

Institute for Economic Forecasting



STRATEGIC DEVELOPMENT PROSPECTS FOR THE LABOR MARKET IN ROMANIA, AS INTRODUCED BY THE EUROPE 2020 STRATEGY

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Abstract

The paper presents some necessary, but not sufficient aspects, introduced first by the Europe 2020 Strategy. We designed scenarios of the economic structure of Romania using 2008 data as a fixed base and the comparable Database EIMBusiness_PolicyResearch2009. On the basis of input variables, the increase in value added and the growth of productivity for the period 2008-2020 are projected, both internally determined in the definition cell located at division level in conditions of average dimension of the unit constant. Simulating for the extremes of the historical spectrum of input variables, we further auto-project the gross value added and the apparent productivity and we dimension the number of employed persons and of enterprises for four scenarios.

Keywords: labor force and employment, size and structure, simulation of growth of apparent productivity

JEL Classification: J21, J24, J23

1. Introduction³

One of the positive effects of the global crisis is the emphasis on the need to defend certain essential issues that express the common interest at global level. It is

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³ This paper presents the partial results obtained by the project POSDRU/63/3.2/S/41637, Romanian labor market response to the crisis: The flexibility and adaptability of enterprises and enhancement of worker safety, the European Social Fund, Sectoral Operational Programme Human Resources Development 2007-2013, Priority Axis 3: Increasing adaptability of workers and enterprises, Key area of intervention 3.2: Training and support for enterprises and employees to promote adaptability,.

necessary to clarify the key priorities that impose the global collaboration and cooperation as a stringent necessity for achieving a common desideratum: to surpass the crisis and ensure the conditions to avoid the occurrence of such a situation completely ruling out the loss of resources through the fragmentation of policies and through the reduction in overlapping. The limited financial/budgetary resources offer a chance of a clear and decisive evaluation of some more efficient development options. From these points of view, being part of the Europe 2020⁴ strategy becomes a European, national, local and also an individual priority. This axis of reference represents a chance for Romania to establish the collaboration and cooperation channels, to program the display of coordinated and synchronized activities that assure achieving a competitive national advantage, but also an effective contribution to the growth of the European economy as a whole. Europe 2020 proposes ***an intelligent, sustainable and ecological growth model favourable to the social inclusion***, and the achievement of this model depends on:

a. Building a single European market, with obvious impact on Europe's economic structure. This is already expressed in the Common Agricultural Policy (initiated in 1960⁵, and largely recognized in 2009 as having a huge importance for the future). It also has important impact on areas of common interest and of general interest. Dealing with the labor market cannot be confined to the national borders. The development prospects for Romania's labor market in 2020 are strongly conditioned by the general European competitiveness and the global economy performance. Acquiring the "mass" of the economy is not enough to provide the targeted performance, namely "the world's leading economy", making clear that the qualitative aspects (the way to achieve value added) as well as coordination and timing are essential in defining all the economies of the EU-27 member states (value added analysis, creation of the network value/value chain).

b. Increasing competitiveness, as well as an economic recovery solution – the flexible specialization as a new competitiveness strategy. Among the different competitiveness/specialization/diversification strategies, flexibility represents an instrument that must be used in an intelligent, coordinated and synchronized manner, taking into account the long-term vision. "The communities that will surpass the recession faster are those that are specialized in certain economic fields, but which are flexible enough to value new opportunities offered by the emergent global markets. The growth in importance of green technologies⁶, of the health sector and

⁴ The first objectives of the Common Agricultural Policy established in the Treaty of Rome (1957) and later renewed in the Treaty of Rome and Green Europe (June 2000 European Parliament Activity 4.1.1.).

⁵ **Europeans, Agriculture and the Common Agricultural Policy** conducted by TNS Opinion & Social at the request of Directorate-General for Agriculture and Rural Development Survey coordinated by Directorate-General for Communication, **Special Eurobarometer 336**, TNS Opinion & Social.

