

The Contribution of Total Factor Productivity on Economic Growth in Selected Southeastern European Countries

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Abstract: This paper delves into the impact of capital accumulation, effective employment, and total factor productivity (TFP) on the economic growth of five Southeastern European countries: Albania, Croatia, North Macedonia, Serbia, and Slovenia. The examination is based on the Solow-Swan neoclassical growth model and the Cobb-Douglas production function, which dissects economic growth into capital, labour, and productivity inputs. The analysis pays particular attention to the growth dynamics of North Macedonia over the entire period (1998-2019) and two sub-periods (1998-2008 and 2009-2019). The article seeks to provide a comprehensive evaluation of the primary drivers of economic growth in Southeastern European countries, emphasising the evolving roles of capital, labour, and productivity over time. Through a detailed analysis of these determinants, the study offers insights into the necessary policy actions to ensure sustainable long-term growth, especially in transition economies. The empirical analysis utilises the growth accounting framework and employs regression analysis to estimate the output elasticities of capital and labour inputs. The data analysis covers the period of 1998-2019, specifically focusing on two sub-periods to investigate shifts in growth drivers over time. Each factor's contributions are presented in absolute terms (percentage points) and relative terms (percentages) to provide a comprehensive understanding of their roles. The findings indicate that capital accumulation has been the predominant growth driver in most countries, especially Albania, Croatia, and North Macedonia. However, in Serbia and Slovenia, total factor productivity (TFP) played a more significant role, contributing substantially to growth. In North Macedonia, TFP showed strong contributions during 1998-2008 but declined sharply in 2009-2019, leading to increasing reliance on capital and labour inputs for growth. This study is valuable in emphasising the shift in growth drivers over time and highlighting the importance for Southeastern European countries to concentrate on productivity enhancements, innovation, and labour market reforms to sustain long-term growth. These findings provide significant insights for policymakers seeking to improve economic performance in transition economies.

Keywords: Total factor productivity, economic growth, Southeastern Europe.



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Introduction

Economic growth is commonly studied using production functions, in which the output of an economy is formulated as a function of inputs such as labour and capital. A pivotal theory in this realm is the neoclassical growth model, introduced by Solow (1956: 65-94), which underscores the significance of capital accumulation, labour, and external technological advancement in propelling long-term economic growth. In this model, technological progress, often quantified by total factor productivity (TFP), is crucial for sustained growth as it accounts for the additional increase in output that cannot be solely attributed to the accumulation of labour and capital.

The concept of total factor productivity was initially formalised in Solow's seminal work (1957:312-320), which introduced the residual approach to measuring technological progress. Solow's growth accounting framework is based on the premise that economic output can be broken down into contributions from labour, capital, and a residual term representing TFP. This residual encompasses factors such as technological innovation, efficiency enhancements, and institutional elements, all of which contribute to increasing the productive capacity of an economy without proportional increases in input quantities. In Solow's model, capital demonstrates diminishing returns, indicating that without ongoing technological progress (represented by TFP growth), economies will eventually encounter a deceleration in growth rates.

Expanding on Solow's foundational work, the endogenous growth theories developed by Romer (1990: 71-102) and Lucas (1988: 3-42) shifted the focus from external to internal factors influencing technological change and productivity growth. These models emphasise the significance of human capital, innovation, and knowledge spillovers in driving sustained long-term growth. For example, Romer's (1990: 71-102) model contends that investments in research and development (R&D) and the accumulation of knowledge can result in increasing returns to scale and ongoing growth in total factor productivity. In this context, institutions and policies that foster innovation and knowledge diffusion are critical in shaping a country's productivity and long-term growth potential (Aghion & Howitt, 1992: 323-351).

Based on Solow's neoclassical theory, the growth accounting framework is a widely utilised method for empirically evaluating the factors contributing to economic growth. This approach provides a structured way to quantify the influences of capital, labour, and total factor productivity on overall growth (D. Jorgenson & Griliches, 1967: 249-283). The fundamental growth accounting equation is derived from the Cobb-Douglas production function, where output is represented as a function of capital and labour inputs, adjusted by their respective elasticities, along with an efficiency term representing TFP. By examining the growth rates of output, labour, and capital, the framework enables researchers to calculate the residual growth attributed to TFP (Barro & Sala-i-Martin, 1995).

