NOMINAL CONVERGENCE CRITERIA AND EUROPE 2020 STRATEGY: CONVERGENT OR DIVERGENT OBJECTIVES?

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Abstract:

Sustainable development is a major subject of discussions worldwide and especially in the European Union. A lot of studies, papers, reports had analyzed the subject of sustainable development and many of the indicators of sustainable development have been transposed in public policies objectives. The Europe 2020 Strategy is such of programmatic document, which contains some of the sustainable development indicators. Though is recognised that supporting economic growth, environmental protection and employment are important, in Europe and whole around the world, fiscal disequilibria and monetary issues seem to come first, as is the case with nominal convergence criteria for the countries in acceding process to the euro area. Thus, this article tries to analyse to what extent Nominal Convergence Criteria affects the sustainable development indicators and especially Europe 2020 targets and what can be done to mitigate the possible conflict between their objectives.

Keywords: nominal convergence, Europe 2020, employment rate, education

JEL classification: F15, O23, Q56

Introduction

Global financial and economic crisis, whose beginning was marked by the collapse of Lehman Brothers in 2008, brought to the forefront many markets inefficiencies, but also of monetary systems, of world economies and of macroeconomic public policies. Indirectly, the euro area (EA) has suffered greatly, thus raising the question of the benefits and costs of euro adoption for future acceding countries, not so much in terms of the European currency crisis, but especially in terms of a takeover of the euro area problems over the national ones.

New Member States, including Romania (which is European Union (EU) member from 2007), have undertaken the obligation of adopting the euro currency. As we know, the EU accession marks the completion of the first stage of joining the Economic and Monetary Union (EMU), thus the member states, which are willing to introduce euro, have to be able to coordinate their economic policies with other countries based on guidelines set by the Commission and to develop and to implement national convergence programs. In the second stage, Members adhere to the Exchange Rate Mechanism (MRS 2), in this respect committing to maintain the exchange rate within a certain band of variation in relation to the euro, national central banks signing an agreement with the European Central Bank (ECB), in which they are taking the obligation to participate in this mechanism. Also in this stage, Member States must fulfil the nominal (monetary and fiscal) convergence criteria, which are stipulated in the Treaty of Maastricht.

In the vision of European leaders, Maastricht convergence criteria describe a "healthy" economy, more exactly a low inflation, attractive interest rates on long-term government securities, a stable exchange rate, fiscal balances and public debt in sustainable limits. Achieving these criteria in a coherent, consistent, transparent and sustainable manner is the basis for assessing the readiness of an economy to adopt the single currency.

It is questionable whether the nominal convergence criteria are set properly, being a series of criticisms regarding them (Lewis and Staehr, 2007, Dinga, 2011). However, it is more difficult to say in which way it affects or not the achievement of real convergence and especially how it affects some indicators of sustainable development.

When referring to some indicators of sustainable development, it should not be overlooked the strategy launched in 2010 called Europe 2020 (European Commission, 2010). This was conceived as a 10-year strategy to support employment and smart, sustainable and inclusive growth. In this respect, Europe 2020 has set five objectives regarding employment, research and development,

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education, climate and energy sustainability issues and also the thorny issue of social inclusion and poverty reduction.

Specifically, the five objectives are:

- Increasing the percentage of the population aged between 20 and 64 years who has a job to 75%;

- Receiving of at least 3% of Gross Domestic Product (GDP) on research and development;

- Reducing carbon dioxide emissions by 20% and even more if conditions allow it, increasing of the proportion of renewable energy to 20% and energy efficiency 20% growth;

- Reducing the early school leavers share below 10% and increasing the percentage of people who completed a form of higher education to 40%;

- A reduction of 20 million people of the number of EU citizens threatened by the poverty flagellum.

The objectives listed are supported by seven flagship initiatives and the strategy is carried out under the monitoring of the European Semester and has the support of other EU policies and instruments, including the EU budget.

