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DOMESTIC PRODUCT VERSUS PERSONAL INCOME CONVERGENCE, WITHIN EU AND EURO AREA

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DOMESTIC PRODUCT VERSUS PERSONAL INCOME CONVERGENCE, WITHIN EU AND EURO AREA

DAN CONSTANTIN OLTEANU[1]

Abstract: *This study aims to assess the extent to which the economic integration process of the EU and the Eurozone, expressed by the convergence of GDP per capita, is reflected in the convergence of economic well-being of households, revealed by income and consumption, during the last 20 years (2000-2019). We find that, first of all, the convergence process of GDP per capita is strongly correlated with that of household income and consumption, both for the EU and the Eurozone level. This proves that GDP remains a relevant determinant of economic well-being of population. Secondly, our analyzes show that the socio-economic convergence process has been mainly supported by the growth of emerging Eastern European economies. Together with the declining Southern countries, they are converging to a level below the current EU average. On the other side are the developed countries of Central and Northern Europe, which include a core with constant developments well above the EU average and a group of poor performing countries, which tend to approaches the EU average. For the group of initial euro area members, the alternation of convergence/divergence tendencies, together with the coefficient of variation in 2019 located very close to the 2000 one, indicate a lack of convergence during this period, both for GDP and household income.*

Keywords: *growth convergence, well-being convergence, household income and consumption, EU integration.*

JEL: *O47, I31, O52.*

1. Introduction

The real convergence process within the EU has been a long-standing issue for researchers and policy makers since its inception in 1993, with the conclusion of the Maastricht Treaty. Accelerating this process is one of the basic requirements for the enlargement of Eurozone and the achievement of Economic and Monetary Union (EMU). As a result, the objective of convergence and, implicitly, the balanced development of the Union has often been mentioned in the European strategies and strongly supported by cohesion policies aimed at assisting emerging economies to catch up with developed ones. Less discussed, initially, in European strategies, was the extent to which the convergence of domestic product - the main indicator for assessing real convergence - led to the convergence of income and economic well-being of the population. This was seen as an objective that falls rather within the scope of national governments' concerns / responsibilities, and less so as a Community objective. Gradually, however, the persistence of considerable gaps in living standards - despite the highly publicized rise in domestic product - in Eastern European countries, as well as the stagnation of welfare and economic performance in southern countries, have generated a strong current of Euroscepticism. This phenomenon, together with the need to monitor more broadly the impact of European policies, has led to the increasing inclusion of population well-being among Community objectives.

Achieving economic convergence is a controversial topic both theoretically and empirically. Regarding the first aspect, Iancu (2009b, pp.1-2) summarizes the main theories on real convergence and shows that there are 3 main currents of approach: the first one considers convergence a natural process determined by free market forces and competition; the second current denies the convergence effect of the free market and draws attention to polarization trends between central and

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peripheral (north-south) European countries; the third current is a mix of the first two, and admits the convergence process only in the presence of macroeconomic policies that can correct some of the negative effects of free market imperfections, and support the small economies in the early stages of the convergence process.

The results of empirical research are also divided, but rather confirm the third category of the mentioned theories. For example, Iancu (2009a, p.20) finds a very slow process of convergence at EU-25 level, in the period 1995-2016, revealed by reducing the coefficient of variation for *gross domestic product* (GDP) per capita expressed at purchasing power parity, from 0.44 to 0.42. On the other hand, the same author shows that, at the level of the EU-15 group, the coefficient has increased from 0.25 to 0.32, which indicates a divergence tendency.

Chivu and others (2019, p.60) also demonstrate the existence of the GDP convergence process per capita at EU-27 level, proved by a reducing variation coefficient, from 28.3% to 19.8%, in the period 2000-2016. Olteanu (2019a) confirms a convergence trend, between 1997 and 2017, at EU-28 level, in terms of a series of economic and social indicators including GDP per capita, final consumption and annual income of households. Finally, Alcidi and others (2018) conclude that, although there has been a process of convergence of GDP per capita in the last 15 years, two clusters have emerged: the first is the Eastern European one, which is close to the EU average, and the second is formed by the Southern European states, which rather tend to move away from the European average.

Regarding the correlation between domestic product convergence and welfare convergence, since 2009, the Stiglitz-Sen-Fitoussi (2019) report warned that the evolution of GDP reflects less and less the dynamics of population welfare, and proposes the measurement of a new series of social indicators. At the same time, a Communication from the European Commission in the same year (EC, 2009) emphasizes the need to measure social and environmental indicators in order to more comprehensively assess the results of Community policies. More recently, a substantiation document prepared for the European Council by the OECD (2019, p.4) states that GDP does not provide decision-makers with a sufficiently rich and accurate picture to assess how economic performance leads to the population well-being, and proposes the concept of "welfare economy", along with a series of policies on social protection and income redistribution, education, etc. which support the achievement of this goal.

Also related to the correlation between domestic product and welfare, Leitner and Römisch (2015) note the imbalance between the labor and capital remuneration; they show that, between 1995 and 2011, GDP growth in Eastern European countries is reflected much more in company profits and less in employee income. ETUI (2020) also mentions the need for wage convergence, in order to ensure a balanced pattern of labor mobility within the EU, and concludes that *"after ... 14 years of EU membership the closing of the gap in living standards between western Europe and eastern and central Europe remains as elusive as ever, with little likelihood of any meaningful convergence happening any time soon"*.

The present study aims to assess the extent to which the process of economic integration within the EU and the Eurozone, expressed by the convergence of GDP per capita, is reflected in the convergence of population economic well-being, measured by household income and consumption. First, we briefly analyze the GDP convergence process during the last 20 years (2000-2019), after which we study in detail the correlation between its convergence, on the one hand, and that of household income and consumption, on the other hand.

2. A survey on the GDP convergence at purchasing power parity, at EU-28 level, during 2000-2019

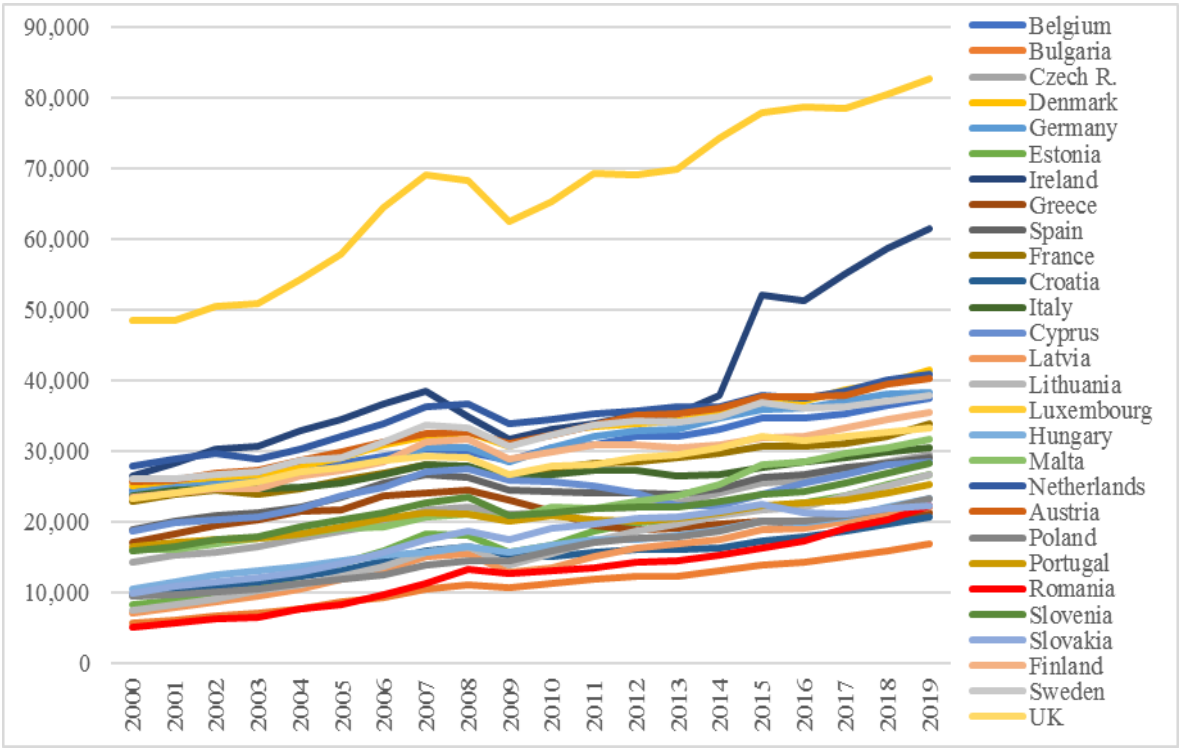
We will further present a synthetic analysis of GDP convergence at EU28 level. For this purpose, in Fig. 1 we first draw the evolution in the last two decades of domestic product per capita, expressed in current prices at purchasing power parity (euro purchasing power standards, as