In addition to capital and labour inputs, institutions play a vital role in influencing TFP growth. Institutional quality, encompassing property rights, governance, regulatory efficiency, and political stability, impacts a country's capacity to embrace new technologies and enhance productivity (Acemoglu, Johnson, & Robinson, 2001: 1369-1401). Robust institutions foster an environment conducive to investing in physical and human capital, while weak institutions can impede productivity enhancements by introducing inefficiencies and obstructing innovation. Consequently, institutional quality has emerged as a central focus in the literature on economic growth, especially in post-transition economies such as those in Southeastern Europe (Estrin & Uvalic, 2016: 455-483).

This paper employs the growth accounting framework to dissect the growth of GDP per capita into components arising from the growth of capital per capita, the growth of employment per capita adjusted for human capital growth, and the residual element attributed to total factor productivity growth in the case of 5 Southeastern European countries for the period 1998-2019. The main hypothesis is that in the context of Southeastern European countries that have undergone significant political and economic transformations, the role of total factor productivity in driving economic growth is particularly noteworthy. These economies have seen varying degrees of success in productivity gains, with factors such as institutional reforms, EU integration, and foreign direct investment (FDI) playing pivotal roles in influencing TFP growth (Djankov & Murrell, 2002:

739-792). Therefore, comprehending how TFP contributes to growth in these countries and how institutional factors may influence this relationship is crucial for crafting policies to enhance long-term growth prospects.

The remainder of the paper is organised as follows: following the introduction, the second section reviews the relevant literature on the relationship between total factor productivity and economic growth. The third section outlines the empirical methodology used to compute the average contribution of TFP to the average economic growth of the selected Southeastern European economies. The fourth section presents and discusses the results. Finally, the concluding section provides conclusions and policy recommendations based on the results.

Literature Review

It is widely recognised that total factor productivity plays a critical role in driving economic growth, especially in developing economies. Research indicates that TFP growth significantly contributes to economic advancement in countries such as the Czech Republic (Hájek & Mihola, 2009: 740-753) and Pakistan (Saleem, Shahzad, Khan, & Khilji, 2019). Hájek & Mihola (2009: 740-753) suggest that TFP was the primary driver of the Czech Republic's accelerated economic growth from 1995-2000 to 2001-2007, with the share of TFP in economic growth increasing from 74% to 78%. Saleem et al. (2019) found that innovation significantly contributes to Pakistan's economic growth and production levels, with important policy implications for sustainable economic growth in Pakistan and other emerging economies. Additionally, innovation and institutional quality are key determinants of TFP and economic growth in emerging economies (Saleem et al., 2019; Sawyer, 2011). A study by Huseyni, Eren, & Celik (2017: 63-73) explored the relationship between TFP, economic growth, and exports in OECD countries from 1990-2013, suggesting that TFP and exports positively impact economic growth, with TFP having a stronger positive impact than exports. The study also highlights that OECD countries can enhance economic growth by improving production efficiency and directing exports to the most efficient areas.

The relationship between total factor productivity and economic growth is intricate, with some researchers contending that TFP may not accurately measure technological change (Carlaw & Lipsey, 2003: 457-495; Chen, 1997: 18-38). TFP is deemed an unreliable gauge of technological change and economic growth. True economic growth is driven by continually creating opportunities for further technological advancements rather than by the supernormal profits of technological change (Carlaw & Lipsey, 2003: 457-495). The significance of TFP in economic growth varies depending on its definition and measurement. Technological change's importance in economic growth largely depends on how TFP is defined and measured. The conclusions drawn by Young (1994: 964-973) and Krugman (1994: 62) about the insignificance of TFP in East Asian economic growth, as noted by Chen (1997: 18-38), are unwarranted. Unlike other newly industrialised economies, Singapore's economic growth has not been propelled by improvements in TFP. The lack of TFP growth in Singapore is a vital concern that should not be underestimated, as it signifies the high cost of achieving economic growth in Singapore. Singapore's TFP growth has been notably low compared to other developed countries, prompting the government to set a target of at least 2% TFP growth to sustain high productivity and GDP growth. The estimates of TFP growth in Singapore vary significantly across different studies due to discrepancies in methodologies and periods examined (Renuka, 1999: 61-67).

