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BULGARIA — STRUCTURAL DEVELOPMENTS AND CHALLENGES IN THE CONTEXT OF THE EURO ADOPTION

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Abstract: Bulgaria has been the country recording the most sustainable convergence towards the EU average in the past decades. This process was strongly determined by the currency board implemented since the 1990s and by the forces of EU integration. The economic activity grew for the fifth year in a row in 2025, by an annual rate of 3.1%, according to the preliminary estimates of Eurostat. Noteworthy is the advance of gross fixed capital formation by 11.4%, as the companies accelerated the investments before the effective introduction of the EUR. In this paper, standard econometric tools are applied, while the Eurostat database is used to analyse the structural developments over the past decades and to identify the medium-term challenges for Bulgaria. According to the results of the econometric analysis, the annual potential growth pace in Bulgaria has been on an upward trend since 2014, to a level above 3.5% in 2025, the highest level since 2008 (the year of the outbreak of the Global Financial Crisis). The upward trend for the annual potential growth was mainly determined by the significant improvement of the multifactor productivity, to record high levels (above 2.5pps) in recent years. This evolution expresses positive prospects for the macroeconomic performance of Bulgaria in the medium run, and a strong resilience in the event of the outbreak of future global shocks. On the other hand, our analysis also identifies structural challenges for Bulgaria, including the downward trend for the labour force and the deteriorating public finance.
Keywords: Bulgaria; potential output; multifactor productivity.
JEL: E13; E32; O47; H60

INTRODUCTION

Bulgaria has recorded a very sustainable economic convergence process towards the European Union average in the past decades. The GDP per capita at purchasing power standards (PPS), as a percentage of the EU average, rose from less than 30% at the end of the 1990s to almost 70% at present (68.1% in 2025), according to the estimates of Eurostat (2026), represented in the following chart.

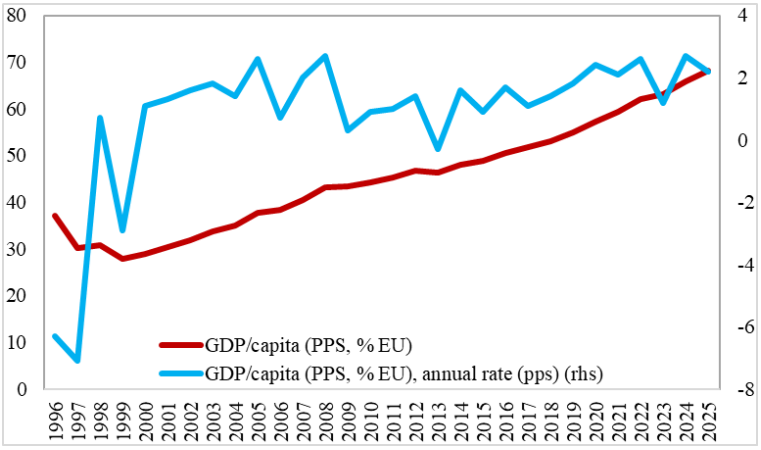


Fig. 1. GDP/capita in Bulgaria at purchasing power standards (PPS) (% of the EU average)

Over the past three decades (the period 1996 – 2025), this indicator (GDP/capita at PPS, as a percentage of the EU average) declined in Bulgaria in only four years, a better performance at least compared to the major economies in Central and Eastern Europe (Poland, Romania, Czechia, and Hungary).

The huge capital investment flows into the country in the past decades were one of the main factors contributing to the sustainable convergence of Bulgaria towards the European average. This, in turn, was supported by the high level of discipline in terms of the economic policy (following the implementation of the currency board in July 1997), and the forces of EU integration, with a positive impact on the investment climate. In this respect, the report of the International Monetary Fund (1999) signalled the fundamental importance of the currency board in the macroeconomic stabilization of the country, very necessary in order to prepare Bulgaria to join the European Union.

Apparently, there have been strong inflows of foreign direct investments in Bulgaria over the past decades. During the period 1996 – 2024, the inflows of foreign direct investments recorded an annual average of around 7% of the GDP, significantly above the averages in the world economy (2.6%) and the European Union (3.9%), according to the estimates of the World Bank (2026a), represented in the following chart.

