a completely logical outcome, bearing in mind the fact that the analysis showed that more than 50% of the respondents understood controlling as information support to management and that the accounting and information-oriented controlling concepts dominated in the analyzed companies. The lowest-rated statement is that reading The Management accept controlling philosophy, with a score of 4.06. Thus, all the statements that reflect the assumptions of controlling and controller success are rated with the average scores greater than 4. The value of the median in the statements is either 4 or 5, while the most common score is 5; so, it can be concluded that the respondents attributed great importance to all the statements. As many as five of the eight statements concern the relationship between management and controllers. In a fashion similar to the previous research studies (Osmanagić-Bedenik, 2007, 248; Očko & Švigir, 2009), the results of this research study show that the relationship between controllers and management is a controlling success factor. Their relationship must be a partnership and can be described as a relationship of cooperation and complementarity. It is based on teamwork, where each team member has his/her place and his/her role, i.e. he/she respects a contribution made by another team member.

Table 3 shows the descriptive analysis of the respondents' attitudes towards the controller's tools and responsibilities. Table 3 includes the 9 statements sorted by the average level of the respondents' agreement with each one of them. The highest average score of 4.57 is given to the statement The controller's tools are the budget, variance analysis, the short-term calculation of results. This result is in line with the previous research, since the controller can be described as an accountant responsible for planning, control and information (Roman *et al*, 2014). The second most important statement is The controller is knowledgeable of the operational and strategic controlling tools, with a score of 4.37. Research in the world (Guilding *et al*, 2000; IMA, 2013) especially emphasizes the application of strategic controlling tools, and the results of this research study show that the respondents in the analyzed companies are in a similar position. The lowest average grade of 1.63 is given to the statement the controller is the head of accounting, and the next lowest average score of 2.06 is given to the statement the controller is the director of the financial-accounting function. Such results are expected, logical and in accordance with the results of the analysis conducted in the sample description section, which showed that, in the largest number

Table 2 The descriptive analysis - the critical success factors

Statements	Mean	Med.	Mod.	SD
The controller's expertise and competence	4.74	5	5	0.443
The highly developed accounting function	4.71	5	5	0.519
A quality information system in the company	4.63	5	5	0.690
A partnership between the controller and the manager	4.54	5	5	0.611
Interested and dedicated management	4.49	5	5	0.658
Management ready for change	4.40	4	5	0.651
The Management think like the controller	4.26	4	5	0.919
The Management accept controlling philosophy	4.06	4	4	0.906

Source: Authors

Table 3 The descriptive analysis - the tools and the controller's responsibilities

Statements	Mean	Med.	Mod.	SD
The controller's tools are the budget, variance analysis, the short-term calculation of results.	4.57	5	5	0.778
The controller is knowledgeable of the operational and strategic controlling tools.	4.37	4	4	0.731
The controller supports management in the accomplishment of the profit-oriented goals.	4.31	5	5	0.900
The controller solves problems, develops and applies new tools.	4.09	4	4	1.011
Reports and calculations are the controller's tools.	3.86	4	4	1.033
The controller deals with data accuracy and contributes to business realization.	3.74	4	4	1.238
Target costs, lean production and strategic control are the controller's tools.	3.60	4	3	1.143
The controller is the director of the financial-accounting function.	2.06	1	1	1.305
The controller is the head of accounting.	1.63	1	1	0.877

Source: Authors

of cases, controlling is managed by the Controlling Head. Concerning the controller's responsibilities, it can be concluded that the most valued statement is the controller supports management in the accomplishment of the profit-oriented goals, with a score of 4.31. The controller's and the manager's goals are almost identical, but they use different tools to achieve them as they do not have the same responsibilities. Managers are responsible for success, and controllers for its transparency (Osmanagić-Bedenik, 2007, 97).

Table 4 shows the descriptive analysis of the respondents' attitudes towards the controller's tasks. Table 4 includes the 14 statements that represent the controller's potential tasks and the statements are sorted by the average level of the respondents' agreement with each one of them. The highest average score of 4.86 is given to the task Management Reporting, and the second most important is The preparation of information for decision-making with a score of 4.83. Such results are expected if we bear in mind the fact that the largest number of the respondents understand controlling as professional and informational support to management. It can also be concluded that the accounting and information-oriented concepts of controlling dominate in the analyzed companies, i.e. the management-oriented controlling concept is not developed (Osmanagić-Bedenik, 2007, 81). This is evidenced by the average scores in the last two statements in Table 4. The lowest average score of 3.80 is given to the task Management activities coordination. The task Counseling, encouragement and motivation received an identical average score. These are simultaneously the only two tasks that predominantly belong to the management field and the only two tasks rated with the average scores lower than 4. Analogous to the results presented in Table 3 and in the controller's tasks, the statement Budgeting, variance analysis, proposing and monitoring the implementation of corrective measures is rated very high with a score of 4.80, which is the third most important task. The value of the median in the statements is either 4 or 5, while the most common score is 5; so, it can be concluded that all the respondents attribute relatively high importance to all the statements.

After the descriptive analysis, nonparametric Mann-Whitney's U test was conducted in order to examine the differences in the respondents' attitudes for all the four groups of statements (the perceptions, the critical success factors, the tools and responsibilities, the controller's tasks) shown in Tables 1 to 4. In order to identify the existence of a statistically significant

Table 4 The descriptive analysis - the controller's tasks

Statements	Mean	Med.	Mod.	SD
Management reporting	4.86	5	5	0.355
The preparation of information for decision-making	4.83	5	5	0.382
Budgeting, variance analysis, proposing and monitoring the implementation of corrective measures	4.80	5	5	0.473
The development and maintenance of control systems	4.74	5	5	0.505
Ensuring the transparency of the business results, finance, processes and strategies in a way that contributes to effectiveness	4.69	5	5	0.530
Goal setting, measurement (reporting), variance analysis and the implementation of corrective measures	4.66	5	5	0.482
The coordination of the sub-goals and plans in a holistic way and the creation of a future-oriented reporting system for the company as a whole	4.60	5	5	0.695
Monitoring and controlling the implementation of decisions	4.57	5	5	0.698
Defining the goals, planning and monitoring, so that decision-makers can act in accordance with the goals	4.49	5	5	0.612
Looking for the ways to reduce costs and reducing costs	4.46	5	5	0.852
Cost accounting and the product cost	4.40	5	5	0.976
Closing activities on a weekly, monthly and annual bases	4.09	4	5	1.040
Counseling, encouragement and motivation	3.80	4	4	0.933
The coordination of the management activities	3.80	4	4	0.994

Source: Authors

difference in the respondents' attitudes, the sample was divided according to the four criteria (variables):

- whether the controlling function was independent or not;
- how the controlling function was positioned - as the central function or not so;
- according to the time of controlling having been in place - up to 6 years and for longer than 6 years;
- according to the number of the employees engaged in controlling - up to 5 employees and more than 5 employees.

In the first group of the statements related to the respondents' perceptions of controlling, no statistically significant differences were identified in their attitudes according to every one of the four mentioned criteria.

In the second group of the statements (Table 2) related to the critical success factors, a statistically significant difference was identified in the respondents' attitudes in the case of using two criteria for dividing the sample, namely: there is or there is no independence of the controlling function and controlling is or is not the central function. First, the sample was divided according to the criterion of the independence of the controlling function. A statistically significant difference was identified in the respondents' attitudes ($U = 84.000$, $z = -1.989$, $p = 0.047$) in the statement The Management accept controlling philosophy (a large influence according to the Cohen criterion = 0.788). The respondents of the organizations with independent controlling functions believe to a greater extent that management should accept controlling philosophy and that this is a success factor. In the second step, the sample was divided according to how the controlling function was positioned, i.e. whether it was the central function or not. A statistically significant difference was identified in the attitudes between the two groups of the respondents ($U = 90.000$, $z = -2.176$, $p = 0.030$) in the identical statement The Management accept controlling philosophy (a large influence according

to the Cohen criterion = 0.843). The respondents in the companies where controlling is positioned as the central function believe to a greater extent that management should accept controlling philosophy and that this is a critical success factor.

It is interesting that the use of both previously mentioned sample division criteria resulted in the identification of a statistically significant difference in the attitudes in the same statement. The independent controlling function being in place and positioned at the central organizational level implies specific forms of responsibility, the Board's direct superiority and direct communication with the highest management levels. Therefore, the respondents are in both cases more aware of the need for the management to accept controlling philosophy and they are more aware of the importance of management support to the achievement of controlling success. The obtained result can be important and serve as guidelines and recommendations in the organizations where the controlling function is in the initial stages or at the lower levels of development.

In the third group of the statements (Table 3) related to the tools and the controller's responsibilities, a statistically significant difference was identified in the respondents' attitudes when the number of the engaged employees is in question (up to 5 or more than 5 employees are engaged in controlling) as a sample division criterion. The number of the employees is viewed as the factor that determines the scope and complexity of work, the decentralization level and the task division, as well as the controlling function development level. A statistically significant difference in the attitudes was identified in the two statements: Target costs, lean production and strategic control are the controller's tools: U = 53.500, z = -2.222, p = 0.026 (a high influence according to the Cohen criterion = 0.989) and the controller is knowledgeable of the strategic and operational control tools: U = 58.000, z = -2.072, p = 0.038 (a high influence according to the Cohen criterion = 0.896). In both cases, the second group of the respondents (from the organizations where the number of the employees exceeds 5) attributes more importance to the mentioned controller's tools.

