Volume 12 No 2 2020

Regional and Business Studies

ISSN 2732-2726 (Online)

Szent István University Kaposvár Campus
Faculty of Economic Science
Kaposvár

Regional and Business Studies

Regional and Business Studies is a scientific journal published several times a year, and contains original scientific reports, research results, critical résumés, conference reviews and letters to the editor. The topics of journal include the important fields of rural development, regional, economic- and social science.

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ISSN 2732-2726 (Online)
ISSN 2061-2311 (Print until 2020)

Published and distributed by
Kaposvár University, Faculty of Economic Science
H-7400 Kaposvár, Guba Sándor u. 40.

Responsible for publication

Dr. Orsolya SZIGETI PhD
Dean of Faculty

Kaposvár, March 2021

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Regional and Business Studies (2020) Vol 12 No 2, 1-15
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2508

Accounting Aspects of Digitalization and Industry 4.0 in Hungary

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ABSTRACT

In our present paper, we analyze the accounting aspects of digitalization and industry 4.0 in Hungary. First of all, the accounting profession is a traditional profession and accounting rules and principles are established and have been the same for many years. However, globalization of business, stronger regulations and numerous technological solutions and innovations are not bypassing the accounting profession, either. Challenges for the accounting profession are reflected in the need for rapid adaptation and transformation of business practice and business processes without abandoning basic accounting rules and principles. The aim of this paper is to analyze and systematize the key challenges that digitalization brings for the accounting profession. The paper seeks to examine how, through environmental accounting, the broader context of corporate sustainability could be incorporated into the developing vision for Industry 4.0, the fourth industrial revolution.
Keywords: accounting, auditing, bookkeeper-accountant problem
JEL code: O33, M41, M42

INTRODUCTION

Western civilization has lived in three industrial revolutions so far. In the wake of steam engines and automatization now a brand new, fourth industrial revolution takes place. The essence of this new industrial revolution is that the physical machines and objects all connect to an informational system, while real economy integrates into a huge and intelligent informational system. The Industry 4.0 is such a conception, which reacts to the challenges of the recent revolution, which is mainly conducted through full digitalization of the industrial processes. This is not just about the penetration of technology, but the paradigmatic change of business processes and change of the role of the state. Industry 4.0 is what Hungary and Europe need (*Strange & Zucchella*, 2017).

Joseph Schumpeter's "creative destruction" or Clayton Christensen's "disruptive innovation" is now reaching the accounting, auditing and tax consulting profession. It is not an exaggeration to say that what we experience in our lifetime is as revolutionary as the invention of a humble Franciscan friar, Luca Pacioli's was in the 16th

century when double-entry bookkeeping and balance sheets were introduced as we know them today. Maybe today it is not the "what" but the "how" is changing. Accountancy and its functions remain the same but most accountants might disappear sooner than one can imagine. Klaus Schwab says that automation is a substitute for human labour and can create inequalities in the world economy with regard to the labour market. This inequality and disruption can upset the order of creating capital gains and create a gap (*Schwab*, 2016).

The phrase "Industry 4.0" indicates the fourth industrial revolution. This process will generate the total transformation of our economic life, the strengthening intertexture of informational technology and automatization, and as a result of this, the total revolution of manufacturing processes. With the help of M2M (Machine to Machine), machines will be able to carry out the control of more complex tasks, the basic of which is that they have the ability to communicate with each other with human assistance. The extent of productivity can significantly increase as a result. Automation will be able to cover almost the full spectrum of economic processes. With the help of process automation and machine learning, companies can be transformed into digital companies. Plenty of data also means plenty of analysis opportunities, the Big Data effect means processing and transmitting a huge data set. This is aided by data mining, which helps with the analysis of large amounts of data by discovering and presenting the relationships between the data. The role of automation and decentralized management is increasing, so the importance of production flexibility is growing. Industry 4.0 therefore requires a high degree of variability and flexibility, which increases the complexity of process control (*Szóka* 2015, 2018; *Végvári et al.*, 2019).

Industry 4.0 refers to the Fourth Industrial Revolution. We consider two multi-dimensional definitions for the 4th Industrial Revolution: Industrie 4.0 is a broad term that encompasses different perspectives, industries, corporate functions, technologies and fields. The experts interviewed in the study considered its holistic conceptual basis to be one of its key strengths. As a rule, the concept has been understood and successfully exported across the globe. Industrie 4.0 serves as an important model for companies around the world for the vertical integration of smart machines, products and production resources into flexible manufacturing systems and their horizontal integration into cross-industry value networks that can be optimized on the basis of different criteria such as cost, availability and resource consumption (*Kagermann et al.*, 2016, p. 19).

Recent concepts such as the Internet of Things, Industrial Internet, Cloud-based Manufacturing and Smart Manufacturing address this vision of future digitally enabled production and are commonly subsumed by the visionary concept of a Fourth Industrial Revolution or Industry 4.0. Lean management as a learning topic clearly dominated the scene in the last decades. However, for future production scenarios in the sense of Industry 4.0 also other competencies need to be addressed that enable future managers and workers of a factory to deal with the challenges of an increasingly digitalized production system (*Erol et al.*, 2016, p. 13).

The breathtakingly fast pace of technological innovation, especially in the field of information technology, will render many of previously revered professionals useless by making their knowledge and techniques obsolete and futile forever. Those who cannot cope with the changing profession will have to seek other employment opportunities or retire from business if they can. If one becomes unskilled despite his or her education he or she might experience his or her situation even worse than it is in reality. It is timely to think now and not to be surprised in the near future.

MATERIALS AND METHODS

In this research we examine the background, the advantages and disadvantages of digitalization with a focus on technologies applicable primarily in accountancy and secondarily in auditing. The data we use here emphasize only partial segments of a more wide ranging research that can be interpreted independently. Certain relationships can also be examined for parts. We have built upon our own research work. We have also used reports from the Hungarian Chamber of Auditors. In the analysis of data survey we could draw a lot of conclusions on how digital development might influence auditing activities and the audit society. Obviously, we do not even try to give a full examination on the effects of digitalization in general, however in the Summary of this paper we draw our more general conclusions as well.

In accordance with the generally accepted rules of international literature, we list the materials under examination and show their object. Since the nature of our work does not allow us to apply extensive statistical methods or calculations because of its ethical aspects, we point out that the work presents representative results. Theoretical work consisted of the conceptual definition and the clarification of the concepts. In the logical system, we included the main definitions of the subject.

A BRIEF OVERVIEW OF DIGITALIZATION

Digital solutions in every walk of life are becoming ever more widespread all around the world. People therefore should adapt to digitalization. In our globalizing world almost no one can avoid the use of new technologies. A lot of people experience this necessity of keeping up with progress as an absolutely crucial condition to remain in business. Digitalization can simplify work routine and be a useful time saving tool for improving efficiency in communication. Gen Y people are already born into this world where the recognition of the importance of IT knowledge is almost given. Older age groups have to cope with the challenge of learning the new skills (Hegedűs & Nedelka, 2020; Szabó-Szentgróti & Gelencsér, 2018).

It is trivial to say digitalization has a lot of advantages and disadvantages as well what prospective users must consider on their own to find how they can find its optimal applications suitable for them. For instance, e-mail replaces conventional postal services, electronic signature and smart contracts make paper contracts with several required signatures obsolete, mobile wallets can organize our vouchers and even our

checkbook money to handle payments. There are software solutions for sending and receiving invoices. Using OCR (optical character recognition) we can digitize incoming paper invoices without human intervention. The AI based system recognizes text via photo or scanning and send it directly to the accounting program: one no longer has to enter and organize data manually.

We might soon arrive in a world that will be eventually paperless. Organization of work, revision of processes and seeking for weaknesses in control points increases a firm's responsiveness to the changing business environment. Since digital processes can be easily tracked, this might play a role in "bleaching" the economy as governments can enforce regulations more effectively – this can increase their tax revenue as well (*Ambrus & Széles*, 2017). Digitalization can reduce the workload of employees by making them faster in performing their tasks. This increased efficiency can result also in cost reduction, since the more administrative or bureaucratic work become paperless the less resources they use up (*Tusnádi*, 2018). Dynamic technological innovation in healthcare can be a driving force in global social development, in the reformation of healthcare systems and in the reconsideration of its financing and efficiency issues (*Hegedűs*, 2017).

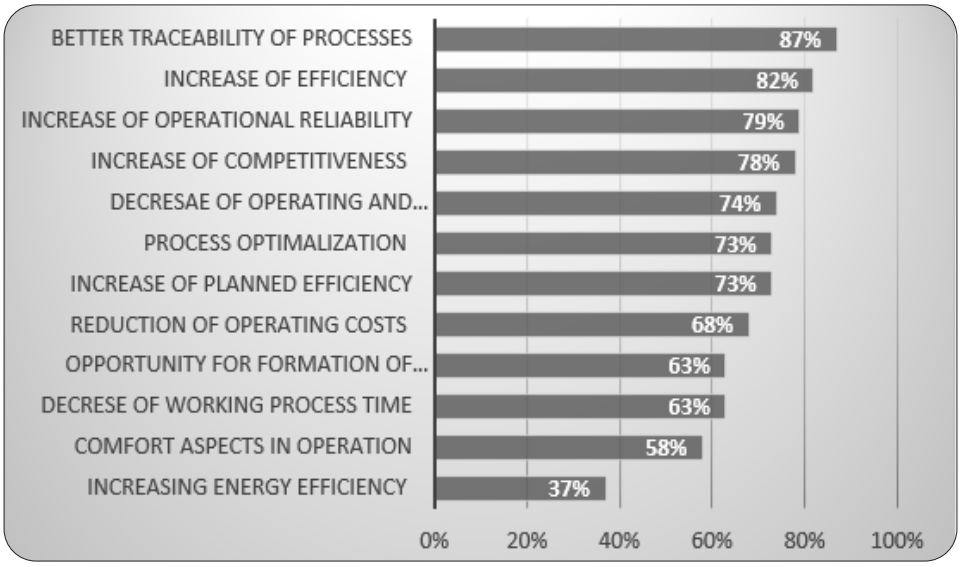
Digital development also carries several risks, so it is essential to develop data protection and IT security solution along with those to be protected. Jobs and whole professions can also disappear due to technological innovation and this may result in millions of individuals and families who cannot adapt to an immensely unfavorable situation. These disadvantages, however, can be largely offset by retraining for the newly appearing jobs. Of course, we should recognize that not everyone is receptive to new knowledge. Their presence can hinder the economy in working properly, stably and well.

In 2016 GKI Digital conducted a research on the advantages of digitalization. Respondents had to name factors they regarded advantageous in digitalization. Most of them emphasized better traceability of processes in the first place. Secondarily, they mentioned efficiency increases and better operational reliability. These factors are also important for accounting professionals. *Figure 1* shows the results which point to the fact that energy efficiency is not considered among the most important ones – only 37% of the respondents thought it to be essential (*GKI*, 2016).

This 2016 GKI research outlines six arguments, as shown in *Figure 2,* put forward by respondents explaining why they lack digital development. 35% of them said the reason why they did not opt for digital solutions was that it required significant financial investment. 29% of them said that their experiences with digitalization did not meet their expectations for it – it either remained unfulfilled or lagged. Some organizations do not introduce digital solutions because they are facing resistance on behalf of their owners or their parent company. As it has been already stated, there is also not enough employable labor force. 9% of respondents blamed inflexibility and the absence of infrastructure for lacking digitalization in their organizations.

Figure 1

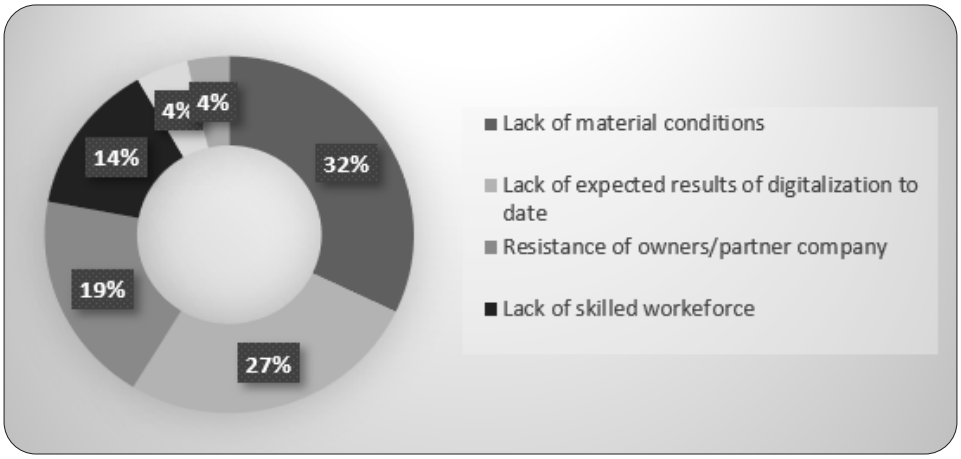
Reasons for digitalization



Source: Based on *GKI*, 2016

Figure 2

Reasons for no digitalization



Source: Based on *GKI*, 2016

It is characteristic of digital development that many people simply do not believe in them. They have doubts about them for their slow spreading in the lower phase

of growth. However, there is a point where growth suddenly jumps up by leaps and bounds. Compared to linear growth, it starts to grow at an unimaginably higher rate, than destroys or, better said disrupts, everything around it.

One of the most significant conflicts in the 21st century that we need to talk about is the absence of digital labor force, because there is a significant demand for those professionals who have digital knowledge and whose knowledge about digital devices is adequate (or at least not out-of-date). This supply is lagging. Today's knowledge may not be worthy tomorrow, therefore professionals in this segment need constant and continuous learning and development. However, not every user can make the change in this "comfortable world" at the right place (*Halmosi*, 2018).

Automation reduces the amount of live work, but not the wage bill, more skilled, better paid work comes to the fore. For example, the Hungarian tax system has rightly shifted towards sales taxes, because it encourages individual work performance, and on the other hand, even if the labour input is really significantly lower, the state will still have enough revenue. This trend has also been supported by tax benefits and subsidies, with the intended purpose of encouraging household spending, and thus to increase governmental revenues from sales taxes (*Ságiet al.*, 2017). In addition, by broadening the circle of taxpayers (burden sharing), advanced technology operators, who are now in the forefront of being taxed, will become revenue generators for the state (*Lentner*, 2017). The reform of the tax system in Hungary after the crisis of 2008 showed an effort to reduce the tax burden on labour. In the period of 2004-2015, there were two different cycles: the first cycle was between 2004 and 2008, when the rate of labour taxes was increasing, and the rate of consumption taxes was decreasing. At that time, however, the trend was reversed and it was clear from 2009 to 2015 that the proportion of sales-to-consumption taxes rose from around 36% in 2008 to 45-46%, while the proportion of labour taxes rose to 52% in 2008 from around 45-46% of total tax revenue by the end of the period (*Varga*, 2017).

Our research shows that the main benefit according to the respondents is that processes become visually more traceable, and the rational use of new technologies can lead to increasing efficiency and cost reduction. Disappearing jobs can badly affect those who will lose employment in decades to come because they insisted on doing well-trained working processes. Naturally, some job tasks will be performed by digital technologies. These will require new employees in order to discover, develop and apply them. Constant changes also indicate that the digitalization of processes is not an overnight phenomenon, though it happens rapidly. It will require constant and continuous training and retraining in order to keep employees in the labor market, even those who are members of previous generations and do not deal with digital solutions so frequently.

THE TRANSFORMATION OF ACCOUNTING

It is a common experience to everybody involved in accounting that the profession is undergoing a profound change. We see how applications of artificial intelligence

make data recording ever faster (Kokina & Davenport, 2017). Certain accounting documents are no longer printed but their data is transferred directly to the accounting software between interconnected databases.

For example, not that long time ago, printed bank statements were delivered to the accounting firm by mail that took days. The accounting firm's specialist employees entered the data into an accounting software manually, which was a time consuming chore for office workers. Now they are loaded automatically into the accounting software's bank logs in a blink of an eye.

Not so long ago transactions on the bank account were sorted out and recorded by bookkeepers in a seemingly never ending process. The most common bank transactions are trade accounts receivables and payables. Sorting them out and interconnect them by hand from analytics is again a time consuming chore (*Ligeti et al.*, 2019).

Nowadays, it is easy to code computer programs that can replace human labor in this process very efficiently. These business algorithms can perform these tasks in a much shorter time and with much fewer mistakes than bookkeepers ever could.

We might think that human labor is no longer needed for them, but that would be a mistake. For centuries from the invention of double-entry bookkeeping by the Italian Franciscan friar Luca Pacioli there were no computers at all. Data was handwritten by bookkeepers into the books of the firm. With the advent of the computer, there was a huge change in the profession, as it was no longer necessary to write analytics in books by pen and compile a general ledger with an unimaginable amount of analytics. Even rudimentary accounting software could easily replace human labor. This development started to happen only 60-70 years ago, yet neither the bookkeeper nor the accountant profession disappeared – they only changed (*Tóth & Széles*, 2019).

In our view the industry 4.0 revolution will bring about a similar transformation but not any destruction. No business activity will cease that creates value. We can feel that our well-known processes are turned upside down and inside out and therefore we are experiencing a crisis, but we should not forget that in Japanese script the word "crisis" is indicated by two punctuations: one meaning danger, the other meaning chance. We should rather focus our attention on what opportunities we can discover and then exploit in this inevitable change hitting the accounting profession.

The impact of the industry 4.0 revolution may affect the bookkeepers' work more than that of the accountant. Bookkeeping can be almost entirely automatized, but well-trained accountants will always be in dire need by businesses. National accounting systems are ever more complemented with IFRS that require more specialized accounting work. While a Hungarian financial statement comprises of three parts (balance sheet, income statement and notes), an IFRS financial statement is made up of five (balance sheet, comprehensive income statement, statement of change in equity, cash flow statement, notes). In addition to that, IFRS financial statements require more labor year round, and not just when they must be prepared. This work must be done by accountants.

THE THEORETICAL PROBLEM OF THE DIFFERENCE BETWEEN ACCOUNTANTS AND BOOKKEEPERS

In 1494 the Franciscan friar Luca Pacioli published his Summary of arithmetic, geometry, proportions and proportionality. In this monumental work he describes the logic of double-entry bookkeeping. The procedures themselves changed a lot over the centuries but the logic remained the same.

The basic idea of double-entry bookkeeping is that cash flow (Cash basis accounting) and fulfillments (Accrual accounting) are different. The bookkeeper is someone who knows the techniques of this aforementioned logic and applies them to actual bookkeeping. This work can be summarized as follows:

- books have two pages: debit and credit
- assets and expenses appear on the debit side, while equity, liabilities and revenue appear on the demand side
- if a sum is recorded on either side, it must be recorded on the other as well to maintain balance
- revenue and expenses must be combined and their balance transferred to equity as a result
- on the balance sheet turning date in the current year it is closed and reopened with the same values for the following fiscal year.

From the description of the mechanism of double-entry bookkeeping, we can see with our eyes today that this can now be easily programmed, no bookkeeper is required. Much more, the process requires IT professionals who understand how the system works and can program the necessary processes and oversee the proper running of the programs. The work of bookkeepers described above is being largely taken over by artificial intelligence as a result of industry 4.0 (*Tiwari & Khan*, 2020).

The accountant is familiar with the legal rules, which are designed to determine the income of the company as accurately as possible, to show a reliable and true picture of the assets on the balance sheet date. Statutory rules or accounting principles (US GAAP, IFRS, etc.) set out procedures that do not follow the logic of double-entry bookkeeping, but serve to ensure that market participants base their decisions on reliable financial statements (*Sangster*, 2018). For example, if a company has 400 kg of goods worth 120 EUR / kg. He buys an additional 600 kg of goods for 110 EUR / kg. He sells half of the goods to a customer at a price of 200 EUR / kg with a 30-day payment deadline in the middle of the year. Within two weeks of the balance sheet date, the company becomes aware that liquidation proceedings have been initiated against the buyer and, according to the liquidator, there is no chance of settling the claim (*Table 1*)

It is clear from the example that with the bookkeeper mechanism, the corporate income in the transaction is a profit of EUR 41,000 and a trade receivable of EUR 100,000 in the balance sheet. According to the accountant, the corporate result on the transaction is a loss of EUR 59,000 and no trade receivable is recognized in the

balance sheet. It is clear that the work of an accountant is essential in the course of corporate work.

Table 1

The work of accountant vs bookkeeper

bookkeeper replaced by artificial intelligence	accountant
purchase of goods Db Goods – Cr Liability 600 kg x 110 EUR/kg = 66.000 EUR	
	The inventory valuation procedure needs to be defined by the accountant. In this case, it reduces its stocks from the warehouse according to the FIFO method.
goods sales revenue accounting Db Trade receivables – Cr Revenue 500 kg x 200 EUR/kg = 100.000 EUR	
	Revaluation of the result according to the information known to the balance sheet: Db Direct expense – Cr Trade receivables 100.000 EUR

THE IMPACT OF DIGITALIZATION ON ACCOUNTING AND TAX SYSTEMS

Conferences and retrainings in 2019 were preoccupied with the big question: what will digitalization bring to accountancy and auditing? Can we really rely on scanned or photographed documents handled by artificial intelligence without human intervention? How will their accounting be done by a mere software? Will accounting be reduced to digital transfers between programs? Could IT solutions take over the role of accountants? If yes, how much? Will record analysis be easier if we implement Receipt Bank, 1tap receipts, SMACC, SDSYs or other systems? Will the intuitive work of bookkeeping be completely replaced by process control based on mathematical formulas which no longer require human work?

These questions can be answered from many perspectives, but all depend on the accounting and tax systems as well as the structure and business environment of SME sectors in respective countries. Governments are primarily interested in increasing – or at least maintaining – their tax revenues, so there is already a simplified accounting system that we can boldly call tax accounting (e.g. in Hungary there are "EVA", "KIVA" and "KATA" – a simplified corporate tax, a small business tax and a small payer's lump sum tax, by which the government adjusts tax revenues to some kind of index while marginalizes the role of conventional financial accounting).

This simplification has several disadvantages. A lot of them are even threatening.

They make it difficult to determine the property, income and efficiency of microenterprises from aggregated data without additional annexes, since a lot of data important for such an evaluation are lost or not even presented.

The structure of the SME sector in Hungary shows an extremely distorted picture due to their numerosity, capital strength, responsiveness, technical level and number of employees. We can discuss their efficiency only with due caution, unbiased from the preferences they might acknowledge as an indicator of marketability (*Sági*, 2017). In many countries the development of the SME sector and the improvement of financial and accounting knowledge on the level of entrepreneurs would be necessary for development. Such a development could be accompanied by the development of the ethical behavior of entrepreneurs. Any small shift in morality could be measured in terms of tax revenue. Coercive means are always bad. This recognition can lead Eastern European countries to a right direction (*Hegedűs & Nedelka*, 2020).

Simplification of accounting and tax systems combined with increased control seem to be the only way to improve predictability and tax revenue levels (Hegedűs, 2019). This reshaping of current tax and accounting systems should serve the elimination of structural distortions which favor one interest group over another. Digitalization makes the economy more transparent, government control more efficient and gives it the ability to filter out unreal economic events. We can get rid of the underground economy, track cross-border services and transform accounting systems by making use of digital technologies. Auditing and accounting will also be transformed with the development of digitalization which will result in new methods, simplification and real-time measurement.

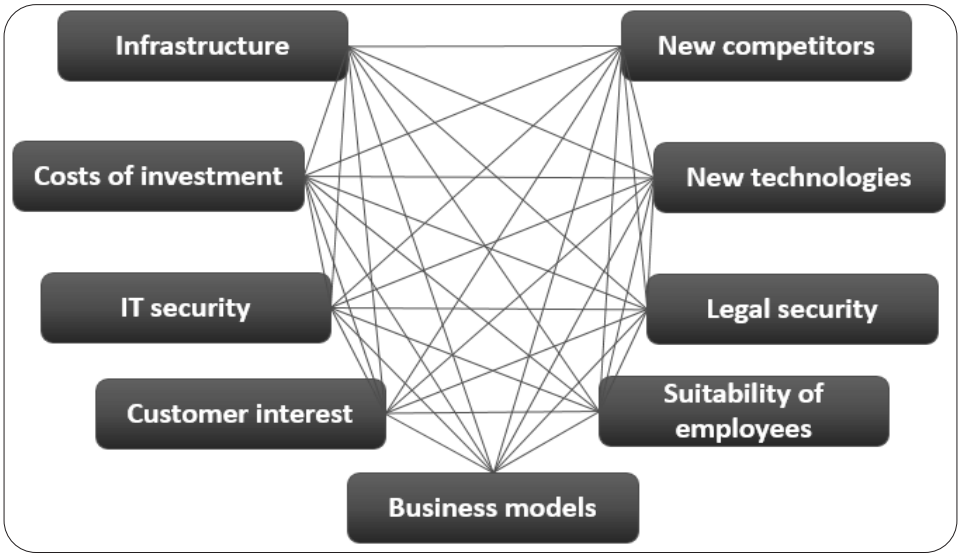
We must cope with the challenge we face by new digital solutions. Otherwise their imperfect implementation will result in inefficiency and new technologies will not work well – especially not in our favour. Whatever the level of investment will be, we should make it and take their long run returns into consideration from the very beginning. Inevitably the parallel creation of IT security solutions and further clarification of GDPR issues are crucial (*Jósvai*, 2018).