Recent research has delved into the positive relationship between total factor productivity growth and economic prosperity in Central, Eastern, and Southeastern European countries (Aktaş, 2023: 145-160). The study reveals that TFP growth substantially and positively impacts economic prosperity, as indicated by the Legatum Prosperity Index, in 18 Central and Eastern European nations from 2007 to 2020. The biggest contributors to economic prosperity in these countries were the labour and capital share in GDP. Policies that enhance factors such as health, education, skills, and knowledge, which can boost labour productivity, could positively affect economic prosperity in Central and Eastern European countries (Aktaş, 2023: 145-160). TFP in Slovenia experienced rapid growth in the early 1990s but then decelerated significantly in the latter half of the decade, with real GDP growth primarily stemming from capital deepening and rises in labour participation instead of TFP growth. Slovenian policymakers

should prioritise measures that enhance economic efficiency and promote TFP growth to achieve swift and continual economic growth (Mrkaic, 2002: 445-454). Additionally, Habib, Abbas, & Noman (2019: 756-774) examine the influence of human capital, intellectual property rights, and research and development spending on TFP, which in turn drives economic growth, using a panel data analysis of BRIC and Central and Eastern European countries from 2007 to 2015. They deduce that human capital, intellectual property rights, and research and development expenditures are pivotal factors in determining variations in total factor productivity, ultimately leading to economic growth.

The surge in productivity growth fueled by information technology stands out as a significant factor in the revitalisation of economic growth in the late 1990s in the United States. During this time, the US economy witnessed a marked increase in output growth compared to the early 1990s, driven by rapid capital accumulation, increased hours worked, and faster total factor productivity growth (D. W. Jorgenson & Stiroh, 2000: 125-210). Furthermore, an examination of US agriculture history indicates that total factor productivity is internally generated and co-determined with growth rather than driving it (Mundlak, 2005: 989-1024). This study delivers a comprehensive overview of the growth trajectory of US agriculture over the past two centuries, emphasising the pivotal factors contributing to this growth, such as available resources, technological advancements, and product demand. The author contends that the economic context influences dissecting output growth into total factor and total factor productivity and that adopting new technologies hinges on the incentives and limitations producers face. In conclusion, the US experience has benefitted from a relatively seamless resource flow between agriculture and non-agricultural sectors, which has been crucial for leveraging the opportunities arising from changes in available technology.

Empirical Methodology and Data

This study utilises the growth accounting framework based on the Solow-Swan neoclassical growth model (Solow, 1956: 65-94) and expanded to integrate

human capital, as proposed by Mankiw, Romer, & Weil (1992: 407-437). This framework dissects GDP per capita growth into components arising from capital per capita growth, employment per capita adjusted for human capital growth, and the residual element attributed to total factor productivity growth.

The production function is based on the widely used Cobb-Douglas specification, favoured in growth literature for its simplicity and flexibility in depicting the connections between inputs and output. Incorporating human capital embodies the endogenous theory, emphasising the significance of education and knowledge in improving productivity.

The aggregate production function expressed in Cobb-Douglas form is:

$$\frac{Y}{N} = A \times \left(\frac{K}{N}\right)^\alpha \times \left(\frac{L}{N} \times H\right)^{1-\alpha} \quad (1)$$

where Y is real output, A is TFP, K is the capital stock, L is labour input (employment), H is a human capital index, and N is the population. α is the output elasticity of capital, and $1 - \alpha$ is the output elasticity of effective employment (employment adjusted for human capital).

