VINKO KANDŽIJA
MARIO PINES

ECONOMIC SYSTEM OF EUROPEAN UNION AND ACCESSION OF BOSNIA AND HERZEGOVINA – CHALLANGES AND POLICIES AHEAD
III

SYSTÈMES ÉCONOMIQUES DE L'UNION EUROPÉENNE ET ADHÉSION DE BOSNIE ET HERZÉGOVINE - CHANGEMENTS ET POLITIQUES À VENIR
III

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CONTENT

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FINANCIAL HYSTORICAL SYMMETRIES

Abstract

“The Dutch, it seems, more than anyone in the West since the palmy days of ancient Rome, had more money than they knew what to do with. They discovered, unlike the Romans, that the best use of money was to make more money. They invested it, mostly in overseas ventures, utilizing the innovation of the joint-stock company in which private investors could purchase shares, the most famous being the Dutch East India Company.” (Kuzminski, 2013:38).

In almost all the previous 20th century’s literature, the Keynesian General Theory have been the leading issues up to the Friedman historical review of the general efforts to reconstruct the international financial and monetary stability, with the Mundell century’s synthesis (Mundell, 2000). In the new century recurring monetary policies, based on Central Banks credit or money printing, in a deflating stagnation, with monetary policy emphasis, up to the Wray MMT, with growing sectoral imbalances, both internal and external.

The only game left in town, has been the relevant ascent of Central Banks, the prevailing monetary targets first and the financial instability mechanism later, then and finally, the signs of the approaching financial collapse.

In the previously planned economy countries, pulled by the Chinese miracle, the capitalistic mechanism have promoted a huge economic growth and a boost from the relevant technological evolution.

The instruments operating in this new era, within the European Union monetary system, have been the following, the:

- *European Financial Stability Facility (EFSF),*
- *European Stability Mechanism (ESM),*
- *European Fiscal Compact (EFC),*
- *Emergency Liquidity Assistance (ELA),*
- *Long-term refinancing operation (LTRO),*
- *Quantitative easing operations,*
- *Targeted longer-term refinancing operations (TLTRO).*

Under supervision of the:

- *European Banking Authority (EBA),*
- *Single Supervisory Mechanism (SSM),*
- *Economic and Financial Affairs Council (ECOFIN).*

"Faced with all this chaos and the possibility of even worse things to come, central banks shifted from a laissez-faire mode to an interventionist "whatever it takes" (WIT) mode. It was a dramatic change. Working with their counterparts in fiscal agencies - a phenomenon that was anticipated by that dramatic joint visit by Chairman Bernanke and Secretary Paulson to the leadership on Capitol Hill, they threw everything they had, and could think of, into stabilizing an enormously dysfunctional financial system. The money-printing presses went into overdrive. A myriad of emergency funding windows were opened to enable cash to be injected into the financial system and from virtually any and all directions." (El-Erian, 2016:48).

The present situation shows a clear historical synchronic trend, started with the debasement of the gold standard. Definitely, exhaustively in the great depression, unsuccessfully tempered by the New Deals efforts, not recovered by the after war quotas and national bilateral contingents, the international monetary system collapsed in the first global market. The concurrent efforts of the WTO, the IMF and the BCE, have not been able to settle the structurally imbalanced global transactions. "In retrospect, citizens finally saw Keynesianism for what it was, mere window dressing for political expedience." (Shlaes, 2019:13).

Keywords: *Central banks, monetary policy, financial instability, gold standard and exchange rates*

JEL: G28

1. MONETARY AND FINANCIAL CYCLICAL SYNCHRONIES

The present literature shows a common recurring nostalgic rekindling of the self-adjusting real value settlements and, most of the agreeing scientific convergence, researchers have issued only hopes and projects, without any real concrete result in definitely stabilizing the unpredictably fluctuating real world.

"*In the 1930s, the New Deal had failed to reduce unemployment. The prolonged periods of joblessness were what had made the Depression "Great". But the memory of the New Deal failure had faded just enough that younger people liked the sound of the term. And memories of more recent*

success fueled Americans' current ambition. Many men were veterans. They had been among the victorious forces that rolled across Europe and occupied Japan at the end of World War II. Compared with overcoming a Great Depression, or conquering Europe and Japan, eliminating poverty or racial discrimination had to be easy. American society was already so good. To take it to great would be a mere "mopping up action," as Norman Podhoretz, who had served in Europe, would put it." (Isserman, 2000:211) (Shlaes, 2019:5).

In the modern industrial age, characterized by the 18th century industrial revolution, the development of the economic activity has undergone recurring phases of expansion, contraction and technological deep evolution, with always-new factors and determinants and with different configurations. The comparative advantages as outlined by A. Smith, have been always showing their main focus of real causes and factors affecting the "*Wealth of Nations*", that almost after three Centuries, seem now to result sound according only to synchronic circumstantial recurring factors of growth, depression, great depressions and finally recessions evolving in new cycles of growth.

The economy and development models had focused, instead, mostly on monetary and social relations forces, prevalent determinants assumed in order to explain growth, depressions and economic crises, mostly recurring in the financial markets and their gyrations.

Actually, some monetary unsuccessful experiments historically verifiable and surfacing in their narrative, started with the John Law Louisiana bubble and the uncovered paper money issuance of John'a *Bank of France*. Then the French Revolution dissolved the printing of the "assignats" and the German induced the dissolution of its huge war debt through the marks Weimar inflating issuances. The WW2 monetary collapses induced the AME, a sort of European local multilateral monetary System agreement, based on the external convertibility. The consistent Triffin dilemma, foresaw the unavoidable 15 August 1971 President Nixon declaration and "de facto" a dollar debasement, leading to the end of the Bretton Woods dollar-exchange epoch. Since then, the international interstate monetary systems have never regained a settlement of the unbalanced trading unpaired national balances of payments.

Since the pronouncement about the gold exchange standard, the coverage at 35 dollars an oz. of the general multitude of currencies, dollar based on a fixed exchange rate, when adhering to the IMF system, entered an indirect gold-paper money standard. Since then, uncertain boundaries about monetary quantitative issuance, linked to the urgency as artificial money

and the real value of the monetary titles was limited by some gold nominal but real value content. The US Congress had passed the *Emergency Currency Act,* modeled on these principles, and signed into law since May 30, 1908. The act was named the Aldrich-Vreeland Act, after its political sponsors.

The Aldrich-Vreeland Act provided a mechanism that would permit banks to use securities, other than U. S. government bonds, to obtain short-term increases in their circulations. Two types of entities could apply for the additional currency: (1) groups of at least 10 banks formed into national currency associations and (2) individual banks.

National currency associations were accepting securities from a member bank and then apply to the Comptroller of the Currency for additional circulation for that member bank.

The total amount of emergency currency issuable under this act was set originally at $500,000,000. This amount was subsequently raised over $1 billion by a hastily passed amendment, dated August 4, 1914, immediately following the outbreak of World War I in Europe.
Actually, the dump of the gold standard has no scientific justifications; neither has been ever planned such an event. The Keynesian barbaric *relic* appears as *a bolt from the blue* on the front pages of the New York Times on Saturday August 1st, after the previous Friday 31th, when, in resuming the outcome of the J. P. Morgan informal meeting result, the paper wrote the opposite, as anticipated to William G. McAdoo, U.S. secretary of the treasury. In the Vanderbilt Hotel, at the meeting of the local Clearing House association. On Thursday July 30th, the decision was not to close the New York Stock Exchange, at the final ultimatum day to Serbia. On Friday 31th the assumed decision is reversed as the closure is imposed by the markets unforeseen events. The markets will remain closed everywhere all over the World, until December. "*Britain suspended temporarily the convertibility of its currency into gold during the Napoleonic Wars, America suspended it during the Civil War, and France suspended it during the Franco - Prussian War*" (Bordo and Rockoff, 1996:414-415).

2. MARKET STRUCTURES RECURRING SHOCKS

After the WW1, the Genoa Conference adopted the Hawtrey's predictions and proposed the return to the gold; further Hawtrey's theory was obscured by the Keynesian approach, which lasted as long as it could satisfy political expediencies. Most of the theoretical base brought by Ralph Hawtrey, in his taking part to the Bruxelles Conference and to the two commissions

appointed by the League of Nations, lead to the resolution 5, based on the dollar re-basement through a general return to that standard. The (PSFM) *Price Specie Flow Mechanism* seemed the only solution to a global international debt imbalances' system. The Hyman Minsky Financial theory, explains why the Hawtrey – Cassel model of the financial turbulences were linked to a common solution, the inconsistent monetary base. R. Batchelder and D. Glasner put the secular basic question "What Ever Happened to Hawtrey and Cassel" just at the end of the fifth huge financial and monetary turbulence following the 1971 decision to abandon the dismiss standard (Batchelder and Glasner, 2013).

The recurring shocks in the market have always generally been connected to specific conditions or unusual events like wars, technological innovations, natural unforeseen events or whatever else may start some impulse of positive or negative trends.

"*As Germany's outspoken chancellor Helmut Schmidt put it, Volcker pushed real interest rates (interest rates adjusted for inflation) to levels not seen "since the birth of Christ. He did not exaggerate. In June 1981, the prime lending rate touched 21 percent. The result was to send a shuddering shock through both the American and the global economies. The dollar surged, as did unemployment. Inflation collapsed from 14.8 percent in March 1980 to 3 percent by 1983 In Britain this was the crisis with which the Thatcher government began. In Germany, it would contribute to Schmidt's unseating and his replacement by the conservative government of Helmut Kohl, France's Socialist government under President Francois Mitterrand would be forced into line in 1983. Volcker's shock set the stage for what Ben Bernanke would later dub the great moderation. It was an end not just to inflation but to a large part of the manufacturing base in the Western economies and with it the bar of the manufacturing base in the Western economies, and with it the bargaining power of the trade unions. No longer would they be able to drive up wages in line with prices. And there was another part of America's postwar political economy that did not survive the disinflationary shock of the 1980s: the peculiar system of housing finance that had emerged from the New Deal era*." (Tooze, 2019:14).

Since the market economy removed the primordial barter economy and the first human settlement started to realize and exchange some products, money became the functional mean of exchange. To avoid the barter solutions, money has always permitted savings as a deferral of consumption, future choices, measuring items as a means of attributing value and mainly as a functional intermediation instrument among different needs and different surpluses, in space and time variables. The classic

origin of industrial and financial unbalances have also been understood, described and explained, in terms of: unbalanced trade, production and consumption. In a multitude of national factors, linked to natural resource, savings and social-political local factors have been the basis of any evolution.

The local expansion and depression phases of the various economic social systems, have mostly been associated to the speculative, arbitrage and quantitative evolution of the entrepreneurial projects as described clearly by (Minsky, 1992:1) *"… capitalist economies exhibit inflations and self-deflations, which seem to have the potential to spin out of control .."* or to the innovative Schumpeterian industrial processes. Now they seem out of the "rules of the game", since the industrial activity, related to the global market, seems to respond to different impulses. The new Century has disregarded most of the classical economic rules, in the new global competitive arena where, after almost two Centuries of unchanged models, the prevailing rule of the game has become the original competitive game based on cost of production and comparative market volumes.

These factors have become enormously favorable to the new Asian markets, free of rigid Well Fare State hurdles. The new scenery has definitely disclosed the heavy obstacles introduced in solving the problems stemming out of the warfare strategies, all agreed in two connected World Wars in one single Century.

The current excessive leveraged financial systems show unusual high volumes, since the present monetary system is pure based on legal paper currency, but the bubble might burst at any signal of irrational exuberance. "*Leverage has come down throughout the U.S. financial system, including on household, business, and bank balance sheets. That's good news, even if some of the deleveraging came in a painful way-as debts were wiped out by default. Regardless, our financial system is now fat less leveraged, and hence less vulnerable, than it was in 2008. But let's not pat ourselves back too hard for the bigger question is whether leverage is down for the count. My answer is: Don't count on it. As confidence returns, so in all likelihood will higher leverage. But for now, the leverage coast looks clear*." (Blinder, 2014:450).

The system did not work as foreseen by Drezner in the year 2012.

3. THE PROGRESSIVE APPROACH ON THE TIME HORIZONS PERSPECTIVES

In the contribution to the Vice President Johnson's, an outstanding figure is described in the Harrington narrative about *The Other America*, supported by Mojnihan from the New York Office of Governor W. Averell Harriman, before joining the Administration of President John F. Kennedy in the year 1961. There he worked as Secretary Assistant, managing the relations with the Labour Unions, under both President Kennedy and his successor President Lyndon B. Johnson.

Mostly recording his time spent to the warfare against poverty, in the year 1965, he published his controversial Report Moynihan, considering poverty among Afro-Americans. Daniel Patrick Moynihan left the Johnson Administration in the year 1965 as he got a teaching position at the Harvard University. His contribution, then relevant in fighting poverty, must be considered as the second experience in a new sort of New Deal, as promoted by Kennedy but recurring as a pilot program that unfortunately prolonged unemployment rather than meet its goal, curtailing joblessness. The most important political event of the twentieth century, declared the commentator Irving Kristol in 1976, *"…. is not the crisis of capitalism but the death of socialism…"* in February 1979, Kristol appeared on the cover of Esquire. When, in 1989, the year the Berlin Wall came down, Michael Harrington happened to publish a book titled Socialism, he looked like yesterday's fool. In Britain, the rise of Margaret Thatcher reflected a post-socialist respect for the individual: *"There is no such thing as society,"* Thatcher said *"There are individual men and women and there are families.*" (Joseph Memorial Lecture of 1996, given to the Centre for Policy Studies). In the period following the 70s from Reagan to Bush, Clinton and Bush again, the Great Society collectivism was outgrown in its ideal structure, but the period of both monetary and financial crisis started their long new era, which has become a definite model in connection with the prevailing unlimited artificial currency *misrepresentation* epoch.

The period between the declaration of the debasement of the dollar, August 1971, and the disregarding of the deficit Maastricht's parameters, typical characteristic of the agreements signed in the Dutch city of Maastricht in December 1991, looks like a deceiving confiscation of the existing currency value. Its value indeed is reconsidered inverse function of its quantity, practically now unlimited, reduced to the essence of artificial uncovered money. In this perspective, the banking activity, from custodian of peoples' real value assets, becomes potentially that of an accounting-clearing machine of valueless memory's accounting annotations. Without reliable

savings and related trustworthy values, from the artificial instruments, the whole investment function is trimmed.

"*As Minsky insisted "stability is destabilizing" - and this seemed to perfectly describe the last few decades of U.S. experience, during which financial crises became more frequent and increasingly severe. We could list for example, the savings and loan crisis of the 1980s the stock market crash of 1987, the developing country debt crises (1980s to earlv 1990s), the Long Term Capital Markets (1998) and Enron (2001) fiascoes, and the dot-com collapse (2000-2001} as precursors to the final "great crash" in 2007* " (Wray, 2016:138).

During the last large unpredicted financial instability, 2008-2012, the recovery was assumed possible on the monetary policy uncontested line, believing that the monetary incentive would be the recovery correct path to follow in order to stimulate the economic activity towards the desired full employment and stability values, that is to recover the lost financial stability.

On the contrary, the assumed line defines, the monetary and financial assumptions by then prevailing: "*By September 2008, it was clear that the US financial markets were seizing up, but non-American actors treated the news with more than a little schadenfreude. To Europeans, the subprime mortgage crisis was the fault of US market fundamentalism. In a March 2008 interview, the French foreign minister Bernard Kouchnern declared, - The magic is over for the United States. Six months later, German finance minister Steinbruck predicted, that the United States would soon lose its status as financial superpower.-*" (Drezner, 2012:9). The Drezner comment coincides with the deeper crisis ever at the center of the financial World, which deepens down in the year 2012 at the deepest derivatives' crisis.

At that corner, the gold overpasses the 2,000 dollar an ounce price and the interest rates fell to a symbolic positive value, never seen before. The following monetary adjustment, according to the prevailing monetarist perspective, lead to a different profile in the economist comments. The center may be located in the Eric Helleiner comments, quite different and considering for the first time a new dollar likely evolution in the transition from the G7 to the G20 meetings: *"Financial and central bank officials of this grouping had been meeting since 1999 - that organization had failed to carve out much of an influence indipendence of the G7countries that had dominated global financial decision making since the id 1970s. This dynamic changed rapidly after Bush's announcement, with the G20 leader' forum quickly displacing the G7 from the control role in global financial governance*" (Helleiner, 2014:25). The problem faced by the G20 was on

the international regulatory agenda, stating technical issues policy makers drew prevented the worst.

The first most relevant issues were the new:

- market contents of international standards, Basel III agreement;
- governance and content of international accounting rules;
- international standards for credit rating agencies, hedge funds, over the counter derivatives;
- lessen cross borders capital mobility.

"*After the failure of Lehman Brothers pushed the global financial system to brink, they asserted that no additional systemically significant financial institution would be allowed to fail and then delivered on that promise reforming the governance and the content of international financial regulations*." (Eichengreen, 2016:1).

4. PENDING UNRESOLVED QUESTIONS

"*The Fed was criticized equally for doing too much and too little. Members of the too-much school warned that its insistence on keeping interest rates low augured an explosion of inflation. When that inflation failed to materialize, they then dismissed the Fed's credit market interventions frustrating the necessary consolidation of the country's finances. The central they warned, was only setting the stage for more financial excesses like those that caused the crisis."* (Eichengreen, 2016:304). Most of the historically recent financial and monetary crisis are linked, more or less, to the role of Central Banks and their actual political role, both as public employees and, secondary, as political entities affecting political choices.

The link arises from the functional role of money. There are only two possible considerations: money is a title with intrinsic value, either representative of such a circumstance, or money is a legal release of a paying debtor whose only consideration is the hope of to utilize it in a future transaction. Under an unconditional trading of risk to loose value, that likely happens in an economy with a debased currency.

The simple monetary stability boundaries, like the 2% rate within the EU monetary agreement and in the FED '70s programs are mere political strategies in the short time. The shift of Central Banks into the financial stability arena is still to reconsider. "*The credibility of its commitment to maintaining price stability would be damaged, undermining the ability to achieve its goals. Memories of the 1970s, for those who had lived through the decade and histories of the 1970s for those who had not, strongly*

informed the outlook of officials, shaping and constraining policy. For all these reasons, raising inflation above 2 percent and keeping it there would not be easy." (Greenspan, 2014:228).

The Central Banks presently are confusing their specific statutory role between monetary and financial stability *"In the last three years plus, central banks have had little choice but to do the unsustainable in order to sustain the unsustainable until others do the sustainable in order to restore sustainability."* (El-Erian, 2016: 48).

Up to the '70s monetary crises, in the planned economies, the Central Bank monetary units issued within the Comecon through the bilateral trading agreements, were finally sold on the Swiss market (Zurich) discounted up to 40% of their internal trading value, denominated *light currencies* against main *hard western currencies*, mainly dollars and German marks.

Actually all currencies issued under Central Banks legal tender rule, since John Law first French experiment, lost their nominal issuances purchasing power in real terms. In Trieste, where I attended my Faculty courses, the potential secondary market, Comecon clearing unclosed balances, reached historical minimum values as the spread between hard and light currencies was progressively widening.

The cost of labour was the main factor in the Chinese capitalistic reforms, designed and grown on the global free market, ruled by tough competition. *"The share of our private sector workforce belonging to unions declined from around 35 percent in the 1950s to 7 percent in 2013. Strikes or threats of strike - labor most formidable tool of the fifties – rapidly diminished. In 2013 the number of workers on strike was less than 4 % of the average number that "hit the bricks" throughout the 1950s. The Gini coefficient's dramatic rise starting in the 1970, reflected in part the diminishing clout of labor unions."* (Eichengreen, 2016:303).

The support to the dollar attributable to China is understandable, even in a debased dollar system because*, "The fact that China and other foreign official dollar holders had many reasons to continue to support the dollar meant that the United States itself did not have to work too hard to cultivate this outcome. To be sure, if the United States had closed off its markets to foreign exports, foreigners might have reconsidered their support for the dollar*" (Helleiner, 2014:68).

5. CONCLUSIONS

The economic cycle has always shown and shows today as well, a continuous random evolution with expansions and contractions of the economic activity, always unpredictable and erratic. Such periodical evolutions are due to endogenous causes linked to the gyrations in the market, connected primarily to the monetary quantities and their evolutions and the prices fallouts*. "There is no means of avoiding the final collapse of a boom brought about by credit expansion. The alternative is only whether the crisis should come sooner as the result of voluntary abandonment of further credit expansion, or later as a final and total catastrophe of the currency system involved."* (Von Mises, 1949:570).

The actions described seek to assist banks, businesses and consumers, all of them faceing unique challenges, because of the sudden closure of businesses activities, blowing and related expanding market volatility. In doing so, in the USA the Central Bank is issuing upon its authority under the famous section 13(3) of the Federal Reserve Act. Distinct from the last financial crisis 2008-2012, however, these actions appear to be alternatives to shut downs in the real economy and to face directly the need for credit, extended to a range of borrowers themselves, rather than a seizing up of the illiquidity and non-performing loans of the financial institutions themselves.

The market economy, without alternatives, in the free consumer's choices, has not suggested positive alternative solutions, without authoritative impositions, linked to the compulsory substitution of personal preferences with central impositions and programmed behavioral preferences.

"*These historical episodes are evidence supporting the view that the economy does not always conform to the classic precepts of Smith and Walras: they implied that the economy can best be understood by assuming that it is constantly an equilibrium seeking and sustaining system*." (Minsky, 1992:10).

The '90s paper money engulfment, before the competing China lower costs' concurrence, would have rapidly destroyed the Western *comparative* advantage, it was just a pure Wicksell effect, just monetary blowing bubbles ready to burst. "*I had ongoing conversations with Bob Rubin on the subject. We were both somewhat concerned. We'd now seen the Dow break through three "millennium marks"- 4,000, 5,000, and 6,000 - in just over a year and a half. Though economic growth was strong, we worried that investors were getting carried away. Stock prices were beginning to*

embody expectations exorbitant that they could never be met." (Greenspan, 2007:176).

When Henry M. Paulson, Jr. then CEO of Goldman Sachs, was appointed Secretary of the Treasury in 2006, he had no suspect that he would soon be at the world's most cataclysmic financial crisis since the Great Depression.

"*I came to Treasury I was concerned for example about the riskiness of the biggest banks, but to stem the crisis we allowed some big banks to get even bigger and even more complex. The consequences of our decisions will make the job of policymakers who follow us more difficult*" (Paulson, 2013:xiv).

In the US, some major institutions, including Bear sterns, Fannie Mae, AIG, Merrill Lynch Lehman Brothers were collapsing, and some collapsed soon after.

"*Many of the actions I took-seizing control of the quasi-governmental mortgage giants Fannie Mae and Freddie Mac and injecting capital into the banks through the Troubled Assets Relief Program (TARP) - were deeply distasteful to me. But today I believe more ever that they were absolutely necessary*." (Paulson, 2013:xv).

"*When Paulson was worried about a Chinese dollar sell-off, he knew whom in Beijing to call. Larry Summers's cold war analogy proved more apt than he realized. The balance of financial terror held.s6 But in the meantime, what became increasingly been focused, as Bradford DeLong would put it, on the "wrong crisis". The crisis that will forever be associated with 2008 was not an American sovereign debt crisis driven by a Chinese sell-off but a crisis fully native to West capitalism—a meltdown on Wall Street driven by toxic securitized subprime mortgages that threatened to take Europe down with it*" (Tooze, 2019:41).

These consideration lead to a critical standpoint in the general market economy, after the exhausted planning or mixed economies of the 20th century. *"Beginning in 1998 some of us who had adopted the MMT approach began to warn that the Goldilocks economy had produced unsustainable sectoral balances in the United States. We had recognized that the economy of the time was in a bubble, driven by unsustainable deficit spending by the private sector - which had been spending more than its income since 1996. As we now know, we called it too soon; the private sector continued to spend more than its income until 2006."* (Wray, 2015:34). The only solution was clearly perceived by Jacques Rueff when

he said, just after the Bretton Woods compromise that *"Money will decide the fate of mankind"* (Rueff, 1964:IVX). Amity Shlaes in her Great Society, (Shlaes, 2019) clearly has reconstructed the whole monetary and financial catastrophe that led to the Nixon resolution, to debase the dollar and to start the great MMT that had been a real prophecy made by Von Mises in his total scientific life. The present financial and monetary crisis stems from to the unresolved question, what might be a sound monetary basis *"A handful of other major currencies, like the euro, play a role like this as well. But none come close to dominating markets the way the US dollar does. Nearly 90 percent of currency trading involves the US dollar. This is the situation people are referring to when they say the US dollar is the dominant global currency. Could that change? Yes, of course. Nothing lasts forever. As MMT economist L. Randall Wray put it, "the dollar will not always reign supreme, but it has a lot of life remaining as the most desirable asset to hold in portfolios."* (Kelton, 2020:141-142).