Data protection in the digital world is of primary importance in accounting. While we are eager to further technological innovation, we should also constantly check whether employees who are expected to use new technologies can perform this task or not – they might need further training or we should lay them off and hire new staff. All these measures require careful consideration, as they keep us competitive. The connection points between digitization and the industry 4.0. are illustrated in *Figure 3*.

The Future of Jobs study published by the World Economic Forum in 2016 predicts that the possibility of disappearance of accountants by 2025 is 98%. The study emphasizes that significant part of bookkeeping is just a routine and which are mostly automated. Controlling represents higher added value which can be more difficult replaced by robotic solutions, but due to the development of artificial intelligence, these workflows are also not protected from automatization (*World Economic Forum*, 2016).

Figure 3

Challenges of digitalization and Industry 4.0



Source: Based on http://industry4.hu/images/cikk_kepek/ipar4_kihivasai.png

In the future we will do the bookkeeping and auditing service in a different way (*Kovács & Kovács*, 2017). Thanks to automatization and digitalization we will most probably be able to save considerable time and human resources, the output of the work done will be visually more attractive and better, and we can increase efficiency, too. We will save time on different testing tasks, make reports automatized and always available. With the help of automated software, the large and often non-similar data can be processed, and then they can be interpreted in a more digestible, visualizable form. A paperless office, electronic filing systems, digital signatures can be realized, which reduce invested human work or make knowledge of processes faster. Reporting becomes simpler, authorities can get information about financial-administrative activities of companies simultaneously with carrying out of processes as a result of automatization and this might make intervention more effective. Such accounting and taxation solutions gain ground which strive for unified ones without borders (IFRS) (*Kenyeres et al.*, 2016).

CONCLUSIONS

In the accounting and auditing profession we are also in the age of digitalization, which has a significant impact on our work. If we want to be successful in our job and want to perform it efficiently, then we have no choice but to keep up with the trends of artificial intelligence and automatization. The accounting-auditing profession is suitable for highly educated and skilled professionals who are willing to cons-

tantly adapt to the changing world. Accounting data is being digitized. If more and more people are talking about its impact, their skepticism about or even fear of it is normal and acceptable. Automatization and artificial intelligence are surrounded by a constant paradox, digital technologies transform previously known frameworks. Digitalization will have a decisive impact as the pace of information expansion and of calculations will match the computing capacity of computers. This capacity – according to Moore's law – will grow exponentially. However, exponential growth can be deceptive, estimating future effects can only be done with correct correction.

We can conclude that the named item expenditure is a sign of the fact that Hungarian legislation recognized the significance of the fourth industrial revolution. The effect of the fourth industrial revolution on live labour and the structure of labour market is unquestionable. However, Hungarian accounting closely follows the central measures of the EU and the developed western world.

It is necessary to recognize and apply changes because this is a basic requirement in the accelerating and ever-changing 21st century. We cannot reduce the pace of change, we can only ignore it, but in turn, it may result in a deserved loss of market or employment. Bookkeeping and auditing will not disappear in the coming decades. Without accounting there is no controlling and without knowledge about the past, the future can only be determined based on estimation or prediction.

Audit remained what is was. It is and will be about to increase confidence for financial statements and to improve the quality and reliability of information provided by annual reports. Accountancy and tax consultancy provide high quality added value by supporting customers in achieving their goals.

Artificial intelligence can analyze risks, set up and apply mathematical models. People will have to compete with smart machines someday but behind the machines there will always be people who build and train them. Only human beings can coordinate human intuitions, intelligence, thinking, organizational skills and many other aspects, therefore human resources will always be needed.

ACKNOWLEDGEMENT

„Supported by the ÚNKP-20-3-I-NKE-140 New National Excellence Program of the Ministry for Innovation and Technology from the source of the National Research, Development and Innovation Fund."

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Regional and Business Studies (2020) Vol 12 No 2, 17-32
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2516

From Analogue to Digital Banking: Developments in the European Union from 2007 to 2019

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ABSTRACT

Research on banking regularly assumes that digitalisation has an impact on banking. This blanket assumption is not erroneous, but it is too inaccurate, too undifferentiated and probably only applies in the long term. Results of this study show that the customers' habits and requirements and thus the willingness to accept digital technologies in the banking sector are changing within a significantly different speed. The spread ranges from almost complete use, as in Scandinavia, dynamic development, as in the Czech Republic and Greece, to almost complete rejection, as in Bulgaria and Romania. This paper examines and demonstrates the influence of various socio-demographic and emotional characteristics on the use of digital media. Shifts in customer behaviours are revealed and discrepancies are identified by time series analyses and factor analyses. The results reveal the forthcoming death of the bank branch network accompanied by a regionally varying acceptance of Internet and mobile banking. This area of tension requires banks to have a good understanding of customer requirements regarding the demand for digitisation in order to avoid misguided decisions. However, the bank's side in the adoption process of new technologies by customers has been neglected by scientific studies so far. In order to measure the state of digitisation of banking services, a comparison equation is presented that allows banks to be benchmarked in terms of the degree of digitisation and enables banks to dynamically track changes in their customer portfolios.

Keywords: Adoption of technologies, distribution channels, financial services and technology, Internet and mobile banking

INTRODUCTION

Whereas customers used to seek access to their bank advisor through branches and preferred a local relationship, this behaviour has changed significantly in recent years, although it is not equally intense and synchronized everywhere. It is noticeable that the branch density has been considerably reduced and bank customers seem to be looking for other routes to their financial institutions. To obtain an overview of whether the transition from the analogue banking business to digital is proceeding in the same way, this paper examines the banking market in the European Union (EU).

Digital banking has provided a significant impetus for change in banking, as it has shifted the ways in which customers access a bank. The popularity of mobile

phones and tablets and the high usage rates of customers gave rise to the demand for banking products linked to these forms of mobile communication. In the meantime, the mobile phone has been established in the banking business and new banking and customer solutions are increasingly being offered via this channel. In order to examine the significance of the changes in customers' access points to the bank, this study first analyses the banks' branch density to gain clarity on the access channel preferred by customers so far. Frequently, it is assumed that digitalisation affects all customers equally. In order to analyse this aspect in more details, this study examines factors influencing different levels of acceptance. It is elementary for banks to understand why customers are changing their access to banks and which customer groups are looking for these ways now and in the future. Existing literature examines this issue from the customers' perspective and neglects the banks' perspective. Banks usually react late to changing customer requirements and are therefore increasingly in competition with new competitors who have often recognised this demand earlier. For this reason, in addition to proximity to the customer, dynamic controlling of one's own customer portfolio is extremely important in order to be able to perceive changes immediately and react to them promptly. This study provides key figures that enable banks to dynamically review their customer portfolios and to control and benchmark their own level of digitalisation.

LITERATURE REVIEW

Points of contact with customers in the banking business are comparable to those in the retail and wholesale trade, although the banking business provides services and the retail and wholesale business offers goods. The standard customer interfaces in the banking business are either stationary (e.g. branch office, mobile field service) or virtual (e.g. Internet banking, mobile banking, telephone banking) (*Sousa & Voss*, 2004). Digitalisation enables banks to network their distribution channels and customer touchpoints holistically in order to create added value for bank customers (*Menrad*, 2020). In this respect, there is no fundamental difference between the different sectors, although in banking, compared to retail and wholesale where the decline in branch numbers occurred earlier, bank branches continued to be frequented by customers. Past literature discussed on the one hand the marketing of services in comparison to physical goods and, on the other hand the identification of specific marketing strategies to deal with the problems posed by the unique characteristics of services (*McKechnie*, 1992). Both aspects are still highly relevant in the marketing of banking services. Services differ in general essentially from goods and face other problems because of different rules and laws. Service marketing is completely different to the marketing of goods as well – but first and foremost the feeling is sold in both cases – and requires own service marketing solutions (*Zeithaml et al.*, 1985). Even though services and goods still have intersections, they essentially differ in intangibility, inseparability, heterogeneity and transience (*McKechnie*, 1992). According to the European Commission, a financial service means any service of a banking, credit,

insurance, personal pension, investment or payment nature (*European Parliament and Council*, 2002). This very general definition by the European Parliament shows the wide scope of banking services, which often lead customers to contact their advisor with questions (*Walter*, 2003). For this reason, customers used bank branches to discuss solutions in the past in an environment that allows a high degree of interaction (*Black et al.*, 2002). Banking services are not directly comparable to those of competitors because many factors have an impact on quality, performance, liability and security. If the criteria are determined, however, they can be comparatively well objectified and compared schematically (*Messerschmidt et al.*, 2010). Product channel selection in the financial business is highly influenced by consumers themselves, the financial services requested, the characteristics of the channel and the reputation of the organization (*Black et al.*, 2002). The product complexity and the perceived product risk tend to lead the customer directly to the local advisor. Further criteria are accessibility, channel costs and channel risks that influence channel selection positively or negatively depending on the fulfilment. Essential for the use of the channels is on the one hand confidence but also the age of the customers on the other hand. Younger customers tend to use novel forms of distribution, while wealthier and older customers prefer the face-to-face contact. Shopping motives and social motives are relevant for the product channel selection as well. While social motives tend to increase the use of branches, shopping motives lead to the most convenient channel for the customer. The organization itself and its image as well as size are further relevant aspects for the selection (*Black et al.*, 2002).

Digital change and the achievements of digital communication do not stop at the banking business. On the contrary, the effects have a very significant impact on the banking business. Research and development (R&D) have often been neglected in the banking business. Digitalisation has initiated a process that pushes R&D in banking to a more advanced level, but it also involves the dangers of disruptive developments (*Christensen et al.*, 2015). In terms of process flows, digitalisation has a profound influence on the core banking process (from the front office to the back office) (*Gasser et al.*, 2017). Digitalisation is a factor inherent of progress and science. Digitalisation is discussed in the current literature in this context over the aspect of adoption of new technologies. It is understandable, since the process of analogue to digital banking must be assumed first. Competing theoretical approaches examined the determinants of the acceptance of new technologies. Different models were developed and analysed in the past. Conceptually, two essential directions (two major theories') can be separated. One of them is, Innovation Diffusion Theory (IDT) based on Roger's model considerations (*Rogers*, 1962; *Tornatzky & Klein*, 1982) and on the other one is an essential representative in this research direction, the Technology Acceptance Model (TAM) (*Davis*, 1989). Various other models partly chronologically before TAM such as Theory of Reasoned Action (TRA) by *Fishbein and Ajzen* (1975), TAM2 by *Venkatesh and Davis* (2000), Theory of Planned Behavior (TPB) by *Ajzen* (1985) and Decomposed Theory of Planned Behavior (DTPB) by T*aylor and Todd* (1995) are related to TAM and deal with similar factors. New models

are increasingly addressing the issues of trust and risk for bank clients. Probably the most complete model in existence today is DTPB, as it provides a clear understanding between attitudes and intentions, however, the above models IDT and TAM are most used in various new studies. Meanwhile, both models IDT and TAM, but also many other models listed above are also linked to each other via various papers and among different regression analyses.

The research in the field of adoption of new technologies is unbroken and has been strongly nourished by digitalisation. Hanafizadeh et al. (*2014*) had identified research gaps related to adoption of new technologies in banking business, which still exist and are to be supplemented as follows: (1) Factors influencing digital banking adoption in less developed regions and regions with subjectively low perceived IT security; (2) Discussing descriptive variables like demographics, socio-cultural, political factors and others, which impact to technology adoption; (3) Customer adoption to omni-channel distribution, new deployed media, in particular mobile phones, virtual reality and augmented reality as well as experience with smart data in banking; (4) Using further, less frequently used theories to explain technology adoption or even more advanced ones; (5) Broadening of perspectives such as the corporate customer perspective.

Based on these research gaps, the following hypotheses are examined in this paper to further explore the relevance of new technologies in this context for the banking business.

H1: Banks reduce regional access to their customers

H2: Internet banking is increasingly used by customers

H3: Sociodemographic characteristics can influence Internet banking usage

H4: Digital banking is used regionally with varying intensity

Data analysis below provides insight into whether customer behaviour is changing as a result of the increasing degree of digitalisation. As the focus of research so far has been on the customer side, the focus of this study is on the banks, as a comparative equation is used to show how the banks can measure their level of digitalisation.

MATERIALS AND METHODS

This study is quantitative in nature and the underlying data are secondary data from publicly available data sources. In order to conduct this data analysis, the data sources European Banking Federation, Eurostat and The World Bank were researched to obtain data on customer behaviours and banks. Time series and factor comparisons were conducted on the basis of these data. In order to gain a deeper understanding of the transformation in the banking business and to analyse the evolution from an analogue to a digital business, the authors started by examining the development of existing bank branches in the EU. For this purpose, available data were obtained from the European Banking Federation and the development was analysed over a time series. To be able to estimate the further development, a polynomial regression over the existing time series was conducted. The results show a significant change in the banks' branch network and thus a shift in customer access to the banks.

Thereafter, the authors examined the development of customer acceptance of Internet banking within the EU. For this purpose, the authors used secondary data from Eurostat to reveal customer behaviours by means of a quantitative time series analysis and descriptive factor comparisons. As digitalisation for bank customers is very strongly linked to mobile banking activities, the authors have expanded granularity by further data analysis using The World Bank data and have drawn up further data comparisons.

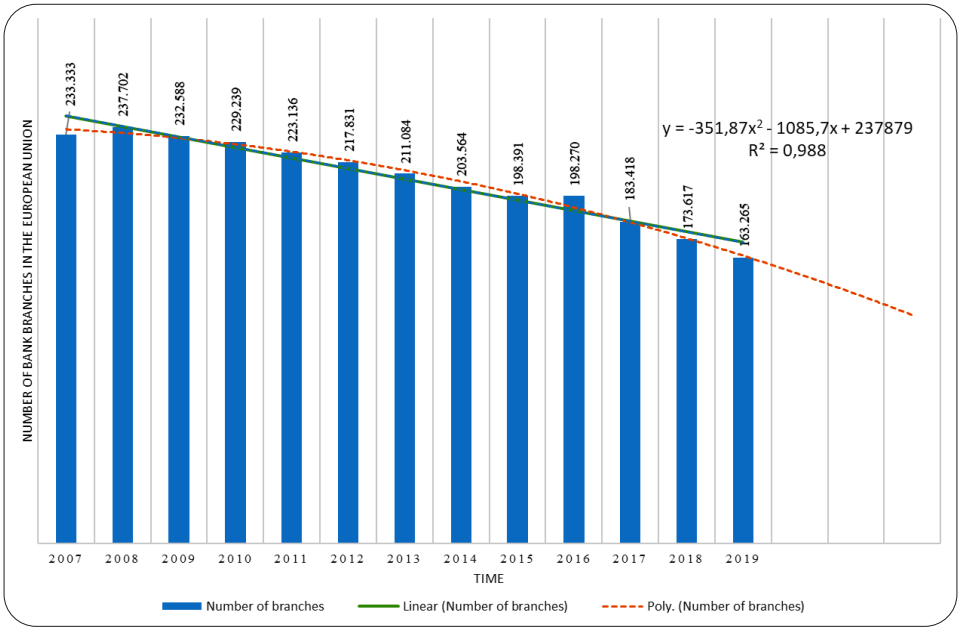
In order to exclude a distortion due to the 2008 financial crisis, data from 2007 onwards were included.

RESULTS

The authors considered the traditional branch banking to be the analogue banking since the face-to-face contact to the customer and not the digital communication is the primary issue. The object of investigation was the total number of bank branches (*Figure 1*).

Figure 1

Bank branches in the European Union, 2007-2019



Source: Based on *European Banking Federation* (2020)

We have measured a polynomial regression of degree 2 over the existing time series in order to be able to assess the further development and to determine the point at which

all bank branches in the EU have completely disappeared in an extreme scenario. A time series analysis was used as an auxiliary variable (ceteris paribus) for various factors, which will be examined in more details below to predict how the trend observed in the data is likely to continue. Time is to be interpreted as a modification parameter for the transmission from analogue to digital.

$$y=f(x)=-351{,}87x^2-1085{,}7x+237879 \quad (1)$$

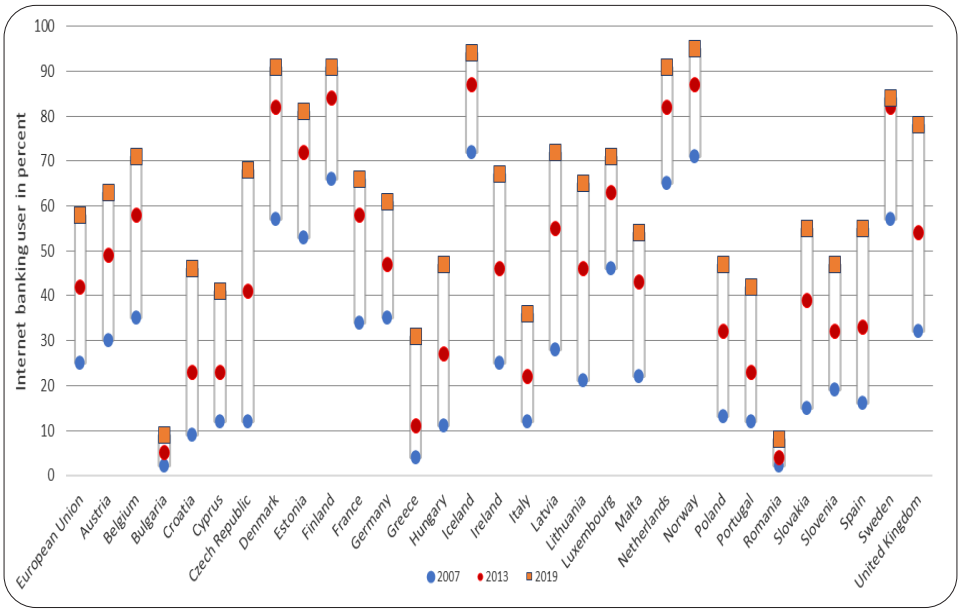
where, x=1 for year 2007 to x=25 for year 2031.

The results indicate that, based on the development to dataset and by neglecting the influence of other variables, the analogue channel will be further diminished and regional access degraded. According to regression, the branch system will no longer exist in 2031. However, this trend can be interrupted or changed by economic, political, cultural, technological or by reaching a minimum level for customer care. In addition, of course, also due to customer demand. There are several reasons for the high number of branch closures. First, the high fixed cost burden resulting from the operation of branches (*Köhler & Lang*, 2008). This leads to empty costs if the employees in the branch office are underutilized (*Swoboda*, 2004). Low branch utilization was also caused by a changed pricing policy of the banks. Advisory-intensive products were distributed through the branches, standardized products through other channels (*Menrad*, 2020). As a result, business activities gradually shifted and customers were encouraged to access the digital channels. Consequently, bank branches were reduced as capacity utilization shifted towards digital channels. Simultaneously, consumer behaviour changed, as customers increasingly used digital media, which also became attractive for the banking business. To investigate whether customers meanwhile prioritise a different banking access, the authors analysed customers' Internet banking access in more details. In this study, the authors consider Internet banking (sometimes termed online banking) as access via PC to the bank. The average online rate (*Bhatnagar et al.*, 2000) has meanwhile risen significantly and is within the EU at 58% (+132% in 12 years and +38% since 2013). However, there is no uniform change, as *Figure 2* illustrates.

While the Scandinavian countries already have an almost complete internet banking rate and customers certainly have confidence in the access channel, bank customers in the countries Bulgaria and Romania still make little use of this access point. Although the network exists in these countries, bank customers are not willing to do their banking online due to significant safety concerns (*Bhatnagar et al.*, 2000). In many other EU countries, the willingness to act online has changed considerably in recent years. Particularly noteworthy is the development in the Czech Republic. Here, the availability of online banking has increased from 12% to 68% within twelve years.The development in Greece is also substantial. While the Greeks almost did not use Internet banking eleven years ago, the usage rate today is nearly seven times higher. Today, more than one-fourth of the Greeks are connected online to their banks.

Figure 2

Internet Banking users in the EU between 2007 to 2019



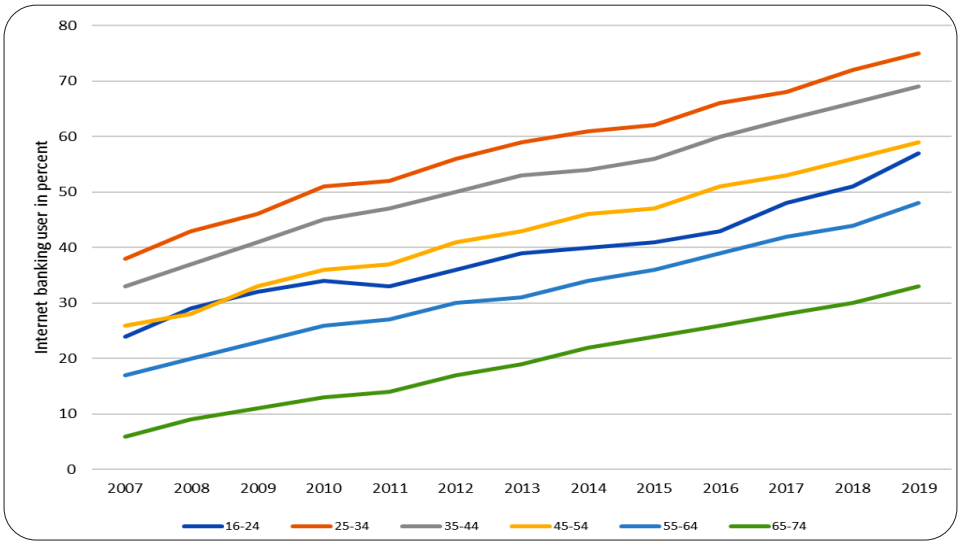
Source: Based on *European Commission*, 2020

Even though the customer usage rate at a younger age is greater than that of older EU residents (*Figure 3*), the development is almost synchronous. In the 45-54 age group, 59% of EU citizens already use Internet banking. It is also remarkable that 33% of Europeans over the age of 65 use Internet banking for transactions. Over three-quarters of the 25-34 age group use the Internet for their banking business, which is 37% more than twelve years ago. It is iastonishing indeed that the absolute number of users (age-independent) has increased significantly over the period investigated, but that the development is almost synchronous and the delta of the different age groups changes insignificantly.

Around 80% of highly educated EU citizens use online banking, while less educated citizens prefer other banking channels (*Figure 4*). The differences in education levels indicate that this factor shows a high relevance and is thus a suitable indicator for the use of this access channel to a bank. Another indicator with conspicuousness and high rates of change is average income. Nearly 70% of higher-income people use Internet banking. It is astonishing that low-income residents tend to use Internet banking significantly less. In fact, one could assume that low-income customers use standard services and high-income customers are advised in bank branches, but this does not seem to be the case.

