

NEW AND OLD DUAL ECONOMY

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Received: 23. 11. 2021

Accepted: 12. 3. 2022

DOI <https://doi.org/10.30924/mjcmi.27.1.5>

Preliminary communication

UDC 338.1(100-775)

Abstract

This paper aims to provide a possible explanation for the strange reoccurrence of the dual economy in developed countries. The dual economy is understood as consisting mainly of two sectors that differ in productivity, salaries, and related characteristics. It was hypothesized there is a relationship between secular stagnation, the slowdown in productivity growth, stagnation in wages, and the dual economy's reoccurrence. In explaining this relationship, technological progress and the process of globalization, which have

been prevalent in recent decades, play a crucial role. It is concluded that the era of the new dual economy and the productivity paradox represents a particular phase of economic growth. Since the phenomenon of the reoccurrence of the dual economy in developed countries has been noticed and studied only recently, further research is needed, focusing on the empirical studies.

Keywords: *dual economy, productivity paradox, secular stagnation.*

1. INTRODUCTION

In this paper, the dual economy is understood as an economy consisting mainly of two sectors that differ in productivity, salaries, and similar characteristics. The fact that these sectors differ in productivity implies that such economies can grow by reallocating resources from less productive to more productive sectors. Such growth is quite different from the widely accepted balanced growth. Indeed, the nature of dual economy growth is known as unbalanced growth. The concept of a dual economy is an old one. It was first formulated long ago by Arthur Lewis (1954) and then developed by many other authors. It is known that the

old model of the dual economy was used to explain the process of industrialization and to evaluate various measures aimed at accelerating the process of industrialization. Once industrialization is completed in a country, it is natural to assume that the country's economy has jumped onto the path of balanced growth.

In recent decades, however, we have experienced something quite different from what we have come to expect in the most developed countries due to globalization. The dual economy is a strange and unexpected reoccurrence in the most advanced and technologically advanced countries. Of course, this new type of dual economy

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is very different from the old one, and this paper will try to clarify these differences. What is even more interesting is that both types of duality exist simultaneously in our era of globalization. The relationship and interaction between the two types of duality are critical to explaining globalization itself and its consequences for developed and less developed countries.

The appearance of new dual economies is a puzzle that needs a proper explanation. However, this puzzle is related to some other growth puzzles in recent decades. The phenomenon of the new dual economy can only be understood if we explain these puzzles and paradoxes. The first refers to the productivity paradox, i.e., the total factor productivity (TFP) and the growth rate of labour productivity beginning to slow down after 1973. This is extremely strange, knowing that many important technological and social innovations have appeared in these years. The second puzzle is that, despite positive productivity growth, which was lower than before 1973, but still positive, workers' salaries stagnated in all developed countries during the same period. The result is a lower share of labour income and a higher share of non-labour income in GDP. As a result of the above and some other facts, income inequality is dramatically increasing to levels never recorded in the statistical history of the world. The last point is the phenomenon of secular stagnation observed in developed countries after the 2008 crisis. These puzzles can only be solved together and offer a deeper insight into the current problems of the global economy.

The following section explains the differences between the two dual economies. Since the old type of dual economy is reasonably well known, this study focuses on explaining the new dual economy in developed countries. It is argued that the

reoccurrence of the dual economy in advanced economies is due to revolutionary innovations that have taken place since the early 1970s. In addition to the reasons for the pronounced incidence of the dual economy in well-developed countries, this section discusses the main features and differences between the old and the new dual economies. The third section of the paper is devoted to explaining the productivity paradox. This paper argues that the productivity paradox, manifested in a permanent decline in the productivity growth rate since 1973, is a consequence of the reoccurrence of the dual economy. Therefore, this section presents the formal interpretation of the analyzed phenomenon. The fourth chapter addresses the interplay between old and new dual economies in the era of globalization. Old dualism belongs to the past of the majority of developed countries and some of the developing ones. However, many developing and underdeveloped countries have old dual economies. Trade and capital liberalization have increased their growth and convergence speed, contributing to a new dual economy in developed countries. In the fifth section, we have tried to give a brief overview of the main features of the new dual economy in Europe and some implications for management. The paper ends with concluding remarks.

2. OLD AND NEW DUAL ECONOMY

2.1. Old dual economy

The old dual economy and unbalanced growth model is also known as the model of growth with an unlimited supply of labour. Arthur Lewis, Nobel Prize winner, developed it in the early 1950s (1954). Gustav Ranis and John Fei (Ranis and Fei, 1961; Fei and Ranis, 1964) formalized the model

from a mathematical perspective somewhat later. Other versions with similar assumptions quickly evolved around the basic ideas of Lewis' papers. Indeed, these models can adequately describe the beginning of industrialization in most countries that are now considered developed.

Moreover, beginning in the mid-20th century, the model was used in many discussions of development strategies newly decolonized and other countries might adopt. Lewis became known as one of the leading scholars of economic development theory. The prevailing school of economic development was known as the Theory of Strategies of Economic Development. More recently, it has become popular, but it is now known as Old Economic Structuralism, leading to the development of the New Economic Structuralism.

The basic idea of this model can be stated simply. With the onset of industrialization, two opposing sectors emerged: the industrial (commercial, urban), commonly referred to as the "modern sector," on the one hand, and the agricultural (rural) sector, commonly referred to as the "traditional sector", on the other. The traditional sector is a source of income for many people who depend on agriculture. There is an "unlimited supply" of labour in this sector and, thus, in the economy as a whole. In such economies, it is typically assumed that there is an unlimited supply of labour.

Consequently, the marginal productivity of labour in the traditional sector is zero for most workers. Marginal productivity in the traditional sector is lower than its average productivity. In contrast, the marginal productivity of labour in the modern sector is higher than its average productivity. Due to a relatively high capital-labour ratio, marginal productivity in the modern sector is much higher than in agriculture.

In addition, technological progress and the associated steady increase in the capital-labour ratio contribute to a widening gap between the marginal productivity of labour in the modern industrial sector and that of the traditional sector in the long run. This long-lasting difference between the productivity of the two sectors is one of the reasons for the long-term industrialization, urbanization and modernization processes in general.