REFERENCES

1. Batchelder, R., and Glasner, D. (2013, April 30), *Pre-Keynesian Monetary Theories of the Great Depression: What Ever Happened to Hawtrey and Cassel?*, retrieved from http://dx.doi.org/10.2139/ssrn.2029813.
2. Blinder, A. S. (2014), *After The Music Stopped*, New York, N.Y.
3. Bordo, M. and Rockoff, H. (1996), *The Gold Standard as a "Good Housekeeping Seal of Approval"*, The Journal of Economic History, 56(2), 389-428. doi:10.1017/S0022050700016491.
4. Drezner, D. W. (2012), *The System Worked, How the World stopped another Great Depression*, Oxford, N.Y.
5. Eichengreen, B. (2016), *Hall of Miirrors*, New York, N.Y.
6. El-Erian, M.A. (2016), *The Only Game in Town*, New York, N.Y.
7. Greenspan, A. (2007), *The Age of Turbulence*, New York, N.Y.
8. Greenspan, A. (2014), *The Map and the Territory 2.0*, London, U.K.
9. Helleiner, E. (2014), *The Status Quo Crisis, GlobalFinancial Governance After the 2008 Financial Mektdown*, Oxford, N.Y.
10. Isserman, M. (2000), *The Other American*, New York, N.Y.
11. Kelton, S. (2020), *The Deficit Myth: Modern Monetary Theory and the Birth of the people's Economy*, New York, N.Y.
12. Kuzminski, A. (2013), *The Ecology of Money: Debt, Growth, and Sustainability*, Plymouth, U.K.
13. Minsky, H. P. (1992, May), *The Financial Instability Hypothesis*, retrieved from http://www.levyinstitute.org/pubs/wp74.pdf.

14. Mundell, R. (2000, August), *A Reconsideration of the Twentieth Century*, retrieved from http://www.columbia.edu/~ram15/nobelLecture.html.
15. Paulson, H. H. M. (2013), *OnThe Brink*, New York, N.Y.
16. Rueff, J. (1964), *The Age of Inflation*, Chicago, Henry Regnery Co.
17. Shlaes, A. (2019), *Great Society*, New York, N.Y.
18. Tooze, A. (2019), *How a Decade of Financial Crises Changed the World*, Penguin Books, U.K.
19. Von Mises, L. (1949), *Human Action: A Treatise on Economics*, Norwich, U.K.
20. Wray, L. R. (2015), *Modern Money Theory*, Basingstoke, U.K.
21. Wray, L. R. (2016), *Why Minsky Matters*, Princeton, N.J.

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IMPACTS OF THE ILLICIT TOBACCO TRADE: EXPLORING PUBLIC PERCEPTIONS IN THE WESTERN BALKAN REGION

Abstract

The aim of this paper is to examine the attitudes of respondents from seven countries on the Balkan tobacco smuggling route on the impact of grey market of tobacco products on society and what are the factors influencing the differences in their attitudes. Tobacco smuggling is a source of funding for criminal activities, but it also poses a health risk, increase unemployment, causes damage to the state budgets and weaken the sustainability of public finances. It therefore has significant impacts on national economies. Periods of economic crises and other economically demanding times such as this caused by a virus pandemic of virus COVID-19, which result in rising unemployment and declining purchasing power, are especially favourable periods for the growth of illegal trade in tobacco products and grey market of tobacco products. The results indicate significant differences between citizens in different countries about their perception towards the grey market of tobacco products.

Keywords: *tobacco, smuggling, grey economy, Western Balkan countries*

JRL: Q1

1. INTRODUCTION

Tobacco smuggling is a source of funding for criminal activities, terrorism and the corruption at the international level, but it also poses a health risk, increase unemployment, causes large lossesfor the state budgets and weaken the sustainability of public finances. According to European Commission estimates (2021), illicit trade of tobacco products causes an annual loss of about EUR 10 billion for the national and European budgets.KPMG (2016) estimates show that counterfeit and contraband account for about 9 percent of total consumption, which in financial terms corresponds to a tax loss of EUR10.2 billion. Periods of economic crises and other economically demanding times such as this caused by a virus

pandemic of virus COVID-19, which result in rising unemployment and declining purchasing power, are especially favourable periods for the growth of illegal trade in tobacco products and the grey market of tobacco products. On the other hand, positive macroeconomic trends contribute to the reduction of demand for illegal tobacco products (KPMG, 2016).Although it should be noted that once established demand in the illegal market is difficult to return to the legal market.

In 2013 European Union adopted a strategy against cigarette smuggling (European Commission, 2013) according to which the term illicit trade includes different types of smuggling of both genuine and counterfeit tobacco products, as well as illicit internal European Union production and distribution. Furthermore, in 2017 European Commission published progress report (European Commission, 2017) in which states that tobacco smuggling is one on the major problems in Europe and, thus, new action plan (European Commission, 2018) which is valid until 2022 is adopted. In the Action plan European Commission states that illicit tobacco trade causes fiscal, health and security concerns. In 2019 survey analysis investigating the attitudes and opinions about illicit tobacco market in 28 European Union countries was conducted. The results shows that only 15 percent of respondent mentioned black market of cigarettes as the source of revenues for organised crime, although 40 percent of respondents pointed out that the illicit market in cigarettes causes a loss of budgetary revenues (European Commission, 2019).

The paper focuses on the attitudes of respondents in the countries on the Balkan rout about impacts of the grey market of tobacco products on the society. According to the Rutgers and Ierace (2019) it is estimated that around 29 billion of illicit cigarettes are trafficked along Greece, Bulgaria, Romania, North Macedonia, Kosovo, Serbia, Albania, Montenegro, Bosnia and Herzegovina, Croatia, Slovenia and Turkey in 2017, which authors consider as extended Balkan route. Balkan route has been a main transition area for illicit tobacco, while Bulgaria has been a major origin country of illicit cigarettes smuggled through the Balkan region (Rutgers and Ierace, 2019).

The aim of this paper is to examine the attitudes of respondents from seven countries on the Balkan tobacco smuggling route on the impact of grey market of tobacco products on society and what are the factors influencing the differences in their attitudes.KPMG (2016) stress that social acceptability is an important driver of the purchase of illegal products and that in many European Union countries there is a high willingness of individuals to switch their consumption to the illegal market. Therefore, this paper investigates whether citizens recognize the economic and social

impacts of buying on the illegal tobacco market because it can be assumed that in those countries where awareness of the harmful effects of the grey tobacco market is higher, individuals will be less likely to start buying on the illegal market.
The analysis is based on data collected for seven Western Balkan countries: Bosnia and Herzegovina, Croatia, Kosovo, North Macedonia, Montenegro, Serbia, and Slovenia.
This paper consists of five parts. The next part provides a brief overview of literature dealing with this topic. The third par describes the data and the methodology used to conduct the analysis. The fourth part provides the results, and the last part gives conclusions.

2. LITERATURE REVIEW

The literature indicates significant adverse effects of tobacco smuggling on different segments of the economy. Joossens et al. (2009) state the fact that around 11.6 percent of the global cigarette market is illicit. In financial terms this approximation corresponds to an estimate that illicit tobacco trade causes loss of revenues in the state budgets estimated at between USD 40 and 50 billion (Jossens and Raw, 2008; Joossens et al., 2009; WHO (2021).European Commission (2011) estimate that the direct loss in revenues from customs which is result of the tobacco smuggling in European Union could amount around EUR 10 billion every year.

The scale of illicit trade is also indicated by the WHO (2021) data which shows that in some countries illicit trade reaches up to 50 percent of the overall tobacco market. They also point out that the growing consumption of tobacco products caused by lower prices due to smuggled or counterfeit cigarettes causes significant damage to health and costs to the health system. That awareness of the harmful effects of smoking on health is widespread among young people is confirmed by the research of Awotedu et al. (2006) conducted among the student population. Allen (2011) noted that there is great influence of illicit trade in tobacco products on economic and social dimension in the society.

Although the literature indicates that tax policy is an effective measure to reduce the consumption of tobacco products, avoiding paying excise duties by purchasing contraband or counterfeit cigarettes is causing damage to the sustainability of public finances (Joossens and Raw, 2012). The rates of excise duties on cigarettes in the Western Balkan countries vary considerably. Among analysed countries, the lowest excise duties on cigarettes are in North Macedonia and Kosovo, while the highest are is Slovenia and Croatia which are European Union countries and European

Union legislation prescribes the minimum excise duty on cigarettes (The Institute of Economics, 2019).Agaku et al. (2016) investigates the impact of differences in price of the cigarettes between European union countries and notice that price differences encourage cross-border purchases of tobacco products. Prieger and Kulick (2016) analysis show that there is negative correlation between the price of illicit cigarettes and share of illicit cigarettes in consumption in the European Union.

Mashiri and Sebele-Mpofu (2015) observe the effects of illicit trade in an even broader aspect, and state that illicit trade has a significant negative impact on economic growth. Thus, they state that, in addition to the above, illicit trade has an impact on the level of corruption and destabilization of society, loss of productivity and other social costs.

Numerous literatures indicates that the illegal trade in tobacco products is gaining momentum in countries with already have established trafficking routes, organized crime, higher levels of corruption and the grey economy (Calderoni et al. 2016, Joossens et al., 2000).

3. SURVEY DATA AND METHODOLOGY

The paper examines the attitudes of citizens living in countries on the so-called Balkan tobacco smuggling route, and their thinking about the impact of grey market of tobacco products on society, and whether they recognize the damage that buying on the grey market causes. This research is based on the data collected by a survey conducted in 2018 on a sample of 21,008 respondents from 7 countries to determine whether differences in citizens' attitudes can be attributed to differences in their socio-demographic characteristics or some other factors. Do men or women have a more negative attitude about grey market of tobacco products? Do differences in attitudes depend on the age of the respondents? Do the differences in the attitudes of the inhabitants depend on whether they come from the country which is a member state of the European Union or not? All statements in the survey was set on the Likert-scale from 1 – completely disagree to 5 – completely agree.

The paper uses the k-means cluster method to investigate whether there are groups of citizens who have different views about grey market of tobacco products. K-means clustering was developed by MacQueen (1967) as a method that enables to divide the data into the groups, while minimising the clustering errors. K-means cluster analysis is used to prove the existence of clusters, ie groups that have the characteristic that they are heterogeneous between clusters, but also maximally homogeneous within

each cluster. Therefore, the application of k-means cluster analysis allows the grouping of respondents who have similar views on the impact of grey market of tobacco products on society, despite having different levels of education or living in different countries or differing in some other factor. In the second phase of the analysis, the distinctive features of individual clusters are investigated using the chi-square test and t-test. The purpose of this analysis is to determine the factors on which citizens' attitudes about grey market of tobacco products depend.

Data were collected by using a structured questionnaire of 3,000 citizens from each of the seven countries. Thus, the survey included citizens from Slovenia, Croatia, Serbia, North Macedonia, Kosovo, Montenegro and Bosnia and Herzegovina. Data were collected during 2018. The results were analysed using the statistical program SPSS Statistics 23. Table 1 shows the characteristics of the sample.

Table 1. Sample characteristics

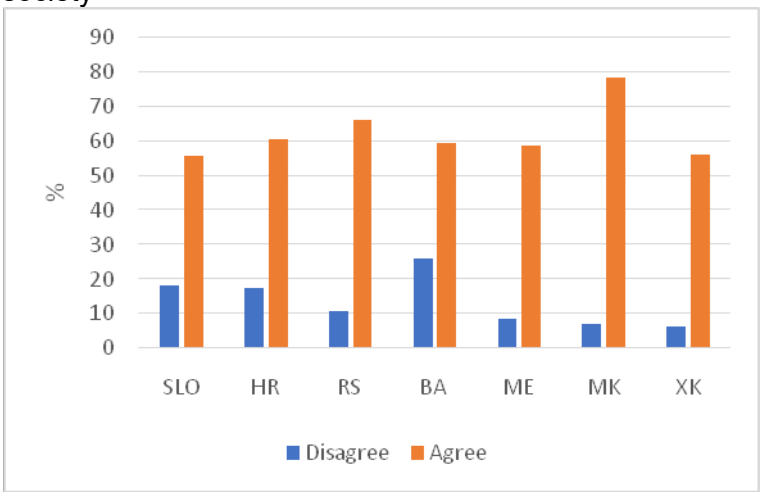
Variable		%
Smoker	Yes	36.3
	No	63.7
Age	18-24	10.9
	25-34	17.7
	35-44	18.4
	45-54	17.6
	55-64	16.2
	65+	19.2
Settlement size	Up to 2,000 inhabitants	41.4
	2,001-10,000 inhabitants	15.0
	10,001-100,000 inhabitants	24.7
	More than 100,000 inhabitants	18.9
Gender	Male	49.8
	Female	50.2
Country	Croatia	14.3
	Slovenia	14.3
	Bosnia and Herzegovina	14.3
	Serbia	14.3
	Montenegro	14.3
	North Macedonia	14.3
	Kosovo	14.3

Source: survey data.

4. RESULTS

Figure 1 shows the attitudes of citizens on the effects of the grey market of tobacco products on society by country. These attitudes reflect the subjective perception of citizens, and whether they believe that the grey market of tobacco products causes significant harm to society. The assumption is that, if they believe that there are negative effects of the grey market for society, they will be less inclined to buy tobacco products on the grey market so they will not be prone to cause negative economic and other effects to the economy.

Figure 1. Grey market of tobacco products causes considerable damage to society



Source: author based on the survey data.

The results show that 62 percent of all surveyed citizens in the seven countries analysed believe that the grey market of tobacco products causes considerable damage to society. On the other hand, 14 percent of respondents do not have such an attitude. The remaining quarter of respondents neither agree nor disagree with this statement. Observed by country, most of those who are aware of the effects of buying tobacco products on the grey market are from the North Macedonia. In North Macedonia, 79 per cent of respondents believe that the grey market of tobacco products causes significant damage to society. The lowest number of respondents who agree with this statement is in Slovenia, where 56 percent of respondents have such an attitude.

In Bosnia and Herzegovina, as many as 26 percent of respondents believe the opposite, that grey market of tobacco products does not cause considerable damage to society.

The results of the k-means cluster analysis indicated the existence of two clusters of respondents, which is shown in Table 2. The first cluster consists from the people who believe that the grey market of tobacco products has no harmful consequences for society or they are indifferent to the consequences. The mean value for this group of respondents is 2.6. The second cluster is larger in terms of the number of respondents, and it is made up of 62 percent of respondents. They believe that the grey market of tobacco products causes considerable damage to society, and their mean value is 4.6, which indicates a very high agreement with this statement.

Table 2. Results of k-means cluster analysis

Variable	Cluster 1 Grey market of tobacco products does not cause considerable damage to society, n= 7935	Cluster 2 Grey market of tobacco products causes considerable damage to society, n=13074	ANOVA
Grey market of tobacco products causes considerable damage to society	2.6	4.3	F=52500.942 p=0.00

Source: author.

Further, we analyse the factors that explain the difference between clusters, ie what influences the differences in citizens' attitudes about the impact of the grey market of tobacco products on society. Table 3 shows the results of the chi-square and t-test analysis.

Table 3. Differences between clusters

	Cluster 1 Grey market of tobacco products does not cause considerable damage to society, n= 7935	Cluster 2 Grey market of tobacco products causes considerable damage to society, n=13074	
Purchase of grey market tobacco products causes the loss of jobs	**Mean value**		

1-completely disagree; 5-completely agree	2.7	3.4	Chi-square: 2265.2; p=0.00
Grey market tobacco products are more harmful to health than legal ones	**Mean value**		
1-completely disagree; 5-completely agree	2.9	3.6	Chi-square: 2292.9; p=0.00
Cigarette and tobacco smuggling is part of organized crime	**Mean value**		
1-completely disagree; 5-completely agree	2.6	4.3	Chi-square: 2720.8; p=0.00
Age	**%**		
1 – 18-24	13,0	9,6	Chi-square: 230.9; p=0.00
2 – 25-44	40,6	33,4	
3 – 45-64	30,3	35,9	
4 – 65+	16,1	21,1	
Gender	**%**		
1 - Male	50.5	49.4	F=8.932 t=-1.495 p= 0.003
2 - Female	49.5	50.6	
Education	**%**		
1– Elementary school or less	12.8	14.8	Chi-square: 15.833; p=0.00
2 – Higher school	60.2	58.9	
3 – College, university or higher	27.0	26.3	
Settlement size	**%**		
1 – Up to 2,000 inhabitants	43.1	40.4	Chi-square: 32.171; p=0.00
2 – 2,000-10,000 inhabitant	13.5	15.9	

3 – 10,001-100,000 inhabitant	23.9	25.1	
4 – More than 100,000 inhabitants	19.5	18.5	
EU membership	**%**		
1 – EU member country	31.6	68.4	F=183.122 t=-7.636 p= 0.000
2 – Non-EU member country	26.7	73.3	

Source: author.

The results shown in the table indicate that the two clusters of respondents differ significantly in several factors. In the first cluster, which consists from the citizens who consider that the grey market of tobacco products has no major negative impact on society, there are mostly people not sufficiently familiar with the conclusions of the literature that tobacco smuggling and illegal tobacco market are part of organized crime. On the other hand, people who express a high degree of agreement with the claim that cigarettes and tobacco smuggling are part of organized crime also have the view that the grey market for tobacco products is harmful to society.

As could be expected, people who do not consider that grey market of tobacco products are more harmful to health than legal ones are also people who do not recognize the harmfulness of the grey market of tobacco products for society. In the European Union, the public expenditures of the health system for diseases caused and related to smoking amount to EUR25 billion per year (Yeh et al., 2017). Although it should be noted that the social costs of smoking for the European Union society are even much higher and except from direct costs for the public healthcare system, they also consist of the costs due to productivity losses because of absenteeism, early retirement or premature death and other indirect or induced costs (Jarvis, 2012).
Respondents which are in the second cluster agree more with the claim that buying tobacco products on the grey market stimulate the rise in unemployment in their countries.

Also, the two clusters differ in the socio-demographic characteristics of the respondents, but also in the size of the settlement in which they live. In the first cluster there are more people either from very small or very large settlements. The differences in the illegal market of tobacco products at the regional level are discussed in the paper Calderoni (2014). He investigates illicit trade across regions in Italy in the period 2009-2012 and concludes

that the prevalence of illicit cigarettes significantly oscillates between different Italian regions depending on the proximity to countries where the cigarettes are cheaper.Curti et al. (2019) analysis show that geographic location and proximity to the borders had impact on the switch of demand for tobacco products to the illegal market after the increase in taxes on manufactured legal and roll-your-own cigarettes. The survey results conducted in Lithuania showed that people living in smaller local government units are more willing to buy illicit tobacco products than those living in the big cities (Liutkute-Gumarov et al., 2020).

Also, there are slightly more men in the first cluster, while the view that grey market of tobacco products cause considerable damage to society is somewhat more prevalent among women.

Interestingly, the awareness of the harmful effects of the grey market of tobacco products is more prevalent in countries that are not members of the European Union. However, this can be explained by the fact that the members of the European Union have already applied the European legislation, and in them the illegal purchase of cigarettes is at lower levels and, thus, it is a smaller issue than in the countries that have not adopted European legislation. Research by Calderoni et al (2016) states that the lack of legislative measures is a key factor leading to the growth of the grey economy and the illegal trade in tobacco products. KPMG (2016) states that a tighter legislative framework and stronger cross-border securities contribute to reducing counterfeit and contraband in the European Union countries, and that 55 illegal tobacco factories in the European Union have been closed. Yürekli and Sayginsoy (2010) also proxy anti-smuggling law enforcement using corruption indicator and state that the it contributes to increase in tax revenues.Mikulić and Buturac (2020) consider that the underdeveloped institutional framework, weak rule of law and heavy taxation of tobacco products are factors which are guilty for higher illicit trade in Western Balkan countries compared to the more developed European Union countries. Budak et al. (2021) research show that for most repressive measures and policies against illegal trade in Western Balkan countries are, according to the citizens opinion, non-smokers and citizens from those Western Balkan countries which have no comparative advantages in tobacco trade such as Bosnia and Herzegovina, Kosovo, North Macedonia and Montenegro.

5. CONCLUSION

The paper examines the attitudes of citizens in seven countries that are on the so - called Balkan smuggling route on whether the grey market of tobacco products causes harm to society. Although the literature indicates a number of socio-economic costs of illegal trade of tobacco products, survey results indicate that about a third of citizens are still unaware of these consequences. However, these results are lower than those for European Union members about public perception on illicit tobacco trade shown in the Eurobarometer survey (European Commission, 2019). Respondents who believe that illegal tobacco products could cause greater damage to their health are also those who believe that buying tobacco products on the illegal market causes significant damage to society. Also, the results indicated that the attitudes of the residents depend on a number of socio-demographic characteristics of the respondents.

The negative attitude towards the illegal trade in tobacco products is more prevalent in non-EU countries, which could be the result of a still underdeveloped legislative framework than in European Union countries. Also, the results reveal that respondents from the small and very big local government units measured by the number of inhabitants are less concerned about the socio-economic consequences of illegal tobacco trade. Thus, in some future research, it would be interesting to investigate the influence of the geographical position of the local government unit on the attitudes of citizens about the illegal trade in tobacco products.

Given that this analysis is made for the countries which are on the Balkan tobacco smuggling route, the results of this research are important for the implementation of public policy measures aimed at decreasing the grey market, as well as informing citizens about the economic and social consequences of buying tobacco on the grey market.

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REFERENCES

1. Agaku, I., Blecher, E., Filippidis, F., Omaduvie, U., Vozikis, A. and Vardavas, C. (2016):Impact of cigarette price differences across the entire European Union on cross-border purchase of tobacco products among adult cigarette smokers, *Tobacco Control*, 25:333-340.
2. Allen, E. (2011): The Illicit Trade in Tobacco Products and How to Tackle It. London: International Tax and Investment Center.
3. Awotedu, AA.; Jordaan, ER.; Ndukwana, OZB.; Fipaza, NO.; Awotedu, KO.; Martinez, J.; Foyaca-Sibat, H.; Mashiyi, MK. (2006): The smoking habits, attitudes towards smoking and knowledge regarding anti-smoking legislation of students in institutions of higher learning in the Eastern Cape Province of South Africa,*South African Family Practice*. 48(9), 14-14d. DOI: 10.1080/20786204.2006.10873456
4. Budak, J., Rajh, E., Buturac, G. and Brkovic, A. (2021): Tobacco Grey Market in the Western Balkans, *Journal of Balkan and Near Eastern Studies*, 23(1), 62-77.
5. Calderoni, F. (2014): A new method for estimating the illicit cigarette market at the subnational level and its application to Italy, *Global Crime*, 15 (1-2): 51-76.
6. Calderoni, F.; Brenner, A.; Karayotova, M.; Rotondi, M.; Zorč, M. (2016). The Eastern Balkan Hub for Illicit Tobacco. Transcrime – Research Centre on Transnational Crime, Università Cattolica del Sacro Cuore: Milano.
7. Curti, D., Shang, C., Chaloupka, F. and G.Fong (2019): Tobacco taxation, illegal cigarette supply and geography: Findings from the ITC Uruguay Surveys, *Tobacco Control*, 28, 53-60.
8. European Commission (2011): Action plan to fight against smuggling of cigarettes and alcohol along the EU Eastern border, SEC(2011) 791 final.
9. European Commission (2013): Stepping up the fight against cigarette smuggling and other forms of illicit trade in tobacco products - A comprehensive EU Strategy, Communication from the Commission to the Council and the European Parliament, COM(2013)324 final, Brussels.
10. European Commission (2017): Progress report on the implementation of the Commission Communication „Stepping up the fight against cigarette smuggling and other forms of illicit trade in tobacco products - A comprehensive EU Strategy“, Report from the Commission to the Council and the European Parliament, COM(2017)235 final, Brussels.
11. European Commission (2018): 2nd Action Plan to fight the illicit tobacco trade 2018-2022, Communication from the Commission to the Council and the European Parliament, the Council and the European Economic and Social Committee, COM(2018) 846 final, Brussels.