Following the growth accounting framework, the output per capita growth rate is decomposed using the first difference of the logarithms of the variables:

$$\Delta \ln \left(\frac{Y}{N}\right) = \Delta \ln A + \alpha \Delta \ln \left(\frac{K}{N}\right) + (1 - \alpha) \left(\Delta \ln \left(\frac{L}{N}\right) + \Delta \ln H\right) \quad (2)$$

where $\Delta \ln(Y/N)$ is the growth rate of output per capita, $\Delta \ln A$ is the TFP growth rate, $\Delta \ln(K/N)$ is the capital per capita growth rate, $\Delta \ln H$ is the employment per capita growth rate and $\Delta \ln(L/N)$ is the human capital index growth rate.

TFP growth rate as the portion of economic growth not explained by capital and labour inputs, reflecting exogenous technological progress in the original Solow model and endogenised through human capital in the extended model, is computed as:

$$\Delta \ln A = \Delta \ln \left(\frac{Y}{N} \right) - \alpha \Delta \ln \left(\frac{K}{N} \right) - (1 - \alpha) (\Delta \ln \left(\frac{L}{N} \right) + \Delta \ln H) \quad (3)$$

A fixed effects regression model is used for unobserved heterogeneity across countries to estimate the contributions of capital per capita growth and effective employment growth to output per capita growth. The regression model is specified as follows:

$$\text{outputg_pc}_{it} = \beta_1 \times \text{capitalg_pc}_{it} + \beta_2 \times \text{employmentg_pc}_{it} + \gamma_i + \epsilon_{it} \quad (4)$$

where outputg_pc_{it} is the output per capita growth rate for country i and time t , capitalg_pc_{it} is the capital per capita growth rate for country i and time t , effective employment growth rate for country i and time t , γ_i represents the country-specific fixed effects and ϵ_{it} is the error term.

This study examines the impact of total factor productivity on the average economic growth in five Southeastern European countries. Three of these countries are non-European Union members (Albania, North Macedonia, and Serbia), while the other two (Croatia and Slovenia) are European Union members with close historical and political ties. The analysis covers the period from 1998 to 2019. For North Macedonia, the analysis is conducted for two sub-periods: 1998-2008 and 2009-2019, as well as for the entire period. The descriptive statistics of the variables are presented in Table 1.

Table 1. Descriptive statistics of the variables

Variable	Obs.	Mean	Std. dev.	Min	Max	Source
Output	110	59954.72	32952.33	14369.19	123007.1	Penn World Table, Real GDP at constant 2017 national prices (in mil. 2017US\$)
Capital	110	315631	164714.5	72343.69	534133.9	Penn World Table, Capital stock at constant 2017 national prices (in mil. 2017US\$)
Employment	110	1.43	0.80	0.56	4.40	Penn World Table, Number of persons engaged (in millions)
Human capital	110	3.06	0.32	2.14	3.62	Penn World Table, Human capital index, based on years of schooling and returns to education
Population	110	3.76	2.03	1.99	9.69	Penn World Table, Population (in millions)

Source: Authors' calculations.

