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DIGITAL SERBIA: ECONOMIC CONTEXT ADJUSTMENTS FOR DOUBLE GDP

Digitalna Srbija - prilagođavanje ekonomskog konteksta
za udvostručeni BDP

Abstract

Serbia's economy is full of binding constraints feeding the crisis of transitionism. Breaking away from transitionism requires a complex reform agenda, including three sets of activities. First, annulation of past failures through crisis management (or fiscal consolidation) as well as structural reforms. Second, adoption of the new growth model and economic policy framework consistent with paradigm change in economic theory and policy, as well as with new normalities. Third, investment in new fields in accordance with mega trends.

This paper updates the status of debate about what to do in Serbia after success in program of fiscal consolidation 2015-17. There are two priorities. First, for catching up to the EU, Serbia must double the output in the foreseeable future. Second, to achieve meta-national advantage, Serbia's economy must undertake digital transformation. Our intention is to offer a conceptual paper, by debating broad-based institutional design questions with some nitty-gritty technical points and provide recommendations based on past experience in Serbia and successful examples of other countries. After fiscal consolidation, we propose concentrating on two remaining issues. Along with locking-in fiscal balance, our priorities are: the manufacturing-led growth model based on digital transformation and heterodox policy platform with industrial policy for ICT in the center. In the suggested growth model (and policy platform), the main sources of growth are advanced manufacturing and high value-added services.

In terms of digital transformation, Serbia is lagging behind its counterparts from the EU. In closing the gap, the role of industrial policy is imminent. Our objective is to analyze the general principles to guide industrial policy for ICT sector in the long-run, as well as to discuss

specific measures to be taken today. In our previous papers we have already advocated for heterodox approach giving the framework with concrete hard macroeconomic policy regime as well as the architecture of industrial policies, both horizontal and vertical.

This paper explores how policy makers can facilitate transition toward digital economy and what choices they can make to prepare for the impending wave of change. In a digital transformation, Serbia must concentrate on structural reforms based on broader adoption of ICT products and solutions in advanced manufacturing that will reconfigure value chains of industry leaders and boost productivity in tradable sectors from the real economy (manufacturing, agriculture, physical infrastructure, transport and logistics, waste management, etc.). Also, it must concentrate of high value added services (science, education, health care, programming, etc.) due to their catalyst role in dynamic economic growth.

Previous logic is a base for structuring the following sections. The paper is organized in seven sections, apart from Introduction and Conclusion. We start with two main realities, the fourth industrial revolution and demising orthodox approach in economics and economic policy formulation, continue with new global normalities and heterodox approach as an antidote to crawling jobless growth around the world, and finish with fiscal balance and the role of industrial policies in the new growth model as well as with the role of digitalization in tradable sectors. Special attention is dedicated to industrial policy in ICT and its role in Serbia's economic recovery.

Keywords: *Industry 4.0, digital transformation, ICT, fiscal consolidation, heterodox approach, hard macro-economic policy regime, automatic stabilizers, industrial policy*

Sažetak

Ekonomija Srbije obiluje uvreženim ograničenjima koja su uslovlila krizu tranzicionizma. Izlazak iz tranzicionizma zahteva program kompleksnih reformi koji uključuje tri grupe aktivnosti. Prvo, otklanjanje grešaka iz prošlosti pomoću kriznog menadžmenta (ili fiskalnu konsolidaciju) kao i strukturne reforme. Drugo, primenu novog modela rasta i nove platforme za vođenje ekonomskih politika koji su konzistentni sa promenom paradigme u ekonomskoj teoriji i politici kao i sa novim normalnostima. Treće, investicije u nove oblasti koje su u skladu sa mega trendovima.

Ovaj članak daje presek debate o tome šta Srbija treba da uradi posle uspeha programa fiskalne konsolidacije 2015-17. Postoje dva prioriteta. Prvo, za dostizanje EU, Srbija mora u sagledivoj budućnosti da duplira BDP. Drugo, da bi se ostvarila meta-nacionalna prednost, ekonomija mora da sprovede digitalnu transformaciju. Naša intencija je da ponudimo konceptijski članak, na bazi analize najopštijih institucionalnih rešenja kao i određenih tehničkih detalja kako bi smo dali predloge na bazi prošlog iskustva u Srbiji i uspešnih primera iz drugih zemalja. Posle fiskalne konsolidacije, mi predlažemo prebacivanje pažnje na dva preostala pitanja. Pored očuvanja fiskalne ravnoteže, naši izbori su na proizvodnji zasnovan model rasta i heterodoksna platforma za vođenje ekonomskih politika sa industrijskom politikom za IKT u centru. U predloženom modelu rasta (i platformi za vođenje ekonomskih politika), glavni izvori rasta su napredna industrijska proizvodnja i usluge najvećeg stepena dodate vrednosti.

U pogledu digitalne transformacije, Srbija zaostaje za zemljama EU. U zatvaranju jaza, uloga koncepta industrijske politike je neizbežna. Naš cilj je da analiziramo opšta pravila za formulisanje industrijske politike za sektor informacionih i komunikacionih tehnologija (IKT) u dugom roku kao i da diskutujemo o konkretnim kratkoročnim merama. U našim prethodnim radovima više puta smo usmeravali pažnju prema heterodoksnom pristupu predlažući čvrst režim makroekonomskih politika kao i odgovarajuću arhitekturu industrijskih politika, kako horizontalnih, tako i vertikalnih.

Ovaj članak istražuje kako da donosioci odluka naprave prelazak prema digitalnoj privredi i koje izbore moraju da učine kako bi se pripremili za talas značajnih promena. U digitalnoj transformaciji Srbija se mora skoncentrisati na strukturne reforme zasnovane na široj primeni tehnologija napredne industrijske proizvodnje koje imaju moć rekonfigurisanja lanca vrednosti granskih lidera kao i rasta proizvodnje i produktivnosti u realnoj ekonomiji (industrija, poljoprivreda, fizička infrastruktura, transport i logistika, upravljanje otpadom i dr.). Takođe, neophodno je usmerenje na usluge najvećeg stepena dodate vrednosti (nauka, obrazovanje, zdravstvo, programiranje i dr.) zbog njihove katalizatorske uloge u dinamičnom ekonomskom rastu.

Prethodna logika je osnova strukturiranja izlaganja koja slede. Rad se sastoji od sedam delova, pored Uvoda i Zaključka. Započinjemo sa dva realiteta, četvrtom industrijskom revolucijom i napuštanjem ortodoksnog pristupa u ekonomskoj teoriji i politici, nastavljamo sa novim normalnostima i heterodoksnim pristupom kao lekrom za puzeći rast praćen gubitkom radnih mesta širom sveta, i završavamo sa ulogom fiskalne konsolidacije i industrijskih politika u novom modelu rasta kao i ulogom digitalizacije u sektorima razmenljivih proizvoda. Posebna

pažnja biće posvećena industrijskoj politici za IKT i njenoj ulozi u obnovi srpske privrede.

Ključne reči: *Industrija 4.0, digitalna transformacija, IKT, fiskalna konsolidacija, heterodoksn pristup, čvrst režim makroekonomskih politika, automatski stabilizatori, industrijska politika*

Introduction

In the new economy, usually labeled “Industry 4.0”, there are two explanatory elements: the fourth industrial revolution and new normalities in a socio-economic context. These elements are not stand-alone, but interrelated. Also, the structure of relations and intensity of dependency between their components are pretty unstable. Sometimes they are reinforcing, sometimes they are offsetting each other. No matter what the final result is, their interactions influence the structural changes in economy and society.

Technology is the main driver of economic growth and social prosperity. Also, it influences the growth model, economic policy platform and behavior (business model and strategy) of basic economic agents. Technology is an ambivalent phenomenon, a factor shaping opportunities (inclusive innovations) and threats (disruptive innovations), or both (structural changes). Industrial revolution exacerbates velocity and impact of changes enabling change imperative to function.

The purpose of this paper is to discuss the impact of the last version of change imperative on the economy and business organizations inside them with the purpose to extract the main theoretical and policy recommendations. This is particularly important because there is a real threat that the Great Recession of 2008-2009 and, particularly, counter recession measures until today exacerbated the global turmoil and diminished the capacity to respond adequately on national and company level to new normalities. It is particularly true for peripheral economies lagging significantly behind core economies. Our intention is to offer a conceptual paper with feasible recommendations.

Our view is based on three mainstays. First, the model of managed capitalism as a preferred socio-economic framework for manufacturing-led development. In the case of Serbia it could be the framework to escape transitionism as never-ending transition [6], as well as for catching up with

developed economies. We strongly believe that advanced manufacturing and high value added services are the main drivers in the new model of growth. Also, we are advocating for “heterodox approach” as a conceptual platform for new economic policies with industrial policies in the center. We will implement this conceptual novelty in the case of Serbia offering the framework with core elements of the hard macroeconomic policy regime providing stability as well as concrete vertical and horizontal industrial policies with the purpose to capitalize growth potentials. We will particularly concentrate on information and communication technology (ICT) as the industry with the greatest potential for transformation not only for itself, but also for other industries. ICT is embedded in other technological fields. It has potential to revolutionize everything (economy, business model and strategy of business organizations, the way of life, etc.).

Industry 4.0: The impact on an economy

The industrial revolution is an ongoing process, a concept standing for major alterations occurring within a relatively short period that cause fundamental change in the economy and society. In the industrial revolution we can distinguish four stages since its start in 1784. In each stage, the impact of core technology for economic and social development has been enormous.

Regularly, technology change enables exponential growth of opportunities expressed by an S-shaped curve. According to K. Schwab [38], until the advent of the first mechanical weaving loom and water and steam technology, and its application in emerging industries signifying the start of the first industrial revolution, humankind lived in abject poverty. Industrialization of the economy and expansion of new jobs in emerging industries provoked a standard of living increase by movement of people from rural to urban areas and expansion of modern cities with better infrastructure and social services, including education, science, and health care.