12. European Commission (2019): Public perception of illicit tobacco trade, Special Eurobarometer 482, Available at: https://ec.europa.eu/anti-fraud/sites/antifraud/files/eurobarometer_2019_report_en.pdf.
13. European Commission (2021): Public perception of illicit tobacco trade, OLAF European Anti-Fraud Office, European Commission, Available at: https://ec.europa.eu/anti-fraud/public-perception-illicit-tobacco-trade_en
14. European Commission (2021a): Tobacco, Available at https://ec.europa.eu/info/food-farming-fisheries/plants-and-plant-products/plant-products/tobacco_en
15. Jarvis., A. (2012): A study on liability and the health costs of smoking, DG SANCO (2008/C6/046), Final Report, Available at: https://ec.europa.eu/health/sites/health/files/tobacco/docs/tobacco_liability_final_en.pdf.
16. Joossens L, Merriman D, Ross H, Raw M. (2009): How eliminating the global illicit cigarette trade would increase tax revenue and save lives. Paris: International Union Against Tuberculosis and Lung Disease.
17. Joossens, L. and M. Raw (2008): Progress in combating cigarette smuggling. *Tobacco Control*, 17(6):399–404.
18. Joossens, L. and M. Raw (2012): From cigarette smuggling to illicit tobacco trade. *Tobacco Control*, 21(2):230–234.
19. Joossens, L., Chaloupka, F. J., Merriman, D. and A.Yurekli(2000): Issues in the Smuggling of Tobacco Products. In Tobacco Control in Developing Countries, ed by. Frank J. Chaloupka and Prabhat Jha, 393–406. Oxford: Oxford University Press.
20. KPMG (2016): Project SUN: A study of illicit cigarette market in the European Union, Norway and Switzerland. KPMG: Amstelveen. https://assets.kpmg/content/dam/kpmg/uk/pdf/2017/07/project-sun-2017-report.pdf
21. Liutkutė-Gumarov, V., Galkus, L., Petkevičienė, J., Štelemėkas, M., Miščikienė, L., Mickevičienė, A. and J. Vaitkevičiūtė (2020): Illicit Tobacco in Lithuania: A Cross-Sectional Survey, *International Journal of Environmental Research and Public Health,* 17(19), 7291.
22. MacQueen, J. B. (1967): Some methods for classification and analysis of multivariate observations. Proceedings of the Fifth Symposium on Math, Statistics, and Probability (pp. 281–297). Berkeley, CA: University of California Press.
23. Mashiri, E.; Sebele-Mpofu, Y.F. (2015): Illicit trade, economic growth and the role of Customs: A literature review. World Customs Journal, 9(2), 38–50.
24. Mikulić D, Buturac G. (2020): In What Measure Is Public Finance Sustainability Threatened by Illicit Tobacco Trade: The Case of

Western Balkan Countries. *Sustainability*. 12(1):401. https://doi.org/10.3390/su12010401.
25. Prieger J,. and Kulick, J. (2016): Cigarette Taxes and Illicit Trade in Europe, Pepperdine University School of Public Policy Working Papers , available at School of Public Policy Working Papers.
26. Rutgers, Rogier Alexander and Federica Daphne Ierace(2019): Extended Balkan Route - Mapping Cigarette Trafficking Along the Extended Balkan Route. In ITTP NEXUS in Europe and Beyond, edited by Alberto Aziani and Marco Dugato. Milano: Transcrime – Università Cattolica del Sacro Cuore.
27. The Institute of Economics (2019): Illegal Trade of Tobacco Products: Smuggling as Experiences along the Balkan Route, Zagreb: The Institute of Economics, Zagreb, Croatia.
28. World Health Organisation (2021): Illicit trade increases tobacco use, available at: http://www.emro.who.int/noncommunicable-diseases/highlights/illicit-trade-increases-tobacco-use.html.
29. Yeh, C., Schafferer, C., Lee, J., Ho, L. and Hsieh, C. (2017): The effects of a rise in cigarette price on cigarette consumption, tobacco taxation revenues, and of smoking-related deaths in 28 EU countries--applying threshold regression modelling, BMC Public Health, 17(1)
30. Yürekli, A.; Sayginsoy, Ö. (2010): Worldwide organized cigarette smuggling: an empirical analysis. *Applied Economics*. 42(5), 545-561. DOI: 10.1080/00036840701720721

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CAN THE SPREAD OF COVID-19 BE APPROXIMATED WITH FIBONACCI GROWTH SEQUENCE?

Abstract

COVID-19 represents not only public health emergency but has also caused global economic crisis. Economic consequences of COVID-19 contagion are detrimental to all economic sectors. In order to investigate and evaluate the spread of COVID-19 disease, in this paper a novel approach for approximation of COVID-19 spread with the Fibonacci growth sequence has been introduced. For that purpose two Fibonacci methods were used. The results of the analysis have showed that Fibonacci method 2 has better forecasting ability but has no satisfactory forecasting ability when applied on a global country level. On the other side, it has reasonable to good prediction ability when applied to a regional level of separate countries. Limitation of the paper is related to the fact that not all the COVID-19 variables were available for all selected countries. Recommendations for future research in this field can go in the way of lowering the analysis on a city level.The results obtained from this paper can be important for economic and health policy makersand EU potential member countries on consumers and health protection in the light of European Union enlargement process.

Keywords: *COVID-19, Fibonacci growth sequence, MAPE, European Union.*

JEL: I19, J1

1. INTRODUCTION

The spread of COVID-19 disease represent a public health emergency but has also negative impact on global economy. Containment and mitigation measures are therefore necessary to limit the spread of the virus in order to save lives, Loayza, and Pennings (2020). Economic implications of COVID-19 are detrimental not only to public health systems but to trade and travel, food and agriculture industries, various market types and retail chains, among others, Evans (2020). Therefore, it is important to analyse the process of spreading of the disease. In this papera novel approach for approximating ofspreadingtheCOVID-19 disease with Fibonacci growth sequence is analysed. Fibonacci numbers can be found in nature and are applicable to growth of every living thing, from single cell to spiral galaxies, Watson (2017). Fibonacci numbers have application in various fields of human activity such as arts, architecture, biology and economy, Debnath.The methodology of the paper relies and continues on Žmuk and Jošić (2019) using two forecasting methods for prediction of COVID-19 disease spread. The precision of two forecasting methods is being evaluated with the help of the MSE, RMSE and MAPE metrics. It is expected that the Fibonacci growth sequence can be reasonably good approximation of COVID-19 disease spread because the virus has natural origin and behaves according to the laws of nature. The relavance of results and conclusions obtained from this papercan be for consumers and health protection. In the light of European Union enlargement process, member States need to transpose the acquis into national law, put in place independent administrative structures and enforce powers allowing for effective market surveillance and enforcement of the acquis, European Commission (2020).

Paper is structured in fivechapters. After the introduction, short literature review elaborates on the applications of Fibonacci growth sequence in economics and urban economics specifically. In the methodology and data section descriptive statistics of data are presented and methodology of the paper is explained. In the results and discussion section the main results of the analysis are displayed, firstly on the global (country level) and after that on the regional level of separate countries with the most cases of infection with the COVID-19 disease.Final chapter presents concluding remarks.

2. SHORT LITERATURE REVIEW

In this chapter the application of Fibonacci growth sequence in economics will be displayed and elaborated. Fibonacci sequence has been applied in economics in a wide range of topics but the most important one is for stock market prediction, Giryn and Kozubski (2012), Kumar (2014),Talreja (2014). Other applications of Fibonacci sequence in economics are in the field of

probablistic and artificial intelligence, Tanackov, Tepić and Kostelac (2011), Kalman filter and optimal control, Benavoli, Chisci and Farina (2009) and even on betting on soccer draws, Lahvicka (2013).Another application of Fibonacci sequence is in urban economics for prediction of settlements size. Fonseca (1988) studied the actual and predicted population of United States urbanised areas for the years 1970 and 1980 using the Fibonacci sequence. The results have shown that Fibonacci sequence can be a good methodology for approximation of urban population growth. Žmuk and Jošić (2019) continued on Fonseca (1988) and investigated the urban ir(regularities) such as Zipf's law and Fibonacci growth sequence for Eastern Croatia in the case of decreasing population in the period from 1991 to 2011. The research question investigated whether the structure of Eastern Croatia's urban system complied with the Fibonacci growth sequence using wo forecasting methods. The precision of forecasting methods was evaluated using the MSE, RMSE and MAPE metrics. Both forecasting methods achieved a highly to good accurate forecasting on MAPE metrics with the Fibonacci method 2 being more accurate than the Fibonacci method 1 (8.32% vs 13.08%).
The connection between the spread of COVID-19 disease and Fibonacci growth sequence has not been established yet in the empirical research. Dündar(2020) in the short paper however get into relation the the weekly gowth of COVID-19 cases and the Fibonacci numbers. This paper is a novel paper in this field. We use the methodology of Žmuk and Jošić (2019) in order to approximate the spread of COVID-19 disease with the Fibonacci growth sequence firstly by taking into observation all countries in the world and after that the analysis was lowered on the region level of selected countries with the most cases in infection.

3. DATA AND METHODOLOGY

In this paper the ability to forecast the spread of COVID-19 disease by applying the Fibonacci sequence is inspected. Main COVID-19 variables under the study are new cases, total cases, new deaths and total deaths. In the analysis the data from April 25, 2020 are used. In the first step, the COVID-19 variables are analysed by taking into account all countries in the World (where the COVID-19 appeared). After that, the COVID-19 variables are observed for selected countries with the most cases of infection according to their regions. Therefore, the more closely observed countries are: Italy, France, the United States of America, Spain, Germany and the United Kingdom. In addition, the case of Croatia will be analysed.

Unfortunately, not all the COVID-19 variables are available for all selected countries. In both cases, when all countries of the World and when regions

of a chosen country are observed, values of the observed COVID-19 variable are ranked. The ranking is conducted in decreasing order. Afterwards the Fibonacci sequence is used to select countries or regions for which the values at the COVID-19 variables will be forecasted. In order to forecast two methods will be applied. In the first approach, the forecast values are calculated as follows:

$$F_2 = \frac{y_1}{\varphi_1}$$
$$F_i = \frac{F_{i-1}}{\varphi_1}, i = 3,4,5,\ldots, \quad (1)$$

where F_i is forecasted value of the unit with rank *i* given according to the Fibonacci sequence, y_1 is the highest actual value (or value with rank 1) of the observed COVID-19 variable, φ_1 is the golden ratio with value of 1.6180339887. In the second approach, the forecast values are calculated by applying following equation:

$$F_i = \frac{y_{i-1}}{\varphi_1}, i = 2,3,4,5,\ldots, \quad (2)$$

where F_i is forecasted value of the unit with rank *i* given according to the Fibonacci sequence, y_i is the actual value of the observed COVID-19 variable for the unit with rank *i*, φ_1 is the golden ratio with value of 1.6180339887.

The accuracy of the two applied methods will be then compared by applying overall forecasting errors: mean squared error (MSE), root mean squared error (RMSE) and mean absolute percentage error (MAPE). The forecasting errors are calculated as follows:

$$MSE = \frac{\sum_{i=2}^{n}(y_i - F_i)^2}{n}, \quad (3)$$

$$RMSE = \sqrt{\frac{\sum_{i=2}^{n}(y_i - F_i)^2}{n}}, \quad (4)$$

$$MAPE = \frac{\sum_{i=2}^{n}\left|\frac{y_i - F_i}{y_i}\right| \times 100}{n}, \quad (5)$$

where *i* is the unit rank according to the Fibonacci sequence, y_i is the actual value of the observed COVID-19 variable for the unit with rank *i*, F_i is forecasted value of the unit with rank *i* given according to the Fibonacci sequence.

In Table 1 are given basic descriptive statistics of the four selected COVID-19 variables for overall 207 countries worldwide. The results are related to April 25, 2020.

Table 1. Descriptive statistics results of the COVID-19 variables, the World, n = 207 countries, April 25, 2020

Statistics	COVID-19 variable			
	New cases	Total cases	New deaths	Total deaths
Mean	370	13,260	25	944
Median	9	447	0	10
Mode	0	11	0	0
Standard Deviation	1,697	67,751	107	4,756
Coefficient of variation	459%	511%	429%	504%
Kurtosis	115.7	138.3	54.5	67.5
Skewness	9.9	11.0	6.8	7.6
Range	21,352	890,524	1,054	51,017
Minimum	0	0	0	0
Maximum	21,352	890,524	1,054	51,017
Sum	76,607	2,744,744	5,150	195,386

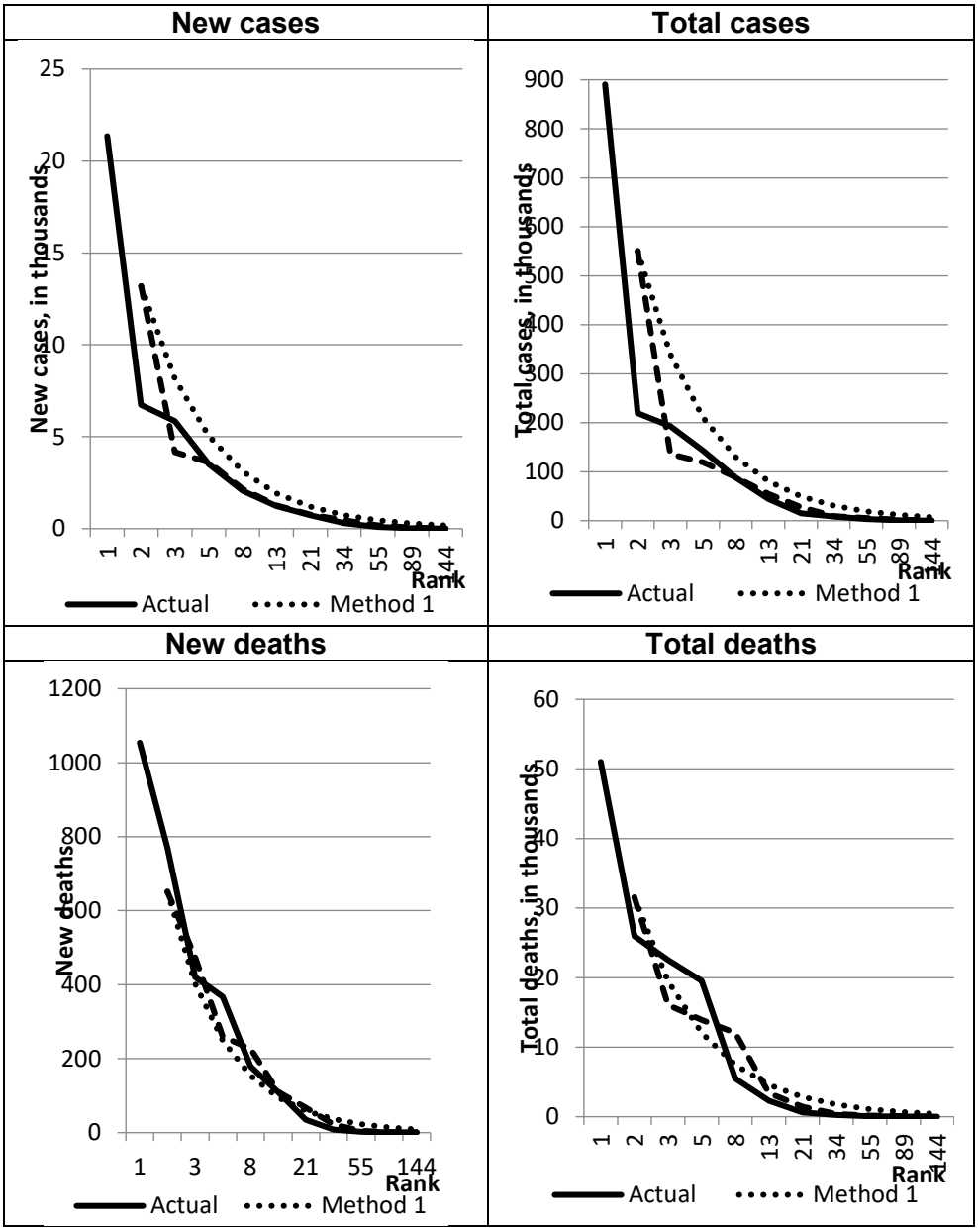
Source: EU Open Data Portal (2020), authors.

There are overall 207 countries observe in the analysis. Country with the most new cases, total cases, new death and total deaths due to COVID-19 infection are United States of America. As from April, 25 there were 2,744,744 cases of infection and 195,386 cases of death globally.

4. RESULTS AND DISCUSSION

In Figure 1 actual and forecasted values of the COVID-19 variables for the observed countries in the World on April 25, 2020 are shown.

Figure 1. Actual and forecasted values of the COVID-19 variables, the World, April 25, 2020



Source: EU Open Data Portal (2020), authors.

The actual and forecasted values are not shown for all observed countries but only for those which are ranked according to the Fibonacci sequence. In this case all countries are firstly ranked according to the size of the observed

variable in descending order. After that the actual values from the 1st, the 2nd, the 3rd, the 5th, the 8th, the 13th, the 21st, the 34th, the 55th, the 89th and the 144th country are used to calculate the forecasted values by applying the two forecasting methods. According to Figure 1 it seems that forecasting method 2 performs better than method 1.

Table 2. Overall forecasting errors, the World, April 25, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
New cases	Method 1	5,159,426	2,271	1,983%
	Method 2	4,457,837	2,111	143%
Total cases	Method 1	14,057,509,203	118,564	1,035%
	Method 2	11,342,134,312	106,499	95%
New deaths	Method 1	3,070	55	357%
	Method 2	3,165	56	56%
Total deaths	Method 1	11,365,337	3,371	2,000%
	Method 2	14,886,546	3,858	96%

Source: EU Open Data Portal (2020), authors.

In Table 1 the overall forecasting errors are given. According to the mean absolute percentage error, it is confirmed that the forecasting method 2 is more precise in forecasting the observed COVID-19 variables. Furthermore, the mean absolute percentage errors for method 1 are too large. Therefore, the method 1 cannot be recommended to forecast the COVID-19 variables.On the other hand the value of MAPE of 56% and 95% and 96% can be interpreted as inaccurate forecasting, Lewis (1982).In Figures A1, A2, A3 and A4 in the Appendix the Fibonacci spirals for the observed COVID-19 variables at the World level are given. So, those four figures are showing countries which are selected according to the Fibonacci sequence and used to calculate forecasts. The first country which was observed more closely is Italy. In the analysis Italy was observed according its regions. Accordingly, Italy was divided into following 20 regions: Abruzzo, Aosta Valley, Apulia, Basilicata, Calabria, Campania, Emilia-Romagna, Friuli-Venezia Giulia, Lazio, Liguria, Lombardy, Marche, Molise, Piedmont, Sardinia, Sicily, Trentino-South Tyrol, Tuscany, Umbria and Veneto. Data for following COVID-19 variables were available for Italian regions: total cases, total deaths, total recovered and total tested. The forecasting analysis was used on the same way as before at the World level. The results of the overall forecasting errors are shown in Table 3.

Table 3. Overall forecasting errors, Italy, April 15, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	81,492,275	9,027	85%
	Method 2	68,739,087	8,291	42%
Total deaths	Method 1	5,776,398	2,403	218%
	Method 2	3,660,065	1,913	57%
Total recovered	Method 1	13,194,989	3,632	198%
	Method 2	8,144,552	2,854	48%
Total tested	Method 1	1,470,680,568	38,349	26%
	Method 2	1,435,186,535	37,884	20%

Source:Ministero della Salute (2020), authors.

According to the results, it can be concluded that method 2 is more accurate that the method 1 at all observed COVID-19 variables. The value of MAPE in the range of 20-50% can be interpreted as reasonable forecasting.

Table 4. Overall forecasting errors, France, April 16, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total hospitalized	Method 1	3,547,282	1,883	361%
	Method 2	2,073,831	1,440	158%

Source:Sante publique France (2020), authors.

Analysis regarding France was conducted based on its 13 regions: Auvergne-Rhône Alpes, Bourgogne-Franche-Comté, Brittany, Centre-Val de Loire, Corsica, Grand Est, Hauts-de-France, Ile-de-France, Normandy, Nouvelle-Aquitaine, Occitanie, Pays de la Loire and Provence-Alpes-Côte-d'Azur. Unfortunately, the only available COVID-19 variable at region level was the total number of hospitalized. According to overall forecasting errors given in Table 4, it can be concluded that the method 2 is more precise than the method 1. However, according to mean absolute percentage errors, which are too high, both methods seems to be inappropriate to used in this case.

Table 5. Overall forecasting errors, the United States of America, April 16, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	1,143,044,252	33,809	127%
	Method 2	640,394,073	25,306	43%
Total deaths	Method 1	9,793,106	3,129	317%
	Method 2	5,935,871	2,436	56%
Total tested	Method 1	2,409,729,431	49,089	30%
	Method 2	3,043,748,379	55,170	19%

Source:Wordometer (2020), authors.

The United States of America was observed according to its 52 states. The conclusions based on overall forecasting errors, which are given in Table 4, are in line with previous conclusions, the value of MAPE metrics between 20-50 percent can be interpreted as reasonable forecasting. As well as for previous cases, it has been shown that the method 2 is more accurate in forecasting the COVID-19 variables than the method 1.

Table 6. Overall forecasting errors, Spain, April 15, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	11,805,088	3,436	34%
	Method 2	21,322,188	4,618	38%
Total deaths	Method 1	329,160	574	96%
	Method 2	105,575	325	33%

Source:Centro de Coordinación de Alertas y Emergencias Sanitarias (2020), authors.

The COVID-19 variables are forecasted for Spain according to its regions called communities. There are overall 19 communities (Andalusia,Aragon, Asturias,Balearic Islands,Basque Country,Canary Islands,Cantabria,Castile and León,Castilla-La Mancha,Catalonia,Ceuta,Community of Madrid,Extremadura,Galicia,La Rioja,Melilla,Murcia,Navarre,Valencian Community). The overall forecasting errors results, given in Table 5, have shown that the method 1 is more precise at variable total cases, whereas the method 2 is more precise at the second variable, variable total deaths. However, it has to be emphasized that the difference in accuracy between

the method 1 and the method 2, if mean absolute percentage error is observed, it is almost negligible.

Table 7. Overall forecasting errors, Germany, April 17, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	38,645,428	6,217	43%
	Method 2	42,846,976	65,456	50%
Total deaths	Method 1	25,684	160	61%
	Method 2	25,688	160	45%

Source:Robert Koch Institut (2020),authors.

The same conclusions as at the Spain communities, can be brought for German states as well. There are 16 German states observed: Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein and Thüringen. According to the results from Table 6, for forecasting total cases the method 1 appeared to be more accurate whereas for forecasting total deaths the method 2 is better choice. The obtained values for MAPE metrics about 50% borders between reasonable and inaccurate forecasting.

Table 8. Overall forecasting errors, the United Kingdom, April 16, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	6,952,696	2,637	30%
	Method 2	3,599,186	1,897	16%

Source:Statista (2020), authors.

Unfortunately, for the United Kingdom regions only data for total cases variable from all the COVID-19 variables were available. The United Kingdom was split into 12 regions: East Midlands,East of England,London,North East,North West,Northern Ireland,Scotland,South East,South West,Wales,West Midlands andYorkshier and the Humber. According to the results from Table 7, both used forecasting methods have good precision or forecasting. Namely, mean absolute percentage error at bot forecasting methods is below 50%. However, the forecasting method 2

performed better than the forecasting method 1. The analysis was also conducted for the Croatia.

Table 9. Overall forecasting errors, Croatia, April 16, 2020

COVID-19 variable	Forecasting method	Mean squared error	Root mean squared error	Mean absolute percentage error
Total cases	Method 1	2532	50	138%
	Method 2	4500	67	125%

Source: GDi (2020), authors.

For the sake of the analysis, Croatia is divided into 21 counties (City of Zagreb, County of Bjelovar-Bilogora, County of Dubrovnik-Neretva, County of Istria, County of Karlovac, County of Koprivnica-Križevci, County of Krapina-Zagorje, County of Lika-Senj, County of Međimurje, County of Osijek-Baranja, County of Požega-Slavonia, County of Primorje-Gorski kotar, County of Sisak-Moslavina, County of Slavonski Brod-Posavina, County of Split-Dalmatia, County of Šibenik-Knin, County of Varaždin, County of Virovitica-Podravina, County of Vukovar-Sirmium, County of Zadar and County of Zagreb). The data for total cases was the only available data related to the COVID-19 variables at the county level. According to the mean absolute percentage errors, results given in Table 8, the forecasting method 2 is slightly more precise than the forecasting method 1. However, the both forecasting methods are quite inaccurate because their mean absolute percentage errors are above 100%.

