An Overview of Economic Growth in Central and Eastern Europe

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Abstract. *Financial development is one of the most studied topics in specialized literature due to the significant role it plays in the development of countries. The development of the financial sector takes place in the process of establishing and growing financial institutions, traded instruments and financial markets that support investment and economic growth, with favorable effects on reducing poverty and increasing the welfare of the population. In the framework of this article, in the first part I will analyze the main theoretical approaches regarding financial development and the possibilities of its quantification, and in the second part I will measure financial development from a quantitative point of view, in the countries of Central and Eastern Europe , for the period 2007-2017. For quantitative measurement, we construct a 5-variable composite index that measures the size and depth of banking, equity and insurance markets. In this sense, we used as variables for the quantitative quantification of financial development: the internal credit granted to the private sector by banks, the volume of general insurance premiums, the volume of life insurance premiums, stock market capitalization and international debt issues, all related to GDP.*

1. Introduction

In the specialized literature, a multitude of definitions for the concept of economic growth are offered. The first economist to define economic growth in a manner close to today's understanding was Roy F. Harrod, in 1939, attributing to it the notion of an increase in a country's production capacity, identified by sustained growth in real national income over several years. The concept of economic growth is used to denote the amplitude of economic activity, at various levels, from the enterprise to the national and even global economy, but in all these applications, it implies a long-term approach (Rostow, 1960). According to the dictionary of economics, economic growth is defined as a global process expressing the upward evolution of aggregate economic magnitudes over a period of time, at the national or international level, with favorable effects on economic and social life (Dobrota, 1999).

The IMF defines economic growth as the increase or improvement in the inflation-adjusted market value of goods and services produced by an economy in a financial year. Statisticians conventionally measure such growth as the percentage rate of growth of real gross domestic product or real GDP (IMF, 2012). According to the Oxford Business and Management Dictionary, in simpler terms, economic growth refers to an increase in aggregate production in an economy, generally manifested by an increase in national income (Jonathan Law, 2009). Khan Academy defines economic growth much more simply as sustained growth in real GDP per capita over time (Khan Academy, 2019). Additionally, economic growth can be defined as "an increase in a country's production capacity, identified by sustained growth in real

national income over several years" (P. Hardwick et al, 2002) or "the expansion of a country's production or potential GDP" (Samuelson et al, 2000). Economic growth can be seen as a process whereby, by maintaining a constant volume of work, someone can benefit over time from an increasing quantity of goods and services (De La Croix & Baudin, 2015). Consequently, we see that economic growth refers to the increase in a country's productivity over the long term, determined by numerous quantitative and qualitative factors.

It is essential to understand that the process of economic growth is not merely one of positive and ever-ascending evolution but also includes some temporary oscillations and regressions. Thus, there are several forms of economic growth, depending on the manner in which economic growth is achieved, the contribution of factors, the rate of growth of aggregate indicators per capita, the compatibility of economic effects with social and ecological ones, etc. According to these criteria, economic growth can be extensive, intensive, consolidated, balanced, sustainable, negative, zero, etc. (Dobrota, 1999). Extensive economic growth is characterized by an increase in GDP per capita primarily due to the influence of quantitative (volume) dimensions of production factors: more workers, more machinery and technological equipment, more arable land, etc. (Bjork, 1999). On the other hand, intensive economic growth materializes through an increase in GDP per capita mainly due to the combined influence of qualitative (efficiency) dimensions of production factors, manifested in: increased labor productivity, increased land yield, reduced unit production costs, improved quality of goods, etc.

The type of consolidated economic growth is characterized by the compatibility of economic criteria with social-human, ecological criteria, imposed by the necessity to create permanent conditions for equal opportunities for generations that coexist and succeed each other on planet Earth, while the type of balanced economic growth provides for the equality of production that can be achieved with the productive potential demanded by the market, with no underproduction or overproduction, and economies are equal to investments. Potential economic growth expresses the maximum growth rate of national production, based on the existing economic, human, and natural resources at a certain moment, while zero economic growth is characterized by an increase in aggregate economic results at the same rate as the population growth of a country.

Thus, we see that over the years, the concept of economic growth has been defined differently, adding elements of novelty as a result of human and technological evolution, which has allowed for a deeper understanding of the phenomenon of economic growth. In the specialized literature, two main categories of models are encountered: precursory and modern, which are further divided into classical, neo-classical, transitional, and respective models of destructive creation, exogenous growth, endogenous growth, and unified growth.