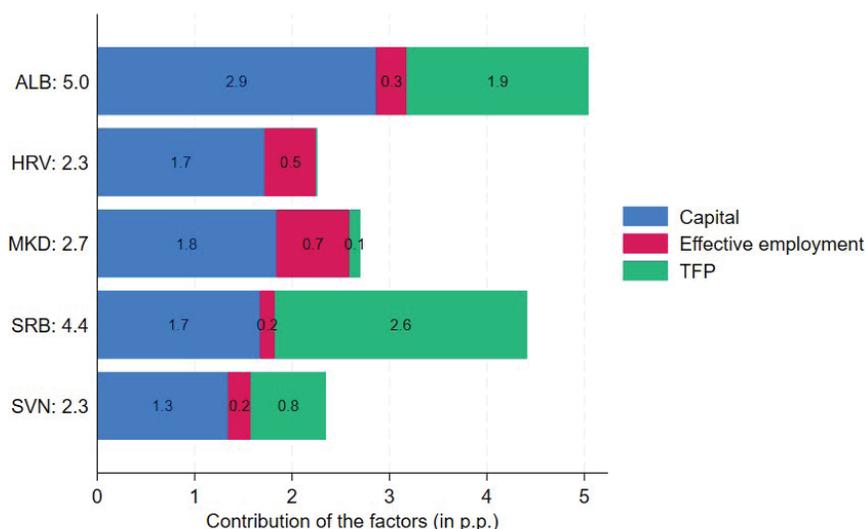
Results and Discussion

The analysis includes two figures (Figures 1 and 2) that break down the average impacts of capital accumulation, effective employment, and total factor productivity on the average economic growth of Albania, Croatia, North Macedonia, Serbia, and Slovenia from 1998 to 2019. The first figure illustrates these impacts in percentage points (p.p.) of the average economic growth rate, while the second figure represents them as percentages (%) of each country's average growth rate. By examining the absolute contributions (in p.p.) and relative contributions (in %), we can understand how different growth factors influenced the economic performance of these countries. The output elasticity of capital for the entire period is calculated as 0.76, and the output elasticity of effective employment is 0.24.

The data illustrates that capital accumulation played a significant role in driving economic growth in several countries. For instance, in Albania, capital contributed 2.9 percentage points to an average growth rate of 5.0 percentage points, accounting for 57% of the average growth. Similarly, in Croatia, capital contribution was 1.7 percentage points, representing a substantial 76% of the country's average growth of 2.3 percentage points. North Macedonia also heavily relied on capital, with 1.8 percentage points (68%) of its 2.7 percentage point average growth coming from capital. These findings are consistent with recent empirical studies emphasising the pivotal role of capital accumulation in driving growth, particularly in developing or transitioning economies. Generally, early-stage economies, especially in Eastern Europe, depend heavily on physical capital investments, particularly in infrastructure and industrial capital, to fuel growth.

It's important to note that while capital accumulation has been an important factor driving growth, overreliance on this factor without substantial productivity improvements can lead to diminishing returns. Economies that fail to diversify their growth drivers, especially by enhancing productivity, may struggle to sustain high growth rates over the long term. The relatively modest contributions of capital to growth in Serbia (1.7 percentage points, or 38%) and Slovenia (1.3 percentage points, or 57%) suggest a more balanced growth model, where other factors, notably total factor productivity, have played a more significant role.

Figure 1. The contribution of factors to economic growth (in p.p.)

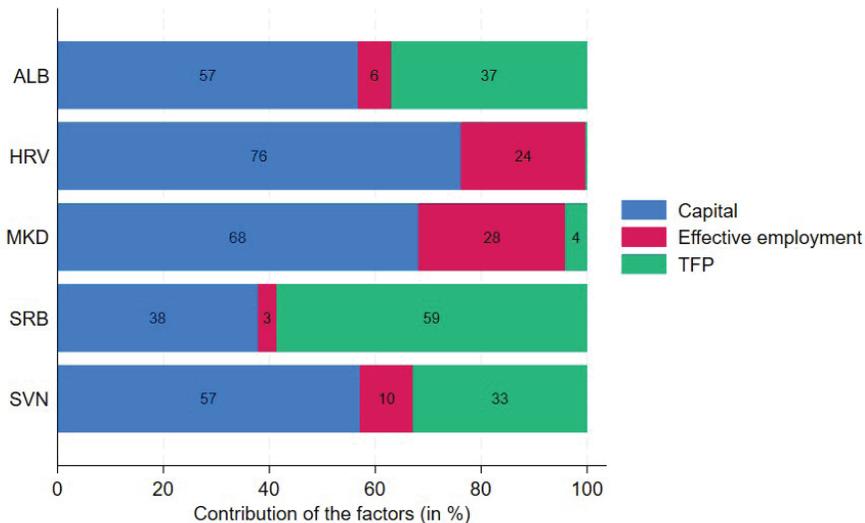


Source: Authors' calculations.