calculated by Eurostat). We notice a significant synchronization in the evolution of this indicator among EU members states, an evolution in which 3 periods can be distinguished: the first one is the ascending trend up to the impact of the financial crisis of 2007, followed by recession; the second one is composed of a period of consistent recovery, followed by a capped or even downward trend in some economies (Italy, Spain, Finland), after which the rise resumes, until 2015; the third period includes an initial moderation in the rise of domestic product, followed by a growth rebound until 2019, the last year considered.

Among the analyzed countries in fig.1, there are two with extreme values – Luxembourg (yellow line) and Ireland (dark blue line) - for which the trend of GDP per capita gets very far from the others (Luxembourg for the whole period, and Ireland since 2015). We will exclude them from the calculation of variation coefficient, in order to avoid distortion of its values.

For the other countries, the amplitude of the value corridor seems to be constant. A first indication of GDP per capita convergence is the decreasing evolution of the ratio between the maximum and the minimum GDP value, among the member countries. This ratio takes the values 5.5 in 2000, 3.5 in 2007 and 2.4 in 2019.

Fig. 1. GDP per capita, Euro PPS, current prices



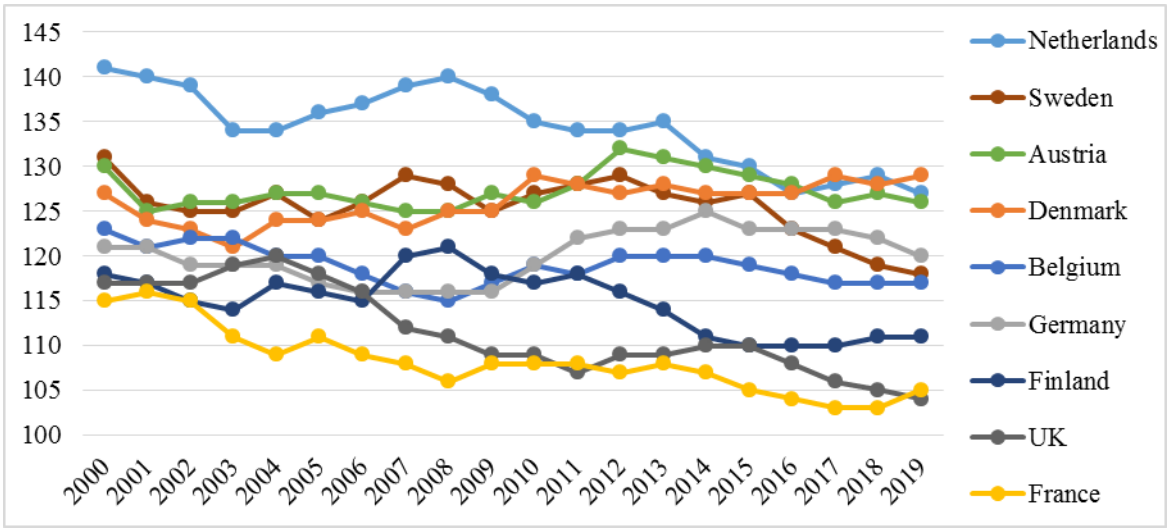
Source: Eurostat database.

A second indicator of convergence we use is *the share in EU-28 average* of GDP per capita for each country. In this regard, three groups of countries can be differentiated, depending on these shares and their evolution. In fig.2 and 3 we represent in detail these trends for the three groups.

The *first group* include the Central and Northern European countries (CNE), with shares higher than European average, but with a downward general trend (fig.2). We further distinguish here 3 categories. One of them has a constant evolution along a central trend of almost 125% of EU-28 average: Sweden, Austria, Denmark, Belgium and Germany. The second category only includes the Netherlands, with initial values far above the others, but gradually descending towards the central tendency. The third category includes France, Finland and the United Kingdom, which tend to leave the CNE group and gets closer to the EU average. With the exception of the

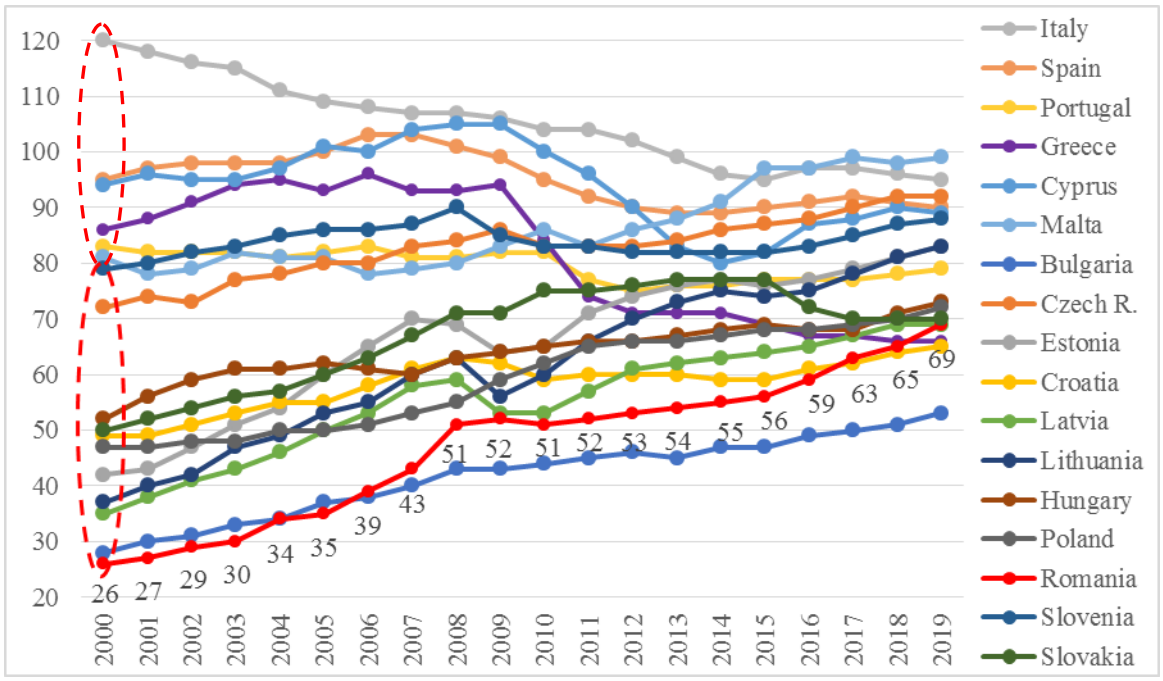
Netherlands, the amplitude of the corridor in which the CNE group's values fall increases over time, which reveal a divergence tendency between these economies.

