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COMPARATIVE ANALYSIS FROM A MACROECONOMIC PERSPECTIVE OF INNOVATION FINANCING IN THE NEW EU MEMBER STATES

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Abstract. The article aims to follow the development of innovation activity and its financing in the new EU member states through a theoretical review and comparative analysis using macro-statistical indicators. It is noted that the so-called new EU member states continue to lag significantly behind in their innovation development compared to Western economies. It is typical for innovation activity to expect a leading role from the private sector, but the role of the state should not be excluded from the equation, which, no matter how much it is branded as a „bad manager", remains essential, not only for a high, but also for any level of innovation activity, and hence the inseparable connection between innovation and economic growth.

Keywords: innovation; innovation financing; economic growth; intellectual property

Introduction

Innovation has been driving the world forward throughout mankind's history. It has played a fundamental role in the world's economic development. In the last two centuries alone, humanity has witnessed revolutionary discoveries – from the steam engine to the Internet, from the telegraph and telephone to the ability to make money transactions worldwide at the touch of a button. All this shows the crucial importance of innovation for economies. „Innovation is the driving force of the new economic reality" (Stoyanova 2022), „intellectual property continues to be the primary tool for achieving technical progress, and hence economic growth" (Petrova 2021), and „well-structured intellectual property protection policy stimulates economic growth" (Strijlev 2019). In addition, innovation contributes to economic growth by contributing to factors such as the creation of new jobs and competition in society and the economy. Hence, the maxim that those who do not grow – lag behind, and those who do not innovate – fail.

Literature review

It can be assumed that the innovation economy was formed in the late 1920s and early 1930s as an economic science. Kondratiev (1925) noted that the changes occurring in the technical field have a positive impact on the economy. Joseph Schumpeter (1934) was the first to describe "innovation" in the field of economic science: "Innovation is a new look, an approach to the existing process and involves the application of time, development or progress." According to Schumpeter, it is the innovative approach to economic activity that determines the level of development of the economic system in each period. In his theory, Schumpeter considers entrepreneurship as the fourth factor of production. He defines the task of entrepreneurs as using invention to create new products or transform old products, using new raw materials or sources of materials, and creating new markets, thereby reshaping and improving production. According to Schumpeter, the revolutionization of the economy occurs thanks to innovation and entrepreneurship in the economy.

In turn, Simon Kuznets (1973) created the concept of "epic innovations" in economic science. According to his theory, in certain periods of economic development, innovation leads to sustainable economic growth, and he defines science as its source. According to Kuznets, there are right and wrong periods for innovation in the national economy, which in turn can lead to positive or negative effects. Thus, the role of the state in the development and implementation of innovations in the production activity of the national economy is of essential importance for socio-economic relations. The constant introduction of scientific and technological innovations in the economy is an important factor for a sustainable increase in economic efficiency and leads to a breakthrough in society, such as unemployment, employment, and job creation.

In the 1980s and 1990s, economists increasingly focused on the importance of technology for economic growth and development. An important foundation was the creation of the so-called "new growth theory" (Romer 1986, 1990; Aghion and Howitt, 1992, 1998), according to which differences in economic development between countries should be understood as the result of differences in endogenous knowledge accumulation within national borders.

The innovation-economic growth relationship has been extensively studied by many researchers over the years, both at the micro and macro levels. The direction from which this relationship can be viewed is extensive. Cassiman et al. (2010) examine the positive relationship between innovation and economic development at the micro level by examining the innovation-productivity-export relationship. Others (Tsai and Wang 2004; Zhang et al. 2012) pay more attention to research and development (R&D) and productivity at the micro level. Castellacci and Natera (2016) focus on the positive relationship between innovation and economic growth at the macro level. Köhler et al. (2012) also confirm the hypothesis that technological change stimulates economic growth. In particular, less developed regions of the

EU, whose public R&D spending is higher, report higher GDP growth rates. R&D spending has different short- and long-term effects on growth.

Some, such as Grossman and Helpman (1991), focus on innovation and growth on a global scale. Others, such as Rosenberg (2006), consider technological innovation as a major driver of economic growth, focusing on the characteristics of innovation in highly industrialized economies in the OECD region. A similar analysis is made by Aleksandrov (2022), examining the role of patents for economic growth at the micro and macro level, comparing highly technological and rich countries and companies with those highly dependent on natural resources and raw materials. Broughel and Thierer (2019) also point to technological innovation as a major driver of economic growth. They also emphasize government regulations' role in fostering innovation, growth, and the continuous improvement of the population's quality of life. Garland and Allen (1995) analyze the relative importance of public and private R&D for economic growth in different countries. They confirm that private R&D has a more significant impact on growth than public R&D, which is mainly devoted to basic research. Silaghi et al. (2014) empirically assess the role of private and public R&D spending on the growth of the economies of Central and Eastern European countries for the period 1998 – 2008, finding that public R&D is statistically insignificant. Szarowska (2017), on the other hand, concludes that there is a clearly positive and statistically significant impact of public R&D on economic growth. Szarowska finds that its effect is the primary driver of economic growth and has a stronger effect than traditional growth variables such as investment and human capital. What is surprising in her study is that private R&D spending is negatively effective and statistically insignificant in most cases.

In their study, Sokolov-Mladenovic et al. (2016) concluded that a 1% increase in R&D spending as a percentage of GDP would increase the real GDP growth rate by 2.2%. In their study, Rzayev and Samoilikova (2020) concluded that a 1% increase in gross R&D spending financed by the public sector leads to a 0.15% decline in GDP, while funding from the business sector results in a 0.13% increase, while foreign financing results in an expected growth of 0.1%. The authors conclude that effective legislation is more important than the source of financing for innovation activity but also that financing from private and foreign sources is preferable to government financing to increase the economic growth of the national economy. According to them, the state's role is limited to providing effective mechanisms for the transfer of innovations in the business environment.

However, not all studies find a positive relationship between economic growth, whether at the micro or macro level, and the innovativeness of firms or the state. A strong but negative relationship between financial innovation and economic growth was found by Afzal and Gauhar (2020) in their study, which includes the period 1990 to 2017 and covers 164 countries worldwide. An adverse impact of innovation on the economy was also found by Coad et al. (2021) due to excessive patent

protection and monopoly position. They found that this harms consumer welfare and does not lead to economic growth while at the same time increasing social inequality in society.

A short-term negative relationship between product innovation and the growth of production and sales was found by Freel and Robson (2004) in their study of business innovation and economic growth at the micro level in the UK. In their studies of Chilean and Brazilian companies, a similar conclusion has been reached at the micro level by Benavente (2006) and Carvalho and Avellar (2017). Correa (2012) finds mixed results in his study of the relationship between innovation and competitiveness at the micro level in the United States. He found a positive relationship between the period 1973 and 1982, but there was no relationship between the period 1983 and 1994. Pessoa (2007) concludes that increasing R&D spending is not a guaranteed way to boost economic growth, especially for countries below the technological frontier.

In a proposed author‘s model, Suzuki (2020) assumes that the innovation-competitiveness relationship can be negative or represent an inverted U-shaped curve. Suzuki also shares the thesis that excessive intellectual property protection can be a problem for the national economy and does not necessarily lead to improved innovation at the national level. Similarly, Ma et al. (2022) confirm the vital role of scientific and technological activities in achieving sustainable economic growth and emphasize the need for nations to join forces to promote and improve their scientific potential, incorporate scientific progress into innovative activities, and improve the quality of life of their citizens.