From the aforementioned results of the analysis it can be concluded that the forecasting method 2 was more precise in forecasting the observed COVID-19 variables. The values of MAPE above 50%, when all countries in the world were observed, can be interpreted as inaccurate forecasting. When the analysis was brought down on the regional level of selected countries with the most cases of infection, the results were different. In the case of United Kingdom's regions the accuracy of Fibonacci methods displayed good forecasting precision. Also, the value of MAPE for Italian regions and U.S. states and Spanish communities were in the range of 20-50% which can be interpreted as reasonable forecasting. The obtained values of MAPE metrics for German states bordered roughlyat 50% can be interpreted between reasonable and inaccurate forecasting. According to mean absolute percentage errors, which were too high for French regions and Croatian counties, both methods seemed to be inappropriate inforecasting the spread of COVID-19. One could ask why the forecasting ability of Fibonacci methods 1 and 2 was much better at regional level of chosen countries than on the

global country level? The reason can be found in data heterogeneity related to different characteristics of individual countries on a a global level, various containment and mitigation measures directed to limit the spread of the virus (with or without quarantine) and different stages of infection in observed countries so the results achieved at the world level cannot be taken as conclusive.

5. CONCLUSION

The goal of the paper was to investigate whether the spread of COVID-19 could be approximated with the Fibonacci growth sequence. For that purpose two Fibonacci methods were used. The results of the analysis have showed that the Fibonacci growth could not be applied on a global country level but on the regional level of individual countries the precision of Fibonacci 2 method could be characterized as satisfactory one, from reasonable one to good forecasting ability.

Limitation of the papers related to the fact that not all the COVID-19 variables were available for all selected countries. Recommendations for future research in this field can go in the way of lowering the analysis on acity level. In that case it is expected that the predictive power of Fibonacci methods would be even better or more precise than the results achieved on the regional level.The results obtained from this paper can be important for economic and health policy makers for their COVID-19 guidance and surveillance and for implementation of public health policy measures. As mentioned beforethe relavance of conclusions obtained from this paper can also be for EU potential member countries on consumers and health protection in the light of European Union enlargement process, especially regarding the Chapter 28, Consumer and health protection.

REFERENCES

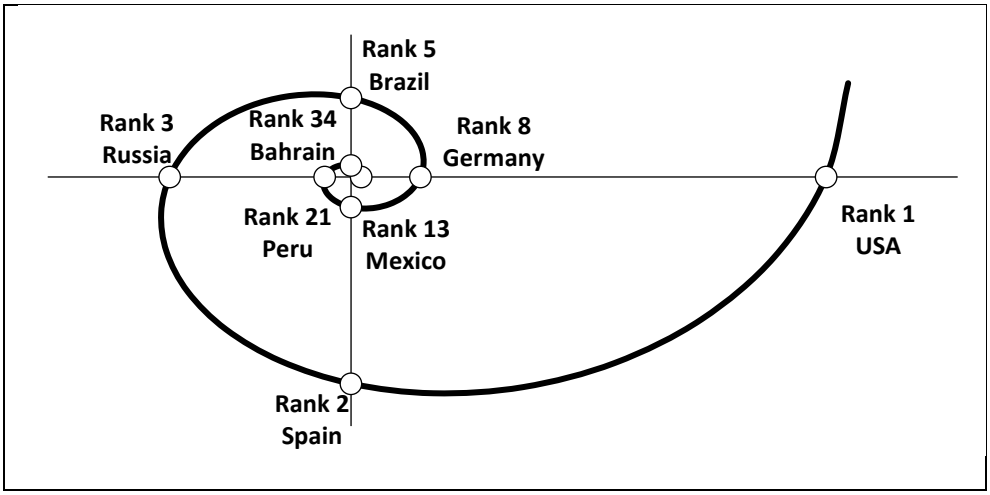
1. Benavoli, A., Chisci, L. & Farina, A. (2009). Fibonacci sequence, golden section, Kalman filter and optimal control, *Signal Processing*, 89(8), pp. 1483-1488.
2. Centro de Coordinación de Alertas y Emergencias Sanitarias (2020). Actualización nº 76. Enfermedad por el coronavirus (COVID-19) [online]. Available at: https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov-China/documentos/Actualizacion_76_COVID-19.pdf[1 May 2020].

3. Debnath, L. (2011). A short history of the Fibonacci and golden numbers with their applications, *International Journal of Mathematical Education in Science and Technology*, Vol. 42, Issue 3, pp. 337-367, DOI: 10.1080/0020739X.2010.543160.
4. Dündar, F. S. (2020) COVID-19 and the Fibonacci Numbers. Available at:https://www.researchgate.net/publication/339939433_Covid19_and_the_Fibonacci_Numbers[1 May 2020].
5. EU Open Data Portal (2020). COVID-19 Coronavirus data [online]. Available at: https://data.europa.eu/euodp/en/data/dataset/covid-19-coronavirus-data/resource/55e8f966-d5c8-438e-85bc-c7a5a26f4863[1 May 2020].
6. European Commission (2020) European Neighbourhood Policy And Enlargement Negotiations, Chapter 28:Consumer and health protection. Available at:https://ec.europa.eu/neighbourhood-enlargement/policy/conditions-membership/chapters-of-the-acquis_en[1 May 2020].
7. Evans O. (2020). Socio-economic impacts of novel coronavirus: The policy solutions. *BizEcons Quarterly*, Vol.7, pp. 3–12.
8. Fonseca, J. W. (1988). Urban Rank-Size Hierarchy: A mathematical interpretation, *Institute of Mathematical geography*, Ann Arbor: Institute of Mathematical Geography, Monograph Series, Monograph #8, 1989. Available at: https://deepblue.lib.umich.edu/handle/2027.42/58235. [1 May 2020].
9. GDi (2020). Koronavirus Hrvatska [online]. Available at: https://gdi-online.maps.arcgis.com/apps/opsdashboard/index.html#/47451c9cab8649c49ebfad8db4f64aec [April 17, 2020].
10. Giryn, C. & Kozubski, A. (2012).Fibonacci numbers as a tool for technical analysis in the Forex market – the attempt of application,*Studies & Proceedings of Polish Association for Knowledge Management*, 61, pp. 54-66.
11. Kumar, R. (2014). Magic of Fibonacci Sequence in Prediction of Stock Behavior, *International Journal of Computer Applications* (0975 – 8887), 93(11), pp. 36-40.
12. Lahvicka, J. (2013). The Fibonacci Strategy Revisited: Can You Really Make Money by Betting on Soccer Draws?, MPRA Paper No. 47649. Available on: http://mpra.ub.uni-muenchen.de/47649/. [1 May 2020].
13. Lewis, C. D. (1982). Industrial and Business Forecasting Methods. Butterworths Publishing, London, 40.
14. Loayza, N. V. & Pennings, S. (2020). Macroeconomic Policy in the Time of COVID-19:A Primer for Developing Countries, *Research & Policy Brief From the World Bank Malaysia Hub*, Research & Policy Brief No.28.
15. Ministero della Salute (2020). Aggiornamento 15/04/2020 ore 17.00 [online]. Available at:

http://www.salute.gov.it/imgs/C_17_notizie_4470_0_file.pdf [April 17, 2020].
16. Robert Koch Institut (2020). COVID-19: Fallzahlen in Deutschland und weltweit [online]. Available at:https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Fallzahlen.html [April 17, 2020].
17. Sante publique France (2020). COVID-19: point épidémiologique du 16 avril 2020 [online]. Available at: https://www.santepubliquefrance.fr/maladies-et-traumatismes/maladies-et-infections-respiratoires/infection-a-coronavirus/documents/bulletin-national/covid-19-point-epidemiologique-du-16-avril-2020 [April 17, 2020].
18. Statista (2020). Number of coronavirus (COVID-19) cases in the United Kingdom (UK) as of April 16, 2020, by country/region [online]. Available at: https://www.statista.com/statistics/1102151/coronavirus-cases-by-region-in-the-uk[April 17, 2020].
19. Talreja, P. (2014).To Study the Trend and Behaviour Analysis of Indian Equity Market Using Elliott Wave Principle and Fibonacci sequence,*International Journal of Innovative Research in Science, Engineering and Technology*, 3(6), pp. 13465-13476.
20. Tanackov, I., Tepić, J. & Kostelac, M. (2011). The golden ratio in probablistic and artificial intelligence, *Tehnički vjesnik,* 18(4), pp. 641-647.
21. Wordometer (2020). United States [online]. Available at: https://www.worldometers.info/coronavirus/country/us[April 17, 2020].
22. Watson, A., R. (2017). The Golden Relationships: An Exploration of Fibonacci Numbers and Phi, Duke University, Graduate Liberal Studies. Available at:https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/14077/Tony%20Watson_Masters%20Project_Final%20Draft.pdf?sequence=1.[1 May 2020].
23. Žmuk, B. & Jošić, H. (2019). Urban (ir)regularities in Eastern Croatia: are the main urban economics law followed or not?, *8th International scientific symposium economy of Eastern Croatia – vision and growth, Osijek, Croatia, 2019.* Available at:https://bib.irb.hr/datoteka/1005049.muk_Joi_2019.pdf[1 May 2020].

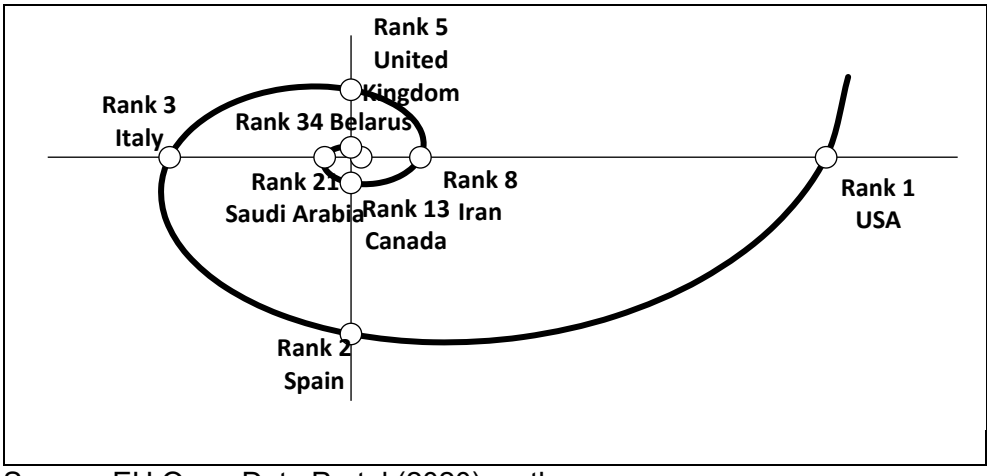
APPENDIX

Figure A1 Fibonacci spirals of the COVID-19 variables, new cases, the World, April 25, 2020



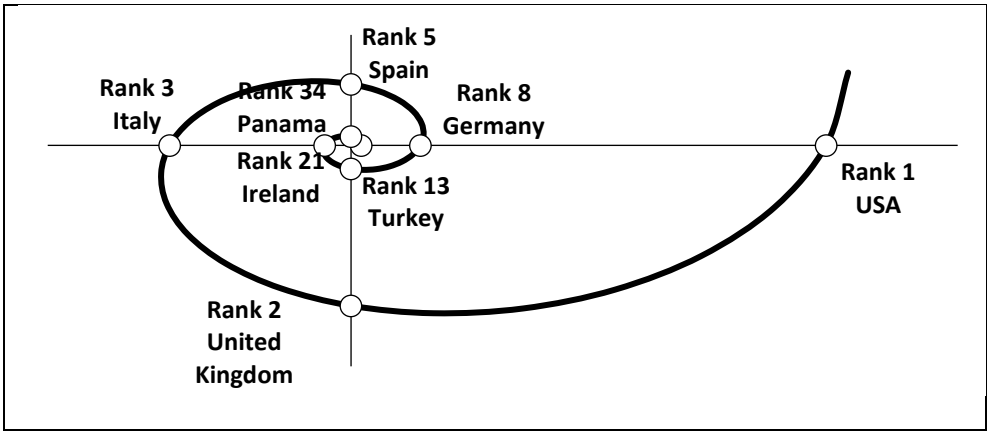
Source: EU Open Data Portal (2020), authors.

Figure A2 Fibonacci spirals of the COVID-19 variables, total cases, the World, April 25, 2020



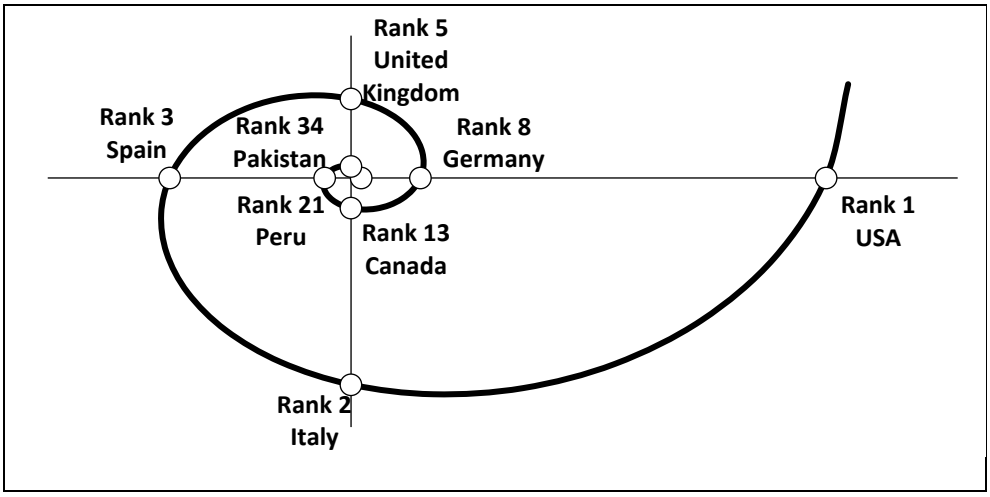
Source: EU Open Data Portal (2020), authors.

Figure A3 Fibonacci spirals of the COVID-19 variables, new deaths, the World, April 25,
2020



Source: EU Open Data Portal (2020), authors.

Figure A4 Fibonacci spirals of the COVID-19 variables, total deaths, the World, April 25, 2020



Source: EU Open Data Portal (2020), authors.

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THE MODEL PREDICTIONS OF ACTUAL DEMAND WITHIN THE SERVICE ACTIVITY

Abstract

The concept of functioning of manageable business systems is oriented towards achieving optimal business efficiency, which is conditioned by the adequate planning and implementation of business processes based on the optimal structure and scope of business activity. The demand for services has a predominantly stochastic character, with no optimal or unique prognostic method, while possible errors and uncertainty of prediction are significantly expressed.

Adequate solutions to the problems described are generated by a combination of complex methods of forecasting future demand for services, and are based on the volume of services provided in the previous time period Scope of services provided coincides with their demand only if the volume of realization is below the working capacity, and if the volume of realization is at the level of working capacity, the additionally requested service is denied to the user, whereby additional demand information is not recorded and becomes a censored demand in the process of predicting future demand.

The need to upgrade the decision model by predicting and incorporating censored data is tested by a simulation method in comparison with actual demand. The aim of the applied methodology is that the decision-maker chooses the best management option and to indicate the impact of the prediction model on the business result. Benefits resulting from the modelled information significantly exceed the cost of their acquisition, and thus the above procedure significantly upgraded information platform of many business systems.

Keywords: *censoring demand; demand forecasting; managing a service company; statistical methods;*

JEL: C1

1. INTRODUCTORY CONSIDERATIONS

The tourism and hospitality industry in Bosnia and Herzegovina, as well as in the Republic of Srpska, has a significant and underutilized potential, and thus the basis for achieving numerous benefits for businessmen, local communities and the entire socio - economic community. The development of economic entities of the stated business orientation requires maximization of the expected business results, which cannot be achieved with an intuitive approach to the formulation of business strategies.

Improving the efficiency of the business system is based on the method of choosing management alternatives and it is conditioned by the model used in the selection process. Management decisions, as derivatives of the decision-making process, are made by different decision-making models, where the quality of their implementation is reflected in the rationality of the decision-maker in their generation. The specific category of business systems includes service enterprises, whose business efficiency is predominantly conditioned by adequate service demand forecasting, both in terms of scope and structure, and the required service.

The usual practice of demand forecasting is based on the realized scope of services in the previous period, and its identification with the actual demand. Actual demand is equal to the volume of realization only if it is less than or equal to the available working capacity of the business system

Generating the management decisions through the decision-making model is conditioned by the similarity degree among the model, as the image of the real system whose behavior we predict by it. The degree of agreement between the model and the part of reality that the model depicts is conditioned by the consistency of the information platform

The construction of the optimal model of demand forecastig is significantly hampered by the unavailability of value of demand data in the previous period, as well as the stochastic nature of the variable whose value we model.
The conversion of the traditional approach is based on a comparison of decision-making models and significantly enriches the research process with valuable management guidelines and thus shifts the boundaries from randomness to legality, making the calculation of profitability with censorship more reliable.

2. PREVIOUS RESEARCH

Business systems in the field of tourism and hospitality sector exist in an environment of high sensitivity of users to the quality of the service process, as well as a significant degree of impact of customer impression on potential customers in the future. Availability of information through social networks facilitates the dissemination of information globally, with research in the UK showing that the preferences of 35% of service users are based on the attitudes of users launched through social networks (Report, 2010), noting that their impact is weaker in restaurants with significant market image (Vermeulen & Seegers, 2009)

Service business concept is based on market positioning realized through the harmonization of business results with customer requirements and expectations, complemented by comparative analysis with a competitive portfolio and respect for the specifics of the company's business. The modern business concept builds on the traditional concept of competitive advantage as the exclusive consequence of control, costs based on monopolistic resources control, territorial rent, superior technology and management, added value primarily through fostering partnerships with users of business system products and / or services. (Todorović, Đuričin, & Janošević, 2000)

The potential of tourism and hospitality is the subject of interest of global organizations, where "according to UNWTO, WTTC and USAID (CCA) projections and in accordance with the" Vision of Tourism until 2020 ", it should become a strategic industry in the upcoming period that will contribute to economic prosperity, economic growth and development of the national economy, because with its multiplicative character (multiplicative function) as well as other functions, tourism can explicitly influence certain macroeconomic indicators and the balance of payments of BiH. " (Arnaut, 2009)

The developmental potential of the tourism and hospitality industry is recognized as a significant source of economic growth, development, but also of solving economic problems such as unemployment. In line with the above, “Portugal and Austria, as distinct tourist destinations, and Ireland, have recognized the employment potential offered by tourism and have used it to reduce the unemployment rate. Unfortunately, in most Mediterranean countries, where tourism is often one of the most important branches, this has not been done and they still have high unemployment rates. ” (Blažević & Vuković, 2001)

The tourism and hospitality industry is not institutionally supported enough, therefore the companies business, from the analyzed business domain, requires the ability of self-sustainability through the optimization of business results.

3. BUSINESS OPTIMUM METRICS OF SERVICE ENTERPRISES

The scientific platform of managerial behavior is based on the recognition, quantification and composition of system factors and system environment in a decision-making model in order to achieve and maintain optimal business results expressed and measured by the degree of achievement of business goals. Management balance is determined by the optimal use of natural and technical goods, and it is achieved by minimizing the difference between the existing and optimal business results.

Forming and applying the decision-making models refer to the approximation of the structure and behavior of the modelled system and it is contained in the key factors of business success. When we talk about service enterprises of tourist - catering orientation, the key factor of business success is contained in the ability to meet the demand on services.

Demand is variable, with distinctly stochastic character, and it conditions the structure and dynamic of exchange, and thus the production of services. Optimal identification of the scope and structure of demand enables optimal business result, which cannot be realized in the analyzed business environment, where demand values are projected by intuitive methods or possibly equalized with the scope of realized services date in previous periods.

There is significant difference between the scope of realization on one hand, and the structure and scope of demand in services, on the other hand, as well as the fact that these values match only if demand has less or equal value, while exceeding the working capacity remains unfamiliar.
Demand forecasting is a key variable in the projection of business results, and thus the need to determine a prediction model that will minimize the difference between the actual and projected value of demand in hospitality services.

The optimal identification of the scope and structure products of hospitality businesses is effectively complemented by the optimal model of composing the personnel structure of the desired level of knowledge, skills and abilities. The efficiency of the scope and structure of the business process

enables a balanced symbiosis with the corresponding systems, as a condition for the survival and development of both the modeled system and the global economic system of which it is a part.

3.1. The concept of functioning and key factors of business success of hospitality enterprises in BiH / RS

Hospitality enterprises can operate on the principle of open offer, timely reservations or a combination of those two. Enterprises in the analyzed business environment generally combine the offer by excluding the reserved seats from the current offer, and the rest of the offer is opened. The business environment in which the analyzed business entities realize business activity is characterized by the practice of not charging reservations, thus there is a phenomenon that the reservation is not a safe realization for the restaurant, but a significant loss of income

The time coverage of the research refers to the summer months, with an emphasis on the evening offer, when the concentration and frequency of the population, tourists and the diaspora is more significant and when the demand for services is most significant during the year. The realization of dinner services in one catering facility on the territory of Banja Luka for the period from 2010 to 2018 and from 1.7 to 31.8. In that period, data on the average price of the evening menu and the number of realized meals during the evening hours in the analyzed and competing
catering facilities, were collected.

When it comes to the offer of a catering facility, it is limited by the capacity of the hospitality enterprices which refers to 50 places, where the scope of unsatisfied demand does not only refer to the situation of reaching working capacity, but service request is possible while the facility has a reserved capacity that is ultimately not used due to non-use of the reservation, which is not sanctioned in any way.

The intention of the researchers is to forecast the demand for 2019 for the same time period on the basis of the collected empirical material and to compare the projected business methods based on different prognostic models with the actual business result using the mathematical simulation model.

3.2. Prediction of real demand in the function of optimizing the business result of a hospitality enterprise

The concept of forecasting future demand is based on current trends focused on future events. The consistency of the chosen method is

conditioned by the initial assumptions of previous trends, the range and time frame of the data used. It is important to emphasize that in addition to the method, the approach to the use of available empirical material determines the result of the assessment, and thus the consequences upon which the business concept is based. When it comes to the starting point for the prediction of actual demand, it is possible:

- Ignoring the censored data;
- Recording of data on unsatisfied demand and
- Upgrading of censored data by statistical methods. (Cooper, Mellu, & Kleywegt, 2006)

Ignoring the censored data prevents a real picture of the actual demand, which causes the discrepancy of the decision-making model with the part of reality to which it is applied. Recording of unsatisfied demand data as credible data cannot be obtained because the concept of functioning places the responsibility on service workers, who, due to the scope of work and lack of understanding of importance, will not responsibly approach the mentioned procedure. Future demand forecasting is based on appropriate quantitative and qualitative methods, among which, for the needs of the candidate research project, we use:

- Time series analysis;
- Regression analysis and
- Delphi method.

Quantitative methods of demand forecasting are based on taking into account previous movements of the analyzed phenomenon, enriched by recognizing and taking into account the factors that conditioned it. Time series analysis has the task of decomposing the time series into the components that make it, which are:

- Trend component - represents a long-term developmental tendency of occurrence in time;
- Cyclic component - refers to periodic repetition at the level of a certain number of years;
- Seasonal component - represents the laws of behavior of the phenomenon within a shorter period of time (less than a year);
- Residual component - represents a stochastic member, ie non-systematic influences. (Landika & Mikić, 2015)

The conducted research project involves determining the function of the linear trend on the basis of data demand in the previous period, as well as predicting future demand values taking into account seasonal phenomena. This refers to the appreciation of cultural, sports and / or entertainment content, as well as holidays and weekends in the analyzed time interval,

which affect the demand for the analyzed product or service of the analyzed catering facility. The prediction procedure itself is based on the application of a linear trend with respect to seasonal coefficients.
Demand values are projected in three ways:

- Using a linear trend with seasonalization of extrapolated values;
- Using a regression model;
- Using the Delphi method;

The concretely obtained linear trend equation is:

$$Q_{ti} = 35{,}805 + 0{,}118 * X_i$$

Where:
- Q_{ti} - theoretical (forecasted) demand for a product / service;
- X_i - time expressed in years ending in 2010;
- 35,805 - average value of demand in the fina year (2010);
- 0.118 - average annual increase in demand.