2. Methodology and data

To measure economic growth, several macroeconomic indicators are commonly found in the specialized literature, capable of expressing the positive variation in the quantity of goods and services produced over a period of time, typically in the long term. The most frequently used indicators include Gross Domestic Product (GDP), Gross Domestic Product per capita (GDP per capita), Gross National Income (GNI), Gross National Product (GNP), Net Domestic Product (NDP), Gross National Product (GNP), and the Consumer Price Index (CPI).

Despite the numerous methods of quantification, the most relevant and commonly recommended by specialists are the indicators: the GDP growth rate, which measures the market value of goods and services produced, and the GDP growth rate per capita. These two indicators are considered the most important for quantifying economic growth because the GDP growth rate has the capacity to express by what percentage the economic situation has improved in year T compared to year T-1, adjusted for inflation, while the GDP growth rate per capita helps us deduce whether the living standards have improved for the inhabitants of that country in year T compared to year T-1.

The GDP growth rate of a country is defined as the percentage change from the previous year. The calculation relationship to determine the GDP growth rate is:

$$GDP\% = (GDP_t - GDP_{t-1}/GDP_{t-1})*100\% \qquad (1)$$

This formula expresses the percentage change in GDP from year *t-1* to year *t*.

The GDP growth rate per capita expresses the percentage change from the previous year of GDP per capita and is determined by the calculation formula:

$$GDP\_per\_capita\% = (GDP_t - GDP_{t-1})/ GDP_{t-1} * (P_t/P_{t-1})*100\% \qquad (2)$$

Where:
- GDP_t represents *GDP* in year *t* expressed in the prices of year *t-1*
- GDP_{t-1} represents GDP in year t-1,
- P_t represents the stable population in year t, and
- P_{t-1} represents the stable population in year t-1.

Our dataset contains the GDP growth rates and GDP per capita growth rates for the 12 countries in Central and Eastern Europe for the period 2000-2020. These data were collected from the World Bank database, which is considered a reliable and important source of economic and social information.

Summary statistics regarding the GDP growth rates and GDP per capita for each country in Central and Eastern Europe are presented in Table 1 and Table 2.

Table no.1. Summary statistics by country-annual GDP percentage growth

	Bulgaria	Czech Republic	Cyprus	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia
Mean	3.147	2.547	2.423	3.795	2.333	3.519	4.009	4.266	3.571	3.676	3.471	2.171
Median	3.4	3	3.7	3.8	3.9	3.9	4	4.1	3.8	4.1	3.3	3.2
Maximum	7.1	6.8	6.6	10.1	5.4	12	11.1	19.7	7.1	10.4	10.8	7
Minimum	-4	-5.5	-6.6	-14.6	-6.6	-14.3	-14.8	-8.3	-2	-5.5	-5.5	-7.5
Std.Dev.	3.1435	3.199	3.844	5.592	3.184	5.984	5.138	5.418	2.062	4.224	3.648	3.443
Skewness	-0.76	-1.13	-1.02	-1.80	-1.53	-1.21	-2.24	0.55	-0.77	-0.63	-0.50	-1.38
Kurtosis	2.935	3.986	2.792	6.757	4.622	4.872	9.821	5.285	3.796	2.887	3.736	4.461
Jarque-Bera	2.038	5.387	3.696	23.73	10.51	8.24	58.39	5.65	2.663	1.41	1.38	8.568
Probability	0.360	0.067	0.157	0.000	0.0052	0.016	0	0.059	0.263	0.4921	0.5012	0.0137
Sum	66.1	53.5	50.9	79.7	49	73.9	84.2	89.6	75	77.2	72.9	45.6
Sum Sq. Dev.	197.6	204.6	295.5	625.5	202.80	716.2	527.99	587.3	85.04	356.85	266.3	237.16
Observ.	21	21	21	21	21	21	21	21	21	21	21	21

Source: Own processing

Through these descriptive statistics, which provide a simplified overview of the data regarding the GDP growth rates for each country in Central and Eastern Europe (CEE), several observations can be made. We observe that the mean GDP values for

each country vary between 2,171 and 4,266, with the highest values recorded for Malta and Poland, and the lowest for Latvia and Bulgaria. The median, representing the central value of the data and being less sensitive to extreme values than the mean (Justusson, 1981; Savur, 1937), ranges between 3 and 4.1, emphasizing that over the entire period, the GDP growth rates tend towards these values. By examining the maximum and minimum, we can identify the lowest and highest GDP growth rates for each country. At the sample level, the variation is significant, with maximum values between 5.4 (Hungary) and 19.7 (Malta) and minimum values between -14.8 (Lithuania) and -2 (Poland).