The fourth group of the statements (Table 4) related to the controller's tasks also identified a statistically significant difference in the respondents' attitudes when the time of the controlling function having been in place criterion (i.e. the controlling function being in place for up to 6 years or for longer than 6 years) was used. The assumption was that the longer this function is in place, the higher level of its development is implied. A statistically significant difference in the attitudes was identified in only one statement. This is the statement related to the controller's tasks reading: The preparation of information for decision-making: U = 107.500, z = -2.169, p = 0.030 (a big influence according to the Cohen criterion = 0.737). The respondents from the companies in which the controlling function had been in place for a period up to 6 years assessed this task as more important compared to the other group of the respondents, where the controlling function had been in place for a longer period of time, and a higher level of its development was assumed.

The obtained results related to the third and fourth criteria are completely logical and the same can be interpreted by the level of the development of the controlling function. At the lower levels of the development of the controlling function (a shorter lifespan and fewer employees), the controllers are more involved in routine tasks and preparing information for decision-making. The controlling information role is also emphasized, and more traditional tools are used accordingly. The evolution of the controller's role towards navigators and innovators, i.e. the development of controlling, changes the controller's focus and tasks towards support, counseling, problem solving, orientation towards the future and strategies, i.e. a more significant application of new, operational and strategic tools (Blažek *et al*, 2014, 211).

CONCLUSION

In accordance with the subject and the set goal, a theoretical analysis was performed first; it was followed by an empirical analysis of how controlling, tools and the controller's tasks were understood and which critical success factors were needed for them.

The analysis was carried out through a survey of employees in the controlling field. The questionnaire was completed by 35 controlling employees. The context of the research study which consists of the digital environment provides opportunities to draw conclusions from a particular point of view. Digitization has reached incredible proportions and brought fundamental transformations of the accounting profession. As the previous research studies have demonstrated (IMA, 2013; IMA & Deloitte's Center for Controllership, 2018; IGC, 2020; Demko-Rihter, 2021), the application of various ICT tools is implied in controlling. This research study has confirmed the fact that the use of ICT tools is common in controlling and various ICT tools are used, from those traditional (such as Excel) to those more advanced (such as Power BI).

Based upon the performed analysis of the answers given by the 35 respondents, it can be concluded that a multidimensional understanding of controlling prevails. One of the most important results of the research study is that there is a multidimensional understanding of controlling. As many as 85.71% of the respondents chose two or more than two answers to understanding controlling. The two most common answers are, first, that controlling is professional support to management and, second, that controlling is information support to management. A deeper analysis of the respondents' perceptions of controlling is in accordance with the previously presented conclusions. The respondents predominantly believe that the controller needs to turn the accounting language into information usable and understandable to management. The results indicate that controlling is treated as a sub-function of the management function in the analyzed companies. Also, there is the predominance of the accounting and information-oriented controlling concepts in the analyzed companies. These concepts are essentially focused on the controlling information goals and connecting the management process and the information process. Controllers should provide an answer to the question how to use accounting information, i.e. they should enable accounting and finance not to be viewed as a "black box" (Očko & Švigir, 2009, 12; Luković and Lebefromm, 2009, 29). The results of the analysis regarding the tools and the controller's tasks also support these conclusions. The most important controller's tools are the budget, variance analysis and the short-term calculation of results. It is the group of traditional tools. However, the fact is that the second most important are controlling operational and strategic tools, which speaks in favor of the positive trends in the development of controlling in domestic practice. In the tasks field, the three highest ranked tasks are reporting to management, the preparation of information for decision-making and budgeting, variance analysis, the proposal and implementation of corrective measures.

This research study has significant theoretical and practical implications. The key theoretical implications reflect in the dissemination and supplementation of the knowledge of modern trends in the development of controlling (management accounting) and financial management. The research results can contribute to a better understanding of the essence of controlling and the controller's role. Concerning practical implications, it should be noted that a special part of the research study has dealt with the controlling key success factors. The results show that the most important prerequisite for controlling success is the controller's expertise and competence, which is similar to the results obtained in the previous research studies by (Očko & Švigir, 2009; IMA & Deloitte's Center for Controllership, 2018). In addition to the highly developed accounting function (Osmanagić-Bedenik, 2007, 248; Očko & Švigir, 2009), the results show that a partnership between the controller and management is a success factor, which may be important for the companies that are only just starting the controlling implementation process or are in the initial implementation stages. The point is that the adequate identification and management of critical success factors is essential for the implementation and improvement of controlling.

The results of the performed nonparametric testing also have significant practical implications. The fact that an independent controlling function is in place and that it is positioned at the central organizational level can be considered as a success factor of controlling, which can be an important guideline for companies in their organizational structuring

processes. Positive trends in the development of controlling in domestic practice have been identified, primarily in the direction of a greater application of various strategic and operational tools. Acquiring additional knowledge and skills is certainly a prerequisite for a further development of controlling practice.

Our research study has several limitations. The most important limitation is the sample size. Also, the sample includes the companies from only one country. Hence, the presented conclusions exclusively refer to the respondents. Increasing the sample size would allow the application of more advanced statistical methodology and may lead to different results. In future research, attention should be paid to measuring controlling success.

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DOES INCOME INFLUENCE RATIONAL DECISIONS?

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This study explores the impact of income on customer loyalty so as to verify whether consumer decision-making is bounded by rationality or not. The empirical findings show that income positively affects customer loyalty in choosing leisure parks. Specifically, high-income customers prefer to reduce the time cost of information collection. Therefore, they are more inclined to choose a specific resort or a leisure activity park of a particular brand rather than spend their time searching and planning for the most appropriate location of a leisure activity park. This result supports the notion that customers' consumption decisions are bounded by rationality, not for the purpose of making the optimal decision, but in order to pursue satisfying their own needs instead.

Keywords: income, rational decision, loyalty, bounded rationality, decision choices

JEL Classification: A10, D01, D12, D52

INTRODUCTION

This study explores whether income influences consumer rational behavior decisions in choosing a leisure activity location. According to the rational economic man hypothesis (Uzonwanne, 2016), consumers will make decisions to maximize their own utility under resource constraints. Because of incomplete pieces of information available to customers, however, they are easily affected by a past knowledge or past experiences in making their consumption decisions, as a consequence of which they are inclined to make decisions based on loyalty to or the convenience of choosing a specific brand rather than on the selection of a product offering the greatest utility, which all results in irrational decision-making (Pekovic & Rolland, 2020; Huang & Sudhir, 2021; Khan, Salamzadeh, Iqbal & Yang, 2022).

The traditional economy uses mathematical deduction as the method and takes complete rationality and self-interest as the basic assumptions (Gigerenzer, 2020; Giarlotta, Petralia & Watson, 2022). The so-called 'economic man' means that a human being's economic behavior will take the pursuit of the maximum profit or maximum satisfaction as the main decision-making

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goal (Uzonwanne, 2016). Another strand of literature related to behavioral economics documents that, in reality, a human being's economic behavior often systematically violates predictions made by these theories. Faced with this kind of problem, economists used to call it 'irrationality' or a 'puzzle' with theory (Güth, 2021; Hsee, Zeng, Li & Imas, 2021).

The prior literature has not reached a consensus on consumer behavior when making a decision on a leisure activity, which is the motivation for the current study to investigate whether a choice of a leisure park is more aligned with the phenomenon of the economic manor is more inclined towards behavior theory. This study takes Taiwan's leisure industry as an experiment, because the government's implementation of the five-workday week in Taiwan makes people have more leisure time and be more willing to participate in outdoor leisure activities in order to relieve the long-standing stress at work. A study by H. J. Chen, Y. S. Ting, Y. L. Hsu and C. C. Lu (2017) indicates that participation in leisure activities in Taiwan may help people release their emotions and restore their spirit, make them healthy and energetic, improve the quality of their lives, stimulate their intelligence, improve their efficiency and enjoy a happy life.

In Taiwan, there are many options for leisure activity parks, which often takes people a lot of time to collect information on and to plan for tourism and leisure activities. Consumers may not choose leisure activity parks based on the rational decision of the maximum utility. Therefore, this paper takes leisure activity parks as the research subject matter in order to explore whether income affects customer loyalty or not. In particular, this paper postulates that higher-income customers are more likely to be limited by the time cost of information collection and are more inclined to choose a specific location or brand of leisure activity parks rather than select a leisure activity park with the highest utility.

A positive correlation between income and customer loyalty is expected to be found in this paper, especially so among the high-income consumers who would demonstrate greater customer loyalty. In other words, under the cost of information search, high-income customers do not necessarily make decisions based on rationality but have higher customer loyalty to certain leisure park brands instead. In brief, the contribution made by this study reflects in its filling the gap of the research in the field of customer's consumption decisions and their economic rationality, especially since the existing papers have rarely explored the influence of income on rational decision-making because it is usually difficult to obtain data on residential income.

The remainder of the paper is structured as follows: Section 2 presents a literature review and the hypothesis development; Section 3 describes the research design; Section 4 displays the empirical outcomes and Section 5 provides the conclusions of the study.