After extrapolation, the obtained demand values are seasonalized by multiplying by appropriate seasonal coefficients.

The regression model obtained by analyzing the empirical material used on a specific problem to predict the actual demand had the following form:

$$Q_{ti} = 29{,}4995 + 0{,}1484 * X_{1i} + 0{,}1314 * X_{2i}$$

Where:

- Q_{ti} – theoretical (forecasted) demand for a product / service
- X_{1i} – average price of product / service in the observed catering facility
- X_{2i} – average price of products / services of competing companies in the closer environment

The minimum scope of demand averages 29.4995 products / services of the analyzed type, where a unit increase in the product average price in the observed facility leads to an average increase in demand by 0.1484; while the same increase in competing companies increases the offer by 0.1314.

Prediction based on the Delphi method represents a consensus of individual forecasts of experts, where researchers, the owner of the restaurant and the manager of the catering facility are engaged, while the quantitatively projected demand indicators are corrected by the experience and intuition of the staff involved in the process

3.3. Simulation of monetary consequences for comparison of real and projected demand

In order to be a faithful copy of the real system the symbolic description of the decision model requires the detection of the qualitative, quantitative and dynamic aspect of the research problem, which is effectively solved by the simulation model. Preparing a business system for optimal functioning requires the recruitment of operational resources in line with market opportunities and requirements

The quality of business is determined by the realized profit, as a monetary expression of the business result. The business result represents the ratio of output and input variables, where in a specific problem the input (independent) variable refers to the number of produced services $Q_{pi} = Q_{ti}$), and the output (dependent) variable to the number of realized products (Q_{ri})[1] during one day. The random variable is the actual demand (Q_{sti}). Its worth is:

$$Q_{ri} = \min (Q_{sti}; Q_{ti})$$

Kriterijumska promjenljiva je ostvareni profit kojeg izračunavamo posredstvom obrasca:
The criterion variable is the realized profit, which we calculate by using the form:

$$Pf_i = \begin{cases} Q_{sti} < Q_{ti}; 5 * Q_{ti} - 3 * (Q_{sti} - Q_{ti}) \\ Q_{sti} \geq Q_{ti}; 5 * Q_{ti} \end{cases}$$

The time frame of the simulation is 62 days (1.7 - 31.8.2019). The results of the simulation procedure with respect to the values of the criterion variable can be shown in the following table.

[1] The product whose realization we project is the evening menu

Table 1. Profit values obtained using mathematical simulation (Landika & Račić, research and analysis, 2020)

Demand forecasting method	***Profit value*** $\sum_{i=1}^{62} Pf_i$	$\frac{\sum_{i=1}^{62} Pf_i}{max \sum_{i=1}^{62} Pf_i} * 100\%$
Actual demand	*12.335*	*100%*
Linear trend	*10.931*	*88,61%*
Multiple linear regression	*10.690*	*86,66%*
Delphi method	*11.317*	*91,75%*

Sources: Landeka & Račić, 2020

The value of the modeled information indicates the fact that the Delphi method can be declared as the most reliable prognostic model in comparison with the analysis of time series (linear trend with seasonalization) and the multiple regression model.

4. CONCLUDING REMARKS

The value of demand and its credible prediction within the service and catering business predominantly determines the business result. The business entity should adjust the resources and organizational structure to the market requirements, and must comply with market conditions that are unknown to him at the time of making a business decision.

The assessment of actual demand is hampered by a high degree of uncertainty, and thus the possibility of error. Prognostic methods have a certain theoretical - practical basis, they are based on data from previous periods with the need to upgrade censored data. A universal and unique forecasting model does not exist, nor does it adapt to different business situations, but also to different time intervals eather. The credibility of the projection on one system is not a guarantee of credibility for other systems, and the quality of future projections is not conditioned by the quality of previous projections eather.

The necessity of prognostic activity, as well as the efforts to achieve a satisfactory degree of reliability requires the use of prognostic models and the choice of the optimal one. The model choice of the management option is adapted to the specific business system and its goals. The simulation model enables the research of the effects of the candidate management options, while it is possible to consider the implications of a certain option before its implementation.

The analyzed management task was solved by comparing three prediction models, whereby the effects of prediction were analyzed with real demand, and Delphi method was shown as the optimal prediction model, which enabled the realization of 91.75% of the possible business results.
Prediction models start from different assumptions. The linear trend model based on the period of the previous 8 years, enriched by respecting the seasonal component, would enable the realization of 88.61% of the possible business results.

The demand for products is conditioned by factors of different forms and measures of influence, among which are the price of products and the prices of competing products. There is the influence of other factors, such as purchasing power and average income of users, where these indicators cannot be reliably determined in the analyzed circumstances. The credibility of the projected results is conditioned by the explained variability in the regression model, which in this case is 86.70% (Landika & Račić, research and analysis, 2020), justifies its use, while this approach allows the realization of 86.66% of possible business results .
The demand projected by the Delphi method corresponds to the observed decision-making circumstances to the greatest extent, however, the above should be constantly checked and improved.

5. CONCLUDING REMARKS

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The assessment of actual demand is hampered by a high degree of uncertainty, and thus the possibility of error. Prognostic methods have a certain theoretical - practical basis, they are based on data from previous periods with the need to upgrade censored data. A universal and unique forecasting model does not exist, nor does it adapt to different business situations, but also to different time intervals eather. The credibility of the projection on one system is not a guarantee of credibility for other systems, and the quality of future projections is not conditioned by the quality of previous projections eather.
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REFERENCES

1. (ISO), T. I. (2008). *The International Organization for Standardization (ISO) 9000:2008.*
2. Arnaut, E. (2009). GLOBALIZACIJSKI PROCESI U TURIZMU I UTJECAJ MEGATRENDOVA NA KONKURENTNOST TURISTIČKE INDUSTRIJE BIH. *Tranzicija 11*, 29-41.
3. Blažević, B., & Vuković, T. (2001). MOGUĆNOSTI TURIZMA U RJEŠAVANJU PROBLEMA NEZAPOSLENOSTI. *Tourisam and hospitality managmemant*, 21 - 36.
4. Cooper, W. L., Mellu, T. H.-d., & Kleywegt, A. J. (2006). Models of the Spiral - Down Effect in Revenue Management. *Operations research Vol.54, No.5,* , 965 - 977.

5. Landika, M., & Mikić, Đ. (2015). *Metodi statističke analize - primjena u oblasti zdravstvenih, sportskih i inženjerskih nauka.* Banja Luka: Panevropski univerzitet "Apeiron".
6. Landika, M., & Račić, Ž. (2020). *istraživanje i analiza.* Banja Luka: PEU "Apeiron" Banja Luka.
7. Report, I. (2010, 12 31). *4.7.2016, World Travel Market*. Retrieved from http://www.wtmlondon.com/files/wtm2010_global_trends_reporte1.pdf: http://www.wtmlondon.com
8. Todorović, J., Đuričin, D., & Janošević, S. (2000). *Strategijski menadžment.* Beograd: Institut za tržišna istraživanja.
9. Vermeulen, I. E., & Seegers, D. (2009). Tried and tested: The impact of online hotel reviews on costumer consideration. *Tourisme managment*, 123-127.

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DO COUNTRIES DIMINISH THE NUMBER OF NEW COVID-19 CASES? A TEST USING BENFORD'S LAW AND UNIFORM DISTRIBUTION

Abstract

COVID-19 represents not only public health emergency but affects all aspects of our lives. Countries all over the world are fighting hard against this pandemic. However, there are doubts regarding the reported number of a newly infected people. In this paper Benford's law and uniform distribution are used for detection of false number of reported COVID-19 cases. The analysis when all countries have been observed together showed that there is a potential doubt that countries falsify their data of new cases of infection intentionally. On the other side, the analysis on an individual country level has shown that most countries do not diminish their numbers of new COVID-19 cases deliberately. However, further investigation should be made in this field in order to validate the results of this research. The limitation of the methodology used in this paper is related to he reported number of cases of infection that is actually lower than the real number of infected people. The results obtained from this paper can be important for economic and health policy makers in order to guide COVID-19 *surveillance and implement public* health policy measures.

Keywords: *COVID-19, Benford's law, uniform distribution, detection of false number of infection cases.*

JEL: C12, I10.

1. INTRODUCTION

The spread of COVID-19 disease has affected all aspects of human life. It represents not only public health emergency, but also an economic crisis, Loayza and Pennings (2020). The economic implications of this pandemic are detrimental not only to public health systems but also to trade and travel, food and agriculture industries, oil industry, financial markets and so on, Evans (2020). Countries all over the world are fighting hard against the epidemics. However, there are doubts on the reported number of infected people. In this paper Benford's law and uniform distribution are used for detection of false number of reported COVID-19 cases. Benford's law, or Newcomb-Benford law, has many applications in economics but the most important one is as forensic accounting tool, auditing and fraud detection, Nigrini (2012). This paper follows on Zhang (2020) who tested case numbers of coronavirus disease in China in 2019 using Newcomb-Benford law. In this paper, using Benford's law, Newcomb (1881) and Benford (1938), the distribution of first and last digits in new cases of COVID-19 infection for all countries worldwide will be inspected. In order to detect possible false or fraud numbers of infection cases, chi-square and Kolmogorov-Smirnov Z tests are conducted. It is expected that the distribution of first digits in new cases would follow the Newcomb-Benford law distribution meaning that countries do not falsify or diminish the number of new cases of COVID-19 infection. In addition it is expected that the last digits in new cases of infection would follow the uniform distribution or equal probability of occurrence. Paper is structured in six chapters. After the introduction, short literature review elaborates on the applications of Benford's law in economics. In the methodology and data section descriptive statistics of data are presented and methodology of the paper is explained. In the results and discussion section the main results of the analysis are displayed, both for the first digit and last digit using Benford's law and uniform distribution. Final chapter presents concluding remarks.

2. SHORT LITERATURE REVIEW

Benford's law or Newcomb-Benford law originates in 1881 when Simon Newcomb (Newcomb, 1881) noticed that first pages of logarithmic tables were more worn out implying that there were more numbers beginning with the digit one than expected under the uniform distribution. Almost 60 years Newcomb's work has not been recognized until Frank Benford, unaware of Newcomb's findings, published a paper, Benford (1938), about the law of anomalous numbers which was later named Benford's law or Newcomb-Benford law. The most important application of Benford's law in economics is for forensic accounting and fraud detection, Durtschi et al (2004).

Benfords's law has also been used for campaign fraud detection (Cho and Gaines, 2007), fraudulent scientific data (Diekmann, 2007), governmental statistics inspection (Hindls and Hronová, 2015) or for investigation whether countries falsify economic data strategically (Michalski and Stoltz, 2013). Benford's law has also been used in research of psychological prices oriented on consumer price digits before and after the introduction of the euro in 2002, El Sehity et al (2005). Wagner and Jamsawang (2012) investigated several aspects of psychological pricing using empirical evidence from Austrian retailers. There was also application of Benford's law in psychological pricing detection, Jošić and Žmuk (2018). In order to investigate the application of Benford's law in psychological pricing detection, Benford's law and uniform distribution were observed in the case of first and last digits of UK retail prices. This paper follows on Zhang (2020) who tested the case numbers of coronavirus disease in China in 2019 using Newcomb-Benford law. This author found that p-value of 92.8% for cumulative case number of infection abide by the Newcomb-Benford law. Even though the reported case number could be lower than the real number of affected people, the test does not seems to indicate the detection of frauds.

3. DATA AND METHODOLOGY

In this paper Benford's law and uniform distribution are used for inspection of new cases of COVID-19 disease. To be precise it is inspected whether the distribution of first digits of new daily cases follows the Benford's distribution. A reasonable expectation might be that the COVID-19 case numbers follow the Newcomb-Benford law, as it seems to grow exponentially particularly at the beginning stage, Zhang (2020). It is also assumed that it is very hard to fabricate data closely following the Newcomb-Benford law distribution implying that if the distribution of first digits for new daily cases follows the Benford's distribution there are no frauds or possible diminishing of the new number of daily cases of COVID-19 infection. Also, it is inspected whether the distribution of last digits of new daily cases follows the uniform distribution. If daily data for new cases of COVID-19 infection were not falsified it is expected that this distribution would follow the uniform distribution. According to the uniform distribution each number has a same frequency of occurrence of 10%. In order to conduct analysis, data about the new cases of COVID-19 are taken from the EU Open Data Portal database, EU Open Data Portal (2020). The number of the new cases is observed from the December 31, 2019 to April 23, 2020. However, the days in which were no new cases were omitted from the analysis. The data for overall 206 countries are collected. In the first part of the paper the analysis has been conducted by taking into

account all observed countries together. In the second part, the analyses have been conducted for each country separately. In order to inspect whether the distributions of the first and the last digits follow Benford's law or uniform distribution, chi-square test and Kolmogorov-Smirnov Z test were used.

The chi-square test value was calculated by using following equation:

$$\chi^2 = \sum_{i=1}^{n} \frac{(f_i - e_i)^2}{e_i} \quad (1)$$

where f_i are actual values of the total number of the i-th first or the i-th last digits and e_i are actual values of the total number of the i-th first or the i-th last digits under the assumption that the distribution of the first digits is distributed according to the Benford's distribution or under the assumption that the distribution of the last digits is distributed according to the uniform distribution. Similarly, Kolmogorov-Smirnov Z test was calculated as follows:

$$K - S = \frac{\sqrt{-\frac{1}{2} ln\left(\frac{\alpha}{2}\right)}}{\sqrt{n}} \quad (2)$$

where α is statistical significance level (here 0.05) and n is the total number of daily values. For both statistical tests the null hypothesis contains assumption that the observed daily new cases variable follows the certain distribution (here Benford's or uniform distribution). On the other hand, the alternative hypothesis assumes that the observed data do not follow certain data distribution. Before conducting of the chi-square and Kolmogorov-Smirnov Z tests basic descriptive statistics analysis were done. In Table 1 basic descriptive statistics for new cases and for the first digit and for the last digit of the new cases by taking into account all countries together.

Table 1. Descriptive statistics for new cases and for the first digit and for the last digits of the new cases, all countries together, daily values from December 31, 2019 to April 23, 2020

Statistics	New cases	First digit	Last digit
Sample size	6,787	6,787	6,787
Mean	381.36	3.17	3.95
Standard deviation	1,998.73	2.34	2.76
Coeff. of variation	524%	74%	70%
Skewness	12	0.98	0.35
Kurtosis	176	-0.09	-1.11
Mode	1	1	1
Minimum	1	1	0
1st quartile	4	1	1
Median	19	2	4
3rd quartile	106	5	6
Maximum	37,289	9	9
Range	37,288	8	9
Interquartile range	102	4	5

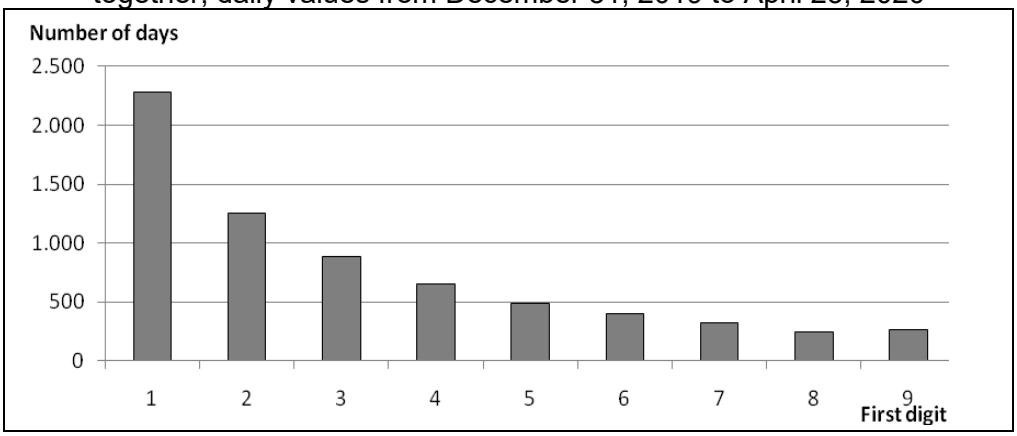
Source: EU Open Data Portal (2020), authors.

According to the Table 1 results overall 6,787 daily data about new cases are observed. On average there were 381 new cases per day with average deviation of huge 1,999 new cases or 524%. The very high variability level is obvious if just minimum and maximum values are compared. From the new cases values their first and last digits are taken and basic descriptive statistics analysis is conducted as well. The results are shown in the last two columns in Table 1 and they are quite similar.

4. RESULTS AND DISCUSSION

In addition to the numeric analysis of the first and the last digits, their distributions are also graphically shown in the Figure 1 (for the first digit) and Figure 2 (for the last digit).

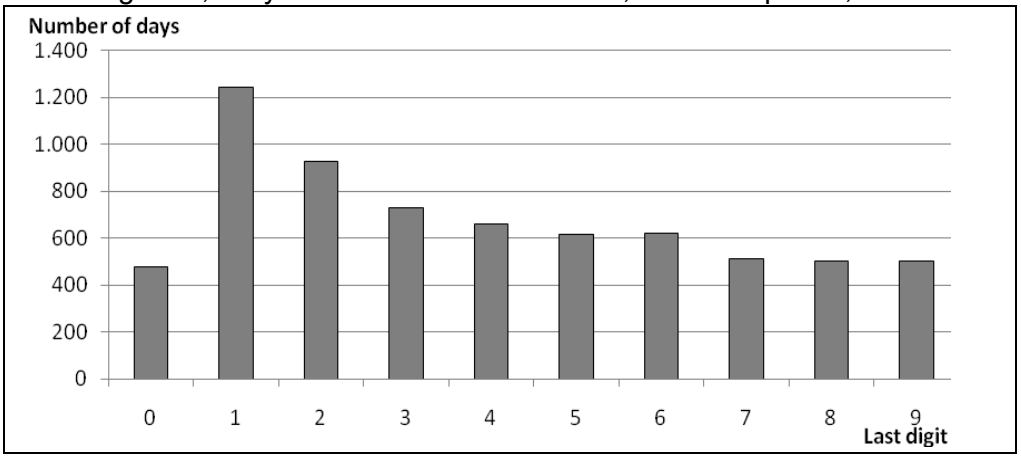
Figure 1. Distribution of the first digits of the new cases, all countries together, daily values from December 31, 2019 to April 23, 2020



Source: EU Open Data Portal (2020), authors.

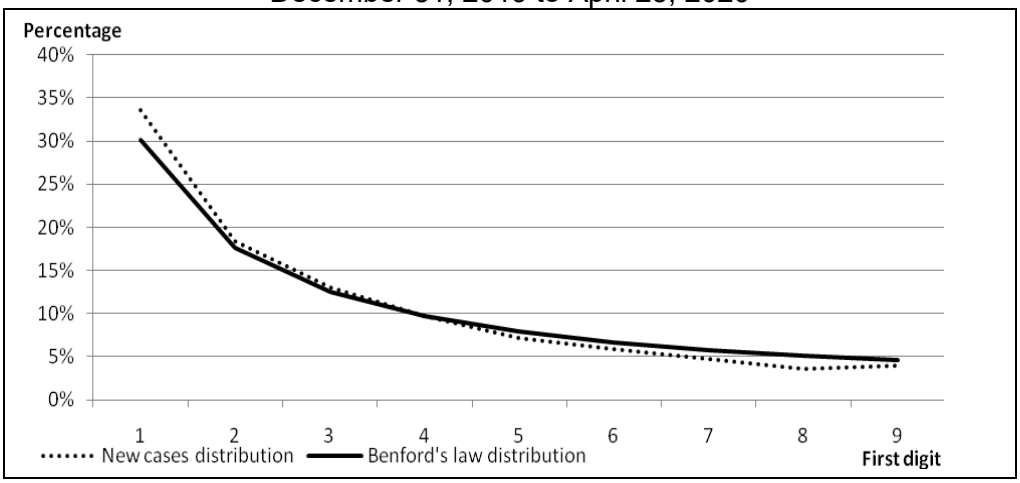
According to the Figure 1, the most common first digit is one. It appeared in 2,279 cases or 33.58% of total cases. On the other hand, the lowest appearance had the number eight, in 244 cases or 3.60% of total appearances.

Figure 2. Distribution of the last digits of the new cases, all countries together, daily values from December 31, 2019 to April 23, 2020



Source: EU Open Data Portal (2020), authors.
Similarly, according to Figure 2 the most common last digit is one (1,242 cases or 18.30% of total cases) and the least common last digit is zero (478 cases or 7.04% of total cases).

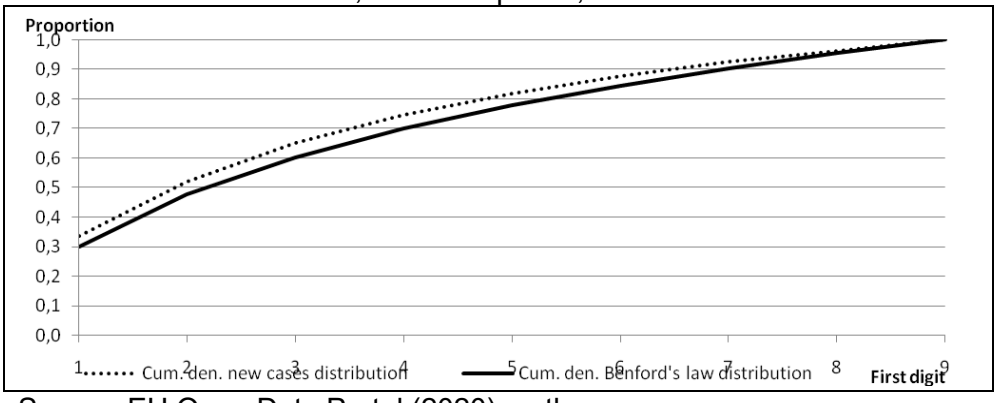
Figure 3. Comparison of the first digit distributions for the new cases and the Benford's law distribution, all countries together, daily values from December 31, 2019 to April 23, 2020



Source: EU Open Data Portal (2020), authors.

According to Figure 3 it seems that the distribution of first digits for new cases follows the Benford's distribution defined by the Benford's law. However, the conducted chi-square test results have shown that this is not the case. According to chi-square test results (empirical chi-square value = 92.196, p-value < 0.0001) the null hypothesis of the chi-square can be rejected at any commonly used statistical significance level. In that way, it can be concluded that the first digit distribution of new cases, when all countries are observed together, is not following the Benford's distribution meaning that countries are possibly falsifying the number of new cases of COVID-19 infection.

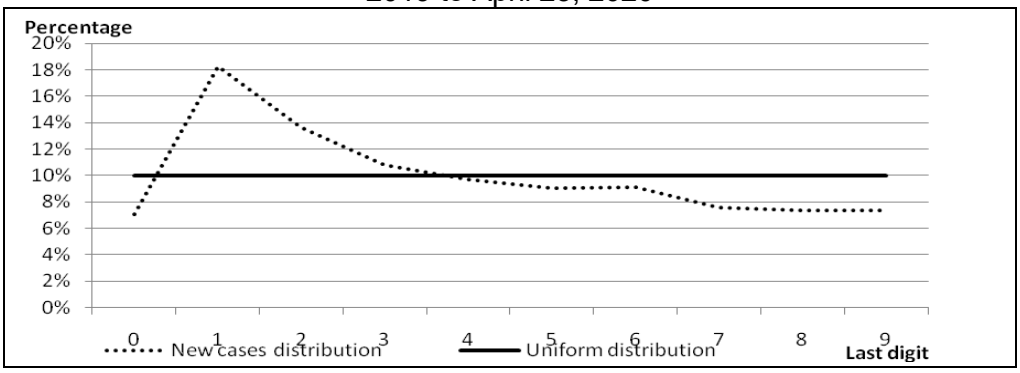
Figure 4. Comparison of the first digit cumulative density distributions of new cases and the Benford's distribution, all countries together, daily values from December 31, 2019 to April 23, 2020



Source: EU Open Data Portal (2020), authors.