⁶ *The U.S. State of Michigan included in the economic sector of green industries key areas: agriculture and natural resource conservation, clean transport and fuels, increasing energy efficiency, pollution prevention and environmental cleaning, renewable energy - see Francesca Froy and Sylvain Giguère, Putting in Place Jobs that Last, A Guide to Rebuilding Quality Employment at Local Level, p.50.*

the nurture of the elderly can prove to be significant sources of jobs on medium and short term. The training and education services are compelled to prepare future workers in these domains. At the same time, one should not overlook the local assets and the local comparative advantage. *The flexible specialization will be the key*⁷. The responsible and sustainable exploitation of resources provides opportunities to create new skills for new jobs (Europe 2020) and for preservation-oriented activities. “The establishment of a systematic assessment of a long-term supply and demand in the EU labor markets that are structurally organized in economic sectors, occupations, skill level and countries” is absolutely mandatory.

c. The amendment of the function of the labor market through the deployment of flexicurity policies as a response to the effects of the structural dynamics of economy/economies. The removal of barriers and the stimulation of the growth rate of efficient labor reallocation among industries, firms, jobs (labor reallocation is an important driver of productivity growth): “Less productive firms tend to destroy more jobs and more productive ones create more jobs”⁸.

2. Data and methodological elements

Starting from the idea formulated by Michael Schrage (Schrage, 2010) “great managers first think about what kind of value they want to create and then consider how IT can help them create it”⁹, we restate that Romania, too, is at a decisional crucial moment: *what kind of value does it seek to achieve and then in which sectors of the national economy can it act to create such value?*

This paper will not deal with the first part of the previous question but with the second one. We develop an *original model* focused on simulating the economic structure of Romania at NACE section level for the period 2009-2020, with 2008 data as fixed base, in order to identify some strategic development prospects for the labor market in Romania, as introduced by the Europe 2020 Strategy requirements. In order to develop an empirical analysis, we used the EIMBusiness_PolicyResearch2009 Database. All the countries included in this database are member states of the EU27 and partner states (Iceland, Israel, Switzerland, Albania, Croatia, Liechtenstein, Montenegro, Serbia, the United States, Japan, Norway, and Turkey); for each one of them, 19 main indicators/variables are presented. These indicators/variables are built by a unique methodology and, therefore, they are comparable. Each indicator is presented at the mini-aggregate level with the following particularization degree for each year during the period 2002-2008:

a1. the economic activity of the non-financial business sector, by NACE Rev.1 structure, namely I-C industry, K with the following level of detail: 8 sections, 22 subsections and 45 divisions;

⁷ Francesca Froy and Sylvain Giguère, *Putting in Place Jobs that Last, A Guide to Rebuilding Quality Employment at Local Level*, p.4.

⁸ Employment Outlook 2010, Moving beyond the job crises, OECD, 2010, ISBN 978-92-64-08614.

⁹ *Idem.*

a2. by type of enterprise (Table 1, panel data, we have not considered the probability of resizing an enterprise by taking the number of employed persons in the sense of transition from one category to another, for instance from micro to small enterprise).

Table 1

Type of enterprise by personnel size

Code	Enterprise type	No. of employees
1	micro-enterprises	1-9
2	Small	10-49
3	Medium	50-249
4	Large	250+
5	SMM	1+2+3
6	Total	4+5

a3. in our study we used at this stage the following indicators (see Table 2):

Table 2

General features of indicators

Variables Eurostat	General Cod	Working Cod	Indicator	Unit	Details NACE	Enterprise Type	Country
V11110	ent	NUti	Number of enterprises	[units]	45 divisions	1-4	Ro, UE27
V16120	emt	NOti	Number of persons employed	[people]	45 divisions	1-4	Ro, UE27
V12150	ygf	VAti	Value added at factor cost	[Millions Euro]	45 divisions	1-4	Ro, UE27
<i>Other variables</i>							
	lpr	Lapti	Labor productivity / (apparent) productivity	[thousands Euro/person/year]	45 divisions	1-4	Ro, UE27

Source: Based on Metadata from Database EIMBusiness_PolicyResearch2009.

Where:

NUti - The size of the enterprises is defined in terms of number of employees.

VAti - Value added (at factor cost) is the difference between the produced value and the intermediate consumption that enters production, minus the production subsidies, costs, fees and indexation included.

NOt1 - The total number of employees is defined as the total number of persons working in different industries: salaried, non salaried (e.g. family workers, delivery personnel) with the exception of agency workers (temporary work)¹⁰.

Lapt1 - Apparent productivity is a simple productivity indicator calculated as value added at factor cost divided by the number of persons employed - see relation (1)

$$Lapt1 = VAt1 / NOt1 \quad (1)$$

In order to apply our model, we aggregate the vectors: NU_{ti} Number of enterprises, NO_{ti} Number of persons employed, VA_{ti} Value added at factor cost from 45 (divisions) *4 (types of enterprises) = 180 types of divisions and firm dimensions to the 22 (subsections) *4 (types of enterprises) = 88 subsections and firm dimensions types.