Figure 3

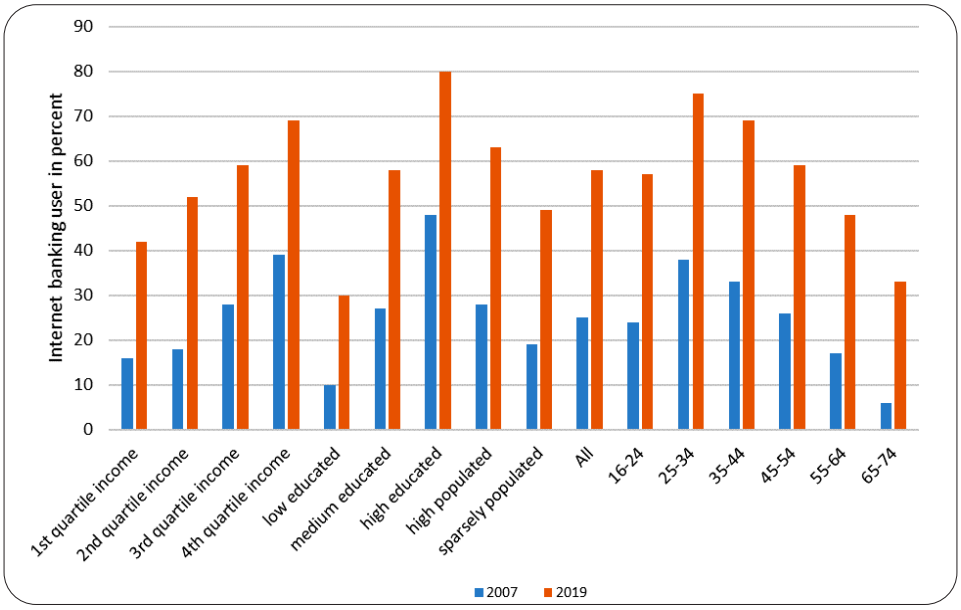
Internet banking users in the EU between, age comparison, 2007 and 2019



Source: Based on *European Commission*, 2020

Figure 4

Internet banking in EU, individual criteria, 2007-2019

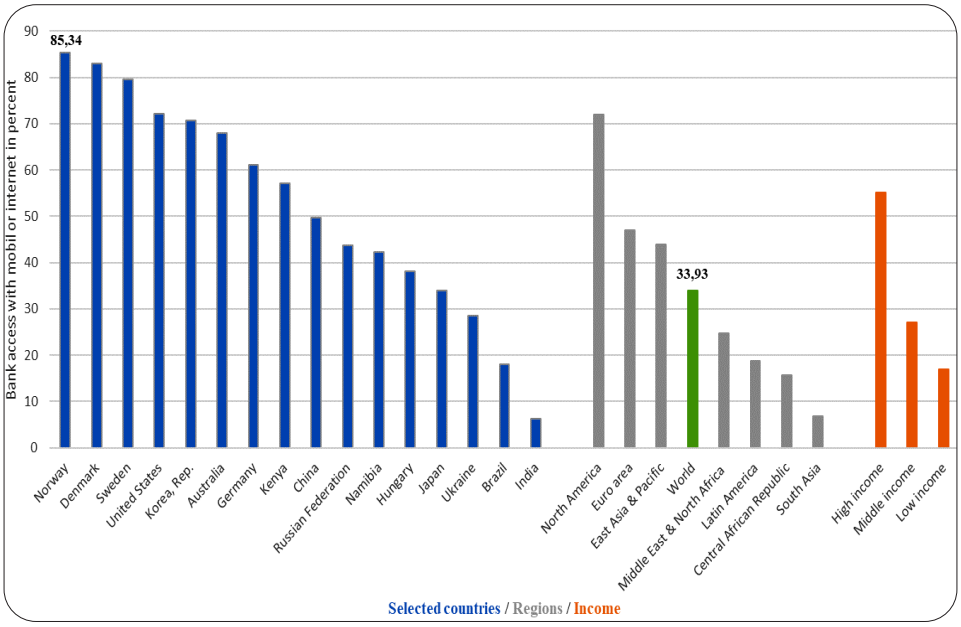


Source: Based on *European Commission*, 2020

Digital banking does not only refer to online banking but increasingly also to mobile banking. Mobile banking is referred to as the interaction between customers and banks via a mobile phone, tablet or comparable, to do bank business at anytime from anywhere (*Dahlberg et al.*, 2008). Apart from the necessary conditions that require the operation of mobile networks, mobiles now offer the possibility of being free from spatial and temporal limitations. This provides a large convenience to the user and bank customers (*Zhou*, 2011). While security aspects severely limited the spread and acceptance of mobile banking in the past, the community has now come to terms with this technology. Banks have invested heavily in the security of digital channels in recent years, also in order to build customer confidence in this product field. The authors of this paper have conducted a global comparison in order to have an international benchmark in this fast-changing distribution channel of banks. The study examined bank customers' access to the bank via mobile phone and/or the Internet. A continental comparison was conducted and individual selected countries were highlighted. In addition, the authors have set a cluster delimitation on the available income of the bank customers. The results (*Figure 5*) show that in North America, the EU and parts of Asia, digital access to the bank is used intensively, whereas in other regions of the world, access is significantly lower. One third of the world's population uses digital access points to the bank.

Figure 5

Global comparison: Applied access to a bank account with a mobile phone or with the Internet during the past year



Source: Based on *World Bank*, 2018

Figure 5 also illustrates that customer income is a relevant factor for the use of digital channels. Customers with higher incomes are more willing to interact with their bank via digital access than customers with lower incomes. Bank customers in the Northern European countries interact most intensively with their bank via digital channels, also in an international comparison.

Recent research addresses and validates the determinants of mobile banking usage. Trust plays an important role in influencing user behaviour as it uses only technology and no personal interaction (*Gefen & Karahanna*, 2003; *Grazioli & Jarvenpaa*, 2000). According to *Gu et al.* (*2009*) structural assurances are the most appropriate way of building trust with the intention of promoting mobile banking. Customers will only make extensive use of mobile banking free of fears and uncertainty once they have gained trust and transaction security (*Gu et al.*, 2009; *Mahmoud*, 2016). To promote this technology, banks must prevent fraud and customer damage. This can be achieved in particular through guarantees and warranties (*Gu et al.*, 2009). Other research has shown that satisfaction and perceived enjoyment play a relevant role (*Agrebi & Jallais*, 2015). The success of mobile banking is very different regionally and culturally. For a variety of reasons, mobile banking is already highly successful in North America, Europe and East Asia and in parts of Africa. In developing countries, especially in Africa, mobile banking could play a strong role, providing a way to overcome financial exclusion and physical distance by enabling the local population to conduct financial transactions (*Baptista & Oliveira*, 2015). In many developing countries with a high rural and agricultural structure, the poor infrastructure for a retail banking network is difficult and inappropriate. However, mobile communication networks and mobile banking now offer the opportunity to venture into remote rural areas. Within just a few years, Kenya has become a leading country for the penetration of mobile banking, and mobile banking was instrumental in giving non-banks access to financial services (*Lee et al.*; *Rouse & Verhoef*, 2017). India needs to catch up considerably (*Sha & Mohammad*, 2017). In summary, customer interest in digital banking access has increased significantly in recent years. Although there are significant regional differences, customers have accepted new technologies in banking. The current literature on new technologies and their use and adoption in the banking business has focused very intensively on the consumer side. Different customer groups, satisfaction and loyalty with the bank's offering and a very intensive analysis of the adoption perspective were examined by different researchers (*Hanafizadeh et al.*, 2014; *Hernandez & Mazzon*, 2007).

The bank's side of the adoption process has rarely been investigated by scientific studies. Statements are more frequently provided in the annual reports of banks or in perspective studies by consultants (*Ernst & Young AG*, 2018; *Wyman*, 2018). The following section presents a concept for measuring the degree of digitization (G) on the banking side in order to intensify this previously neglected aspect in the future. It will be measured with the sum of all digital banking action (YDIG) divided by the sum of all banking service income (Y).

$$G = G\ (Y^{DIG} / Y) \qquad (2)$$

We define all banking services as the total banking income (Total net revenues, Y). Banks usually measure their income by interest rate income (Yinterest), by commission and by fee income (Ynon-interest).

$$Y = Y^{interest} + Y^{non\text{-}interest} \quad (3)$$

The first part (interest rate income, Yinterest) is mainly in indirect connection with the digitalisation process and is usually presented as "Net interest income after provision for credit losses" in the income statement. This income depends on the difference between credit rate (icredit) and the deposit rate (ideposit). Some banks have now standardized, digitalized and automated parts of the interest business, such as the consumer credit business, using scoring models and platforms, allowing interest income to be more accurately calculated. The second part of the income (service income, Ynon-interst) is independent of interest rate and usually presented as the "Total noninterest income" in the income statement. This income essentially originates from transmitting of money (payment services, remittances), commission income, brokerage and others. This income group is directly related to the banks' digitalisation efforts and can be linked to them to a considerable degree. These revenues are usually generated by processes within the bank and therefore can be aggregated into digital and analogue processes. Some parts of the Total noninterest income are income, but not directly attributable to digitalisation, therefore we define another $Y^{OTHER\text{-}NON\text{-}INTEREST}$. To these groups we include positions such as "Net gains (losses) on financial assets/liabilities"

$$YD = Y^{interest} (i^{D}_{credit} + i^{A}_{credit} - i_{deposit}) + Y^{non\text{-}interest} - Y^{other\text{-}non\text{-}interest}, \quad (4)$$

where, iDcredit is the interest rate originated from digital interest business and iAcredit from analogue interest business. The dependent variable YDIG can then be very precisely measured, evaluated, compared, benchmarked and controlled. As shown above in this paper, the bank can evaluate customer attributes such as age, income, education, region, population density and others and initiate targeted digitalisation measures in order to convert analogue transactions previously preferred by customers into digital transactions. Thus, for example, the bank result achieved in a certain customer age group can be evaluated in relation to total banking income but also to total digital income.

$$G = G (YDIG\ Agegroup\ / Y) \quad (5)$$

$$G = G (YDIG\ Agegroup\ / YD) \quad (6)$$

DISCUSSION

The initial analysis of bank density revealed that bank branches in the EU are being reduced and thus the density of branches is decreasing. It can be assumed that this trend has not yet been arrested. Should the development of previous years continue in the same trend in the future, the branch system of banks within the EU will disappear in year 2031 and banks will have lost their regional access to customers using branch

operations. In order to investigate alternative customer access to the bank, the development of Internet banking was analysed. A very heterogeneous development was observed. Overall, this customer access point to the bank has developed positively in all EU from 2007 to 2019. However, the dispersion of customer usage is significant. While in some countries customers use the Internet almost completely for their banking transactions, in other countries it is not yet popular for banking. Overall, bank customers in the EU have expanded their Internet banking activities. It has been determined that individual criteria such as age, income, region, population and education have an influence on the willingness to act digitally in the banking business. It is also evident that digital banking is being used to varying degrees by customers worldwide. It was found that there are considerable country-specific differences in the use of digital banking. Even within world regions such as Europe, the differences are remarkable. The Scandinavian countries continue to be the region with the strongest affinity to digital banking, whereas Bulgaria and Romania continue to face significant country-specific problems in operating digitally in the banking business. In addition, an international comparison on the use of digital banking channels revealed that customers' income is a relevant indicator. Within the EU it can be stated that bank customers with a good education are more likely to be enthusiastic about digital banking than bank customers with a lower level of education. In addition, the authors have found that in areas of the EU with a high population density, the willingness to engage in digital banking is greater than in areas with a lower population density. The study reveals that there is still considerable potential for digital development in banking in countries such as India and Brazil, but also in world regions such as Latin America, Central Africa and South Asia. In summary, it is remarkable that one third of the global banking population already interacts digitally with their bank via the Internet or by mobile phones.

In contrast to the previous line of research, which examines the adoption behaviour of the customer, a concept was presented that examines the degree of digital technology on the part of the bank. This enables banks to dynamically review their existing customer portfolios and immediately identify changes in customer behaviour. Banks are enabled to follow and benchmark their own development, but also to analyse the development of their customers. Knowledge of the relevant factors for customer behaviour is fundamental for banks, as this is the basis for individual customer marketing. The factors age, income, education, region, culture, and others have been examined in the context of the use of digital access and can be both granularly analysed at the portfolio level of the bank and managed factor-specifically in the future.

CONCLUSION

The objective of this study was to investigate customer behaviours with regard to the acceptance of digital channels and technologies in the banking business and, based on this, to focus on the bank rather than on customer adoption only. For this purpose,

the banking market in the EU was examined in more details. Evidence has revealed that banks are increasingly reducing local customer access using branches and customers are increasingly using digital access points to their banks. However, customer behaviour is not consistent, as the dispersion in the use of digital channels varies significantly, although the overall direction of development is equal and positive. Banks have lost the direct access to the customer initially and must rebuild this probably painstakingly and service-oriented in future. In complement, it can be concluded that additional research is needed to analyse country-specific aspects in order to examine the change from analogue to digital banking.

Additionally, this study presented an approach to measure the degree of digitalisation of a bank. The approach requires a very precise controlling within the bank. The annual financial statements only show the aggregated data and not the detailed customer data. In order to achieve an exact result, it is necessary to separate the customer data from the bank's income data. If bank controlling is able to provide such accurate data, the degree of digitalisation is very valuable and provides precise impulses and approaches for sales and management. Based on this information, the bank is able to control efficiently the digitalisation process.

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Regional and Business Studies (2020) Vol 12 No 2, 33-46
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2518

The Effects of Diversity on Achieving Reduced Inequalities

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ABSTRACT

The Sustainable Development Goals (SDG) were introduced in 2015 by the United Nations and include 17 goals and 169 actions on how to achieve a more sustainable future. This research addresses the SDG 10, which focuses on the reduction of inequalities. By 2030 the goal is to achieve reduced income inequalities, opportunity inequalities and all other forms which might hinder equal chances. The United Nations has already introduced financial and economic measures on how to achieve equality. The aim of this review paper is to challenge the current approaches by emphasizing that too little attention is paid on the people themselves. The goal achievement will require working groups of diverse nationalities, backgrounds, tenures and values. This research presents why it is essential to include diversity research in the work and how this can influence group processes and outcomes, such as conflict, performance or group commitment.
Keywords: value-, ethnic-, information-, tenure diversity, reduced inequalities
JEL code: O33, M41, M42

INTRODUCTION

The Sustainable Development Goals

The Sustainable Development Goals (SDGs) came into effect on 01.01.2016 and are followed by all members of the United Nations (*Figure 1*). They are built on the Millennium Development Goals which were the basis for the work on a more sustainable future until 2015. These goals already provided a framework and led to great development and progress. The Sustainable Development Goals shall now in return go beyond those goals by defining economic, social and environmental objectives. The underlying motivation of the SDGs is also called the 5 PI's and consists of the following dimensions: Within the dimension of people the overall goal is to end poverty, hunger and inequality and to provide a healthy environment for all. The protection of the planet and actions on climate change are covered within the Planet division. Within property and peace, the achievement will be to provide a prosperous and fulfilling life to all and to enable life in peaceful societies without any crime. Partnerships will enable the achievement of the goals based on global solidarity and participation of all. These principles are further characterized by 17 Sustainable Development Goals and 169 precise targets.

These efforts will overcome current failures such as poverty, hunger, inequalities, the disregard of Human Rights or the climate change. The SDGs describe actions until 2030, the year when all goals will be achieved by all nations (*General Assembly*, 2015).

Figure 1

Overview of the Sustainable Development Goals:

Source: *United Nations Department of Global Communications*, 2019

Overview of the Sustainable Development Goals:

All goals will be achieved by the countries individually, as well as on a global level, while ensuring that national policies and international laws are respected. However, it is considered that some countries require special attention and support. Governments, public institutions, international and regional institutions, academia, volunteer groups and all people are asked to work together closely. Global solidarity and joint approaches are essential, while still accepting that approaches, visions, models and tools vary among the countries (*General Assembly*, 2015). A variety of actions can be defined in order to ensure a goal achievement, which can among others be, the mobilization of financial resources, the transfer of technologies to favourable terms or financial sources. Further actions range from a more equally shared wealth to higher participations of less developed countries in international economic decision making (*General Assembly*, 2015). In the table below the working status and current achievements can be tracked per region and as data shows, there is still a significant amount of work to be done.

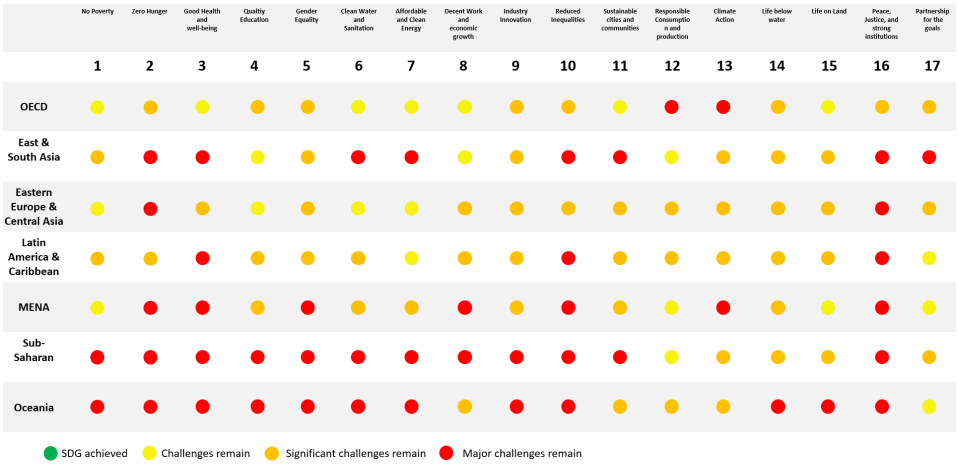
Overview of the current level of goal achievement

In general, the Sustainable Development Goals are highly interdependent and have significant relationships among many goals and targets, as for example that education reduces inequalities (*Sachs et al.*, 2019)(*Figure 2*). Within this paper, however, the

focus is mainly on Sustainable Development Goal 10, which is aimed at reducing inequalities within and among countries. According to the United Nations, inequality refers to 'the state of not being equal, especially in status, rights, and opportunities' (*Afonso et al.*, 2015). Most often we refer to economic inequality which involves mainly the debate about two perspectives. First, this is the inequality of outcomes, associated with individuals not possessing the same amount of material wealth or general living economic conditions, such as standards of living, income, wealth, education, health and nutrition. Secondly, the debate involves inequality of opportunities, specifying the inequality of individuals not having the same opportunities to influence their life outcomes, such as attributes like gender, ethnicity, family background influencing their chances (*Afonso et al.*, 2015). According to the United Nations, from 2011–2016 the bottom 40% of the population managed to accomplish a higher income growth than the average, but income inequality stills rises in many parts of the world. Today the bottom 40% receive less than 25% of the total income or consumption, compared to the top 1%, who receive an increasing share of income (*United Nations*, 2019).

Figure 2

Overview of the current level of goal achievement



Source: Based on *Sachs et al.,* 2019

Market forces are not sufficient to overcome the inequality gap, which leads to a rising demand of further actions (*Sachs et al.,* 2019). These are among others the elimination of discriminatory laws, policies and practices. Furthermore, the United Nations suggests developing countries increase their representation in international organizations, economic and financial institutions use their voting shares and take part in decision-making. Further approaches can be summarized with Foreign Direct Investments in less developed countries, beneficial trade tariffs and duty free access

for exports, which already takes place on large scales (*Economic and Social Council*, 2019).

Even though, actions are defined and worked on, the reduction of inequalities remains a major challenge for almost all countries, even in developed countries as shown above (*Economic and Social Council*, 2019). Despite all the introduced efforts and the emphasis of the United Nations to include economic, social and environmental factors, this paper suggests that additional research needs to be added. The argument is that current approaches focus too much on economic indicators, businesses and regulations, but too little on the people themselves. For a successful goal achievement cross-cultural, cross-functional and diverse working groups are required, as well as the regional population who need to adapt to these changes. I argue that even when reducing inequalities, inequalities or diversity matter significantly and need to be taken into account.

METHODS

To incorporate inequalities or diversity in the study and associate it with the SDGs, a narrative literature review was conducted. The data bases GoogleScholar, ScienceDirect and Ebsco were screened within the research to determine all relevant articles in the field of diversity research. In the first step, an overview is provided on the principles and effects of diversity according to current existing literature. In the second step, different diversity types are analysed based on the reactions, behaviour and consequences they have on individuals and groups. Whereas, these results also rest on current research findings of academia, in the final step a connection is established by the author, matching the literature status-quo on diversity with the author's suggestions of possible effects on the achievement of the SDGs. The suggested effects derive from the key results of the narrative literature review and provide recommendations for improvements, as well as further research.

APPLICATION OF LITERATURE

Diversity Theory

Diversity theory argues about a unique definition of diversity (*Phillips & O'Reilly*, 1998), its causes, as well as its effects on group performance (*Guzzo & Dickson*, 1996). Some researchers strengthen a narrow definition of diversity, only focusing on race, gender and cultural attributes (*Cross et al.,* 1994), while others support larger definitions, including all possible variables (*Thomas & Ely*, 1996). Within this work, I define diversity as any kind of attributes people use to differentiate themselves from another person (*Mannix & Neale*, 2005; *Phillips & O'Reilly*, 1998). Three major theoretical underpinnings characterize diversity research, which are social categorization, similarity attraction and the effects on information and decision making. Social categorization theory basically argues that differences in the demographic composition of work groups or teams

influence group processes and performance (*Phillips & O'Reilly*, 1998). It describes the assumption that individuals have a general desire to maintain high self-esteem, which is done via social comparison. Within this comparison individuals categorize themselves and others according to salient attributes, such as age, race, membership, status or religion (*Tajfel*, 1981; *Turner et al.*, 1987). By doing so, individuals can define themselves regarding social identity, for example as an individual or a member of a group (*Phillips & O'Reilly*, 1998). Individuals principally perceive themselves as positive, while tending to perceive others as less attractive (*Kramer*, 1991). This categorization is sufficient for individuals to regard outgroup members as less trustworthy, honest and cooperative compared to their favoured in-group members (*Tajfel*, 1982) and to apply stereotyping processes (*Tajfel*, 1981). Some research therefore suggests that heterogeneity in workgroups can generate decreased satisfaction, increased turnover desires, lower levels of cohesiveness, reduced communication and cooperation, as well as higher levels of conflict (e.g., *Triandis et al.*, 1994). This already leads to the first argument, why diversity needs to be considered when reducing inequality. Working on a global level when achieving the Sustainable Development Goals involves people of a variety of demographic characteristics to work together, whereas social categorization can affect the processes and outcomes; according to theory most likely negatively. As social categorization is at least partly anchored to the subconscious level of everyone, it cannot be avoided or ignored by individuals. However, social categorization is contradicting to the goal which shall be achieved and might get people in difficult personal situations and decisions. Therefore, my first argument is to carefully study and discuss social categorization on a broader level that working teams can understand and resolve it accordingly.

Similarity attraction, the second theory influencing diversity research, suggests that individuals always prefer to work or interact with similar ones, when they have the choice to decide (e.g. *Burt* & *Reagans*, 1997). Similarity can vary from attitudes and values, backgrounds to demographic variables, which in turn influence attraction and liking (*Byrne et al.*, 1966), followed by work group processes and outcomes. The key negative outcomes suggested by research are decreased or incorrect communication as well as message distortion (*Barnlund* & *Harland*, 1963), negative results on group processes and performance and a higher turnover rate (*Jackson et al.*, 1993; *Jehn et al.*, 1997). Resulting in the second argument, I suggest that working on the SDGs involves dissimilar partners to work on common goals. Most likely dissimilarity covers all areas such as values, backgrounds or demographic variables and therefore needs to be carefully addressed. My second argument is strongly related to the first one, which is to openly discuss similarity attraction and to agree on working modes and communication principles which enable group members to shape processes and outcomes as beneficially as possible.

Heterogeneity in work groups can also have positive outcomes, which leads to the third theory, the information and decision making. Research suggests that diverse teams might possess a broader range of skills, abilities, information and knowledge, which can in return positively affect decision-making (*Tziner* & *Eden*, 1985). Most

researchers therefore agree that multiple perspectives can be beneficial for a team, if problems are complex or tasks benefit from diverse inputs and if diversity is task-related, such as differences in skills or knowledge (*Pelled et al.*, 1997). As already mentioned above, different institutions, governments, non-profit organizations and people are supposed to work on the SDGs. This work can benefit from the diverse skills and backgrounds the participants possess.

Next, I reflect on different types of diversity affecting the equality achievement and demonstrate which influences they have on an individual's affective reactions, their behavior and in the end, what kind of consequences this leads to, based on the model of Jackson and colleagues (*Jackson et al.*, 2003)(*Figure 3*).

Researchers differentiate distinct categories of diversity, each consisting of different types of diversity. These categories are social-category differences, differences in knowledge or skills, differences in values or beliefs, Organizational or community-status differences and personality differences and differences in social and network ties (*Mannix* & *Neale*, 2005). The latter two will not further be considered within this paper. For the remaining four categories, the most relevant diversity type according to its direct effect on the work of the United Nations was identified and is further discussed.