In Figure 4 the cumulative density distributions of first digits of new cases and cumulative density distribution for Benford's law are shown. Again, at first, it could be said that the first digit distribution for new cases follows the Benford's distribution. However, the conducted Kolmogorov-Smirnov Z test (empirical test value = 0.0479) indicate that the null hypothesis can be rejected at any commonly used statistically significant level. So, the conclusion is that the first digit distribution of new cases does not follow the Benford's distribution. In Figures 5 and 6 are presented the comparisons between the last digit distributions of new cases and the uniform distribution (Figure 5) and the comparisons between the last digit cumulative density distributions of new cases and the uniform distribution (Figure 6).

Figure 5. Comparison of the last digit distributions of new cases and the uniform distribution, all countries together, daily values from December 31, 2019 to April 23, 2020



Source: EU Open Data Portal (2020), authors.

According to the Figure 5 it is obvious that the last digit distribution of new cases does not follow the uniform distribution. The conducted chi-square test (empirical chi-square value = 767.335, p-value < 0.0001) confirmed that the null hypothesis of the test can be rejected at any usually used statistically significance level.

Figure 6. Comparison of the last digit cumulative density distributions of new cases and the uniform distribution, all countries together, daily values from December 31, 2019 to April 23, 2020

Source: EU Open Data Portal (2020), authors.

Figure 6 and conducted Kolmogorov-Smirnov Z test (empirical test value = 0.0979) led to the same conclusion as Figure 5 and the corresponding chi-square test. The conclusion is that the last digit distribution of new cases does not follow the uniform distribution. It can be concluded that when all countries in the world are observed together, there is a potential doubt that countries falsify their data of new cases of infection intentionally.

The same analysis, as explained here for all countries together, was conducted for each country separately. The aggregated results are shown in Table 2.

Table 2. Number of countries for which the null hypothesis of conducted chi-square and Kolmogorov-Smirnov Z tests are not rejected or are rejected, 206 countries, data are daily values of new cases in the period from December 31, 2019 to April 23, 2020

Continent	Test conclusion at significance level 0.05	Null hypothesis: the distribution of the first digits of new cases is following the Benford's distribution		Null hypothesis: the distribution of the last digits of new cases is following the uniform distribution	
		Chi-square test	Kolmogorov-Smirnov Z test	Chi-square test	Kolmogorov-Smirnov Z test
Overall	Do not reject null hypothesis	167	175	127	146
	Reject null hypothesis	39	31	79	60
Africa	Do not reject null hypothesis	50	47	28	32
	Reject null hypothesis	2	5	24	20
America	Do not reject null hypothesis	40	43	22	34
	Reject null hypothesis	9	6	27	15
Asia	Do not reject null hypothesis	32	34	27	27
	Reject null hypothesis	10	8	15	15
Europe	Do not reject null hypothesis	36	43	46	48
	Reject null hypothesis	18	11	8	6
Oceania	Do not reject null hypothesis	8	7	3	4
	Reject null hypothesis	0	1	5	4
Other	Do not reject null hypothesis	1	1	1	1
	Reject null hypothesis	0	0	0	0

Source: EU Open Data Portal (2020), authors.

When the analysis is lowered to an individual country level, different conclusions can be brought. The chi-square tests have shown that for 167 countries (out of 206) the distribution of the first digits for new cases follows the Benford's distribution meaning that countries does not falsify or diminish data for new cases of COVID-19. The distribution of the last digits of new cases is following uniform distribution for 127 countries leading to the similar conclusion. The Kolmogorov-Smirnov Z tests results are going even more in favour of not rejecting the null hypothesis. The difference between the results achieved in the analyisis for all countries together and on the individual country level can be explained with heterogeneity in data or characteristics of each individual country.

5. CONCLUSION

The conducted Kolmogorov-Smirnov Z test and chi-square test for all countries together confirmed that the distribution of the last digit of new cases does not follow the uniform distribution. On the other side, when the individual countries were observed, the distribution of the last digit for new cases followed the uniform distribution. The results of Kolmogorov-Smirnov Z test and chi-square test point out to the conclusion that the first digit distribution of new cases, when all countries are observed together, is not following the Benford's distribution. When the individual countries were observed, for 167 countries according to Chi-square test and 175 countries according to the Kolmogorov-Smirnov Z test out of 206, the Benford's law for the first digit was obeyed, indicating that countries do not diminish their numbers of new COVID-19 cases deliberately. Additionaly, when the distribution of last digit in new cases of infection is observed, the similar conclusion could be brought.

Limitation of the research is related to uneven number of observed days of infection duration for each of observed country. Also, the reported number of cases is lower than the real number of infected people. The statistical data can be biased due to the lack of medical equipment and resources with many suspected cases remained to be confirmed or some people showing symptoms may not even be counted as suspected cases yet, Zhang (2020). The possible future directions of the research conducted in this paper could go in the way of detailed analysis of individual countries, observing cumulative number of cases or the number of reported deaths, etc. The results obtained from this paper can be important for economic and health policy makers in order to guide COVID-19 surveillance and implement public health policy measures.

REFERENCES

1. Benford, F. (1938). The law of anomalous numbers. *Proceedings of the American Philosophical Society*, 1938, Vol. 78, Issue 4, pp. 551-572.
2. Cho, W. K. T. & Gaines, B. J. (2007). Breaking the (Benford) Law: Statistical Fraud Detection in Campaign Finance. *American Statistician*, 2007, Vol. 61, Issue 3, pp. 218-223, doi: 10.1198/000313007X223496.
3. Diekmann, A. (2007). Not the First Digit! Using Benford's Law to Detect Fraudulent Scientific Data. *Journal of Applied Statistics*, 2007, Vol. 34, Issue 3, pp. 321-329, doi: 10.1080/02664760601004940.
4. Durtschi, C.; Hillison, W. & Pacini, C. (2004). The effective use of Benford's law to assist in detecting fraud in accounting data*. Journal of forensic accounting,* Vol. 5, Issue 3, pp. 17-34.
5. El Sehity, T. J.; Hoelzl, E. & Kirchler, E. (2005). Price Developments after a Nominal Shock: Benford's Law and Psychological Pricing after the Euro Introduction. *International Journal of Research in Marketing (IJRM)*, Vol. 4, Issue 22, pp. 471-480.
6. EU Open Data Portal (2020). COVID-19 Coronavirus data [online]. *Available from*://data.europa.eu/euodp/en/data/dataset/covid-19-coronavirus data/resource/55e8f966-d5c8-438e-85bc-c7a5a26f4863 Accessed: 2020-04-23.
7. Evans O. (2020). Socio-economic impacts of novel coronavirus: The policy solutions. *BizEcons Quarterly*, Vol.7, pp. 3–12.
8. Hindls, R. & Hronová, S. (2015). Benford's Law and Possibilities for Its Use in Governmental Statistics. *Statistika*, Vol. 95, Issue 2, pp. 54-64.
9. Jošić, H. & Žmuk B. (2018). The application of Benford's law in psychological pricing detection. *Zbornik radova Ekonomskog fakulteta Sveučilišta u Mostaru*, Vol. 24, 2018.
10. Loayza, N. V. & Pennings, S. (2020). Macroeconomic Policy in the Time of COVID-19:A Primer for Developing Countries, *Research & Policy Brief From the World Bank Malaysia Hub*, Research & Policy Brief No.28.
11. Michalski, T. & Stoltz, G. (2013). Do countries falsify economic data strategically? Some evidence that they might. *The Review of Economics and Statistics*, 2013, Vol. 95, Issue 2, pp. 591-616.
12. Newcomb, S. (1881). Note on the Frequency of Use of the Different Digits in Natural Numbers. *American Journal of Mathematics*, 1881, Vol. 4, Issue 1, pp. 39-40, doi: 10.2307/2369148.
13. Nigrini, M. J. (2012). Benford's Law: Application for Forencis Accounting. Auditing, and Fraud detection, 2012, John Wiley and Sons.
14. Wagner, U. & Jamsawang, J. (2012). Several Aspects of Psychological Pricing: Empirical Evidence from some Austrian Retailers. In: Rudolph T., Foscht T., Morschett D., Schnedlitz P., Schramm-Klein H., Swoboda B. (eds) *European Retail Research*. European Retail Research. Gabler Verlag, Wiesbaden.
15. Zhang, J. (2020). Testing Case Number of Coronavirus Disease 2019 in China with Newcomb-Benford Law, *Physics and Society*.

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HOW TO ACCELERATE ECONOMIC DEVELOPMENT AND INCREASE ITS COMPETITIVENESS

Abstract

The transition from a state-planned and administrative social and economic system to a democratic society and market economy is long and difficult for all countries, even for those that have not had wars or major financial and other problems. That is why some countries that spent it took more time, and some less, and in all it was a problem to change the awareness of people, individuals and interest groups that acquired or learned criteria and values from the previous system will not be valid in the new one, that democracy is not anarchy. that companies will not be able to survive in the market if they do not operate successfully and if they cannot make a profit from selling their products and services on the market, that the state will not have the obligation or be able to pay salaries as it did in the previous system. they will not be able to earn, etc.

The transition from a non-market to a market economy (transition) is a complex, time-consuming and expensive process, and a market economy cannot be established and exist in a non-democratic society and with state (social) ownership, but with companies that are (mostly) privately owned. it cannot do without the organization of a democratic society, and it is based

on human rights (freedom), private property, free enterprise and more parliamentary democracy. That is why a democratic society and a market economy need to be established and built in BiH as well, they cannot do without each other and these are the basic preconditions for faster economic development and increasing the competitiveness of the economy at the state and local levels in counties.

Keywords: *economic development, opportunities of the local community, stimulating and limiting factors of economic development*

JEL: O1, O52

1. INTRODUCTION

Bosnia and Herzegovina is one of the 47 European countries, of which 28 (27) are members of the EU, three are members of the European Economic Area (EEA), four are members of Schengen (along with 22 EU members) and can be treated as EU members. the same applies to Andorra, Monaco, San Marino and the Vatican. Five countries have candidate status, two have potential candidate status, and three have signed an economic association agreement with the European Union. Practically only two European countries (Belarus and Russia) are not directly involved in the EU.

The process of BiH's accession to the EU began with the submission of membership applications and their acceptance, and according to what has been done so far, not much has been done and BiH is rated as the least advanced country of all other countries that have expressed readiness to join the EU.

Accession is important because it creates the preconditions for prosperous social and economic development much higher than they would have if BiH remained alone-isolated and higher than if it joined another country (Russia, China) or a group of countries, and it is important even if the EU ceased to exist as it is now because European democratic standards would remain (which is also very valuable).

Therefore, accession to the EU should be accelerated as much as possible, encouraging the authorities to meet the conditions for accession as soon as possible, to prepare for adoption and to adopt all legal and other acts necessary for accession. In addition, in cooperation with the Directorate for

EU Integration, develop a plan and program of activities (lectures, seminars, round tables, consultations, promotional activities, etc.) that would encourage accession ("gained votes" for accession) and emphasize the benefits of accession, acquainted with the omissions that could be made (and the damage that could occur) if the EU is not acceded to, if the accession process is prolonged or delayed, and explained the unfounded arguments of those who oppose accession.

Without EU accession, meeting the conditions for joining and adapting the entire social and economic system to systems such as those in EU countries will not make it possible to accelerate economic development, increase the competitiveness of the economy and reduce the development gap with EU countries. This equally applies to the development of the entire state and its individual parts, counties and local communities.

2. SITUATION IN THE ECONOMY OF HN COUNTY

HN County belongs to the group of more developed counties in the FBiH, it needs an even higher level of development and objective opportunities for its economy to be more developed and competitive. From data published in statistical and other publications in 2016/2017. It follows that out of the total number of registered legal entities in the county (12,238), the largest number refers to micro and small enterprises, 6,650 crafts and 2,408 companies. The total number of employees is 48,245, of which 31,330 are employed in economic entities (64.94%), and the largest number of employees is in large companies (41.53%), 22.12% are employed in medium-sized enterprises, and 23 in small enterprises 05% and micro enterprises 13.30%. There are 33,818 unemployed. Compared to the employment situation in 1991, the number of employees decreased by 12,961 (or 78.82% of the number of employees in that year), and out of the total number of employees (61,206), 31,903 worked in industry (in Mostar alone there were 35,306 employees).). Realized gross domestic product (GDP) amounted to 1,888,180,000.00 KM (11% of GDP of the F BiH), ie 8,428.00 KM per year GDP per capita and is lower than in 1991.

3. PROBLEMS IN THE ECONOMY DUE TO CHANGES IN THE ECONOMIC SYSTEM

It is very difficult to compare data on economic development in the existing and the system as it was the previous except in exceptional cases and on some indicators, and what is the difference between these two systems, the former self-governing socialist system and the existing, transitional is

easiest to understand which in the existing system do not work and some, in the previous system very successful, companies that were not destroyed in the war and looted in the privatization process. Most of them would not have been able to operate successfully even if there had been no war because they operated according to administrative rather than market conditions and criteria. Some of the largest in the so-called dedicated industry permanently lost after the war the main, in some cases the only, customer - the army, or the state (companies that worked for military aircraft), and all others could not continue to operate because their products and services were uncompetitive compared to others that have appeared on the market, from imports or domestic private enterprises.

Companies that have exported abroad before were trained for market conditions and had no problem continuing to do so in the new system, and those that did not have it failed. They could not find buyers for what they sold, and the state could no longer give them money for what they produced. The municipalities of Mostar and Konjic, part of the HNC, had a very developed industry for the needs of the JNA with a very large share in total GDP and employment, so after the war they stopped operating, and many others continued to operate with much smaller capacity and number of employees.

In the previous system, the state-planning, administrative or self-governing system of measures and criteria of success was determined by the state, not the market. Companies sold their products and services at prices set by the state, salaries were paid to employees equally when their companies operated successfully and when they did not, and financial resources were provided by the state, by borrowing (at home and abroad) and printing money (inflation).
Differences in economies are due to differences in political and social systems. The previous system, socialist and self-governing society, was based on a one-party system, state (social) ownership and state-planning, administrative regulation of the economy, and a democratic society and market economy, as sought to be built, is based on private ownership, free enterprise, multi-parliamentary democracy and civil rights.

The transition from one state to another is called transitional, it can be described as a system in which there is no socialism or state-planned economy, and a democratic society and market economy have not yet been built, neither socialist nor market. Companies operate under new regulations, which were not valid in the previous system, will not be valid in the new market as advocated, as in European and other developed countries, and according to how their application is manifested in practice "are more capitalist and exploitative" 'of those recorded in the earliest

stages of industrialization and capitalism, are to the detriment of employees, the state, or society, natural resources, sustainable development and the environment. It is a period in which individuals and groups usually profit and everyone else loses. Most of the countries of the former socialist bloc have gone through it, some before and more successfully, several of them are still in that phase, more than 20 years, and among them is BiH, including the FBiH and HNC.

4. STATE AND PROBLEMS OF THE ECONOMY IN THE TRANSITION PERIOD

At the end of 2014, 258 state-owned companies and institutions, 2,665 private companies and agencies, and 3,766 independent taxpayers (independent craft, trade and catering shops, independent carriers) operated in the existing structure of economic entities in the HNŽ area.
Among the 258 state-owned enterprises are formerly socially owned enterprises with a very large share of GDP and employment, and among these enterprises are two different groups of enterprises that directly and indirectly slow down the transition process and hinder the introduction of a new system, democratic society and market economy. is in EU countries.

One group of enterprises consists of public enterprises and will remain so (or most of them) even after the transition, but will be restructured and trained to perform activities of common public interest according to socially acceptable criteria and performance criteria, as companies in countries with developed democratic society and market economy.

In almost all public companies and with the approval of the relevant authorities, work is irrational, with more employees and costs higher than objectively necessary, which results in higher prices for services paid by citizens and the economy, and this directly affects the competitiveness of domestic operators. and in the foreign market, more competitive are companies from abroad that pay lower prices of services to public companies in their countries.

The administrative bodies in these companies manage state (public) assets and funds, not their own as in private companies and have no material responsibility if their business results are bad, they cover losses with higher prices of services provided and approved by the authorities, and paid by citizens and companies. They report to the governing boards (supervisory boards) appointed by the competent authorities. In the worst case, they can be fired, sometimes with large severance pay ("golden parachutes"), and they will be replaced by people who value eligibility more than ability, and

they are replaced (mostly) with a change of government regardless of the results. of their work. It cannot be claimed that they work more for the party than the public interest, and they can work for the public as dictated to them by party officials in government bodies. Compared to the same companies in developed countries, they are equal only in the services they provide and nothing more. Authorities should adopt regulations that do not allow this and that such conduct would be unlawful and result in appropriate sanctions.

The second group of state-owned enterprises among the 258 enterprises, apart from public ones, are those that have not been privatized in the privatization process so far, and the reasons for not doing so are the same as in public enterprises. It is not a (formally) negligible reason that privatization was postponed due to social reasons, so that a large number of employees in these companies would not lose their jobs and sources of income, and the problem is that such behavior causes irreparable damage to current and long-term market economy processes.

State-owned enterprises are in a better position than private ones, legislation is more on their side, they have a more favorable position than private ones in terms of inspections, violations, payments to the state and mandatory funds (health and pension insurance and others) and greater influence on new regulations from private.

Private companies are discriminated against against them because the authorities do not give them money to cover losses like these, non-privatized companies. The money to cover the losses of these companies is provided by the authorities from their budgets and from the realized profits of public companies resulting from the high prices of their services, and the money in the budget and prices of public companies is paid by citizens (and employees) in private companies and private companies. owners.

Thus, the owners of private companies are discriminated against, which discourages them from greater investments and more engagements, which directly affects the lower level of economic development, and employees in their companies are also discriminated against. In many cases) they do not have Christmas, Easter or other incomes as in public and non-privatized companies and when their companies operate successfully, but they do not have salaries and are fired when they operate at a loss, which is not the case with employees in non-privatized companies.

A special problem is that administrative bodies in non-privatized, as well as in public, companies have no personal responsibility for business, except

moral. They are elected, appointed or appointed by the authorities and are accountable only to them, and their personal success and career depend more on their loyalty to the authorities than on the success of their business according to economic and market criteria.

The biggest problems are that this situation has not changed for more than 20 years, that the assets in these companies have not increased but decreased, that the reasons for postponing privatization are "justified" by creating conditions for eliminating irregularities (and robberies) that occurred in some previous cases and examples (it is not known how much privatization was annulled and that some responsible for irregularities were sanctioned), that privatization, ie sale of some companies is considered only to cover budget deficits or some other reasons, it is possible to favor some interested partners and for personal or party gain, and not for a fundamental reason, that non-privatized companies have no future and cannot survive in a market economy in which private companies should play a dominant role, and there should be public and only in some cases some state-owned companies as they exist. and in European and other countries with developed market economies.

Without the privatization of non-privatized companies and the restructuring of public ones, a desirable and appropriate market economy cannot be built, the transition period in which the assets of these companies can be further reduced and ultimately become worthless, budget funds instead of being used for other purposes and stimulating economic development will be set aside to cover their losses, public companies will be denied investment in their capacity with the amount they will set aside to cover losses in these companies, all of which will directly affect the slowdown in economic development and reduce the competitiveness of the county's economy.

4.1. Expensive and inefficient administration slows down economic development

Equally negative for the economic development and competitiveness of the economy can be inefficient administration in state and public authorities, administration, institutions, education, health and all other segments of work and activities that are financed and for which funds need to be provided.

It is not difficult to find a justification for the need to allocate funds to finance war victims, to help the socially vulnerable, unemployed, retirees, for higher salaries in administration, health and education, military, police and other

activities, to build and equip necessary facilities, for monuments , religious, sports, recreational and other facilities.

It is a serious and big problem to harmonize all these needs with the real possibilities of their financing in a way that they are as possible and as possible satisfied and that the total allocations for these needs are not disincentive for employers in private companies, so that their allocations opportunity to make a profit, which could cause them to stop doing business and for employees so that their salaries are not overburdened so that they do not have a stimulating effect on greater work and commitment.

Objectively, there are not great opportunities to reduce the overall needs, but there are more rational use of available funds, for setting priorities and financing those that are deemed necessary and should be financed. In doing so, it would be advisable to break with the existing practice and the bad legacy of socialism and apply the experiences and practices from EU countries regarding the reduction of public administration and administration costs.
In their budgets, there are almost no costs for official vehicles and their maintenance, or they are negligible, because civil servants and employees use taxi services. Thus, their costs are much lower, and they apply this practice of "outsourcing" to other, "non-core" activities. By doing so, they have less need for financial resources and can reduce the burden on the economy, which directly increases competitiveness, encourages entrepreneurs to invest and create new jobs.

The purpose and philosophy of state management in the EU and other developed countries is to make the administration as efficient and "cheaper" as possible, to cost taxpayers less, to make their businessmen less burdened. tax and other rates, to stimulate them to invest in business, business, and when they do, then they need labor and employ it. With higher levels of employment and lower burden rates (tax and other) employees can raise planned budgets and have less need for funds to pay unemployment benefits, and such practices and behaviors apply equally to all items in budget.

The entire social and economic system of EU and other developed countries aimed at encouraging businessmen to invest in business, monetary policy affects lower interest rates for savings, which discourages savings in banks and encourages money owners to invest in securities of companies that have the opportunity obtain money for business investments free of charge (if they buy shares) or with a pre-agreed interest rate (if they buy bonds), or with lower interest rates if they take loans from banks (because banks also pay low interest rates on savings). All this is

possible if there are legal regulations and all other prerequisites, if financial markets, capital and securities function and if all other mechanisms are built that provide the necessary security to all participants in business activities, investors, investors, banks, entrepreneurs and everyone else, if the relations between employers and employees and between employers and the state are regulated.

This way they can benefit, employers because they will be able to achieve the planned goals for which they undertake business activities, employees because they will have secure jobs and salaries from which they will be able to live decently, investors because by investing in securities, stocks and bonds they will be able to earn more (from dividends and interest) than if the money were kept in banks, the state would have a developed economy and full employment, which would allow with low rates of burden on taxpayers, citizens and companies, fill budgets and direct funds to security, health and social care, education , science, infrastructure, energy facilities and other purposes that will further stimulate economic development and improve the quality of life.

Such a system cannot be redrawn, copied, built and implemented in the short term in our BH reality, but we should start building it on these principles and build it as soon as possible. It is not ideal and has many shortcomings, and there is no better and more democratic one in the world. Therefore, there are unemployed in these countries, but no social unrest, employees would like to have higher wages and rights, but no strikes (except in some state-owned companies), there are crises but they are overcome easier and faster, there is no absolute social security and welfare, but nor countries in which it is better regulated, such as. in Scandinavian countries, etc.

5. OPPORTUNITIES FOR GREATER ADMINISTRATION EFFICIENCY AND COMPETITIVENESS OF THE ECONOMY

It is not incomprehensible that the needs for budget funds are objectively high and that due to the low level of the economy and employment the burden rates must be higher, the problem is that a lot of money is spent on financing the administration, and even greater because the burden on the economy is higher than in other countries. and what this directly affects low competitiveness.
In EU countries, budget revenues are based (more than 80%) on consumption and income, and to a lesser extent on capital and assets, which means that most budget funds are collected from VAT, profit tax and income tax. In Croatia, with higher incomes, 61% of gross income goes to

the state, and only 39% to workers. The situation is slightly better with lower incomes, but the tax burden is still much higher than in the surrounding countries.

Budget funds in BiH are also collected from these taxes, and in addition there are so-called parafiscal levies (allegedly there are more than 200, and at the level of F BiH 68) which is why the burden on employers is highest in the region and among the highest in Europe. It amounts to 72.2%, which means that for each paid stamp for salary, the state must pay 0.722 KM, or 0.90 KM with all parafiscal levies (not the same in all counties and municipalities).

Excessive and inefficient administration, non-restructured public and non-privatized companies do not help solve the problem, currently only benefit employees and politicians, harm everyone and overall development in the long run because it can not reduce the burden on the economy, relieve it and increase its competitiveness. , unfavorable business climate and environment, discourages domestic and foreign investors, hinders the development of both economies and societies. In this way, the transition process is slowed down and the introduction and construction of a market economy as it is in the EU countries is delayed, without which there is no progress.

It is not difficult to find reasons why it is trying to keep the existing ones and to whom it suits, as well as "justifications" that some problems cannot be solved faster and more efficiently, but it is difficult to understand that after more than 20 years the privatization of companies to be privatized and the restructuring of public enterprises, that since the multi-year commitment to join the EU, very little has been done since 2005 to prepare, draft and adopt legislation and other acts and to adapt norms and standards, including market ones, to those in the Member States, and without that the conditions for membership will not be fulfilled. Judging by this, it could be concluded that some influential authorities do not care about EU membership or do not understand, do not know or do not understand how important it is for prosperous social and economic development and that this is the only right way and way to address backwardness.