Given the above differences in marginal productivity, it is natural to expect that a simple reallocation of a unit of labour from the traditional to the modern sector would lead to GDP growth even without a capital increase. For this reason, many authors have referred to this model as the "Model of Growth with Zero Accumulation". Of course, this is a simple stylization because it is impossible to reallocate labour to another sector without capital accumulation. As explained earlier, this process of labour reallocation, i.e. the process of industrialization, is of long duration. However, this whole process can be divided into two stages. The first stage refers to the beginning of industrialization when labour with zero marginal productivity is transferred from the traditional sector to the modern sector. Once this process is completed, we reach the end of the modernization stage.

In the second phase of this growth model, there is also a transfer of labour from the traditional sector to the modern sector, except that the marginal productivity of labour in the traditional sector is not zero. It is higher than zero but still lower than in the modern sector, which is why we still have a high growth rate. Because of the increase in employment in industry and the resulting decrease in the marginal productivity of labour in industry, and because of the decline in employment in the traditional sector and the consequent

increase in its marginal productivity, the marginal productivity of labour in the two sectors will eventually become equal. At that moment, this kind of source of growth, which can be called the inter-sectoral contribution to growth, becomes zero. At that moment, the country begins to accelerate its growth, as described in balanced growth models. Moreover, it may take decades for the two growth phases to be completed. There is a surge in growth as they take place, including even the growth acceleration.

While the beginning of industrialization resulted from some essential technological and social innovations acting like shocks, innovations and technological progress in the context of balanced growth act more, as Schumpeter (1934) called it, in terms of creative destruction. The notion of destruction refers to the entrepreneurs introducing new technologies, which usually leads to unemployment, as machines and cheaper means of production replace labour and other expensive means of production. However, due to capital accumulation, attracted by new profitable technologies and the resulting increase in demand for labour, both wages and the number of workers increase, which is a creative part of the process. Indeed, empirical data show that this type of growth occurred in the United States and other developed countries from the late nineteenth century through the early 1970s.

2.2. New dual economy

It was noted long ago that growth in TFP and labour productivity had declined sharply since the early 1970s worldwide, especially in developed countries. Interestingly, all this happened despite the evident and strong technological progress since the early 1970s. Salaries should have increased at the same (lower) rate as TFP, but labour productivity stagnated in most developed countries from 1973 onward.

Some economists heavily exploited the above facts and questioned the importance of progress through new technologies. Other researchers point out that such innovations and technological progress are fundamentally different from the past ones. This is a well-known productivity paradox for which there have been many attempts at explanation since the late 1970s.

Of course, there have been other attempts to explain the reasons for the slowdown in productivity growth. The most likely among them may be the peculiar reoccurrence of a dual economy and the factors that caused it. The available evidence shows that the reoccurrence of the dual economy results from a breakthrough in innovations of a technical nature and, secondly, as a result of hyper-globalization, which began around the same time.

On the one hand, new technology leads to an enormous substitution of expensive labour. The IT revolution has made it possible for computers and inexpensive machines manufactured by electronics companies to replace human labour. Computers are indeed replacing labour in the production and processing of information. According to some widely held estimates and opinions from the early 1980s, about 80 percent of the corporate or public sector¹

¹ Business historians are aware of the fact that it was not only the market that dictated new social and other matters triggered by new revolutionary technologies. Alfred Chandler (1977) explained that hierarchical structures in companies also need to grow and adapt, not only the market. Consequently, in addition to the market development, there is a whole set of activities that were closed in the companies. Consequently, hierarchical structures and the number of employees working in them began to grow. From a historical perspective, therefore, it can be argued that technological progress was accompanied not only by the capital labour substitution but also by the substitution of executive labour with labour within the hierarchical structure, i.e., information-processing labour. For additional insight see Coase (1937), Simon (1947), and Williamson (1985).

workforce was engaged in information processing. Later research has shown that these estimates were not far from the truth². Similar estimates from the 1980s also show that a single PC can replace eight workers employed in information processing.

Even simple calculations suggest that the immediate diffusion of computer and IT technology in the mid-1980s could have replaced about 70 percent of the labour force. Of course, immediate diffusion of technology is not possible, and second, these new technologies create demand for other types of labour. As the cost of producing information has fallen dramatically, the demand for information in businesses and other organizations has also increased. All of this may explain why labour substitution has not been as astounding as the 70 percent figure suggests. Despite the impact of these buffers, the opportunities for labour substitution have been so enormous that they are a critical factor in explaining the severe pressure on labour supply in the labour market and the resulting stagnation in wages and reduced employment opportunities.³

On the other hand, hyper-globalization in developed countries through import activities or foreign direct investment from developed countries has opened the door

² See for example the findings of Eden and Gaggl (2014, 2016).

³ It is important to say that the approach taken here differs from two prevailing secular schools of stagnation in two important respects. First, we believe that supply-side and demand-side explanations are not in conflict but should be integrated to provide a comprehensive explanation. Second, the supply-side argument here differs significantly from that of Gordon (2012, 2014a, 2014b, 2014c, 2015), who insists on a slowdown in technical progress and a reduced importance of innovation. The approach taken here focuses on the impact of computers and IT innovation on hierarchical structure and hypothesizes that the revolutionary nature of these innovations contributed to secular stagnation. For a more detailed overview of this approach, see: Popović (2018).

for cheap labour from China and other underdeveloped countries to replace domestic labour. This is a natural consequence of the liberalization of trade and capital in the early 1980s and 1990s, respectively. There is no doubt that globalization has had almost the same impact on the labour market as technological progress. After all, importation is always treated as an alternative technology in economics textbooks. Trade liberalization causes the relative prices of imported goods to fall, leading to increased importation or increased use of “import” technology. Many industrial companies from the developed world have relocated their production capacity from developed countries to less developed countries to keep competitiveness high. The developed countries experienced the so-called premature deindustrialization (Rodrik, 2011, 2015). The spread of “import technologies” and the relocation of industrial capacity has further reduced the demand for labour in developed countries.