The literature review supports all ideas about the importance and impact of R&D on economic growth – positive, negative, and zero- and various efficiencies of public and private R&D spending. The diversity of findings is generated by differences in the econometric models used, country samples, observation period, and variables considered, as well as by the multifaceted nature of innovation activity and the unpredictability of a national economy. The review demonstrates that the importance and impact of R&D on economic growth are not unambiguous, and published studies present both positive and negative effects.

Methodology

The object of the study is R&D expenditure and its comparison with GDP and total public expenditure, from which an attempt is made to derive a relationship between their growth rates. The share of public and private R&D expenditure in total R&D expenditure, as well as the ratio between them, are also derived. The study involves 13 countries – the so-called “new member states” of the EU – Bulgaria, Romania, Hungary, the Czech Republic, Poland, Lithuania, Latvia, Estonia, Cyprus, Malta, Slovenia, Slovakia and Croatia. They were selected with

the idea of comparing the indicators considered for the countries and comparing them, which will give an idea of their performance after their entry into the EU and whether this has affected the innovation activity in the countries through R&D expenditure.

1. Results and discussion

1.1. Bulgaria

The only relationship that can be reflected in Fig. 1 is the correlation between general R&D expenditure and private R&D expenditure, the difference being only the depth of fluctuations. For the other indicators considered, no correlating trends lasting more than a few years can be identified. The lack or very low level of coincidence between the general expenditure of the state with GDP or with R&D expenditure is also striking.

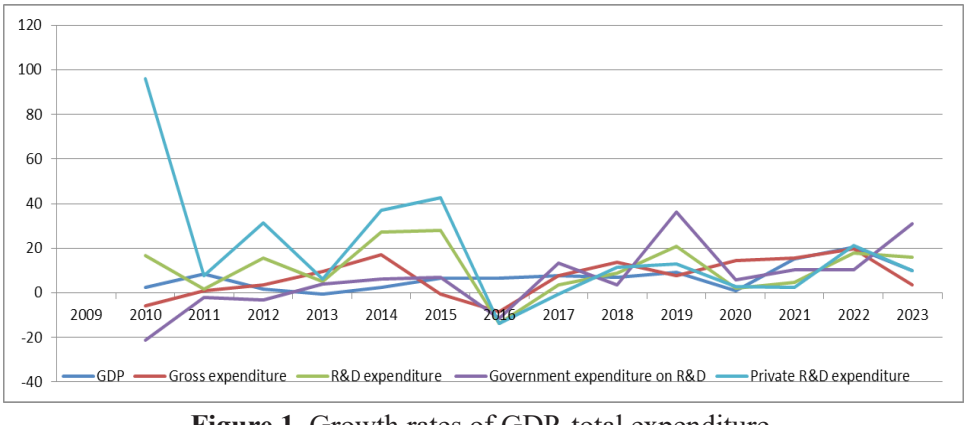

Figure 1. Growth rates of GDP, total expenditure, and R&D expenditure for Bulgaria

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

In Fig. 2, it can be clearly seen that the last time government R&D expenditure exceeded private R&D expenditure was during the global financial crisis. This is entirely normal since, during crises, companies usually reduce their expenditure and investments while the state, trying to maintain economic activity, increases its expenses and investments. The figure shows that the ratio between public and private R&D expenditure is almost constant for the entire period under review.

The low innovation level of the Bulgarian economy can easily be explained by the low share of R&D expenditure in total expenditure – between 1.26% in 2009 and 2.04% in 2023, with a peak of 2.35% in 2015.

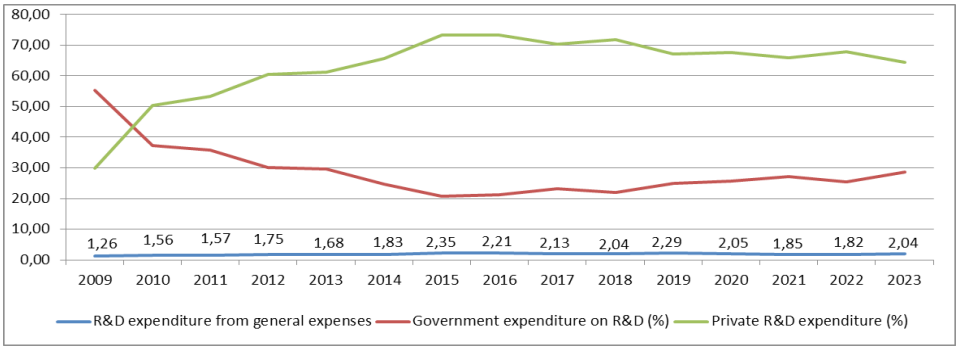

Figure 2. Ratio and share of R&D expenditure for Bulgaria
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.2. Romania

In Romania, a correlation can be found between the growth rates of R&D expenditure, government R&D expenditure, and private R&D expenditure. However, this relationship has not been observed throughout the entire period under review. The growth rates of total spending and the country's GDP for most of the period under review move in a correlated manner, with only in individual periods a coincidence between the growth rates of all indicators.

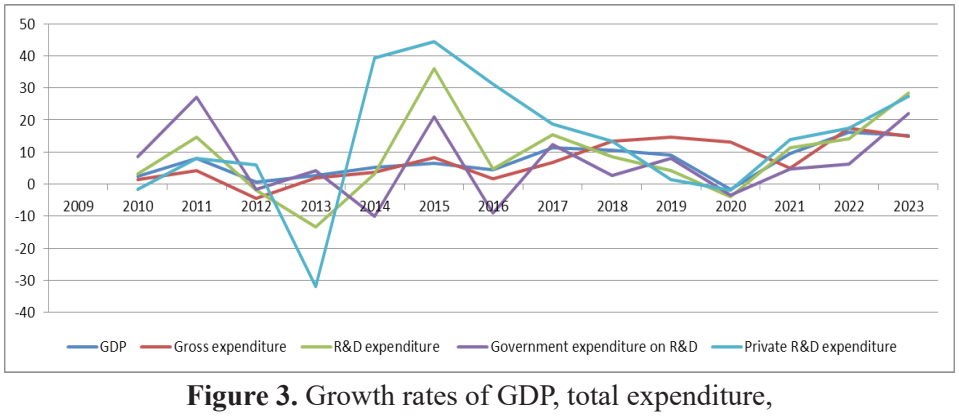

Figure 3. Growth rates of GDP, total expenditure,
and R&D expenditure for Romania
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

In Romania, as can be seen from Fig. 4, the ratio between private and government R&D expenditure was almost equal until 2015, and only in 2016 did the scissors start to stretch, and private R&D expenditure took the larger share. This partly explains the country's very low share of total R&D expenditure compared to total

state expenditure. It is striking that from 2015, when the trend reversed and the private sector increased its innovation activity, the share of R&D investments also increased, but it is also noticeable that this share has been falling again in recent years. This also coincides with the increasingly falling share of government R&D investments. All this also indicates the country's very low innovation level. It is also striking that throughout the period under review, between 10 and 20% of R&D expenditure in the country cannot be explained by investments from the private or public sector.