3. The Model

Considering that “the productivity’s effect: the capital and the innovative intensity of the sector interact with other factors, such as the skills of the workforce, the learning process, the organizational models, the infrastructural conditions, the localization of external economies, etc., then different productivity growth rates may be found at sector level. The impact of productivity on employment is a complex issue; it depends on the sources of productivity growth and on demand patterns, productivity growth may parallel employment growth (as in the 1960s and 1970s), or may be associated to job losses (as in the 1980s and 1990s). The specific features of economic areas lead to a large discrepancy in the productivity performances, which affects the model of aggregated growth of the national economies (Appelbaum and Schettkat, 1995)¹¹. Concurrently, “...the growth in the number of opportunities is higher in the countries that develop new fast growing economic sectors, with the same importance in industry and in services. *The sectoral structure of economies is, therefore, an important factor that can count for the differences in the national economic performances.* Its importance is emphasized by the globalization process that exacerbates competition and further accentuates the relative advantages associated to the ‘structural’ competitiveness and the disadvantages associated to traditional industries. Therefore, this is a very important, but rather neglected factor in explaining the different employment models of the US and Europe.”¹²

Recently, in this context of global recession, OECD studies have shown that the decrease in aggregate consumption demand led to lower production in terms of historical performance. Adjustment of labor demand was made by the balance between two main options: a) decrease in demand for employees and, consequently, employees’ layoffs; b) reduction of working time and option for a part time job. Supply pressures have hindered the implementation of the first option, the second one being preferred. The underlining of “there is still a tendency for greater reliance on hours’ adjustment to be associated with a greater decline in hourly productivity”¹³ sets the “alarm” for maintaining and increasing competitiveness.

In this paper, we develop an *original model* focused on simulating the economic structure of Romania at NACE section level for the period 2009-2020, with 2008 data as a fixed base, in order to identify some strategic development prospects for the

¹⁰ <http://epp.eurostat.ec.europa.eu/tgm/web/table/description.jsp>

¹¹ M. Pianta and M. Vivarelli, Unemployment and the Sectoral Composition of the Economy, ILO, <http://actrav.itcilo.org/actrav-english/telearn/global/ilo/art/5.htm>.

¹² *Idem*.

¹³ Employment Outlook 2010, Moving beyond the job crises, OECD2010, ISBN 978-92-64-08614, p. 38.

labor market in Romania, as introduced by the Europe 2020 Strategy requirements regarding the employment target.

Path dependence as a result of continuous evolution described by history, as well as the spatial/geographic characteristics of the area where work is performed, differentiates the probability of survival of a sectoral subsection in a competitive environment. The finer this projection framework becomes, the more transparent the main economic activity is; it is expressed in disjoint areas that synthesize occupational, organizational, and production type features, the use of intensive labor, of high technology, of knowledge intensity, of the sectoral interdependence, of economic engines, etc. Our model simplifies the complexity of labor market, ignoring the labor market's effect of regulation - considering that the Employment Protection Legislation (EPL) does not vary. Meantime, it ignores other effects listed by the ILO: the structural composition effect, the capital intensity effect, the technological effect, the demand effect and the trade effect. The main hypotheses of our model are represented by the idea *that performance and productivity are strongly conditioned by the economic sector's specificities*, strongly differentiated by the dimension of the enterprise (the 4+2 types presented in Table 1, which are considered heterogeneous) and by the economic activity at the NACE subsection (with data for Romania for 22 subsection). We generate as input vectors of performance the "annual growth rates of value added at factor costs" and, for productivity, the "growth rates of the apparent productivity", of [1,132] vector dimension. The first [1,88] two vector characteristics offer the best "resolution" in a synthetic manner of the technological solution implemented in an organizational "agglomeration" represented by the dim_unit medium size of the unit specific to any type of analyzed unit, ignoring the firm transition by dimension (demography of the firm dimension covers the SMM's and large firms' typology). Considering that the sectoral variety generation is imperceptible and in direct correlation with the technological paradigm, changing then the dim_unit medium size of the unit is specific to any [1, 132] type in the present technological paradigm. Romania's spectrum of units typology (88 types) is symbolized as a structural working vector that covers every NACE Rev.1 at subsection level (22 subsections) and the 4 types of distinct firms, considered as constant for the 2008-2020 horizon, a vector with slow variation. In other words, the triad GrVA- annual growth rates of value added at factor cost, GrLpr, annual growth rates of apparent productivity and dim_unit medium size of the unit has unique values for each characteristic of the structural working vector [1,88]) and reflects the "materialization" of the active technological paradigm that gives the sectoral NACE affiliation. The main output of the functioning of a "constant" technological paradigm is the dimension of the size of the economic activity sector at subsection level, in terms of number of employees and number of active units. From this perspective, the number of employees and the number of active units represent the variables with high variation, volatile in level and dynamics, especially in a competitive and globally opened environment, etc. In order to illustrate these effects we follow 4 steps:

Step 1. Calculating the annual growth rates of value added at factor cost, annual growth rates of the apparent productivity and the medium size of the unit specific to any type of analyzed unit by NACE subsection, type of enterprise given by the personnel size, for the period 2002-2008;

Step 2. Generation of input vectors to apply the simulation model according to the extreme variations (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) to the annual growth rates of value added at factor cost and to annual growth rates of the apparent productivity during the period 2002-2008.

Step 3. Projecting the economic structure of Romania at the 2020 horizon, for NACE Rev.1. subsection level according to four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]), namely projecting the 2008 fixed base level of value added (VA_{2008}) and apparent labor productivity (Lpr_{2008}) using the annual growth rates of value added at factor cost and the annual growth rates of the apparent productivity during the period 2002-2008.

Step 4. The economic structure of Romania projected at the 2020 horizon, by NACE Rev.1. section level simulated in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) and its strategic development prospect analysis of the labor market in Romania, as introduced by the Europe 2020 Strategy.

Step 1: Calculating the annual growth rates of value added at factor cost, the annual growth rates of apparent productivity and the medium size of the unit specific to any type of analyzed unit by area, NACE subsection, type of enterprise given by the personnel size, for the period 2002-2008:

a. Calculating the annual growth rates of value added at factor cost, for 2002-2008:

$$GrVA_{t+1/t[country_c][m][k]} = \frac{VA_{t+1[country_c][m][k]} - VA_{t[country_c][m][k]}}{VA_{t[country_c][m][k]}} * 100 \quad .[\%] \quad (2)$$

$VA_{t[country_c][m][k]}$ *Value added (at factor cost) in Euro, current prices, annual, by area, NACE Rev.1 subsection, type of enterprise given by the personnel size, i;*

$GrVA_{t+1/t[country_c][m][k]}$ *Annual growth rates of value added at factor cost, by area, NACE subsection, type of enterprise given by the personnel size, i-1;*

b. Calculating the annual growth rates of apparent productivity, for 2002-2008:

$$GrLpr_{t+1/t[country_c][m][k]} = \frac{Lpr_{t+1[country_c][m][k]} - Lpr_{t[country_c][m][k]}}{Lpr_{t[country_c][m][k]}} * 100 \quad .[\%] \quad (3)$$

$Lpr_{t[country_c][m][k]}$ *Apparent productivity in thousand euro/person/year, by NACE Rev.1 subsection, type of enterprise given by the personnel size, (i);*

$GrLpr_{t+1/t[country_c][m][k]}$ Annual growth rates of apparent productivity, by NACE Rev. 1 subsection, type of enterprise given by the personnel size, (i-1);

c. Calculating the medium size of the unit specific to any type of analyzed unit by area, NACE division, type of enterprise given by the personnel size, for the period 2002-2008:

$$dim_unit_{t[country_c][m][k]} = \frac{\sum_{t=2002}^{2008} \frac{NO_{t[country_c][m][k]}}{NU_{t[country_c][m][k]}}}{Max(i)}$$

[Number of employees/unit by NACE Rev. 1 division, type of enterprise by personnel size] (4)

dim_unit Medium size of the unit specific to any type of analyzed unit by area, NACE division, type of enterprise given by the personnel size, for the period 2002-2008

where:

$i \in [1;7]$ - the 7 series terms for annual growth;

t - years 2002 -2008;

$[country_c]$, with $c \in [1;2]$

$[country 1]$ - Romania denoted by [Ro];

$[country 2]$ - 27 European Union Member States, denoted by [UE27];

$m \in [1;22]$ the economic activity of the non-financial business sector, by NACE Rev.1 structure, namely I-C industry, K with the following level of detail: 8 sections, 22 subsections

The dimension of one vector is aggregated from division level $[1, 45*6] = [1,270]$ to subsection level $[1;22*6] = [1,132]$ built from the matrix $[7, 132]$. The growth vector $[1,132]$ is dimensioned by using the matrix with a rule selection $[6,132]$ presented in Step 2.