Fig. 2. GDP (PPS per capita) in Central and Northern European countries, EU-28=100



Source: Eurostat database.

Fig.3. GDP (PPS per capita) in Sothern and Eastern European countries, EU-28=100



Source: Eurostat database. Note: figures correspond to Romania (red line).

The *second group* is that of the Southern European countries (SE), located in the upper part of Fig.3, which mostly tend to move downwards, away from the EU28 average: Italy, Spain, Portugal, Greece, Cyprus, and Malta. Only the last one managed to increase its share between 2000 and 2019. At the opposite pole is Italy, with a steady decline, which stood at 25 percentage points (p.p.) in the considered period. Spain, Greece and Cyprus are getting closer to the EU average by 2007, after which the impact of financial crisis severely affects their trajectories. They fail to rebound, even in 2019, to the 2000 level. Among these, Greece stands out in a negative way, with a 20p.p. decline. We cannot draw a clear conclusion on the convergence / divergence within this group: on the one

hand, Italy, initially far from the other countries, is gradually joining the other countries; on the other hand, countries like Portugal, and especially Greece, are moving away.

The *third group* is that of the emerging Eastern European countries (EE), located at the bottom side of Fig. 3, defined by a clear trend of approaching the European average, which confirms the β-type convergence (economies with initially lower GDP per capita grow faster). Of these, significant EU-28 share increases were recorded in Lithuania (46p.p.), Romania (43p.p.), and Estonia (41p.p.). These ascensions in countries with lower GDP per capita initial levels, higher than those achieved in countries with higher levels (as Slovenia, the Czech Republic, or Hungary), lead to a trend of convergence also within the EE group; Bulgaria is the only exception not following this pattern. We also may notice a significant convergence between these two groups (SE and EE) taken together, while, we recall, at the level of CNE countries the trend is rather divergent.

3. Convergence of GDP, GNI, household income and consumption

3.1. An overview

We further aim to compare the evolution of GDP convergence, along with that of *gross national income* (GNI), income and consumption of the population, all expressed per capita at purchasing power parity (euro PPS). This way, we want to assess the extent to which macroeconomic convergence, expressed by the change in GDP per capita at Member State level, is reflected in the convergence of the economic well-being of the population.

For measuring personal income we use the *adjusted gross disposable income* of households and non-profit institutions serving households. It represents income from wages, social benefits, plus net interest and dividends, deducted taxes and social contributions, and adds the value of in-kind services, such as health, education, or housing subsidies, received free of charge or at reduced prices from the government or non-profit institutions serving households. For measuring private consumption we use the *final consumption* and *actual individual consumption* of households (which includes both the direct consumption of goods and services and the services received from the government and non-profit institutions serving households). For all these indicators, the data source is Eurostat[2].

For measuring convergence we use the *coefficient of variation* (CV), which is a measure of σ type convergence. We will perform the analysis at 4 group levels of member countries: *EU-26* (EU-28 without Luxembourg and Ireland), *Euro-17 area* (Euro-19 excluding Luxembourg and Ireland), and *Euro-9 area* (Euro-11 without Luxembourg and Ireland). To these we added a group noted *EU-5*, consisting of the initial core of the European Economic Community established by the Treaty of Rome (Belgium, France, Italy, Luxembourg, the Netherlands and West Germany), from which we eliminated Luxembourg; for Germany we considered the whole territory (including the eastern part). We have included this group for assessing to what extent the "European project" of economic and social integration, started in 1957, has proved successful.

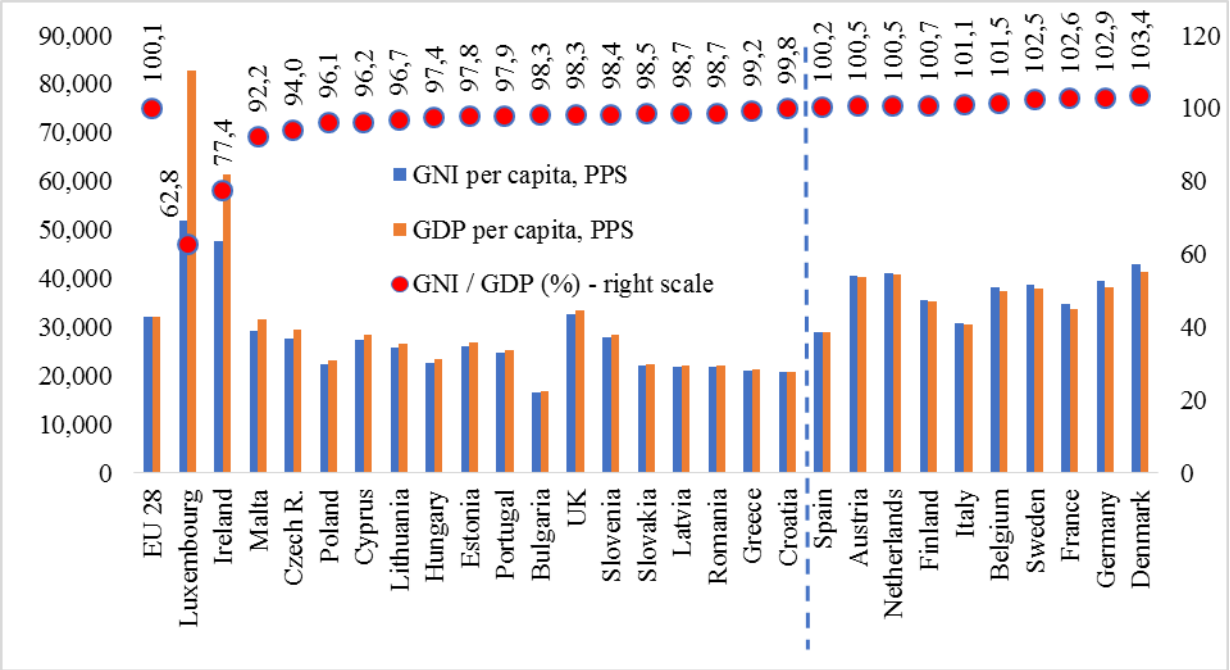
As mentioned before, we exclude Luxembourg and Ireland from calculation of variation, primarily because of substantial distancing from the trends of the other Member States (Fig. 1), which distorts the values of the coefficient of variation. Another reason is that a significant share of domestic product made by companies in these economies leaves the country, and thus is not found in the national income and, further, in the personal income. This can be observed in Fig. 4, which presents the GNI / GDP ratio in the EU28 Member States.

The GDP share not found in GNI goes up to 37.2% in the case of Luxembourg, and 22.6% for Ireland. These values are far away from the others, and affects the correlations between GDP and household income / consumption, which we are going to analyze. In Fig. 4 we also notice that

[2] https://ec.europa.eu/eurostat/data/database .

countries with a ratio over 100%, which benefit from a positive net income from abroad, are the developed ones, with high levels of GDP per capita. On the other side, with subunit ratio, there are emerging economies, hosting foreign companies that repatriate profit, but also few developed economies with foreign labor force that repatriate earnings (e.g. UK).