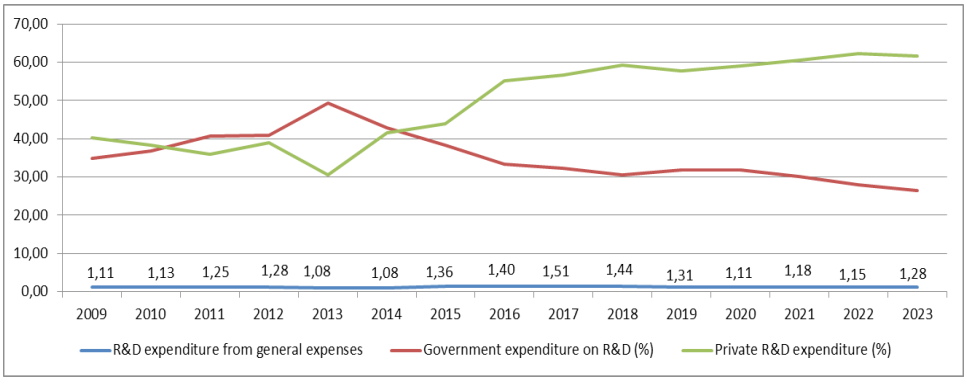

Figure 4. Ratio and share of R&D expenditure for Romania
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.3. Hungary

In Hungary, the correlation between the growth rates of all indicators is visible throughout the period under review. The only difference comes from the depth of fluctuations. In isolated cases, a given indicator does not correspond to the general movement trend. This can be partly explained by the political situation in the country over the years and the rupture with EU policies.

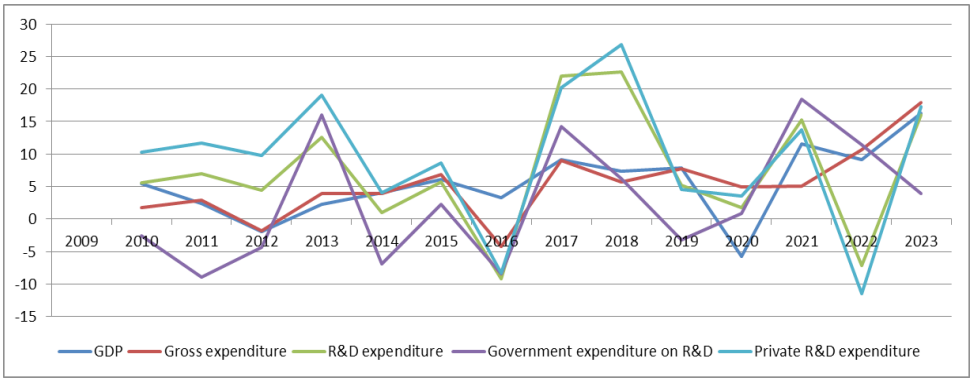

Figure 5. Growth rates of GDP, total expenditure, and R&D expenditure for Hungary
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

In Hungary, a substantial gap between government and private R&D investments has been observed throughout the period under review. This apparent lack of interest on the part of the state in investment in innovation, however, allows the private sector to take over the investment activity. Hungary is known for attracting many foreign private companies to develop production on its territory, which is necessarily associated with investment in innovation. The share of R&D expenditures, as a percentage of total expenditures, is relatively high, which is also the reason for the higher innovation activity and the better performance of the country in various international innovation indicators.

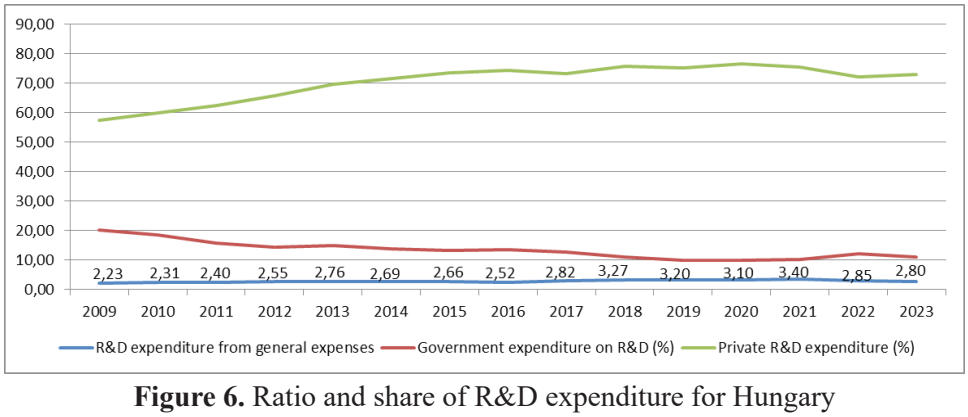

Figure 6. Ratio and share of R&D expenditure for Hungary
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.4. Poland

Fig. 7 shows the growth rate of the considered indicators for Poland. It is difficult to identify a clear correlation in the movement of the trend of the R&D expenditure indicators. For most of the period under consideration, such a correlation can be deduced between total R&D expenditure and private investment in innovation, but even in these cases, there are some discrepancies. The only specific correlation is observed in the movement of the GDP and total expenditure indicators, which move correlatedly throughout the period under consideration.

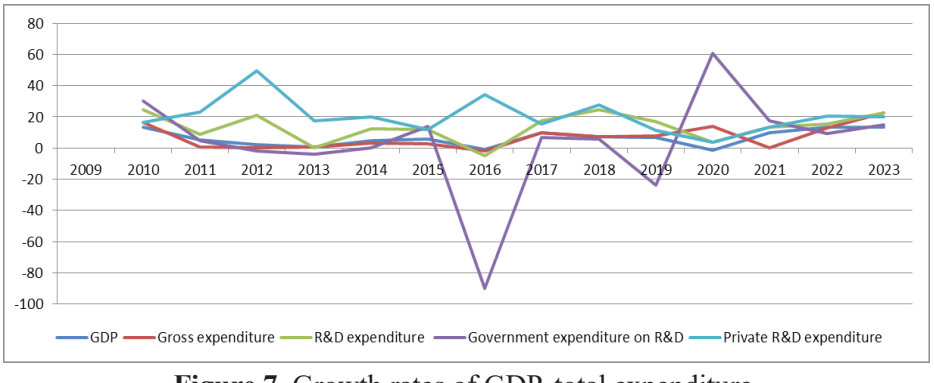

Figure 7. Growth rates of GDP, total expenditure, and R&D expenditure for Poland

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

Although as a share of total expenditure, R&D expenditure in Poland is constantly increasing and represents a relatively high percentage, the share of public and private investment in R&D is extremely low, with nearly half of these investments not being explained by state or private sector investments. The gap between public and private sector innovation investments opened up as early as 2012, but since 2016, it has taken on enormous proportions, with the public sector almost disappearing as a participant in this investment process. With a share of between about 1 and 3% of all R&D investments, the Polish state has left the innovation initiative entirely to the private sector. Obviously, this does not pose a serious problem for the country, given its relatively good performance in international innovation indices. Here, as in Bulgaria, the state‘s role was more prominent in the crisis and post-crisis period, but since 2016, it has also acquired its current framework.