Description of the problem

Many opinions highlight the lack of sustainability in terms of maintaining the nominal convergence criteria also after the entry into EMU, thus making discrimination against EMU countries which are still not members. However, it would be normal after the entry into EMU the nominal criteria to continue to be compulsory for all member states, both to ensure the fairness of the integration process in EMU and the very sustainability of the area and for the better calibration and internal harmonization of economies.

Also, it would be normal that the evaluation period of nominal criteria (especially monetary ones) to be predictable and constant over time, convergence reports of the European Central Bank (ECB) disregarding any rigor in this regard. Thus, the reference periods does not present any methodological continuity, being established arbitrarily between different calendaristic years (i.e. September – August, November – October, April – March, May – April) and not a normal calendaristic year (January – December). This would be desirable especially that the statistical bases, such as Eurostat, provide monthly, quarterly or yearly information, and in some respects the comparability (over time and across indicators) and the relevance of the information can be obtained in a satisfactory manner only on annual data.

Another aspect of poor assessment on the Maastricht nominal convergence criteria is the unpredictable way of calculating the benchmarks or the reference values, ECB reserving the right to change from year to year and to insert or remove from the reference values the "aberrant" or the "exceptional" values (outliers) observed in some countries (i.e. inflation criterion). The appreciations regarding the outliers have of course numerous reasons, often relevant, but their scientific base is not fully cleared, and therefore is not widely accepted by specialists and academics. These methodological obstacles make very hard the assessment and the comparability of the information regarding the nominal convergence criteria (itself, and between each other) and therefore hardly comparable to other methodological guidelines, as is the case of Europe 2020 targets.

Thus, if we consider the relationship between real convergence (including some indicators of sustainable development) and nominal convergence it is difficult to establish a general conclusion. Studies such as those of Bjorksten (2000) points out that following the achievement of nominal criteria it will be also achieved a real convergence, while others point to a possible contradiction between the two types of convergence (Lojschova, 2003), in which the real exchange rate appreciation, through the Balassa-Samuelson effect, may conflict with the fulfilment of inflation and exchange rate criteria imposed by EMU entry.

When referring to the strategy Europe 2020, four years after its launch, in March 2014, the European Commission has analyzed the strategy, concluding among other things that: "The analysis presented in this communication show that the balance of the objectives and flagship initiatives of the Europe 2020 strategy is inhomogeneous. The EU is on track to meet or approaches of the goals on education and climate and energy, but the situation is different in the

case of objectives regarding the employment, research and development or poverty reduction. "(European Commission, 2014b). Moreover, the European Commission surprise as an "uncomfortable" element: the increasing of the trend of growing disparities between the countries with the best results in achieving the objectives of Europe 2020 and the weakest, or between different parts of a country or between regions from different countries, and between urban and rural environment, challenges that aims to address in future adjustments of the strategy.

Note that although the European Union, through its institutions, emphasis increasingly more on aspects of sustainable development of society, yet continues to give priority to the fiscal-budgetary objectives to ensure financial stability, especially in the context of deepening deficits and public debts of member countries. Also, the European banking system has received, in numerous occasions, due to the sovereign debt crisis, substantial support in order to increase the overall supervision and to achieve a profound reform to provide an effective mechanism for restructuring and recovery of banks in distress. Thus, surveillance of economic and budgetary components became the focus of European economic governance in order to surprise earlier and as much as possible the macroeconomic imbalances.

If fiscal and budgetary or monetary imbalances are at the centre of concerns and implicitly of macroeconomic policies of the Union, not the same thing can be said about social policies and sustainable development. My assertion is based on the fact that gradually, over time, nominal targets imposed through the Maastricht criteria for joining the euro area have become increasingly accessible to EU countries, while Europe 2020 targets, which outline EU social and environmental perspective, have become almost unapproachable for many countries. In this context, Romania does not make a discordant note. Thus, according to the most recent ECB Convergence Report (Convergence Report 2014), Romania meets fiscal criteria and long-term interest rate but does not meet the two criteria relating to inflation and exchange rate variation. Instead, from all the eight indicators listed in Europe 2020 Strategy, only two from the field of environmental issues can be considered complying with European targets (indicator on reducing greenhouse gas emissions compared to 1990 and the share of energy renewable in final energy consumption) in Romania. Social indicators, the ones of labour market and the educational ones are lower than the Europe 2020 strategy targets and the national targets.