Figure 3

Diversity types & its consequences

	Diversity	Reaction	Behavior	Consequence
Values & beliefs	▪ Value diversity	▪ Decreases satisfaction ▪ Decreases commitment to remain	▪ Increases relationship, task and process conflict	▪ Decreases work morale ▪ Decreases intent to remain ▪ Relationship decreases productivity, information processing and performance ▪ Mixed results on process and task conflict and performance
Knowledge & skills	▪ Information and Functional diversity		▪ Increases process and task conflict ▪ Increases communication ▪ Increases creativity	▪ Increased performance when task are complex ▪ Increases performance when social category and value diversity are low
Social category	▪ Ethnicity and race diversity	▪ Lower satisfaction ▪ Lower commitment ▪ Lower social integration	▪ Increases relationship, task and process conflict ▪ Lowers openness ▪ Increases creativity	▪ Minorities are more likely to leave ▪ Mixed results on performance outcomes, possibly depending on the emphasis of each conflict type
Organizational diversity	▪ Tenure diversity	▪ Lower level of social integration	▪ Poorer communication ▪ Increases relationship, task and process conflict	▪ Higher turnover rates ▪ Mixed performance results, possibly depending on the emphasis of each conflict type ▪ Lower degree of group functioning ▪ Problems during implementation periods

Source: Based on *Jackson et al.*, 2003

Overview of diversity types and its reactions, behaviour and consequences

Value Diversity

Value diversity describes any form of differences resulting from opposing opinions of group members about the real task, the actual goal and target or the mission of a group (*Jehn et al.*, 1999). Jehn, Northcraft and Neale found out that perceived

value diversity decreases work morale (*Jehn et al.*, 1999), as well as satisfaction and commitment to the group (*Mannix & Neale*, 2005). In regards to team behaviour research has proven that value diversity increases all types of conflict (*Jehn et al.*, 1999). Even though, research is debating about a unified definition of conflict, within this paper I use the widely used definition of 'perceived incompatibilities or discrepant views among the parties involved' (*Jehn & Bendersky*, 2003, p. 189). Most research differentiates between relationship, task and process conflict, whereas relationship and task conflict are most often referred to. Relationship conflict arises from interpersonal incompatibilities among group members (*Jehn & Bendersky*, 2003) and comprises non-work related issues, such as personality differences or political beliefs (*De Dreu & Weingart*, 2003; *Jehn*, 1995). Task conflict involves disagreements among group members about the task or ideas and opinions related to the task. It is linked to differences in viewpoints, ideas and opinions or disagreements about strategic decisions (*De Dreu & Weingart*, 2003; *Jehn*, 1995). Process conflict entails means of how to accomplish a task, but doesn'tnot refer to questions about the task itself (*Amason*, 1996; *Jehn*, 1995). Some research argues that process conflict often contains an emotional component, comparable to relationship conflict, because it involves questions about desired resources or undesired assignments (*Greer et al*, 2005). The consequences of value diversity are on the one side hand a decreased intent to remain (*Jehn et al.*, 1999) and on the other hand the consequences resulting from the increased conflict. Relationship conflict leads to decreased productivity, creativity and consensus (*Wall & Nolan*, 1986) and negatively affects performance due to reduced abilities of members to process new information or new ideas and because of losses in time and energy (*Pelled*, 1996). Researchers present mixed results on the effects of task conflict. A majority of findings states that task conflict can have positive outcomes on team performance (*Jehn et al.*, 1997; *Jehn & Mannix*, 2001), due to improved decision makings or strategic planning via disagreements, increased information exchange and information assessment (*Amason & Schweiger*, 1994; *Jehn & Bendersky*, 2003), as well as enhanced creativity (*DeDreu & West*, 2001; *Nemeth*, 1995; *Nemeth*, 2001). Some studies have, however, also proven proved that despite the positive outcomes, task conflict can cause dissatisfaction (*Jehn*, 1995) and negative affective reactions (*Baron*, 1990) and that people generally demonstrate higher level of satisfaction and an increased desire to stay within a group, when the group shows higher levels of consensus (*Schweiger et al.*, 1986). Process conflict is complex, as it results out offrom tasks, but involves people, in forms of the assessment of individual abilities, skills or values (*Jehn & Bendersky*, 2003). Discussions about resource allocation or task assignment in small amounts, especially when starting a task, can be beneficial (*Jehn et al.*, 1997; *Jehn & Bendersky*, 2003), but except of for that, most research results present negative results on performance (*Jehn et al.*, 1999; *Jehn & Mannix*, 2001; *Thatcher et al.*, 1998).

It was has already been stated by the United Nations that the SDGs shall will be achieved, but that visions, tools and approaches can vary (*General Assembly*, 2015), which points out the existence of value diversity to some extent. As value diversity

leads directly and indirectly to a variety of negative reactions, behaviours and performance outcomes, this needs to be considered and managed by the United Nations in order to avoid process or outcome losses.

Informational and functional diversity

Addressing differences in knowledge and skills, I focus next on information and functional diversity. Information and functional diversity are not clearly distinguished, but are interrelated, which results in me my considering them as one. Information diversity can be described as differences in knowledge and perspectives, which is most often caused by differences in education, experience or expertise (*Jehn et al.*, 1999; *Stasser*, 1992). Jehn and colleagues have researched that information diversity increases process and task conflict, which resulted in increased performance outcomes, when value diversity and social category diversity were low (*Jehn et al.*, 1999). Information diversity proved to be more beneficial for performance, when tasks were complex (*Jehn et al.*, 1999), or involved high-quality decisions and creativity (*Bunderson & Sutcliffe*, 2002; *Carpenter*, 2002). In general, functional and information diversity can have positive outcomes on group processes, whereas the negative effects of task and process conflict need to be considered, as well. Therefore, the Most most important one therefore is the management of conflict in order to foster the positive outcomes and avoid negative feelings and debates, which can hinder group processes and performance.

The SDG working groups and all people involved, will possess an incredible variety of backgrounds, education, and experiences. This diversity can benefit increase the group processes and performance significantly, if managed correctly. I therefore suggest that task and process conflict need to be carefully managed in order to enable all the people to achieve the best results.

Ethnicity and race diversity

Within the social category dimension, I will focus on ethnicity or race diversity, as this is the most visible diversity within the working groups to achieve equality among all people and nations. When referring to race, ethnicity or also cultural diversity, we most often refer to country-based diversity or cultures, but one can also differentiate between organizational or regional cultural differences (*Stahl et al.*, 2010). Within this paper, I refer to diversity among countries. There is still little research on race and ethnicity diversity, compared to other variables such as functional or tenure diversity (*Phillips & O'Reilly*, 1998). As already introduced earlier, social category diversity is expected to influence group processes and outcomes negatively (*Jehn et al.*, 1999; *Pelled et al.*, 1997), race and ethnicity being one of the most visible differences, is part of social categorization theory (*Jehn et al.*, 2008). Some researchers argue that cultural diversity cause affective reactions, such as decreased satisfaction and commitment and increase all types of conflict, referring to process-, relationship-, and task conflict (*Vodosek*, 2005). *Vodosek* (2005) also stated within the research that in all three set-ups performance decreased. In addition to that, Research research suggests in addition

that, that in the absence of priori group interactions, that the greater the cultural heterogeneity is, the more decreased the openness towards group members will be (*Julian et al.,* 2009). However, other results found lower levels of social integration, but did not report any effects on relationship or process conflict or communication and satisfaction and even reported higher levels of creativity (*Stahl et al.*, 2010). Phillips and colleagues also reported mixed results on performance outcomes, but stated that minorities were more likely to leave groups and to feel less satisfied (*Phillips & O'Reilly*, 1998). It needs to be stated that several factors, such as national variety (*Ayub & Jehn*, 2014), trust (P*arayitam & Dooley*, 2007) or positive emotions (*Shah & Jehn*, 1993) can influence group processes and outcomes, which might lead to different research results. Even though, diverse results exist, I argue that social categorization, and in more details, race and ethnicity influence the achievement of equality, as it might complicate the work itself. It is stated that the SDGs shall be achieved on a regional and global level and mainly with global solidarity. As the United Nations consists of almost all countries in the world, all races and ethnic groups will be represented and need to work on the reduction of inequalities. Even when having the goal to eliminate all forms of discriminatory laws and policies, this is not enough. Taking into account the findings of social categorization and the results of lower levels of satisfaction and openness and increased conflict, this diversity type needs to be openly discussed and managed by all working teams continuously.

CONCLUSION

The goal of this work is not to question the Sustainable Development Goals, or equality, because those initiatives are significant for a more sustainable and better future. The actions described by the United Nations are of great importance and shall be pursued without any hesitation. The purpose of my work is to strengthen the importance of putting the people themselves in the centre of discussion, because economic and financial measures will not be enough. Even though, it sounds ironic, that diversity matters, when reducing inequality, a great amount of research has already introduced how different types of diversity cause affective reactions, lead to unproductive behaviour, and harm group outcomes. A worldwide achievement of the Sustainable Development Goals demands work on a diverse level; possibly one of the most diverse works, which can exist. No matter how professional and experienced individuals are, diversity can still affect group processes and outcomes. This research has limitations and suggests further research, mainly on a precise evaluation of which diversity types affect the work on the SDG achievement most. Furthermore, I only point out the importance of considering diversity, with all forms of outcomes and do not give many suggestions. Future research should be added in order to provide suggestions on how to manage diversity correctly, in order to benefit of from it and try to avoid as many negative consequences as possible. Research has already provided some results on how training and commitment can benefit eliminate negative results (*Kochan et al.*, 2003) and how trust can weaken the relationship between relationship and task conflict (*Simons & Peterson*, 2000).

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Regional and Business Studies (2020) Vol 12 No 2, 47-63
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2519

Analysis of Organizational Excellence Based on Independent Key Indicators among Hungarian SME Leaders

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ABSTRACT

Excellence and success are those questions, which could hardly be held or clarified because there are exceptionally subjective and complex correlations behind the definitions. In specific literature we could see that success could be defined in many ways, but there is not any index number or formula that anyone could determine easily and according to that, "label" the companies. The conventional performance/excellence measuring methods are based on the financial indices, but we had a plan to measure other indicators. Therefore, we asked questions about the market share, size of the company, growth rate, export activities, efficiency, and the amount of turnover, awards, prominence lists, years of experience as a leader, quality of abilities as a leader. The number of the incoming questionnaires was 148 from Hungary (CEO-s and leading managers from the highest positions). Our results shows that the chosen variables to measure the organizational excellence as awards and appreciations, export activity, TOP-listing and market influence has impact on organizational excellence, so we can conclude that in the performance measurement systems it is important to include the "non numeric financial" indicators, too. Based on the correlations between the indicators and the organizational excellence we can conclude that in line with the company size, the chance rises to be awarded, the number of employees influences the chance to appear on prominence lists, and also affects the strength of the market position. Regarding the personal leadership we can establish that the micro- and small-sized enterprises have got real backwardness in the field of management in proportion to the multinational companies, and the self-assessment of the leaders is still rather low.
Keywords: organizational behavior, leadership, effectiveness
Jel codes: M12, M14, M54

INTRODUCTION

For a long time, the corporate performance was measured by financial indicators (see (*Getz & Carlsen*, 2000; *Howard*, 2006) and the growth in terms of income (*Walker & Brown*, 2004). In the Hungarian literature we can find these topics in the work of (*Bódi-Schubert*, 2012; *Chikán & Czakó*, 2009 and *Kerepesi*, 2009) pointing out that the goal is also influenced by funding efforts. According to the study of the GKI economic researcher (*Némethné Pál & Papanek,* 2014) the goals can be written down by financial indicators as increasing income, decreasing costs, increasing profit, increasing market share and corporate value. According to *Cole* (2017) the success is not only the accomplishment.

At the same time success has external factors, too. Based on the research of GKI (*Némethné Pál & Papanek*, 2014), the factors explaining success include labor and capital as necessary resources; the improvement of performance created by labor division (*Ridley*, 2012) and the competitive impact (*Porter*, 2006). There are also other types of grouping, as listed on the World Competitiveness Yearbook (*IMD*, 2012), where the external factors are: economic power, government efficiency, business efficiency and the infrastructural level.

According to *Neely et al*. (1995), the efficiency or effectiveness means meeting company goals, and the economy means the efficacy of the use of resources required to achieve the objectives. *Cho and Dansereu* (2010) say that organizational performance refers to the achievement of goals and objectives, and *Tomal and Jones* (2015) regard the organizational results or outputs as organizational performance. Similarly to international literature, the Hungarian sources, like *'Böcskei and Fekete* (2012) link the corporate performance to three elements: efficacy, efficiency and the relationship between the tools used and the results achieved, while *Szűts* (1983) examines corporate efficiency from quantitative and qualitative perspectives. On the quantitative side, it shows the result-expenditure ratio, while on the qualitative side it shows the realization of the goal. *Dobák* (2008) links the effectiveness of the organization to the realization of the organization's goals and the organizational efficiency to the achievement of the objectives. The decisive role of the leadership is also unquestionable in the efficiency of the organization (*Bakacsi*, 2019; *Kollár & Szabó*, 2019; *Pierog et al.*, 2017; *Kőműves et al.*, 2018) and it is closely related to other factors not discussed in this article, such as human resource management (*Dajnoki & István*, 2020; *Pató & Illés*, 2018). In general, organizational growth processes result from a cycle of three main processes: corporate planning, strategy implementation and performance measurement or evaluation (*David*, 2011).

According to the classical approach, in order to know how my company, my organization is performing, to be able to see how it is moving towards excellence, performance measurement is a must. „The performance measurement is part of the corporate control process. The goal of the corporate measurement is the evaluation and continuous monitoring of the efficiency and efficacy of the company operations. In the frame of the plan-do-check-act cycle, the measurement provides feedback, signals for any intervention that may be needed and information to support decisions at both, strategical and implementation levels.

The method of the measurement can significantly affect the company's operations and the development of the performance. Performance measurement cannot only provide information to help decisions, but also directly influence decisions, the actions of stakeholders (company managers, employees) who try to influence the development of the factors focused on the performance measurement system. At the same time, an inappropriate yardstick can also encourage you to act against your goals" (*Wimmer*, 2002).

During the research we have repeatedly faced the question of how to measure the performance of a company, how we can know whether a company or enterprise

is performing well or excellently. In order to develop a performance measurement system, it is necessary to determine the key factors. According to *Lorino and Gehrke* (2007), only corporate performance that contributes to the achievement of strategic goals or contributes to the improvement of value/cost ratio can be considered.

Atkinson (1988) formulates it in this way: „Strategical performance measurement determines the purpose and focus of managerial accounting. Strategical performance measurement begins with the owners of the organization by defining their primary goals. The organization's designers conduct strategical planning exercises to learn how they will pursue the organization's primary goals. The chosen strategic plan is the result of a quantity of formal and informal concluded contracts between the organization and stakeholders. The sale and purchase between the organization and its critical stakeholders determines the secondary objectives of the organization. The importance of the secondary goals varies depending on their impact on the achievement of primary goals. Secondary goals are critical, because they are variants used by the employees of the organization to achieve success – defined as the desired performance in the organization's primary goal. As the employees monitor the level of achievement of the primary and secondary goals, the data obtained can be used by them to review their perceptions of the organization's primary and secondary goals, which is an organizational learning process. The last step in the strategic performance measurement is to link incentive payments to performance measurement results".

Gates (1999) based on a research which involved 113 companies stated: "The strategic performance measurement systems turn the business strategies into achievable results. The financial, strategic and operational measures can be combined to measure how well a company can meet its goals".

Based on *Neely's* (1998 then 2004) opinion, the measurement systems help the decision preparation, because they make efficiency and effectiveness measurable. *Ittner at al.* (2003) who surveyed financial service provider firms, state that strategic performance measurement systems provide information that identifies a firm's strategies, providing the best opportunities to achieve the firm's goals and align management processes with the achievement of selected strategic goals.

As we can see, the performance measurement systems are very different, but they have one common property: the results depend based on the extent the objectives, strategies, processes, activities and the evaluation of results are clearly defined. For this reason, we considered it necessary to include in the primary research a strategic model that could be adapted to the topic of managerial thinking. That is how the choice fell to *Sinek's* (2019) model and at the value-creating processes (functions) level to certain elements of *Kapferer and Porter's* (2008) value-chain model.

Zsidó and Fenyves (2015) divided the performance measurement systems into two groups: traditional and reusable ones. Traditional performance measurement systems are based on the strategy, objectives and methods used and are expressed in financial indicators. The most common ones are:

- Profitability indicators, which measure the ability of companies to generate income, how they can generate income from sales, assets, and capital.

- Efficiency indicators, which measure how the companies can generate income with their assets.
- Financial indicators that show the financial position of a company.

The idea of "new" performance measurement methods starts with *Kaplan and Johnson* (1987) who indicated that the traditional financial indicators could not show the change generated by the competitive market and the modern organization's strategy. In addition to past financial information, according to *Rappaport* (1983 then 1999), the future also must be considered in terms of what the company will be able to accomplish in the future. In the 1980s, theories were born and empirical research addressed to the survival and to the long-term success of companies, concluding that the results were not only caused by the increase of the shareholder value. Based on *Donaldson and Preston's* (1995) "stakeholder" theory, in addition to the input-output model, any person or group, who has a legitimate interest and based on that participates in the firm willing to achieve some kind of profit, at the same time creates value, because the process is bilateral, having back and forth effect. In this way, they have an impact on corporate profitability.

MATERIALS AND METHODS

Excellence and success are those questions, which could hardly be held or clarified because there are exceptionally subjective and complex correlations behind the definitions. In the literature we could see that success could be defined in many ways, but there is not any index number or formula that anyone could determine easily and according to that, "label" the companies. The everlasting dilemma appears between the accounting approach and the financial result. Both are based on that the financial results determine the successfulness, but the subject of the debate between the two approaches is the question of the value of time. It means that: Is it possible to draw any conclusion according to the former accountancy numbers or should we correct it with the time-factors? The modern times profession expands it with the organizational behavior. Because of these, the question arises how to measure it. What kind of key factors could influence the corporate performance and what kind of value should they have to say to an organization that it is excellent? The conventional performance measuring methods are based on the financial indices, whereas the new methods are complemented with the strategic goals, the fulfilment of the goals and the changes, which are generated by the competitive market.

From this approach we planned to distinguish the actions determining excellence from those already achieved activities which highlight the company from the others. These are: awarding, belonging to the TOP 100 or TOP 500 companies and we took the export activity, as a measuring index, because we think that a successful challenge at the export competitive market is an eminent result criterion. Besides these, we asked questions about the market share, growth rate, efficiency and the amount of turnover to confirm or disprove the statements. Self-declaration elements were also included among the human factors, such as: the participant's self-assessment of how

good/excellent the leader is, and whether the organization that he/she manages is a market leader or not, and what the growth rate of the organization is in the market.

The market research was conducted by a research-group of Kaposvár University with the title "Leadership practice in small and medium-sized enterprises and startups – success-thinking and marketing strategy decisions" within the scope of the EFOP-3.6.1-16-2016-00007 NK2 project. It was supported by the Intelligent Specialization Program at Kaposvár University, and was entitled „Excellence in Leadership and Management" and „Humanagement – Human Value" research groups as founders of the Leader's Habits Network (leadershabits.com).

The aim of the research was to reveal a general survey, to establish a 'diagnosis', which could be later a base for a national research. Because of this neither randomness nor representativeness was our goal and qualitative research was counted nearly with the same importance in the evaluation of the results as the quantitative procedure. The chosen topic is many-sided, with extraordinary complex and diversified components. The whole research had an exploration 'pilot' character because we did not find any validated questionnaire in the chosen context that analysed all the designated dimensions (*Berke*, 2019). Our target was - in general – the senior managers: not only "the excellent" ones but also all of them who are leaders of an organization and lead themselves and/or a smaller-bigger community, manage different processes and are responsible for the results. The fundamental question for this article is the following: Is there any connection between the organization's leader's excellence (awards, growth rate, etc.) and the organization size and the number of the employees? And: How do the objective, external measurement elements (for example TOP-list's participations, awards, growth rate, etc.) appear as the final result of managerial work?

In the frame of the project there were two-step examinations. On one hand, there was a chain of focus group interviews, which was conducted among the Hungarian entrepreneurs. On the other hand, there was a questionnaire. The quantitative examinations took place after the qualitative examination. We asked company leaders, senior leaders to fill in our questionnaire. It was not random, nor representative, because it was hard to reach and mobilize the senior leaders and owners in favour of the research. Neither the research plan included this as an expectation because we knew that this special target group could be reached with difficulty and because of the unrevealed character of the target area of the research. We tried to send the questionnaire to more address-lists, for example to the list of the Chamber of Industry and Agriculture with the support of HSZOSZ or to the list of the local organizations of BNI but the respondent-willingness was almost immensely low, although we extended the period of the retrieving phase. As the questionnaire did not appear among the undertaken mandatory tasks, it appeared only in the research plan, the main results were phrased by the research group based on the focus group interviews.

We made the managerial questionnaire in Google Forms based on partially the processed focus group interviews, partially the results found in professional literature and international practice and partially the first version of the research group's questionnaire. The questionnaire contained 45 questions, closed and opened types equally, and also the so-called confidential ones, too.

In the examination 148 people could be involved, partially because of the low availability and respondent willingness and partially maybe because of the confidential characteristic of the questions and the big extent of the questionnaire (it needed circa 25-30 minutes to fill in). We wanted to analyse a complex economic/corporate problem with the help of the survey. Because of it we used a variance- (PLS) based modelling (*Kemény*, 2015.), not the probability sample purchasing, the arbitrary (send to a pre-arranged address-list) or the expert (judging sampling) one (*Majoros*, 2010). In this case the minimum number of the elements are between 30-130, according to literature. "Because of the problematic target group or research circumstances, that sample, which minimum consists of 60-70 elements, could be acceptable," said (*Lázár*, 2009.). *Bányai and Sipos* (2019) named similar problems from the field of the academic examinations. In their case the number of the base-multiplicity was 916, but they could realize only 103 appraisable answers after a more-step approach/promotion. The GDPR regulation, which was promulgated in May 2018, raised the number of difficulties.

We evaluated the data in groups with statistical methodology, based on personal features of the respondent leaders and the parameters of the organizations. We analysed the questions of the questionnaire with arithmetic mean, distribution coefficient and organizing the answers into groups depending on their nature. We used SPSS program for the analysis.

RESULTS AND THEIR ASSESSMENTS

Half of the organizations which were involved in the examination, could be found in the service industry; 16.9% of them in the public sector. Other industries were represented: manufacturing industry, commerce etc. The regional distribution was the following: the biggest rates were from Southern-Transdanubia (35.1%) and Central-Hungary (31.9%) but Southern Great Plain (16.9%) and Western-Transdanubia (10.1%) were also represented, as well as three more regions with smaller rate. By the age of the companies they were represented as follows: the young companies, under 5 years old (23.6%), 11-20 years old companies (23.6%) and the 21-30 year old companies (22.3%), so the distribution of the different ages was similar to each other. The distribution of the number of the employees are the followings: 45.3% are between 0-9 people, 21.6% are between 10-49 people and 8.1% are between 50-249 people, but in smaller rate those companies were also represented, which had more employees. In the aspect of the amount of the turnover, the companies were represented to over 10 billion HUF, at a larger rate there were those companies, who had 10-50 million HUF per year (19.6%), under 5 million HUF per year (16.2%), over 10 billion HUF per year (14.9%) and between 50-100 million HUF per year (12.8%). We made a classification based on the growth rate: the majority had adequate growing (43.2%), and similar rate had the stagnant ones (25%) and the prominent growing ones (24.3%). 77 percent of them are profitable.

According to the SMEs categories, there were decisively microenterprises (45.3%) and small sized enterprises (37.2%). Half of them were family businesses, but with a very small rate the start-up companies (14.9%) were also represented. 61.5% of the represen-

ted companies do not have any export activities; 12,9 percent of them are on a TOP-list and according to the growth-rate, 64,9 percent of them increased in the last year.

The applied independent (market) key performance indicators for the measurement of organizational excellence and their assessments

For the measurement of organizational prominence, we applied the following key performance indicators (value indicators), supposing that these were adequately objective and capable of distinguishing those who perform better, from those who perform on the average. These were: placement on a "TOP-list" (prominence list); awards and appreciations; export activity; the trend of the leading position on the market and the market growth rate. The majority of these examine the results inherently from a financial point of view, and this question group had high priority. In case of that if there was anyone between the organizations from the sample who performed well on these independent challenges, then we could take the opportunity to analyse the connections with the human factors focusing on those who performed eminently well.

Awards, appreciations

We asked the question: Did the organization win any awards in the last 5 years? From the 148 respondents 102 (68.9%) did not have any awards, so 46 respondents (31.1%) received some kind of award. During the analysis we examined the connection between all the unobserved latent variables. We found significant correlation in functions of the SME categories, the age of the company and the amount of the turnover. *Table 1* contains the results.

Conclusions:

- Depending on the number of employees the rate of the awarded companies is increasing, but not proportionally.
- *in line with the size of the enterprises the chance of the awarding is also rising.*
- so *the longer past an organization has*, the bigger the chance of the rewarding, or being rewarded is.

Belonging to a prominence list

For the question if the organization is belonging to the TOP 500 (or TOP 100) companies in Hungary (or in the county) – which counts as one kind of "independent" key performance indicator, 19 people (12.9%) gave "yes" as an answer, or "I think so, yes". 79.1%, namely 117 people surely did not belong there, and 12 people declared that they did not know. So, approximately *every tenth organization asked* got some kind of appreciation, which allow(ed) them to be on some kind of prominence list.