LITERATURE REVIEW AND THE HYPOTHESIS DEVELOPMENT

Traditional economic theory emphasizes the fact that people are rational and that their decisions are based on how they will maximize their economic benefits after searching for perfect information necessary for them to make their decisions, namely the most appropriate decisions (Uzonwanne, 2016). In reality, however, C. K. Hsee *et al* (2021) and W. Güth (2021) indicate that there are in fact more phenomena showing that the conditions of the economic man may not be in proper agreement with facts since a human being's economic behavior is not only affected by environmental 'economic factors', but it is also influenced by a human being's 'emotional factors'.

Scholars first studied the bounded rationality of behavioral decision-making. The bounded rationality concept mainly originated from the rationality of the economic man, which was put forward by H. A. Simon, the Nobel Prize winner in economics in 1978, whose concept suggests that bounded rationality means that people make decisions based on limited information. Therefore, when a person makes a decision, it is not the best result they are pursuing, but the satisficing conclusion instead.

H. A. Simon (2000) proposed bounded rationality and customer satisfaction theory, arguing that the majority of people on the market could not make the most appropriate decision. Instead, they make decisions based on limited information. G. Gigerenzer (2020) also mentioned that, according to economists, the so-called pure rational decision-making method pursuing the maximum utility may not exist. Consequently, people do not often make a utility maximizing decision, but a 'satisficing' decision instead. Moreover, A. Giarlotta, A. Petralia and S. Watson (2022) suggest that a rational decision is rare and emphasize the fact that the environment in which a decision-maker is located has a big (but predictable) influence on the decision-maker's behavior. This study of ours attempts to examine whether Taiwanese consumers demonstrate a rational behavior or a more emotional behavior in selecting a leisure park (resort) when searching for their holiday location.

What would be the reason lying behind the emotional purchasing behavior of the consumer? This study proposes customer loyalty as the key factor in the leisure industry. Another strand of literature related to this study refers to customer loyalty. Customer loyalty implies that consumers adhere to their choice due to the conversion of commercial marketing methods (Gremler, Van Vaerenbergh, Brüggen & Gwinner, 2020; Rita and Okorie, 2022). O. Iglesias, S. Markovic, M. Bagherzadeh and J. J. Singh (2020) point out the fact that consumer loyalty is achieved in a repeated purchase behavior. S. Pekovic and S. Rolland (2020) suggest that customer loyalty is significantly affected by one's past consumption experience. M. Kocic and K. Radakovic (2019) document that a firm should enhance its customer relationship management, whereas G. Huang and K. Sudhir (2021) and R. U. Khan *et al* (2022) suggest that customer satisfaction forms customer loyalty, hence leading to a better reputation of the firm.

The income factor is one of the key factors that determine a decision made by a consumer (Vilkaite-Vaitone & Skackauskiene, 2020). The income effect implies that, when real income increases, the real purchasing power for a commodity also increases, resulting in the growth of demand for the commodity (Nanda & Banerjee, 2021). K. W. Clements and J. Si (2018) point out the fact that increasing income leads to consumers seeking for a high-quality consumption and fewer budgetary constraints allow more substitutes-in-consumption (Nguyen, Tran & Tran, 2020), which may lead to change in consumption preferences. Therefore, it is difficult for the rational decision-making model to exist in reality in human society. Instead, decision-making is also driven by an emotional factor, such as customer loyalty. Scholars such as H. A. Simon, V. Smith, and K. Kahneman, replace complete rationality with bounded rationality, and advocate replacing the optimal with satisfactory (Gigerenzer, 2020). H. Ren and T. Huang (2018) and Y. Song, X. Zhao, W. Zhu and Y. Chen (2019) also suggest that bonded rationality is common, the basic point or the important concept of this theoretical decision-making model lying in the factors affecting the decision-maker's misbehavior, including the decision-maker's limited ability, incomplete information, a tendency to simplify problems and situations, susceptibility to past knowledge or past experiences, subjection to the influence of the order of the information obtained, often replacing a correct piece of information with approximate information, usually making intuition-based decisions.

Therefore, our study postulates that higher-income customers are more likely to be limited by the time cost of information collection (bounded rationality) and that they are more inclined to choose a specific location or a specific brand of leisure activity parks (the tendency to simplify problems and situations, susceptibility to past knowledge or past experiences), rather than select a leisure activity park with the optimal utility. In other words, under the cost of information search, high-income customers will choose accepted leisure parks according to their past knowledge or experience, which results in greater customer loyalty. Thus, the following is hypothesized:

H: Income is positively correlated with customer loyalty according to bounded rationality theory, people do not often make a utility maximizing decision and they will make a limited-information-based 'satisficing decision'.

RESEARCH DESIGN

Data source - the questionnaire design

The pre-test questionnaire designed in this study is divided into the four parts: Part 1 is dedicated with the learning incentive and the leisure incentive; Part 2 is about travel satisfaction; Part 3 deals with customer loyalty, and Part 4 is the basic personal information. The items of each dimension in the questionnaire were designed according to the research study by C. R. Liu, T. C. Wu, P. H. Yeh and S. P. Chen (2015), and H. Jiang and Y. Zhang (2016). The detailed questionnaire items of Part 1, Part 2, and Part 3 can be found in the Appendix, whereas the Part 4 items related to the personal information are of a confidential nature. There are 30 items in total in the questionnaire. The people who participate in leisure activities and who look for a specific resort or leisure park location are included as respondents in the survey. The Summated Rating Scale method refers to the five-point Likert scale, and the respondents selected among 'strongly agree', 'agree', 'neutral', 'disagree', and 'strongly disagree' with the questionnaire items according to the preference degree with 5 points, 4 points, 3 points, 2 points, and 1 point assigned to each of the above options, respectively.

Customer loyalty refers to repeated consumption and making a recommendation for a particular leisure park to others according to a past purchasing experience. Furthermore, the customer will have a long-lasting degree of preference for this particular leisure experience, and they are even not attracted by the competitor's marketing activities. A. Rasool, F. A. Shah and N. Tanveer (2021) also show that customer loyalty is related to a past purchase experience. Consumer loyalty is classified into two parts in this study: the one is 'repeated consumption intention', which refers to the consumer's repeated purchasing behavior meaning their revisiting a leisure spot, and the other is the 'past-purchase intention', which refers to the consumer's intention to recommend the leisure park they have already visited.

The main subjects of this study are the urban residents of the Taoyuan County in Taiwan. The questionnaire survey method used implies the distribution of the questionnaire to the people who have an experience of visiting a leisure park. The implementation period was from January 5 to February 4, 2022. As many as 350 copies of the questionnaire were distributed and 341 copies were recovered, with a questionnaire recovery rate of 97.42%. Those questionnaires with incomplete answers, omissions or repeatedly selected answers, or randomly answered questions were classified as invalid questionnaires. After 15 invalid questionnaires had been deducted, 326 valid questionnaires remained, with the recovery rate of the valid questionnaires 93.14%.

Factor analysis

After the results of each question of the questionnaire had been collected, factor analysis was carried out to extract the main factors. Then, the orthogonal rotation axis was carried out with the maximum variance rotation (Varimax) so as to extract the important factors. The arguments made by J. F. Hair, R. E. Anderson, R. L. Tatham and W. C. Black (1994) were the basis of the extraction criteria of various dimensions, with the eigenvalue greater than 1 as the criterion for the selection of a number of factors. The maximum variance axis rotation method was adopted then. The absolute value of the factor loading after the rotation must be greater than 0.5, the difference between the value of this factor loading and the values of the other factor loadings must be greater than 0.3, and the above-mentioned criteria must be met so as to combine the variables of this factor. Finally, the variables were named according to the components of each factor.

This study used content validity and construct validity to test the validity of each scale. Factor analysis is carried out so as to simplify the factor structure and maximize the explanation of the total variation with the least common factors. The greater the value of the factor loading, the greater the importance of the item in the common factor, and the greater the construct validity. 'Principal component analysis' is used in the study in order to extract the common factor with the

eigenvalue greater than 1 and the greatest eigenvalue of the dimension factor as the representative of the dimension, and the axis is rotated with the maximum variance of the orthogonal axis.

H. F. Kaiser (1970) pointed out the fact that the KMO (Kaiser-Meyer-Olkin) coefficient was used to test the suitability of sampling and the judgment criterion of factor analysis implied that the value above 0.9 was excellent and above 0.6 was normal. The greater the value of the KMO index coefficient, the better the suitability of the factor analysis. In this study, the KMO coefficients of all the items in each one of the four dimensions are above 0.6, thus indicating the fact that the suitability of the factor analysis made in this study is above the level.

The reliability and validity concepts cannot be separated from the measurement as they are the sources of the measurement error. Reliability refers to the characteristics of the test scores, or the consistency or stability of the measurement results. This study used Cronbach's α coefficient to test for internal consistency. The greater the value of the α coefficient, the better internal consistency. The α (Alpha) coefficient was developed by L. J. Cronbach (1951) in order to perform reliability analysis on questionnaire data so as to check the structure and stability of the questionnaire itself. The acceptable Cronbach α value range exceeds 0.5.