Both technological progress and globalization contributed to a sharp decline in the relative demand for labour in developed countries, causing the price of labour to either fall or stagnate. The share of labour in the distribution of national income fell from about 70 to 60 percent, which, along with the other factors, led to a rise in inequality. Income inequality rose to levels never before seen in the statistically recorded history of developed countries. As a result, on the one hand, the marginal propensity to consume fell, and household consumption grew slowly. On the other hand, the marginal propensity to save rose and savings grew faster. Under these circumstances, the only way to keep aggregate demand at the level needed to maintain full employment and potential GDP growth is to equate investment with savings. The only way to do this in developing countries is to have a

negative real interest rate. In other words, the “natural interest rate” is negative in the developed world.

Of course, the possibility of a negative real interest rate is limited because of the ZLB (zero lower bound). The only way to achieve a negative real interest rate is to have a high level of inflation. In other words, a positive growth rate is only possible in the presence of financial instability (i.e. inflation). However, such growth is unsustainable in the long run and far from optimal. On the other hand, the only way to achieve financial stability under these circumstances is to forgo growth. A closer look at the development of economic growth in the developed countries over the past decades shows that episodes of strong growth have been accompanied by financial instability and, conversely, periods of financial stability have been associated with weak and stagnant growth.

In recent decades, efforts to increase economic growth by lowering real interest rates have been used extensively. As a result, since the early 1980s, the data show a permanent decline in the real interest rate and (or the natural interest rate). Another name for this is financialization, the process of permanent monetary expansion through cheap loans to households and other subjects. The intention was to increase aggregate demand, which was shrinking due to the previously described process of relative decline in household consumption and insufficient increase in investment.

Currently, all developed countries are experiencing weak or stagnant growth, followed by efforts to maintain financial stability. Interestingly, despite a positive increase (the exception being Southern Europe), the growth path of developed countries in the last decade after the onset of the Great Recession is far below the growth path of

the last hundred years. In most recent academic discussions, this type of growth stagnation is referred to as secular stagnation.⁴ Secular stagnation characterizes the growth path of developed countries and, because of the extent of their presence, the growth path of the world economy. Interestingly, there is no evidence of secular stagnation in developing countries.

Note that besides the authors who explain the current stagnation in developed economies by one of the two hypotheses of secular stagnation (supply-side or demand-side), many other authors deny the existence of secular stagnation and explain the current stagnation in an old-fashioned way. Rogoff (2015), Borio (2017), Koo (2003, 2014) and others claim that this extended stagnation of growth rates is caused by another financial cycle, i.e. a mega-financial cycle. To understand this, we need to look at the past and consider the time when inflated bubble(s) burst. When an asset bubble bursts, people usually rush to pay back their loans. Therefore, deleveraging begins. From an individual perspective, this is a reasonable thing to do. From a societal perspective, however, massive deleveraging

⁴ For deeper insight into this issue see Summers (2013, 2014a, 2014b, 2015, 2016). While authors like Gordon (2012, 2014a, 2014b, 2014c, 2015) look at the supply side dynamics in explaining secular stagnation, Summers (2013, 2014a, 2014b, 2015, 2016) insists on the demand-side story just explained, based on problems created by the mismatch between savings and investment. It seems that there is no reason for the current confrontation between the two schools. The aggregate demand part of the story is reasonable. However, once an explanation for such long-run aggregate demand dynamics is needed, it is necessary to look at supply-side dynamics and the issue of capital labour substitution caused by the new IT revolution. However, the supply-side explanation promoted by Gordon, according to which all important innovations have already been discovered and stagnation is the result of a slowdown in technical progress, is unacceptable. For more detailed elaboration of just sketched circular and cumulative causation between Aggregate-Demand and Aggregate-Supply explanation, see: Popović (2018).

can have disastrous consequences. As everyone intends to repay their loans, aggregate demand shrinks, leading to a significant decline in aggregate supply. Since deleveraging takes time to unfold, the decline in aggregate demand leads to a long-term decline in GDP growth. Richard Koo (2014) argued that “the bursting of a debt-financed asset bubble and the fact that such ‘balance sheet recessions’ take a long time to recover from” is a standard key feature of two major crises in the last hundred years-1929 and 2008. Nevertheless, this process is impossible without shifts in supply and demand and the real economy. It would be helpful to combine this explanation with the supply-side arguments. The bubble and subsequent financialization resulted from efforts to overcome demand-side constraints.

Let’s consider the consequences of the Great Recession described so far. We can conclude that many adverse effects of the IT revolution on the economy have assumed such magnitude that it seems more appropriate to consider IT as a destructive creation rather than creative destruction.

Now, two phenomena can be explained: the appearance of the dual economy and the paradox of productivity. The stagnation of wages for more than forty years has lowered the relative price level of labour compared to other inputs and resources. With such a lower relative price of labour in developed countries, it has been possible to develop and increase the share of services that require high labour intensity and low technology. Since productivity and wages in these services were low, workers could easily switch from one occupation to another, thus increasing their numbers. This refers only to low-productivity services, not labour-intensive manufacturing or industry. This is not surprising since the developed

and advanced Western economies are already heavily deindustrialized, leading to the dual economy re-emergence in the developed countries. Therefore, we can assume the existence of two sectors in developed countries (Temin, 2015; Storm, 2017).

One of these two sectors is the technologically advanced sector. It has a high and constantly increasing total factor and labour productivity. Second, it is characterized by a growing share of its GDP in the total GDP of developed economies. Third, while its share of GDP is growing, its labour share tends to decrease due to the substitution of labour by capital. According to Temin (2015), the technologically advanced sector currently employs about 30 percent of the labour force in the United States. Temin (2015) coined the term FTE for this advanced sector, emphasizing the importance of Finance, Technology, and Electronics to this sector.