The standard deviation measures the degree of data dispersion around their mean (Sarhan, 1955; Douglas, 2008; Lee, D. K., In, J., & Lee, S., 2015). The standard deviation values are relatively large, with the highest values observed for Latvia, indicating significant variation in GDP growth rates.

Skewness refers to asymmetry and indicates whether the data distribution is symmetric or not (Doane & Seward, 2011). Negative values indicate a distribution slightly skewed to the left, while positive values indicate a distribution skewed to the right (Ho, & Yu, 2015). In this case, all skewness values are negative, indicating a slight left skewness of the distribution. Furthermore, kurtosis measures the "peakedness" of the data distribution (DeCarlo, 1997). Higher values suggest heavier tails and extreme points in the distribution. Generally, the values are positive, indicating a relatively pronounced peakedness of the distribution.

The next analysis unit through the Eviews application is the Jarque-Bera test, which checks if the data has a normal distribution. High values of this test, together with low probabilities, indicate that the data distribution is not normal (Jäntschi, & Bolboacă, 2009). The probability complements the Jarque-Bera test and shows its result for the normality of data distribution. The lower the probability, the less likely the data is normally distributed. In our sample, the null hypothesis is rejected for the countries: Estonia, Hungary, Latvia, Lithuania, and Slovenia, while for the other countries, we can speak of a normal distribution of data.

Sum, by its name, suggests the role of this operation, that of summing the values for each dataset. It shows the total of GDP growth rates for each country, with the highest value obtained by Malta, suggesting a total GDP growth rate superior to other CEE countries. The sum of squared deviations shows the sum of squared deviations, i.e., the difference between each value and the mean squared, separated for each dataset (Livingston, 2004). These values are used to calculate the data dispersion (Edjabou, et al., 2017). The last element of descriptive statistics concerns observations, i.e., the total number of observations in each dataset. In this case, there are 21 observations for each country, meaning that the data is based on the same amount of information for each country, covering the years 2000-2020.

These descriptive statistics provide an overview of the distribution and variability of data regarding GDP growth rates for each country in CEE.

Table no.2. Summary statistics by country annual-GDP per capita percentage growth

	Bulgaria	Czech Republic	Cyprus	Estonia	Hungary	Latvia	Lithuania	Malta	Poland	Romania	Slovakia	Slovenia
Mean	3.985	2.361	1.157	4.019	2.566	4.652	5.166	2.847	3.68	4.447	3.414	1.876
Median	4.1	2.6	2.8	3.6	4.1	4.7	5	2.7	3.9	4.5	3.4	3.1
Maximum	8.2	6.5	6.1	10.4	5.5	13	12.4	18.9	7.1	11.1	10.8	6.4
Minimum	-3.4	-5.7	-6.4	-14.5	-6.5	-12.8	-13.9	-10.3	-1.8	-4.7	-5.6	-8.4
Std. Dev.	3.324	3.229	3.794	5.698	3.181	5.900	5.284	5.291	2.078	4.432	3.677	3.558
Skewness	-0.705	-1.190	-0.787	-1.724	-1.587	-1.165	-2.164	0.627	-0.749	-0.498	-0.499	-1.522
Kurtosis	2.755	4.074	2.302	6.457	4.820	4.743	9.297	6.598	3.527	2.615	3.710	4.805

Jarque-Bera	1.794	5.973	2.597	20.869	11.717	7.416	51.100	12.70	2.209	1.000	1.314	10.960
Probability	0.407	0.0504	0.272	0.000	0.002	0.0245	0	0.001	0.331	0.606	0.518	0.004
Sum	83.7	49.6	24.3	84.4	53.9	97.7	108.5	59.8	77.3	93.4	71.7	39.4
Sum sq.	221.06	208.54	287.97	649.41	202.42	696.35	558.44	559.9	86.37	392.95	270.54	253.31
Observation	21	21	21	21	21	21	21	21	21	21	21	21

Source: *Own processing*

In the case of data regarding GDP growth rates per capita, Eviews exported the following descriptive statistics: the mean for each country ranged from 1.876 for Slovenia to 5.166 for Lithuania; the median ranged from 2.6 in Czechia to 5 in Lithuania. For example, in Romania, the median was 4.5, suggesting that half of the indicator values are less than or equal to 4.5, and half are greater than or equal to this value. The maximum of these rates was 18.9 (Malta) and the minimum was -12.8 (Latvia).