The following stage of industrial revolution started in 1870. The symbol of this stage is the conveyor belt. This time, electrical power gave birth to mass production of standardized products. The second industrial revolution

brought modernization and formidable rise in quality of life and thus unprecedented population growth. It also opened the door to the service economy expansion.

The first programmable logic control system in 1969 was just an overture to the third wave of industrialization. In the third industrial revolution, also called “information revolution”, a symbiosis between electronics and ICT led to further automation of the processes and their integration along the value chain. Internet and millions of connected devices gave the new meaning to communication. Starting in this period, artificial intelligence has been replacing humans in a vast array of activities.

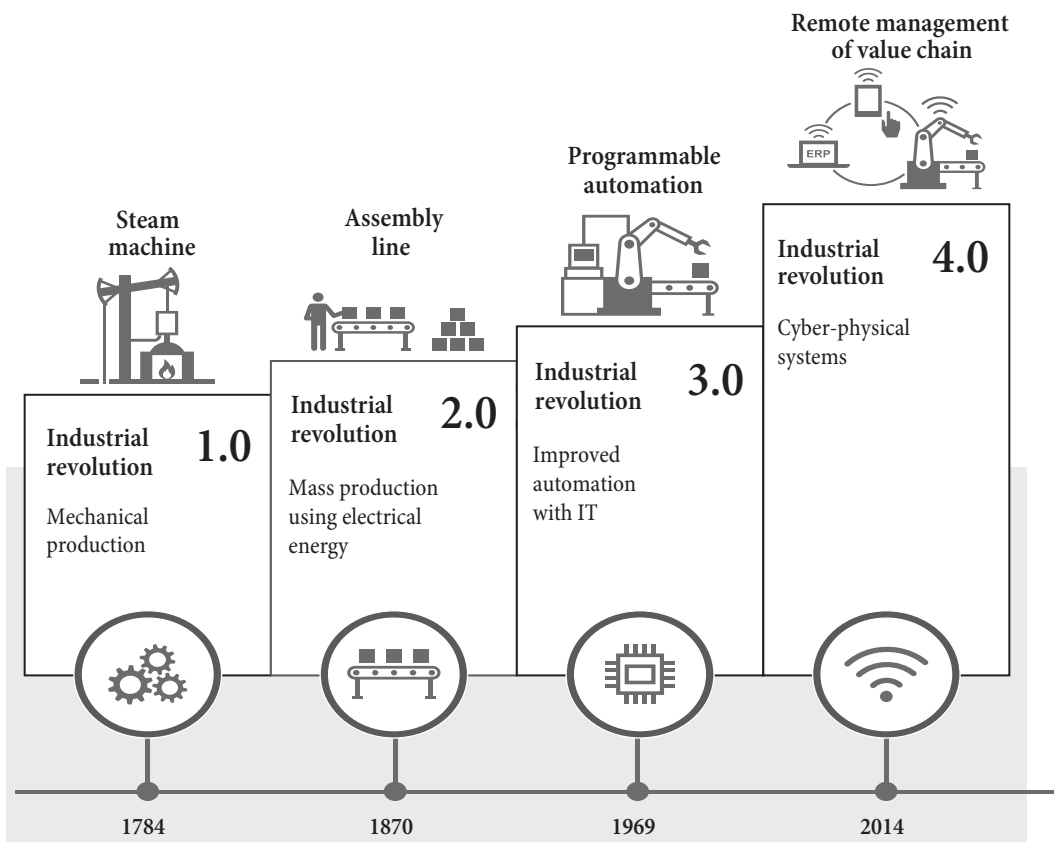
Now we are in the midst of the fourth wave of major technological advancement, known as “digital revolution”. The fourth industrial revolution is fundamentally different in comparison to the other three. New technologies are fusing the digital world, from one side, and physical and biological worlds, from the other side.

The main characteristic of digital economy (or Industry 4.0) are cyber-physical production systems, or symbiosis of the real and the virtual world. Cyber-physical production systems are in fact network of machines organized in a similar way as social networks. Mechanical and electronic components linked by ICT communicate via networks.

Over time, the character and impact of former industrial revolutions on economy and society have changed dramatically (see Figure 1). The main consequence of the first industrial revolution was that machines substituted labor. The main impact of the second industrial revolution was automation of production process based on the assembly line and power of electricity. The main impact of the third industrial revolution is augmented automation based on information technology. In the center of the fourth industrial revolution is remote control of whole value chain based on universal connectivity.

Industry 4.0 is more than ICT that lies beneath. What distinguishes the fourth industrial revolution from previous ones is its speed and scope of change. The latest industrial revolution is so complex that it has the systemic impact on economy and society. It is embedded technology. It has potential to revolutionize everything, including other technological fields out of ICT, entire economy, and the way of life. Also, there is a difference in

Figure 1: Industrial revolution impact



speed and the scope of the innovative solutions diffusion. In previous industrial revolutions, with the exception of the third industrial revolution, diffusion of innovations came relatively slowly leaving many potential acquirers, including whole continents, unaffected. The new industrial revolution brought about a profound and systemic change in the economy and society. The core structural change is universal connectivity, breaking down barriers between industries as well as between business and private life. Digital forces like disintermediation, disaggregation and dematerialization also contribute to structural changes, by reshaping traditional value chains.

The term digitalization encompasses three aspects. First, digitalization of assets, including infrastructure, connected devices, data and data platforms, and technologies like big data analytics, cloud computing, internet of things (IoT), virtual reality (VR), augmented reality (AR), 3-D printing, etc. Second, digitalization of business model, including robotics in operations, customer and supply chain interactions, mobile payments and other activities from the value chain. Third, digitalization of labor, including

employee’s use of digital tools, new digital jobs and new digital responsibilities. Mentioned aspects of digitalization belong together. In measuring return on investment we find relatively large disparities across national economies, industries and business organizations. Without any doubt, a significant part of future economic growth and productivity improvement could come from digital applications. It is particularly important for peripheral economies lagging behind the core economies since they are looking for the way for catching up and income conversion.

The rate of structural changes and the level of disruption of incumbent technologies driven by digital transformation are enormous. Large-scale innovation from ICT, fueled by other form of consumerization of ICT, continuously drive change in demand and other technological fields, as well. Also, in Industry 4.0, new possibilities for manufacturing emerge so quickly that it is regularly difficult for business organizations to keep pace of the progress. Typical innovation is, actually, the amalgam of innovation from cyber (or digital) space, from one side, and physical and biological space, from the

other side. Also, it changes the character of competition from product to amalgams of products and services. As a consequence, a modern competitive arena is dominated by double amalgams (between different technologies and between products and services) that are usable, available, affordable and accessible to almost unlimited number of users.

Nowadays, traditional manufacturing is exposed to digital transformation caused by emergence and fast implementation of cutting-edge technologies in advanced manufacturing. The pace of change reflects almost Moore's law on the speed at which information technology driven change happens [32].

Three digital forces: disintermediation, disaggregation and dematerialization are continually shifting value from conventional business models to new ones, from slow-moving incumbents to nimble digital attackers, and from one activity in value chain to another [22].

Industries which are ripe for disintermediation are industries with high margins on offline channels, a lack of information transparency due to multiple layers between suppliers and customers, and a highly fragmented landscape. Typical example is retailing. In the global context, continued growth of online sales has disrupted retail industry by cutting out a middle layer and linking suppliers and consumers directly through digital platforms. Integrated omnichannel experience for consumers that mixes offline and online (O2O) in combination with further penetration into rural areas and smaller cities exacerbates this trend.

Disaggregation takes place when digital attackers disrupt conventional business models and reinvent industries by disaggregating huge assets into many pieces, turning them into services, and serving fragmented consumer bases. Industries that have high value, high durability, and fluctuating utilization are the main territory for disintegration. Share mobility is a prime example.

Dematerialization is virtualization. It changes processes and products, or both, from physical to virtual, unbundling demand with digital delivery and enabling consumers to receive products or services anywhere and anytime. Prime examples are e-book and distance learning.

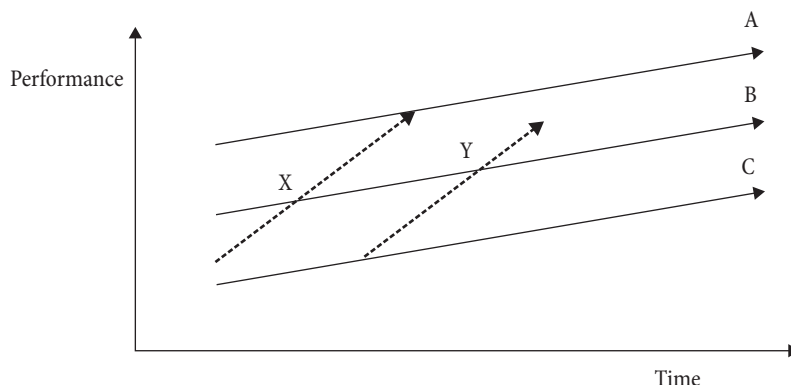
According to [22], between the three main digital forces, disintermediation and disaggregation can have the largest impact. Also, the pattern of impact of the three digital forces varies according to the sector. In the case of disintermediation and disaggregation, digital platforms play an important role by directly matching fragmented suppliers and customers, by improving transparency across the value chain, while offering multisided solutions that enable the rapid expansion of supply and cater to underserved demand.