The remaining 70 percent of workers are working at low levels and stagnant productivity in the service sector. According to Storm (2017), most workers in the US had to find a job in the service sector. He estimates there are about 18.9 million workers in the EHS (education, health, and private social services) sector, 16.2 million in the PBS (professional and business services) sector, 14.3 million in the “other” sector (arts, entertainment, recreation, food services, and others), 13.5 million in the public sector, and 5.7 million workers in the FIRE (finance, insurance, and real estate) sector. The low level and low growth rate of productivity are the essential characteristics of the service sector. In addition, services mainly belong to non-tradable activities, while jobs in the services sectors remain perceived as precarious or uncertain, despite reasonable wages. Therefore, in addition to income inequality, the concept of

redistribution uncertainty should also be considered.

In recent decades, risks have been redistributed primarily to the non-advanced sectors and their employees. Therefore, an appropriate term for this class of the new poor is precariat, with the term being derived from the notions of the proletariat and the 'precarious' work. Low-paying jobs exist in the non-advanced sector, but market arbitrage makes them low even in the advanced sector. These are reasons for the stagnation of wages from the mid-1970s to the present, except for the mid-1990s.

3. NEW DUAL ECONOMY AND THE PRODUCTIVITY PARADOX

It is now clear that the above considerations can also explain the productivity paradox. Technological progress leads to a high increase in TFP and labour productivity only in the advanced sector. However, due to labour substitution, the number of employees in this sector decreases. In contrast, the number of employees in the less advanced and less productive sectors increases, slowing down overall productivity growth.

The rate of growth of two sectors can be presented in the following way⁵:

$$r_{Q_A} = a_A r_{K_A} + (1 - a_A)r_{L_A} + r_{T_A} \quad (1)$$

$$r_{Q_U} = a_U r_{K_U} + (1 - a_U)r_{L_U} + r_{T_U} \quad (2)$$

Here, r represents the growth rate of the variables in the subscripted number, Q , K , L , and T represent the level of production (output), capital, labour, and total factor productivity for the sectors indicated in the subscripted number, while a and r stand for advanced and non-advanced stagnant sectors.

As usual, a_A and a_U represent elasticity of production concerning capital in two sectors, while $(1 - a_A)$ and $(1 - a_U)$ represent the elasticity of production concerning labour in two sectors:

$$a_A = \frac{F_{KA} K_A}{Q_A} \text{ and } a_U = \frac{F_{KU} K_U}{Q_U},$$

where F_{KA} and F_{KU} represent the marginal productivity of capital in the advanced and stagnant sectors, respectively. Similarly:

$$(1 - a_A) = \frac{F_{LA} L_A}{Q_A} \text{ and } (1 - a_U) = \frac{F_{LU} L_U}{Q_U},$$

where F_{LA} and F_{LU} stand for marginal productivity of labour in the advanced and stagnant sectors. Total GDP can be represented as a sum of GDP in the advanced and stagnant sectors. The same applies to the total capital and total labour in the economy. Considering this argument, the growth of total GDP can be represented as follows:

⁵ For a more rigorous derivation, see Appendix.

$$r_Q = \left(\frac{Q_A}{Q}\right) [a_A r_{K_A} + (1 - a_A)r_{L_A} + r_{T_A}] + \left(\frac{Q_U}{Q}\right) [a_U r_{K_U} + (1 - a_U)r_{L_U} + r_{T_U}] =$$

$$\left[\left(\frac{Q_A}{Q}\right) a_A r_{K_A} + \left(\frac{Q_U}{Q}\right) a_U r_{K_U}\right] + \left[\left(\frac{Q_A}{Q}\right) (1 - a_A)r_{L_A} + \left(\frac{Q_U}{Q}\right) (1 - a_U)r_{L_U}\right] + \left[\left(\frac{Q_A}{Q}\right) r_{T_A} + \left(\frac{Q_U}{Q}\right) r_{T_U}\right] \quad (3)$$

If we now add a subtract $a r_K$ from the first part of the above equation and $(1 - a)r_L$ from the second part of the same equation, the following equation is obtained:

$$r_Q = a r_K + a \left\{ \left(\frac{F_{KA}}{F_K}\right) \left(\frac{\Delta K_A}{K}\right) + \left(\frac{F_{KU}}{F_K}\right) \left(\frac{\Delta K_U}{K}\right) \right\} + (1 - a)r_L + (1 - a) \left\{ \left(\frac{F_{LA}}{F_L}\right) \left(\frac{\Delta L_A}{L}\right) + \left(\frac{F_{LU}}{F_L}\right) \left(\frac{\Delta L_U}{L}\right) \right\} +$$

$$r_T = [a r_K + (1 - a)r_L] + \left\{ a \left(\frac{F_{KA}}{F_K}\right) \left(\frac{\Delta K_A}{K}\right) + (1 - a) \left(\frac{F_{LA}}{F_L}\right) \left(\frac{\Delta L_A}{L}\right) \right\} + \left\{ a \left(\frac{F_{KU}}{F_K}\right) \left(\frac{\Delta K_U}{K}\right) + (1 - a) \left(\frac{F_{LU}}{F_L}\right) \left(\frac{\Delta L_U}{L}\right) \right\} + r_T \quad (4)$$

These expressions clearly show the impact of different sectors on aggregate economic growth and productivity paradox phenomenon. The first part in brackets shows the overall impact on aggregate labour and capital growth. Consequently, all other elements represent the impact of aggregate TFP (total factor productivity) on economic growth. It consists of three parts. It should be noted that $\left(\frac{F_{KA}}{F_K}\right)$, $\left(\frac{F_{LA}}{F_L}\right)$, $\left(\frac{F_{KU}}{F_K}\right)$, and $\left(\frac{F_{LU}}{F_L}\right)$ stand for the ratio of marginal productivity of the factor in question in a given sector and the aggregate marginal productivity of that factor. Naturally, this ratio is greater than 1 for the advanced sector and lower than 1 for the stagnant sector. On the other hand, $\left(\frac{\Delta K_A}{K}\right)$, $\left(\frac{\Delta L_A}{L}\right)$, $\left(\frac{\Delta K_U}{K}\right)$, and $\left(\frac{\Delta L_U}{L}\right)$ represent the change in the share of capital or labour of a given sector in aggregate capital and labour. These elements can be either positive or negative.