Conclusions:

- *the more employees the organization has*, the bigger the chance to be on some kind of prominence lists is.
- *with the process of aging the rate of belonging to the TOP 500 (or to other TOP-lists) is increasing.*

Table 1

Examination of the correlation in function of the last 5 years awarding, appreciations, rewards (n=148)

What kind of awards, appreciations was you/your organization rewarded in the last 5 years?							
	Have not got	**Have got as a person, from external source**	**Have got as an organization**	**Have got as a person from the employees**	**Total**	**p**	**Cramer's V**
How many employees does your organization have? (including yourself)							
0-9 people	54%	46%	13%	67%	45%		
10-49 people	23%	15%	20%	33%	22%		
50-249 people	10%	15%	30%	0%	14%		
250-500 people	7%	15%	10%	0%	8%		
501-1499 people	3%	0%	7%	0%	3%		
>1500 people	4%	8%	20%	0%	7%		
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**0.024**	**0.249**
SME categories							
Micro	54%	46%	13%	67%	45%		
Small	33%	31%	53%	33%	37%		
Medium-sized enterprises	6%	15%	13%	0%	8%		
Large company	7%	8%	20%	0%	9%		
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**0.028**	**0.208**
How long has the company (represented by you) been operating?							
less than 5 years	29%	0%	17%	0%	24%		
between 6-10 years	19%	8%	7%	33%	16%		
between 11-20 years	25%	38%	13%	33%	24%		
between 21-30 years	21%	23%	30%	0%	22%		
over 31 years	7%	31%	33%	33%	15%		
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**0.006**	**0.249**
How many is the annual turnover of your company?							
under 5 million HUF	23%	0%	0%	33%	16%		
between 5-10 million HUF	14%	8%	3%	0%	11%		
between 10-50 million HUF	17%	38%	17%	67%	20%		
between 50-100 million HUF	16%	8%	7%	0%	13%		
between 100-500 million HUF	7%	8%	3%	0%	6%		
between 500 million and 1 billion HUF	5%	8%	10%	0%	6%		
between 1-5 billion HUF	7%	0%	27%	0%	10%		
between 5-10 billion HUF	3%	15%	0%	0%	3%		
over 10 billion HUF	10%	15%	33%	0%	15%		
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**0.001**	**0.335**

The role of export

In the followings we examined the organizational unobserved latent variables with the context of the export activities, supposing if a company could export their final product, then its performance was over the average on the market anyway. For that question if the organization had any export activity 49 respondents gave yes as an

answer, so 33.1% of the examined companies. 91 (61.5%) companies do not export at all and the number of those who have already started the organizing of the export activities are infinitesimal – 2 companies (1.4%) have started it and 6 more (4.1%) have been thinking about it. Overall we can see, that in the *highest turnover categories the export activities are characteristic in any case.*

Analysis of the occupied position on the market (positioning)

As an important factor of the excellence, we tried to examine the occupied position on the market with the following question. In the questionnaire we did not give any separated explanation what kind of totality of indices we meant by the answers and because of the diversity of the respondent's professional background, we analysed the ensemble of the three indices in wide interpretation during the connection-examinations. We asked the answer classified in 5 categories, which were as follows (*Table 2*).

Table 2

Analysis of the occupied position on the market (n=148)

	Distribution, %
We are market leaders with decisive influence	7.4
We belong to the defining actors	42.6
Probably average performance is characteristic of us	40.5
We are lagging.	5.4
We are loss-making, we are fighting for survival	4.1
Total	100.0

Merging the categories, our opinion is that the number of prominently efficient companies is 74 (50%) and the lagging and the loss-making ones are only 14 (9.5%). The leaders of the remaining 60 companies (40.5%) attributed to their organizations an average performance. The conclusions of the connection-examinations with using unobserved latent variables are:

- *the strength of the market position is increasing in line with the number of employees;*
- *the quantity of the market contest-power is closely related to the size of the company;*
- *the more heightened the growth rate is, the more the company belongs to the market leaders, or to the defining actors* – and reverse.
- *all in all, those whose annual turnover is over 500 million HUF, represent bigger rate between the excellencies* (market leaders and defining organizations).

Opportunities and limitations of personal leadership

Size of the organization

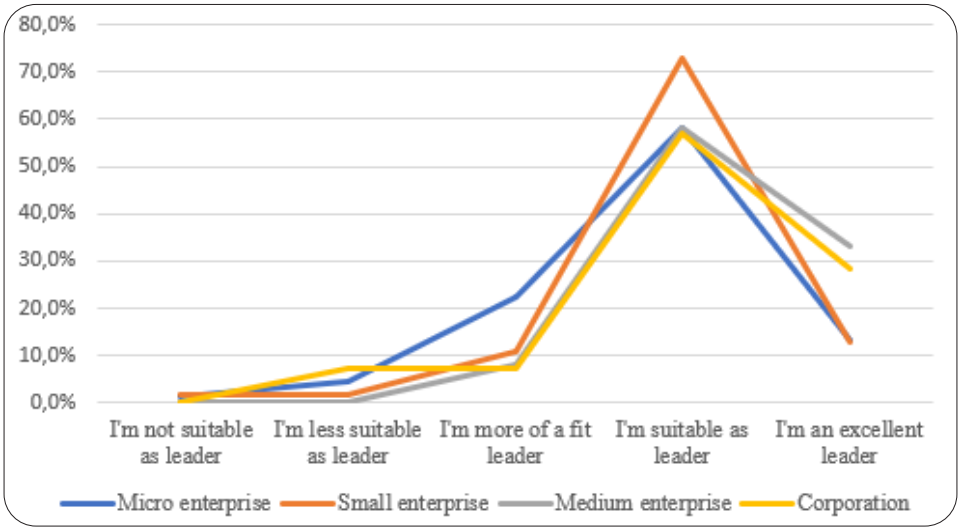
Despite the national economic importance of the smaller companies, they are still lagging behind the large companies concerning the aspects of quality and excellence – according to research (*Demirbag et al.*, 2006; *Herzallah et al.*, 2014; *Sternad et al.*, 2017).

The reason for this, according to *Sternad et al.* (2017), is that the SMEs still hesitate to consider comprehensive managerial systems, which help to monitor the quality and support the organizational and managerial excellence, because of their limited financial, time and human resources. The lack of awareness and understanding contribute to this, as well as the attitudes of the leaders and the concept fears, too – according to *Murphy and Leonard* (2016).

In the questionnaire we asked the question: how much do they think themselves excellent on a 1-5 Likert scale? The average was 3,9 (the standard distribution = 0.754), so the respondents find themselves capable of being a leader, but only 16.2% qualified themselves as excellent. On *Figure 1* it can be seen that the leaders of medium-sized and large enterprises find themselves excellent, as long as the leaders of small and micro-sized enterprises find themselves excellent to a much smaller rate.

Figure 1

Managerial excellence depending on the size of the organization (n=148)



We can conclude from this the following: the micro- and small-sized enterprises have real backwardness in the field of management compared to the multinational companies. The reasons which lead to this would be worth examining, henceforth directed help, consultation could be provided for the leaders of micro- and small-sized enterprises in order to develop their efficiency, because they have significant impact on every country's national economy. It causes more difficulties that only 10-15 percent of the leaders receive training and even fewer of them (5-10%) avail themselves of coaching. It would be suggested to support the trainings centrally, the leading development programs and to share the good practices in wider circles for free. As in qualification they do not have any backwardness in proportion to the leaders of large companies, further education and adult education could be suggested, too.

Level of the profit

Comparing the claim how much the leaders think themselves excellent with the profit, the growth-rate and the market influence, we are able to draw more conclusions. We discovered that it showed significant connection with the profit (n=148, p=0.001, Cramer=0.354). It means, that 17.54% of the leaders of the long-term profitable organizations describe themselves as an excellent leader; 65.78% of them as absolutely competent and there is no one, who find themselves less competent or incompetent. The leaders of the non-profitable companies gave the following answers for this question: 20.54% of them do not, 55.88% of them find themselves „just" competent to be a leader.

Growth rate

Although the examination does not show any significant correlation between the growth rate and the managerial competence, the results are informative. All the leaders of the „rocket-mode soaring" companies find themselves competent to be a leader, respectively the excellent ones. The leaders of those companies which are growing significantly gave similar answers, only 3% of them do not find themselves competent to be a leader. In the "stagnant" and "decreasing" categories the rate is much smaller: in case of the stagnant companies 13.51% of the leaders, in case of the decreasing companies none of them think themselves to be an excellent leader. 36.36% of the leaders of the market leader companies find themselves excellent, 54.54% of them find themselves competent to be a leader and there is no one who would find him/herself less competent or incompetent.

The rate is similar in case of the defining market actors. The results are well demonstrated on *Figure 2*:

Figure 2

Market influence depending on managerial adequacy (n=148)

One of my personal observation, based on these results, is that the *self-assessment of the leaders is still fairly low,* which is a very important element of emotional intelligence. An emotionally intelligent leader has high-level self-knowledge, which includes self-assessment, too. Those leaders who lead permanently profitable or „rocket-mode soaring" companies, should see themselves as excellent leaders, but somehow - according to their self-assessment, they do not. All in all, there is significant correlation between the measurement tools of excellence and managerial excellence, although, the tightness of it is low or medium strong based on this sample.

Experiential years as a leader

There is not any significant correlation between managerial excellence and the number of experiential years as a leader based on this research. In my humble opinion is that it is thanks to the fact that the younger, less experienced leaders have higher self-assessment, and the excellent qualified companies' leaders were conservatively in this topic respectively.

Other cases from the other parts of the original survey

We have found important connections related to the managerial excellence in three other cases, depending on the company size.

- it is less characteristic of the large companies to focus only on the results, without considering the efforts. (n=148, p=0.030, Cramer=0.229), but it is very characteristic of the micro-enterprises;
- proportionate to the company size the number of those leaders increases, who ask for continuous feedback from their subordinates about themselves as leaders. (n=148, p=0.000, Cramer=0.249);
- proportionate to the company size the time spent in the 3. time managerial quarter – the quarter of the urgent, but not important activities decrease. (n=148, p=0.022, Cramer=0.426)
- In one case, we have found important connection depending on the number of employees. Depending on the increase of the number of the employees the rate of those leaders increases, who ask for continuous feedback from their subordinates about themselves as leaders. (n=148, p=0.050, Cramer=0.277)

CONCLUSIONS AND LIMITATION OF THE RESEARCH

The comparisons with the applied independent(market) key performance indicators to the measuring of the organizational excellence brought the following results (*Table 3*).

As it can be seen, significant correlation can be found in case of three variables from the six, regarding the mentioned unobserved latent variables – appreciations, to be awarded, to be on a TOP-list and market influence. The export, the growth rate and the profitability are not dependent on the company size or on the number of the employees.

Table 3

Examination of the organizational excellence depending on the company size and the number of employees (n=148)

Variable	Company size according to the SME categories	Number of the employees
Awards, appreciations	Generally, the most awarded was the micro and then small enterprises. They have got mostly personal appreciations from the employees, while the medium-sized enterprises and large companies have got as an organization, and personal appreciations from external sources. (n=148, p=0.028, Cramer=0.208)	Significant correlation can be found in the examination according to the number of the employees, and similarly according to the company size. (n=148, p=0.024, Cramer=0.249). As we can see, the most awarded people are in those companies, where the number of the employees was under 9 people, which was followed by the 10-49 category.
Export	No significant correlation	No significant correlation
TOP-list	Primarily the large companies and the medium-sized enterprises belong to the TOP-list companies. Our examination showed significant correlation between the two variables. (n=148, P=0.000, Cramer=0.375)	81,82% of those companies which have more than 1500 employees are on a TOP-list and it is decreasing in proportion to the number of the employees. (n=148, p=0.000, Cramer=0.431)
Market influence	According to our examination, the market influence is increasing in proportion to the size of the company. (n=148, p=0.000, Cramer=0.312)	100% of those companies which have more than 1500 employees are market influencers, and it is decreasing in proportion to the decreasing number of employees. (n=148, p=0.000, Cramer=0.314)
Growth rate	No significant correlation	No significant correlation
Profitability	No significant correlation	No significant correlation

We can conclude from this the following: the micro- and small-sized enterprises have real backwardness in the field of management in proportion to the multinational companies.

As we could see in the examinations of the correlations between the examined variables, the Cramer's V contingency coefficient test showed mostly a moderate association, a strong relationship, the value being around 0.3. In the future it may be worthwhile to involve data mining, with bicluster procedure in the R program.

The limitation of this research is that it is a small, not representative sample, based on the national data from 2018, our sample of 148 covers 2.01% of Hungarian corporates based on the number of staff (basic population = 3 121 thousand people, *KSH*, 2018). Instead, small businesses and large corporations are relatively overrepresented to national data.

In this way the result cannot be generalized, but can be a good foundation for further, national level research and represents progress in the field, because we have succeeded in validating some new independent variables which could measure organizational excellence.

ACKNOWLEDGMENT

This publication has been written by "Excellence in Leadership and Management" and "HumanagementHuman Value" research groups as founders of the Leader's Habits Network-leadershabits.com.

The research is carried out by EFOP-3.6.1-16-2016-00007. It was supported by the Intelligent Specialization Program at the University of Kaposvár.

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Regional and Business Studies (2020) Vol 12 No 2, 65-76
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2520

The Effects of Wine Regions on the Profitability of the Hungarian Winers

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ABSTRACT

The aim of our research is to analyse the profitability and efficiency performance of different Hungarian wine regions. In our study, we make the initial assumption that wine regions function as a separate agglomeration zone, an industry cluster in the life of wineries. Consequently, it makes sense to evaluate profitability and efficiency not at the corporate level but at the wine region level. In the study, we used the DuPont scorecard system, which is now preferred by companies for planning and control purposes. According to the results of the 2017 large wine test, we divided the Hungarian wine regions into four groups, and in the case of wineries that cannot be classified as wine regions, we created two more groups. Our results are consistent with the theory of agglomeration zones and industrial clusters. In winemaking, it can also be demonstrated that wine regions, which can be considered as a special industrial cluster, have a significant impact on the economic performance of wineries.

Keywords: wine sector, wine region, dupont analysis, profit margin, asset productivity
JEL codes: M21, R12, Q14

INTRODUCTION

The global wine market has undergone significant changes in recent decades. In addition to traditional or so called "old world" wine producing countries, the "new world" wine producing countries are playing an increasing role. "Old world" countries include countries with traditional and long-standing wine cultures and documented wine histories, including some countries in the European Union (e.g., France, Italy, Spain, Hungary) and the Middle East (e.g., Turkey). "New world" wine producers include areas occupied by European conquerors following great geographical discoveries, where viticulture was established later (e.g., United States, Chile, Argentina, New Zealand, Australia) (*Balogh*, 2016).

In recent decades, the world's vineyards have been declining. Around the turn of the millennium the territory was 7.8 million hectares, while in 2018 the global production area was nearly four percent lower, about 7.4 million hectares, according to the *OIV* (2019). In particular, the area of "old world" wine-producing countries has declined significantly, mainly due to the European Union's wine market reform in 2008, which was intended to restore the reputation of community wines and balance

supply and demand. In parallel, several Asian countries have significantly increased their territories in the "new world" due to government incentives (*Jiao & Ouyang*, 2019). In recent decades, the U.S. has moderately increased its area, while China has nearly tripled its wine producing territory (*OIV*, 2019).

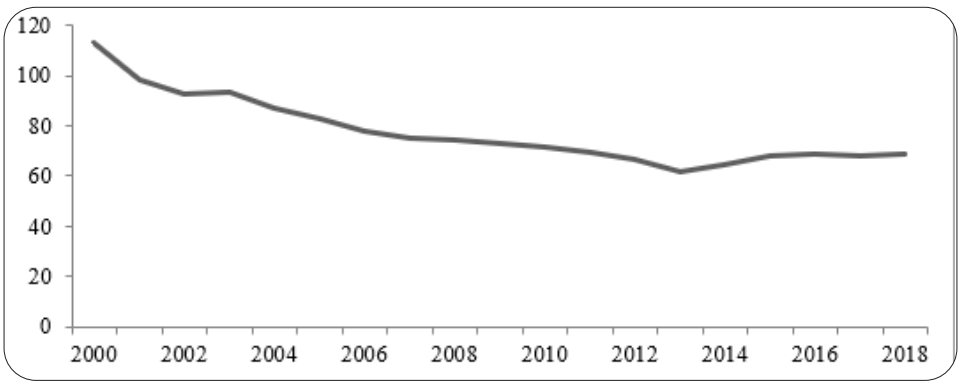
There have also been recent changes in wine consumption. Global consumption rose by nearly ten percent by the turn of the millennium. This increase, in addition to the stagnation of "old world" wine consumption, was due to the increase in "new world" wine consumption. Since 2011, the U.S. has been the largest consumer of wine (*OIV*, 2019). Global wine trade, and thus indirectly even wine consumption, according to a study by *Balogh* (2016) and *Balogh and Jámbor* (2018), has a negative effect on geographical distance, while a positive effect has a number of cultural factors such as former colonial relationship, common religion, or common language.

Hungary is one of the traditional wine-producing countries of the "old world". It has a long history of viticulture, so it is one of the defining elements of Hungarian culture and economy (*Törökné Kiss*, 2014; *Balogh*, 2015), thanks to which Hungarian literature is also rich in economic research related to the sector.

Similarly to the trends of "old world" wine-producing countries, Hungary was also characterized by a decrease in wine-producing areas after the turn of the millennium, as shown in *Figure 1*. In 2000, 113 million hectares of vineyards were cultivated in Hungary, which by 2013 fell to just under 62 million hectares, and by 2018, according to OIV data, it had risen again to 69 million hectares, which still represents a decrease of almost 40% compared to the millennium. According to *Szamosköziné* (2018) a favourable grubbing-up and restructuring promotions, an aging grape and wine-producing society, a changing legal background, administrative burdens, asymmetric information shifts, increasingly extreme weather, aging plantations, specialist shortages, economic crisis cause a lack of cooperation and mistrust, as well as unfavourable profitability leads to declining producing areas.

Figure 1

Hungary's grape growing area between 2000 and 2018 (thousand hectares)



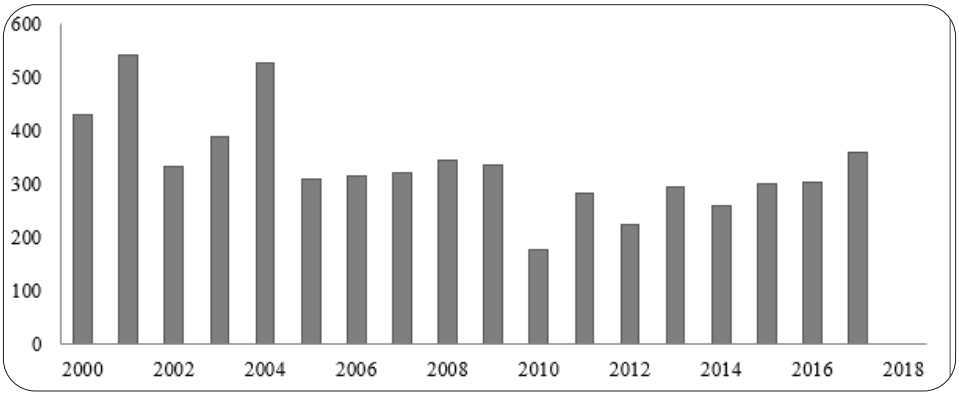
Source: *OIV*, 2019

Wine grapes are produced on about 85-90% of Hungary's grape producing areas, most of which are white grape varieties today, which is 69% of the planted area. The proportion of this varies between wine regions, but the national average has been between 65-70% in recent years. The situation was similar in 2019 as well, the area planted with blue grapes was 19694 hectares, while with white grapes it was 44693 hectares (*HNT*, 2019).

Based on the data of *KSH* (2020) (*Figure 2*), Hungary's wine production shows declining values after the turn of the millennium, similarly to other "old world" wine-producing countries. In 2000, Hungary produced more than 430 million litres of wine, and until the accession to the European Union, our production exceeded 500 million litres in two years. Subsequently, there was a significant decline in the market in 2005 and domestic wine production reached a low point in 2010 with a production value of about 180 million litres. In the last few years, domestic wine production has been rising again.

Figure 2

Hungarian wine production between 2000 and 2018 (million litters)



Source: Based on *KSH* 2020

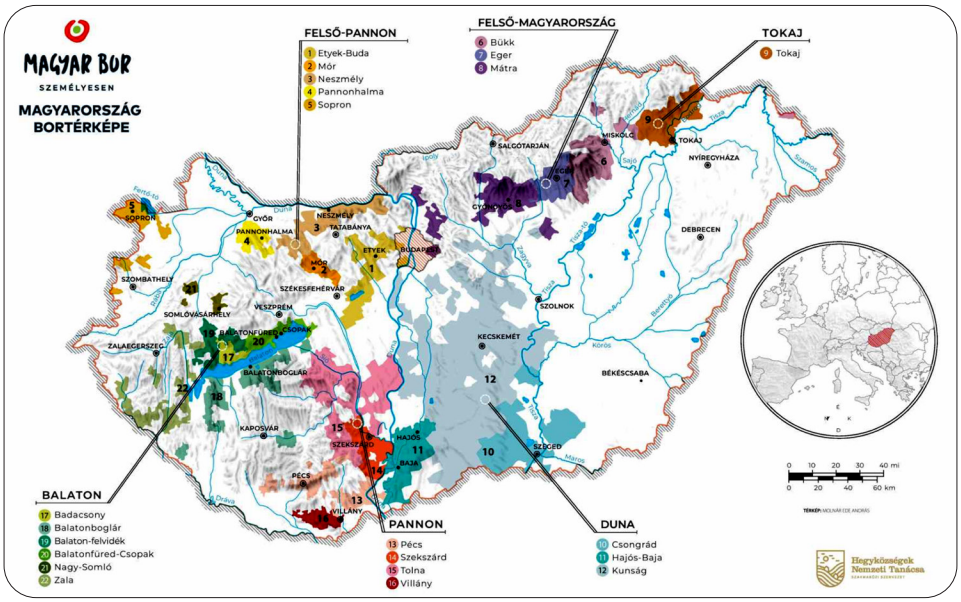
There are six wine areas in Hungary (Felső-Pannon, Felső-Magyarország, Tokaj, Danube, Pannon, Balaton) and within them a total of twenty-two wine regions (*Figure 3*), which are responsible for domestic wine production and are also essential parts of Hungarian wine tourism. They are unique in terms of their climate, topography, soil and history, so the wines produced in the area are also different from each other.

The concept of a wine area is defined in the law CCXIX of 2012. The law states: „a voluntary association of wine regions established for the promotion of their common interests and for the protection of the origin, quality and origin of the products they produce, consisting of a number of wine regions with similar wine-growing traditions, geographically close or adjacent". In order to interpret the definition, it is important to know the concept of the wine region, which was established in the

law XVIII. of 2004: „a set of production areas with similar climatic, topographical, pedological conditions, plantations with a characteristic variety composition and cultivation, specific viticultural and wine-growing traditions and from which specific wine and wine-related products are derived."

Figure 3

Wine map of Hungary



Source: *Magyar Bor* n.d.

It is also clear from the definition that wine areas and wine regions, which are separated on the basis of historical, cultural and natural (geographical and climatic) conditions, have become one of the most important differentiating factors of the domestic wine product market. The results of several studies (*Totth & Szolnoki*, 2019; *Harsányi & Hlédik*, 2017; *Darvasné Ördög et al.*, 2014; *Harsányi*, 2012; *GFK*, 2008) prove that the origin of the wine plays a prominent role in the purchasing decisions of Hungarian consumers. In this respect, it is understandable that in recent years several domestic researches have been done concerning the different marketing issues of a wine region (*Bartos-Slezák & Vas-Guld*, 2018; *Kiss*, 2014; *Kispál*, 2014a; *Gálné Czékus*, 2013; Molnár et al., 2009), or the economic analysis of the wineries (*Kismarjai*, 2015; *Kispál*, 2014b).

However, we are not aware of any work that has comprehensively analysed the impact of wine regions on the profitability of wineries. We want to fill this gap with our study. The aim of our research is to analyse the profitability and efficiency performance of different Hungarian wine regions.

In the next chapter of the article, we show the positive impact of a territorial agglomeration or industrial area, including wine regions, on the enterprises located within its area. Then we describe the data and methods used in the research. Finally, we publish our results and the conclusions that can be drawn from them.

THEORETICAL BACKGROUND - ECONOMICS OF AGGLOMERATION EFFECTS

In our study, we make the initial assumption that wine regions function as a separate agglomeration zone, an industry cluster in the life of wineries. As a result, it makes sense to evaluate profitability and efficiency not at the corporate level but at the wine region level. However, before presenting the primary research, we would like to present briefly the theory of agglomeration zones and industry clusters.

By industrial cluster we mean a group of companies belonging to a given industry, competing and cooperating at the same time, suppliers and service providers are capable of meeting the needs of the industry, and related industries and institutions are concentrated in a well-defined geographical area (*Porter*, 2000). The geographical proximity between the enterprises and institutions that make up the cluster, as well as the high territorial concentration of the industry, offer a number of advantages (*Csonka and Fertő*, 2017, 2020; *Csonka et al.*, 2018) for the actors of the cluster, which is called positive agglomeration externality, positive agglomeration effect or agglomeration advantage (*Lengyel et al.*, 2012). Agglomeration advantages can be divided into static and dynamic agglomeration advantages according to *Lengyel and Leydesdorff* (2008) and *Capello* (2002). By static agglomeration benefits we mean primarily "classic" external effects that reduce costs. Static advantages include, for example, a locally available specialized workforce, a specialized supplier base, a scientific environment and the presence of large, diversified input and/or output markets. The dynamic benefits, on the other hand, stem from an overflow of information and knowledge. In globalized competition, dynamic agglomeration effects, especially spillover effects, are increasingly able to provide a real lasting competitive advantage. According to industry relationships, we can distinguish between horizontal (within industry) and vertical (between industries) spillovers (*Wolfe and Gertler*, 2004; *Bathelt*, 2005). The available empirical research findings on the impact of vertical and horizontal spillover on firm performance (productivity) are inconsistent (*Wang and Wu*, 2016). Several studies confirm the negative effect of horizontal spillover and the positive effect of vertical spillover (*Jeon et al.*, 2013; *Le and Pomfret*, 2011; *Liu et al.*, 2009; *Jordaan*, 2008). However, there are researches that show opposite results as well (*Barbosa and Eiriz*, 2009; *László and Balázs*, 2007). It can also be seen from the above that corporate agglomerations also carry negative externalities. There is empirical evidence that in a given area and at a given time, these negative externalities may have a stronger impact than the positive ones, namely high territorial concentration in the sector may ultimately reduce corporate performance (*Marco-Lajara et al.*, 2016).