Fig.4. GNI, GDP, and GNI / GDP ratio, 2019



Source: Eurostat database and own calculation.

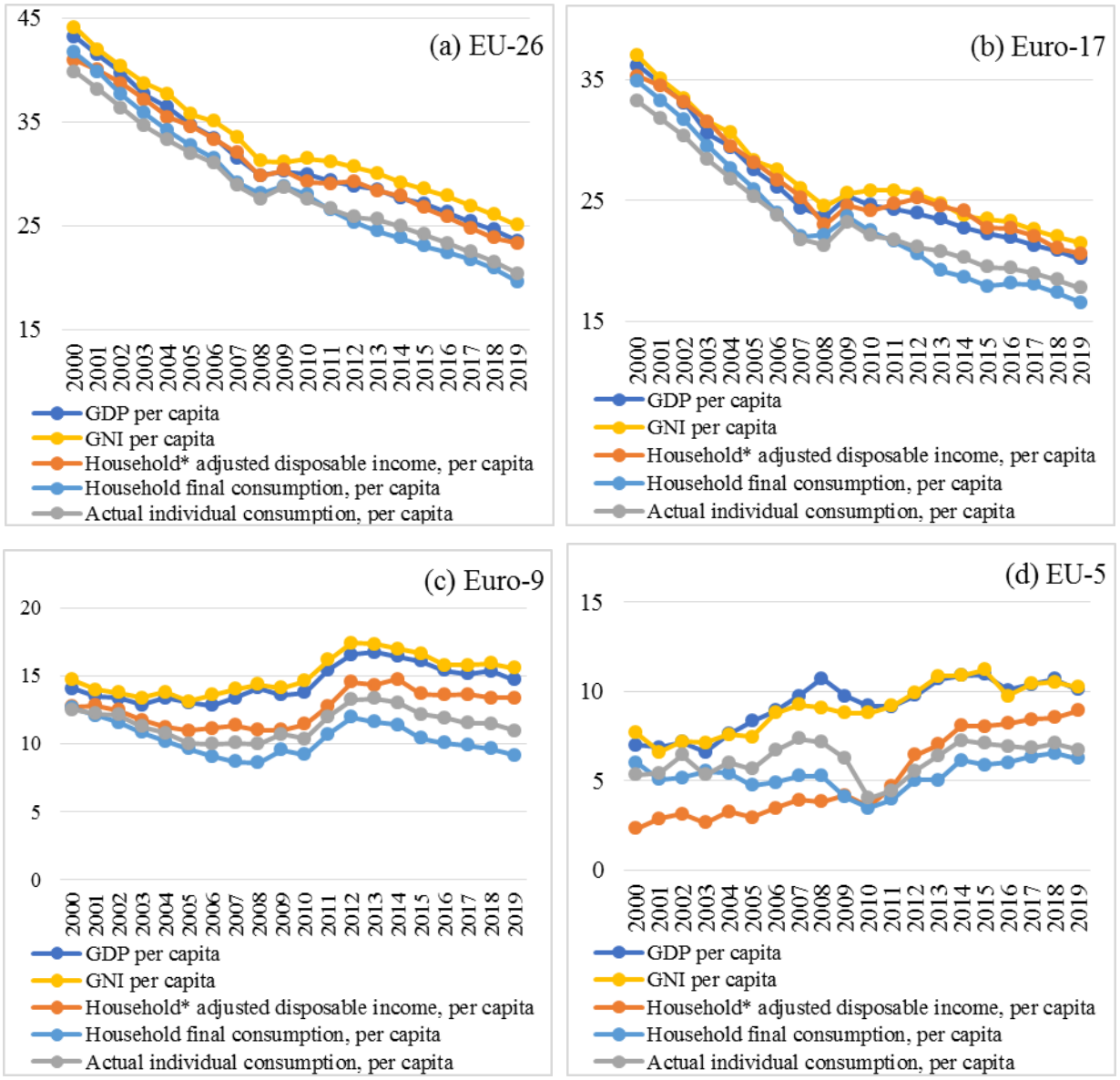
In fig.5 we presented an overview of the CV evolution during 2000-2019, for domestic product, national income, income and consumption of households, all expressed per inhabitant, at purchasing power parity (euro PPS). As expected, the value of CV - spread of values expressed as a percentage of average - decreases as we reduce the number of countries considered and move closer to the central core of the EU (EU-5). On the other hand, the closer we get to the central core, the less significant is the σ-type convergence, revealed by CV reduction tendency, or even a slight divergence emerges (as CV increases). Therefore, we may conclude that the convergence process is mainly determined by the approximation to the EU average of emerging countries that have recently joined the EU, which used to grow relatively faster (β-type convergence).

For example, in the case of GDP, the change in CV between 2000 and 2019 is -19.7p.p. in the case of the EU-26 group, -16p.p. for Euro-17, 0.7p.p. for Euro-9, and 3.1p.p. for EU5. It means that, for the first two groups, there is a convergence tendency, while for the last two groups there is a general divergence trend between the component countries. The same pattern is found at national income and adjusted disposable income of households. For the latter, CV changes are: -17.6p.p. for UE-26, -14.7p.p. for Euro-17, 0.7p.p. for Euro-9, and 6.6p.p. for UE-5. In the case of consumption, the divergence trend only occurs within the EU-5 group.

Another aspect revealed by Fig.5 is the strong impact of financial crisis, manifested since 2008, on the slope of CVs. In the short term, the effect of crisis is to temporary reverse the trend of CV, namely an increase (divergence) for the first three groups, respectively a decrease (convergence) for the last group. The change is relatively short-lived (2008-2009) for the EU-26 and Euro-17 groups, mainly due to EE countries resuming their growth relatively quickly compared to the others, as shown in Fig.2-3. For the Euro-9 group, the reversing effect lasts a little longer, until 2012, due to the somewhat slower return of the NE and SE countries. In the case of the EU-5 group, the general trend of divergence in GDP, GNI and household income, caused mainly by

developments in France and Italy, is interrupted by the financial crisis only until 2010, after which CV has an approximately constant evolution.

Fig.5. Coefficient of variation for GDP, GNI, household income* and consumption (%)



Source: Own calculation, based on Eurostat data. * Including non-profit institutions serving households.