The part of the equation in the first large bracket represents the impact of the increase/decrease in factor shares in advanced sectors on economic growth. The ratio between the marginal productivities of the factors in that sector and the aggregate marginal productivities is higher than one. Thus, for example, if the share of capital or labour in the advanced sector tends to

increase, this would positively affect the aggregate TFP growth rate and the growth rate in general. However, if the share of capital or labour in the advanced sector decreases, the effect on the aggregate TFP growth rate is negative.

Similar is the interpretation of the third part of the above equation given in the second large bracket. However, we are concerned with the change in stagnant sector factors' share and their contribution to the aggregate TFP and economic growth. It is already known that the ratio between the factors' marginal productivities in this sector and the aggregate marginal productivities is less than one. Consequently, if the share of capital or labour in this stagnant sector increases, then the aggregate TFP rate decreases and the same applies to the rate of economic growth. However, if the share of capital or labour in the stagnant sector decreases, the impact on the rate of aggregate TFP growth is positive.

Two previously analyzed parts of the aggregate TFP growth rate inter-sectoral contributions to TFP growth or simply the inter-sectoral technological progress. On the other hand, the last part of the above equation is the intra-sectoral technological

progress. Equation (3) represents a weighted average of TFP in two sectors, using the shares in GDP of the advanced and stagnant sectors as weights. Suppose we accept the realistic assumption that the growth rate of TFP in the stagnant sector is zero. In that case, it follows that as the share of the stagnant sector increases, which occurs as a result of an increase in the new dual economy, the growth rate of aggregate TFP inevitably falls. The same is true for the growth rate of labour productivity. This is a central feature of the productivity paradox.

It is now easy to explain the productivity paradox, i.e., how computers and other related IT innovations have caused TFP and the growth rate of labour productivity to fall since the early 1970s. To quote Robert Solow's (1987) famous question: How can there be computers everywhere but in statistics. The previous paragraph gives only a tiny part of the answer to this question, which relates to intra-sectoral technological progress. The second, more critical part of the answer lies in the second and third parts of the expression, related to the inter-sectoral contribution to the TFP growth rate. The extensive substitution of labour with capital in the advanced sector leads to a relative decline in the labour share in the advanced sector, which reduces the aggregate TFP growth rate (see the second part of expression four in the first large brackets). Of course, this could probably be offset by an increase in the capital share in the advanced sector (the first part of the expression in the first large brackets). More importantly, labour substitution in the advanced sector leads to a reallocation of labour from the advanced sector to the stagnant sector because of high labour supply, labour market pressures, and the resulting decline in labour prices. A higher share of labour in a sector with below-average TFP and labour productivity inevitably leads to a slowdown in labour productivity and the TFP growth rate. Thus, both the inter-sectoral

and intra-sectoral parts of aggregate TFP explain the productivity paradox phenomenon.

It is important to note that the reoccurrence of dualism and the slowdown in TFP and labour productivity growth in its first decade, in the 1970s, was not the only result of the technological shocks that occurred at that time. To a large extent, especially early on, it resulted from the increased entry of the baby boomer generation into the labour force and the labour market. Born between 1945 and 1960, the baby boomers constitute a larger group than the earlier and later generations. Their large numbers thus represent a significant pressure on labour supply in the labour market. More importantly, women's labour force participation increased dramatically for the first time in this generation. It was the end of the "single-earner family," in which the father participated in the labour market while the mother worked at home: raising children, preparing meals, cleaning the house and running similar errands, as well as taking care of the neighbourhood. Of course, the rise in female labour force participation was made possible by technological advances beginning in the 1950s that reduced the "male" requirements for almost all occupations and made them attainable for women. These two facts contributed to a sharp increase in the relative labour supply in the labour market. As a result, labour income stagnated, further driving the development of a new dual economy and increasing the number of "bad" jobs. All this eventually led to the first signs of a productivity paradox.

Note also that the above expressions can describe the growth of the old dual economy quite well. However, in this case, the labour force is moving in a very different direction. It moves from the traditional sector to the modern sector. In contrast, in the new dual economy, the labour force moves from the advanced, highly productive sector to the

stagnant, less productive sector. As a result of the difference in the movement of labour and other resources described above, the old dual economy is characterized by an acceleration of economic growth. In contrast, as seen and explained, the new dual economy is followed by a slowdown in economic growth. While the old dual economy is characteristic of underdeveloped or developing countries, the new dual economy is characteristic of highly developed countries.

Some argue that the new dualism is an appropriate growth model because it proposes stabilizing growth, solving or mitigating problems caused by rapid growth (e.g., ecology), and achieving full employment. Still, stabilizing growth could be a challenge. The slowdown in TFP and labour productivity growth indicates a slowdown in technological progress. The low wages that dualism entails further reduce labour substitution, especially in traditional services that employ redundant workers and in other activities that are already relatively labour-intensive. Robotisation would be slow to develop. Given that labour is the scarcest resource, technological progress would be very slow in both short and long terms, with the latter even more dangerous. Other forms of technological progress, such as energy supply or environmental conservation, do not face this difficulty⁶.

4. INTERACTION OF OLD AND NEW DUAL ECONOMIES IN THE ERA OF GLOBALIZATION

Based on the above considerations, one could argue that the era of the new dual economy and the productivity paradox

represents a particular stage of economic growth. To put it more precisely and radically, one can argue that this era represents the last stage of capitalism as we know it. From the point of view of growth mechanics, one can speak of three stages of growth from the beginning of industrialization or the beginning of the culture of growth.

The first growth stage is related to **the old dual economy and the unbalanced growth** that prevailed. This is, of course, a long and very complex stage of growth. Following Rostow's (1960) classification of the stages of economic growth, it includes:

- a) stage of traditional society,
- b) stage of transition, and
- c) take-off period.

The main feature of this stage is a slow but inevitable acceleration of economic growth caused by the reallocation of labour (and sometimes other resources) from the traditional (primarily agricultural) sector with zero marginal productivity to modern sectors (mainly manufacturing and industry in general) with high marginal and average labour productivity.