MATERIAL AND METHOD

In the paper, we used the DuPont scorecard system, which is according to *Katits et al.* (2019), popular among companies for planning and controlling purposes, as their advantages include simplicity, transparency and comparability of companies operating in different sectors and of different sizes. In the model the top indictor is the ROA (return on assets), which we divide into profit margin and asset turnover branches (*Kemény*, 2009). In the study, we want to compare the economic performance of Hungarian wine regions and area-independent wineries. To achieve this goal, the economic data of companies / enterprises are taken from the Crefoport Scholar database.

According to the results of the Great Wine Test in 2017 (*Nagy Bor Teszt*, nd), the Hungarian wine regions were divided into four groups, and two more groups were created in the case of wineries that cannot be classified in any of the regions (*Table 1*). Wineries in group 5 typically operate in smaller areas which do not belong to any wine region, while the wineries in Group 6 are interested in several wine regions due to their integrated operation.

Table 1

Grouping of wineries

Group	Wine region/ settlement/ winery
1. Highly popular	Villány-Siklósi, Egri, Tokaj-hegyaljai
2. Preferred	Badacsony, Balaton-felvidéki, Szekszárdi
3. Less preferred	Balatonfüred-Csopaki, Etyek-Budai, Soproni, Balatonboglári, Mátraaljai
4. Least preferred	Csongrádi, Hajós-Bajai, Kunsági, Ászár-Neszmélyi, Móri, Pannonhalma-Sokoróaljai, Nagy-Somlói, Pécsi, Bükkaljai, Tolnai
5. Wineries not belonging to a wine region	ex.: Székesfehérvár, Debrecen, Pomáz, Érd, Nagytarcsa Dunakeszi
6. Area-independent wineries	ex.: Varga Pincészet Kft., Szent Imre Pincészet Kft., WEINHAUS Kft., VINOTRADE Kft.

RESULTS

The results of the DuPont model are summarized in *Table 2*. The three wine regions of Group 1 (Villány-Siklósi, Egri, Tokaj-hegyaljai) have the most operating enterprises compared to all the six categories. In the examined years (2009-2018) the number of winery enterprises increased from 160 to 176, while in one enterprise there were on average 6-8 employees, which means a high employment rate compared to the other groups. This group includes such famous wineries as Csányi Pincészet, Ostoros bor,

Bock Pincészet, Varsányi Pincészet and Royal Tokaj Pincészet, among others. Compared to the fact that the wineries are known and based on the results of the Great Wine Test, nearly 50% of consumers prefer these wineries, the results of the DuPont index are the weakest compared to the wineries of all the six categories. The worst years were 2012 and 2016, when the loss exceeded HUF 15 million on average. Group 1 achieved the most convincing result in 2018, when the ROA peak was -0.24%, which is due to the improvement in the profit margin (-0.84%), which is due to the relatively high sales revenue (HUF 102 million) and the relatively low profit loss (HUF 858 thousand). It is true that wineries in this group are successful and internationally recognized, but their deteriorating competitive position is mainly caused by innovative wineries in emerging wine regions and their high costs result in a loss-making marketing year.

Table 1

Grouping of wineries (%)

Group	Indicator	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
1.	Profit margin	-1,58	-2,10	-2,10	-15,31	-1,47	-14,29	-7,43	-21,10	-4,25	-0,84	-1,99
	Asset turnover	32,46	34,22	33,53	34,53	35,08	27,71	24,81	26,68	28,03	27,97	30,44
	ROA	-0,51	-0,72	-0,71	-5,29	-0,52	-3,96	-1,84	-5,63	-1,19	-0,24	-1,99
2.	Profit margin	18,09	15,15	22,33	14,78	15,74	16,95	14,63	13,76	11,09	9,83	14,63
	Asset turnover	32,15	32,70	31,91	24,82	25,37	23,01	29,97	28,67	26,72	25,25	27,33
	ROA	5,82	4,95	7,13	3,67	3,99	3,90	4,39	3,95	2,96	2,48	4,00
3.	Profit margin	9,56	-1,09	2,59	4,31	3,48	2,41	3,83	4,78	9,23	7,95	4,85
	Asset turnover	37,67	31,67	21,86	27,87	30,59	29,11	30,49	32,11	31,20	32,21	30,42
	ROA	3,60	-0,35	0,57	1,20	1,07	0,70	1,17	1,53	2,88	2,56	1,48
4.	Profit margin	-5,54	0,27	-0,04	8,59	5,21	5,49	2,83	3,84	11,81	13,61	4,60
	Asset turnover	40,09	50,57	50,50	46,44	46,05	45,78	49,61	46,61	48,93	49,78	47,37
	ROA	-2,22	0,13	-0,02	3,99	2,40	2,51	1,40	1,79	5,78	6,77	2,18
5.	Profit margin	-45,01	-8,40	-59,33	8,45	14,66	0,55	-12,02	22,12	-11,24	10,94	0,91
	Asset turnover	8,35	7,65	5,34	13,62	11,77	12,75	17,20	18,19	16,49	18,87	13,81
	ROA	-3,76	-0,64	-3,17	1,15	1,72	0,07	-2,07	4,02	-1,85	2,06	0,13
6.	Profit margin	4,14	4,19	1,83	2,69	5,79	4,65	5,17	3,58	6,55	10,02	5,07
	Asset turnover	75,97	81,03	83,15	93,83	68,89	75,73	72,73	74,69	72,89	72,65	76,17
	ROA	3,15	3,40	1,52	2,52	3,99	3,52	3,76	2,67	4,77	7,28	3,87

The group of preferred wine regions (Group 2), similarly to the first group, includes the wineries of three wine regions (Badacsonyi, Balaton-felvidéki, Szekszárd). The number of enterprises is the lowest compared to the other groups, in the examined years (2009-2018) it ranged from 51 to 60. The best-known wineries in this category include Bodri Pincészet, Laposa Birtok, Lajvér Pincészet and Takler Pincészet és Borászat, among others. The wineries of the second category have an outstanding economic performance compared to the other groups. The ROA ranged from 2.48% to 7.13%. 2009 and 2011 were outstandingly good years. Although sales show an increasing trend year on year, this asset is not reflected in proportional profit, due to the declining trend in profit margins, but even so, the wineries in the group are

the most economically efficient. The emerging wineries belonging to this group have innovative ideas, are open for development, and thus have an increasingly strong competitive position. Their marketing strategy is not only for wine sales, but for their hospitality and appearance at various sport events (e.g. UltraBalaton, Bodri Trail, Wine Region Half Marathon).

The third category (Group 3) includes wineries from five wine regions (Balatonfüred-Csopaki, Etyek-Budai, Sopron, Balatonboglár, Mátraaljai). The group's best-known wine businesses include Nyakas Cellar, Twickel Vineyard, Légli and last but not least Bujdosó. While in 2009 the return on assets (ROA) was outstandingly positive at 3.6%, in 2010 this figure was - 0.35%. In both years, the profit margin and the profitability ratio caused the fluctuation, within lead to high profit after tax in 2009 and the loss of HUF 666 thousand in 2010.

The group of least favoured wine regions (Group 4) includes wine regions with lesser known or poorer quality wines (Csongrád, Hajós-Baja, Kunsági, Ászár-Neszmélyi, Móri, Pannonhalma-Sokoróalja, Nagy-Somló, Pécs, Bükkalja). Among the products of these wine regions, we have traditionally found non-quality table wines, but in recent years, thanks to the development of technology and demanding wine-makers, good quality, light wines are also made. In cased of Group 4 the results of the DuPont analyses showed a loss in 2009 and 2010. As in the other groups, the profitability indicator of the companies caused the loss, which was caused by the profit after tax of the enterprises in a given year. In 2017 and 2018, due to the high profit, the profit margin was outstanding (12% and 14%), thus the top indicator (ROA) of the system was also high (6% and 7%). The asset efficiency showed exceptionally high results (40-50%) in the ten years of the examined period.

Group 6 includes wineries that purchase products from several wine regions, ie.they are not linked to an area or a single wine region, so we call them area-independent wineries. Relatively few wineries belong to the group, but the higher the number of employees they have. This includes large companies such as Varga Pincészet. The wineries in the sixth group are large and efficient wineries. Their sales and profits were also the highest in the years under review, compared to the other groups. The efficiency rate was outstandingly high in all the years, with values between 73% and 94%. From the results of the sixth group, we can conclude that the wineries belonging to the group operate economies of scale due to their large plant size. Another reason for the high efficiency indicator is the integration, because these companies buy grapes from several wine regions, they have partners in several wine regions, thus they are less influenced by the weather conditions of a given area.

One of the best and most successful companies in the group is Varga Pincészet, which also has cellars in the Badacsony, Eger and Tokaj wine regions. They produce grapes on nearly 250 hectares and also purchase from third party producers. Thanks to their continuous technological developments, they have become one of the most developed and successful wineries in Hungary.

CONCLUSIONS

In our study, we classified Hungarian wineries into six groups, based on the result of the Great Wine Test in 2017. The first group includes wineries from different wine regions which are considered as highly popular according to the costumers. These wineries have a long history and usually make their wines using their traditional process. Their brand is well-known on the market and their products are popular among consumers. On the other hand, our results show that the companies belonging to this group were loss-making during all the examined ten years. Behind this is the deterioration of the competitive position, which may be caused by the expansion of other wine regions. In addition to optimizing production, providing additional services to the consumers may change this trend. Besides this, the use of new marketing tools can help them to reach new consumers on the market (eg.: support various cultural or sport events).

The second group included wineries in wine regions that have become increasingly prominent in recent years and their products are in a preferred category by the consumers. The results of the DuPont scorecard also prove that these businesses are performing well, with the best results on the profitability side. No wonder, as innovative and youthful wineries such as Lajvér and Laposa belong here, which, with their modern look, can also appeal to the younger, gastronomic-demanding circle of consumers. The wineries belonging to this group become more and more popular among wine lovers, their continuous developments and their appearance at different cultural and sport events will strengthen their market position.

We consider it important to highlight the group of area-independent wineries. The best and best-known example of these wineries is the Varga Pincészet, which also has sites in three wine regions (Badacsony, Tokaj-Hegyalja, Eger). Thanks to this integrated operation and the large volume of grapes purchased, the specifics of each vintage in a wine region have less impact on the company's production. In addition, thanks to their large operational size and managerial skills, they can operate optimally and size efficiently. The other companies in this category also had outstanding efficiency indicators, which can be attributed to similar characteristics to Varga Pincészet.

Our results are consistent with the theory of agglomeration zones and industrial clusters. In winemaking, it can also be demonstrated that wine regions, which can be considered as a special industrial cluster, have a significant impact on the economic performance of wineries.

ACKNOWLEDGMENT

This study was conducted in the framework of the research EFOP 3.6.2-16-2017-00018 „Produce with the nature - Agroforestry as a New outbreaking possibility".

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Regional and Business Studies (2020) Vol 12 No 2, 77-91
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2521

Reviews of Sustainable Rural Development in the Scope of Building New Rural Areas in Vietnam

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ABSTRACT

In Vietnam, rural area is a region for living and working of a rural resident community, including mainly farmers. It is a region of agricultural production (by the general meaning). Besides, there are manufacturing activities and service, but priority is given to agriculture and rural community. Meanwhile, the rural density is lower than urban density. Vietnam introduced its development programme "Building new rural areas", which program aims at finding a concept of sustainable development in rural areas in order to emerge the role of sustainable development toward the National direction for local strategies and to ensure sustainable rural development. This paper is a work at the scope of reviews and literature available worldwide in development policies and programmes on sustainable rural development. It compares the dimensions of these policies and programmes on the basis of definitions, methodology and practical framework applied in order to identify a promotion for building new rural areas in disciplines, and especially supply a background for data analyses of the Vietnamese case in the National Target Programme "Building new rural areas during the period 2011-2015".
Keywords: sustainable rural development, sustainability, new rural areas, Vietnam, commune, rural development program, rural development policy

INTRODUCTION

Rural areas have been in focus of various local, national and international level policies, and most of it explains the relevance of them with its role in food supply, the high proportion of population living there and – in relation with many consequences - the poverty of rural people (*Anriquez & Stamoulis,* 2007).The International Fund for Agricultural Development estimated already in 2001 that among the poorest 1.2 billion people in the world, surviving with less than a dollar per day, three out of four lived in rural areas. They constitute the poorest fifth of world population and do not earn enough to cover their food needs. In comparison, In 2018, four out of five people below the international poverty line lived in rural areas globally according to *Worldbank* (2020). The fight against poverty and for the rise of rural areas is supported by worldwide programmes, however different regional level strategies and programmes call various approaches.

The EU's Rural Development policy supports rural areas to meet the wide range of economic, environmental and social challenges. It's target fields comprise the

competitiveness of agriculture, the sustainable management of natural resources, and climate action, and a balanced territorial development of rural economies and communities, the creation and maintenance of employment. Rural areas account for 90% of the territory of the 27 Member States and more than 56% of the EU's population. As early as in 2008, European Communities stated that agriculture and rural development is central to national and international development agendas due to its contribution to poverty reduction (*European Communities,* 2008).

In Vietnam, building new rural areas or rural transformation or rural development process is in the centre of the developing country's strategy. Because "There is a firm aspiration that by 2035, Vietnam will be a modern and industrialized nation moving toward becoming a prosperous, creative, equitable, and democratic society" (*World Bank,* 2016, p. 17). The Vietnamese state was consistent and determined with its policy orientation to develop the economy in parallel with improving social life and protecting the environment.

LITERATURE REVIEW ON RURAL DEVELOPMENT CONCEPTIONS

Sectoral approach based rural development

As rural areas are in large areas, they are affected by natural conditions at diversified levels. To resolve the multi-faceted problems of the rural population in a holistic manner is not possible (*Schmidt-Kallert*, 2005). Sectoral approaches perceive the rural population in a specific role: i.e., the farmers as food producers, so they focus specifically on "layers" of rural population. This is supported by the approach of European Communities to capture the role and position of Agriculture and Rural Development programme in order to improve rural areas in EU countries. It underlies that rural development lays in a multi-sector concept, including agriculture, rural infrastructures, rural water and forestry (*European Communities*, 2008).

Specifically, on the farmers' level, the Farming systems research approach (*Tanic & Dixon*, 2002) defines the rural development process as a process which encompasses the whole aspects of society, economy, environment, and political position of rural areas and it puts the farmers at the central issue of the solutions.

Participation-based approaches

Participatory and Negotiated Territorial Development (PNTD) approach proposed the question whether top-down or bottom-up concepts are successful. According to the past 30 years of experiences in technical assistance projects they identified mainly top down, supply-driven approaches. Interventions were defined by sectoral issues (agriculture, natural resource planning and management, soil, and water conservation, etc.). It was found that these interventionas failed adaption to local context as addressed only partially the constraints and potentials of the territories they dealt with (*FAO*, 2005).

Contrary, collective action theories concentrate also endogenously provided development factors, which can be interpretetd as participation-based, locally induced

development approaches. These researches' findings may contribute to the main questions to identify endogenous development factors for a small community in the Red River delta in Vietnam.

According to *Vanni* (2014) the importance of Collective Action theory was supported by the fact that in the last few decades an increasing number of literature on collective action and natural resources has emerged. They extensively discussed the conceptualization of collective action and the analytical framework necessary to study it.

From the point of view of methodology to study collective actions, the most important finding is that among factors that affect emergence, as well as performance of agriculture, natural resource management and rural development programs in developing countries "Cooperation has always been fundamental for human society and played a particularly prominent role in rural development programs" (*Meinzen-Dick et al.,* 2004, p. 1) The evidence for collective actions cover include collective decision-making, setting rules of conduct of a group and designing management rules, implementing decisions, and monitoring adherence to rules.

The collective actions was defined by *Meinzen-Dick et al.* (2004) as it "requires the involvement of a group of people, … a shared interest within the group and it involves some kind of common action which works in pursuit of that shared interest. ... This action should be voluntary, to distinguish collective action from hired or "corvee" labor…". (*Meinzen-Dick et al.*, 2004, p. 4)

Definitions of rural areas

Looking back at some main approaches to study "rural development" in a theoretical scope, this paper would research the real challenges and achievements of rural development programmes to overcome the difficulties of transformation of living conditions in order to make rural areas attractive and viable places, thus stopping migration of farmers to cities.

Theoretical framework of rural development and sustainable rural studies

In general, to draw attention to rural areas is not easy by a unique conception in rural studies. This paper discusses here different rural development conceptions.

Vietnam

In Vietnam, rural areas are the settlement for living and working of communities with mainly activities of agricultural production. Rural areas locate in large areas where nature - society - economics differ significantly. Meanwhile, rural areas are the places to supply foodstuff for living, to supply raw material, goods for industry and export, labor for industry and urban areas. It is also the large market for consumption of industrial goods and services. However, the difference between rural and urban areas in Vietnam is not only the type of job of rural residents but also the difference of natural and socio-economic aspects. So, a conception of rural areas was formulated like this: "it is a large area with a community of residents in which they work for agriculture (agriculture, forest, and fishery), it has a low population density, behind

legging infrastructure, low educational, technological and scientific qualification, and the living standard of rural residents is lower than urban citizens" (*Thang & Dinh*, 2002, p. 10).

European Union

Rural areas are defined as "those parts of the space economy which are least affected by the process of urbanization and are therefore more associated with a much more dispersed pattern of population distribution and economic activity." Therefore, "[t] hey are also affected by varying levels of peripherality, depending on their distance from markets and their access to service." (*Grimes*, 2000, p. 13).

Food and Agriculture Organisation

According to the ESA Working Paper No. 07-02 of FAO, two main methodologies are used to define the 'rural'. "The first methodology is to use a geopolitical definition. Because urban is defined by law as all the state, region, and district capitals (centers), and by exclusion all the rest is defined as rural. The other popular methodology is to use observed population agglomeration to define urban. Therefore, in this case populations that live within an area where contiguous households form populations larger than, say 2,000 inhabitants are considered urban, while by exclusion the rest is defined as rural." (*Anriquez & Stamoulis*, 2007, p. 4).

Organisation for Economic Co-operation and Development

Nowadays, OECD countries operate the common Rural Policy Programme because of the fact that "[t]he success of large numbers of rural regions highlights the potential that can be tapped when rural communities are able to mobilise their place-based assets." (*OECD*, 2017, p. 2) So, OECD considers the direction of their future work for new diversified rural policy: "[r]ural is not synonymous with agriculture and is not synonymous with economic stagnation" (*OECD*, 2017, p. 4). *Table 1* indicates the different conceptualization of the paradigm shift in rural policy of OECD.

Table 1

Pesaran CD test for cross-sectional dependence

From Paradigm The 2005 New Rural Paradigm (NRP)		**To Policy**: Integrating policy domains to address well-being dimensions
Main tools	Investment	Complementarities with cities
Objectives	Competitiveness of rural areas	Low density economics
Key target sector	Holistic approach to include various sectors of rural economies	Better understanding of the variety and diversity of rural areas
Key actors	Multi-level governance	Toolkits/Policy dialogue

Source: *OECD*, 2017, p. 7

The traditional definition of rural as 'not urban' still lingers in some countries. The OECD regional typology is based on two main territorial levels. Besides this, OECD countries have three types of important distinction for rural regions (*Table 2*).

Table 2

The OECD regional typology - Three types of rural regions

<table>
<tr><td colspan="2">The Territorial Level 2 (TL2)</td><td colspan="3">The Territorial Level 3 (TL3)</td></tr>
<tr><td colspan="2">- the first level below the national one
- administrative units in most countries</td><td colspan="3">- the territorial level above the local level
- administrative units in some countries</td></tr>
<tr><td colspan="2"></td><td>predominantly urban</td><td>intermediate rural</td><td>predominantly rural</td></tr>
<tr><td>Rural inside the functional urban area (FUA)</td><td>Rural outside but in close proximity to the FUA</td><td colspan="3">Rural is remote from the FUA</td></tr>
<tr><td>These rural areas are part of the catchment area of the urban core and their development is intimately linked to that of the city.</td><td>These rural communities often enjoy a good industrial mix, which makes their local economies more resilient.</td><td colspan="3">Primary activities play a relevant role in the regional economy.</td></tr>
</table>

Source: Based on *OECD*, 2017

Those disciplines above support significant keys for the process of decision-making about rural development policies and accordingly to the relation with agricultural development policies, especially for the process of building new rural areas in Vietnam.

The following part of the paper discusses rural development and programmes in different practices.

RURAL DEVELOPMENT PROGRAMMES

World Bank

As early as the Sector paper of World Bank in 1975 presented the guidance of rural development programme and this knowledge is still an effective basis for developing countries at present, especially for the case in Vietnam. It advises that a national program for rural development includes a variety of activities, targeting to raise agricultural output, create new employment, improve health and education, expand communications and improve housing (*World Bank*, 1975).

Food and Agriculture Organisation

Contrary, FAO considers rural development as one with "particular reference to agriculture". It recognizes agriculture as the basis of the livelihood of most rural families, and therefore the basis for the development of rural areas. FAO defines

rural development as a "process of analysis, problem identification and the proposal of relevant solutions. This process is usually encompassed within a programme or a project which seeks to tackle the problem identified" (*Oakley & Garforth*, 1985, p. 29). Although, this approach is criticized by the author: the problems that rural development programmes attempt to solve are diverse, the programmes should not focus only on agriculture but the social or institutional problems in rural areas, too. Therefore, rural development strategies and programmes implement complex projects in a specific rural area. These provide basis for government and non-government efforts, and they include both agricultural and non-agricultural projects. The principles of rural development programmes according to Oakley- Garforth is presented in *Table 3*.

Table 3

Principles of rural development programmes

1. Access	Ensure that the programme and its benefits can reach those in need.
2. Independence	Devise a programme which helps and supports the farmers.
3. Sustainability	Ensure that the programme's plans and solutions are relevant to the local economic, social and administrative situation.
4. Going forward	Technological aspects should help the farmers to take the next step in the development.
5. Participation	Try to consult the local people, find out their ideas and involve them as much as possible in the programme.
6. Effectiveness	A programme should be based on the effective use of local resources and not necessarily on their most efficient use.

Source: *Oakley & Garforth*, 1985, p. 38

For the case of the National Target Programme Vietnam for building new rural areas during the period 2011-2015, each actor of the RD programme (decision-makers, stakeholders, groups, communities, organizations...) can have different approach for the implementation to reach the different outcomes within the main principles.

International Fund for Agricultural Development

In the IFAD Report 2016 about rural development, a transition of rural areas toward an inclusive growth was defined: "Inclusive rural transformation is … a critical component of inclusive growth as a whole, of sustainable development in all its dimensions - social, economic and environmental. It is both a vision and a lens through which to interpret historical processes in rural areas across the world" (*IFAD,* 2016, p. 263). This process defined a preservation of the rural heritages but also a promotion of all-inclusive growth to create a sustainable development for rural areas and it supports important lessons for the case of Vietnam for building new rural areas during the period 2011-2015.

Vietnam

The point of view on rural economic development is in the process of industrialization and modernization by four major dimensions. First, an effective rural economic development must contain three pillars: society, economics and environment. Second, the rural development must have a multidimensional rural economy under the market mechanism and the management of the state. Third, the development of rural areas should be done comprehensively regarding to the comparative advantages of different regions. Rural development is not only economic development but also a development of society and security, and environmental protection. Rural development is not only a development in the agricultural sector but also in industry and service. Fourth, rural development has goals in industrialization and modernization by eradicating lagging behind of rural areas, building rich and civilized rural areas to tackle rural areas toward industrialization and modernization (*Thang & Dinh*, 2002).

Generally, to find a concept of sustainable development in rural areas to emerge the important role of sustainable development toward the National direction for local strategies and to deal with sustainable rural development in Vietnam is the aim in this section.

SUSTAINABLE DEVELOPMENT OF RURAL AREAS

The multi-faceted goals of rural development including maintenance and improvement of natural resources and economic growth calls the definition of sustainable rural development.

Sustainable development in OECD countries

According to OECD, sustainable development means integrating the economic, social and environmental objectives of society It targets to maximise human well-being in the present without compromising the ability of future generations to meet their needs. The task is to improve the coherence and complementarity of policies across a wide range of sectors, in order to respond to the complex development challenges (*OECD*, 2001).

Vietnam

In Vietnam, it was realized that: "sustainability is a method of reasonable development". Economic globalization has a wide effect on economic development, but it has to meet the goals of economic-social-environmental effects and sustainability harmoniously and comprehensively (*Dung et al.*, 2010).