Step2. Generation of input vectors to implement the simulation model, according to the extremes variations (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) of the annual growth rates of value added at factor cost and of annual growth rates of the apparent productivity during the period 2002-2008

For the period 2009-2020, we consider the vector “x” that describes the constant annual growth rates of value added at factor cost and the vector “y” that describes the constant annual growth rates of the apparent productivity by area, NACE division, and type of enterprise given by the personnel size, in accordance with 4 extreme scenarios:

Scenario Min_Min: with the vectors “x” and “y” built with minimum annual growth rates of value added at factor cost and annual growth rates of the apparent productivity, in 2008 constant prices, from the values registered in Romania during the

period 2002-2008, at NACE subsection level, type of enterprise given by the personnel size;

$$\text{Case } \textit{minGrVA} \quad x = \text{Minimum GrVA[Ro][m][k]}; \quad (2 \text{ a})$$

$$\text{Case } \textit{minGrLpr} \quad y = \text{Minimum GrLpr[Ro][m][k]}; \quad (3 \text{ a})$$

Scenario Med_Med: with the vectors “x” and “y” built with average annual growth rates of value added at factor cost and annual growth rates of the apparent productivity, in 2008 constant prices, from the values registered in Romania during the period 2002-2008, at NACE subsection level, type of enterprise given by the personnel size;

$$\text{Case } \textit{AverageGrVA} \quad x = \text{Average Vector GrVA[Ro]}; \quad (2 \text{ b})$$

$$\text{Case } \textit{AverageGrLpr} \quad y = \text{Average Vector GrLpr [Ro]}; \quad (3 \text{ b})$$

Scenario Max_Max: with the vectors “x” and “y” built with maximum annual growth rates of value added at factor cost and annual growth rates of the apparent productivity, in 2008 constant prices, from the values registered in Romania during the period 2002-2008, at NACE subsection level, type of enterprise given by the personnel size;

$$\text{Case } \textit{maxGrVA} \quad x = \text{Maximum Vector GrVA[Ro]}; \quad (2 \text{ c})$$

$$\text{Case } \textit{mmaxGrLpr} \quad y = \text{Maximum Vector GrLpr [Ro]}; \quad (3 \text{ c})$$

Scenario Med[EU27]_ Med[EU27]: with the vectors “x” and “y” built with average annual growth rates of value added at factor cost and annual growth rates of the apparent productivity, in 2008 constant prices, from the values registered in EU27 during the period 1995-2007, at NACE subsection level, type of enterprise given by the personnel size;

$$\text{Case } \textit{med[UE27]GrVA} \quad x = \text{Average Vector GrVA[UE27]} \quad (2 \text{ d})$$

$$\text{Case } \textit{med[UE27]GrLpr} \quad y = \text{Average Vector GrLpr [UE27]} \quad (3 \text{ d})$$

Step 3. Projecting the economic structure for Romania at the 2020 horizon, at NACE Rev.1. subsection level in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]), namely projecting the 2008 fixed base level of value added (VA_{2008}) and apparent labor productivity (Lpr_{2008}) using the annual growth rates for value added at factor cost and the annual growth rates of the apparent productivity during the period 2002-2008.

Output I: The projection of the vectors through the simulation of the growth rates (x,y) of the vectors “value added at factor cost” and “apparent productivity” for the years 2009-2020, at NACE Rev.1. subsection level and by type of enterprise:

$$VA_{[B+j][Ro][m][k]} = VA_{B[Ro][m][k]} \left(1 + \frac{x_{[country][m][k]}}{100} \right)^j \quad \begin{array}{l} \text{[million euro, 2008} \\ \text{current prices]} \quad (5) \end{array}$$

$$Lpr_{[B+j][Ro][m][k]} = Lpr_{B[Ro][m][k]} \left(1 + \frac{y_{[country][m][k]}}{100} \right)^j \quad \begin{array}{l} \text{[euro, 2008 current} \\ \text{prices/employee]} \quad (6) \end{array}$$

Output IIa: The projection of employed persons' vector for the years 2009-2020, at NACE Rev.1. division level and by type of enterprise:

$$NO_{[B+j][Ro][m][k]} = \frac{VA_{[B+j][Ro][m][k]} * 1000}{Lpr_{[B+j][Ro][m][k]}} \quad \text{[number of persons] (7)}$$