Research model

In order to explore the influence income exerts on customer loyalty, a regression model was established as follows:

$$Loyalty_i = \beta_0 + \beta_1 Income_i + \beta_2 Learning_i + \beta_3 Leisure_i + \beta_4 Satisfication_i + \varepsilon_i$$

where *income* was measured by *personal income* and *household income*. *Personal income* is divided into six grades, including less than NT$ 300,000, 300,000-600,000, 610,000-1 million, 1.01 million-1.5 million, 1.51 million-2 million, and 2.01 million or more, assigned 1-6 points, respectively; *household income* is divided into less than NT$ 500,000, 500,000-1 million, 1.01 million-1.5 million, 1.51 million-2 million, 2.01 million-3 million, and 3.01 million and above that amount, assigned 1-6 points, respectively. In addition, *loyalty* means customer loyalty, *learning* refers to the learning incentive, *leisure* implies the leisure incentive, and *satisfaction* pertains to customer satisfaction.

All the variables, except for the income variable, are the values after the rotation axis of the principal component method of the factor analysis on the data collected from the questionnaire. If β_1 is a positive value, it means that income will positively affect customer loyalty - i.e. the higher the income, the greater customer loyalty, which is supportive of the fact that consumers are characterized by bounded rationality.

Previous studies show that a gender plays an important role in personal income (Roszkowski & Grable, 2010) and consumer behavior (Dang & Nguyen, 2021). N. I. M. Najib and N. Majid (2021) and J. Q. Cheong, S. Narayanan and J. L. Fernandez (2022) show that the income earned by male practitioners is on average higher than that earned by female practitioners.

P. K. Korgaonkar, D. Lund and B. Price (1985) indicate that female consumers demonstrate stronger repatronage behavior than male consumers. J. W. Gentry, M. Doering and T. V. O'Brien (1978) suggest that both male and female customers are different in their respective perceptions and their respective preference of goods and leisure activities. H. A. H. Dang and C. V. Nguyen (2021) examine the COVID-19 effect on customer behavior and show that women have a tendency to decrease their current consumption and increase savings after COVID-19. Moreover, S. Fournier (1998) concluded that interpersonal and brand relationships were stronger for women than for men.

The aforementioned studies imply that the effect of income on customer loyalty may be different between men and women. Therefore, another test was conducted in this study in order to ensure the robustness of the results. That is, this study further examines whether a gender would influence the relationship between income and customer loyalty in the 4.5 Robustness test.

EMPIRICAL RESULTS

Descriptive statistics

As many as 326 valid questionnaires collected during the conducting of this study were analyzed using descriptive statistical methods for the composition of the sample data so as to better understand the data characteristics. The respondents' basic data included eight questions of the gender, age, title, marital status, educational level, personal annual income, total annual family income, and place of residence in order to fully understand their distribution. The sample structure and the characteristics of the personnel sample were analyzed according to the distribution, as is shown in Table 1. The unemployed are classified into the 'housekeeper'.

The preliminary analysis of income and customer loyalty

If the customer options of 4 points and 5 points are set as 'agree', then the agreement ratio of each age group to each customer loyalty question is shown in Table 2 and Table 3. In terms of personal annual income, among the 12 respondents with personal annual income exceeding 2.01 million, nearly 89% of them agreed with customer loyalty, whereas only 82% of those with annual income below 300,000 agreed with customer loyalty. For those with the annual income of 610,000 to 2 million, more than 90% agreed with customer loyalty. The household income results of Table 3 are also similar. Among the group with the annual income of 1.51 million to 3 million, over 90% agreed with customer loyalty. This preliminary result shows that the groups with upper-to-middle annual income demonstrate greater customer loyalty.

Factor analysis and the scale reliability analysis

After the reliability analysis of the questionnaire and the question items with bad values had been removed, the questionnaire was divided into the four major dimensions. The first, i.e. the learning incentive, implies visiting a leisure park for the purpose of learning. The second, i.e. the leisure incentive, implies visiting a leisure spot for the purpose of relaxing and releasing the pressure. The third, i.e. customer satisfaction, means visiting a leisure park for the satisfaction of the environment, the service and the facility. The last fourth, i.e. travel loyalty, means the intention to re-visit a leisure park or recommend a leisure park to other friends.

Overall, after the reliability analysis of the scale had been carried out, the Cronbach α values of each dimension in the study were all above 0.7. Moreover, the KMO coefficients of all the items were greater than 0.6, indicating that the questionnaire had good internal consistency, as is shown in Table 4.

Regression empirical results

In order to verify whether income affects customer loyalty when choosing leisure parks or not, the regression results are accounted for in Table 5. The table shows that the regression coefficient of the income is positive and has reached a significant level of 1% either in *personal income* or in *household income*. That is, when the learning incentive, the leisure incentive, and satisfaction are controlled, the higher the income of the customer, the greater customer loyalty (*loyalty*).

The regression results shown in Table 5 imply that the customers earning higher income are more likely to be limited by the time cost of information collection and more inclined to choose a leisure activity park of a specific location or a specific brand, rather than the leisure activity park with the greatest utility. The results thus support the fact that customers are bounded-rational rather than absolutely rational, which is consistent with the hypothesis of the study.

When the control variables are concerned, the leisure incentive (*leisure*) is positively correlated with customer loyalty (*loyalty*), which implies that relaxing the customer's mind and body plays an important role in determining their loyalty. In addition, customer satisfaction (*satisfaction*) had a positive impact on customer loyalty (*loyalty*), which means that, if a

Table 1 The respondent basic data

Basic data	Item	No. of the respondents	Percentage
Gender	Male	146	44.80%
	Female	180	55.20%
Age	Younger than 20 years of age	8	2.40%
	20-30 years old	56	17.20%
	31-40 years old	61	18.70%
	41-50 years old	106	32.50%
	51-60 years old	82	25.20%
	61 years old or older	13	4.00%
Job type	Housekeeper	82	25.10%
	Entry-level employee	45	13.80%
	Grassroots supervisor	68	20.90%
	Mid-level executive	86	26.40%
	Senior executive	25	7.70%
	General manager (deputy)	20	6.10%
Personal annual income	Less than 300,000	12	3.70%
	300,000-600,000	49	15.00%
	600,000-1000,000	158	48.50%
	1,000,000-1,500,000	77	23.60%
	1,510,000-2,000,000	18	5.50%
	Above 2,010,000	12	3.70%
Annual household income	Less than 500,000	0	0.00%
	500,000-1000,000	25	7.70%
	1,010,000-1,500,000	87	26.70%
	1,510,000-1,200,000	136	41.70%
	2,010,000-3000,000	63	19.30%
	Above 3,010,000	15	4.60%
Marital status	Married	206	63.20%
	Single	120	36.80%
Place of residence	The Taipei-Keelung metropolitan area	108	33.10%
	The Taoyuan-Hsinchu-Miaoli area	156	47.90%
	The Taichung-Changhua-Nantou area	17	5.20%
	The Yunlin-Chiayi-Tainan area	18	5.50%
	The Yilan-Hualien-Taitung area	25	7.70%
	Offshore island	2	0.60%
Educational level	Junior high school	6	1.80%
	Senior high/vocational school	93	28.50%
	Junior college	52	16.00%
	College	143	43.90%
	Graduate school or above	32	9.80%

Source: Authors

Table 2 The percentage of approval regarding customer loyalty by annual personal income

Personal Income	I will promote the advantages of leisure activity parks.	Customer loyalty in the leisure activity park focuses on the consumption quality.	After my experience, I think that leisure activity parks are worth being recommended to others.	I will take the initiative to recommend leisure activity parks to my relatives and friends.	I will take the initiative to recommend leisure activity parks to my colleagues.	When choosing a leisure activity park, I will give priority to this place.	Mean
<300,000	100.00%	75.00%	83.33%	66.66%	75.00%	91.66%	81.94%
300,000-600,000	87.75%	91.83%	85.71%	87.75%	91.83%	83.67%	88.09%
600,001-1,000,000	96.83%	100.00%	94.93%	93.67%	91.77%	94.93%	95.36%
1,000,001-1,500,000	94.80%	97.40%	96.10%	96.10%	92.20%	90.90%	94.58%
1,500,001-2,000,000	88.88%	100.00%	100.00%	94.44%	94.44%	88.88%	94.44%
>2,000,000	83.33%	100.00%	91.66%	91.66%	83.33%	83.33%	88.89%
Total	94.17%	97.23%	93.55%	92.33%	91.10%	91.41%	93.30%

Source: Authors

Table 3 The percentage of approval regarding customer loyalty by annual household income

Household Income	I will promote the advantages of leisure activity parks.	Customer loyalty in the leisure activity park focuses on the consumption quality.	After my experience, I think that leisure activity parks are worth being recommended to others.	I will take the initiative to recommend leisure activity parks to my relatives and friends.	I will take the initiative to recommend leisure activity parks to my colleagues.	When choosing a leisure activity park, I will give priority to this place.	Mean
500,001-1,000,000	96.00%	92.00%	88.00%	84.00%	80.00%	84.00%	87.33%
1,000,001-1,500,000	91.95%	95.40%	87.35%	89.65%	87.35%	91.95%	90.61%
1,500,001-2,000,000	97.79%	99.26%	94.11%	93.38%	92.64%	94.85%	95.34%
2,000,001-3,000,000	95.23%	96.82%	95.23%	92.06%	87.30%	93.65%	93.38%
>3,000,000	73.33%	100.00%	86.66%	80.00%	73.33%	93.33%	84.44%
Total	94.47%	97.23%	91.71%	90.79%	88.34%	92.94%	92.58%