Rural development policy reforms in the European Union (EU)

In the European Union, rural development policy promoting sustainable economic, social, and environmental development is integrated as a component of the common agricultural policy (CAP) (*European Commission*, 2006).

Decoupling of price support, area payment and aids for diversification of rural economy has been taken place through consecutive reforms of CAP (in 1960, 1992,

1995, 2003), while more emphasis has been put on animal welfare and nature conservation actions, in further modifications of the programme (*2005, 2007*) that brought EU Rural Development Regulation (RDR) into effect (*Borec - Turk*, 2009).

Furthermore, historical evolution of rural development policy in the EU is also integrated with the Cork Declarations (1996, 2016), and Leader initiative. First, the Cork declaration (1996) aimed at improving Living countryside through ten points (*European Commission*, 1997); later, the Cork 2.0 Declaration defines ten policy orientations with the aim of providing Better life in rural areas in an innovative, integrated and inclusive rural and agricultural policy with special regards to Promoting Rural Prosperity, Strengthening Rural Value Chains, Investing in Rural Viability and Vitality, Preserving the Rural Environment, Managing Natural Resources, and Encouraging Climate Action (*European Union*, 2016). There is an inheritability conjunction from Declaration in 1996 to version in 2016. This is a coherent, integrated implementation of rural development policy to get well-being and wealth for rural resident and get attention for the effective green growth for rural areas of EU countries.

LEADER approach

LEADER Community Initiative has enabled new paths to be taken in rural development for the task of revitalising rural areas in the EU countries. Leader stands for 'Links between actions of rural development'. Leader approach is a tool that works well, in quite different situations and types of areas, thus adapting rural policymaking to the extreme diversity of rural areas' needs. For these reasons, it has now become an integral part of rural development policy. It is an area-based and bottom-up approach, involving local communities and adding value to local resources, gradually came to be seen as a new way of creating jobs and businesses in rural areas. Leader began in an experimental way bringing together, at local level, various projects and ideas, stakeholders and resources. It proved to be an ideal instrument for testing how to expand opportunities for rural areas (*European Commission*, 2006)

In the rural development context, LEADER is implemented under the national and regional Rural Development Programmes (*European Communities*, 2014) (RDPs) of each EU Member State, co-financed from the European Agricultural Fund for Rural Development (EAFRD) (*European Union*, 2017). It aims at forming multi-stakeholder networks for rural development and strategies on the mutual partaking in development programmes.

So, the overall circumstance of rural development policy and/or programme in the EU is lessons to learn for rural development policy and programme in Vietnam. Finding impacts of sustainable rural development in the EU can be seen as a target learning in building new rural areas in Vietnam at present.

The notions of the three pillars of economic, social and environmental aspects are correlative with the concepts of rural areas, rural development and sustainable development. It is clear that the basic and specific disciplines in rural studies and the studying of rural development are the key notes for data analysis of the RD programmes

MATERIALS AND METHODS

Deriving from the judgment of the relation between theory and practice in studying rural development, I had carried out a preliminary research through various approaches.

In this paper I discuss criticism about sectoral approaches of rural development and highlight the importance of and compare participation-based approaches through international practices. The selection of publications and materials used as secondary sources for this analysis was based on that they cover the general concept of approaches to rural development programmes and policies.

In further part of this paper the conceptions of rurality are discussed on the basis of articles and policies. The review covers the definitions of rural areas, rural development (and programmes) and sustainable development of rural areas – comparing the European practice and Vietnamese evidences.

The other half of the paper introduces the so called practical framework for rural development from the context of rural characteristics of Vietnam. The source of secondary data shown here is the national statistical office; and Vietnam's development programme was used as secondary information source. The Results and discussion part also covers lessons to learn from EU and international practice.

RESULTS AND DISCUSSIONS

In this section, I present a practical framework about rural development to have a real comparison of rural development policy and programme in the EU and in Vietnam.

Characteristics of rural areas in Vietnam

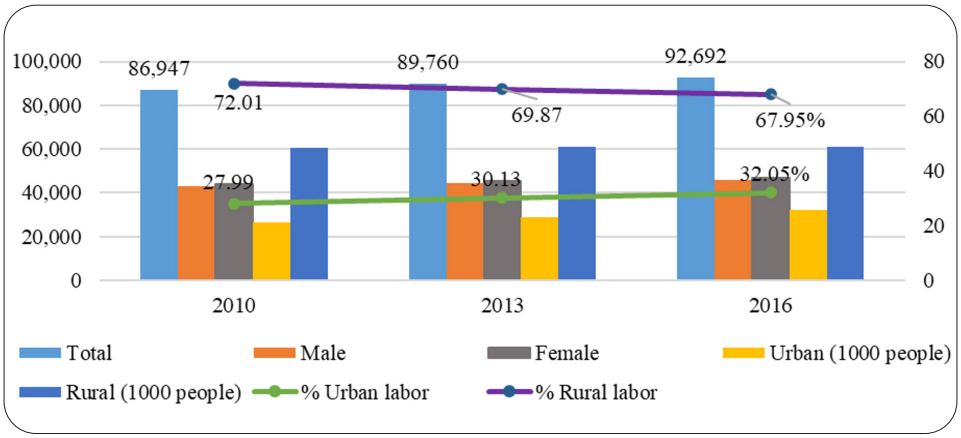
Rural areas have a vital role and position in the development of the country. Rural areas is a region where foodstuff for basic needs and supply cereals, raw materials for industry and export are produced. For several years, the agricultural sector has produced 40% of national income and 40% of export value to create a cumulative source for industrialization and modernization for the country. It supplies profuse human resources for society derive from, it gives 67.95% of the labor force. However, in industrialization and modernization, there is transfer of rural labor. They have moved to work for industry and service in urban areas and industrial zones. Rural areas accounted 67% in 2013 and reduced to 65% in 2016 regarding the whole population of the country. So, rural areas in Vietnam are still a large market of domestic consumption of industrial and service products (*Figure 1*).

Rural areas has over 50 ethnic groups living together, including many different members, classes, beliefs, and religions and this is a basis to guarantee a stable socio-economic condition of the country and to strengthen the unity of ethnic communities.

Rural areas are placed in the large areas where there are different natural, economic and social conditions. That is a huge potential of land, minerals, fishery for sustainable development. (*Thang & Dinh*, 2002).

Figure 1

Population in Vietnam by gender, urban - rural areas and labor force period 2010-2016



Source: *GSO*, 2018a; *GSO*, 2018b

Therefore, the agricultural and rural development policies in Vietnam are always based on those special characteristics which decide all orientations of the Government and the State in this section.

Rural development policy at present in Vietnam

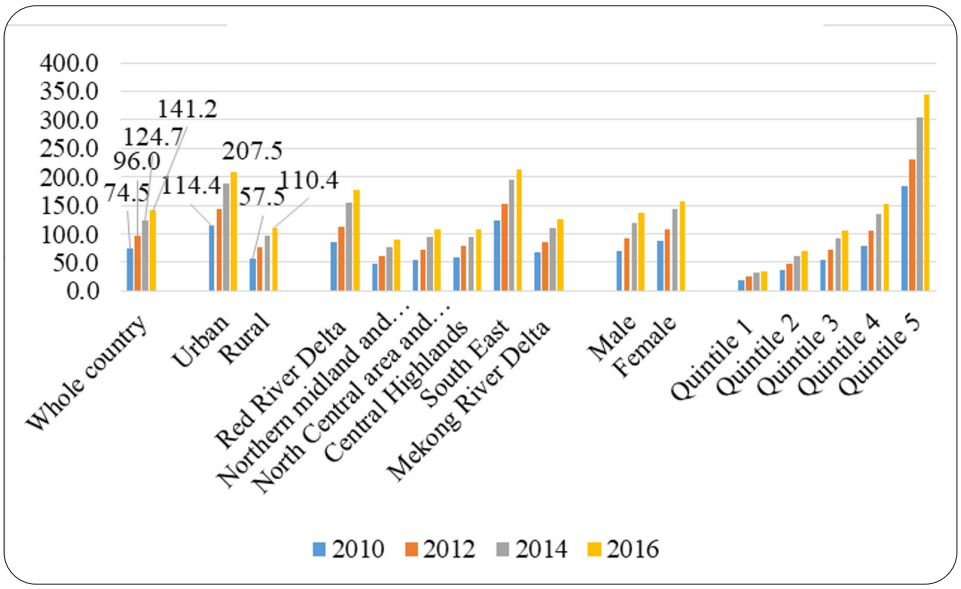
Rural, agricultural policy is the overall economic and other methods of the State (from central to local) affecting agriculture, rural areas and all fields, sectors in rural areas and agriculture (*Khoi*, 2007). The rural policy targets not only the economic activities but also particular social activities. As job, poverty, population, rural custom, rural traditional living issues may differ from urban areas, an intervention into economic activities and the influence on social activities are very important directions of rural development policies (*OECD*, 2015).

Vietnam Sustainable Development Strategy 2011-2020 is a point of view of state management about sustainable development on a macroeconomic level in Vietnam. It considers human beings as the center of sustainable development. Creation of favorable conditions is important for individuals and community in order to have equal opportunity to develop talents; access to joint resources; and participate in building of, contribute to and benefit from knowledge, material and cultural backgrounds for the next generations.

Vietnam SD Strategy 2011-2020 approved the general objectives as the aims to achieve sustainable rural development from three aspects. The economic aspect aims at the process of urbanization and modernization of rural areas which needs to comply with the norms of building new rural areas, decrease the development gap between urban and rural areas. *Figure 2* illustrates the regional and quintile incomes in Vietnam.

Figure 2

Monthly income and Income quintile in Vietnam by VHLSS 2016



Source: *GSO*, 2018a; *GSO*, 2018b

Figure 2 indicated challenges of the income gap between rural and urban areas which occurred among regions in Vietnam and reflected upon the reality of wealth by income generation and affected consumption expenditure.

The third, social aspect is developing urban areas, building new rural areas and allocating population and labor in each region properly and sustainably. *Figure 3* illustrates the income inbalances in Vietnam.

Imbalances of incomes increased according to above statistics, although in urban regions, variation of GINI is more moderate and these regions seem less vulnerable than rural areas.

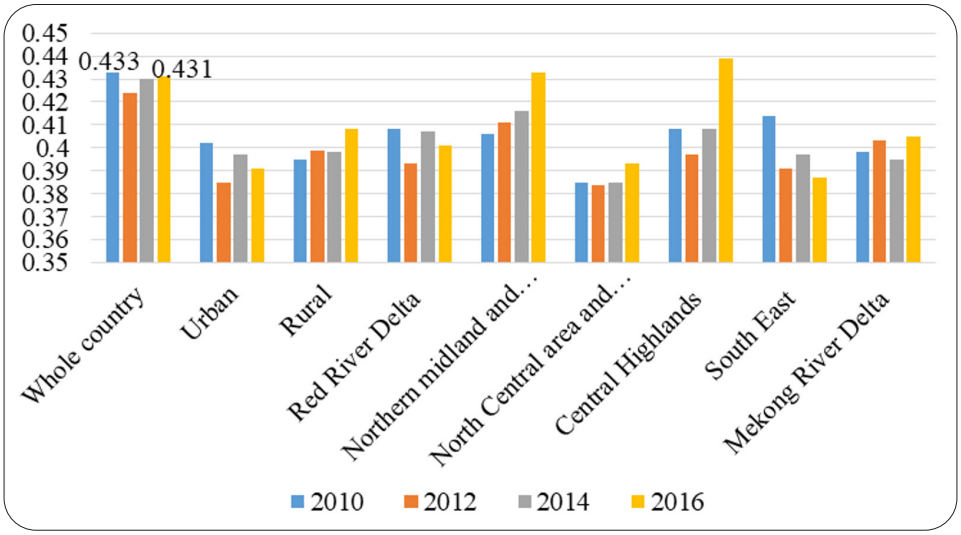
The aspect of maintaining resources and environment includes degradation prevention, effective and sustainable use of land resources; protection of water environment and sustainable use of water resources; protection of marine, coastal, island environment; forest protection and development; reduction of impacts, climate change adaptation, prevention of natural disasters (*Dung*, 2012).

The National Target Programme for building new rural areas in Vietnam

The reality of practical framework of rural development policies are not comprehensive for performance in rural areas in Vietnam at present. They should be put in and operated by National Target Programmes and National Development Strategies under the conduct of the Government.

Figure 3

GINI coefficient in Vietnam by VHLSS 2016



Source: *GSO*, 2018a; *GSO*, 2018b

The National Target Programme for building new rural areas in the 2010-2020 period and vision into 2030 was worked out by the government to build new rural areas in Vietnam. It will produce socio-economic infrastructure, economic structure and organization production models reasonably that combine agriculture with developed industry and service; combine rural development and urban development programs. According to this programme, rural society must be democratic, sustainable, rich of ethnic culture; its ecosystem is prevented; its entertainment and spirit of life is improved.

CONCLUSIONS

This paper's literature review chapter aims at the synthesis of conceptions, definitions, and approaches in rural studies in general and in rural development studies to describe an overarching understanding about rural areas and sustainable rural development. Every piece of literature in this chapter explained the essence of progress of socio-economic growth and development in rural areas, but this progress should depend on the characteristics of each economic model all over the world.

To sum up we can say that this paper contains analyses of theoretical and practical framework in rural development studies to conceive the significant lessons and important keys for decision making, for effective institutions of rural development policy and rural development programmes. Especially, this research work can recognize the target lessons by analyses of all literature as the goals to support the implementation of the National Target Programme building new rural areas in Vietnam in the first stage during the years 2011 - 2015.

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Regional and Business Studies (2020) Vol 12 No 2, 93-107
Szent István University Kaposvár Campus, Faculty of Economic Science, Kaposvár
doi: 10.33568/rbs.2523

Application of a Simulation Model in an Agricultural Vocational School Through Examples from the Livestock Sector

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ABSTRACT

In today's education system, it is possible to prepare a skilled workforce within the framework of public education, higher education and vocational training outside the school system. One of them young people need to be prepared for activities that require adaptability and perseverance. In contrast, there has been a level of development in agriculture that neither teacher training nor vocational training can keep up with, as a result of which it is not possible to teach in the same wayas before. Significant renewal is needed in secondary agricultural education. One of the areas of this is the renewal of technical and IT training, the improvement of the standard of practical education following technological innovations. Numerous researches show that educators need to breakaway from the "outdated" methods used so far, more emphasis should be placed on motivation and practice, as these graduates will ultimately be business leaders who will coordinate the work of their professionals (Berke and Kőmüves, 2016; Kőmüves, Berke and Póra, 2016). It is therefore important and necessary to apply and put into practice the ever-expanding innovative teaching methods. As an innovative pedagogical method, I examined the possibilities of applying the simulation model I created, as this model can point to interdisciplinary relationships that enable students to study an economic process in a broader, more complex light by broadening their knowledge and reflectiveness.
Keywords: agricultural, education, junior high school, innovation, simulation, model

INTRODUCTION

In 2005, Andor drew the attention of educators to the fact that many educators do not know about the innovative methodological solutions needed for differentiated development, they do not even recognize the professional problem and often see a disciplinary issue which they should solve with pedagogical tools.

Demonstrating this idea, *Lakatosné Török* (2010) examined - what the reason may be why educators are reluctant to switch from traditional methods to innovative methods. The counter-arguments included the lack of time and resources, which, in the opinion of researchers, shows that the majority of the interviewed educators are not really clear about the essence of the methods mentioned above.

Based on a number of other studies (*Falus*, 2001; *Petriné Feyér*, 2001; *Radnóti*, 2006; *Szűcs*, 2018) we can say that teachers in schools are reluctant to employ

methods that disrupt the normal, traditional „order" to some extent. For 45-minute lessons, this thinking is particularly striking. This also explains the fact that the various methods, which can be called novel, even if they occur in schools, are still more in the practice of only one teacher (*Radnóti*, 2009).

However, it should be emphasized that literature increasingly reports on innovation efforts, changed trends, and even paradigm shifts in educational methods. According to these literature sources,traditional roles in education have changed, the role of the teacher facilitator has come to the fore, just like teamwork and cooperation, we can meet more and more innovative aspirations, mega renewal intentions are becoming more and more pronounced (*Czakó*, 2017).

In today's educational system, more emphasis is placed on theoretical education. Traditional Central European education systems primarily provide lexical knowledge that is easily and quickly available on the Internet, and knowledge of the facts alone does not provide as much competitive advantage as in the past (*Schmuck*, 2018). In the labor market, however, there is a growing need to train practice-oriented professionals who can make professional decisions quickly and efficiently in everyday life. Simulation models can also be used appropriately in agricultural education to develop all these skills.

It is also important to emphasize that the changed economic and technological environment requires the development of new modern educational curricula. This is also theopinion of *Dailey* and his research team (2001), who emphasize that technological advances have made it timely to update curricula, integrate several other disciplines to develop effective teaching-learning strategies, such as precision agriculture, where knowledge complexity is required, with the simultaneous application of several disciplines. Challenges need to be addressed in the short term as this can be a barrier to further development. Technology innovations, which involve the day-to-day use of IT tools, are important. The other important area, in my opinion, is innovation. In the rapidly evolving world of technology, scientific and technical "literacy" is becoming an important part of studies. Most schools have found that nowadays retaining students, or even avoiding school closure, also depends on the ability to innovate (*Bartha*, 2007).

Innovation lies in the use ofnew pedagogical methods that are different from traditional frontal education and differ from existing teaching practices. The IT tools that have always stimulated the development of the information society must not be left out of this quest for renewal. The emergence and educational application of technical tool miracles cannot yet be called innovative in pedagogical practice. School innovation lies primarily in the free access to information, which cannot be limited to IT or just computers, or even the use of the Internet. It includes everything that the teacher or student uses during the teaching-learning process. In this group of methods, thanks to learner-centered activities, students can be part of knowledge building. Thanks to next-generation methods, learners not only gather information using a computer, but use the information gathered to create new content. In this process, they become active knowledge creators instead of actors, students and teachers, information consumers (*Filep*, 2017).

In the teaching of agricultural sciences, we must strive to capture reality as realistically as possible, in order to present the various biological processes as accurately as possible. If this is not possible, we can use other tools or methods to illustrate the phenomenon, such as modelling, in which innovative tools can provide significant help.

In the case of animal husbandry process models, the essence of the simulation is to monitor the development of the animals by selected time units or days. According to the context of the model, the characteristics of the changes (reproduction, weight gain, feed use, etc.) during the period are calculated using the initial data. The results of the process are summarized at the end of the simulation. Animal husbandry simulation usually covers the whole process and often consists of several, successive repetitions (*Csáki*, 1976).

In collaboration with the Department of Feeding of the University of Kaposvár and the Feeding Group of the University of Wageningen, a dynamic - mechanistic model has been developed to estimate the performance of piglets with a live weight of 20-105 kg (*Halas et al.*, 2004). The developed model is suitable for estimating the growth rate and performance of animals, even within wide body weight limits. However, a qualitative estimate can also be made if the body fat content or the protein / fat ratio is taken into account as a qualitative factor in the calculations, so that the model can be used to determine the optimal nutrient content of the feed mixes fed in each feeding phase, necessary to achieve growth or protein incorporation. Using the model, the most optimal feeding strategy for the herd can be developed, and feed manufacturers can also benefit from the development of a new feed or a new feeding system that better meets the needs of the animals (*Halas and Babinszky*, 2007).

So far, attempts have been made to solve the tasks of organizing and planning the livestock sectors with various methods, such as calculation methods, but the further development of all of these is moving towards simulation methods, which can be used to examine the operational characteristics of biological systems. This state-of-the-art operations research procedure makes it possible to examine the complex impact mechanism and correlation of the ecological, economic and agrotechnical factors influencing the income of the given sector, and it can also provide the analysis of the separate, partial efficiency of each factor. *Balogh* (2017), in his doctoral thesis "Economic Analysis of Pig Meat Production and Consumption", he developed a simulation model of a pig farm, taking into account the farm values of the fattening raw material production farms, in which the profitability indicators of sow keeping and pig farming can be forecast by incorporating various risk factors. The model can be applied to any pig farm, providing an opportunity for economic analysis of herds with different constitutions. In his study, based on the results of the model used, he showed that among the production (natural) factors, the fluctuation of the farrowing average and pig feed consumption is the most significant for farm profitability, value. As a result of the changes in the economic and environmental factors, there was a growing need to apply the results obtained during the simulations in practice as a decision - support system. Examples are CLIMAK, CROP or the 4M method, which are used to increase the high efficiency of field crop production.

METHODS

The parameters of the simulation model I made were provided by the data of a livestock farm in Somogy county. The farm has been operating since 1999, with nearly 65 sows. Their work also includes breeding and fattening, so they deal with nearly 1800-2000 animals per year showing conspicuous differences. Since the main goal of pig breeding is meat production, for the economic production of which it is essential to ensure the right number and quality of reproduction (*Soltész*, 2015). So I started my research by collecting the breeding indicators of the farm, summarizing the data of the last three years from January 2018. The last data set was recorded in March 2020. During the documentation, 433 pups were recorded, in which we covered the number of piglets born alive and still during calving, male and female, and the number of piglets at the time of selection in the proportion of sex. The recording of the data of the pups was followed by the systematization of the data sets, which were individually guided per sow, into the MS Excel program.

After processing the data and statistical analyzes describing the distributions, the simulation method was developed, based on the elements of the Monte Carlo method (MC method for short). The method is essentially based on random sampling, with which we can estimate definite integrals for a large number of samples. In the model to be analyzed, I recorded the influencing variables and their time intervals, probability distributions, and the relationships between the variables. I generated real-value random numbers (1000 pieces) between zero and one - presumably with an even distribution, which I ran with a computer with 1000 experimental numbers, so I got an expected value for the result variable to be determined.

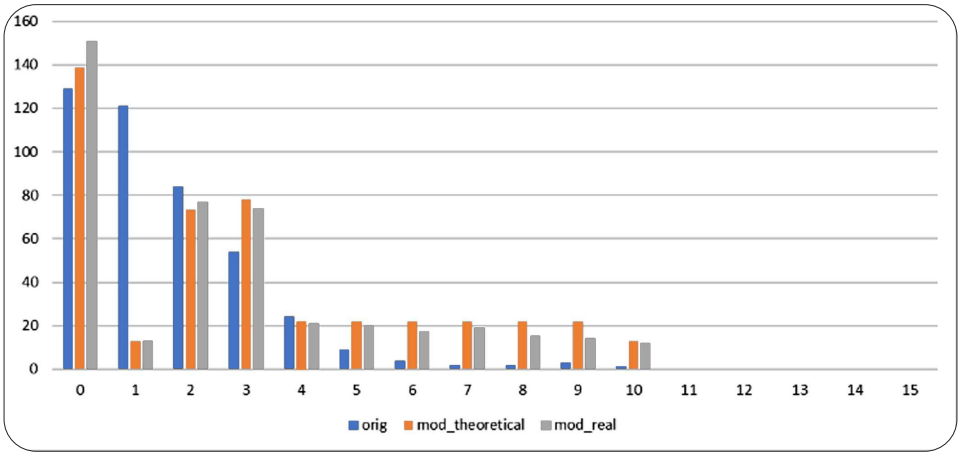
I narrowed the preparation of the model to the total number of piglets born, the number of stillborn piglets, and the number of animals that died before the selection. During the simulation, by changing the variables in the simulation data set from 0 to 1, using the "HA" function in the simulation, both the distribution function and the frequency diagram elements change, showing how the simulation we give affects the elements of reality. In the simulation result, changes affecting the entire economic process can be "predicted", which can form the basis of certain economic calculations, so either revenue-income relations can be forecast in advance, or it is also excellent for ordering feed base or feed raw material.

RESULTS

I present the simulation through the example of pre-election death. In *Figure 1*, a state approaching the baseline was recorded. It is clear from the data that there were 129 cases in the original data set that no deaths occurred until the selection. The value I gave in the simulation assumes 139 cases that reflect the same state. The result of the simulation model in this situation is 151 which can happen with such a number of cases.

Figure 1

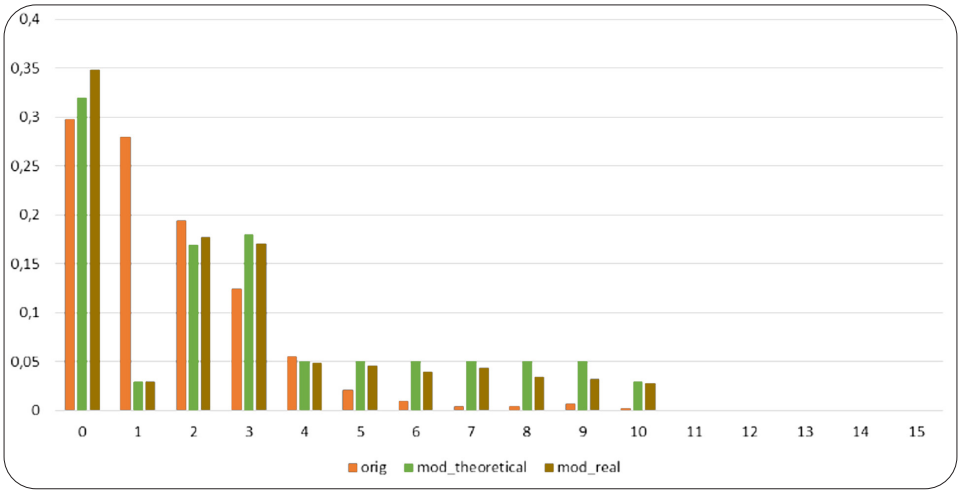
Frequency chart of lost before before veaning



In *Figure 2* we can observe the probability values belonging to the first state, that is, the probability of the realization of the state we assume will occur.