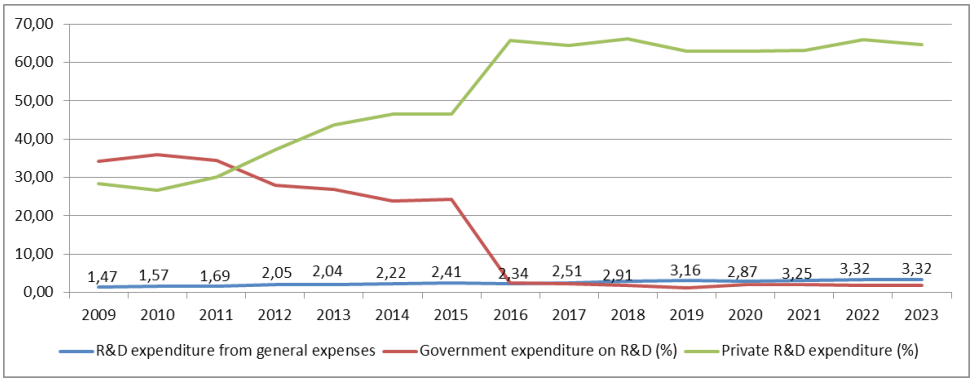

Figure 8. Ratio and share of R&D expenditure for Poland
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.5. Czech Republic

Fig. 9 shows that in both Hungary and the Czech Republic, the growth rates of all indicators are correlated throughout the period, with very slight exceptions for total expenditure at the end of the sample. This synchrony is also indicative of the strong position of the country's economy and its innovation activity, which feed off each other.

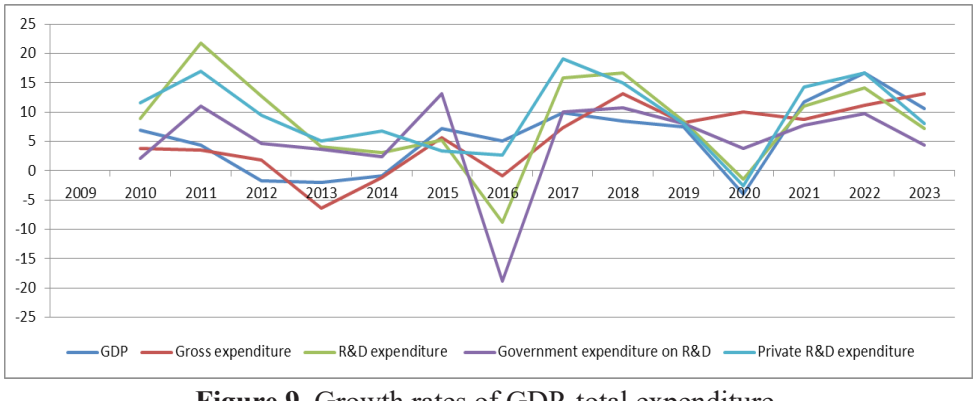

Figure 9. Growth rates of GDP, total expenditure,
and R&D expenditure for the Czech Republic
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

Only between 75 and 85% of R&D investment can be explained by public or private sector expenditure in the Czech Republic, but this does not prevent it from being among the countries with the highest share of R&D expenditure in the total

expenditure in the sample. The decisive role of the private sector in innovation activity underlines this high share, as does the country's good performance in international innovation indices. No fluctuations were observed during the period under review, and this economic stability favors innovation activity, providing security to economic agents.

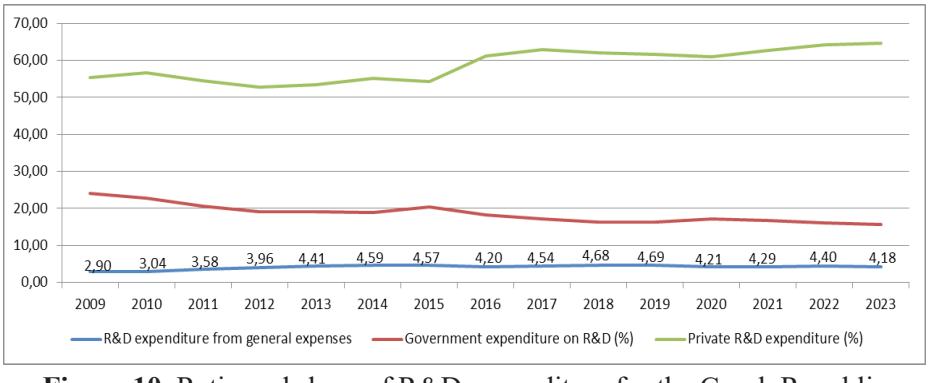

Figure 10. Ratio and share of R&D expenditure for the Czech Republic
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.6. Lithuania

The growth rates of the considered indicators for Lithuania show a lack of almost any correlation. Only in separate periods is there a coincidence in the growth rate of total expenditure and R&D expenditure. For all other indicators, no apparent synchronization is observed. For private and public R&D expenditure, it can be said that there is even an inverse correlation.

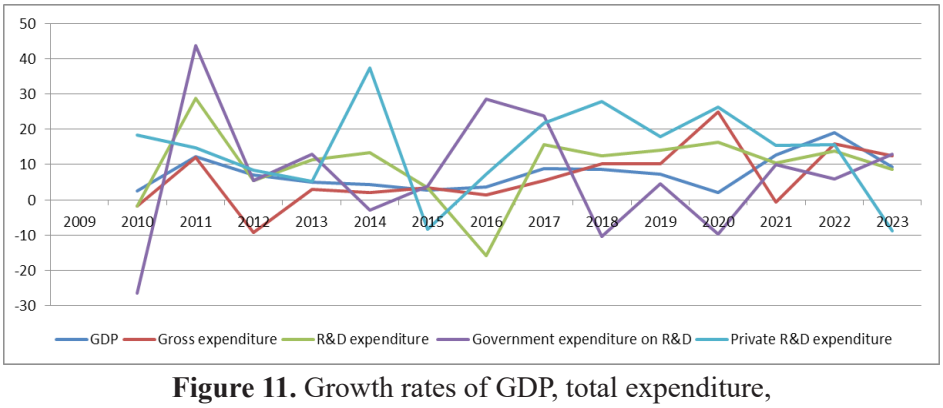

Figure 11. Growth rates of GDP, total expenditure,
and R&D expenditure for Lithuania
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The share of R&D expenditure as a part of Lithuania's total expenditure can be at the average level for the countries considered in the study. Lithuania is not among the countries that perform particularly well in international innovation indices, but it is at a higher level than some of the countries participating in the sample. It is pretty clearly noticeable that a tiny part – around and slightly over half – of R&D expenditure can be explained by the role of the private and public sectors. This is also indicative of the country's lower innovation level. Public and private R&D expenditures were almost equal during 2009 – 2017, after which the gap widened noticeably, and the private sector took a clear advantage in investing in innovation.