HNC has all the necessary resources and capacity for accelerated social and economic development, to create much greater competitive advantages, and should have a little more courage to use knowledge as the largest and inexhaustible source of these advantages. Using this resource will not be difficult to determine what can and should be done at the county level to solve these problems, those for which it is directly responsible - they should be solved and those for which other levels of government are

responsible - they should be encouraged to do so. It will also depend on when and to what extent the competitiveness of the economy will increase and the problems of social and economic development will be solved.

These problems cannot be solved by the county itself without the involvement of the entire community and all authorities at all levels, but it could and should do within its capabilities what it can and what is within its competence. Increase the efficiency of performing the functions and activities it deals with, make more rational use of available budget funds and direct them to meet more priority needs, for greater investments in more important or priority needs and be more at the service of entrepreneurs as soon as possible) can obtain the necessary documentation to start a business, be more competitive and encourage other levels of government to do the same, complete the transition process as soon as possible and build a democratic society and market economy such as in EU countries.

Economic development is not possible without investments, without investing money in business, and domestic and foreign investors will not invest it if they are not convinced that, with acceptable risk, they will not be able to return the invested money and earn more than they would receive interest if they had that money in savings. in banks and if they will not be able to achieve other goals. They, investors do not need to be explained how they can make money and achieve other goals because they know it better than those who would try to explain it to them, they need to create conditions and assumptions for them to come to that conclusion and see for themselves. can only competent authorities, state, county and municipal.

For them, the authorities, this should be the main task because the economy is the only source of budget money to finance all needs, to repay loans if they have them and to encourage the economy, entrepreneurs, those who invest their money in modernizing existing plants and building new ones. retaining the existing number of employees and creating new jobs.

6. CONCLUSION

County, and all others, development plans and strategies are of interest to entrepreneurs only in the parts that refer to "good conditions, assumptions or climate for investments" and to the incentives that are foreseen, how much they can get and for which programs and activities. They will compare them with the conditions and opportunities provided by other

municipalities, counties or states and decide whether it pays to invest at all or not and in which environments they will invest.

County budgets should provide the maximum possible amount of funds for science and scientific research so that the results of these researches can be used in economic practice, so that businessmen can have direct knowledge about new materials, technologies, processes and products, new market needs and other knowledge without of which it is inconceivable to achieve adequate competitiveness, and especially it is not possible to have competitive advantages over others. Knowledge is the biggest source of competitive advantages, and with the acquired knowledge it is not possible to achieve an advantage over the one from when it was purchased, and it is with one's own.

To do this, we need to have outstanding scientists and teams with more individuals specialized in certain areas who will be able to solve scientific and challenges facing the economy and business people, and such should be specialized and educated. A multidisciplinary approach to education as advocated in some circles can achieve good results, but not the top that can be achieved by specialists, experts in their profession and if they work together in a team, with several individual experts and specialists from different fields.

Authorities cannot make the economy developed and competitive, it is neither their obligation nor their task, but they can and should create conditions and assumptions that businessmen will recognize and know how to use if they exist, and the authorities should help and encourage them by persuading concrete measures, means and activities.

REFERENCES

1. Kandžija Vinko, Igor Cvečić: "Ekonomska politika Europske unije," Ekonomski fakltet sveučilišta u Rijeci, 2010.
2. Kandžija Vinko: "The paradigm of new transition" Association for European Community Studies in BiH, Mostar, 2019.
3. Ljubić, F.: Strategije gospodarskog razvitka, Sveučilipšte u Mostaru i Dubrovniku, Fram, Ziral Mostar 2005.
4. Ljubić F: Zašto je važno članstvo u EU i kako ubrzati proces pristupanja, Zbornik radova sa znanstveno-stručnog skupa "Hrvati BiH – nositelji europskih vrijednosti, Drugo dopunjeno izdanje str.323-337., Grafotisak Grude, 2017.

5. Europska komisija, Ured za suradnju EuropeAid. (2017). Smjernice za upravljanje projektnim ciklusom: Podrška učinkovitoj provedbi vanjske pomoći EK, Brussels.
6. Strategija razvitka HNŽ, Mostar 2017.
7. Statistički bilten, Sarajevo 1986.
8. Statistički Godišnjak Republike BiH, Sarajevo 1992.
9. Statistički bilten SIZ za zapošljavanje Mostar (31.12.1980).
10. http://www.hercegbosna.org/vijesti/gospodarstvo/opterecenje-poslodavaca-u-bih-najvece-u-regiji-20369.html
11. https://lider.media/aktualno/tvrtke-i-trzista/poslovna-scena/porezna-nesigurnost-u hrvatskoj veca-je-nego-u-drugim-zemljama-europe/

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CAN THE PROCESS OF BIH'S ACCESSION TO THE EU BE SPEED UP?

Abstract

With the submission of the application for membership and its acceptance, the process of BiH's accession to the EU has begun, and when it will end depends on many factors and circumstances, stimulating and aggravating, external and mostly internal. In the past three years, little has been done to meet the conditions for the start of accession negotiations, which suggests that there are influential groups who do not care about BiH becoming a member of the EU, who oppose accession and will try to prevent or prolong it. If it wants prosperous social and economic development, BiH cannot remain alone and isolated, it does not suit it, and it can connect with the EU, Muslim countries or Russia. None of them will give her anything. Neither the EU is an ideal "paradise on earth", it is fraught with many problems and inconsistent positions among member states on security, terrorism, the refugee crisis, sustainable development, climate change, environmental protection and others, and offers incomparably greater economic and other opportunities, higher democratic standards, human rights, national, ethical and religious and others. Citizens will decide on

joining the EU, and their decisions will be based on personal reasons and motives. Whether emotional or rational criteria will prevail in decision-making will depend on many factors, most notably information and knowledge, facts and personal belief. By effectively promoting and informing about the opportunities offered by EU accession, it is possible to eliminate the influence of groups opposing accession and speed up the accession process.

Keywords: *EU, accession process, emotional and rational criteria, European values*

JEL: O52

1. INTRODUCTION

In the current practice of EU membership, all countries had to meet the conditions for accession, only Bulgaria and Romania were admitted before they met and because of that, both those countries and EU members had certain problems, so such a model is almost no longer discussed. Croatia is the last country to be admitted to membership and should have met more conditions than any other country before it, and it is likely that all other countries, future members, will need to meet them even more. This means that BiH, if it wants to become a member of the EU, will have to meet all these conditions and that no other scenario should be hoped for (Romania and Bulgaria), except in exceptional cases if the EU member states decide.

As such a scenario is unlikely to expect, BiH has no choice but to meet the conditions for accession, and judging by the way it has behaved in meeting these conditions in the past twenty years, it could not be concluded that it is in a hurry and cares about EU membership.

2. FROM THE BEGINNING OF COOPERATION BIH WITH EU

Formal cooperation between BiH and the EU began in 1997, when the EU Council of Ministers set the political and economic conditions for the development of bilateral relations and enabled the use of autonomous trade preferences.

The EU / BiH CTF Consultative Working Group was established in 1988 to provide technical and technical assistance in the areas of administration, regulatory framework and policy, and in 1999 the SAP Stabilization and Association Process began, offering BiH (and five other countries) integration into the EU.

In 2000, autonomous trade measures (ATM) were introduced, which facilitated access to the EU market for BiH products by asymmetric trade liberalization (abolition of customs duties and quotas on exports of products to the EU), and the EU Road Map was published, defining 18 key conditions to be met in order to start the preparation of the Feasibility Study for the start of negotiations on the Stabilization and Association Agreement (SAA) and the approved EU technical assistance program "CARDS" for reconstruction, development and stabilization of BiH.

In 2002, the European Commission (EC) announced that the guidelines of the Convergence Roadmap had been largely met, and in 2003 work began on a Feasibility Study. The EC handed over a questionnaire to the Council of Ministers of BiH with 346 questions on economic and political regulation, and other areas important for concluding the Stabilization and Association Agreement, adopted an assessment of the Feasibility Study and identified 16 priority areas for BiH to open Stabilization and Association negotiations.

In 2004, the EU Council adopted the document "European Partnership with BiH" which sets out key, short-term and medium-term priorities in the process of BiH's accession to the EU, and in November 2005 negotiations on a Stabilization and Association Agreement began.

In 2006, the first plenary round of SAA negotiations was held, and the First Plenary Meeting of the Reform Process Monitoring (RPM), which replaced the previous Consultative Working Body, and the Council of the European Union adopted the second European Partnership with BiH. The EC's IPA assistance program, which finances pre-accession activities, was approved, technical negotiations on the Agreement were completed and the Stabilization and Association Agreement was initialed.

In 2008, the Council of Europe adopted the Third European Partnership with BiH, the Framework Agreement on Cooperation Rules for Financial Support under the IPA Program, the Roadmap for Visa Liberalization, the

Stabilization and Association Agreement signed, and the Interim Agreement on Trade and Trade Issues entered into force. and the first meeting of the Interim Stabilization and Association Committee was held.

In 2009, BiH began issuing biometric passports, the most important condition for visa liberalization, and in 2010 the visa was abolished (December 15), giving BiH citizens the opportunity to travel freely to EU countries that are signatories to the Schengen Agreement.
In November 2011, the first meeting of the Structured Dialogue on Justice between the EU and BiH was held, and in 2013 a meeting on the accession process at which the Roadmap for BiH's application for EU membership was handed over.

In 2014, a new EU IPA assistance program (IPA II), for the period 2014-2020, the Berlin Process and the presented "German-British Initiative for BiH", and in 2015 the Stabilization and Association Agreement between BiH and EU, the first session of the Stabilization and Association Parliamentary Committee was held (in Sarajevo) and the first meetings of the Stabilization and Association Council and the Stabilization and Association Committee (in Brussels).

In 2016, BiH submitted an official application for EU membership, the EC initialed the Protocol on the Adaptation of the Stabilization and Association Agreement (SAA), the BiH Council of Ministers adopted a Decision on the system of coordination of the accession process, joint bodies, their composition, competencies and mutual relations. The EU Council invited the EC to prepare an opinion on BiH's application for EU membership and gave an order to the European Commission to prepare a questionnaire and that questionnaire was delivered to BiH.

In 2017, BiH prepared answers to the Questionnaire of the European Commission and submitted answers in 2018, 2019. The EC adopted the Opinion on the request of BiH and requested answers to additional questions and received answers to them.

What are the problems in the process of BiH's accession to the EU

In the accession process so far, Croatia is among the members whose process lasted the longest, almost 10.5 years since the application for

membership. BiH also received the status of a potential candidate in 2003 (as did Croatia), it took a full five years to sign the Stabilization and Association Agreement (SAA) (2008) and another seven years for the agreement to enter into force (2015). Since 2016, when she applied for membership, submitted questionnaires (2018 and 2019) and received a positive opinion (2019), she has not yet met the conditions for the start of accession negotiations and it is not known when these negotiations will begin at all.

This situation is not and cannot be good for social and economic development or for citizens.

2.1. BiH does not have more suitable option than the EU

BiH cannot be left alone, isolated, it is not in her interest, even much larger and more developed countries of the world such as the USA, China, Russia and others cannot. That is why we need to join the EU. It is one of the 47 European countries, of which 28 (27) are members of the EU, three are members of the European Economic Area (EEA), four are members of Schengen (along with 22 EU members) almost like EU members, including Andorra, Monaco, San Marino and the Vatican. Five countries have candidate status, two have potential candidate status, and three have signed an economic association agreement with the European Union. Practically only Belarus and Russia are not directly involved in the EU.

From a theoretical point of view, BiH could, in addition to the EU, ally itself with Muslim countries or Russia. Cooperation with Muslim countries should not be in question, but those countries do not have an organization that can be compared to the EU. As early as 1969, they founded the Organization of the Islamic Conference (OIC) as a "collective voice of the Muslim world" which, among other things, was supposed to strengthen economic cooperation among member states.

Possible links with Russia include relations with Belarus and the Eurasian Economic Union (SCO), with which the signatory countries intend to "parry" the EU, the US and Japan. The provisions of the agreement on that union are not known, and it can be assumed that they imply direct ties between these large countries with which, negligibly small (in economic terms), BiH

would not be able to win a better negotiating position than it could have in the EU.

Therefore, from the point of view of rational and economic motives, it is difficult to find reasons why BiH would be more suitable to join Russia than the EU, which is much more developed and in which the least developed country (Bulgaria) has almost the same social product ($ 20,116) per capita as Russia. $ 26,105), and democratic norms and standards, human rights, and other democratic values are incomparably on the side of the EU, even for national, ethical, and religious ones.

That is why it is better and more acceptable for BiH to choose the EU than Muslim countries or Russia, because neither of these two other options offers nearly as good opportunities as the EU.

The EU is not an ideal "paradise on earth", it is fraught with many problems and inconsistent positions among member states on security, terrorism, the refugee crisis, sustainable development, climate change, environmental protection and others.

It is difficult to agree on these issues at the national level, between the governing structures and the opposition, and in the EU bodies, among the representatives of the 27 countries, it is even more difficult. Each member has its own specifics and although they advocate the same standards and values, they differ a lot in terms of the level of economic development achieved and other criteria.
The highest social product per capita is in Luxembourg ($ 101,994), and the lowest in Bulgaria, unemployment is the lowest in Germany (4.3% total and 7.2% for under-25s), and the highest in Greece (23.5%, and 46.2% for those under 25), the most indebted country is Greece (179.2% of GDP) and the least Bulgaria (29.4% of GDP).

No economic group, not even the EU, will give or give anything to Bosnia and Herzegovina except the opportunities that are provided equally to all members, and whether or not these opportunities will be used depends on the knowledge and skills of those who work on these issues.

2.2. Who in BiH is not for joining the EU and why

Although research by the Directorate for European Integration shows that, in the event of a referendum on EU membership, 76% of BiH citizens would vote positively (91% of respondents from the FBiH and about 51% of respondents from the RS) should be taken with caution and a number of groups opposing EU accession for various reasons. Some do so for ethnic and religious reasons, others who think they might lose a privileged position and positions, some who think and wish to return to the old system, socialist utopians, ambitious politicians and Eurosceptics.

Employees who are unsure that they will be able to keep their jobs after privatization in non-privatized companies and after the restructuring of public companies could also be against joining the EU and have reason to be worried because this could happen to them, to a greater or lesser extent. Employees in these companies are now, although with low wages and other problems, still in a more favorable position than many others who do not work and have no chance of employment. Therefore, anyone who thinks they may lose their job is likely to be against joining the EU unless they are offered valid reasons to believe that joining them, or their children, can provide them with jobs, benefits and greater opportunities within a reasonable time.

The most influential in the EU accession process are politicians, government officials, party leaders and those who intend to take their places, from the opposition. There are several groups with different views on EU accession. Among those who advocate accession, and who have submitted an official application, there are those who are genuinely committed to it, believe it is the right and best way, and there are those who are in favor of accession for formal reasons, they think it can benefit them, that they can thus gain the trust of their voters, are not enthusiastic about the idea of accession and could easily change their views in the period of accession.

There are probably also those in the group of politicians who are not in favor of accession for personal reasons, which is not in line with European regulations because they could not work and act as they do now or could be held accountable for acts for which they are not accountable now.

Given that the main positions of the current government are for EU accession, opposition politicians will try to gain the trust (and votes) of all those who oppose accession, and they will be supported by uncoordinated positions among officials and parties in power that have voted to join.
In any case, they will all plan, and seek to win, the votes of those dissatisfied with EU accession, and a serious problem could arise if these groups are more numerous and louder than those advocating accession. They should not be trusted until they show and prove that there are other better options than joining the EU.

Socialist-utopians oppose joining the EU because they cannot adapt to the new circumstances, the new system, the capitalist (as they call it), which is not like the one they lived in before. They do not want to accept the new system, and they find "evidence" against it (and the EU) in omissions and abuses in the privatization process, the behavior of new business owners, their greed for wealth, poor legislation, inefficient and corrupt administration and judiciary, and others. negativities.

Transitional problems and difficulties in building a new social and economic system are characteristic of all former socialist countries, are more pronounced in BiH than in some others, and are manifested by a high percentage of "return to the old" and in the country where the process ended. in the short term, with the least consequences and the most effective.

From the point of view of such they have reason to regret the system in which they previously lived, they could, if they were loyal, count on employment, permanent employment until retirement, that they will be able to solve housing issues, get an apartment or a favorable housing loan, have a secure income and health care, free education and study, there were no major differences in wealth, all were equal in poverty and destitution, etc. It goes without saying that all this would be desirable (except poverty), and it will not be possible to achieve by returning to the old (communist, socialist or self-governing) system that proved impossible and unsustainable (utopia), and social peace and security should be achieved in the new system and in the way it is done in the developed democracies of the world, Scandinavia, and some others.

The new system is based on other assumptions, a multi-party parliamentary democracy and a market economy in which there will be no one-party authorities in state administration and administration or state (or social) enterprises in the economy as they existed in the previous system.

In the new system as it is conceived, employers will not give (share) apartments to their employees, nor will the state pay them salaries and allowances when their companies are not able to do so, but they will be able to earn money when the system is built. provide for themselves, and the state will be able to provide them with social security as it can in developed countries.

The group of Eurosceptics does not believe in the EU project, they think that it is not good, that it is unsustainable, that BiH cannot expect anything good from accession, that it can hand over (sell) natural resources, that the entry price is high, that identity can be lost, etc.
Evidence of this is the disagreement among member states on important issues such as the transfer of sovereignty and authority to joint bodies on defense, monetary, borrowing, employment and other issues.
This only confirms that there are inconsistent views among these countries on how these problems should be addressed because each country decides independently, and joint decisions require consensus and are difficult to reach, there is no majority vote.

Evidence against the EU is taken by countries in which crises are escalating, such as Greece (over-indebtedness), Spain (unemployment), problems of low economic growth rates (in most countries), problems of excessive consumption (in many EU countries), etc. as if the crises in those countries were the result of their EU membership, not the weaknesses of economic and other policies in those countries.

The EU has not indebted any of the over-indebted countries, and none of the mentioned countries pays more funds into the EU budget than withdraws them, they are not "net donors" but "net recipients". Their problems are the result of wrong decisions by their authorities, not why they are members of the EU.

The fact that countries with pronounced problems are dissatisfied with the amount of funds granted to them in the form of EU assistance can be

equally objected to by themselves and others because everyone decides equally (by consensus) on these issues, how much to pay into the common Fund. how much and when to pay and under what conditions, and Eurosceptics should know that there is no union, association or association of countries in the world that is comparable to the EU in these matters either.

An important "trump card" against the EU is the exit of England ("Brexit") which "proves" its impotence, weakness ("if it were good, would England come out of it"), the beginning of its end ("doom") and the announcement (their expectations) that some other countries will follow it, and these same (and by no means good and desirable) circumstances can be interpreted in another way. England decided to leave, it is not known how it will leave the EU and when it will be, and it did so for internal reasons (elections) and failed attempts to secure or obtain (retain) a more favorable status compared to other EU member states.

Its exit is a big loss for the EU as well and could change the EU, especially if other countries follow suit, which is unlikely. With Brexit, England will only do harm, not benefit, and the EU can survive and function without it, even be more effective.

The EU will not disappear, it will cease to exist also because it is an interesting community of economic and political cooperation of member states that have, inherit and share common values, the highest democratic standards for human, national, religious and all other rights.
All member states are for their own interests, and experience so far shows that all have benefited from membership. None of them became less developed, less rich than they were before entering, but on the contrary, they became more developed and richer.

There are dissatisfied individuals and groups in all EU countries, and they are used by the opposition and politicians who want to come to power, so in their election campaigns they announce that they will change the situation that does not suit them or raise the issue of a referendum on leaving.

In countries that invest in the EU budget more than they withdraw from it (net donors), they announce that they will not pay that much if they come to

power, and in net recipient countries that they will ask for even more money from the EU.

The EU cannot jeopardize anything as long as it is based on voluntary cooperation between member states, and the best answers to current issues and problems, terrorism, refugee crisis, unemployment, sustainable development, economic growth, social security, environmental protection, improving the quality of life need to be found. etc. It could only be threatened by its democracy if, under the pretext of democratic norms and principles, it allowed its opponents to destroy it in a democratic way, as Socrates had suggested almost two and a half thousand years ago.

People should always be helped no matter who they are and what they are like, where they come from and why they are in trouble, they should be provided with adequate accommodation and stay in safe places, but also in a way that will not endanger security and social system in countries. they receive, that among those who need help cannot come terrorists, the unfortunates whom someone pays and instructs them to destroy themselves, refugees and those who want to help them, a system from which refugees seek help and in which they feel safe.

The EU does not respond to large economic powers either, because they could negotiate with individual countries more easily and with less difficulty than with the EU, they would have greater bargaining power, the position of "big buyer" or "big supplier" and they could negotiate with certain countries. conditions to conclude contracts, do business and trade than with the EU.

3. CAN THE PROCESS OF BIH'S ACCESSION TO THE EU BE ACCELERATED AND IN WHAT WAY

Accession to the EU is a process of preparation and negotiation that cannot be carried out in a very short period of time, even if it is carried out under a special procedure and an accelerated procedure, and can take a very long time if obstructions occur in that process. Therefore, it is important through promotional activities (lectures, seminars, round tables, consultations, etc.) to inform citizens about the opportunities offered by EU membership and emphasize the benefits of accession, learn about the futility of the current situation, stay outside the EU, explain the unfounded arguments of those

opposing accession. and omissions whose long-term consequences could arise in the future by postponing accession or abandoning it, if those who oppose accession "win".

Activities for the start of accession and the opening of negotiation chapters should be accelerated as much as possible, and negotiations may take more or less time, which will mostly depend on the readiness of authorities and their determination to adopt laws and other acts introducing European norms and standards. work could (and should) already begin on their preparation, proposal and adoption in the parliamentary procedure.

At the same time, there could be problems in harmonizing positions on issues of authority and competence, which could complicate or slow down the negotiation process, it will certainly be used by groups opposing EU accession, and judging by the statements of some officials there could be more and they could jeopardize the entire accession project.

That is why it is important to start this process as soon as possible and identify issues that could be controversial and need to be agreed, and Croats in BiH and Croatia can help speed up the accession process.

4. CONCLUSION

EU accession is important to all BiH citizens because it creates the preconditions for prosperous social and economic development much greater than they would if BiH remained alone-isolated and greater than if it joined another country or group of countries, and it is important even if The EU ceased to exist as it is now because European democratic standards would remain (which is also very valuable).

Therefore, the BiH authorities should be encouraged to meet the requirements of the Accession Plan as soon as possible, to agree on uncoordinated positions on all issues related to accession and to prepare for adoption and to adopt all legal and other acts necessary for accession. In addition, in cooperation with the Directorate for EU Integration, develop a plan and program of activities (lectures, seminars, round tables, consultations, promotional activities, etc.) that would encourage accession

("gained votes" for accession) and emphasize the benefits of accession, acquainted with the omissions that could be made (and the damage that could occur) if the EU is not acceded to, if the accession process is prolonged or delayed, and explained the unfounded arguments of those who oppose accession.

REFERENCES

1. Kandžija, V., Cvečić, I.: Ekonomska politika Europske unije, Ekonomski fakltet Sveučilišta u Rijeci, 2010.
2. Kandžija, V.: "The paradigm of new transition" Association for European Community Studies in BiH, Mostar, 2019.
3. Kruger, J., Dunning, D.: "Unskilled and Unaware of It: How Difficulties in Recognizing One 's Own Incompetence Lead to Inflated Self-Assessments". Journal of Personality and Social Psychology 77 (6): 1121-34.)
4. Ljubić, F.: Strategije društvenog razvitka, strategije za opstanak I razvitak Hrvata u BiH, Sveučilipšte u Mostaru i Dubrovniku, Fram, Ziral Mostar 2005.,
5. Ljubić, F.: Zašto je važno članstvo u EU i kako ubrzati proces pristupanja, Zbornik radova sa znanstveno-stručnog skupa "Hrvati BiH – nositelji europskih vrijednosti, Drugo dopunjeno izdanje str.323-337., Grafotisak Grude, 2017.