Source: Authors

Table 4 The factor loadings and reliability

Item	Factor Loadings	Cronbach's α
Learning Incentive		
1.2	0.762	0.912
1.4	0.755	
1.5	0.743	
1.3	0.721	
1.6	0.712	
Leisure Incentive		
2.1	0.766	0.825
2.3	0.763	
2.4	0.748	
2.2	0.662	
Travel Satisfaction		
3.1	0.769	0.832
3.3	0.744	
3.2	0.735	
3.4	0.729	
Customer Loyalty		
4.4	0.823	0.882
4.5	0.808	
4.6	0.754	
4.1	0.739	
4.2	0.732	

Source: Authors

Table 5 The correlation between income and customer loyalty

Variable	Estimate	t	Estimate	t
Constant	0.768***	2.97	0.841***	2.76
Personal Income	0.293***	5.99		
Household Income			0.274***	4.45
Learning	0.066	1.33	0.042	0.78
Leisure	0.394*	1.79	0.315**	2.01
Satisfaction	0.203***	3.24	0.242***	2.95
Adj R^2	0.248		0.267	
N	326		326	

Note: All the variables, except for the 'income' variable, are the values after the rotation axis of the principal component method of the factor analysis on the data collected from the questionnaire. *, ** and *** denote the statistical significance at the levels of 10%, 5%, and 1%, respectively.

Source: Authors

leisure park can improve customer satisfaction, then it can further improve customer loyalty as well. The results are consistent with those of C. H. Wu and Y. F. Pao (2016) and G. Huang and K. Sudhir (2021).

Robustness test - the gender effect

The observations are further divided into the two groups based on their gender, and the regression of Equation is rerun. The results are reported in panels A and B of Table 6. Panel A shows the regression results for the men, while Panel B shows the regression results for the women. The table shows that the coefficient of *personal income* and *household income* is positively related to customer loyalty and has reached a significant level of 1%. The results presented in Table 6 are quantitatively consistent with those of Table 5, and again support our argument. Therefore, regardless of the male-female correlation, there is positive correlation between customer loyalty and the income level.

CONCLUSION

In modern society, the leisure activity is becoming one of the crucial parts of one's life after work. People also pay more attention to the quality and level of the satisfaction of the choice of a leisure spot. This study explores the influence of income on customer loyalty in order to verify whether consumers have bounded rationality or not. The study further investigates the customer's learning incentive and leisure incentive, travel satisfaction, customer loyalty, and their income range through a questionnaire survey, extracts the factors of each dimension through factor analysis, and ultimately tests the relationship between customer loyalty and the income level through regression analysis.

The findings of the empirical results of the research study show that, even after the learning incentive, the leisure incentive, and tourism satisfaction have been controlled, income still significantly and positively affects customer loyalty in choosing leisure parks. This result supports the hypothesis of the research

Table 6 The robustness test: The correlation between income and customer loyalty by different genders

Panel A Male				
Variable	Estimate	t	Estimate	t
Constant	0.513**	2.21	0.492**	2.08
Personal Income	0.421***	3.45		
Household Income			0.315**	2.26
Learning	0.132	0.78	0.025	0.63
Leisure	0.215*	1.81	0.361*	1.76
Satisfaction	0.164**	2.45	0.271***	3.02
Adj^2	0.224		0.263	
N	146		146	
Panel B Female				
Variable	Estimate	t	Estimate	t
Constant	0.615***	3.04	0.624***	2.89
Personal Income	0.315***	3.31		
Household Income			0.283***	3.65
Learning	0.046	1.26	0.036	0.96
Leisure	0.251**	2.03	0.395**	2.26
Satisfaction	0.316***	2.82	0.361***	3.26
Adj R^2	0.361		0.328	
N	180		180	

Note: All the variables, except for the 'income' variable, are the values after the rotation axis of the principal component method of the factor analysis on the data collected from the questionnaire. *, ** and *** denote the statistical significance at the levels of 10%, 5%, and 1%, respectively.

Source: Authors

study reading that the customer's consumption decisions are bounded by rationality, i.e. higher-income customers are more likely to be limited by the time cost of information collection and are more inclined to choose a specific location or a specific brand of leisure activity parks, rather than spend a lot of time searching and planning for the most appropriate leisure activity parks.

This empirical result is supportive of the bounded rationality concept highlighted in the previous literature by H. Ren and T. Huang (2018) and Y. Song *et al* (2019), G. Gigerenzer (2020). In addition, this research study also has management implications in that leisure activity parks should be paying more attention to the high-income customer's needs in order to improve the satisfaction of such customers, which generates more revenue in return.

Therefore, it is our suggestion that leisure park operators should focus on developing their business strategies related to consumer loyalty and bounded rationality decision-making from the perspective of personal income and travel satisfaction so as to reduce unnecessary waste and to better enhance consumer loyalty. This is expected to be potentially useful in managing leisure park business.

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APPENDIX

Table A1 The questionnaire items

The learning incentive
1.1 Leisure activities expose me to different types of people.
1.2 Leisure activities allow me to learn how to get along with others.
1.3 Leisure activities allow me to expand myself in different areas.
1.4 Leisure activities can increase my knowledge.
1.5 Sharing leisure activities experience with others can increase my knowledge.
1.6 Leisure activities can increase my thinking ability.
The leisure incentive
2.1 Leisure activities can make me feel happy.
2.2 The ample space for leisure activities allows me to relax.
2.3 Leisure activities give me a mental break.
2.4 Leisure activities relax my mind and body.
2.5 Leisure activities bring peace to my mind.
Travel satisfaction
3.1 I am satisfied that the environment in the leisure activity park is clean and tidy.
3.2 I am satisfied with the convenience of transportation for me to do leisure activities.
3.3 I am satisfied with the attitude of the service staff toward leisure activities.
3.4 I am satisfied with the facilities where I conduct leisure activities.
3.5 Leisure activities with unique views make me satisfied.
Customer loyalty
4.1 I will promote the advantages of leisure activity parks.
4.2 Customer loyalty in the leisure activity park focuses on the consumption quality.
4.3 After the experience, I think that leisure activity parks are worth being recommended to others.
4.4 I will take the initiative to recommend leisure activity parks to my relatives and friends.
4.5 I will take the initiative to recommend leisure activity parks to my colleagues.
4.6 When choosing a leisure activity park, I will give priority to this place.

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MANAGERIAL TACIT KNOWLEDGE TRANSFER: A POTENTIAL OUTCOME OF CROSS-BORDER MERGERS AND ACQUISITIONS IN THE GCC BANKING SECTOR

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This conceptual paper explores the potential relationship between a manager's contribution in sealing cross-border Merger and Acquisition (M&A) deals, on the one hand, and tacit knowledge transfer, on the other. The paper's basic premise posits that those managers are likely to be exposed to significant tacit knowledge flows as they participate in negotiating, making, and monitoring M&A transactions. The two M&A dimensions taken into account in the conceptual model given in this paper pertain to the number and value of M&A transactions coordinated or accomplished by the manager. Furthermore, there are several moderating factors said to influence the central assumption between the number/value of M&As and the extent of tacit knowledge transfer, i.e. the frequency of face-to-face meetings, the manager's cultural intelligence, the manager's international experience and the number of the languages spoken by the manager. The examination of the research propositions underlying the suggested research model is believed to have a particular importance for the banking sector in the Gulf countries wherein the M&A activity is ubiquitous.

Keywords: cross-border merger and acquisition, tacit knowledge transfer, GCC, banking sector

JEL Classification: F23, G34, M160

INTRODUCTION

Mergers and acquisitions (M&As) play a key role in today's world economy as it represents a rapid alternative for companies to expand their business operations and gain new markets locally or abroad (Savović, 2016). Cross-border acquisitions represent the primary mode of entry especially into developed countries (Herger & McCorriston, 2016). Cross-border M&As are done in the pursuit of different sorts of motives and goals. They may be done to overcome barriers to entry into foreign markets, to smooth learning processes and to create value (Shimizu,

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Hitt, Vaidyanath & Pisano, 2004). V. Tripathi and A. Lamba (2015) listed the top-ranked motives that drive cross-border M&As among Indian companies, namely improving the value chain activities, reducing manufacturing and labor costs, market leadership (i.e. the economies of scale, vertical integration, increasing a market share), gaining strategic resources from the target, and synergistic gains allowing fast entry into new markets. Several banks used M&As to achieve the significant business transformations that positively affected their competitiveness (Shakoor, Nawaz, Zulqarnain Asab & Khan, 2014; Ansari, Bilal, Khan & Tahir, 2021). Yet, it decreased shareholder wealth and banks' financial performance (Kayani, Javed, Majeed & Shaukat, 2013). To our knowledge, no study has focused on M&A implications for individual knowledge gains, especially so for bank managers.