Total factor productivity has been identified as the primary driver of growth in Serbia, contributing 2.6 percentage points (59%) to the country's average growth of 4.4 percentage points. This is in stark contrast to other countries in the region. Slovenia also experienced a significant contribution from TFP, accounting for 0.8 percentage points (33%) of its average growth of 2.3 percentage points. This highlights these countries' focus on enhancing efficiency, innovation, and institutional quality, crucial for maintaining productivity gains. These findings align with Dabla-Norris et al.'s (2012: 422-449) conclusions, emphasizing that economies with strong institutional frameworks and robust innovation ecosystems are better positioned to capitalise on productivity improvements as a key growth driver. Conversely, TFP played a minimal role in North Macedonia, contributing 0.1 percentage points (4%), and had no impact in Croatia (0%). These limited productivity gains in North Macedonia and Croatia suggest that they may still be grappling with structural challenges, including labour market inefficiencies and obstacles to technological adoption, hindering them from fully reaping the rewards of technological progress.

The role of effective employment in driving growth varied across the five countries analysed. In Croatia, effective employment accounted for 0.5 percentage points, contributing to 24% of average growth, the highest percentage among the countries studied. North Macedonia followed with 0.7 percentage points (28% of growth attributed to effective employment). In contrast, Albania showed the smallest contribution from effective employment, at 0.3 percentage points (6%), implying a greater reliance on capital and total factor productivity rather than labour improvements. Aghion et al. (2019: 1-45) suggest low labour force participation, inadequate skills training, and inflexible labour markets can constrain effective employment contributions. This suggests that some countries may benefit from improving labour market flexibility, increasing workforce participation, and enhancing human capital through education and training.

Figure 2. The contribution of factors to economic growth (in %)



Source: Authors' calculations.

Regarding policy recommendations, countries heavily relying on capital accumulation, such as Albania, Croatia, and North Macedonia, should prioritise enhancing productivity to sustain long-term growth. This would involve investing

in innovation, improving institutional quality, and promoting technological adoption. Education and research and development (R&D) investments are crucial for driving total factor productivity growth in economies transitioning from input-driven to innovation-driven growth models. Additionally, these countries may need to address labour market inefficiencies to maximise the potential of effective employment as a driver of growth. For instance, improving the quality of education and aligning it with labour market needs, as Eichengreen et al. (2013) recommended, can ensure that labour inputs significantly contribute to growth.

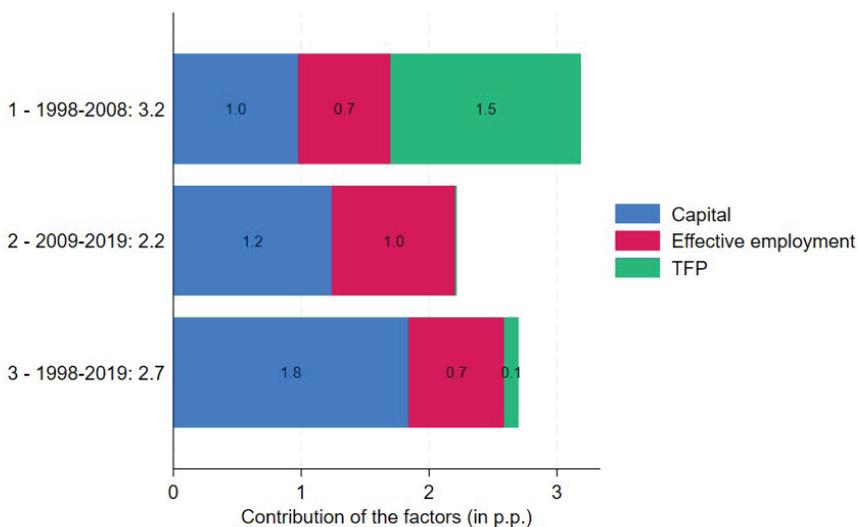
Serbia and Slovenia have experienced significant growth driven by total factor productivity. To sustain this growth, focusing on continuously improving productivity is crucial. According to Cirera & Maloney (2017), achieving ongoing TFP growth entails investing in innovation ecosystems, implementing institutional reforms, and strengthening integration into global value chains. Additionally, these nations should prioritise investment in high-value-added sectors, such as technology, to maintain long-term competitiveness.