Similarly to the GDP growth rates, there is a relatively large standard deviation in GDP growth rates per capita, indicating greater variability in the data, with the highest variability observed for Latvia. The data indicates some asymmetry, slightly skewed to the left, with only Malta having positive values, indicating a long tail on the right side. Kurtosis, which measures the "heaviness of the tail" of the data distribution (Chissom, 1970), with the highest values observed for Lithuania, indicating a heavier tail.

As we know, the Jarque-Bera test checks if the data has a normal distribution, with lower values indicating a distribution closer to normal (Abiodun et al., 2022). Values slightly above 50 were obtained for Lithuania, indicating a distribution opposite to normal, while Romania is at the opposite pole, with the most normal distribution of GDP growth rates per capita in the period 2000-2020.

The probability represents the results of the Jarque-Bera test (Papoulis, 1990; Dekking et al., 2015), with values below 0.05 for the countries Estonia, Hungary, Latvia, Malta, and Slovenia, indicating that the data is not normally distributed. The other countries have values above the recommended threshold of 0.05, so the null hypothesis is rejected, indicating that the data is normally distributed.

The sum of these rates varies between 24.3 for Cyprus and 108.5 for Lithuania, while the sum of squared deviations has values between 86.37 for Poland and 649.41 for Estonia. The number of observations is the same, as we maintain the same years included in the analysis.

3. Results and discussions

The calculation of the annual GDP growth rate is intended to allow comparisons of economic growth dynamics both over time and between economies of different sizes. To measure the GDP growth rate in volume terms, GDP at current prices is evaluated at prices from the previous year, and the volume variations thus calculated are imposed at the level of a reference year. Consequently, price movements will not inflate the growth rate (Eurostat, updated 2023). Similarly, in the case of the GDP growth rate per capita, its purpose is to serve analyses over time and space, regarding changes in welfare and productivity recorded from year to year by the world's economies. Thus, these rates are most suitable for comparative analyses between countries, regarding the dynamics of economic development over the years.

To determine the economic growth of a country, the GDP indicator is most often used, which has the capacity to express the economic evolution and progress of a state over various periods, most commonly over a year. However, to be more relevant,

the GDP per capita indicator is preferred, as the total value of GDP in a country may not truly reflect the standard of living in that country and its efficiency. Thus, by using GDP per capita, the influence of the absolute size of the population is eliminated, allowing for comparison of GDP between countries.

For the analysis of economic growth in the ECE countries, we used the GDP growth rate (at purchasing power parity) and the GDP growth rate per capita for the period 2000-2020, graphically represented in Figure 1 and Figure 2.
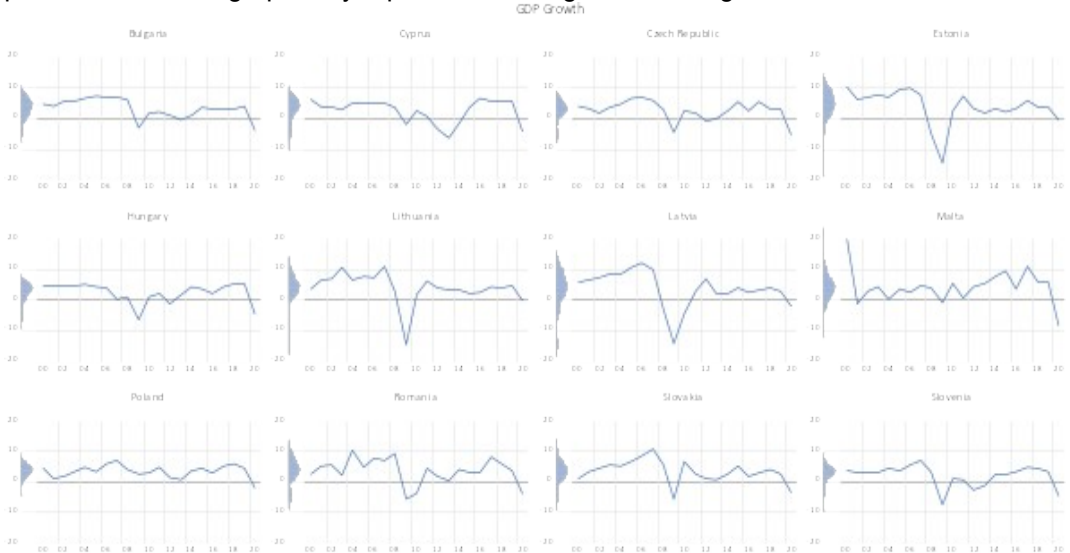