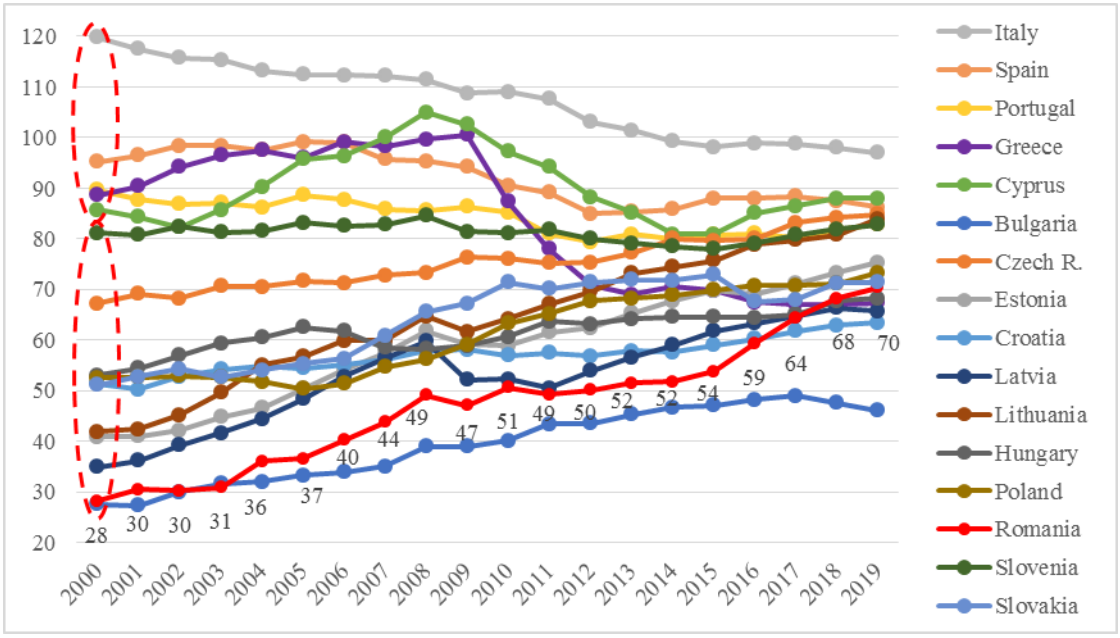
In the long run, the effect of financial crisis is a slight change in the slope of CV trend for the first two groups, in the sense that convergence rate decreases after the crisis, both in terms of GDP, GNI and household income. Overall, we can conclude that there is a substantial correlation between GDP convergence / divergence and that of population income and consumption, except at the EU-5 level. We will detail, in the next section, these correlations, for each considered indicator / group of countries.

3.2. Correlation between GDP convergence and household income convergence

We will start the analysis by highlighting the evolution of the EU-28 share of adjusted disposable income in the EE and SE countries (Fig. 6), for appreciating to what extent these two groups manage to get closer to the European average.

Fig. 6 shows a dynamic similar to that of GDP (Fig. 3), with a slight decline of the SEs, along with a sustained rise for some of the EEs. At the same time, there is a trend of convergence within each of these groups, towards the end of the period. In the case of the SEs, convergence occurs towards an average level of about 85% of EU-28 average, lower than in 2000. There is also a process of convergence between the EEs, through the sustained rise of countries with lower initial levels. For example, Romania achieve an increase, between 2000 and 2019, of 42.1p.p., Lithuania of 42p.p., Estonia of 34.5p.p., and Latvia of 30.8p.p. At the same time, convergence is supported by capping tendencies in countries with higher initial shares (e.g. Slovenia, Hungary). As in the case of GDP, the value ranges of the two groups intersect towards the end of the period, both due to downward developments of some SEs (Greece, Portugal) and due to increasing values achieved by some EEs (Slovenia, Czech Republic, Lithuania). With the exception of Bulgaria and Italy, there is a clear trend of convergence between SE and EE countries.

Fig.6. Adjusted disposable income of households* (PPS per capita) in Southern and Eastern European countries, EU-28=100



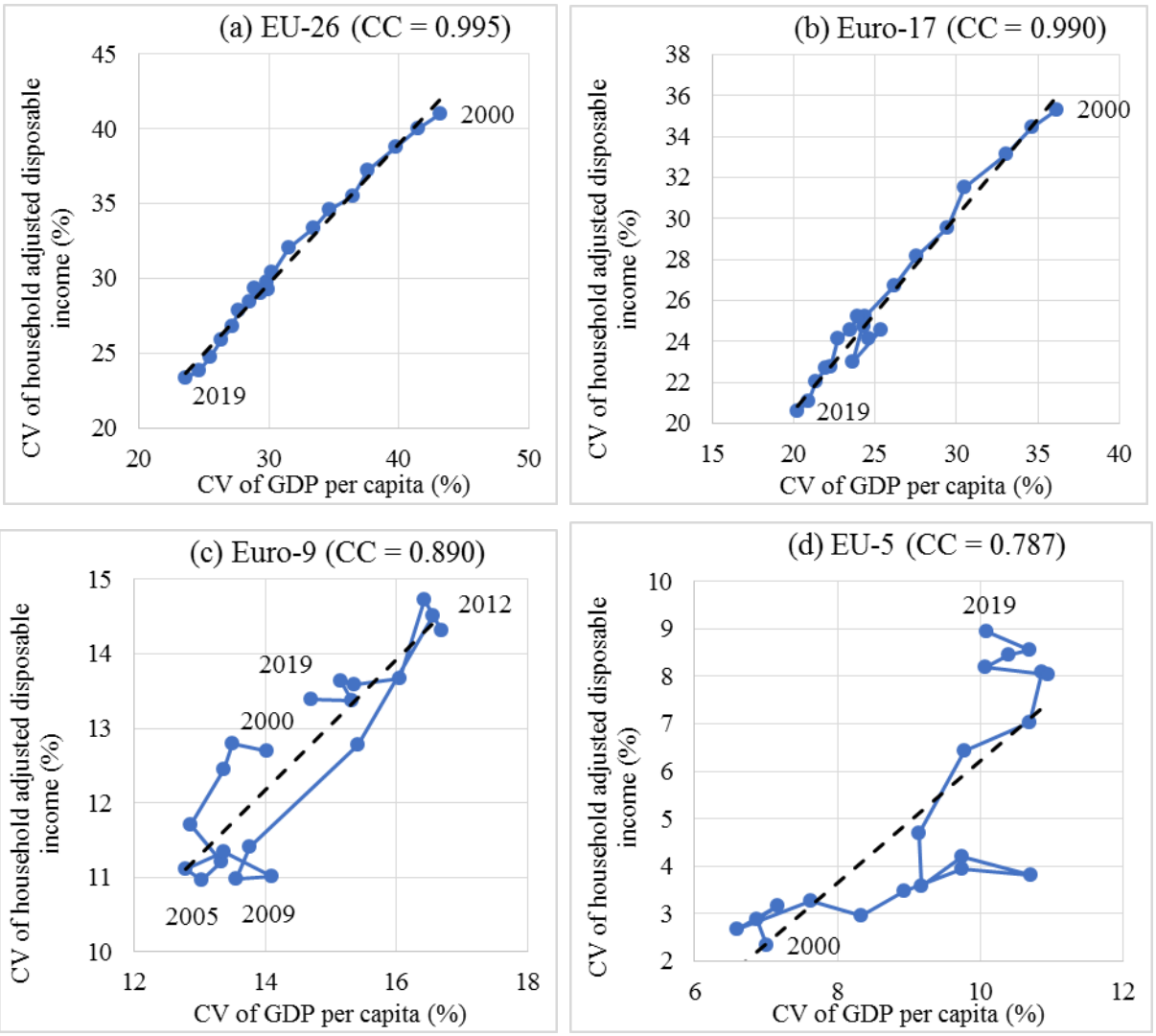
** Including non-profit institutions serving households. Notes: figures correspond to Romania (red line); unavailable data for Malta. Source: Eurostat database.*

In Fig.7a-d we correlated the evolution of CV for adjusted disposable income of households, with that of CV for GDP. In parentheses we noted the *correlation coefficients (CC).* The first two graphs, corresponding to EU-26 and Euro-17 groups (Fig.7a-b) reveal a strong positive correlation between the CVs of the two indicators. Also, the dynamics of CVs reveals convergence tendencies over almost the entire period. The exception is the 2008-2009 interval, when the impact of financial crisis generated a reversal of dynamics, i.e. an increase in CV (divergence) for both indicators and groups (EU-26 and Euro-17). Therefore, we may say that, at the level of these groups, the GDP convergence is found in that of economic well-being of households, expressed by the adjusted disposable income. It is mostly the convergence of countries from the last waves of EU accession, and less that of the old Member States, as we will see below, that contributes to this correlation.