Previous changes require that we master and lead in what might be termed as inclusive innovation instead of disruptive innovation. C. Christensen [3] has differentiated sustaining and disruptive technologies when companies are faced with the so-called "innovator's dilemma". Sustaining technologies improve product performance along the dimensions that customers have learned to expect. In contrast, disruptive technologies initially offer lower performance than existing technologies, but in the meantime their performance improves at higher speed than customers expect. These technologies are ignored by incumbents, because they are underperforming in early stages. However, with time, these technologies outperform sustaining technologies causing new entrants to take over business from incumbents. Demand pull innovation based on rapid customer feedback from early prototypes (or customer relationship management) is critical for rapid and massive diffusion.

Disruptive technologies outperform sustaining technologies causing new entrants to take over the business from incumbents following the "winner-takes-all" strategy. As Figure 2 shows, entrants starting to implement new fertile technology in the low-end segment but finishing in the high-end segment, gradually take over the whole business from incumbents.

From a market forces perspective, in Industry 4.0 the role of technology-push innovations has been increasing. Namely, cyber-physical amalgams of modern technologies could lead to the supply-side revolution. From the demand side, there are also dramatic changes. In global networks the marginal cost lost the meaning, because communication costs tend to be nothing and freight and logistics costs significantly decline. Technological breakthroughs have

Figure 2: Disruptive innovations



Source: [3, p. 44].

potential to accelerate the demand for new products and services, productivity improvement through the value chain, investments in new capacities and pace of growth of the global productivity frontier itself, all of which will open new markets and drive investment and economic growth.

In such a challenging situation, policy makers should first examine current position of the national economy and competitiveness of certain industries within them. Before defining the strategy for digital transformation, it is important to look at the mega trends. Or, answer the question: where the global economy may be going in the long term and what would be the role of some industries? The assumptions of possible adjustments require an effective growth model and efficient economic policy platform compatible with paradigm change in economics and economic policy platform. Skipping these steps can easily lead to new misconceptions.

Rethinking neoliberal orthodoxy in the wake of the Great Recession

In each socio-economic system there are components functioning automatically and components that require human interactions. Previous determined two institutional arrangements, market forces and state intervention, active and reactive both. Market mechanism balancing demand and supply supposes automatic behavior. Industrial policies for tradable sectors respect judgement in human reaction on technology change and mega socio-economic trends. Complementary impact of these choices leads to dynamic equilibrium.

Without any doubt, the hegemony of capitalism as worldwide socio-economic system with three fundamentals, private property, free market (or enterprise) and political democracy has no realistic alternative to compete. Even before the start of the Great Recession in 2008, there was a strong conceptual diversity between economics scholars from developed and developing world regarding the dilemma as to which institutional arrangement primarily influenced growth models and economic policy platform in capitalism. Mainstream economics scholars from developed or industrialized economies (sometimes called “early developers” or “core economies”), preferred market forces, while opinion makers from developing or non-industrialized economies (sometimes called “late developers” or “peripheral economies”) opted for government intervention based on the industrial policy doctrine [45].

To catch up with the developed world, developing economies regularly use technology transfer which is not obviously a manifestation of the free market mechanism. In a great majority of cases it was based on the second industrial generation technology. After industrialization based on technology transfer, under the pressure of global competition, both on the external and internal market, local industrial organizations had to move up the value chain of production and to cutting edge technologies, making more high-end products with more cost effectiveness. They managed to do this in tradable sectors, the sectors that exported or competed with imports. By doing so, national economies run the so-called “double macro deficits” (in current account and in capital balance). Industrialization based on import technologies for tradable

sectors does not lead to sustainable balance of payments due to terms of trade. Moreover, the purchase of cutting edge technology from abroad increases current account deficit. Deficit in capital balance is a result of financing of that purchase. Two macro deficits slow the speed of growth and developing economy enters in the so-called “middle income trap”.

To escape from the middle income trap means, primarily, reduction of dependence on foreign borrowing. But it is not possible without reduction of technology purchase from abroad. In situ development of technology to keep a high level of competitiveness of domestic industry is a way to eliminate double macro deficits. According to [6], the core challenge will be the way for a developing economy to chart the path of technology development, not only as a beneficiary (leapfrogging), but also as an active participant in its development, or in situ research and development (R&D).

This is a complicated journey, because it requires growth that is smart, adequate science policy (and R&D), including also an education system adaptable to the requirements of cutting edge technologies. In some emerging economies from Asia, practical growth models were ahead of neoliberal orthodoxy. Empirics were outstanding, because development of own technologies in tradable sectors produces meta-national advantage and surpluses in current account and capital balance, enabling sustainability of the balance of payments.

In reconsidering orthodox approach, negative experience was also important. The Great Recession emerged in the developed world showed that the economy, unlike the technical system, is not self-stabilizing. It can implode independently of the business cycle fluctuations. There may be hysteresis. The last crisis was a direct consequence of misconceptions of the neoliberal growth model and the related economic policy regime based almost exclusively on a market mechanism. It showed the limitations of monetary policy as a core macroeconomic policy and cast doubt on some of the tenets of its intellectual foundations. On the fiscal policy side, the crisis raised new doubts about what levels of public debt are safe, optimal speed of fiscal consolidation, and the role of macro-prudential instruments.

The last crisis forced economic scholars to explore alternative growth models and economic policy frameworks. There are three main lessons we have drawn from the past. First, exclusive focus on monetary measures, inflation targeting and prime rate rule is not enough to reach sustainability proposal toward both the people and nature. Second, in core macro policies there is more space for fiscal measures, particularly if the safe real rate is lower than growth rate. Third, active role of state in the economy (both proactive and reactive) is inevitable.

One should add and we cannot leave it aside, stationary status of the economy due to high level of financialization. According to G. Mukunda [25, p. 74], financialization is the increase in the influence of financial markets, institutions and elites over both the economy and other institutions of society, including the government. Namely, when the financial sector growth is not harmonized with the growth in the real economy, it leads to structural imbalances like deindustrialization, output gap, asset-price, credit bubbles, and income inequality.

Disequilibrium between the financial sector and the real economy influences disparity between value creation and value release, emergence of speculative bubbles, bubble burst and, finally, the crisis. The crisis imposes costs on the government in the form of lost tax revenues and fiscal imbalance due to increased spending [6].

A growth model related with neoliberal version of capitalism based primarily on services, and predominantly on financial services, is not sustainable, because these activities are distributive by nature. Rent-seeking is a typical manifestation of a distributive mentality. It involves trying to make value by manipulating regulatory policies. In a system with high financialization, a significant share of transactions is zero-sum, instead of positive-sum (or win-win).

There are, at least, fifth weak points of such model. First, over-proportional development of the financial sector increases the economy’s exposure to the downside scenario [16], [18], and [23]. Second, overdeveloped financial sector easily misallocates resources, meaning disproportionately high rewards for executives. Third, investment in financial assets tends to crowd out investment in real assets, because the capital market prefers short-term and liquid

investments [30]. Fourth, deindustrialization. Along with deindustrialization, wealth concentration is another weak point of the neoliberal model of capitalism. Despite global growth, relative income inequality has been on the rise. According to [31], almost half of the world’s wealth is owned by the global “top 1 percent” of the population (which includes about 70 million of people), and the bottom half owns as much as the richest 85 individuals.

The changes in the global economy are so radical that they require an ideological discourse not only in developing economies, but also in developed ones. Instead of the neoliberal blueprint of capitalism up to 2008, when there was no power to balance it, the new normality is a multipolar world with ideological compromise with the market and the state promoted by new structural economics. It leads to the existence of some hybrid capitalist systems with the greater role of the state in the economy. Emerging system in which government gives some level of support along with conventional privileges to favored national champions effectuated many times in superior performance and competitive advantage on the global level. R. Rajan [35, p. 56] labeled this version of capitalism “managed capitalism”. This system is conceptually different from neoliberal model of capitalism. This change opens the new question: What are the fundamentals of the new

structural economics staying behind managed capitalism and its consequence “development state” *vis-à-vis* neoliberal blueprint and “suppressed state”?

Before answering to the previous question, we will analyze whether paradigm change in economic theory and policy is compatible with the new normalities?

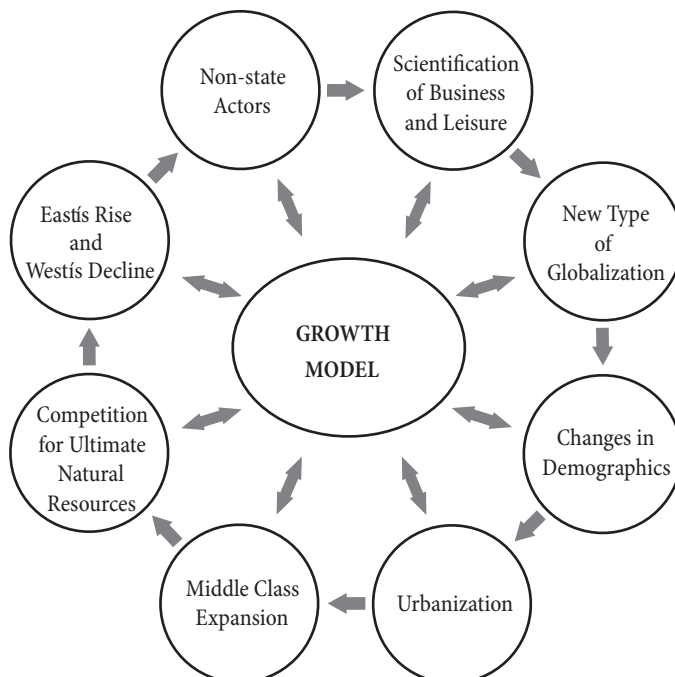
New Normalities: Challenges, opportunities, or both

Macro management depends on socio-economic system and the model of growth. Micro management depends on organization and functioning of basic economic agents responding to the main challenges inspired by own aspirations. In both cases, management is social technology. In every stage of development, there is specific impact of interaction between new normalities and technology change.