The contemporary global business environment is based on the paradigm that views knowledge as an important commodity. In this paradigm, knowledge acquisition costs are considered as an important investment (Dženopoljac, Kwiatek, Dženopoljac & Bontis, 2021). Merger-and-acquisition strategies appear to be crucial for knowledge flows. During the last two decades, scholarship work has been showing mitigated results when the outcomes of acquisitions are concerned (Savović, 2016). Topping that, the study of M&As outcomes has largely been predominated by financial aspects in terms of the stock market reactions and company valuations. Nonetheless, intangible outcomes could also be derived from M&As (Hassan, Ghauri & Mayrhofer, 2018). For instance, M&As are usually driven by transferring vital business knowledge motives (Ranucci & Souder, 2015; Miśkiewicz, 2017). This holds true, specifically so in the case of technological acquisitions, which may serve as an important strategic tool for open innovation and the enhancement of the innovative capacity between the acquiring company and the acquired company. Furthermore, the ability of an acquiring company to embrace and transfer knowledge from the target company significantly affects its ability to develop sustainable competitive advantage (Savovic, Zlatanovic & Nikolic, 2021). Harnessing the linkages between M&As and knowledge management is likely to support the creation of competitive advantages for a combined entity (Kongpichayanond, 2009). The evidence of the M&A activity in the banking sector shows that the structural integration of human resource management practices between the target and the acquirer represents an opportunity for an effective knowledge transfer to occur - although this integration would go through a conflictual phase in the beginning (Gomes, Angwin, Peter & Mellahi, 2012). In this sense, this conceptual research study is aimed at arguing for the potential effects of cross-border M&As on managerial tacit knowledge transfer across acquiring and acquired firms. More specifically, this conceptual manuscript argues for M&As as a potential channel of tacit knowledge gains for the managers involved in the negotiation and completion of those transactions.

Although a large part of cross-border acquisitions still flows from developed countries (Herger & McCorriston, 2016), there is a surge in the number of the cross-border M&As originating from emerging economies (Khan, Rao-Nicholson, Akhtar & He, 2021). For instance, banks from Nigeria, Pakistan and Saudi Arabia have been quite active in doing M&As (Gomes *et al*, 2012; Al-Qudaiby & Khan, 2013; Ansari *et al*, 2021). Companies from emerging economies have actively been involved in cross-border M&As during the last few decades (Ma, Zhu & Cai, 2016). Asset-seeking acquisitions have become predominant among the companies coming from emerging economies investing in more developed countries, particularly so for the reason of the two motives - (a) gaining more capabilities that will strengthen the existing product portfolio (resource deepening) and/or (b) extending to the new business areas that may be distant from the current knowledge base (the resource extension) (Gubbi & Elango, 2016). B. Al-Qudaiby and M. R. Khan (2013), analyzed different cross-border mergers done by Saudi banks and their results indicated that those transactions had partly been aimed at acquiring specialist knowledge and the target bank's knowledge of the market.

In this regard, this paper particularly focuses on exploring the relationship between cross-border M&As and managerial tacit knowledge transfer in the

Gulf Cooperation Council (GCC) banks. Companies from emerging economies have increased their international expansion through acquisitions abroad as this international market entry mode enables them to overcome the impediments implied by the home-country institutional image. Those M&As are facilitated by the cumulation of inward international experience through cooperation with foreign firms and the selection of target markets with similar institutional environments (He and Zhang, 2018). The substantive reforms of financial liberalization and deregulation took place in the GCC countries in pursuit of a decreased dependence on oil and gas reserves (Elfeituri and Vergos, 2019). Multiple consolidation activities were completed in the GCC banking sector, particularly through cross-border M&As, those deals having been encouraged by the public authorities in response to the mounting fears of the incapacity of the financial institutions to meet the growing challenges caused by financial liberalization. As a matter of fact, the banking sector in the GCC region was characterized by the small size of its tenants. As a result, several GCC commercial banks opted for cross-border activities outside the GCC region (Gattoufi, Al-Muharrami & Shamas, 2014). The largest number of the M&As undertaken by the GCC banks were horizontal mergers and acquisitions (Gattoufi *et al*, 2014). That being said, the M&As done by the GCC banks deserve to be investigated with respect to their potential to enhance the acquisition of tacit knowledge by the managers in charge of the negotiation, conclusion and integration of those transactions. In the previous studies, the role of tacit knowledge in M&As were discussed from different perspectives. For example, R. A. Ranucci and D. Souder (2015) explored how tacit knowledge affected M&A implementation effectiveness.

The present manuscript is a conceptual paper aiming to provide a theoretical model underpinned by the research propositions derived from the contemporary relevant literature. The current paper utilizes the common types of research design in conceptual articles. The first type is theory synthesis, which intends to attain conceptual integration between theories. Then, theory adaptation is used in order to revise the current body of the literature and apply those to the M&A field. Finally, the model type of research design that strives for building a conceptual framework which will be able to foresee the nature of the relationships between different concepts is also applied herein (Jaakkola, 2020). The paper is organized as follows: a literature review on cross-border M&As is provided in the next section; the third section draws the conceptual model and details the underlying research propositions; ultimately, the conclusion highlights the main theoretical contributions made by the manuscript and outlines the future steps planned in the empirical phase of the present study.

LITERATURE REVIEW: THE OUTCOMES OF CROSS-BORDER M&AS

Cross-border M&As are defined as "those involving an acquirer firm and a target firm whose headquarters are located in different home countries" (Shimizu *et al*, 2004, 309). Several factors contributed to the growth of cross-border mergers and acquisitions, such as technological developments, globalization, the consolidation of industries, and privatization (Shimizu *et al*, 2004). Most cross-border acquisitions are achieved within the related sectors, whether through horizontal or vertical integration (Datta & Puia, 1995). The horizontal cross-border acquisitions achieved within an identical industry with no supply-chain bonds increase with the market size of both acquiring and target firms of the home country. The labor cost advantages, however, seem to encourage vertical acquisitions, wherein the acquirer and the target are related through the supply chain. The conglomerate acquisitions that do not involve either horizontal or vertical forms of acquisition are driven by the financial motives that revolve around purchasing undervalued companies (Herger & McCorriston, 2016).

The literature shows inconsistent results regarding post-acquisition effects (Savović, 2016). Some research studies focused on human aspects, such as human resource planning, training, and downsizing, in a fashion similar to that of K. Shimizu *et al* (2004). Other studies measured shareholders' wealth effects

in order to assess the performance outcomes of cross-border M&As (Datta & Puia, 1995; Eun, Kolodny & Scheraga, 1996; Gubbi & Elango, 2016; Ma *et al*, 2016; Wu, Yang, Yang & Lei, 2016). This method is referred to as the *event study* methodology. It assesses excess returns to shareholders around the day the acquisition is publicly announced. In this sense, excess returns are the difference between the realized return and the expected return, which in turn portrays the investors' evaluation of the impact of the cross-border acquisition on the acquiring firm. However, it was argued that the investors' evaluation of acquisition returns was not necessarily accurate, since managers might have different views of the long-term outcomes expected from the target's complementary assets (Datta & Puia, 1995).

S. Gattoufi *et al* (2014) used the operating performance approach, which consists of comparing performance ratios before and after an M&A transaction using accounting data. Their study also included the financial ratios related to cost reduction and a profit increase. The other approaches were also applied in measuring the impact of M&As. P. Morosini, S. Shane and H. Singh (1998) chose a two-year time span to assess the outcomes of cross-border acquisitions. They claim that the overall performance of M&As, as well as the results of the integration processes, crystallize after two years.

Consistent with internalization theory, cross-border M&As create value through the synergistic utilization of the target firm's intangible assets (Eun *et al*, 1996). Nonetheless, the performance outcomes of an M&A differ according to the motive pursued: deepening[1] or extending[2] resources. While resource-deepening yields positive effects on shareholder value, the performance outcomes of the resource-extension acquisitions made by the Indian firms in highly industrialized countries are marginal. The two conditions that positively moderate the results of this form of acquisition are the possession of the assimilative capacity (associated with higher research and development investment and export intensity) and the parent company's significant experience in doing M&As (Gubbi & Elango, 2016). Another study identified several factors affecting M&A results for acquirers, namely prior experience in using this entry mode, the percentage of the state ownership, and the size of the acquiring firm (Ma *et al*, 2016). In terms of the state ownership, another research study (Abidi, Antoun, Habibniya & Dzenopoljac, 2018) pointed to an interesting conclusion that relates to decisions on implementing cross-border acquisitions in the region of the Middle East and Northern Africa (MENA). The authors found that the firm size and its performance had a positive effect on the decision to expand within the MENA region, whereas the state ownership had an overall negative influence on this decision, meaning that the companies with a higher percentage of the state ownership were more reluctant to undertake a cross-border M&A in the first place.

P. Morosini *et al* (1998) demonstrated the fact that the national culture distance had a positive effect on the cross-border acquisition performance of the consolidated firm in terms of sales growth. The authors explained that effect by the fact that cross-border acquisitions allowed companies to tap into the organizational routines and practices which were bound to specific national cultures. Asset-seeking acquisitions exert a positive effect on the performance of Chinese firms. Cross-border M&As generate positive abnormal shareholder returns for Chinese acquirers. Because of their incapacity to enhance capability-building in China, assets-seeking M&As particularly in the West allow Chinese firms to gain complementary competencies. Those firms are not in pursuit of operational synergies or cost-reduction objectives. They seek the development of promising business endeavors and the acquisition of innovation capabilities to position themselves as prominent actors within their respective sectors. Wealth effects are positively influenced by research and development intensity and the acquirer's experience in doing outbound M&As. Also, a positive wealth effect is greater in the host countries recognized as more innovative and more developed business environments - R&D investment, intellectual property protection and product complexity (Wu *et al*, 2016).