The second stage includes a **period of balanced growth**. Using Rostow's (1960) classification, it corresponds to:

- a) stage of drive to economic maturity, and
- b) stage of high mass consumption.

The main characteristic of this growth stage is the systematic production of innovations in large enterprises and the resulting systematic and balanced growth of the economy based on the industry of science and innovation. Balanced growth

⁶ See Popović (2018) for a more detailed analysis of this issue.

is characterized by six stylized facts of growth, first established by Kaldor (1957).

Despite many justified criticisms of Rostow's (1960) theory of stages of economic growth and development, it must be admitted that, as far as Western countries are concerned, Rostow predicted the stages of growth and their main features almost perfectly. He did not predict the last stage of growth in which the developed countries find themselves today. This stage is characterized by a **new dual economy and the productivity paradox**. We are back in the era of unbalanced growth. However, this time, there is a reallocation of labour from more productive to less productive sectors. As a natural consequence, the growth dynamic is characterized by a slowdown in TFP growth and labour productivity.⁷ As a result of wage stagnation, the labour share in developed countries has decreased from about 70 percent to 60 percent in a few decades, a decline of about ten percentage points. Other stylized facts are also no longer valid. Therefore, there is room for further research in this area.

Some countries are, indeed, in the early stage of the old dual economy, while others are in the late stage of the new dual economy. In other words, some of them are very advanced, while others are very underdeveloped. It is also interesting to note that this heterogeneity in growth stage and development level is not new. We have been living with it since the beginning of the last century.

The most interesting fact about the co-existence of two types of dualism is the

interaction between them, especially in the age of globalization. It is pretty clear that in the era of Bretton-Woods, the dynamics of both types of dualism were much slower than later in the era of neoliberal hyper-globalization. Because the Bretton-Woods system allowed for more protectionist policies, all processes within different countries resulted from internal interactions rather than external affairs. Consequently, both types of dual economic dynamics in underdeveloped and developed countries resulted from internal forces. In less developed countries, these dynamics were mainly determined by the reallocation of labour from the traditional to the modern sector. The main obstacle to this type of development and growth acceleration has been the ability of the country's market, especially the financial market and the financial system, to harmonize the development of the various sectors. Harmonization had to be directed toward the most dynamic reallocation of labour, i.e. the most dynamic labour reallocation without misallocating resources. This is the only way to achieve full utilization of resources and thus the acceleration of growth in the old dual economy. Such a constraint can be severe, as it presupposes the availability of so-called fundamental factors of growth (institutions, geography, and the like).

In the era of hyper-globalization, the constraints of the market and the financial system become much less binding. This is a natural consequence of the trade liberalization that began in the early 1980s and the capital liberalization in the early 1990s. The international market and the international financial system have become the most critical part of national market systems. Under these circumstances, if a country can produce more cheaply than other national competitors, its products will be sold. For less developed countries, this meant that the old dual economy that characterized

⁷ Note that by adding the last stage to Rostow's five stages of economic development we have created a non-linear model that is quite different from Rostow's linear model. In some ways, it more closely resembles Karl Marx's notion of the inevitable disappearance of capitalism, as we know it.

them would be much more dynamic than in the Bretton-Woods era of globalization. In other words, the growth acceleration would be more robust in these countries. All else being equal, growth acceleration would be stronger in the less developed countries, where the old duality is a more critical feature and source of growth. The same is valid for developed countries. By accelerating deindustrialization in developing countries, the liberalization of trade and capital in the era of hyper-globalization has helped a new dual economy develop more rapidly, and the growth slowdown in developed countries is much more pronounced than it would be in a protectionist environment.

A very illustrative example of the above statement is the story about the interplay between China and the United States in recent decades. The interdependencies between the growths of the two countries have been so strong that some authors have even coined the term *Chinamerica*. What is true for China and the United States is also true for other developed and less developed countries.

China is the latest and most vivid example of an old-type dual economy and strong growth based on the reallocation of labour from the traditional to the modern sector. It is well known that China started its reforms as early as 1978. Until 2012, the country's growth rate reached almost ten percent per year, and the country doubled its GDP every seventh year. Other factors should be discussed regarding China. Firstly, despite the 2012 decision to reduce the growth rate to seven percent, China still has not removed all workers with zero marginal productivity from the rural sector, which means that the decision to slow the growth rate is not the result of the inability to continue using this model. China's rural population accounts for 40% of the total population.

Undoubtedly, much of this is the elderly population, but many are young people who are available for further reallocation. Secondly, there is also a third sector, consisting of state-owned enterprises that are not being privatized or modernized. This sector has been used mainly as a social policy tool by protecting state-owned enterprises and preventing layoffs. For these reasons, some economists use the phrase 'privatization without losers' to describe China's experience with the privatization process. More importantly, this sector and the remaining rural population provide a valuable labour force for reallocation to the modern sector and its rapid growth. Indeed, the current seven percent growth rate is very high by any standard.

The close relationship between Chinese and US dualism in the era of hyper-globalization is apparent. As with other old dualism, Chinese dualism involved reallocating the labour force from the rural to the modern sector. In the era of hyper-globalization, however, Chinese growth was export-led. Trade and capital liberalization allowed China's remarkable growth to be less dependent on otherwise missing fundamental growth factors. China exported mainly manufactured products to the United States and other developed countries. In this context, trade liberalization, which began to accelerate in the early 1980s, was critical to the success of the Chinese economy. Nevertheless, the overall dual economy in the United States and other developed countries would not be possible without cheap imports from developing countries, such as China, and new technologies. An apparent link between the two dualisms has helped them become durable and sustainable.