Methodology and data sources

This paper discusses the implications of nominal convergence criteria at EU level on the indicators proposed by the Europe 2020 Strategy, and in reverse, the implications of Europe 2020 targets on Maastricht nominal convergence criteria. The methodology used is integrative (gathering expertise from previous research literature) and explorative by finding possible logical connections (see Table 1 and Table 2) in order to facilitate the integration of the two types of objectives in a unitary form of EU development strategy. In order to calculate the correlation between the indicators, data sources used were from Eurostat, following their integration into the correlation matrix for the three countries representing the European Union (one of the EMU "core" countries - Germany, another of the EMU peripheral countries - Spain and other outside EMU - Romania). The analyzed period is 2002 – 2013 and because of the limited availability, data series are annual.

Results obtained

The results are described by two matrices through which are correlated from logical point of view the possible effects of variables described by the Maastricht criteria on variables described in Europe 2020 Strategy and *vice-versa*.

Although both types of indicators, set by the Maastricht criteria and some of Europe 2020 indicators (i.e. reducing greenhouse gas emissions compared to 1990 levels, reducing poverty, reducing drop-out rate), aim at decreasing their level, my simulation was in the sense of increasing them. The motivation behind this choice is that, in reality, the indicators subjected to controllability of these criteria (especially of Maastricht ones) rather evolve in an upward manner and therefore their growth poses real challenges in meeting the targets (both to the internal and to the external targets, imposed by other EU strategies and policies). Reducing these indicators can be interpreted inversely, in the sense of a mirror image of the tables shown below.

Table 1

The logical scheme of influence of Maastricht criteria on Europe 2020 targets

Maastricht criteria (increase) \ Europe 2020 targets	Employment rate	Early leavers from education and training by sex (%)	Tertiary educational attainment by sex, age group 30-34 (%)	People at risk of poverty or social exclusion (1000 pers.)	Gross domestic expenditure on Research and Development	Greenhouse gas emissions gaps in report of the base year 1990	Share of renewable energy in gross final energy consumption (%)	Primary energy consumption (Million TOE)
HICP inflation	↑↓ (depending on the connection with Phillips curve)	↑	↓	↑	↓	ct. ↓↑ (depending on elasticity on price)	↓↑ (depending on the motivation of reducing price fluctuation on the energy cost)	↓↑(depending on elasticity on price)
Long term interest rates	↓	↑	↓ (especially the one sustained by credit on many years)	↑	↓	ct. ↓↑ (depending on elasticity on price)	↓↑(depending on the motivation of reducing price fluctuation on the energy cost)	↓↑ (depending on price elasticity)
Exchange rate	↑↓ (depends on elasticity on price) (grows in the field of exporting goods and services)	↑(depends on share of exporting goods in consumption and economy)	↓ (especially the one sustained by loans in foreign currency)	↑ (depends on share of exporting goods in consumption and economy)	↑↓ (depends on share of exporting goods in consumption and economy)	ct. ↓↑ (depending on elasticity on price)	↓↑(depending on the motivation of reducing external price fluctuation on the energy cost)	↓↑(depending on elasticity on price)
Deficit-to-GDP ratio	↑↓ (depending on how much of the deficit is translated in real economy, if creates or not new jobs)	↓↑ (depending on how much of the deficit is translated in real economy, if it is "invested" in education)	↑↓ (depending on how much of the deficit is translated in real economy, if it is "invested" in education)	↓↑ (depending on how much of the deficit is translated in real economy, if it is "invested" in social protection)	↑↓ (depending on how much of the deficit is translated in real economy; if it is "invested" in research)	ct. ↓	↓↑(depending on the motivation of reducing price fluctuation on the energy cost)	↓
General government debt in percent of GDP	↓↑ (depending on how much debt is translated in real economy, if creates or not new jobs)	↓↑ (depending on how much debt is translated in real economy, if it is "invested" in education)	↑↓ (depending on how much debt is translated in real economy, if it is "invested" in education)	↓↑ (depending on how much debt is translated in real economy, if it is "invested" in social protection)	↑↓ (depending on how much debt is translated in real economy; if it is "invested" in research)	ct. ↓	↓↑(depending on the motivation of reducing price fluctuation on the energy cost)	↓

Source: author's conception; ct. means constant.