Another stream of studies shows that cross-border M&As may yield adverse effects on the acquirer performance. Cross-border M&As have a negative effect on value creation for acquiring firms' shareholders in the short run (Ma *et al*, 2016). US

cross-border acquisitions did not create a positive wealth effect for shareholders. On the contrary, the cumulative excess returns that represented the deviation between realized and expected returns were negative. However, the shareholder wealth of the US acquiring firms tends to increase when the cultural distance with the target firm's country was shorter (Datta & Puia, 1995). Furthermore, the acquirer growth rate, the asset size and the ownership concentration exert a negative effect on shareholder returns, which is indicative of the fact that investors hold negative perceptions of the M&As done by growing companies in addition to those that are excessively large or concentrated in the hands of only few shareholders (Wu *et al*, 2016).

S. Gattoufi *et al* (2014) included seven ratios in order to analyze cross-border M&A effects, those ratios including a bank's profitability, solvency, efficiency, lending intensity and risk profile. On the one hand, the biggest number of the acquiring firms registered a lower-risk profile after the merger and lesser efficiency. The capitalization ratio decreased for all the acquiring banks. On the other hand, all the acquiring banks improved their loan loss provisions and lending capacity ratios. The return-on-equity ratio that measured M&A profitability improved for two out of three acquiring banks (Gattoufi *et al*, 2014). In their qualitative study built upon the analysis of the cross-border M&A done by the three large Brazilian firms, G. Mazon, F. Moreira-da-Silva, M. P. Ferreira and F. R. Serra (2017) concluded that the main motive observed was more related to the exploitation of the home-country-based capabilities into new foreign markets. Those companies were presumably less concerned about the exploration of new resources and capabilities from the M&A host countries.

RESEARCH MODEL AND PROPOSITIONS

In today's highly competitive business environment, M&As are increasingly being driven by strategic, rather than financial growth motives. Since knowledge is depicted as the most valuable strategic resource for contemporary organizations, knowledge management has become a central matter in M&As (Viskari, 2020). Although the knowledge transfer issue is extensively discussed in the literature (Ranft, 2006; Viskari, 2020; Xi, Wang & Zhu, 2020; Zhou, Fey & Yildiz, 2020), previous studies explored this topic from the point of view of the organizations involved. Therefore, less is said about M&A payoffs at the managerial level in terms of tacit knowledge gains. As a matter of fact, internal individual processes, such as intuition, personal skills, and abilities embody an individual's tacit knowledge. The latter is difficult to encode and transfer as explicit knowledge (Haldin-Herrgard, 2000). The main assumption of this manuscript is that cross-border M&As imply a significant amount of personal interaction between managers in acquiring firms and those in target/acquired firms. Hence it is likely that tacit knowledge sharing will be reinforced.

"Knowledge transfer and sharing in general is concerned with the effectiveness of knowledge management, which aims at organizing the generation of new knowledge and the transfer of the existing knowledge in a company. The goal of knowledge transfer is bringing together intellectual resources and making them available across the organization" (Dženopoljac, Alasadi, Zaim & Bontis, 2018, 3). Knowledge transfer is a decisive determinant of post-acquisition successful integration (Zhou *et al*, 2020). The evidence collected among a total of 51 American and Canadian banks shows that post-acquisition integration processes are conducive to the accumulation of tacit knowledge (Zollo, 1998). The research study shows that transferring managerial knowledge is challenging, especially so when this is the tacit knowledge bound to a specific cultural context (Park, 2010; Zhou & Huang, 2014). While managerial knowledge represents the routines and know-how necessary for smooth operation and the achievement of tasks (Park, 2010), tacit knowledge refers to the unarticulated and nonverbalized knowledge that stems from one's intuition (Polanyi, 1967). In more simple words, M. Polanyi (1967) portrays this construct as "we know more than we can tell." Tacit knowledge is the type of unwritten and noncodified knowledge learnt through personal observation, experience, and collaborative work (Nonaka & Takeuchi, 1995; Nonaka, Toyama & Nagata, 2000).

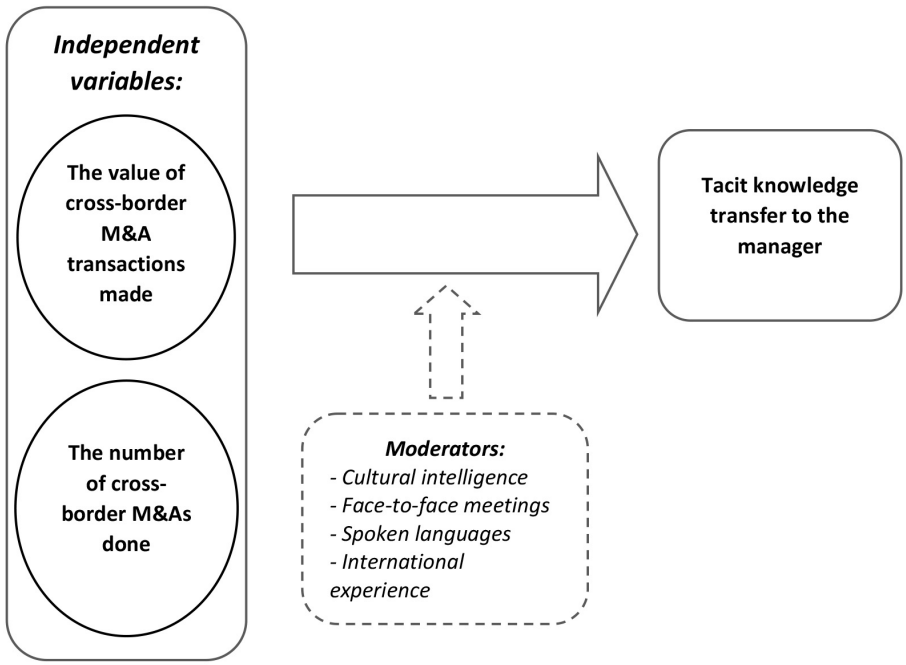

Figure 1 The research model

Source: Authors

According to Y. Zhou *et al* (2020), knowledge transfer depends on the recipient's absorptive capacity, which calls for the adoption of specific HRM practices. T. S. Cavusgil, R. J. Calantone and Y. Zhao (2003) demonstrated the fact that tacit knowledge transfer between managers and between technicians working for collaborating firms had a positive influence on a firm's innovation performance. They explained their results by the difficulty of transferring and deploying tacit knowledge beyond organizational boundaries. Therefore, the authors assumed that type of knowledge to be rare and inimitable by competitors. Indeed, I. Nonaka (1994) claims that tacit knowledge is context-bound. With regard to M&As in the banking sector, tacit knowledge transfer depends on the homogeneity of the past experiences of both entities (Zollo, 1998).

As illustrated above, previous studies largely discussed the knowledge-related issue in cross-border M&As from the point of view of knowledge integration/transfer between the acquiring firm and the acquired firm (Ranft, 2006; Viskari, 2020; Xi *et al*, 2020; Zhou *et al*, 2020). The knowledge integration capability mediates the influence of organizational unlearning on knowledge transfer in cross-border M&As (Xi *et al*, 2020). Also, effective knowledge transfer builds upon the existence of the social integration dynamics underpinned by the employees voluntarily striving to "accept, locate and apply" knowledge from the newly acquired entity (Viskari, 2020).

Hence, our first and central research proposition will focus on exploring the extent to which cross-border M&As help managers derive significant gains in terms of tacit knowledge. The idea here pertains to studying the effects of M&As in terms of the lifetime quantity of deals and the overall achieved deal value.

Research proposition 1: The number and value of cross-border M&A transactions made increase managerial tacit knowledge transfer.

In accordance with L. A. Joia and B. Lemos (2010) finding related to the determinant role of the

employee's idiosyncratic characteristics on tacit knowledge transfer with their peers, the model presented in this paper (Figure 1) argues for the four moderating variables into the core relationship between the number/value of M&As accomplished by a manager and the scope of the tacit knowledge they have gained. Those moderating variables comprise the cultural distance between the manager's national affiliation and the target's home country, face-to-face meetings, the number of the languages spoken by the manager, and their international experience.

CULTURAL INTELLIGENCE

The proposed conceptual model assumes that organizational culture could determine the intensity of tacit knowledge transfer for managers in the context of cross-border M&As. Although some research studies mainly focused on the effect of organizational culture on the quality of tacit knowledge sharing (Suppiah & Singh Sandhu, 2011), there are some other studies which revealed that the role of national culture was also paramount. For instance, D. P. Ford and Y. E. Chan (2003) claimed that linguistic and cross-cultural differences determined the direction of knowledge flows. R. Borges, M. Bernardi and R. Petrin, (2019) demonstrated the existence of significant differences in tacit knowledge sharing habits between Brazilian and Indonesian information technology workers. P. López-Sáez, J. Cruz-González, J. E. Navas-López and M. d M. Perona-Alfageme (2021) found that informal organizational integration was arguably moderated by the cross-national distance in its economic and administrative aspects. However, cultural intelligence helps expatriate managers in their knowledge transfer efforts as it is leveraged in knowledge de-codification and codification (Vlajčić, Caputo, Marzi & Dabić, 2019a). This factor is significantly crucial for the banks' managers who are constantly expected to enrich their cultural competence, notably through informal contacts (Capriglione & Casalino, 2014). A study conducted among 530 bank managers in India revealed that their cultural intelligence had a significant positive effect on their knowledge sharing behavior (Jyoti & Kour, 2015). Thus, cultural intelligence could be added as a parallel dimension along with the perception of the cultural distance. The evidence shows that cultural intelligence has a determining impact in knowledge transfer effectiveness, despite the fact that the geographic distance moderates this relationship (Vlajčić, Marzi, Caputo & Dabic, 2019b).