Figure 1. GDP growth rate (%) in CEE countries
Source: Own processing using the World Bank database

Figure 2. GDP growth rate GDP per capita (%) in CEE countries
Source: Own processing using the World Bank database

Throughout the entire sample, the GDP growth rate in 2001 compared to 2000 averaged 3.8%, while the GDP growth rate per capita was 4.2%. Malta was the only country in the ECE region to experience a decline in 2001 compared to 2000, both in

GDP at purchasing power parity and GDP per capita, by 1.2 and 1.9 percentage points, respectively.

In 2001, the highest growth rates of these two indicators were recorded in Lithuania (6% and 6.7%, respectively), Latvia (6.5% and 7.4%), and Estonia (6% and 6.7%). Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Latvia, Poland, Romania, and Slovakia are the countries where the GDP growth rate per capita exceeded that of GDP, indicating a faster population decline compared to economic growth in these countries. In 2002-2003, no negative values of the GDP growth rate were recorded, with Malta managing to achieve growth rates of up to 4.1% for GDP and up to 3.4% for GDP per capita. The sample average increased in 2002 compared to 2001 by 4.6%, and in the following year, it increased by 5% compared to the previous year. For the same period, improvements also occurred in GDP per capita, with the ECE countries' average increasing by 5% in 2002 and 5.3% in 2003. Estonia, Lithuania, and Latvia maintain their leading positions, recording growth rates almost double the sample average, with the highest growth rates being achieved by Lithuania.

During the period 2004-2007, considerable increases in these rates occurred, especially in Bulgaria, Estonia, Lithuania, Latvia, and Romania. In 2004, Romania recorded growth rates of 10.4% and 11.1%, while at the opposite end was Malta, which achieved a GDP growth rate of only 0.1%, and the GDP growth rate per capita was negative at -0.5%. In 2008, with the onset of the global financial crisis, decreases occurred in GDP, leading directly to a decrease in GDP per capita. The most affected countries were Estonia (-5.1% and -4.9%) and Latvia (-3.2% and -2.2%), while the rest of the countries managed to record positive growth rates, with the sample average being 2.8% and 2.9%, respectively. The highest growth rates were recorded in Romania (9.3%, 11.1%) and Bulgaria (6.1%, 6.9%). Consequently, the onset of the global financial crisis had a significant impact on economic growth in the ECE region. Countries that were more vulnerable in terms of exposure to international financial markets, such as Estonia and Latvia, experienced larger declines in GDP and GDP per capita.

During this period, some countries, such as Lithuania, Latvia, and Estonia, recorded significantly higher economic growth rates due to the successful implementation of economic policies and structural reforms. These reforms included market liberalization, privatization of the public sector, improvement of the business environment, and investments in infrastructure. Additionally, integration into international markets and participation in trade agreements stimulated exports and contributed to economic growth in countries such as Bulgaria and Romania.

The following year was even more challenging economically, with GDP and GDP per capita experiencing drastic declines, with the sample average reaching -6.4% (GDP) and -6.5% (GDP per capita). In detail, only Poland recorded a positive growth rate (2.8% for both rates), while the rest of the countries were heavily affected, resulting in lower GDP values compared to the previous year. The smallest growth rate/largest negative rate was recorded in Estonia (-14.6%, -14.5%), Lithuania (-14.8%, -13.9%), and Latvia (-14.3%, -12.8%). From 2010, the economic situation improved, with growth rates increasing both in GDP and GDP per capita to an average of 1.6% and 1.8% for ECE countries. The only states with negative values were Latvia (-4.5%, -2.4%) and Romania (-3.9%, -3.3%), while Cyprus recorded negative values only in terms of GDP per capita growth rate (-0.4%), with the GDP growth rate being 2.3%. This situation indicates a population growth rate higher than that of GDP.