If we look at the first table, the one of the implications of the Maastricht criteria on the indicators proposed by the Europe 2020 strategy, the result can be interpreted as mixed or uncertain, in the

sense that it is difficult to specify a possible general positive or negative effect on this strategy targets. This uncertainty is mainly due to the manner in which public policies (fiscal and budgetary policy, monetary policy, social policy, environmental policy, etc.) react to the increase or decrease of an indicator whose controllability it is wanted. The transmission level of that measure over the targeted indicator, but also the spread of its effects throughout the entire economy is fundamental for assessing the positive or negative effect on Europe 2020 targets.

In general, higher fiscal and budgetary deficits cannot be auspicious for the labour market indicators and those regarding social policy. This is attributable to the increase of taxes which generally pushes employment and investments down (implicitly the ones in research and development (R&D) and investment in renewable resources). In this context, poverty and dropout rate may increase. However, if the increase of public debt and fiscal deficits is reflected in the ensuring of a satisfactory level of employment or is invested in R&D or in finding alternative and sustainable sources of energy (as from renewable resources), then the overall effect on Europe 2020 indicators cannot be seen as negative, especially in the medium and long term.

Unfortunately, the crisis has shown that the increases in fiscal-budgetary deficits and public debt (but not only, also of the private debt!) putted additional negative pressure on the evolution of labour market and social policy indicators.

Table 2

The logical scheme of influence of Europe 2020 targets on Maastricht criteria

Maastricht criteria / Europe 2020 targets (increase)	HICP inflation	Long term interest rates	Exchange rate	Deficit-to-GDP ratio	General government debt in percent of GDP
Employment rate	↑↓ (depending on the connection with Phillips curve)	↓	↓	↓	↓↑ (depending on public option for credit)
Early leavers from education and training by sex (%)	↑↓ (may conduce to the reduction of employment rate; can decrease in the context of reduced pressure of employment cost on prices)	↓↑ (may cause an increased risk of credit default, which is usually included in price of the credit)	↑	↑	↑(depending on public option for sustaining disadvantaged people through public programs)
Tertiary educational attainment by sex, age group 30 -34 (%)	↑↓ (depending on the connection with Phillips curve)	↓	↓	↓	↓↑ (depending on public option for credit)
People at risk of poverty or social exclusion (1000 pers.)	↓↑ (depending on the connection with Phillips curve)	↓↑ (may cause an increased risk of credit default, which is usually included in price of the credit)	↑	↑	↑(depending on public option for sustaining disadvantaged people through public programs)
Gross domestic expenditure on Research and Development	↓↑ (depending on the connection with Phillips curve)	↓	↓	↑↓ (on a short term it may increase the deficit, but on the long term has a certain positive effect)	↑↓ (on a short term it may increase the debt, but on the long term it contributes to the reduction of debt)
Greenhouse gas emissions gaps in report of the base year 1990	ct. ↑ (on short term it may have no implication, but on long term it can impose a growth in environment costs which can be transposed in general level of prices)	↑	↑	↓↑ (on a short term it may decrease the deficit through environmental taxes, but on the long term has a certain negative effect)	↑
Share of renewable energy in gross final energy consumption (%)	↓ct. (in time, if a big part of energy will be obtained from renewable sources, the impact on prices will be small, almost constant)	↓	↓	↓	↓
Primary energy consumption (Million TOE)	↓↑	↑	↑	↓↑ (on a short term it may decrease the deficit through consumption taxes, but on the long term has a certain negative effect)	↑

Source: author's conception; ct. means constant.

In the second table, the positive effects of the Europe 2020 indicators on the Maastricht convergence criteria seem more obvious. This is due precisely to their sustainability, being important objectives for the development of an economy both on short-term and on long-term, of several generations in a row. When investments aim at increasing employment, and especially in unpolluting fields or in energy efficient areas or at least beneficial to the society (i.e. education, health, culture, economy, etc.), the possible negative effects on inflation, on public debt and on budgetary deficit seem insignificant for long-term gain for the economy and society as a whole.