As we already pointed out [6], there are some mega trends influencing new normalities in socio-economic context of the fourth industrial revolution.

Figure 3 portrays the relationships of mega trends in socio-economic context and the model of growth. Among them, scientification is the most powerful trend. The entire socio-economic context, from business to leisure, is under

Figure 3: The impact of megatrends on the growth model



the impact of scientification. The new technologies (in particular, industrial robots) have potential to disrupt labor markets. As automation that was functioning as neutron bomb, the net displacement of employees by industrial robots might exacerbate the gap between labor income and return to capital. Also, labor markets become increasingly segregated into low-skill, low-pay and high-skill, high-pay segments, which in turn will lead to breaking the social cohesion. Innovators as providers of intellectual capital and investors as providers of financial capital are the larger beneficiaries of technological breakthroughs. Great losers in terms of return on labor are less educated workers with lower competence.

The Great Recession and, almost equally, the anti-recession experimental policy measures¹ in the post-crisis period, discredited the idea of universal effectiveness and applicability of the neoliberal model of capitalism and efficiency of the related economic policy platform and, along with them, in some sense, the idea of global integration.

Despite the ambitions, the neoliberal model of capitalism did not provide global and relatively smooth growth all over the globe. Deglobalization has emerged as one of the most important deviation of the market fundamentalism. Ironically, in the post-crisis period the myth of a borderless economy has come crashing down in the most developed economies from the West.

Geopolitics is the bold pivot of deglobalization. The proliferation of economic sanctions as a foreign policy tool is a good example of political interference in global integration. Strengthening ties between trade and geopolitics changes the integration paradigm in terms of increase of trade and capital flows between emerging super economic blocks, both West-West and East-East, as well as the growing power of state wealth funds and state-sponsored projects, particularly in infrastructure and prestige sectors like space and energy.

It is reasonable to assume that deglobalization will be a temporary phenomenon. It is true that in terms

of international trade and foreign direct investments, globalization as we know it is fading. However, the new globalization pattern is evolving by itself, exchanging the one where information asymmetry (conventional globalization) was the essence for the other where resource combination is the essence (new globalization). The new globalization focuses on the systemic nature of the global economy. Instead of selling to and producing in the global economy, there is an enormous possibility of creating from the global economy. The new globalization is more powerful than the old one, particularly because of its complementarity with the major ICT breakthroughs which leads to universal connectivity.

The orientation toward globalization requires from industrial organization three types of adjustments. First, adaptation by tailoring products/services to local markets. Second, aggregation to achieve economies of scale and scope by extending operations in great many regional market segments. Third, arbitrage to exploit the advantages (comparative, competitive or sustainably competitive). Global market offers aggregation effect by enabling high-perceived value for customers along with high value added for owners. Namely, strategy of global niche players followed simultaneously cost effectiveness and differentiation.

The more global the world is the greater is the significance of local matters. We came up with the new phenomenon, local integration. In many emerging technologies, local competitors were winning the game against the incumbent global companies.

By 2050, the world will have 9.7 billion people compared to 7.3 billion in 2015. Population ageing and shrinking workforce in developed world is opposite to the situation in Africa and Middle East.

Urbanization is a powerful force for output growth, productivity enhancement, and improvements in standard of living. It could be projected that more than 80% of world population will live in 600 mega cities in the time-frame of 25-30 years from now. This structural change also requires huge investments in urban planning, smart cities (and villages), renewable energy sources, transportation and waste management based on the principles of circular economy.

¹ For example, "quantitative easing" is a built-in destabilizer, measure which is not sterilized and thus lead to an increase in money supply in contrast to conventional targeted (or credit) easing measures, that is, purchases of specific financial assets without change in money supply.

Middle class expansion on a global level is a consequence of sustainable and inclusive economic growth in emerging economies. Given the same timeframe, almost half of the world's population might belong to upper or middle class.

Reserves of natural resources are depleting because growth is in relation with growing consumption due to new wave of industrialization. The key question is whether the world can sustain the demands of the resulting new upper and middle class from emerging economies if they choose to replicate the current lifestyle of Western consumers, or would people throughout the world agree to move to different lifestyles that would demand far less from the earth ("green energy", "circular economy", etc.).

Major shifts in economic power are also underway. East's rise and West's decline. As a consequence, global governance, particularly multinational financial organizations, needs to be transformed to reflect new reality in the global economic landscape.

However, in an emerging context where billions of people connect via social media, violent non-state actors are the new phenomenon. As a threat to global security, they may interrupt expected economic development and social progress.

Mentioned trends are not stand-alone, but interrelated. Sometimes they are reinforcing, sometimes they are offsetting each other. The net effect of these trends on an individual national economy and its business organizations will vary from case to case may change overtime, and it strongly depends on the starting position. Great majority of mega trends work to the advantage of managed capitalism as most viable version of capitalism with agile government combining a strong economic policy regime and intelligent industrial policies for tradable sectors.

Necessary adjustments in policy platform are not trivial. The fourth industrial revolution is in infancy stage and it is not easy to forecast what form it will take in the future. The more we can understand its character, the more likely we enjoy benefits. In the growth equation, technology is variable. Technology is an enabler leading to scientification of business and social life, as well. The impact of double amalgams of Industry 4.0 is practically unlimited. Unfortunately, disruptive too. However, when capital markets inhibit reinvestment in research and

development, "innovator's dilemma" is transforming into "capitalist's dilemma" [4].

There are two perspectives, demand side and supply side. As far as the demand side is concerned, innovations from the ICT field have the capacity for becoming an integral part of the product itself and formation of smart connected products (SCP). The phrase "internet of things" (IoT) has risen to reflect the growing power of SCP. Also, a major shift from the demand side is consumer engagement in design, marketing and delivery of new products/services through customer's relationship management (CRM). In the near past there was a disconnection between the usability of digital data and the physical world in which we can apply it. Namely, decisions remain trapped on two dimensional pages and screens (or 2D), while reality is three-dimensional (or 3D). The gap between the real and cyber (or digital) worlds limits capability to use billions of information produced from SCP as actionable information for business decisions. Set of technologies that superimpose digital data and images of the physical three-dimensional world known as augmented reality (AR) can close this gap. Smart glasses and screens have potential to increase demand particularly in consumer's goods, construction and retail [34].

Potential for improvement from supply side is even stronger. Namely, on the supply side, many incumbents are seeing the introduction of new technologies that create an entirely new way of serving existing need as disruption of existing supply-chains. More importantly, demand push innovations will be multiplied if the technology-push innovations in the new technology fields like robotics, 3D printing, artificial intelligence, life science, etc. integrate with them. AR also has a role to play on the supply side. Disruption is also flowing from competitors using global digital platforms for change in business model and improvements in the way how the products or services are delivered.

Life science and health care improve quality and duration of the basic human capital. Basic science and education (particularly dual academic education) offer advanced services for people and, by doing that, improve advanced human capital. Last but not least, every national economy must consider technological base of the energy

production, particularly in the fields of renewable energy and energy storage and conservation of soil and water by projects like smart cities and smart villages.

How to adjust the growth model and react with economic policy to a rapidly changing and complex environment full of mutually interrelated risk stressors, particularly if the economy is, like Serbia's, strongly burdened with binding constraints from the past? To answer this question, we start with a paradigm change in economics and economic policy in the wake of new normalities.

Heterodox approach for tackling new growth and development opportunities

Previous theories of growth and related economic policy platforms have developed from macroeconomics perspective, from an altitude of ten thousand feet. This perspective is good for spotting, for example, the impact of capital expenditures and research and development on the growth. In that case, the outcome (growth) is under the impact of these two independent variables. Despite limitations of modeling in macroeconomics², to understand what causes growth, you have to crawl inside the microeconomics and form a framework from the ground up to adjust risk appetite of business organizations *vis-à-vis* market and technology change. In a search for model of growth and its principal drivers, microeconomics (or business) perspective, also, matters.

Growth (sustainable and dynamic) is, notwithstanding, number one priority. We can all agree that economic reforms after 2008 should be set with that goal in the center.

It took some time to realize that uniform prescription for growth model embedded in market fundamentalism doctrine implemented in all sorts of economies – big and small, developed and developing, with different backgrounds, history and current conditions – did not deliver expected results. From this perspective, it sounds silly to believe that one set of policy measures can produce the same results in a whole array of different conditions.

According to [13], the impact of the neoliberal growth model was heavily dependent on circumstances. Moreover, policies that worked wonders in some places had weak, unintended, or negative effects in others. Empirics confirmed that universal efficiency of the market is not common, particularly in cases of major macroeconomic distortions like output gap, stagflation, and deflation. In such situations, market forces unleash recession, instead of booming development prospects. Moreover, standard anti-crisis measures based on the same doctrine push the economy to jobless recovery, at best. Consequently, there is a growing consensus among relevant economics scholars and practitioners that the industrial policy is an additional common-sense institutional arrangement [1], [21], and [40]. In the context of new structural economics, the relevance of the so-called “heterodox approach” in policy framework formulation, instead of orthodox (or neoliberal) one is increasing. The heterodox approach integrates macro-economic policies (monetary and fiscal) with industrial policies.

Today, in economic theory mainstream there is almost a consensus that not only in crisis, but also in normal times, the functioning of a capitalist economy requires proactive government instead of a passive one choosing wait-and-see behavior against what the market forces dictate [19]. Previous leads to the rejuvenation of industrial policy as a common-sense institutional choice in formulation of economic policies [40]. The concept is acknowledged by mainstream economists from different sides of the ideological spectrum and most influential politicians around the globe, as well. Industrial policy enthusiasts like D. Rodrik [36] have even treated new policy platform as a key lever for income convergence and catching up with developed economies.