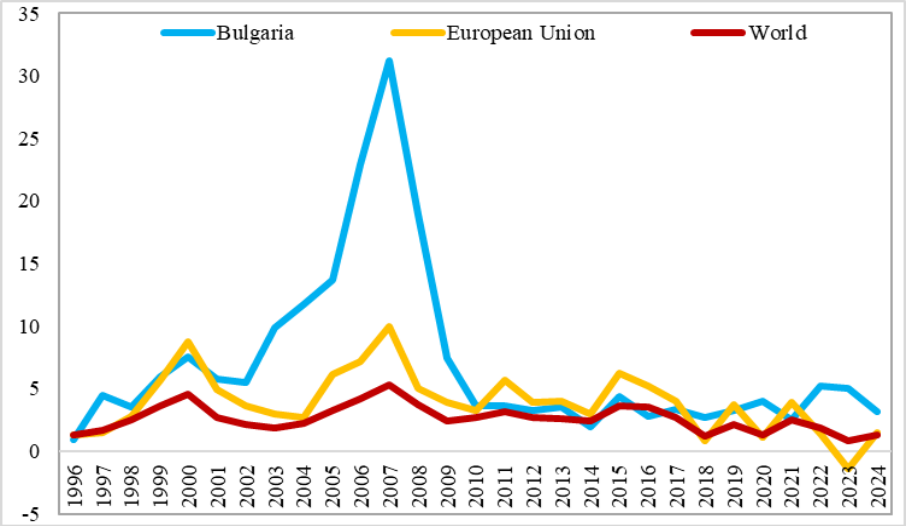


Fig. 2. Foreign direct investment, net inflows (% of GDP)

This impressive, sustainable European economic convergence of Bulgaria is expected to continue in the medium term, with a high probability of getting an impulse following the integration into the Eurozone. However, the country continues to be confronted with structural challenges that can slow down this convergence if not properly addressed in the future.

In this paper, standard econometric tools are implemented, including the Cobb-Douglas production function, and the databases of Eurostat and the International Monetary Fund (IMF) are used in order to analyse the structural developments in Bulgaria.

The results indicate a positive development in the past years in terms of the contribution of the production factors to the annual pace of the potential GDP. This, in turn, confers a high degree of resilience of the economy and supports a positive outlook for the European economic convergence in Bulgaria following the adoption of the euro. However, several structural challenges can also be identified, including those needed to consolidate the macro-financial stability, improve productivity, counter the unfavourable demographic trends, and reduce disparities and inequality.

LITERATURE REVIEW

The European economic convergence of Bulgaria over the past decades has been analysed by many experts, either from the academic field or from international financial institutions.

For instance, the World Bank (2026b) emphasizes the deep transformations in Bulgaria over the past three decades, strongly supported by integration into the European Union, significant inflows of foreign direct investments, and the absorption of EU funds. Furthermore, the Washington-based international financial institution underlined the resilience of the Bulgarian economy to the international challenges and to the domestic political tensions, the annual growth pace maintaining above 3% in 2025, in an evolution determined by the contribution of the domestic demand. There is a noticeable increase in gross fixed capital formation for the fourth year in a row in 2025, at an accelerating rate to 11.4% (from only 1.5% in 2024), the highest pace since 2008, according to the estimates of Eurostat (2026), represented in the following chart.

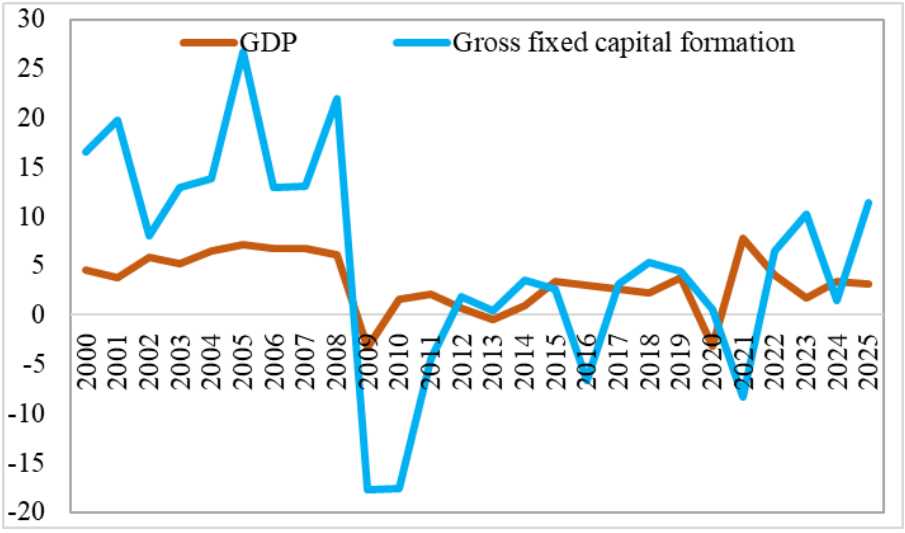


Fig. 3. Annual rate of the GDP and of the Gross fixed capital formation in Bulgaria (%)