In the context of logical correlations from above, it is hard to say which of the two sets of factors is more important, or more precisely, which should be placed in the foreground and which in the background. The crisis has shown that financial sustainability objectives (fiscal - budgetary and monetary) had prevail, so policy makers had "treated" them first, but they being the very source of imbalances it should have been putted behind the sustainable development objectives, including those set out in Europe 2020. Thus, the Europe 2020 targets should have been putted in front and tracked with the same determination in order to be achieved and maintained. Although they may initially be seen as much more expensive, yet provide on a medium-term or on a long time horizon the resolution of many budgetary, fiscal and even money problems (i.e. the increase of employment, investment in research and development and education can reverse the adverse social trends, including demographic, such as population aging, and reduce current and future deficits from public budgets).

If we look at the correlation matrix for the three countries (see Annex 1), two of the EMU (Germany and Spain) and one from outside EMU (Romania), we observe the following:

- For Germany

- inflation appears in a significant positive correlation with the evolution of public deficit (0.721727) and with employment rate (0.247579), - the long term interest rate seems to have a significant inverse correlation with public debt (-0.92181), with the deficit (-0.30293), with employment rate (-0.76148), with research and development (-0.87189), with renewable energy (-0.79572) and with tertiary education (-0.90796), having also a strong positive connection with emissions of greenhouse gases (0.749743), with primary energy consumption (0.695384) and with the school dropout rate (0.586506), – the correlation of public deficit is strong and positive in relation to the employment rate (0.619882), with research and development (0.37911), with the share of renewable energy (0.400441), with tertiary education (0.404947), but also with poverty (0.519192), – public debt shows a strong and positive correlation with employment rate (0.828461), with research and development (0.893932), with renewable energy (0.844477) and with tertiary education level (0.92972), while with the dropout rate, with greenhouse gas emissions and with primary energy consumption has a strong inverse relation, - regarding employment rate, it has a strong positive correlation with research and development (0.91358), with renewable energy (0.97144) and with tertiary (0.911615) - the R&D investment has a strong and positive correlation with share of renewable energy and tertiary education (0.928004), - the share of renewable energy has a strong positive correlation with tertiary education (0.903497);

- For Spain

- inflation has a strong and positive correlation in relation to public deficit (0.620588), with the employment rate (0.346207), with greenhouse gas emissions (0.511142) and with primary energy (0.416714) - long-term interest rate is positively correlated with public debt (0.802019) and with renewable energy (0.699275) – the public deficit is significantly positively correlated with the employment rate (0.69441), with greenhouse gas emissions (0.950459), with primary energy consumption (0.730417) and with dropout rate from education (0.667517), - debt positively correlated strongly with renewable energy (0.825698) and poverty (0.946083) - unexpected is that the employment rate is positively correlated with greenhouse gas emissions (0.840729), with primary energy consumption (0.936665) and with dropout rate (0.666668), - while research and development is positively correlated with tertiary education, with poverty and renewable energy, - tertiary education was positively correlated strongly with poverty (0.649577);

- For Romania

- inflation is positively correlated with public deficit (0.465543), with greenhouse gas emissions (0.482954), with primary energy consumption (0.405767) and with dropout rate (0.857621) - the long-term interest rate is negatively correlated with almost all indicators but only with public deficit

in a significant manner (-0.80918) – public deficit is significantly positively correlated with greenhouse gas emissions (0.721923), with primary energy consumption (0.612218) and with dropout rate (0.657827) – public debt is negatively correlated strongly with employment rate (-0.7017), with greenhouse gas emissions (-0.82804) with primary energy consumption (-0.82611) and with poverty (-0.89315) – the employment rate is positively and significantly correlated with poverty (0.881674), - investments in research and development are positively and significantly correlated with tertiary education (0.68069) and poverty (0.514143), - tertiary education is significantly and negatively correlated with poverty (-0.87297).