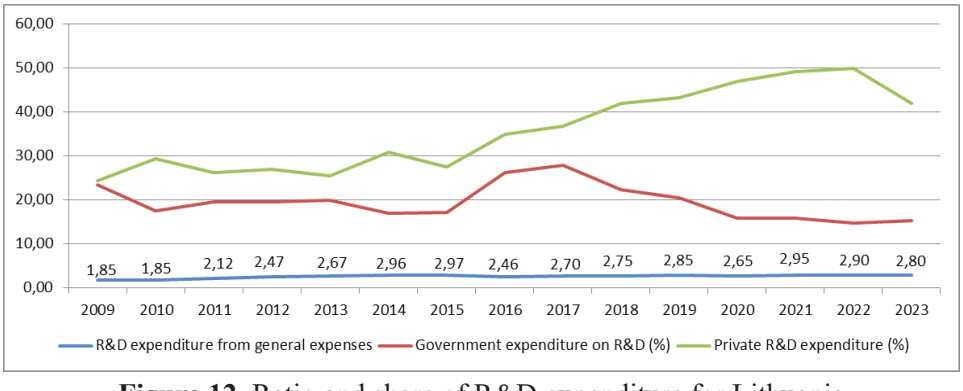

Figure 12. Ratio and share of R&D expenditure for Lithuania
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.7. Latvia

In Latvia, like in Lithuania, no clear correlation can be observed between the growth rates of the indicators under consideration. There is an apparent synchronism between total R&D spending and private sector R&D spending. However, as in other countries, no connection is observed between R&D spending and the country's GDP growth rate.

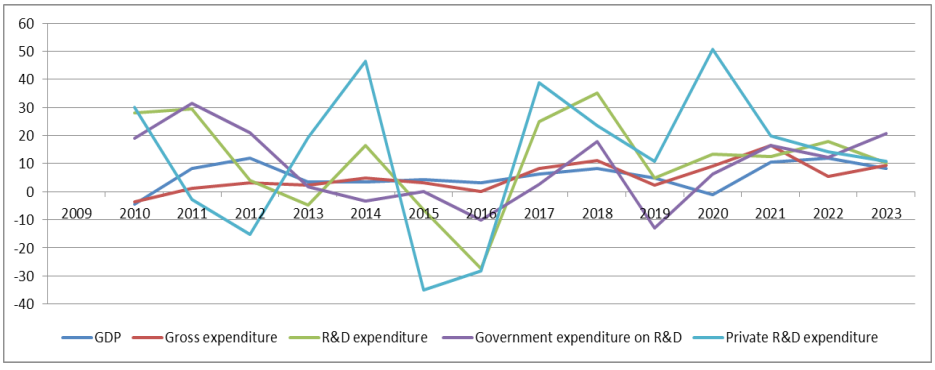

Figure 13. Growth rates of GDP, total expenditure, and R&D expenditure for Latvia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The share of R&D expenditure as a part of the country's total expenditure is among the lowest of the countries considered. This also indicates the country's poor performance in international innovation indices. Again, as in Lithuania, only slightly more than half of all R&D expenditure can be explained by state or private sector investments. Moreover, in Latvia, a fairly close movement of R&D expenditure is observed in both the state and the private sectors, with in some periods state expenditure even exceeding that of the private sector. The trend enters the expected tracks after 2018 when the gap increases, and private-sector investments in R&D take a tangible advantage over state-sector investments.

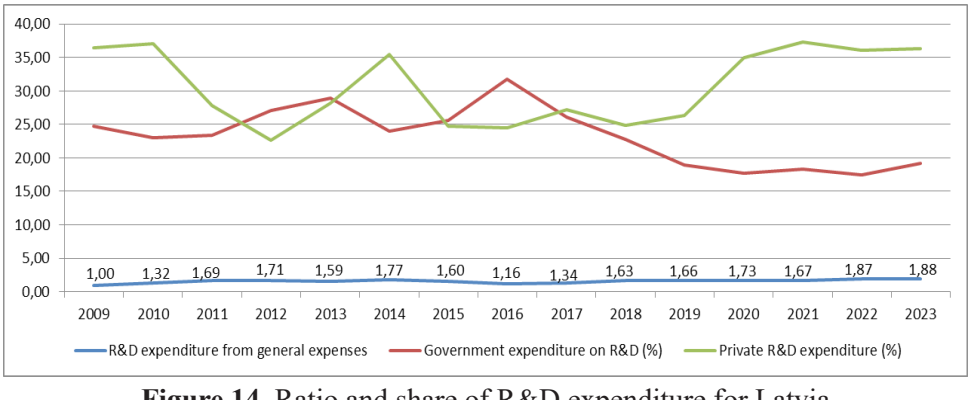

Figure 14. Ratio and share of R&D expenditure for Latvia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.8. Estonia

In the growth rates of the indicators considered for Estonia, much greater synchronization is observed compared to those of its neighboring countries, such as Lithuania and Latvia. Again, the strongest correlation is between total R&D expenditure and private sector R&D expenditure. However, there is also a correlation with government R&D expenditure. GDP and total expenditure of the country also show a close, although not throughout the considered period, movement.

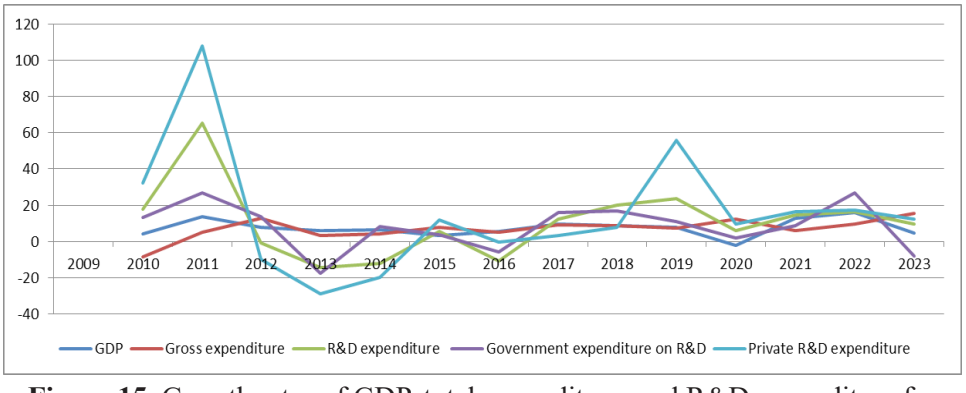

Figure 15. Growth rates of GDP, total expenditure, and R&D expenditure for Estonia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

Estonia has one of the highest shares of R&D expenditure in total government expenditure, which also indicates the country‘s reasonably good performance in international innovation indices. This is also marked by the high share of private sector R&D investment and the relatively low share of public sector R&D. Here, as in Lithuania and Latvia, just over half of total R&D expenditure can be attributed to the public and private sectors.

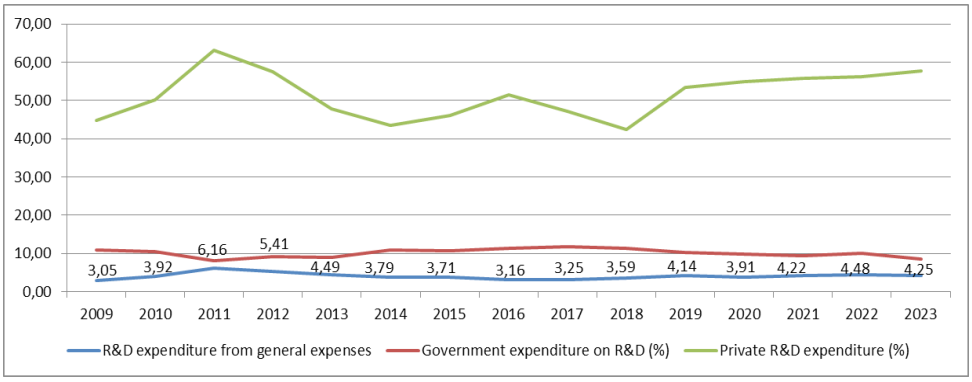

Figure 16. Ratio and share of R&D expenditure for Estonia
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.9. Slovenia

In Slovenia, as seen from Fig. 17, a robust correlation is observed between the growth rates of total R&D expenditure and private sector R&D expenditure. This is generally expected, as it is also developing to a large extent in the other countries considered. Here again, there is no correlation between the movement of the GDP growth rate and government expenditure with the growth indicators of R&D expenditure. However, the inverse correlation of government R&D expenditure with total and private R&D expenditure is striking.