In summary, the analysis of economic growth across Southeastern European countries exposes notable differences in the factors driving growth. Although capital accumulation remains the primary driving force in most countries, particularly Albania, Croatia, and North Macedonia, the significance of productivity improvements, as indicated by total factor productivity, is rising in countries such as Serbia and Slovenia. While effective employment is somewhat less, it still plays a vital role in certain countries, particularly those that have emphasised improvements in the labour market and human capital development. Looking ahead, countries highly reliant on capital should prioritise policies that enhance TFP and labour market efficiency, while those with higher TFP contributions should concentrate on sustaining innovation and productivity advancements to ensure continued economic growth.

The analysis presented in Figures 3 and 4 examines the impact of capital accumulation, effective employment, and total factor productivity on economic growth in North Macedonia from 1998 to 2019 and for the sub-periods 1998-2008 and 2009-2019. Figure 3 illustrates the contributions in percentage points

(p.p.), while Figure 4 illustrates these contributions as percentages (%) of the total growth rate for each period. The output elasticity of capital for the sub-period 1998-2008 is calculated as 0.76, and the output elasticity of effective employment is 0.24, and for the sub-period 2009-2019, the coefficients are 0.59 and 0.41, respectively.

Figure 3. The contribution of factors to the economic growth of North Macedonia (in p.p.)



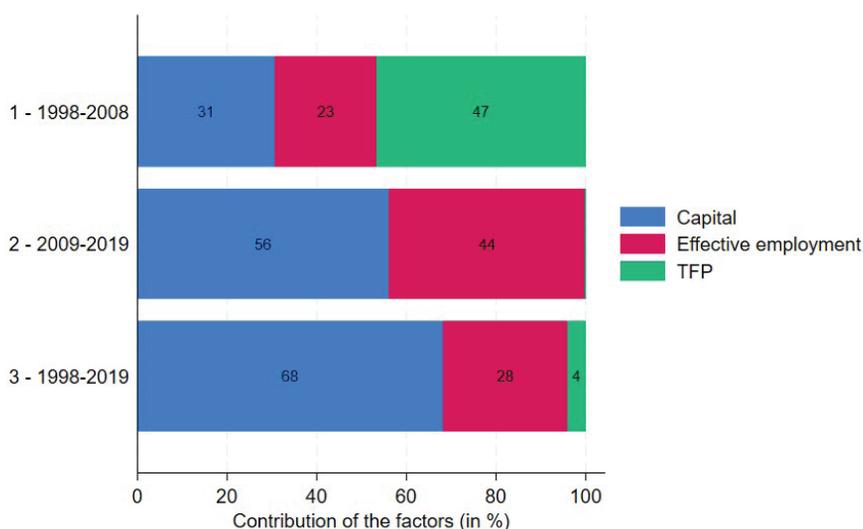
Source: Authors' calculations.

From 1998 to 2019, North Macedonia experienced an average growth rate of 2.7 percentage points (p.p.). The main driver of this growth was capital accumulation, contributing 1.8 p.p. (68%), followed by effective employment at 0.7 p.p. (28%), and TFP at 0.1 p.p. (4%). These findings indicate that the growth in this period was largely influenced by capital stock and labour increases, with minimal impact from productivity enhancements or efficiency gains.

When the analysis is disaggregated into two sub-periods, notable differences emerge. In the first period from 1998 to 2008, North Macedonia experienced

an average growth rate of 3.2 percentage points. Capital contributed 1.0 percentage points (31%) to this growth, while effective employment contributed 0.7 percentage points (23%), and total factor productivity accounted for a significant 1.5 percentage points (47%). This suggests that, during the earlier period, productivity improvements played a much larger role in driving growth, nearly on par with the contributions from capital accumulation. The stronger role of TFP during this period indicates that the economy benefited from efficiency gains, possibly associated with structural reforms or institutional improvements implemented as the country transitioned from a post-socialist economy.