According to W. Lim [19, p. 174], there is possibility to achieve not only a competitive advantage, but also sustainable competitive advantage based on industrial policy. Namely, in later stages of economic development, the growth model based on heterodox approach introduces sustainable competitive advantage, which can be seen as a result of synergies between new technologies and enhanced human capital. In that case, heterodox approach involves horizontal industrial policies or complementary investments

² In such models, a favourite expression is *ceteris paribus*, or with all other things being constant. In reality, other factors hardly ever remain constant.

in physical and human capital through high value added services like science, education, and health care.

In the heterodox policy approach, industrial policies dedicated to advanced manufacturing can be used to correct market failures as well as previous economic policy failures producing double macro deficits. But, industrial policies are not just about advanced manufacturing. Support to technological change and support of infant industries (vertical policies) are also critical tenets in agro-food, infrastructure, automotive, and other industries from the real economy as well as high value added service industries. Education policy, science policy and health care policy are typical examples of sector-neutral (or horizontal) policies.

To conclude, as far as the economic policy platform adjustable for the new growth model is concerned, we see three dramatic changes. First, the shift from orthodox (or neoliberal) to heterodox policy platform with two key components: hard macro-economic policy regime and industrial policies for tradable sectors. To stabilize the output by supporting hard budget constraints (both macro and micro), the architects of the concept, for example O. Blanchard et al. [1] and [2] used the old Keynes's idea of automatic stabilizers particularly in fiscal sphere³. Industrial policies are dedicated to tradable sectors (sectors increasing the export and substituting the import). These policies, actually vertical industrial policies, should be combined with horizontal policies.

Second, wider set of policy tenets in comparison with orthodox (or neoliberal) approach. According to partially modified source [1], the main policy tenets are as follows: (1) the output gap (low and stable) along with inflation (low and stable) as a primary policy tenets, (2) sustainable employment instead of flexible labor market, (3) balanced GDP structure with the growing role of the real economy instead of financial sector, (4) price parity between all types of assets (including FX rate) instead of tolerance towards speculative bubbles, primarily in the financial sector, and (5) dynamic equilibrium between the real economy and the financial sector instead of stability of the financial system.

Third, in policy formulation holistic approach dominates optimization modeling. Hardening budget constraints and introducing "smart" industrial policies based on advanced manufacturing and high value added services should be at the center of the rejuvenated wisdom in economic theory and policy platform known as new structural economics.

Beneficial impact of fiscal balance on heterodox approach implementation

The long-term prospects for dynamic, sustainable and inclusive growth in Serbia depend primarily on the implementation of the strong macroeconomic policy regime. Hardening budget constraints was based on the need to stop unsustainable twin deficits, looming crisis of indebtedness or even sovereign default. Following centrality of hard budget constraints, architects of the last program for fiscal consolidation 2015-17 revisited fiscal golden rule by separating the current account and the capital account. Program of so-called "expansionary austerity" was supported by the IMF three-year precautionary program. Program has actually balanced the current account over the period by financing the capital account partly by debt. Results, both nominal and structural, are signaling the shift of Serbia's economy toward inflection point, from transitional recession to recovery. The most important achievement is fiscal balance because fiscal imbalance always jeopardizes growth prospects. Fiscal balance has improved from a 6.6% deficit (2014) to 1.2% surplus (3Q 2017). Current account deficit has been reduced from double-digit levels to around 5% level, and it is fully covered by FDI inflow. Growth in positive territory is also a respectable achievement indicating turnaround. Price stability is maintained in both components, core inflation and customer price inflation. Level of unemployment is decreasing. The level of debt and cost of debt⁴ is decreasing. Credit rating is one step below investment grade. All of this will narrow the spread between primary and total fiscal balance and improve access to finance, as well.

³ For example, Taylor's Swedish variable investment tax, variable income tax, and variable VAT rates.

⁴ The interest rate spreads have improved by more than 500 b.p.

Despite positive achievements, Serbian macroeconomic reality has a dual nature, the shining upside and the dangerous inside. Some vulnerabilities must be considered. First, indebtedness besides debt declined in 2017 by more than 10% and it is expected to fall further in 2018 for the next 10%. Unfortunately, the median debt-to-GDP is at 60% Maastricht target is not in line with the level considered prudent. Namely, the prudent level for developing economies is considered to be lower, 40-45%. This level of debt has given the national economy more room for countercyclical fiscal policy. Second, impotency. Due to binding constraints, the economy is too sluggish to achieve sustainability proposal toward people and nature. Third, low capacity to respond adequately through investments to new challenges. Earning power and debt capacity of real economy is too weak to follow change imperative inspired by digital transformation.

There are many things to do to achieve the sustainability proposal. Hardening budget constraints requires not only fiscal balance, but also resolution of lasting uncontrolled leakages and points of misuses of public funds (state-owned enterprises from natural monopolies and infrastructure as well as state-owned commercial enterprises). In the following stage of fiscal consolidation, cleaning must replace leaning.

Inflation targeting needs to be reconsidered, too. Large fluctuations in FX, due to a sharp shift in capital flows after, for example, high volume of privatization proceeds, can create new pressure on the output gap. A large appreciation of domestic currency may squeeze tradable sector and make it difficult to recover competitiveness when FX returns back. When significant part of contracts is denominated in reserve currencies, depreciation of domestic currency can cause negative effects on output and stability of the financial system. In a small and open economy, strict inflation targeting is not sufficient and the central monetary power must use other policy tools in a form of reserve accumulation and sterilization.

Debt consolidation also matters. It is a logical consequence of the output gap. Because public investment has been too low during austerity, another imperative is to increase the space for monetary policy maneuvering. Indeed, there is a lot of room for fiscal policy, particularly

in the segment of automatic and semi-automatic fiscal stabilizers.

Today's macro-management in Serbia is much better than in the previous period, but much more can and needs to be done with the growth. After hardening budget constraints and some adjustments in monetary and financial policy, to unleash new avenues of growth we need an improvement in industrial policy platform. Intention to duplicate the level of GDP requires compound average growth rate of 7% for the next 15 years. Also, Serbia's economy must close the gap vis-à-vis global technology frontiers. If it intends to unleash new avenues of growth by adopting cutting edge technologies in carefully selected tradable sectors, the economy must implement industrial policy doctrine in order to create new jobs, increase productivity and improve competitiveness. Industrial policy, both vertical and horizontal, should empower start-ups as manifestation of technological entrepreneurship as well as research parks and clusters development. Also, previous institutional forms are prerequisite for self-employment in micro and small and medium-sized tech companies.

Heterodox economic policy platform structure

The new structural economics tends to emphasize policy of "winners picking themselves" by replacing the conventional industrial policy of "picking winners". Industrial policy has three focuses: (1) particular sectors (vertical or sector-specific policy), (2) the economy as a whole (horizontal, non-discriminatory, or neutral policy), and (3) future opportunities (creation of new strategically important industries). The vertical policy is most suitable for late developers. Horizontal policy that provides better conditions for all sectors in the economy comes with higher income level [6] and [45]. Namely, as the capacity of the private sector improves, the government gains the opportunity to shift to a sector-neutral approach which supports overall competitiveness improvement. This industrial policy, usually, appears as the last stage of development. Economies that wish to go through structural adjustment to achieve meta-national advantage have to implement industrial policy in coordination with compatible macro management automatic stabilizers (in monetary and

fiscal spheres) and follow cutting edge technologies for tradable sectors.

The essence of the heterodox approach is formulation of a framework and measures for achieving national economy growth (dynamic, sustainable and inclusive). Hausmann et al. [13] developed a unified framework for analyzing and formulating growth strategies, in line with heterodox approach, both operational and based on good economic intuition.

Growth strategies are likely to differ according to domestic opportunities and constraints.⁵ The purpose of the model is identifying the most binding constraints on economic activity, and hence the set of policies that, once targeted on these constraints at any point in time, are likely to provide “the biggest bang for the reform buck” [13, p. 1]. The framework is useful for identifying the main causes of stationary status of an economy on the road to dynamic growth. The structure of growth barriers is given in Figure 4.

The first analysis of the binding constraints to growth in Serbia was given in [44]. The main binding constraints identified were: (1) protection of property rights and other

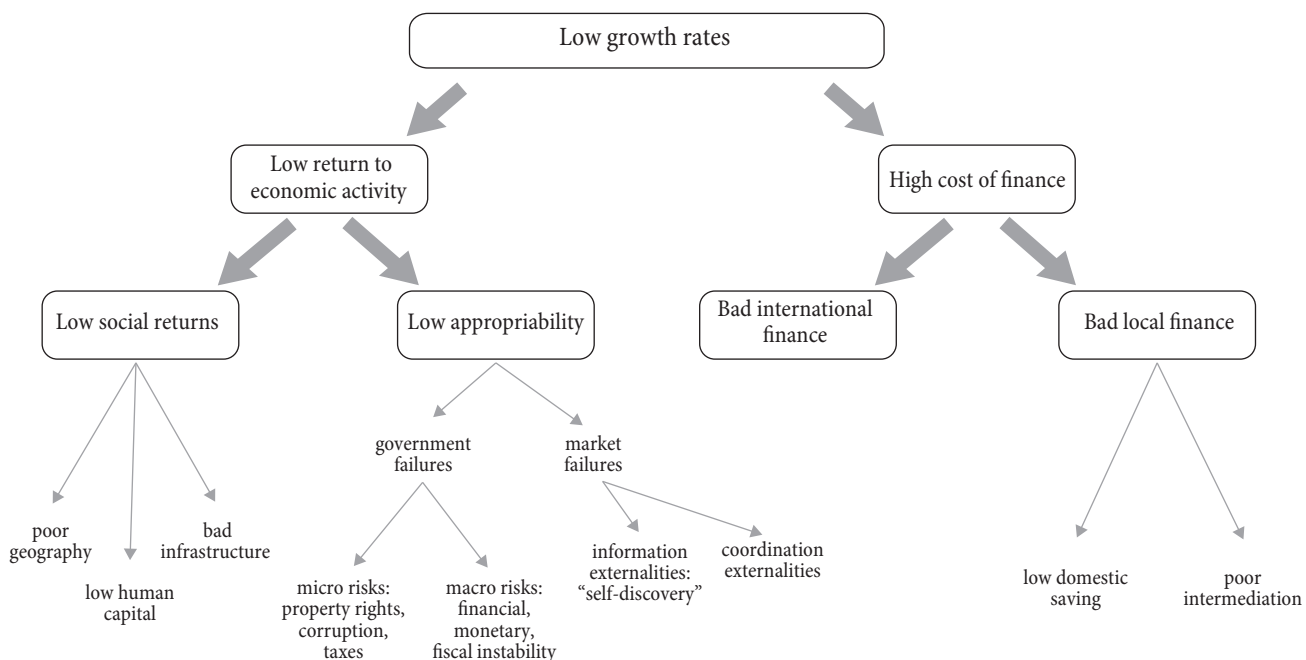
key market institutions, (2) appreciated real FX rate, (3) limited availability of credit, high real cost of financing and inefficient financial intermediation, (4) expensive, large and intrusive state, (5) inefficient corporate governance and expensive labor force (manifested through high unit labor costs or low productivity). Furthermore, the tradable sector was identified to represent a bottleneck in moving the economy to sustainable growth.