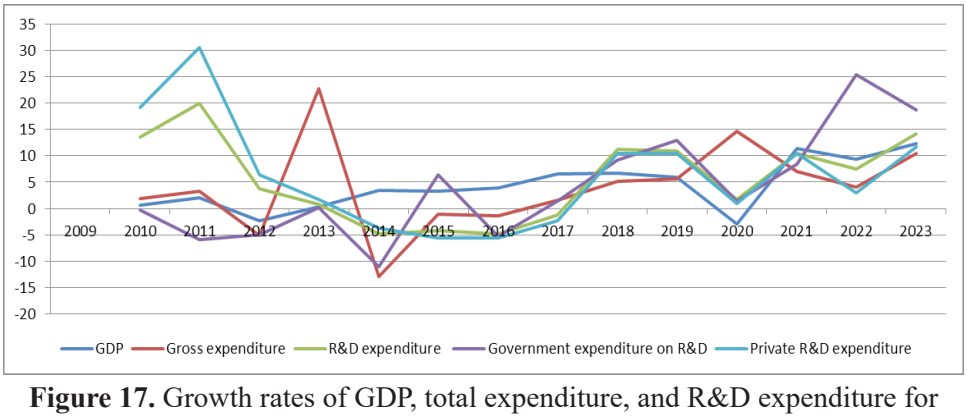

Figure 17. Growth rates of GDP, total expenditure, and R&D expenditure for Slovenia
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

Slovenia shows a very high share of total R&D expenditure as a share of total government expenditure, which is also evidenced by the country's good performance in international innovation indices. There is no point in the period under review when the ratio between government and private R&D expenditure was less than 50%, which is probably the reason for the country's good performance in innovation activity. Almost all R&D expenditures can be explained by government and private investment.

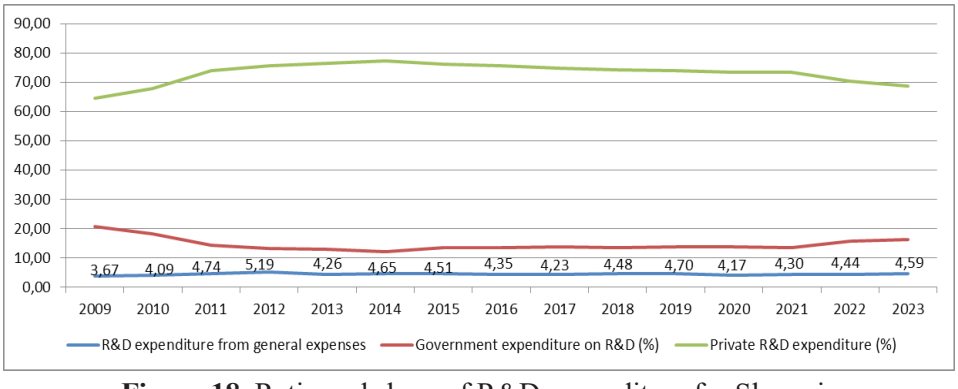

Figure 18. Ratio and share of R&D expenditure for Slovenia
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.10. Slovakia

In Slovakia, correlation in the growth rates of the considered indicators is observed only at certain moments. This applies even to the growth rates of total R&D expenditures and private ones. It can even be said that the public sector investments are more synchronized with the total investments in R&D than those of the private sector. The growth rates of GDP and total expenditures of Slovakia are not correlated with the other indicators.

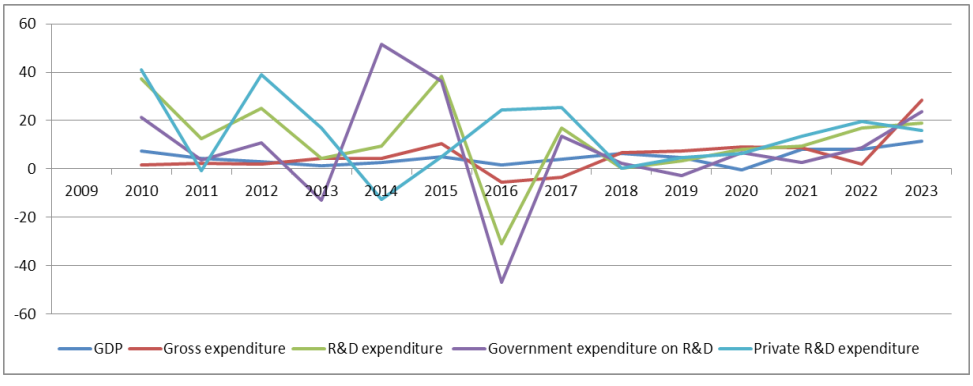

Figure 19. Growth rates of GDP, total expenditure, and R&D expenditure for Slovakia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The gap in the ratio of private to public R&D investment in Slovakia and in some other countries has widened in the period after 2016. Before that, the trends showed approximately the same ratio. The share of R&D expenditure as a part of total expenditure fluctuates around and slightly above the average for the countries considered in the sample, indicating the country's relatively good positions in innovation activity.

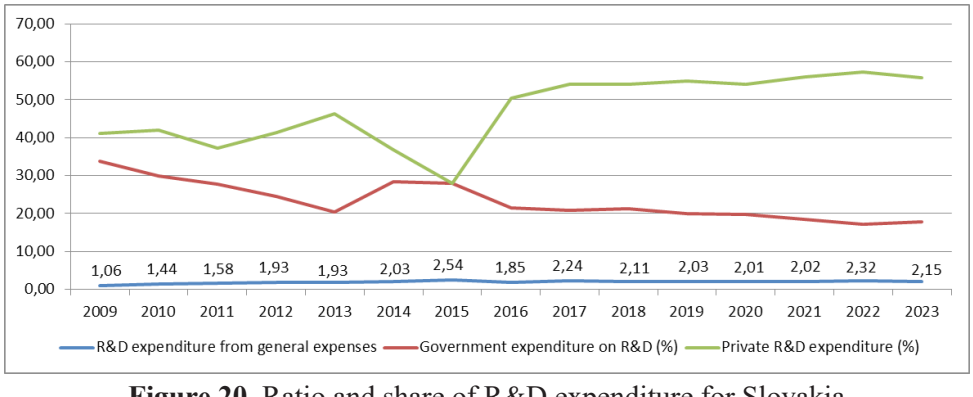

Figure 20. Ratio and share of R&D expenditure for Slovakia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.11. Croatia

In Croatia, shown in Figure 21, the growth rates of total R&D expenditure and private sector R&D expenditure are fully synchronized throughout the period

under review. Moreover, government R&D expenditure also moves in sync with them, something that has either not been observed or has been observed to a much lesser extent in other countries. It should be borne in mind, however, that Croatia is the most recent EU member state, which certainly has a beneficial effect on its economy. Total expenditure and GDP do not show any correlation with each other or with the other indicators.