At the same time, the analysis of the International Monetary Fund (IMF, 2025) underlines that despite the steady economic convergence, the incomes in Bulgaria continue to be below those of the peer countries. In this respect, the experts of the international financial institution recommended several measures to accelerate the economic convergence of Bulgaria, including the increase in investments (improving the EU absorption rate), the improvement in the efficiency of investments, and the public procurement. Using the DIGNAR model (Debt Investment Growth and Natural Resources), the experts at the international financial institution estimate that, if all available EU funds are fully implemented, public capital expenditure (as a percentage of GDP) may increase by 0.9 pps to an average of 4.3% for the period 2026 – 2030.

The experts of the Organization for Economic Cooperation and Development (OECD, 2026a) highlighted the acceleration of the economic convergence of Bulgaria towards the advanced economies in recent years, due to the increase in the hours worked. On the flipside, the report of the Paris-based international institution emphasized the low level of the capital stock, the ageing of the workforce, and emigration as fundamental factors with a negative impact on the potential growth pace. In this context, OECD recommended the implementation of several measures, including the increase in labour participation rate, the improvement of the regulation, and the acceleration of investments in renewable energy and underlying infrastructure. For instance, according to the estimates of the European Environment Agency (2025), the share of renewable energy in total energy consumption in Bulgaria stood at 22.1% in 2024, below the EU average of 25.4%, as represented in the following chart.

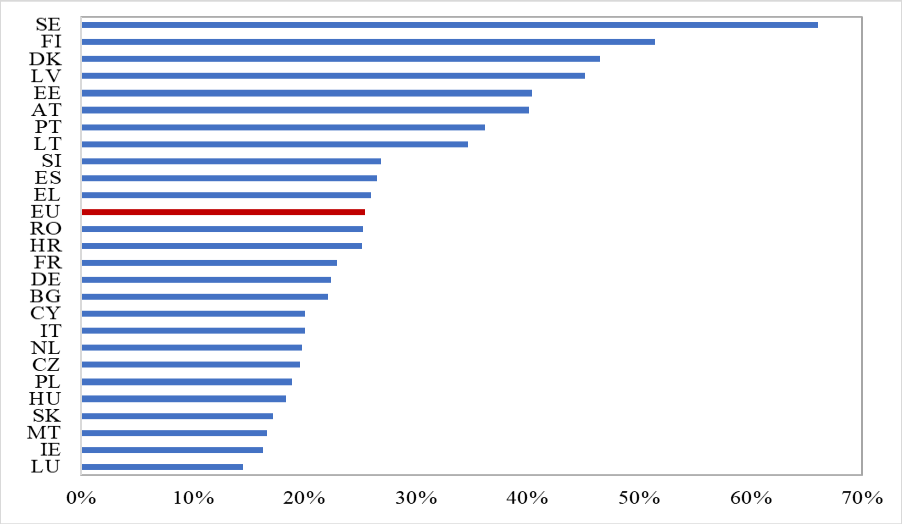


Fig. 4. Share of renewable energy in the final energy consumption by EU country

In a recent report, the experts from the Paris-based BNP Paribas (2026) underlined that GDP/capita in Bulgaria increased 1.8 times during 2007 – 2025, an evolution determined by the significant inflows of capital (including EUR 28bn net entry from the EU funds). On the other hand, this analysis emphasizes the dependence of the European economic convergence of Bulgaria in the future on the acceleration in terms of structural reforms, including in the governance field. Last, but not least, the report of the banking institution identified the demographic decline as the main challenge for the future convergence of Bulgaria towards the European average, as the working-age population has decreased by 7.8% in the past 20 years.

Equally important from the nominal convergence point of view, the Convergence report of the European Central Bank (ECB, 2025) emphasized that Bulgaria fulfilled all the criteria for the adoption of the euro, emphasizing the low level of the government debt-to-GDP ratio (24.1% in 2024, significantly below the 60% threshold).

METHODOLOGY

This paper applies standard econometric tools in order to estimate the contribution of the production factors to the annual potential growth pace in Bulgaria, during the period 2001 – 2025.