Situation is different for the other two groups. For Euro-9 (Fig.7c), although the CC is considerable (0.89) as regards convergence tendency, we distinguish 3 periods, depending on the CV direction. First period, 2000-2005 is characterized by convergence (decreasing CV). In the second one, after a short interval without a clear trend, follows the period 2009-2012 of divergence, when the variation of both indicators increases. Finally, a new period of convergence emerges

during 2014-2019. This alternation of tendencies, given by changes in CVs direction, together with the end point (2019) situated next to the start one (2000), prevent us from drawing a clear conclusion on the convergence / divergence of the two indicators, at the Euro-9 level. However, we may say that the degree to which GDP variation is found in that of household income is significant, as revealed by the CC value.

Fig.7. Correlation between GDP per capita convergence and household* adjusted disposable income per capita convergence, 2000-2019



** Including non-profit institutions serving households. Source: own calculation, based on Eurostat data.*

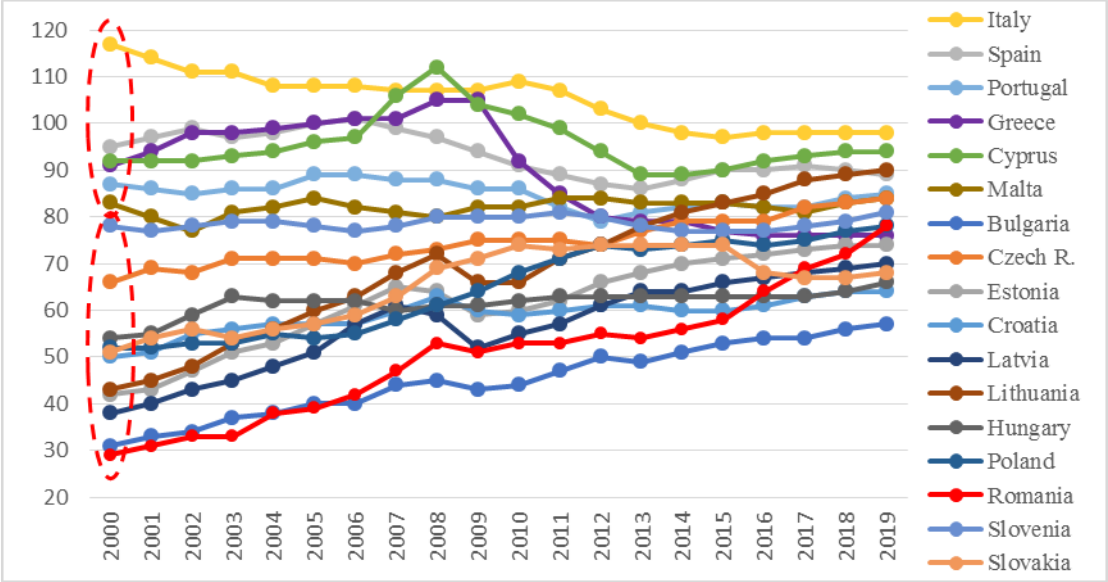
Finally, for EU-5 (Fig.7d), CC remains significant (0.79), but the general trend is one of divergence (CV increases) for both indicators, temporarily interrupted by short uncertain developments or trend reversals. The end point (2019) corresponds to a higher dispersion of both GDP per capita and household income, as compared to 2000. It is worth mentioning that the inclusion of Luxembourg in the analysis would have further increased the degree of divergence within this group.

3.3. Correlation between GDP convergence and household consumption convergence

The evolutions of actual individual consumption of households from the SEs and EEs, expressed as a share of EU-28 average (Fig.8) closely follow those of adjusted disposable income (Fig.6). The income-consumption differences are given, among others, by the propensity to consume and save, specific to each person / household / country in part, as well as by the household financial balance sheet (assets and liabilities).

Some countries have higher EU-28 shares for consumption than for income. Examples in this sense are the two countries with the steepest rises, in the period 2000-2009, of consumption: Romania with 49p.p., and Lithuania with 47p.p. of EU-28 average; these values exceed by 7p.p., respectively by 5p.p. increases in disposable income. In other countries, such as Hungary and Estonia, the rise in consumption is not commensurate with that of disposable income. As in the previous case (fig.6), there are convergence trends both within the EE and SE groups, and also between them.

Fig.8. Actual individual consumption of households (PPS per capita) in Southern and Eastern European countries, EU-28=100



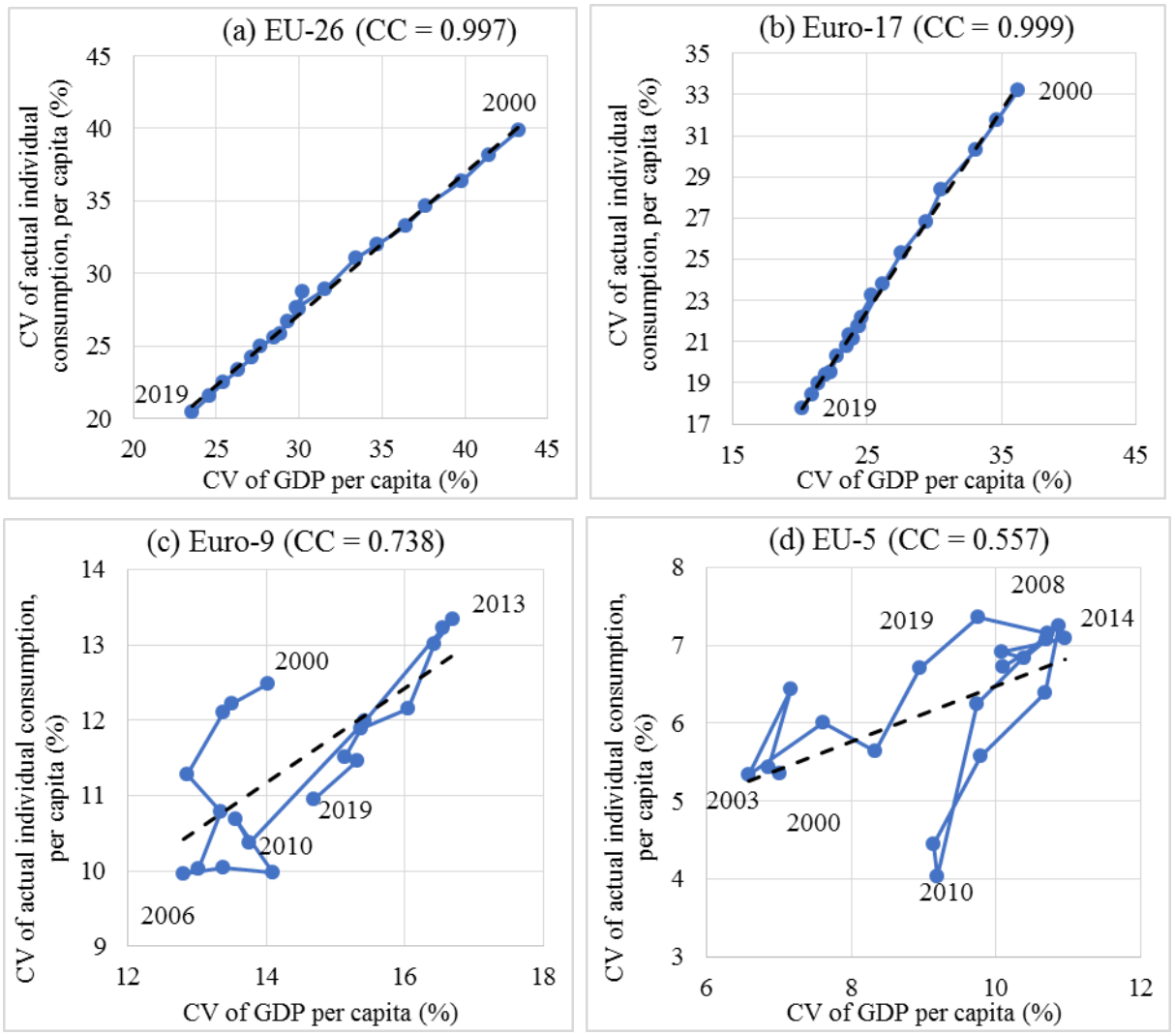
Source: Eurostat database. Notes: figures correspond to Romania (red line).