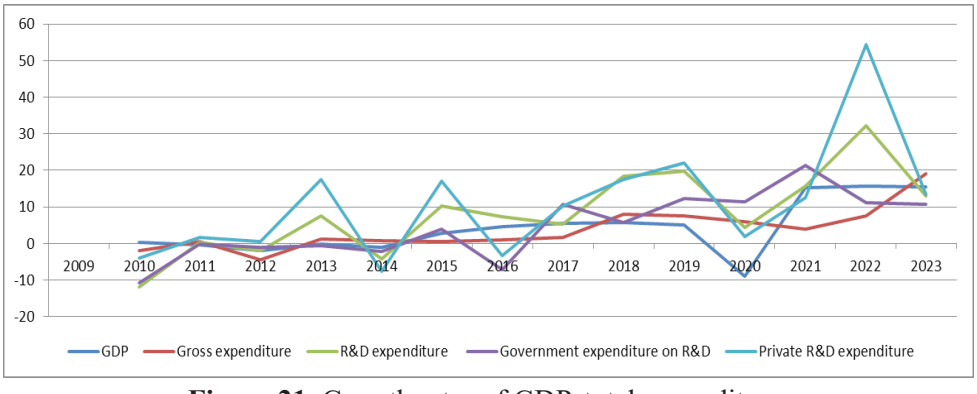

Figure 21. Growth rates of GDP, total expenditure, and R&D expenditure for Croatia

Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The share of R&D expenditure in Croatia as a share of total expenditure in the country is around the average for the sample, and it is striking that in the second half of the period under review, they are twice as large as a percentage. The ratio between private and government expenditure on R&D fluctuates within not too large limits but remains relatively constant over the period under review, without any particular fluctuations. In Croatia, it is also striking that government or private sector investments can explain no more than about 70% of R&D expenditure.

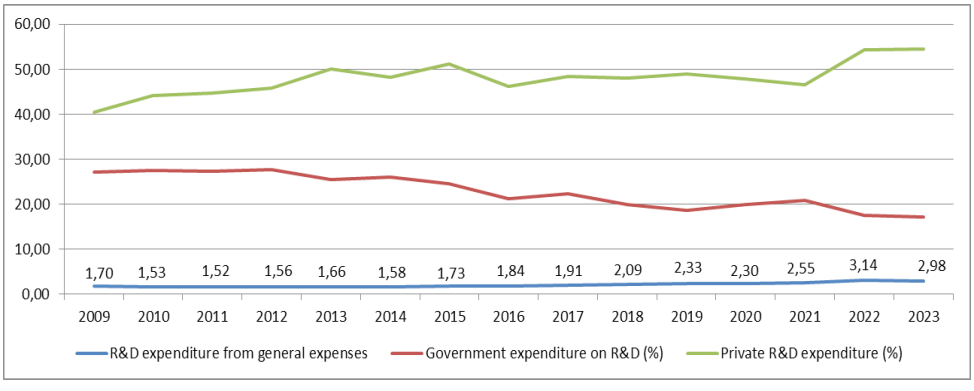

Figure 22. Ratio and share of R&D expenditure for Croatia
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.12. Cyprus

Cyprus is no exception, and the growth rates of private R&D expenditure and total R&D expenditure are mainly synchronized, although not to the same extent as in some other countries considered. The remaining indicators considered do not show any specific synchronization either among themselves or with private or total R&D expenditure, and only in individual periods can one observe a coincidence of peaks or troughs or vice versa – complete asynchrony, which is often observed in the other countries.

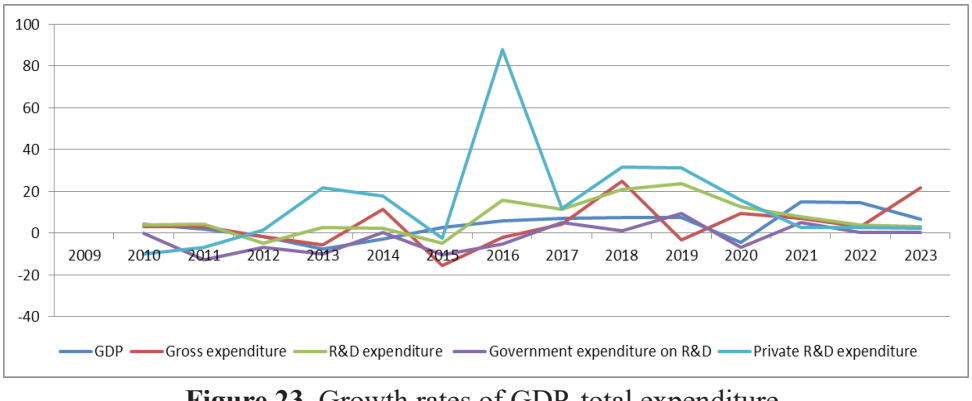

Figure 23. Growth rates of GDP, total expenditure,
and R&D expenditure for Cyprus
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The share of R&D expenditure as a part of the country‘s total expenditure is the lowest of all the countries considered. However, after 2015, an apparent increase

in the percentage values has been observed, which is indicative that policymakers have paid more attention to the innovative development of their country. On the other hand, the ratio between private and government R&D expenditure shows that the reason for this growth in R&D investment is clearly due to the private sector, since throughout the period under consideration, the role of the public sector has been constantly declining. It is precisely since 2015 that the scissors in the ratio have opened up, which means that the state has most likely undertaken regulatory changes to facilitate the private sector in investing in innovation. It should be noted that Cyprus is the country where less than 50% of R&D expenditure can be explained by investments from the private or public sector – the lowest value of all the countries considered. In all likelihood, the larger share of R&D investments is due to FDI, but further research will be needed to confirm such a hypothesis.

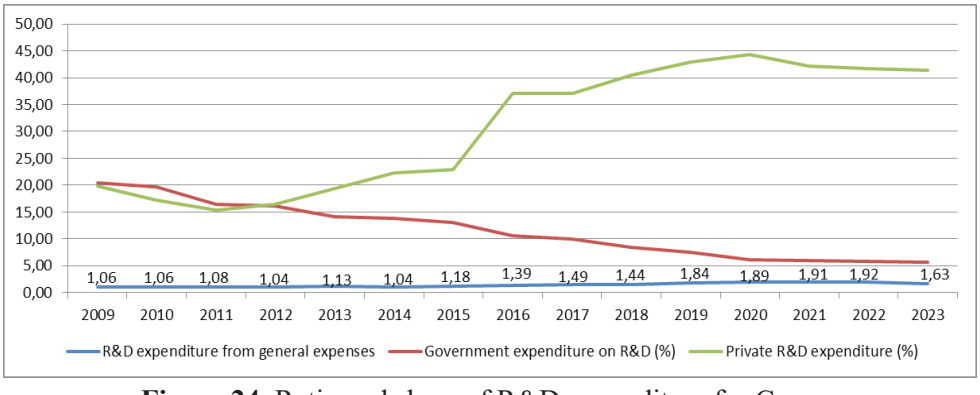

Figure 24. Ratio and share of R&D expenditure for Cyprus
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

1.13. Malta

A correlation can also be identified between total and private R&D expenditure in Malta, although it is of rather low amplitude. It is evident from Figure 25 that government R&D expenditure fluctuates significantly over the years and has an extremely high deviation. Due to the extremely close movements of the growth rates of the other indicators, it is tough to conclude to what extent there is synchronisation between them, but it is evident that the growth rates of GDP and total expenditure do not show a similar synchronisation with the other indicators.