We checked whether the main binding constraints stayed or changed and revealed the following. First, according to [41], Serbia has made significant effort in improving regulatory environment for doing business. The rule of law is still falling substantially behind developed countries, but this reform is expected to be a slow process given the experience of the young EU members. Hence, it would be wise to incorporate horizontal policy measures to provide more favorable business environment in general, and for tradable sectors, particularly.

Second, the real FX rate is slowly depreciating in 2017, although it has been appreciated for most of the past period [26]. Third, even though Serbia used to be a country with the highest interest rate spreads which severely limited operation and growth of the economy [44, p. 273], since 2012, according to the [27], the interest rates on investment loans fell from around 15% to 6.2%

⁵ There are, of course, some general principles in institutional set up, such as property rights, rule of law, sound financial system, and sustainable public finances which are desirable everywhere.

Figure 4: Diagnosing growth barriers



Source: [13, p. 27].

and from 7.3% to 3.3% for non-denominated and euro-denominated loans, respectively.

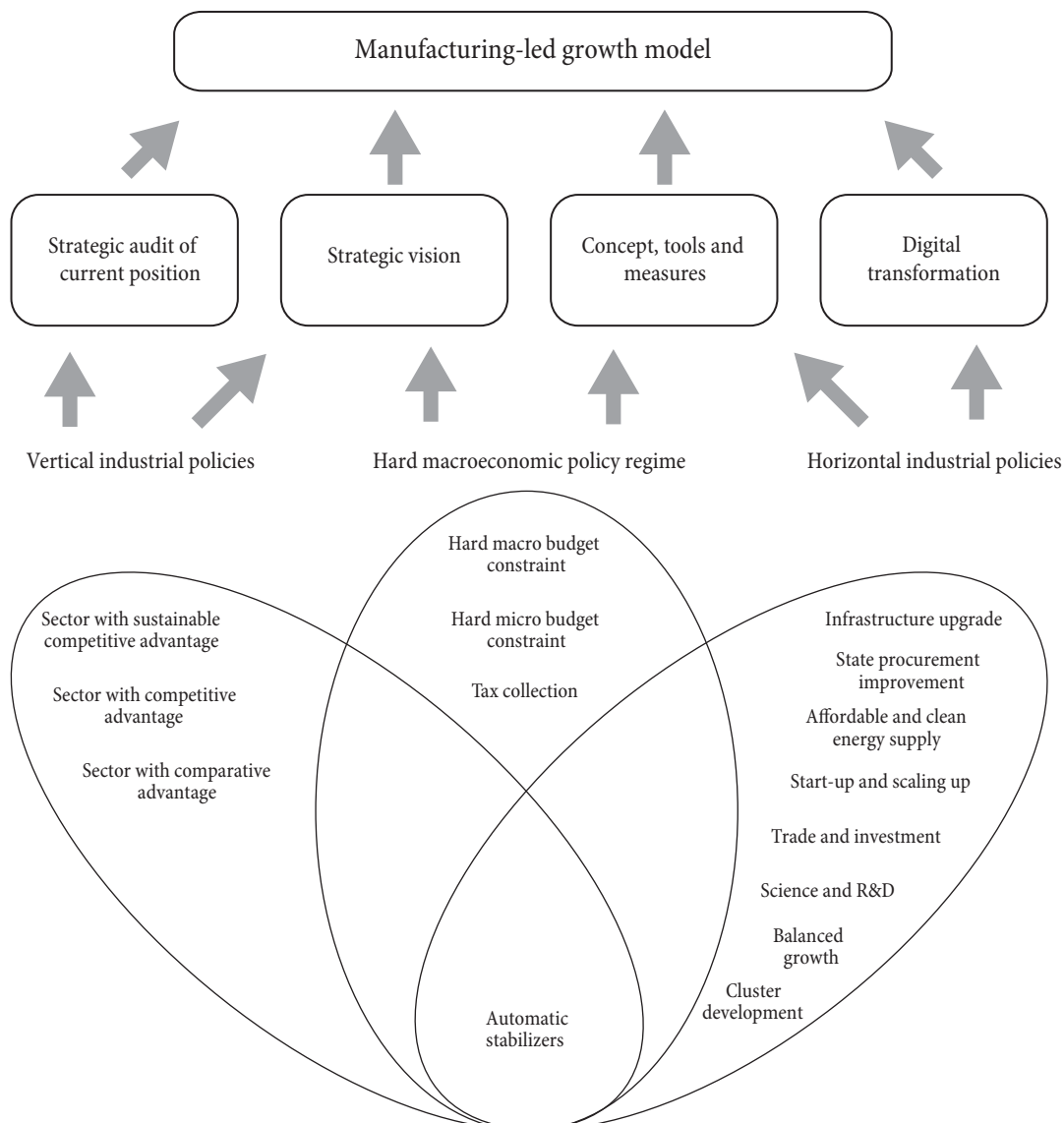
Fourth, the reform of the public administration has started in 2015, but relies on natural leave and retirement of the existing workers while (mostly) restraining new employments. The state is, however, still failing to provide an adequate level of competition in various sectors, and is constantly compromising itself when it comes to public procurement. Public procurement can play a vital role in stimulating business activity in sectors with high priority in country's growth strategy [6].

Finally, according to [44], inefficient (and often unprofessional) corporate governance and unproductive labor force have been a huge deterrent to FDI and business deals, as well as a cause of weak price competitiveness in

many sectors. The visible hand of the state is unavoidable in solving previous problem. We have no cognition of the potential improvements in this field since 2012 but some indicators [42] suggest persistently low level of education system quality and availability of staff training opportunities. Again, horizontal policy measures are aimed at solving previously mentioned problems, but we still don't see sufficiently determined state policy in this field. Rather, we are witnessing slow and often shackled efforts to introduce changes in the education system.

As Figure 5 shows, manufacturing-led development model in Serbia has to be based on three pillars [6]. The first pillar refers to vertical industrial policies. Vertical policies are sector-based. They usually refer to the tradable sector. The tradable sector consists of industries with some kind

Figure 5: Heterodox economic policy framework



of meta-national advantage (comparative, competitive and sustainable competitive). Comparative advantage is based on the abundance of factors of production like natural resources, labor force, financial capital, and position rent (near to market). Competitive advantage is a difference between the value added and cost of production enabling price premium and/or cost leadership for the same level of price. Sustainable competitive advantage is a long-run advantage, one that accumulates such powerful lead over competitors based on innovations that no one can catch up to.

The second pillar refers to horizontal industrial policy including components such as infrastructure upgrade, state procurement improvement, startup and scaling-up, education and developing skills, investment in science and research and development, etc.

The third pillar of new industrialization represents hard macroeconomic policy regime, including hard budget constraint policy (both macro and micro), automatic stabilizers, and tax collection.

In Figure 6 we present tradable industries as candidates for vertical industrial policy in Serbia. As figure shows, the majority of tradable sectors belong to the field of manufacturing. The role of manufacturing in Serbia’s new industrialization is different than in the high income countries. It is true that starting from the early 1980s and finished in the eve of the Great Recession, most of the developed economies in the world experienced a decline in manufacturing as a share in GDP. The decline was the

sharpest in the high income economies. For example, in the US, the share of manufacturing dropped from 19.3% in 1980 to around 12.1% in 2006, and in the EU 15 from 23.5 % to 15.6% during the same period. There are several factors explaining this [45]. First, technical progress improves productivity, reduces manufacturing costs, keeps the prices down and, hence, decreases the share of manufacturing in GDP. Second, services have higher income elasticity and thus have a rising share in the rising GDP, along with economic development and population ageing. Third, it is a consequence of neoliberal growth model based on financialization and deindustrialization through outsourcing.