In Fig. 9 we calculated the correlation between the CVs corresponding to GDP per capita and household consumption, for each group. As in the previous case, the first two groups of countries (fig.9a-b) stand out, with high CCs and an obvious convergence process, during the period 2000-2019, for both indicators. As for the other two groups, correlations are weaker and the convergence / divergence trend is not clear and continuous. In the Euro-9 group (fig.9c) there are again 3 periods, 2000-2006, 2010-2013, respectively 2013-2019, with tendencies of convergence, divergence, respectively convergence. Also similar to the household income case, the end point in 2019 is not far from the initial one in 2000; a decrease of only 1.5% in consumption variation and an increase of only 0.7% in GDP variation occur between 2000 and 2019. This pattern, again, does not allow us to conclude with a clear process of convergence or divergence for the 2 indicators, although the correlation of their CVs is significant (0.74).

For the 4th group, the correlation coefficient of the variations is no more significant (only 0.56). Three periods can be distinguished here, 2003-2008, 2008-2010, and 2010-2014, with tendencies of convergence, divergence, respectively convergence. The general trend for the entire period 2000-2019 is one of divergence, as in the case of household income. This divergence within

the EU-5 group, both in terms of GDP and household income / consumption, warns that, unfortunately, more than 60 years after the establishment of the European Economic Community (1957), its mechanisms have not managed an effective economic integration of the initial members. On the contrary, the economic gaps between these countries have rather widened, at least in the last 20 years. The situation is almost similar for the initial 11 members of the euro area in 1999.

Fig. 9. Correlation between GDP per capita convergence and actual individual consumption of households per capita convergence, 2000-2019



Source: own calculation, based on Eurostat data.

Graphs included in the Annex detail the SEs and EEs dynamics of consumption by main categories of household expenditure: food and non-alcoholic beverages; housing, water, electricity, gas and other fuels; health; education. Different dynamics models appear among these categories, but the general trend is one of convergence. Food and non-alcoholic beverages are the category with the lowest degree of convergence and have an approximately constant tendency, with a few exceptions, such as Greece (steep decline) and Romania (sustained growth). For housing and health expenditures, the convergence tendency is obvious, simultaneously with a gradual approach of the European average. Finally, education expenditures show a convergence trend but it is a downward one, both for SE and some EE countries.

4. Final remarks

Summarizing the above results, we can say, first of all, that convergence process of GDP per capita is strongly correlated with that of household income and consumption, both for the EU and Eurozone level. This proves that GDP remains a relevant determinant of population economic well-being.

Secondly, the results show that the convergence process has been mainly supported by the growth of emerging Eastern European economies, not by old members. Together with the declining Southern countries, they are converging to a level below the current EU average. On the other side are the developed countries of central and northern Europe, which include a core with constant developments (the Netherlands, Austria, Belgium, Sweden, and Denmark) well above the EU average and a group of poor performing countries, which tend to approaches the EU average during the last years (Finland, UK and France).

At the level of the initial members of the euro area (Euro 11 without Luxembourg and Ireland), the alternation of tendencies, given by changes in CVs direction, together with the end point (2019) located very close to the start one (2000), indicate a lack of convergence during this period, both for GDP and household incomes. This raises questions about the positive economic effects of the Single Market and the process of economic and monetary integration; it is also a negative signal for countries preparing to adopt the single currency.

The analyzes in this study stop in 2019. This year (2020), the crisis generated by the covid-19 pandemic has substantially changed the trends of GDP, income and consumption of population, for all the EU member countries. It is assumed that these changes have severely interfered with the convergence process of the analyzed indicators. Unfortunately, the available quarterly data are not expressed at purchasing power parity, which is why they could not be included in the analysis. As a result, the main direction of further research is to study how the current economic and social crisis has influenced economic convergence, welfare convergence, and the correlation between the two, at the EU and euro area level.

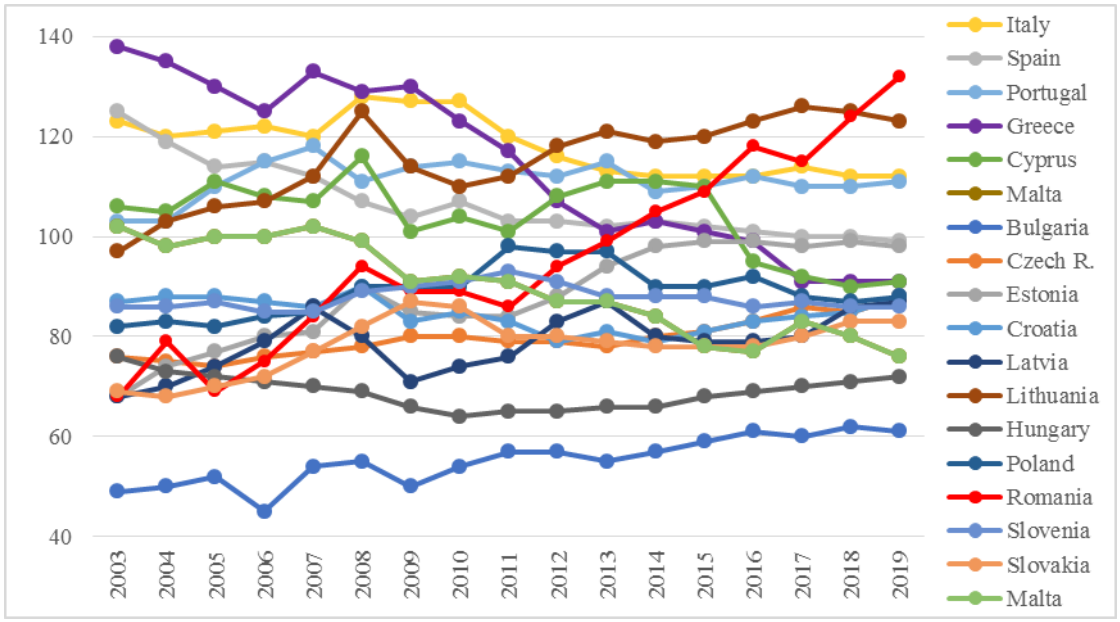
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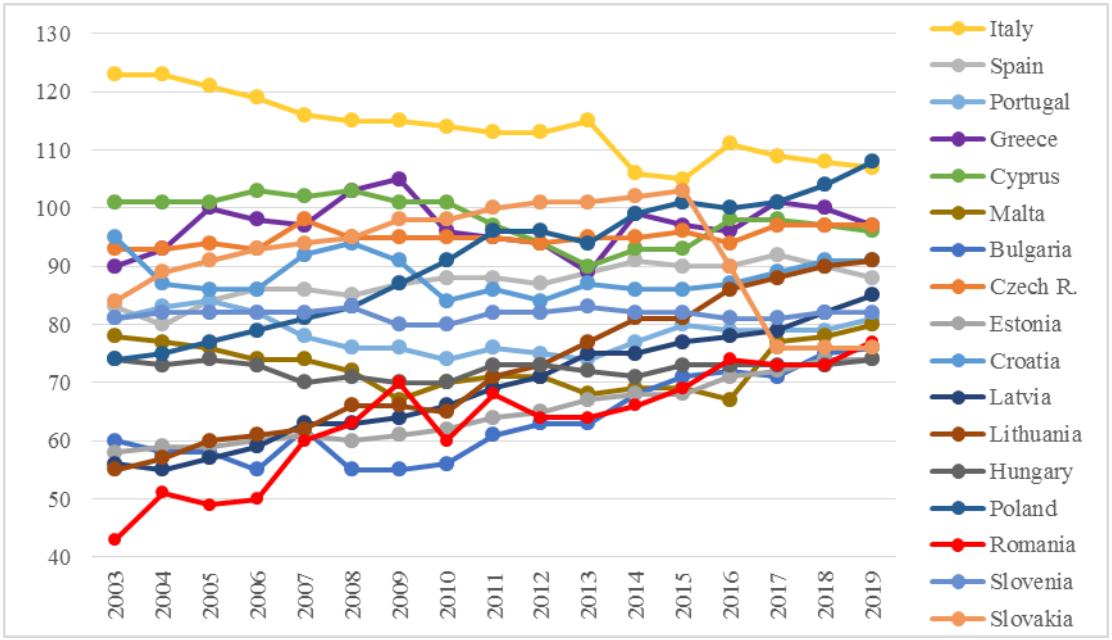
Annex