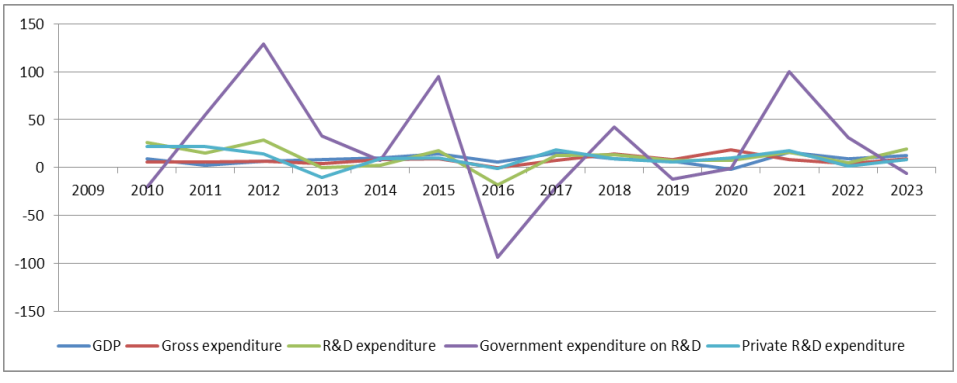

Figure 25. Growth rates of GDP, total expenditure and R&D expenditure for Malta
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

The share of R&D expenditure as a share of total expenditure in Malta is among the lowest of the countries considered, which is not surprising given that Malta is a small economy and investment in innovation activities is not a top priority. It is evident that government expenditure on R&D, as a proportion of total R&D expenditure, is extremely low, even the weakest among all the countries considered. The share of private expenditure is leading in investment in innovation, with over 60% of all R&D expenditure being explained by investments from the private and government sectors.

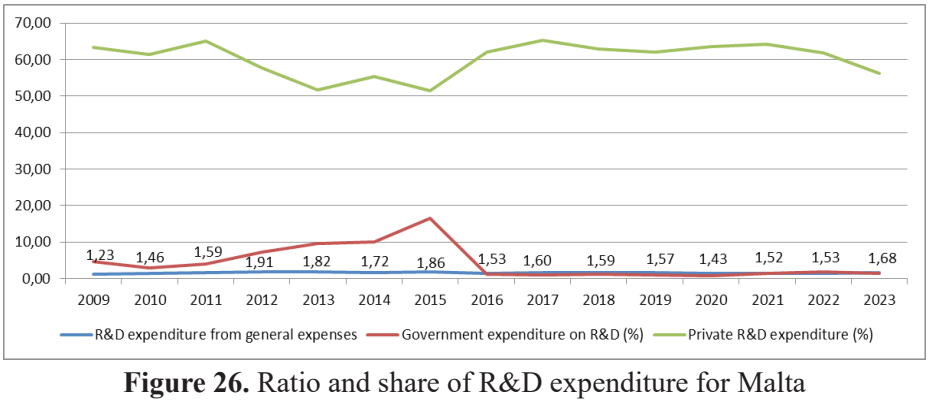

Figure 26. Ratio and share of R&D expenditure for Malta
Source: Compiled by the author based on data from https://ec.europa.eu/eurostat

2. General Findings

It can be concluded that in none of the countries do, the GDP growth rates and the country‘s total expenditure show an apparent synchronization with the indicators

affecting R&D expenditure. The most common correlation concerns private R&D expenditure and total R&D expenditure, which in all countries have a specific synchronization, and in most cases, it is powerful. Government R&D expenditure does not show such a connection with the total ones and much less often shows a correlation with them. Significantly, there is almost no synchronization between government and private R&D expenditure, which is probably a bit unexpected given that even with a widening gap, these expenditures are directly related to the state of the economy.

The share of R&D expenditure as a part of the total R&D expenditure in each country does not show particularly high values, which is understandable, given that innovation is not an expense of primary importance even for the private sector. The fact is that there is an urgent need to increase this share and for both the private and public sectors to invest more in R&D in each of the countries. Of course, it is also important that the final result of these investments is viable and implemented in the national economy to contribute as much as possible to improving the economic well-being of the country.

Regarding the ratio between private and government investment in R&D, each country has a significant preponderance of private over public R&D expenditure. This is something to be expected in modern market economies. What is less expected, however, is the relatively weak role of the public sector in some countries and the fact that the scissors in this ratio are allowed to widen to such an extent.

It is important for each country under consideration that the state has its role in implementing innovation policy and, from there, in investment activity, with which to stimulate innovation activity. The fact is that the role of the state, in most cases, is limited to providing the appropriate conditions for the private sector to implement innovation policy, as well as to offer the opportunity to attract FDI in this direction. But for every modern open market economy, it is essential, even in this activity, to adhere to the more orthodox Keynesian views, which give a far more leading role to the country in the economy. This should not be taken as a proposal for the state to become the leader, but only to increase its share in investing in innovation so that it can thus become a kind of competitor of the private sector and thus stimulate the investment activity of the private sector to an even greater extent. This, of course, includes ensuring appropriate legal and regulatory framework conditions for investment and innovation by both the private sector and for attracting FDI.

Conclusion

The direction of innovation activity at the macro level is not advisable for the favorable development of the national economy. History has long shown that the state is a lousy manager. However, without the active role of the state, no innovation policy would be feasible. The state‘s primary role is to ensure the correct and appropriate regulatory framework and legal basis for innovators to step on. “The importance of the intellectual property system in the modern economy

is constantly growing, which is reflected in the adoption of various international and regional directives and regulations aimed at harmonizing legislation in the field, as well as legislative changes not only in specialized legislation on various intellectual property objects but also of other normative acts." (Papagalska 2022). This includes not only the field of intellectual property, which will always be the main driving force for innovation activity but also a much deeper penetration into the depths of economic science – a suitable atmosphere for making investments, attracting FDI, prudent tax policy, facilitated access to free capital and risk financing and much more. „It is necessary to direct high-risk and significant investments with long-term returns in the field of science and education, including interdisciplinary research institutes, implementation and testing laboratories, and in the field of target sectors of the economy in accordance with the nation's strategic goals... It is also necessary for businesses to invest in creative work with systematic state support for innovative enterprises and culture." (Krushkov 2020).

From the analyses made in the article, it can be seen that the role of the private sector in financing innovations is and will remain leading, but for an innovation campaign to be successful, the state must also contribute, directing investments where they are needed or where access to them is most difficult. In the new EU member states, it is noticeable that, although they are no longer so "new," they still lag significantly behind the Western, far richer, but also far more innovative economies. It is evident that EU membership alone is not enough, and it is necessary to take action on local soil if the goal is to catch up with Western economies. This will only happen if conditions are created to attract new financial resources and, together with the already available ones, direct them to where they are needed to implement the so-called innovative activity.

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