On the one hand, the standard Cobb-Douglas production function was implemented, as represented in the following relation:

$$\mathbf{Y = L^{\alpha} \times K^{1-\alpha} \times MFP} \quad (1)$$

in which Y, L, K, MFP, and α are output (GDP), the labour factor, the capital stock, the multifactor productivity, and the elasticity of output with respect to labour (for which it was considered a value of 0.65).

By applying logarithms, relation (1) is transformed into:

$$\mathbf{Y_t = \alpha \times L_t + (1 - \alpha) \times K_t + MFP_t,} \quad (2)$$

where Y_t, L_t, K_t, and TFP_t represent the annual rate of the GDP, labour factor, capital stock, and multifactor productivity.

The structural components for the labour factor and for the multifactor productivity were estimated by applying the filter developed by Hodrick-Prescott (1997), which is based on the following relation:

$$\text{Min} \sum_{t=1}^{T} (\ln Y_t - \ln Y_t^*)^2 + \lambda \sum_{t=2}^{T-1} ((\ln Y_t{+}1^* - \ln Y_t^*) - (\ln Y_t^* - \ln Y_{t-1}^*))^2 \quad (3)$$

in which Y_t, Y_t^*, and λ are the macroeconomic variable, its structural component (the trend), and a smoothness parameter, for which we used a value of 100, as proposed by the authors, while working with annual data.

Afterwards, the annual potential growth rate was estimated, considering the following relation:

$$\mathbf{Y_t^* = \alpha \times L_t^* + (1 - \alpha) \times K_t + MFP_t^*,} \quad (4)$$

where Y_t^*, L_t^*, and MFP_t^* represent the trend component for the annual pace of the GDP, the labour factor, and the multifactor productivity.

The labour force was defined under the following relation:

$$\mathbf{L = labour\ force * (1\text{-}unemployment\ rate) * number\ of\ working\ hours} \quad (5)$$

in which all the indicators were considered for the segment 20 – 64 years.

As regards the capital stock, the perpetuity method was applied, as represented in the following relation:

$$\mathbf{K_t = K_{t-1} \times (1\text{-}d) + GFCF_t,} \quad (6)$$

in which K_t is the capital stock from the year t, d is the depreciation, while $GFCF_t$ is the gross fixed capital formation from the year t.

The capital stock for Bulgaria from 1995 was considered to amount to EUR 20.7bn, according to the estimates of Derbyshire et al. (2010). At the same time, an annual depreciation rate of 5% was applied.

Last, but not least, the multifactor productivity (MFP) was estimated based on the following relation:

$$\mathbf{TFP_t = Y_t - \alpha \times L_t - (1- \alpha) \times K_t.} \quad (7)$$

In this paper, we work ed with annual observations, considering the database of Eurostat (2026) for the period 2001 – 2025 and using the econometric software E-Views.

INTERPRETATION OF THE RESULTS

According to the result of the econometric estimates, the annual rate of the potential output in Bulgaria has presented an upward trend in recent years. In 2025, the annual potential growth pace in this country was estimated at 3.7%, up from 3.3%, as represented in the following chart. This was the highest level since 2008, the year the economy of the European Union started to be confronted with the waves of the Global Financial Crisis (GFC), the most severe economic and financial crisis in the world in the postwar period.

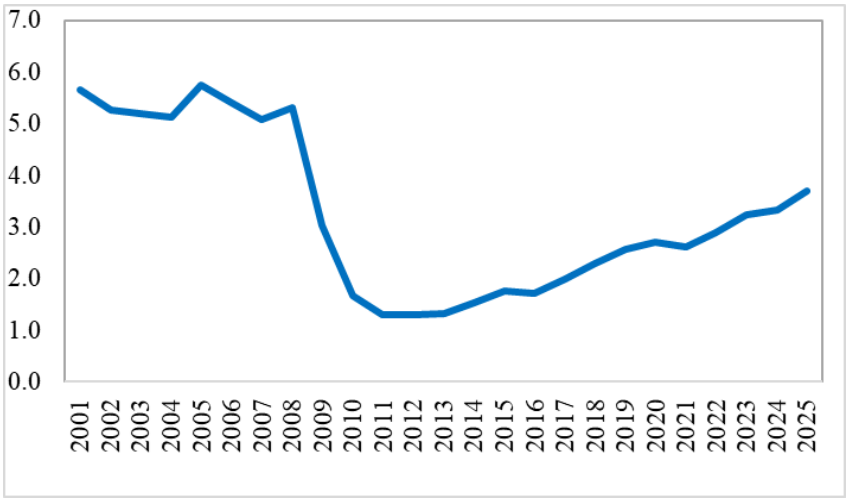


Fig. 5. The annual rate of the potential output in Bulgaria (%)