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SYNERGY OF FINANCIAL AND REAL SECTOR IN BOSNIA AND HERZEGOVINA ON THE PATH TO THE EU INTEGRATION

Abstract

A stable and efficient financial sector is an important precondition for stable and developing national economy. Having in mind banking dominant financial sector in Bosnia and Herzegovina, changes in financial sector and behaviour of the most important sectors in financial system will be observed for the period 2005-2017. Changes in Bosnia and Herzegovina's financial sector will be analysed through a series of indicators for banking and non-banking sectors. Movement of GDP will be analysed for the same period.

Keywords: *financial sector, real sector, Bosnia and Herzegovina*

JEL: G2, EO

1. INTRODUCTION

Bosnia and Herzegovina's (hereinafter BiH) financial system is banking dominant system, which means that banking institutions (credit institutions) are dominantly financial institutions in financial sector. Banks have the main role in the financial intermediation process. However, in the last few years other non-banking financial institutions act more intensive on the financial market in the financial intermediation process. Table 1 shows share of asset of individual financial sectors in the total assets of financial system for the period 2005-2017. Increase of banking sector share shows significance of banking sector in financial system.

Table 1: Share of financial institution's assets in total financial system assets in BiH (u %)

	2005	2007	2017
Banks	77,30	79,90	88,30
Non-banking financial sector	22,70	20,10	11,7
Leasing	4,50	5,80	0,84
Insurance companies	4,00	3,30	2,26
Investment funds	12,10	7,20	2,76
Microcredit organizations	2,10	3,90	5,56
Total financial system assets	100,00	100,00	100,00

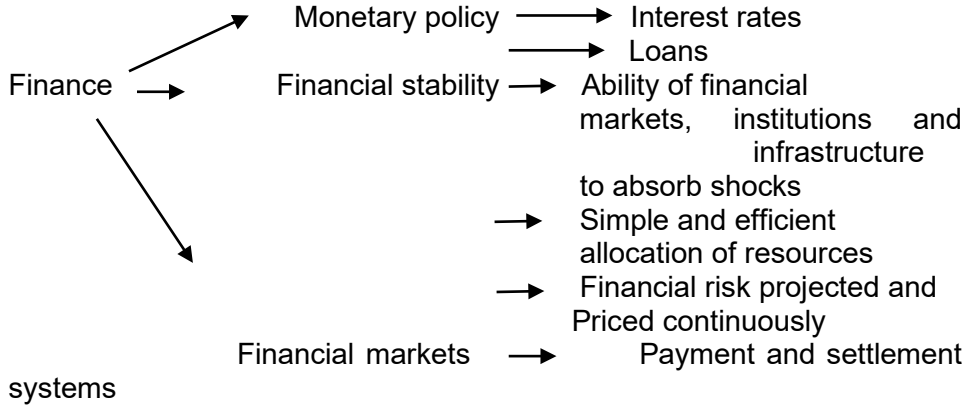
Source: Central Bank of Bosnia and Herzegovina, Financial Stability Report, Sarajevo, different issues

In the last twenty years, banks are dominant in financial system in BiH, while insurance and microcredit organization sector has recorded significant increase. According to researches worldwide, impact of financial system is positive on real sector.

2. SYNERGY OF FINANCIAL AND REAL SECTOR

Financial sector acts on economy indirectly through channels of monetary policy (interest rate and loans). Central banks can occasionally act on economy through their sensitiveness on interest rate changes. Interest rates changes affect savings or financing decisions made by households and non-financial sector. Differences in interest rates between countries are not just consequence of different conditions in observed countries (credit risk, interest rate risk, size of companies, industry structure, development of capital market), but they are also affected by different tax systems, regulation, supervisor efficiency, financial structure etc. Importance of credit supply as instrument of monetary policy depends on central bank's influence on commercial bank in its credit activities as well as the level to which economy is financed by banks loans. This channel can affect companies that have to stop their investment since they did not obtain necessary funds in the form of loans. Ensuring financial stability is another factor affecting economy. During financial instability, banking sector losses possibility efficiently to collect savings and direct it to economy (Figure 1).

Figure 1: Channels of finance impact on economy



Source: Prepared by Authors

In theory, number of direct and indirect channels of financial sector impact on economic growth. Development of domestic financial sector is mentioned among direct channels of financial sector's impact on economic growth.[1] Foreign capital, especially in portfolios, partially means increase of domestic capital markets' liquidity. Increase of foreign capital in banking sector can bring various benefits.[2] Foreign capital provide easier access to foreign capital markets, improves regulatory and supervisory framework for domestic banking sector, introduces new financial products and services, improves technology on domestic markets, improved competitiveness that will result in higher quality of financial services and better allocation efficiency. Researches show that the higher market share of foreign banks in banking system results in better performance measured by faster GDP growth, employment rate growth and bank loans/GDP ratio. This is not case with sector dominated by state-owned banks.[3]

[1] Other direct impacts: encouraging domestic saving eliminate risk; reduction of capital costs through better allocation of resources (entry of foreign investors together with domestic on financial markets means risk diversification, inflow of foreign capital increase financial markets liquidity what decreases risk premium in securities price and cost of capital and ensure higher borrowing for investment), transfer of technology and know- how.

[2] Levine, R.: Financial development and Economic Growth: Views and Agenda, Journal of Economic Literature, 1997.

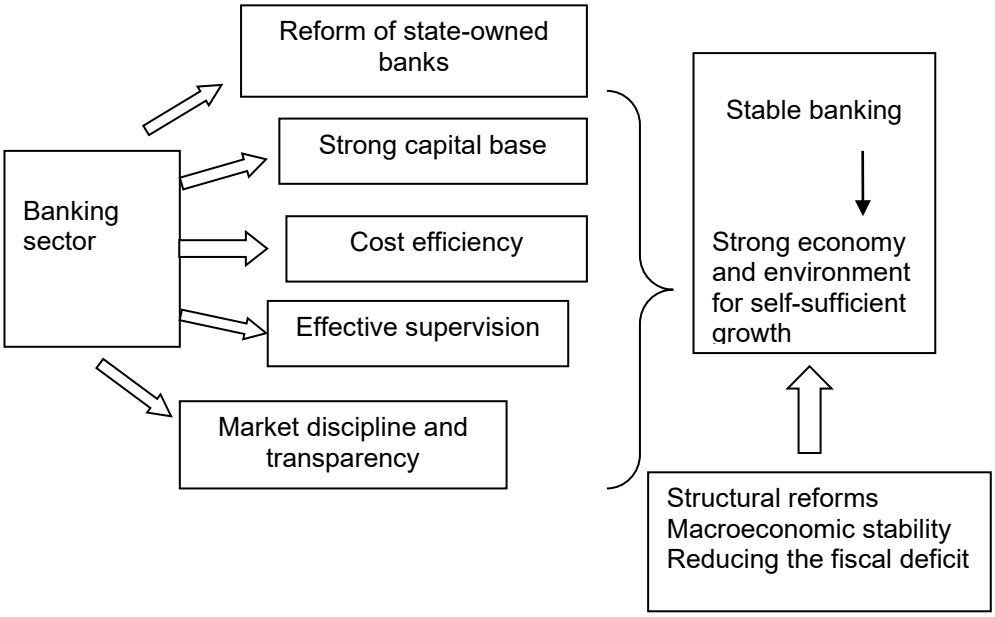
3 Berger, A.N., Hasan, I., Klapper, L. F.: Further Evidence on the Links between Finance and Growth: An International Analysis of Community Banking and Economic Performance, Journal of Financial Services Research, 2004., pp. 2

Development of financial intermediaries can be encouraged by activities on:

- building a legal framework,
- high accounting standards, and
- instruments to ensure financial intermediaries against credit risk.

Therefore, importance of banking sector and its connection with economy can be seen on the Figure 2.

Figure 2: Connection between stable banking sector and economy

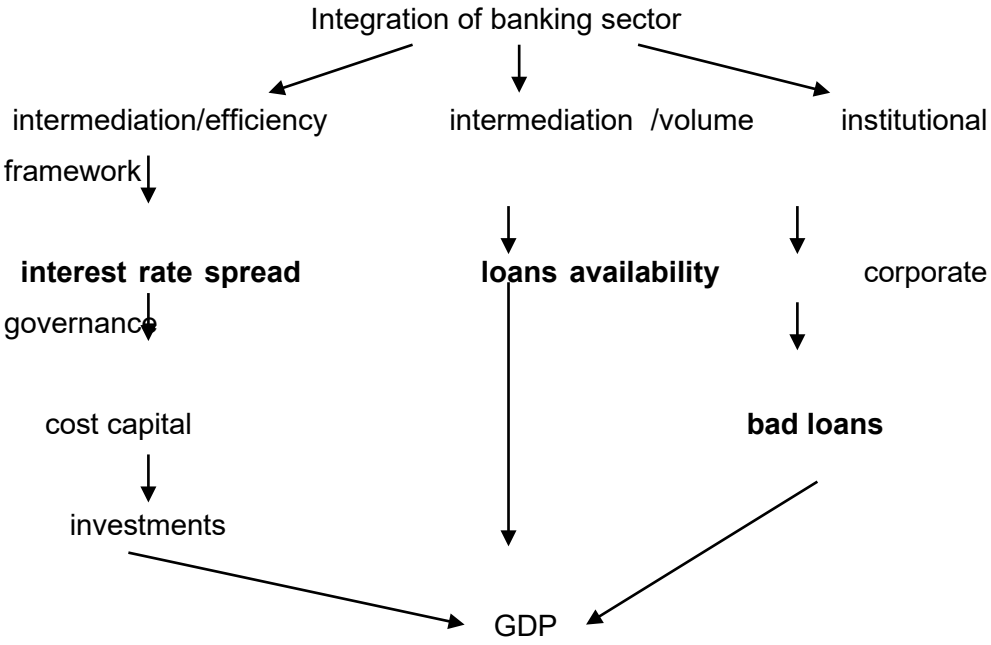


Source: Prepared by Authors

Transmission mechanism of monetary policy can operate through multiple channels, from interest rates, financial assets price to loans. Bank has special role regarding solving problems of information asymmetry because it can establish relation with client and monitor its activity and remove asymmetric information between lender and borrower. Importance of bank in transmission monetary mechanism is precisely in possibility of central banks to act on the real economy through bank loans, that is especially important for new accession countries that have so called banking dominant financial system. In countries with higher share of foreign banks, it is important to know that foreign banks strongly react on increase of interest rates compared to domestic banks. Larger banks also reacts weaker on changes in monetary policy. Liquidity and capitalization of banks does not affect bank's behaviour after change in monetary policy.

Based on the mentioned, it is possible to design some of possible channels for banks to act on economic development (Figure 3). Raising quality of banking services contributes to economic growth (Hassan, Koetter, Wedow, 2007, 2).[4] Banks' impact on economic development in countries depends on certain factors from environment and within banking sector itself.

Figure 3: Channels of banks' impact on real sector in the Southeastern Europe countries



As it can be seen on the Figure 3, changing bank operating environment leads to change of structure on bank markets in observed countries. Liberalization and deregulation of banking sector introduce banks in financial integration process within the EU. Integration increases competitiveness, imposes the need for efficiency what reduces interest rate spread and capital costs for economic projects. On the other hand, integration should increase availability of loan supply to the economy. Quality of banking intermediation and its volume affects positively economic growth. Corporate governance and adoption of good practice and

[4] Accroding to the same research, improvement of operational efficiency of banks for 1 standard deviation (around 6%) will increase economic growth for 0.4%.

construction of an effective risk management system to which bank is exposed will decrease number of bad loans in banks' loans portfolios.

3. BANKING SECTOR IN BOSNI AND HERZEGOVINA

The banking sector in BiH represents the most important financial intermediary whose financial intermediation is growing. Share of bank assets in GDP in 2007 was 90,3%. The same share was recorded in 2017. Banking intermediation shows significance of banks in national economy. The banking sector in BiH has gone through similar path as banking sectors in other transitional countries from privatisation, rehabilitation, recapitalization, consolidation, increasing concentration and emergence of modest competition. In BiH, 23 banks operated in 2007, while there were 23 in 2017. Changes in number of banks (consolidation) and changes in ownership structure are shown in the Table 2. Integration process to the EU and EMU can be additional impulse to development of banks in BiH.

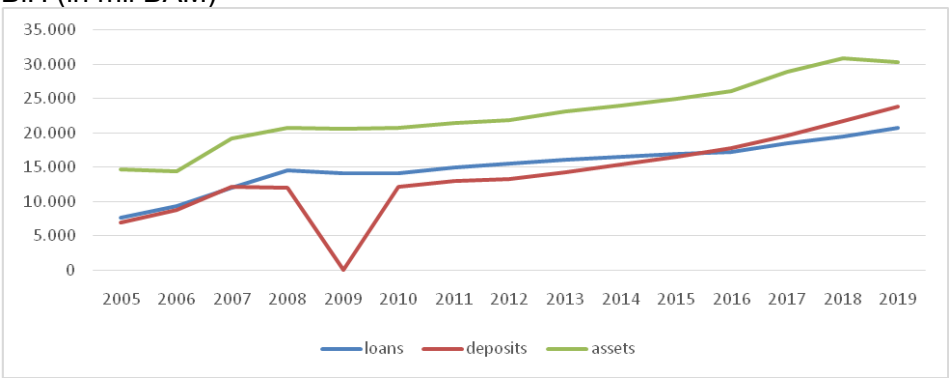
Table 2: General data for banking sector in Bosnia and Herzegovina, 2005-2017

	2005	**2007**	**2009**	**2010**	**2017**
Number of banks	37	33	33	32	23
Banking intermediation	69,3	93,8	86,5	58,6	90,0
Share of foreign capital	67,0	83,0	86,5	85,16	90,0
ROAA	0,7	0,9	0,1	-0,6	1,5
ROAE	6,4	8,9	1,3	-5,5	10,2
CR 3	46,3	40,8	46,4	46,2	
CR5	59,3	56,7	61,8	56,6	
HHI	919	890	999	1.530	1.741,50

Source: CB BiH, Annual report, different issues

The process of integration into the European Union and euro area can be additional impulse to the development of banks in BiH. In 2019, 90% of total capital in banking sector belonged to non-residents, dominantly by Austrian banks. Total assets of banks in BiH in 2018 was KM 30,9 billion in comparison with 2005 when it was KM 14 billion. Loans are dominant in the structure of bank assets and deposits in sources. Banks are still primarily oriented towards deposit-lending operations without significant steps towards development of investment function (Table 3 and 4). Total loans in 2018 were KM19,4 billion and deposits KM21,7 billion. Short-term deposits amounts 61% in the structure of deposits.

Graph 1: Movement of assets, deposits and loans in the banking sector in BiH (in mil BAM)



Source: CB BiH, Annual Report, different issues

The data on the Graph 2 indicate positive trends in the banking sector in BiH. In the last three years, banking sector records higher amounts of collected deposits than loans. As consequence of slowed credit activity, existing excess of liquidity from one hand and risk perception in banking sector, structure of sources in banks in BiH also changes (Table 3 and 4).

Table 3: Structure of consolidated balance of banks in Bosnia and Herzegovina in 2008 (in %)

Assets		**Liablities**	
Cash and cash equivalents	36	Deposits	75
Loans	58	Loans and other forms of lending	11
Fixed assets	3	Other liabilities	3
Other assets	2	Total liabilities	89
		Capital	11
Total assets	100	Total liablities and capital	100

Source: CBBiH, Annual report, different issues

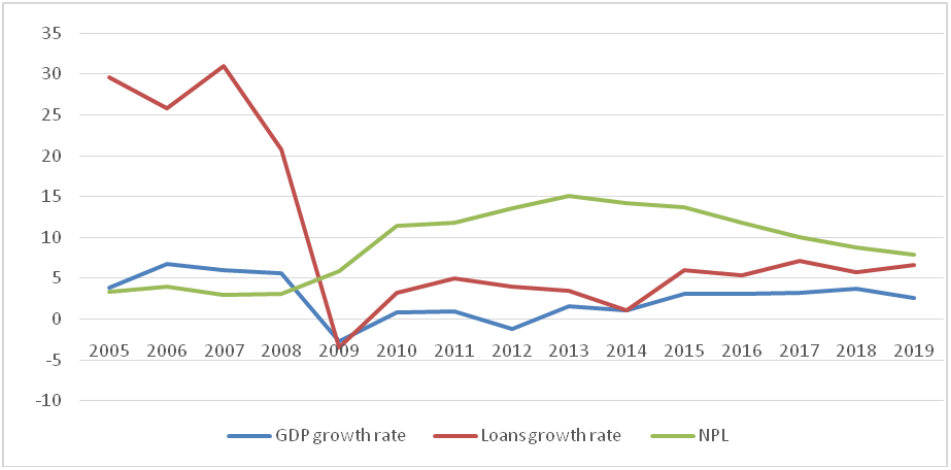
Table 4: Structure of consolidated balance of banks in Bosnia and Herzegovina in 2017 (in %)

Imovina		Liabilities	
Cash and cash equivalents	27	Deposits	76,50
Loans	66	Loans and other forms of lending	4,95
Fixed assets	3	Other liablities	3,44
Other assets	4	Total liablities	84,89
		Capital	14,86
Total assets	100	Total liabilities and capital	100

Izvor: CB BiH, Annual report, different issues

The banking sector in BiH, in macroeconomic environment where it operates with excess of liquidity and increased risk, decrease use of foreign sources trying to keep credit activity. Data show that banking sector is in the consolidation process, it is mostly internationalized and faced with searching for new market niches. Having in mind these changes, it is important to follow indicators that can indicate impaired stability and security of banking sector. It is especially important to fulfil new capital requests.

Graph 2: Comparison of movement of GDP growth rate, credit growth rate and NPL



Sources: Prepared by Authors according to the CB BiH data

Share of banking assets in GDP shows significance of banks in financing and ensuring liquidity of national economy. The data presented on the Graph 2 show the one-way trends in banking credit activity and national economy.

4. NON-BANKING FINANCIAL SECTOR IN BOSNIA AND HERZEGOVINA

In Bosnia and Herzegovina, sporadic jumps in activity of non-banking financial sector are recorded recently. Primarily those are activities on microcredit markets, activities of investment funds, leasing.

Financial markets in BiH, in terms of trading volume and market capitalization and number of participants, are still insufficiently developed and weak. Markets face with different problems as insufficient supply of financial instruments, existence of entity limits, illiquidity in trading and unenviable economic situation in the country.

Table 4: Capital market data in BiH

Sarajevo Stock Exchnage				
2005	**2007**	**2009**	**2012**	**2018**
Market capitalization (billion KM)				
6,4	15,50	7,1	4,5	5,02
Number of traded instruments (in 000)				
64.554	70.773	25.707	35.852,1	27.472,4
Number of transactions				
37	61	19.632,2	11.643	5.315
Banja Luka Stock Exchange				
2005	**2007**	**2009**	**2012**	**2018**
Market capitalization (billion KM)				
2,8	7,7	3,75	3,8	3,6
Number of traded instruments (in 000)				
360.153	702.488	81.474	192.359	193.664
Number of transactions				
191	191	11.527	26.707	17.136

Source: Sarajevo Stock Exchange, Banja Luka Stock Exchange, Annual Reports, different issues

The future of financial market and investment funds is related with reform of pension system. In 2017, there were 27 insurance companies in Bosnia and Herzegovina and in the same year KM 683 million was collected from premiums.

Table 5: Major indicators of insurance sector in BiH

	2005	2007	2009	2012	2017
Number of insurance companies	25	26	26	25	27
Total premium of life insurance (in million KM)	31,9	54,5	69,4	86,1	139,2
Total premium of non-life insurance (in million KM)	300	347,7	389,1	418,9	544
ROAA	4,45	2,51	2,14	2,64	3,83
ROAE	11,83	7,11	6,44	8,46	15,65

Source: BiH Insurance Supervision Agency, different publication

The total assets of insurance sector in 2007 was KM 853 million, while in 2017 it was KM 1,7 billion. IN previous period, life insurances recorded increase even though their share in the insurance premium structure in BiH is still low. In comparison of premium with population, BiH is at the level of Serbia and Romania, and below the level of Croatia, Hungary and Turkey.

There are six leasing companies in the leasing sector in BiH. Number of leasing companies is reduced for two in comparison with 2016. In 2005, assets of leasing sector was EUR 189 million and in 2017 it was EUR 133 million (Table 6).

Table 6: General indicators of leasing sector in BiH

	2012	2018
Number of leasing companies	9	6
Assets (in million KM)	911,7	369,2
Financial leasing (in million KM)		223,36
Operational leasing	15,1	36,84
Profit/loss	-12,6	2,5
ROAA	-2,85	1,5
ROAE	-31,45	12,6

Source: CB BiH, Financial Stability Report, different issues; FBiH Banking Agency, RS Banking Agency, Information on banking sector, different issues

Microcredit organizations have special place in the credit market. They provide microcredits to legal entities and natural persons who do not meet credit requirements of banks. The most important share in credit portfolio of microcredit organizations are retail loans. In 2017, there were 25 microcredit organizations (15 microcredit foundations and 10 microcredit organizations). The sector records founding new organizations increase of credit activity and profitability.

Table 6: General indicator of microcredit sector in Bosnia and Herzegovina

	2005	2007	2009	2012	2018
Number of organizations	46	24	26	22	25
Assets (in million KM)		968,4	1.160,8	745,6	951,1
Given credits (in million KM)		883,6	935,6	584,2	738,5
Received credits (in million KM)		720,9	830,9	424,4	464,4
Profit/loss		216,7	-20,2	13,2	13,8
ROAA		22,9	-3,39	3,45	3,16
ROAE		4,9	-9,53	5,88	4,14

Sources: CB BiH, Information on financial stability, different issues

Of the total amount of loans, 97,7% of microcredits are given to natural persons, of which 37,5% was given to agriculture, 17,9% to services, and 14,5% are housing loans. The main microcredit organizations' source of funds are credits taken from banks and other international financial institutions.

In 2017, there were 36 investment funds, of which 17 were in the FBiH and 19 in the Republika Srpska. Of the total number of investment funds 25 are closed and 11 are opened investment funds. Net value of assets records increase of 5,6% in comparison to the previous year.

To ensure better synergy of financial and real sector, it would be necessary to improve regulation and supervision system (micro prudential and macro prudential), develop financial market, improve commercial banks and economy relation through credit and grant funds models, share financial risk with private creditors, monitor compliance with financial discipline etc.

5. CONCLUSION

The financial system experienced changes in transition and afterward trying to transform in stable and competitive system. Transition has opened new possibilities for financial sector, but it has also showed challenges that national economy faces with due to its impossibility to implement economic policy instruments and manage certain financial sectors within financial system. Data show that there is synergy between financial sector and economy, but not in desired direction. Therefore, it is necessary to pay attention to: changes in structure of banking markets, geographical distribution of providing banking services, behaviour of foreign capital in banks, financial assets price and volatility and sensitiveness of the country to contagion and crises, liquidity of financial markets and their consolidation, respecting acquis and experiences of the Member States.

REFERENCES

1. FBiH Banking Agency, Information on banking system in the FBiH, different issues
2. RS Banking Agency, Information on banking system in the RS, different issues
3. Central Bank of Bosnia and Herzegovina, Financial Stability Report, Sarajevo, 2018
4. Berger, A.N., Hasan, I., Klapper, L. F.: Further Evidence on the Links between Finance and Growth: An International Analysis of Community Banking and Economic Performance, Journal of Financial Services Research, 2004.
5. Central Bank of Bosnia and Herzegovina, Annual reports, different issues
6. ECB, ECB-CFS Research in Network on “Capital markets and Financial Integration in Europe” – a road map, 2004
7. ECB, Financial integration in Europe, different issues
8. Levine, R.: Financial development and Economic Growth: Views and Agenda, Journal of Economic Literature, 1997.
9. Matthäus-Maier, I., Pischke, J. D.: EU Accession Financial Sector Opportunities and Challenges, for Southeast Europe, KfW, 2005
10. Živko, I., Gadžić, M., Skoko, B., Changes in Banking Structure in Bosnia and Herzegovina and Integration in EU Banking Market, Economic Integration, Competition and Cooperation, Opatija, Croatia, 2016, pp. 350-363
11. Živko, I., Grbavac, J., Čolak, A.: Financial Markets in Bosnia and Herzegovina: Current Situation and Trends, Journal of International Scientific Publication, Bulgaria, Vol. 10., 2016, pp. 619-628
12. Čolak, A., Živko, I., Grbavac, J.: The main feature of B&H financial structure and integration in the EU system, Zbornik radova Ekonomskog fakulteta Sveučilišta u Mostaru, pp 276-286.

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