Following the analysis of correlation matrices we cannot draw a clear interpretation supported by the analysis based on logical correlation, only Germany conforming to a greater extent to the logical analysis.

Conclusions

According to the latest developments, the gaps and disparities seem to emphasize at the European Union level between countries and between regions of the member states regarding social, educational and the labour market aspects, while fiscal and monetary matters are experiencing periods of improvement.

Note that fiscal and budgetary targets and monetary ones, regarding the ensuring financial and monetary stability, at the EU level and at the member states (implicit Romania) level, can be easely achieved, on a medium-term or shot-term, while social and educational goals are more difficult to be tracked and reached, requiring a long time (even 20 - 30 years) of implementation of the appropriate policies specific to the realities of each country, with results less visible and clear. Thus, the pace of implementing the necessary reforms, in order to correct the economic, social and educational realities, needs to be more alert in order to retrieve the highly undynamic materialization of the expected and desired results. At the same time, the pace of fiscal-budgetary adjustments can be slow down in order to couple and to synchronize the real economy with the nominal one (a convergence similar to the Beta convergence, which means that the growth pace of poorer economies should be more alert relative to the rich ones, closing the gap in this case taking place between nominal convergence and sustainable development issues).

Adjustments in the budgetary and taxation field have implications on long-term in the sense of creating additional pressure within the social and economic field through the welfare loss both at households and at firms level. Apparently, although the state always seems to be the winner of a more restrictive fiscal and budgetary policies, with high taxes and poor social services, insignificant for the welfare of its citizens, in reality, both on short-term and on the medium and long term it will be the biggest loser. On the short term, rising taxes and the lack of adequate social protection policies lead to poor revenue collection and to the increase of tax evasion, and on long-term inadequate taxation and a poor salary levels translates into loss of welfare for the people, into poverty, into the loss of health of the nation and hence into the burden on the health system, into the unsatisfactory level of education, into emigration, into depopulation and finally into a increasingly imbalanced labour market, with a decrease of human resources and with poor qualifications.

According to the logical analysis, of the implications of the Maastricht criteria on the indicators proposed by the Europe 2020 Strategy, and *vice versa*, the result can be interpreted as mixed or uncertain one in the sense that it is difficult to specify a possible global positive or negative effect on the evolution of the indicators. This uncertainty is mainly due to the manner in which public policies (fiscal and budgetary policy, monetary policy, social policy, environmental policy, etc.) react to the increase or decrease of an indicator whose controllability it is desired, to the level of functioning of transmission mechanism of public decisions on the followed indicator, but also to the indicators of sustainable development and to the economy as a whole.

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Correlation Matrix for Germany

	HICPinfl_rate_DE	LTIR_DE	GGD/S_DE	GGGD_DE	ER_DE	GERD_DE	GGEby1990_DE	SREGFEC_DE	PEC_DE	ELET_DE	TEA_DE	PRPSE_DE
HICPinfl_rate_DE	1											
LTIR_DE	-0,06985	1										
GGD/S_DE	0,721727	-0,30293	1									
GGGD_DE	-0,02725	-0,92181	0,181371	1								
ER_DE	0,247579	-0,76148	0,619882	0,828461	1							
GERD_DE	0,022518	-0,87189	0,37911	0,893932	0,91358	1						
GGEby1990_DE	0,068395	0,749743	-0,37308	-0,84539	-0,89908	-0,87595	1					
SREGFEC_DE	-0,02987	-0,79572	0,400441	0,844477	0,97144	0,928004	-0,86148	1				
PEC_DE	0,050866	0,695384	-0,36478	-0,71581	-0,79444	-0,85657	0,887068	-0,8113	1			
ELET_DE	0,056177	0,586506	-0,29214	-0,59974	-0,71546	-0,82041	0,690824	-0,69712	0,808891	1		
TEA_DE	0,112794	-0,90796	0,404947	0,92972	0,911615	0,957158	-0,88913	0,903497	-0,83758	-0,80077	1	
PRPSE_DE	0,098274	0,410483	0,519192	-0,25452	0,283501	-0,03359	-0,03027	0,156809	0,015556	-0,14399	-0,07926	1