We point out that this upward trend started in 2013, when the economy of the European Union initiated the post-crisis cycle. At the same time, the annual potential growth pace accelerated in the post-pandemic cycle, from 2.6% in the pandemic year 2021 to 3.7% in 2025, an evolution strongly influenced by the preparations and forces to join the Eurozone, which determined the significant increase in investments. In fact, according to Eurostat (2026), the gross fixed capital formation increased at an average annual rate above 7% during 2022 – 2026, a significantly higher pace than that recorded in the previous economic cycle (the post-crisis one).

As regards the contribution of the production factors to the annual potential growth pace in Bulgaria, the econometric results point out the significant improvement in terms of the multifactor productivity, from 0.2 percentage points in 2013 to 2.9 percentage points (a record high level) in 2025, as represented in the following chart. This upward trend accelerated in the post-pandemic cycle, by one percentage point from 2019 to 2025, an evolution determined by the incorporation of technological progress and by the robust investments. We point out that this econometric result is convergent with the analysis of the Organisation for Economic Cooperation and Development (OECD, 2026b) and of the European Bank for Reconstruction and Development (EBRD, 2025).

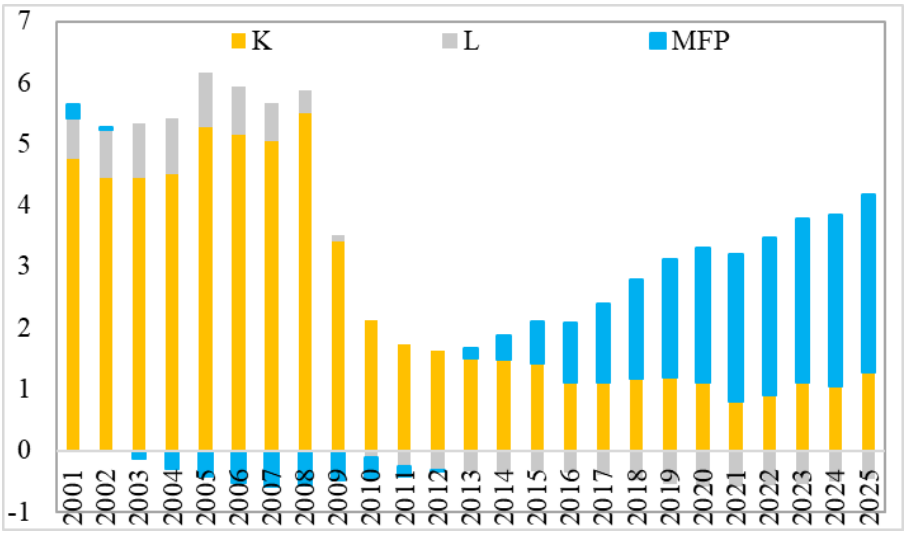


Fig. 6. Contribution of production factors to the annual potential growth in Bulgaria (percentage points)

At the same time, the contribution of the capital factor to the annual potential growth pace has initiated an upward trend in 2022, reaching a level of 1.3 percentage points in 2025, according to the results of the econometric estimates. This is the highest level since 2015, as can be noticed in the previous chart.

The positive prospects for growth and development determined by the entry into the Eurozone prompted the companies to accelerate their investments in this economy. In this respect, we point out that, that the private companies expect the real cost of financing to decline in Bulgaria in the short and medium terms, as annual inflation persists above the monetary policy rate.

In fact, according to the recent forecasts of the International Monetary Fund (IMF, 2026), the consumer prices in Bulgaria may increase by average annual rates of 3.8% in 2026 (accelerating from 3.5% in 2025), 3.7% in 2027, and 3.4% in 2028. Afterwards, the average annual inflation may slow down to 2.5% in 2029, 2.4% in 2030, and 2.2% in 2031.

This factor, corroborated with the tight labour market climate, would generate an impulse for private consumption, the main component of the GDP from the demand side perspective, with a contribution of 58.5% in 2025.