Figure 2

Distribution of lost before veaning

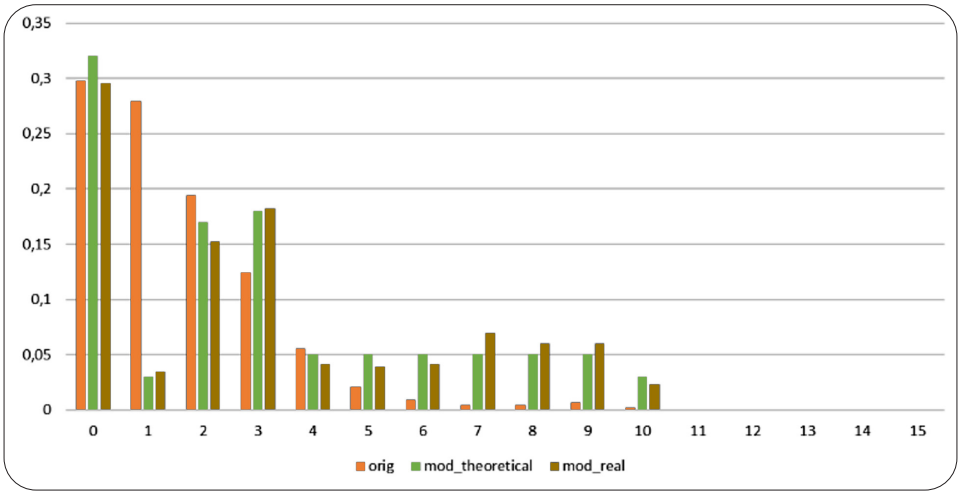


From the data in the graph, it can be seen that according to the original data series, the case of non-deaths until the selection occurred in 30%. As a consequence of the values changed during the simulation, we can expect the same condition to occur in 32%. During the continuous simulation, we generated a case in the probability variables in which the option of non-mortality was chosen in 32%, the number of cases in 3%, the number of two cases in 17%, the death of three animals in 18%, the other

cases were determined with equal percentage probability. The simulation diagram is shown in *Figure 3*.

Figure 3

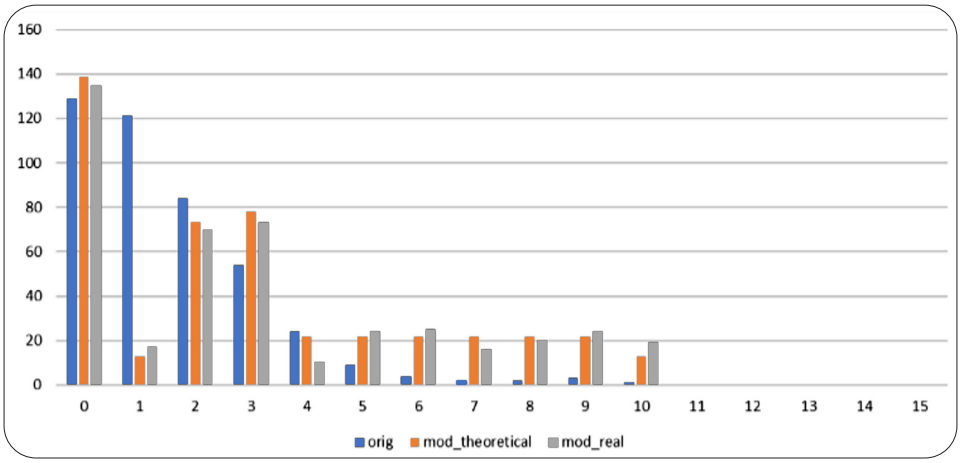
Distribution of lost before veaning after the simulation



With the help of the simulation, after determining the probability variables, it can be seen from the mortality frequency data that the original (129) cases, in which no death occurred during the simulation (due to the change we gave), increased to 139 cases. The result of the simulation (the case simulated by the model) changed to 113 times at which no death occurred until the selection. The results are shown in *Figure 4.*

Figure 4

Frequency chart of lost before veaning after the simulation



Performing economic calculations, the other case numbers must take into consideration in order to achieve values as close to reality as possible. The simulation model described above was presented at Zsigmond Móricz Agricultural Technical School in Kaposvár in November 2020, in the classes I also taught, the selection of which was based on the training courses at the school. Of the 11th farmer grades 24, those in vocational school training 29, and 21 technicians participated in the research. The model was presented via an online system, in view of the Covid-19 situation, in which, first of all, I tried to collect and organize the students' previous knowledge with the help of a PowerPoint presentation in a traditional system, thoroughness of their knowledge. In the introductory phase, I used the economic indicators of the sector to present the world economic situation of pig breeding, the difficulties in Hungary and the quality of production. The introduction, the questioning of the basic professional concepts took one lesson, i.e. 45 minutes, and then the next time the simulation model already sent via the Internet was presented. The characteristics of the students are shown in *Table 1*.

Table 1

Description of the students participating in the simulation model

Aspect / classes	11th / Farmer	11th / Vocational high school	13th / Agricultural technical school
Number of study participants	24	29	21
Boy	24	15	18
Girl	0	14	3
Number of day-pupil	19	21	10
Summary of the class based on study results	average	above average/ good	average/ medium

When applying the model, as a first step, I focused on the interpretation of the data collected and processed in the Excel spreadsheet, in which we looked at the number of live and stillborn piglets during the filing compared to the number of weaners, reflecting 433 calving data.

The presentation of the model and the performance of some of the economic calculations that formed the basis of the data generated by the model again took a lesson, during which the students could also try out the model, which they experienced almost as a "game". After the presentation of the model, I processed the effectiveness of the lessons and the model among the students in all three class types with the help of a questionnaire.

After processing the responses to the questionnaire, I obtained the following results. My questions focused primarily on the extent and effectiveness of our students' ability to create and analyze an Excel spreadsheet to assist in the processing and interpretation of data. The results are shown in *Figure 5* and *Figure 6*.

Figure 5

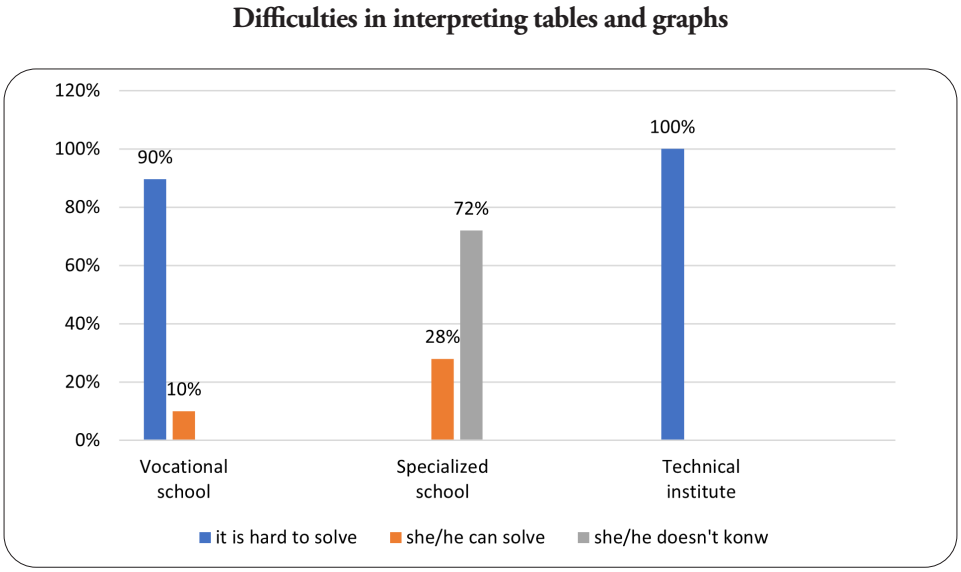
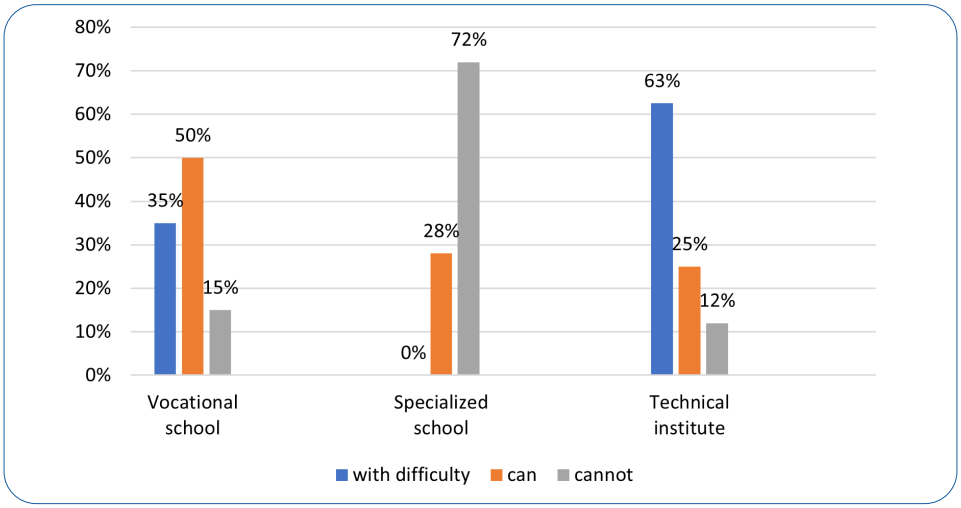


Figure 6



My results differ significantly in the three forms of training. Higher quality students who have already graduated from technical training are able to use the computer 100% for the right purpose, while among our students in vocational training, the use of an independent computer for this purpose is only marginally possible. The majority of vocational high school students are able to use computer programs independently and without help (90%).

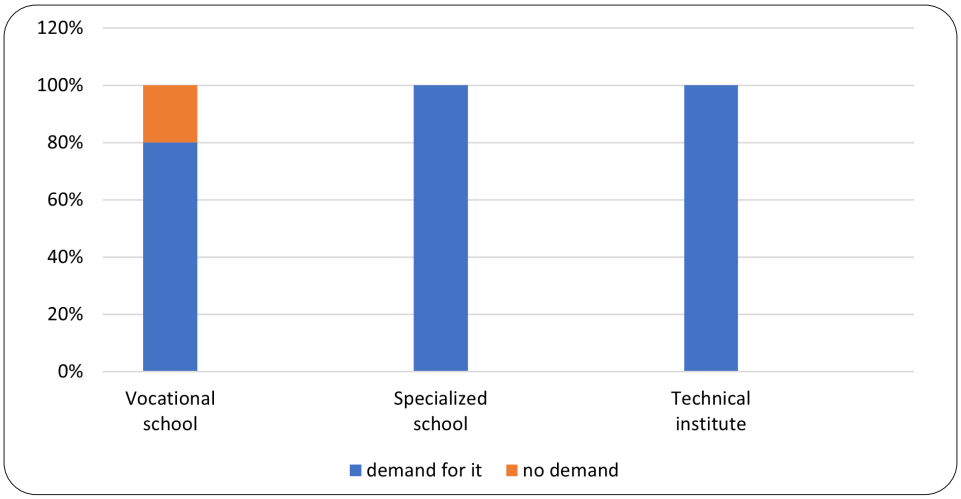
The results of the graph illustrate well that our vocational school students are at a significant disadvantage in this area as well. An interesting result is that students in technical training who excel in creating spreadsheets, have difficulty in reading and interpreting the results. Overall, there is an equal distribution of vocational school students who can interpret the graphs and figures, as well as those of our students who have difficulty.

The inclusion of this data was necessary because the model was developed and processed in Excel, and the changes had to be tracked on graphs. If the interpretation of the data is difficult, it becomes impossible for the user to evaluate the results of the simulation model.

My results were as expected, so I asked at the beginning of the questionnaire how important they think the importance of school IT education was and whether they wanted to gain more IT knowledge. The results are illustrated in *Figure 7*.

Figure 7

To what extent is there a need to expand IT knowledge?



It is commendable on the part of the students that, based on the results of the first two questions, they see the lack of their knowledge about IT and feel the need to broaden their studies. During the lessons the students said that although they had IT lessons, they did not have enough knowledge, they did not have enough time to deepen it enough, and they only used the opportunities provided by the computer for their own purposes, including computer games and social networking. My questions then focused on the extent to which the material related to the curriculum I have described, which was essential for understanding further economic conditions. The results obtained are shown in *Figure 8*.

During the preparation for the lesson it was a primary point, besides neglecting the traditional methods, to implement the innovative lecture principally based on the ICT devices. Unfortunately, due to the changing circumstances (high school and university lectures held online), the background information which was needed for

the understanding of the sumilation method could only be revised on lectures held with the help of traditional methods and frontal class work. Economic concepts, lexical knowledge, analysis, and relationships are difficult to teach. Students' interest in the curriculum is low. The effectiveness of the information processing showed an unexpected picture. The results obtained are shown in *Figure 9*.

Figure 8

Acceptance of "background information" among students to process the new curriculum

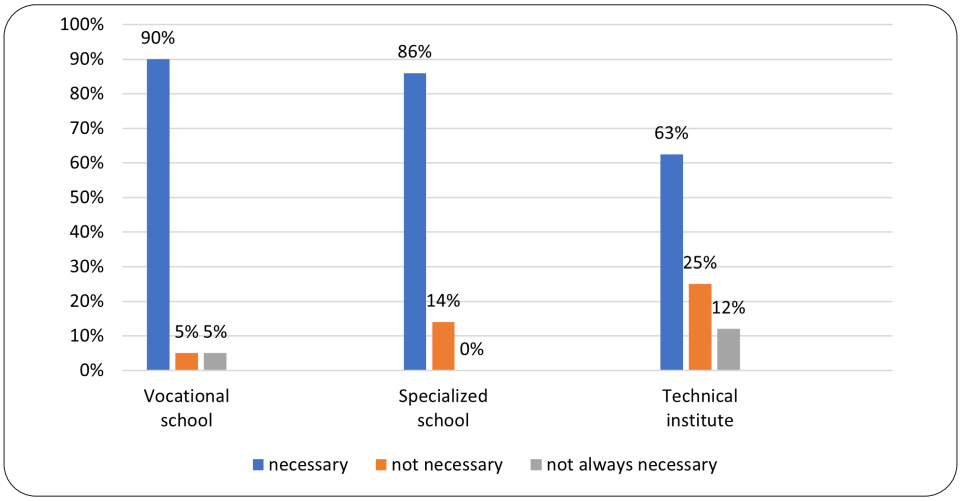
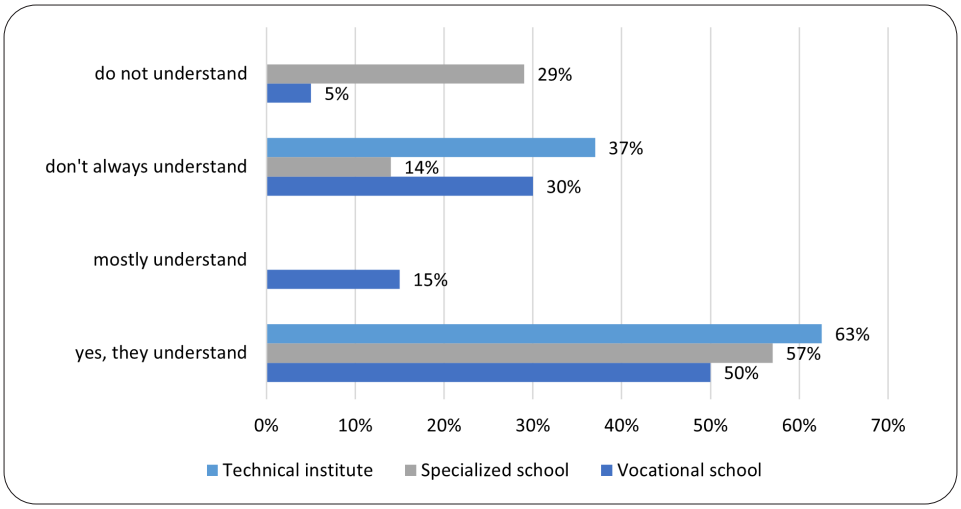


Figure 9

The distinctness of economic analysis



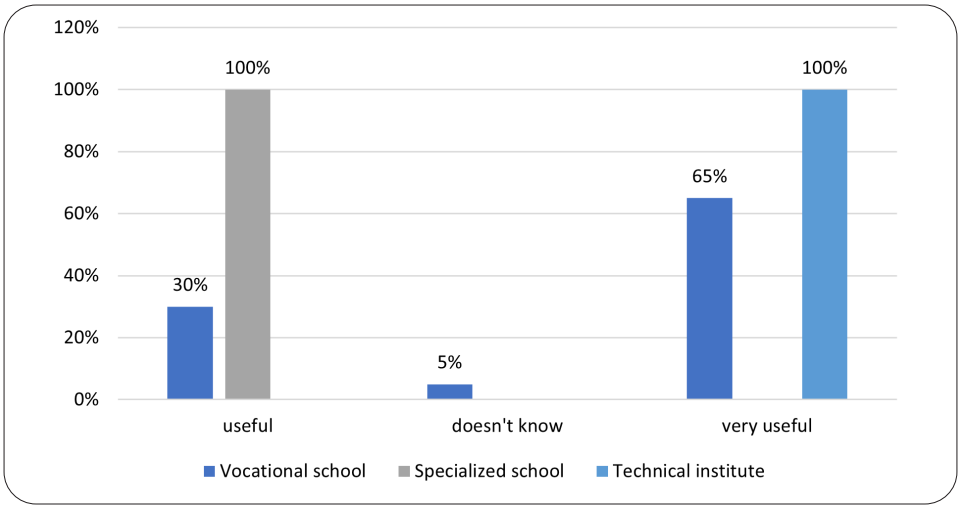
As expected, most people understand the economic context and analysis in the technical class, but it is surprising that the category "does not always understand" - compared to the three forms of training - was most marked in this class. Half of the vocational high school students clearly stated that they understood the connections and analyzes and only 5% could find that they could not interpret what was said on the topic. Surprisingly, more than half of vocational students are susceptible to this type of knowledge and only 14% of the students have difficulty in interpreting, given that students in this type of training performed below average on competence tests.

I also encountered difficulties in the clarity of the meaning of the basic concepts and the accuracy of their knowledge, but these differences could also be attributed to the differentiation of the teaching materials and subjects resulting from the training. 25% of students in vocational high school training, 14% of students in vocational school training and 13% of technicians had not encountered the basic concepts during their previous studies. Not all concepts were encountered by half of the vocational high school students, 45% of the participants in the vocational qualification and 37% of the technicians. Among the advantages of the simulation method, it is important to highlight the fact that students who did not understand or understood only to a lesser extent the meaning of the basic concepts, 35% of vocational high school students, 15% of vocational school students and 13% of technical school students gave the answer that they understood the concepts and contexts through simulation. The primary goal during the development of the simulation was to create a pedagogical method in which the students' thinking, understanding of economic concepts and contexts, their correct application could be developed or formed. In light of the results, the simulation model used in animal husbandry meets our requirements.

Questions about the novelty and usefulness of the method received positive feedback from almost all departments. The answers are given in *Figure 10* and *Figure 11*.

Figure 10

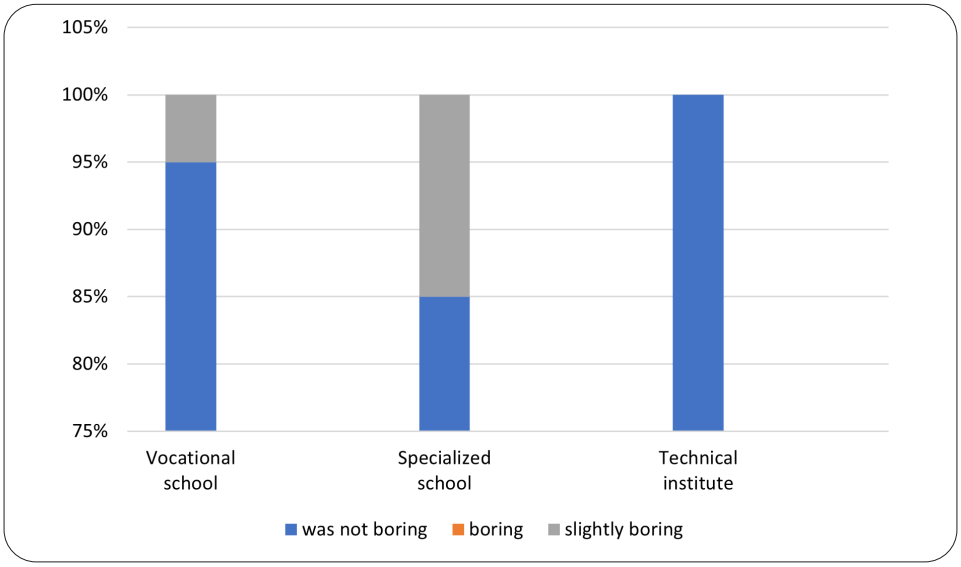
The extent to which the method is considered useful



Useful and very useful answers were chosen by a significant majority of students in both the technical class and the vocational school class, while 5% of students in vocational high school were unable to decide on the applicability of the model in everyday life based on what had been said. The novelty of the method I have described was marked as 100% innovative by our students, with the exception of the technician class, while three students of the classes mentioned had already encountered the method during their internships.

Figure 11

To what extent do you find the lesson interesting?



One of the very significant challenges for teachers in the spirit of the age is to raise the awareness of students during the processing of the curriculum, to maintain the motivation covering the whole lesson while observing the discipline necessary for successful work. So in the end, I asked our students to comment on the extent to which the lesson I compiled was interesting or boring for them. Analysing the answers, our students in the technical training consistently rated the lesson as interesting and effective, while among the other two students in the training there were those, whose parts seemed boring, but they also found the model interesting and effective. They were experienced in a theoretical, systematizing lesson processed with the method of frontal classroom work, but the lesson executed with the innovative method ended with positive experience for them as well. These answers also show clearly our initial assumption that traditional pedagogical methods are not sufficient to prepare students of the present age for exams.

DISCUSSION

Thanks to the pace of development of the technology used in agricultural fields, following the agricultural operations getting more specified we have to pay attention to the individual needs of the branch when it comes to training an expert. The appearance of innovative technology challenges the pedagogues and educators again in fulfilling their work. It is important to mention the fact that the cognitive skills of pupils who attend agricultural education seem to be weaker, than their trade schooler or high schooler partners', therefore during their education pedagogues have to use unique methods during a succesful educator – preceptor process.

In our research we examined – as our innovative educational method – how our simulation models influence or ease the pedagogues in managing the learing process.

The model was published in the circles of technician learners, school leavers and 11th graders of trade schoolers in Zsigmond Móricz Agricultural Trade School of Kaposvár.

The curriculum was presented in two parts, online, due to the Covid-19 situation. The students could get acquainted with the simulation model and the advantages of its use, after performing the mapping of preliminary knowledge and discussing the economic connections. After fnishing the lecture a questionnaire was sent to the pupils to measure the method's effectiveness. Pupils found the simulations efficient and interesting and in their feedback they expressed that mastering their previous studies, economic and proffesional notions and connections were then understandable thanks to the simulation method.

CONCLUSIONS

In the course of my research work, I formulated the following conclusions and suggestions:

- The use of simulation models also requires significant IT knowledge from teachers, and greater emphasis should be placed on introducing pedagogical methods based on ICT tools in the field of teacher training.
- The successful application of simulation models also requires a number of prior knowledge, the mapping of which, the preparation for the use of the model chosen by the teacher presents numerous additional tasks for the teacher, but overall has a positive effect on students' interdisciplinary and cognitive thinking.
- The circumstance influencing the success of the use of the method is that the simulation model can only be used with suitable infrastructure.
- Our research has clearly shown that by applying innovative pedagogical methods that have an experiential effect on students, it is possible to have more successful and productive lessons.
- Hungarian agriculture has also developed to such an extent that neither teacher training nor vocational training can keep pace with, and the result of which is that it is not possible to teach the same in the same way as before. Significant renewal is

needed in secondary agricultural education. One of the areas of this is the renewal of technical and IT training, as well as the in-service training of specialist teachers, which is an essential condition for ensuring quality education.

ACKNOWLEDGMENT

The publication of this paper is supported by the EFOP-3.6.1-16-2016-00007." Intelligent Specialization Program at Kaposvár University" project.

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