Table 4

Correlation Matrix for Spain

	HICPinfl_rate_ES	LTIR_ES	GGD/S_ES	GGGD_ES	ER_ES	GERD_ES	GGEby1990_ES	SREGFEC_ES	PEC_ES	ELET_ES	TEA_ES	PRPSE_ES
HICPinfl_rate_ES	1											
LTIR_ES	0,028816	1										
GGD/S_ES	0,620588	-0,53988	1									
GGGD_ES	-0,31452	0,802019	-0,78012	1								
ER_ES	0,346207	-0,69907	0,69441	-0,91398	1							
GERD_ES	-0,48212	0,215254	-0,73705	0,332973	-0,07386	1						
GGEby1990_ES	0,511142	-0,66771	0,950459	-0,87828	0,840729	-0,57773	1					
SREGFEC_ES	-0,53055	0,699275	-0,94571	0,825698	-0,79238	0,840077	-0,9628	1				
PEC_ES	0,416714	-0,64709	0,730417	-0,80502	0,936665	-0,15586	0,877657	-0,90966	1			
ELET_ES	0,167896	-0,77041	0,667517	-0,89617	0,666668	-0,49514	0,748719	-0,77497	0,557838	1		
TEA_ES	-0,29515	0,158817	-0,56579	0,29162	0,047873	0,916748	-0,38873	0,763498	0,071276	-0,5452	1	
PRPSE_ES	-0,22099	0,84759	-0,85276	0,946083	-0,88938	0,606339	-0,92791	0,902031	-0,89555	-0,9174	0,649577	1

Table 5

Correlation Matrix for Romania

	HICPinfl_rate_RO	LTIR_RO	GGD/S_RO	GGGD_RO	ER_RO	GERD_RO	GGEby1990_RO	SREGFEC_RO	PEC_RO	ELET_RO	TEA_RO	PRPSE_RO
HICPinfl_rate_RO	1											
LTIR_RO	0,248834	1										
GGD/S_RO	0,465543	-0,80918	1									
GGGD_RO	-0,12809	-0,15937	-0,30273	1								
ER_RO	-0,24745	-0,18461	0,221293	-0,7017	1							
GERD_RO	-0,68444	-0,1023	-0,54886	-0,02357	0,359783	1						
GGEby1990_RO	0,482954	-0,20088	0,721923	-0,82804	0,548524	-0,2736	1					
SREGFEC_RO	-0,64849	0,258026	-0,78342	0,764146	-0,44217	0,401016	-0,93136	1				
PEC_RO	0,405767	-0,23662	0,612218	-0,82611	0,587125	-0,14125	0,960735	-0,86298	1			
ELET_RO	0,857621	-0,46898	0,657827	-0,02472	-0,33539	-0,89477	0,433638	-0,54989	0,350608	1		
TEA_RO	-0,76527	-0,15769	-0,64091	0,646436	-0,18476	0,68069	-0,83891	0,889741	-0,76443	-0,76117	1	
PRPSE_RO	0,115824	0,019428	0,334502	-0,89315	0,881674	0,514143	0,875465	-0,79075	0,811453	-0,39535	-0,87297	1

Source: Eurostat database, author's calculation, notations: HICPinfl_rate - Annual average rate of change of inflation (%), LTIR - EMU convergence criterion series - annual data for long term interest rate, GGD/S - General government deficit/surplus % of GDP, GGGD - General government gross debt % of GDP, ER - Employment rate by sex, age group 20-64 (%), GERD - Gross domestic expenditure on R&D (GERD) % of GDP, GGEby1990 - Greenhouse gas emissions, base year 1990, Index (1990 = 100), SREGFEC - Share of renewable energy in gross final energy consumption (%), PEC - Primary energy consumption (Million TOE (tonnes of oil equivalent)), ELET - Early leavers from education and training by sex (% of the population aged 18-24 with at most lower secondary education and not in further education or training), TEA - Tertiary educational attainment by sex, age group 30-34, PRPSE - People at risk of poverty or social exclusion.