In this respect, we point out that, according to the database of the International Monetary Fund (IMF, 2026), the average unemployment rate in Bulgaria declined from 4.2% in 2024 to 3.6% in 2025, the lowest level since 1990, as can be noticed from the following chart. Furthermore, according to the

spring 2026 forecasts of the Washington-based international financial institution, the average annual rate of unemployment in Bulgaria may decline to 3.4% in 2026, 3.3% in 2027, and 3.2% during 2028 – 2031.

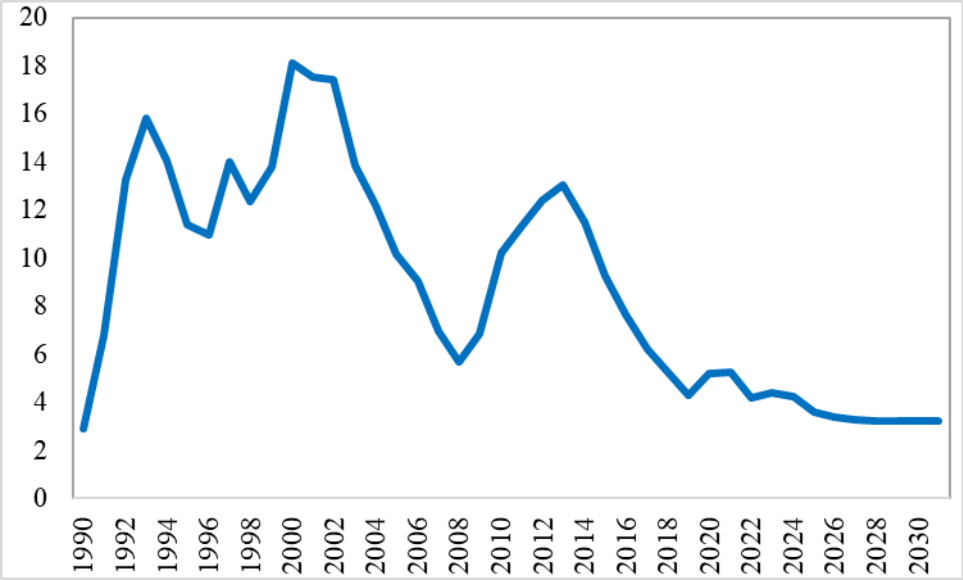


Fig. 7. The average annual rate of unemployment in Bulgaria (%)

On the other hand, the contribution of the labour factor to the annual potential growth pace in Bulgaria continued to be negative in 2025, for the 16th year in a row, according to the results of the econometric estimates, represented in **Figure 6**.

Overall, the results of this analysis indicate an unbalanced contribution of the production factors to the annual potential growth pace in Bulgaria in recent years. This, in turn, represents a factor of risk in terms of sustainability. Therefore, structural reforms should be continued in the coming years, in order to attract more investments, especially in sectors with high value-added. In our view, the policymakers should build on the moment of the entry into the Eurozone, in order to reap the full benefits of this structural change in the Bulgarian economy.

As regards the needed structural reforms, the experts of the Organisation for Economic Cooperation and Development (OECD, 2026b) have recently recommended: the fiscal consolidation through strengthening the tax compliance, and the development of a long-term fiscal and growth strategy; measures to extend working lives and to facilitate the return of Bulgarians, reducing the red tape; strengthen the institutional capacity, applying incentives for investment based on cost-benefit criteria; further reforms in education in order to increase the quality; and the implementation of plans to phase-out coal. Furthermore, measures to accelerate the implementation of technological progress, develop the capital markets, and targeted measures to diminish the inequality are also needed to improve the overall competitiveness and resilience of the Bulgarian economy in the medium term.

CONCLUSION

According to the analysis developed in this paper, the annual potential growth pace has been on an upward trend in recent years in Bulgaria, towards the highest level since 2008, with the contribution of the multifactor productivity being reflected.

Conversely, the structure of the contribution of the production factors to the annual potential growth pace in Bulgaria has not been balanced in recent years, with consequences in terms of sustainability and resilience.

Therefore, the continuity and the acceleration of structural reforms are needed in Bulgaria, in order for the economy to fully benefit from the euro adoption. Among the stringent structural reforms, we mention those needed to maintain the budget deficit below the threshold of 3% of GDP, and to improve

international competitiveness. On the other hand, there are the important measures to address inequality, including those proposed by Peneva (2026) to deal with the weaknesses in terms of the Social Climate Plan (targeting the 34.5% of energy-poor population).

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