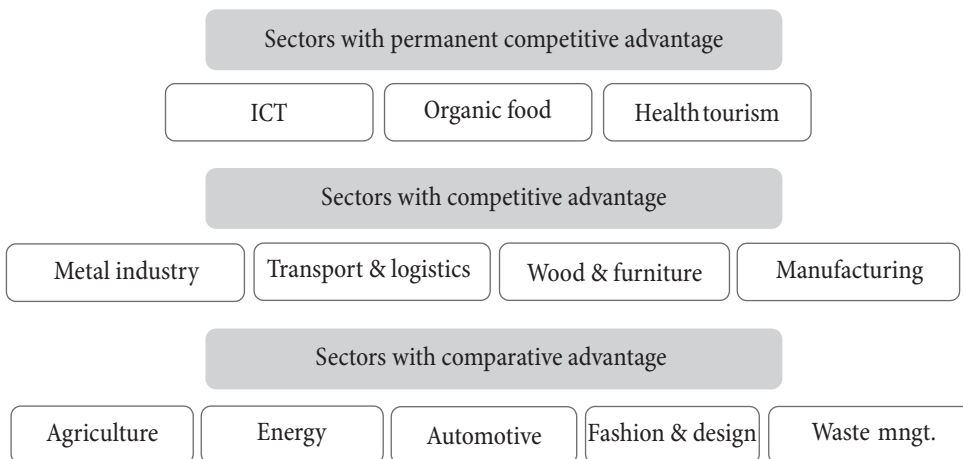
Experience with middle income countries in transition is a little bit different. Economies from the Visegrad Group reached the middle income status maintaining current account balance primarily based on their increase of share of manufacturing in GDP (around 20%), which is comparable to a manufacturing giant like Japan.

Advanced manufacturing combined with high value added services is the way to realize manufacturing-led development model in Serbia. Golden pivot in this model is ICT.

ICT industrial policy specifics

ICT is an industry that gives the “visible hand of the state” full satisfaction, because digitalization has exponential opportunities for growth, productivity increase, and meta-

Figure 6: Main pillars of vertical industrial policies for Serbia



Source: [6, p. 346].

national advantage achievement. The great majority of the world's unicorns⁶ come from this industry. ICT has potential to revolutionize everything, including other technological fields out of ICT. Digital disruption is accelerating globally, and business organizations need to be agile to respond rapidly to this structural change. A new wave of digitalization is now unfolding in which many more businesses from the real economy and high value added services put digital solutions at the heart of their value chain and strategy.

Governments are exploiting their role as a purchaser, user and provider of services using ICT to help accelerate the widespread diffusion of ICT products and solutions. According to [22, p. 5], companies from the most digitized sectors from the US and the EU tend to be two to three times more profitable as those of less digitized sectors. It is, therefore, no surprise that ICT plays an important role in virtually all industrial policy programs.

According to [10], there are several reasons for taking ICT as one of the top priorities for industrial policy program: (1) positive impact on employment, (2) positive impact on productivity growth in other sectors, and (3) positive impact on quality of life. The facilitation and diversification of financial activities, the enrichment of recreational activities, simpler and more accessible government procedures, and the extension of health and education services are just some of the wider benefits of ICT for a national economy [37].

The industrial policy for ICT is a logical choice for a national economy, given the growth potential of the sector and impact on other sectors, particularly for developing economies in the catching-up process [28]. A Korean motto colorfully explains the previous point: "Though belated in industrialization, we should be advanced in informatization". Industrial policy in the ICT sector ultimately strives at transforming a manufacturing of low-end product country into a knowledge-based country (advanced manufacturing combined with high-end service economy).

However, in Industry 4.0 there is a general recognition that without close integration of ICT transformation and

new industrialization (implementation of innovations through investment in advanced manufacturing and their spillover across different industries), no economy in the world has been able to close the development gap between itself and those at the frontier. In this stage of development, ICT becomes an integral part of the product itself (smart connected products - SCP), and by doing so, it has the capacity to unleash a new era of industrialization [33]. Also, high end services have the capability to deal with the output gap and jobless recovery, and, by doing so, to substantially affect the trajectory of the overall economy toward sustainable and inclusive development.

It should be noted, however, that this is a sector in which the US is providing major support to speed up progress, since this to a large degree is what technological ICT upscaling is about. The industrial policy for ICT is somehow specific, because it has both horizontal as well as a vertical character. Namely, ICT has been seen as a sector with significant potential for boosting a national economy's competitiveness since it involves comparatively more value added and has major diversification possibilities, whilst at the same time being an infrastructure for other sectors bringing up their efficiency, and, moreover, the quality of output. Furthermore, ICT industry has stronger domestic sectoral links than the corresponding to other sectors, and has proven to be a growing source of new jobs [37].

Unfortunately, there is a large gap in Serbia vis-à-vis developed countries concerning the level of digitalization. The US and the EU are many times more digitalized than Serbia. As a consequence, Serbia's government has made it clear that digitalization of the economy is a major priority. Industrial policy for ICT is an ideal way to trigger, implement and manage digital transformation. Also, it is in business organizations' interest to keep in touch with such industrial policy and regulatory developments.

The level of digitalization in Serbia varies throughout the sectors. As in other economies, the most digitalized sectors include ICT, media and finance. Internet companies are rapidly ramping up investment in digital infrastructure because digital technologies are a cost of staying on marketplace. They become key enablers by offering their digital platforms for sectors like retail, freight and logistics, hospitality, entertainment, etc. Production of sensors

⁶ Unicorns are defined as privately held start-ups valued at over \$1 billion.

supports automation and digitalization in manufacturing and process management. Consumer facing industries and sectors associated with the government (electric power, water supply, etc.) rank lower relative to their counterparts in the EU. In government associated sectors there is massive investment in smart grid and related technologies. The sectors that lag furthest behind the counterparts from the EU are fragmented and localized industries such as agriculture, construction, real estate, and utilities.

Despite previous facts, Belgrade, Novi Sad and Niš are home to extremely enthusiastic digital natives (aged 25 or under), strongly supported by university and networks of research institutes and innovative centers. Such innovative start-ups already produce and export some digital products and solutions. Earnings from those activities range from 0.7 to 2 billion of euros.

From the perspective of final products, ICT can be seen as a sector that produces two different types of outputs: ICT goods and ICT services. When it comes to ICT goods, electronics is the major manufacturer of the products that vastly rely on digital components, including robots, global positioning systems (GPS), video cameras, Bluetooth, video games, etc., but it is ever more present in more traditional sectors like agriculture or textiles. ICT services are developing faster than ICT goods and include a wide offer, from operation system design and telecommunication, to data processing, data mining and cloud services.

To a greater or lesser degree, industrial policies prioritize the development of ICT in nearly all countries, although in the case of developing ones, actions to encourage the ICT sector are much more modest than in the developed ones. In any case, government measures play a crucial role in ensuring that ICT innovations are developed and diffused throughout society more efficiently. As mentioned previously, there are substantial differences in the development and diffusion of ICT across countries, but at the same time an increasing number of countries are adopting similar policies for ICT [29].

There are two choices when designing industrial policy for ICT. Government can strive towards centralized or more or less decentralized approach. Both approaches

share advantages and pitfalls. The main advantage of a top down centralized approach is that it permits greater and more effective coordination, but tends to diminish the importance of the local environment and faces implementation difficulties. The emphasis on consensus seeking can lead to delays and stagnation in policy definition, but allows for more effective identification of user needs [11]. In general, policy definition is likely to benefit from central coordination, while bottom-up decentralized approaches will usually be better suited to the implementation stages of an ICT policy.

Experience from more developed economies suggests that horizontal industrial policy instruments might generally be the most appropriate policy response in ICT sector. The main issues and barriers that ICT businesses face include: (1) a need for government certainty over the medium term to encourage investment, (2) generic concerns about the availability of particular skills such as STEM or access to necessary skill sets to enable SMEs to grow, and (3) access to finance – either for growth capital or for R&D [11].

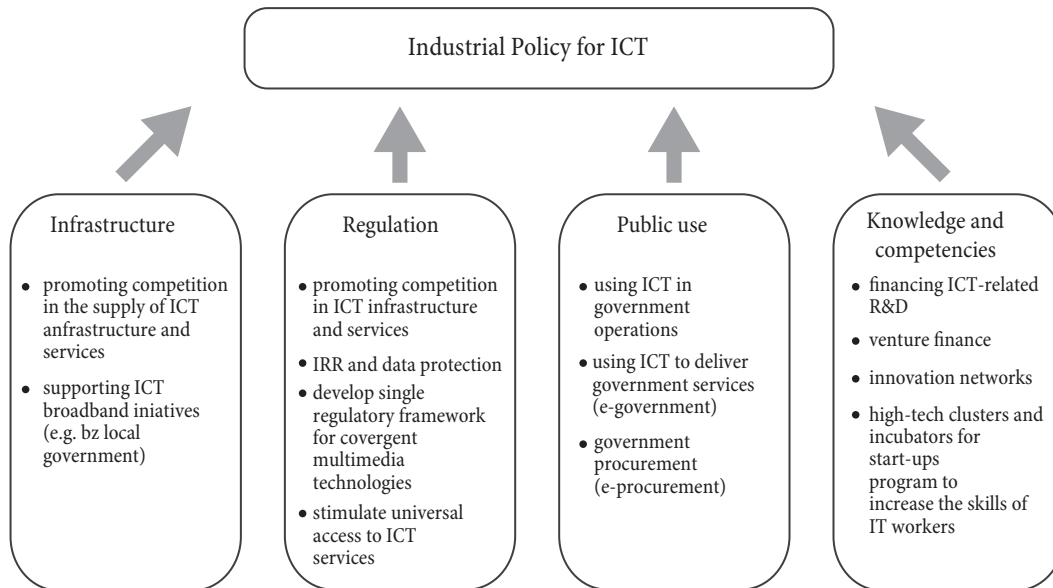
Industrial policy in ICT sector encompasses a wide range of measures related to investment, financing, taxation, export, income distribution, training, government procurement, intellectual property rights, etc., to support a number of aspects of ICT goods and services. For the purpose of more effective implementation of industrial policy for ICT, a foundation of a separate Ministry or similar body with the clear ICT strategy and policies proved as reasonable solution.