5. MANAGEMENT IMPLICATIONS FOR THE SEE COUNTRIES

The dual economy phenomenon has developed more slowly and lesser in Europe than in the United States. Moreover, it is different than in the United States. There are two reasons for this. First, *Europe is much more fragmented* than the United States. Despite a remarkable degree of integration achieved so far, there are still many traditional, state-imposed barriers between EU countries. This, of course, refers mainly to countries that are not part of the EU, such as South East European (SEE) countries or the so-called European super-periphery. Apart from state-imposed barriers, many other significant barriers are crucial for understanding the functioning of European labour and other markets. In this context, the different languages in EU countries are crucial. The free movement of workers is not as critical to the functioning of the labour market as it is in the United States. Other differences include cultural differences, different political preferences, different social protection systems, and the like.

The second significant difference concerns the EU's external relations with other countries. The EU has many substantial, state-imposed external barriers, such as tariffs, quantitative restrictions, and technical barriers. There are two caveats here. First, the EU has many preferential arrangements with SEE, CIS (Commonwealth of Independent States), MENA (Middle East and North Africa), and other regions. All these heterogeneous barriers within Europe and beyond have contributed significantly to the process of a new dual economy developing much more slowly and in a different way in Europe than in the U.S.

As far as Europe is concerned, it is interesting to note an intra-country dualism

and an inter-country dualism. The first, intra-country dualism, refers to new dual economies that develop within specific countries. In other words, two types of sectors (advanced and backward) are developed. Here, local forces act to slow growth in certain countries. Of course, this process is more pronounced in larger and more developed European countries.

Conversely, the inter-country dual economy also contributes to the slowdown of TFP growth in Europe. Note, however, that this type of dualism acts as a buffer against high unemployment in some countries. These are mainly countries in the European periphery with a significant unemployment problem. The influx of capital from developed EU countries often cannot solve the problem of unemployment, while the price of labour becomes low. As a result, market arbitrage causes many non-tradable activities, mainly in personal services, to become attractive for developed countries. Consequently, many unemployed relocate personal services from the EU periphery to the developed countries. It is known that the population of Bulgaria, for example, has shrunk by one million people in recent decades. Similarly, Romania has lost about two to three million people. The situation is similar in Croatia, as well as in other SEE countries.

Those SEE countries, not belonging to the EU, belong to the so-called European super periphery. Here the situation is similar and, as far as unemployment is concerned, even harsher than in Croatia, Bulgaria and Romania. The relative number of emigrants from the Western Balkans was about the same as in the other SEE countries, belonging to the EU (Croatia, Bulgaria and Romania). The only difference is that more emigrants from Serbia, Albania, Bosnia and Montenegro emigrated

to other countries, such as Canada and the US than Europe. Later, however, the number of emigrants from SEE to the developed EU countries, especially Germany and Austria, increased significantly. Part of them were illegal emigrants, especially at the beginning of the process, but later more and more became legal workers. Some came as permanent employees, while others were employed only temporarily. Most of them found work in the personal services sector, an essential part of the dual economy in developed EU countries.

Understanding the dual economy phenomenon, which is most pronounced in developed countries, is essential for structural management and decision-makers in less developed countries. In the context of approximation to the European Union, they face the migration of young people. Other management implications can be viewed through the prism of the old and new dual economies. First, globalization has meant that events from strong economies sooner or later spill over to developing countries, so timely perception of the dual economy realities allows for an appropriate response for growth management purposes.

In addition, the dual economy has essentially led to a migration of labour from less developed to more developed European countries, making it much more difficult for entrepreneurs from less developed countries to function and survive. However, entrepreneurs can indirectly influence the macroeconomic impact of particular policies by choosing the appropriate combination of production factors. Based on the knowledge of the different stages of economic growth and the productivity paradox, public administrators and macroeconomic decision-makers have the opportunity to create better policies, affecting the stability or acceleration of economic growth (based on

the optimal distribution of labour between the two types of sectors - advanced and backward).

6. CONCLUDING REMARKS

This paper attempts to highlight and explain the significant reoccurrence of the dual economy in developed countries. It has been hypothesized that there is a relationship between secular stagnation, declining productivity growth, wage stagnation, and the dual economy reoccurrence. Core processes that explain this relationship are technological progress and globalization, which have been prevalent in recent decades. This type of research is mainly based on literature reviews that deal with the phenomena under consideration. The dual economy reoccurrence in developed countries has only been noticed and studied recently. To date, there is very little research that directly addresses this problem. Further research should focus on empirical research, especially in the European super periphery.

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NOVA I STARA DUALNA EKONOMIJA

Sažetak

U ovom se radu pokušava pružiti moguće objašnjenje neobične ponovne pojave dualne ekonomije u razvijenim zemljama. Nju se razumijeva u smislu postojanja dva sektora, koji se razlikuju u produktivnosti, plaćama i drugim povezanim karakteristikama. Postavlja se hipoteza o odnosu između sekularne stagnacije, usporavanja rasta produktivnosti, stagnacije dohodaka i ponovne pojave dualne ekonomije. U objašnjavaivanju ovog odnosa, ključnu ulogu imaju tehnološki napredak i proces globalizacije, kao ključna

obilježja proteklih nekoliko desetljeća. Zaključuje se da era nove dualne ekonomije i paradoks produktivnosti predstavljaju posebnu fazu ekonomskog rasta. S obzirom da je fenomen ponovne pojave dualne ekonomije u razvijenim zemljama tek nedavno primijećen i tek se odnedavno analizira, potrebna su njegova buduća istraživanja, s naglaskom na empirijske studije.

Ključne riječi: dualna ekonomija, paradoks produktivnosti, sekularna stagnacija.

APPENDIX

The distributional equation for production in sector j is given by:

$$Q_j p_j = w_j L_j + \pi_j K_j \quad (1)$$

Here Q_j stands for the level of production in sector j , L_j and K_j stand for the quantity of labour and capital in that sector, while π_j , w_j , and p_j present prices of capital, labour, and products in sector j . Under the assumption that the production function is linearly homogenous, following Euler's theorem, the above-given equation can be treated as a production function of the respected sector. In that case, the relative price of respected factors in that sector would be equal to the marginal productivity of capital and labour, $\frac{\pi_j}{p_j} = F_{Kj}$ and $\frac{w_j}{p_j} = F_{Lj}$.