Household expenditure on *food and non-alcoholic beverages* (PPS per capita), in Southern and Eastern European countries, EU-28=100



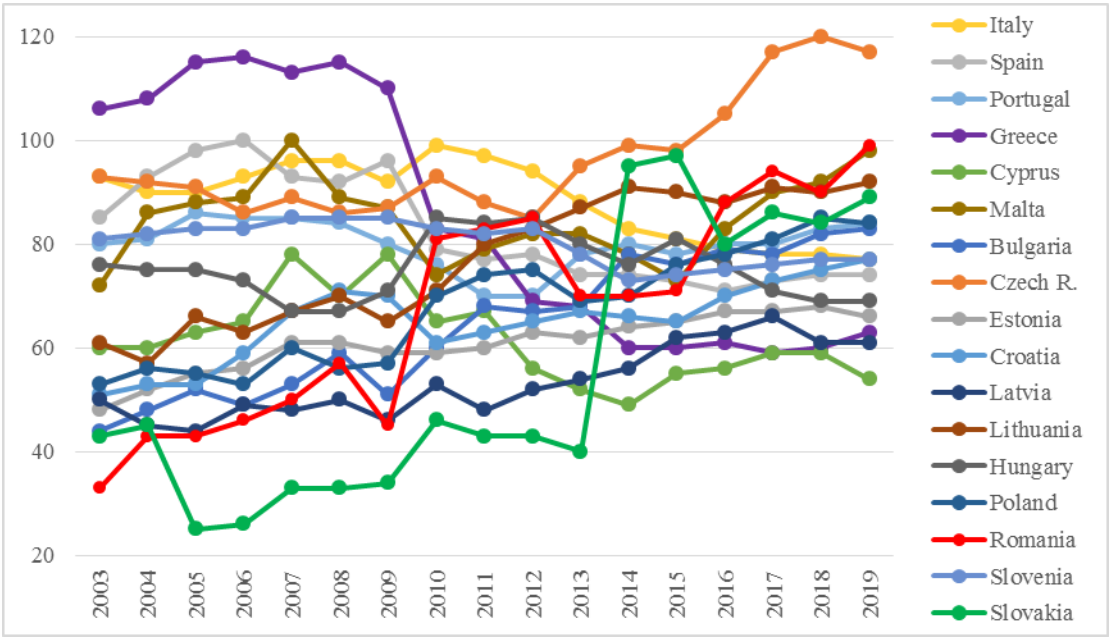
Source: Eurostat data.

Household expenditure on *housing*, water, electricity, gas and other fuels* (PPS per capita), in Southern and Eastern European countries, EU-28=100



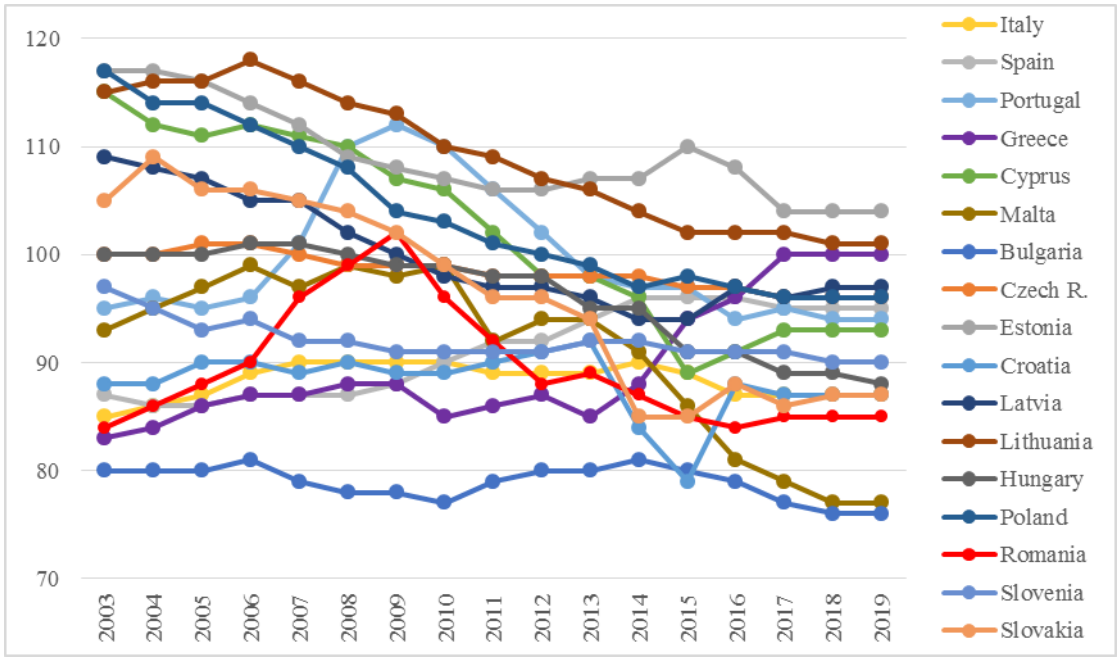
* Housing expenditures usually include rent, mortgage payments, home improvements, maintenance and household insurances. Source: Eurostat data.

Household expenditure on *health* (PPS per capita), in Southern and Eastern European countries, EU-28=100



Source: Eurostat data.

Household expenditure on *education* (PPS per capita), in Southern and Eastern European countries, EU-28=100



Source: Eurostat data.