Figure 4. The contribution of factors to the economic growth of North Macedonia (in %)



Source: Authors' calculations.

From 2009 to 2019, there was a noticeable decrease in the overall growth rate and the contribution of total factor productivity. The average growth rate dropped to 2.2 percentage points, with capital accounting for 1.2 percentage points (56%) and effective employment accounting for 1.0 percentage points

(44%). TFP's contribution declined to zero during this time frame. This alteration in the composition of growth between the two sub-periods underlines a significant shift in the underlying drivers of economic performance. While the initial period saw a balanced contribution from TFP and capital, the later period showed a heavy reliance on capital accumulation and labour inputs, with no enhancements in productivity. This indicates that the factors driving productivity gains in the earlier period might have stalled or regressed later.

From 1998 to 2019, North Macedonia experienced a growth model propelled by capital, with limited input from long-term productivity enhancements. The notable decrease in the role of total factor productivity in the later years raises concerns about the sustainability of future growth. Continuing to rely on capital and labour without concurrent productivity improvements may result in diminishing returns over time. This shift emphasises the importance of policy interventions to enhance productivity through innovation, technological adoption, and institutional reforms to ensure sustained higher growth rates in the years ahead.

Conclusion

This paper delves into the roles of capital accumulation, effective employment, and total factor productivity in the economic growth of five Southeastern European countries (Albania, Croatia, North Macedonia, Serbia, and Slovenia), specifically focusing on North Macedonia. The study utilised the growth accounting framework derived from the Solow-Swan neoclassical growth model to analyse the decomposition of economic growth into three primary factors: capital inputs, labour inputs (effective employment), and TFP. The Cobb-Douglas production function modelled the relationship between these factors and GDP growth. This widely used model assumes constant returns to scale and is instrumental in estimating the impact of capital, labour, and productivity changes on economic output.

Capital accumulation was the primary driver of growth in all five countries, with significant contributions from Albania, Croatia, and North Macedonia,

where capital represented between 57% and 76% of growth. In Serbia and Slovenia, total factor productivity had a greater impact, accounting for 59% and 33% of growth, respectively. While generally playing a smaller role, effective employment was still significant, especially in Croatia and North Macedonia.

An analysis of two distinct sub-periods in North Macedonia revealed a noticeable shift in economic growth factors. During the period from 1998 to 2008, the average growth rate stood at 3.2 percentage points, with total factor productivity accounting for 1.5 points (47%), capital contributing 1.0 points (31%), and effective employment contributing 0.7 points (23%). However, in the second period (2009-2019), growth slowed to 2.2 percentage points, with no contribution from total factor productivity. During this time, the role of capital increased to 1.2 points (56%), while effective employment contributed 1.0 points (44%). The diminishing contribution of total factor productivity over time suggests that the country's earlier gains from productivity and efficiency improvements have not been sustained. Furthermore, it indicates a growing reliance on capital and labor inputs for sustaining growth.

In order to achieve sustainable long-term growth, North Macedonia and other countries in Southeastern Europe should shift their focus from simply accumulating capital to improving productivity. This entails prioritising policies that enhance total factor productivity (TFP) through strategic investments in innovation, technology adoption, and institutional reforms that promote efficiency. Furthermore, implementing labour market reforms that enhance human capital through education and skills development will play a crucial role in bolstering the positive contribution of effective employment to overall growth. By tackling the observed productivity stagnation in recent times, these nations can develop a more balanced and resilient growth model that relies less on capital inputs and more on technological advancements and efficiency gains.

Contribution Rates and Conflicts of Interest

Ethical Statement	It is declared that scientific and ethical principles have been followed while carrying out and writing this study and that all the sources used have been properly cited
Author Contributions	
Data Collection	GM (%60), ED (%40)
Data Analysis	GM (%60), ED (%40)
Research Design	GM (%60), ED (%40)
Writing the Article	GM (%60), ED (%40)
Article Submission and Revision	GM (%60), ED (%40)
Complaints	journalbalkan@gmail.com
Conflicts of Interest	The author(s) has no conflict of interest to declare.
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