If we now take r_x to present rate of growth of variable $x \in (Q_j, K_j, L_j)$, then the rate of growth of production in the respected sector can be decomposed in the following very well-known way:

$$\begin{aligned} r_{Qj} &= \frac{\pi_j K_j}{Q_j p_j} r_{Kj} + \frac{w_j L_j}{Q_j p_j} r_{Lj} + \frac{\pi_j K_j}{Q_j p_j} r_{\pi_j} + \frac{w_j L_j}{Q_j p_j} r_{w_j} - r_{p_j} = \\ &= a_j r_{Kj} + (1 - a_j) r_{Lj} + [a_j r_{\pi_j} + (1 - a_j) r_{w_j} - r_{p_j}] = \\ &= a_j r_{Kj} + (1 - a_j) r_{Lj} + r_T \end{aligned} \quad (2)$$

Obviously, a_j and $(1 - a_j)$ represent elasticity of production with respect to capital and labour, respectively. Consequently, the first part of this equation presents the contribution of capital to the economic growth of the respected sector, the second part presents the contribution of labour, while the last part presents the contribution of total factor productivity of that sector, which, as we see from the brackets, equals the difference between the growth rate of factor prices and price of the product.

Since total GDP is equal to the sum of production in all sectors, that is $Q_t p_t = \sum_{j=1}^k Q_j p_j = \sum_{j=1}^k [w_j L_j + \pi_j K_j]$, it is possible to present the rate of growth in the whole economy as:

$$\begin{aligned} r_Q &= \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) a_j r_{Kj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) (1 - a_j) r_{Lj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) [a_j r_{\pi_j} + (1 - a_j) r_{w_j} - r_{p_j}] \\ r_Q &= \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) a_j r_{Kj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) (1 - a_j) r_{Lj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) r_T \end{aligned}$$

This can be further transformed as follows:

$$\begin{aligned} r_Q &= \frac{F_{KK}}{Q} \sum_{j=1}^k \frac{F_{Kj} K_j}{F_{KK}} r_{Kj} + \frac{F_{LL}}{Q} \sum_{j=1}^k \frac{F_{Lj} L_j}{F_{LL}} r_{Lj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) r_T = a \sum_{j=1}^k \frac{F_{Kj} K_j}{F_{KK}} r_{Kj} + (1 - \\ &a) \sum_{j=1}^k \frac{F_{Lj} L_j}{F_{LL}} r_{Lj} + \sum_{j=1}^k \left(\frac{Q_j}{Q}\right) r_T \end{aligned} \quad (3)$$

Now, after subtracting and adding and from the above expression, we get:

$$\begin{aligned}
 r_Q &= a r_K + (1 - a) r_L + a \sum_{j=1}^k \left(\frac{F_{Kj} K_j}{F_{KK}} \right) \left(\frac{K_j / K}{(K_j / K)} \right) + (1 - a) \sum_{j=1}^k \left(\frac{F_{Lj} L_j}{F_{LL}} \right) \left(\frac{L_j / L}{(L_j / L)} \right) + \sum_{j=1}^k \left(\frac{Q_j}{Q} \right) r_T \\
 r_Q &= a r_K + (1 - a) r_L + a \sum_{j=1}^k \left(\frac{F_{Kj}}{F_K} \right) \Delta \left(\frac{K_j}{K} \right) + (1 - a) \sum_{j=1}^k \left(\frac{F_{Lj}}{F_L} \right) \Delta \left(\frac{L_j}{L} \right) + \sum_{j=1}^k \left(\frac{Q_j}{Q} \right) r_T
 \end{aligned}
 \tag{4}$$

The first and second part of the expression (4) presents the contribution of aggregate capital and labour to the economy growth rate, while all other parts together present the contribution of aggregate total factor productivity (TFP). Note that aggregate TFP is here decomposed into three parts. The first part, $a \sum_{j=1}^k \left(\frac{F_{Kj}}{F_K} \right) \Delta \left(\frac{K_j}{K} \right)$, obviously presents the impact of change of sectoral structure of capital on economic growth. Similarly, the second part of this expression, $(1 - a) \sum_{j=1}^k \left(\frac{F_{Lj}}{F_L} \right) \Delta \left(\frac{L_j}{L} \right)$, presents the contribution of changes of labour sectoral structure to economic growth. Together, these two parts present the so-called impact of inter-sectoral technological change on economic growth. The last part of the above equation, on the other hand, presents the so-called intra-sectoral technological progress.

Assuming only two sectors, we get:

$$\begin{aligned}
 r_Q &= a r_K + (1 - a) r_L + a \left\{ \left(\frac{F_{KA}}{F_K} \right) \left(\frac{\Delta K_A}{K} \right) + \left(\frac{F_{KU}}{F_K} \right) \left(\frac{\Delta K_U}{K} \right) \right\} + (1 - a) \left\{ \left(\frac{F_{LA}}{F_L} \right) \left(\frac{\Delta L_A}{L} \right) + \left(\frac{F_{LU}}{F_L} \right) \left(\frac{\Delta L_U}{L} \right) \right\} + \\
 & \left[\left(\frac{Q_A}{Q} \right) r_{T_A} + \left(\frac{Q_U}{Q} \right) r_{T_U} \right] = \\
 & [a r_K + (1 - a) r_L] + \left\{ a \left(\frac{F_{KA}}{F_K} \right) \left(\frac{\Delta K_A}{K} \right) + (1 - a) \left(\frac{F_{LA}}{F_L} \right) \left(\frac{\Delta L_A}{L} \right) \right\} + \left\{ a \left(\frac{F_{KU}}{F_K} \right) \left(\frac{\Delta K_U}{K} \right) + (1 - \right. \\
 & \left. a) \left(\frac{F_{LU}}{F_L} \right) \left(\frac{\Delta L_U}{L} \right) \right\} + \left[\left(\frac{Q_A}{Q} \right) r_{T_A} + \left(\frac{Q_U}{Q} \right) r_{T_U} \right]
 \end{aligned}
 \tag{5}$$

This is equivalent to expressions given in the main body of the paper.