For the purpose of designing industrial policy for ICT, we divided it into four segments, representing four pillars for further identification of more general as well as tailor-made measures and instruments (Figure 7). The pillars are as follows:

1. Infrastructure
2. Regulatory framework
3. Public use of ICT
4. Knowledge and competences

1. *Infrastructure.* Policy measures and instruments in this area are to support directly the development and deployment of advanced telecommunications infrastructure. In most of the countries, the common policy trend is the support for broadband technologies,

Figure 7: Industrial policy for ICT



including the deployment of advanced mobile phone technologies, digital television, and, in general, the provision of broadband and IP services to the home and businesses.

2. *Regulation.* The changing nature of ICT, and their associated markets (technology, goods and services) requires regular changes in regulation. New regulations are needed to stimulate infrastructure development and facilitate access to key services. In addition, the dissemination and use of ICT has generated new problems requiring novel legal frameworks, such as IPR legislation, and data protection and privacy regulations. Telecommunication regulation, electronic signature law, broadband regulation are just some examples of the regulation with significant influence on country's ICT development.

Regulatory regimes have two key policy objectives. First, to encourage greater competition in ICT infrastructure and services to foster innovation and efficiency in domestic ICT markets. Second, to promote universal access to ICT services to individuals, households (particularly for lower income) and other public institutions (e.g. libraries and schools).

Regulatory regime can be shaped in a way to introduce/promote competition from abroad (South Korea) or to enable protectionism to domestic market (Brazil), but ensure fair competition among existing players. In case a country wants or has to allow for

higher presence of FDI, the regulation can postulate requirements for FDI to incorporate a minimum percentage of national ICT components. In the case of Serbia, attracting FDI can be facilitated due to country's cost advantages, modest quality human capital and proximity to the EU.

3. *Public use.* The first thing we can think of is e-government. A key element in the diffusion of ICTs is their use by government offices and agencies. ICT can be used to improve the delivery of public services and enhance the efficiency of public administration processes. The indirect role of government use can be twofold. First, as a large customer government agencies can act as "first users" and influence the emergence of formal or de facto standards. Second, the use of ICTs for the delivery of public information and services can provide a powerful channel for the diffusion of these technologies among users. Government procurement (e-procurement) can help to stimulate ICT innovation by creating a large source of demand for ICT products and services. Rapid uptake of ICT has been promoted by providing public services online, such as health and education.
4. *Knowledge and competences.* Government agencies can also play an important role in promoting the generation of ICT-related knowledge and technologies, their diffusion and their application. These policies, aiming at generating learning and

improving competences can include, among others, the financing of research and development, the promotion of high-tech innovation clusters and incubators for startups, and support measures to assist in the commercialization of novel applications and the use of new ICT products and solutions across economy.

Governments are funding ICT related R&D programs usually organized as public private partnerships between industry and government-supported laboratories and universities. One of the practical ways of surmounting access barriers to technology is through public-private partnerships with firms that are at the frontier in this industry. In addition, governments have developed a range of indirect measures to support the development and use of ICT by business. These include policies to:

- offer fiscal incentives for R&D (e.g. tax exemptions to firms that agreed to produce certain goods locally, incorporate local content, or undertake R&D)
- enhance startups access to venture capital
- stimulate SMEs activity (e.g. formation of regional centers to support collaboration between SMEs producing software, along with human capital formation and the provision of international links for software export)
- cluster development, existing ICT clusters in Serbia [14], [15] and [43] should be oriented towards becoming smaller scale production of higher value-added goods
- strengthen the ICT skills (e.g. by taking care of ICT-oriented education through horizontal policy measures)

Vertical industrial policies are no different from other areas of policy in facing these risks which can arise for the following reasons: lack of knowledge amongst policy makers about the barriers that prevent the achievement of policy objectives, the incentives on recipients of support to “game” the government, and the risk that recipients act in their own self-interest rather than society at large [11]. All these risks need to be managed. D. Rodrik [36] argues that experimentation in institutional set up is vital

to the successful implementation of industrial policies. In particular, successful policies are likely to emphasize strategic collaboration and co-ordination between the private sector and the government to uncover significant bottlenecks to growth, design the most effective interventions, and learn from any mistakes made.

As Serbia’s economy digitizes, industries will experience huge shifts in competitiveness, revenue and value pools across value chain, involving a degree of disruption that will create losers and winners, and disproportionate value for the latter. It is a price of the progress.

Conclusion

Serbia has been living for more than a quarter of a century in a crisis of transitionism due to a never-ending systemic transition. Systemic crisis needs systemic responses. Moreover, we are living in a very unusual period of a paradigm change in economic theory and policy platform in the wake of the Great Recession, the fourth industrial revolution and new normalities in the global socio-economic context. Now is the time for the visible hand of the state to play a catalyst role in market mechanisms. In formulation of comprehensive economic policies, along with macroeconomic perspective, microeconomic (or business) and sector perspective also matter.

Until fiscal consolidation in 2017, Serbia’s economy was out of tune and impotent. Now, it is pretty balanced, but still impotent. Actually, the economy is in a stationary state. Despite some growth episodes, it has ceased to grow in a sustainable way. As a small economy lagging significantly behind the EU mainstream, Serbia is not going to stay stuck in this situation for a very long time.

To escape from the stationary economy status and to keep up with the speed of changes, Serbia must energize its growth. It is not a trivial endeavor. For example, the strategic objective to double the level of GDP means 7% compound average growth rate until 2033. Last year, the growth rate was 2.4%. Forecast for this year is 3.5%. Is dynamic growth possible? Maybe, yes. Maybe, no. If the answer is yes, it requires adequate institutional, theoretical and policy platform responses. Our choices are manufacturing-led growth model, new structural

economics and a heterodox approach with industrial policies in the center, respectively.

Due to exponential growth of opportunities, digital transformation can help to achieve more robust growth. But, digital transformation is a double-edge sword, because disruption as a side effect is happening globally in ICT and related sectors. In the case of Serbia, advanced manufacturing and high value added services both have potential to create up to one-third of their share in GDP formation by 2033. The rest belongs to traditional drivers of growth like infrastructure (and infrastructure related businesses) and agriculture, as well.

Policy makers in Serbia can facilitate digital transformation in two ways, at least. First, because this technology has exponential growth potential. Second, because it is embodied in other technology fields. There is a huge further scope to use ICT to transform economy. Three specific digital forces (disintermediation, disaggregation and dematerialization) combined with universal connectivity could lead to meta-national advantage. The main digital forces reshape value chains and boost productivity not only in the ICT sector but also in other tradable sectors. There is a need to improve some tradable sectors with applications like programmable automation (organic agriculture, waste management, etc.), 3-D printing and industrial robots (automotive and mobility, wood and furniture, textile and fashion), augmented reality (construction and infrastructure development), and block chain (freight and logistics, energy, etc.).

Artificial intelligence technologies have priority against consumer driven digital economy tools like big data and financial technologies (mobile payments and mobile credit release). The reason for that is the potential impact of advanced manufacturing in keeping output gap on low and stable level as well as in maintaining fiscal balance. Conventional manufacturing companies should drive their digital transformation, building their own ecosystem, and going global. In the global economy, nobody can export if he cannot sell on domestic market. Robotics, 3-D printing, augmented realities are great priorities for advanced manufacturing. Also, digital solutions can be used to build high value added services like education, science, health care, programming skills, etc. For example,

in health tourism digital solutions are a critical success factor to build a patient-centric business model. Moreover, mobile health care applications and telemedicine solutions can help users with chronic diseases.

To achieve Digital Serbia, short-run actions should be consistent with long-run vision. The ICT industrial policy is a key component of the new wisdom. This industrial policy could help transform brokerage mentality-dominated economy with industrial and/or digital one on the road of recovery and catching up. In “3C” requirements for meta-national advantage (competitiveness, capabilities, and connectedness), digital transformation is a bold pivot.

Last year the government became an active supporter of digital transformation. But, to accelerate transition toward the digital economy, more can be done. First, the government should build world-class infrastructure to support digitalization as an investor, developer, and customer. It creates the market for frontier technologies, for example in the military, agriculture, automotive and mobility sectors. Also, the government must give startups in ICT sector and related technology sectors space to experiment before enacting official regulation. It is particularly important in the area of taxation. Implementation of some fiscal automatic stabilizers makes sense, primarily stabilizers relying on intertemporal substitution (variable investment tax), stabilizers relying primarily on relaxing liquidity constraints (variable income tax), and stabilizers relying on a combination of the two (variable value-added rate). As segments of digital sector mature, regulators are becoming more active and their influence on the speed of possible creative destruction is likely to arise. Also, the government must manage the labor market during digital disruption too, by supporting dual university education, lifelong learning, and job redeployment.

ICT sector in Serbia, particularly in the not-at-arm's length part, has the capacity to make the shift from the status of the subject of outsourcing by industry leaders to self-made product developer. Along with games, there are some market niches where this shift in strategy is feasible. Also, the ICT sector in Serbia has an opportunity to support technological entrepreneurship in other tradable industries. Technological entrepreneurship should be a necessary skill for engineers, physicians, scientists and other people with

STEM expertise. We suggest the inverse order. Namely, initiatives for “turning learning into returning” this time come from laboratories, science institutes and R&D units and are targeted toward manufacturing in startups and/or incumbents. Also, privatizations of some state-owned enterprises from commercial sector could be completed in this manner.

In today’s world, people with STEM competence will dominate social animators, including economists. Besides some short-term controversies along with digitalized economy, in the long run, the creative destruction inspired by digital transformation will be a good thing for everyone. In the short run, technological advances can be extremely disruptive, and the disruption can persist into the long run if national economies and business organizations do not have the means to adapt. These days, defining the adequate context for new technological amalgams to prosper, including industrial policies for tradable sectors and complementary horizontal industrial policies, is the role of economists. Great priority is ICT. In a good context, excellence comes along.

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