In 2011, the GDP growth rate and the GDP per capita growth rate continued the upward trend, with the sample average reaching 3% and 3.2%, respectively. The best performances were achieved by Estonia (7.3%; 7.6%), Lithuania (6%; 8.5%), and Poland (5%; 5%), while the poorest rates were observed in Cyprus (0.4%; -2.1%) and

Slovenia (0.9%; 0.7%). The following two years were characterized by a decline in the analyzed indicators, with the sample average for GDP falling to 1.3% and 0.7%, and GDP per capita depreciating to 1.5% and 0.8%, respectively. In 2012-2013, the most performing states were Latvia and Malta, respectively Lithuania and Malta, while Cyprus and Slovenia were at the opposite end. The next six years were characterized by continuous oscillations, with both ascending and descending trends in the analyzed rates. The best rates were obtained in 2017, with the sample average for GDP being 5.3%, and GDP per capita being 5.2%, with Malta and Romania leading the ranking with the highest increases, while Bulgaria and Slovakia recorded the lowest rates. In 2020, as a result of the COVID-19 health crisis, a global economic decline occurred, with the GDP rate in Central and Eastern Europe dropping to -3.6%, and the GDP per capita rate decreasing to -3.7%. The most affected countries were Malta (-8.3%, -10.3%), Czech Republic (-5.5%, -5.7%), and Cyprus (-4.4%, -5.5%), while the countries that best withstood the economic shocks were Lithuania, with 0% for both rates, and Estonia, with -0.6% and 0.7%.

Based on these statistics, we can conclude that the highest GDP and GDP per capita growth rates were recorded in the period leading up to the 2008 crisis when the global economy was in a phase of economic boom. The poorest results were recorded in 2009, post-crisis, as well as in 2020 during the health crisis, with the effects of crises affecting macroeconomic results manifested by rising unemployment, declining productivity, inflation, and other economic disruptions, all leading to a decrease in GDP and GDP per capita.

4. Conclusions

This analysis of the evolution of GDP growth rate and GDP per capita in Central and Eastern Europe (CEE) between 2000 and 2020 reveals a series of significant fluctuations, which were caused by various internal socio-economic factors and a multitude of global events. In the period leading up to the global financial crisis of 2008, the CEE region experienced significant economic growth, stimulated by market liberalization and the accession of eight CEE countries to the European Union in 2004: the Czech Republic, Estonia, Latvia, Lithuania, Poland, Slovakia, Slovenia, and Hungary, with Romania and Bulgaria joining in 2007. Economic growth before the financial crisis was fueled by both foreign direct investment and increased access to international markets. With the onset of the global financial crisis, there was a severe contraction of economies worldwide, with countries in the CEE region also affected, experiencing significant declines in GDP and GDP per capita. The economic decline was amplified by the region's countries' dependence on the financial sector, as well as weaknesses within banking systems.

In the first years after the crisis that shook the world, following the fiscal and monetary stimulus measures adopted by governments, as well as the return of investor confidence, economies in the region began to recover. Improved global economic conditions, as well as continued integration into the European Union, contributed to the resumption of economic growth. The period 2012-2019 was characterized by fluctuations in the GDP growth rate and GDP per capita, influenced by factors such as fiscal policy, political instability, and the evolution of international markets. Economic growth improved in some countries, such as Estonia and Lithuania, while others remained vulnerable to economic shocks, such as Cyprus and Slovenia. The economic decline in 2020, caused by the COVID-19 pandemic, generated a new period of instability and economic contraction in the CEE region. Restrictions imposed to limit the spread of the virus affected key sectors of the economy, such as tourism, trade, and manufacturing, causing significant declines in GDP and GDP per capita.

In conclusion, the fluctuations in economic growth in Central and Eastern European countries are based on a series of factors, both internal and external, such as global events, economic policies, and internal instability. Understanding these causes and their impact can provide important guidance for the formulation of policies and economic strategies aimed at stimulating sustainable economic growth in the region

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