Research proposition 2: The manager's cultural intelligence is likely to moderate the relationship between the number/volume of cross-border M&A transactions and managerial tacit knowledge transfer.

Face-to-Face Meetings

Although tacit knowledge transfer is "desirable and difficult" in M&As within the high-tech sectors, strong communication and the retention of value-adding staff supports knowledge transfer between the acquirer and the target (Ranft, 2006). In an interfirm partnership setting, tacit knowledge transfer requires "close and frequent interactions" (Cavusgil *et al*, 2003, 7). Tacit knowledge transfer depends on opting for rich communication channels, such as personal (face-to-face) interaction. Rich communication media allow the feedback exchange and the close observation of routines and behavioral aspects, the nonverbal language being included (Haldin-Herrgard, 2000). For instance, the evidence shows that tacit knowledge transfer took place when the South Korean shipbuilder Hyundai Heavy Industries "brought" by sending expatriates abroad and using foreign managers from Scott Lithgow shipyards in Scotland (Tenold, Kang, Kim & Murphy, 2021).

In M&As done among banks, the use of rich communication channels allows the exchange of valuable information and the achievement of synergies (Ranft & Lord, 2002). Rich communication is also helpful in mitigating the effects that cultural differences may have on knowledge transfer between the negotiating parties (Gomes *et al*, 2012).

Nonetheless, it is only the information and communication technology (ICT) tools that enable user dialogue that seem to be supportive of tacit knowledge transfer (Castaneda & Toulson, 2021). This

idea is consistent with what I. Nonaka, P. Byosiere, C. C. Borucki and N. Konno (1994) refer to as the socialization process. It supposes that individuals harness tacit knowledge by observing and imitating others, especially when engaged in joint activities. Here, no language is necessarily used. Overall, it is postulated that transferring tacit knowledge to the managers involved in M&A processes is likely to be stimulated when interactions are more personal and (more) frequent. Direct observations and informal communication can accelerate the speed at which tacit knowledge will be shared between individuals.

Research proposition 3: The number of face-to-face meetings conducted in pre- and post-cross-border M&A transactions is likely to moderate the relationship between the number/volume of cross-border M&A transactions and managerial tacit knowledge transfer.

Spoken Languages

Speaking a common language or referring to similar business jargon used in the workplace supports tacit knowledge transfer between individuals (Joia & Lemos, 2010). Using a common language is important for tacit knowledge externalization. People will strive to find different means in order to communicate ambiguous notions by using a figurative meaning and symbols, in which sense the difficulty of transferring tacit knowledge through language is compounded when interlocutors do not have the same profession or background (Koskinen, Pihlanto & Vanharanta, 2003). Therefore, it is assumed in this paper that, when managers have sufficient mastery of different languages, they are likely to be enabled to understand different linguistic codes, although they may be dealing with representatives from different backgrounds. Senior managers in the GCC banking sectors are expected to be either bilingual (i.e. the expatriates who speak English in addition to their mother tongue, or the nationals who speak English in addition to Arabic), or multilingual (i.e. fluent in more than two languages). Few of them would be unilingual. Thus, the more languages a manager speaks fluently, the more they are expected to capture the tacit knowledge deeply rooted in their interlocuters' experiences. Mastering languages allows individuals to understand the highly personal conceptualizations of others which are usually difficult to communicate. In a recent study by D. I. Castaneda and P. Toulson (2021), the authors endorsed a language as the main tool for tacit knowledge exchange. They further emphasized the fact that organizations should invest in their employees' language skills in order to benefit, as a tacit knowledge exchange tool. E. Vaara, J. Tienari, R. Piekkari and R. Säntti (2005) examined the case of a cross-border merger between a Finnish bank and a Swedish bank, concluding that a manager's linguistic skills represented an empowering tool in their communication during a merger. They also argued for the existence of the relationship between those linguistic skills and the manager's professional competence that leads them to benefit from the social networks built throughout the merger.

Research proposition 4: The number of the languages spoken by the manager is likely to moderate the relationship between the number/volume of cross-border M&A transactions made and managerial tacit knowledge transfer to the manager.

International Experience

Senior managers' international experience is thought to be associated with more open-mindedness and a greater capacity to integrate insights from different cultures. Thus, senior managers' international experience is seen as a catalyst enabling multinational companies to successfully carry out their international expansion into new markets (Yi, Zhang, Zhan, Yan & Chen, 2021). Indeed, internationally experienced top executives may benefit from an expanded network of connections that enables them to capture a significant knowledge of overseas markets (Li, 2018). Therefore, it is expected that international experience will assist managers in effectively identifying and absorbing the most winning managerial practices when negotiating M&A deals. M. Rickley (2021) states that international experience is likely to ease knowledge sharing in multinational corporations, which enables employees to integrate a variety of perspectives. Bankers' cumulative experience in performing a variety of

tasks leads to greater productivity in the long run (Staats & Gino, 2012). In this vein, internationally experienced senior bank managers would be expected to show greater effectiveness in unlearning any core assumption gained through home-country practices in business. Consequently, they may have a greater exposure to new tacit knowledge sources when completing cross-border M&As:

Research proposition 5: A manager's international experience is likely to moderate the relationship between the number/volume of cross-border M&A transactions made and managerial tacit knowledge transfer.

Table 1 outlines all the moderating variables included in the model, with a brief discussion of their expected effect on M&As as a tacit knowledge channel for bank managers:

CONCLUSION

A research model is discussed in this research study, which will prelude future studies. The main assumption rests upon the capacity of cross-border M&As in the banking sector in the GCC to represent an opportunity for managers to achieve effective tacit knowledge transfer, which would be conditioned by several moderating factors reviewed in the foregoing research conceptualization and propositions. The present manuscript conveys theoretical contributions as the idea of managerial tacit knowledge transfer was not examined in the cross-border M&A literature. The literature review analysis of this phenomenon indicates the overriding concentration on the financial outcomes of M&As in the banking sector. Although the literature review given in this paper also reveals the presence of a significant number of the research studies that have examined the intangible outcomes of M&As, the individual managerial perspective was largely ignored. Another contribution pertains to the focus on the managerial perspective instead of solely the organizational gains broadly discussed in the relevant literature. In this regard, several individual dimensions are incorporated here, such as the cultural intelligence, interaction settings, multi-linguistic skills, and international experience.

More specifically, the conceptual model presented in this paper is an attempt to draw a preliminary overview of the important factors that could determine the extent of the tacit knowledge gained by the GCC bank managers in the context of cross-border M&As. The largest number of prior studies have predominately been focused on the interorganizational knowledge

Table 1 The model's moderating variables overview

Variable	Expected effect	Sources
Cultural intelligence	Bank managers endowed with strong cultural intelligence may be more eagerly active in deriving valuable insights from their interactions during M&A negotiations.	F. Capriglione and N. Casalino (2014) J. Jyoti and S. Kour (2015)
Face-to-face meetings	Close interactions may allow bank managers to observe and harness managerial skills in negotiations or in communication with their counterparts in M&A discussions.	A. L. Ranft and M. D. Lord (2002) E. Gomes et al, (2012)
Spoken languages	The mastery of foreign languages is likely to support bank managers' capacity to seize valuable tacit knowledge flows.	E. Vaara et al, (2005)
International experience	Cumulative experience in international settings can accelerate bank managers' capturing of tacit knowledge during cross-border M&As.	B. R. Staats and F. Gino (2012)

Source: Authors

transfer aspect with almost negligible attention paid to the individual implications for managers in terms of managerial know-how. The identification of the practical contributions of this conceptual model will depend on the results of an empirical field study upon which the research propositions will be tested/validated. For example, if validated, the cultural and linguistic proximities between the acquiring entity and the acquired entity are likely to draw senior managers' attention to the importance of targeting specific individual traits when designating managers to lead the M&A negotiation process.

The next step will consist in developing an empirical research protocol to test the research propositions listed above. The GCC regional countries, more particularly the senior managers of the banking sector involved in the M&As performed over the last decade will be chosen as the main research area for greater data recency. Case studies are also planned in future research projects as they may allow the refinement of the aforementioned research model before conducting a larger-scale empirical study.

ENDNOTES

1 Resource Deepening Acquisitions: "Acquisitions with the goal of securing resources and capabilities that fill critical gaps in existing resource portfolios and catching up with the competition". (Gubbi & Elango, 2016, 358)

2 Resource Deepening Acquisitions: "Acquisitions with the goal of securing resources and capabilities that fill critical gaps in existing resource portfolios and catching up with the competition". (Gubbi & Elango, 2016, 358)

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