Output IIb: The number of enterprises projection vector for the years 2009-2020, at NACE Rev.1. division level and by type of enterprise:

$$NU_{[B+j][Ro][m][k]} = \frac{NO_{[B+j][Ro][m][k]} * 1000}{\text{dim_unit}_{[Ro][m][k]}} \quad \text{[number of enterprises] (8)}$$

where:

$VA_{[B+j][Ro][m][k]}$ the value added at factor cost vector projection for the years 2009-2020 through the simulation of the $GrVA=x$ in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]), projecting the 2008 VA_{2008} fixed base at NACE Rev.1 subsection level and by type of enterprise;

$Lpr_{[B+j][Ro][m][k]}$ the Lpr apparent productivity vector projection for the years 2009-2020 through the simulation of the $GrLpr=y$ in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) projecting the 2008 VA_{2008} fixed base at level of NACE Rev.1 subsection and by type of enterprise;

B' fixed base of the projection – VA_{2008}

B'' fixed base of the projection – Lpr_{2008}

$j=1 \div 12$, VA projected values for the period 2009-2020

$m \in [1;22]$ the economic activity of the non-financial business sector, by NACE Rev.1 structure, namely I-C industry, K with the following level of detail: 8 sections, 22 subsections

$k \in [1;6]$ see Table 1: Type of enterprise by the personnel size

$NO_{[B+j][Ro][m][k]}$ The projection of employed persons' vector for the years 2009-2020, at NACE Rev.1. subsection, and by type of enterprise:

$NU_{[B+j][Ro][m][k]}$ The number of enterprise vector projection for the years 2009-2020, at NACE Rev.1. subsection, and by type of enterprise

Table 3 presents the main frame of the vectors calculated following the first three steps. The VA , Lpr , NO and NU vector projection for the years 2009-2020, at NACE Rev.1. subsection level and by type of enterprise through the simulation of the $GrVA=x$ and $GrLpr=y$ in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) projecting the 2008 fixed base level for VA_{2008} and Lpr_{2008} .

Table 3

The main frame of the vectors calculated at subsection level following the three steps of the model

	2002-2008	2009-2020	
Scenario	Input Vectors	Output Vectors	
Min_Min	Minimum Vector GrVa[Ro];	VA Ro _{B+j} Minimum GrVa[Ro]	NO Ro _{B+j} Minimum
	Minimum Vector GrLpr[Ro];	Lpr Ro _{B+j} Minimum GrLpr[Ro]	NU Ro _{B+j} Minimum
	dim_unit		
Med_Med	Average Vector GrVa[Ro]	VA Ro _{B+j} Average GrVa[Ro]	NO Ro _{B+j} Average
	Average Vector GrLpr[Ro];	Lpr Ro _{B+j} Average GrLpr [Ro]	NU Ro _{B+j} Average
	dim_unit		
Max_Max	Maximum Vector GrVa[Ro]	VA Ro _{B+j} MaximumGrVa[Ro]	NO Ro _{B+j} Maximum
	Maximum Vector GrLpr[Ro]	Lpr Ro _{B+j} MaximumGrLpr [Ro]	NU Ro _{B+j} Maximum
	dim_unit		
Med[EU27]_Med[EU27]	AverageVector GrVa[EU27]	VA Ro _{B+j} Average GrVa[EU27]	NO Ro _{B+j} EU27 Average
	AverageVector GrLpr[EU27]	Lpr Ro _{B+j} Average GrLpr [EU27]	NU Ro _{B+j} EU Average
	dim_unit		

Step 4. The economic structure of Romania projected on the 2020 horizon, by NACE Rev.1. section level simulated in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27]) and its strategic development prospects analysis of the labor market in Romania, as introduced by the Europe 2020 Strategy.

Before presenting some results of Step 4, we make some comments regarding relative aspects of the Romanian economy. The recent analysis of the economic structure of EU Member States made in 2009 for 2006¹⁴ placed Romania (with about 7 points) in the EU27 countries hierarchy by the intensity of specialization on 2nd position after Malta, followed by Bulgaria (with about 6.7), on a scale of which the minimum is occupied by France with 1.9 points. The same report shows that with the size of its economy, the degree of diversity is directly correlated with economic performance in terms of GDP (PPP billion). Other references in the literature (European Reports) rank Romania's "specialization degree" in relation to the "European mosaic":

a. With significant values in the sectoral specialization index 1995-2007 (see Table 4) at the section level: A agriculture and C extractive industry, at subsection level. DC, DF, DA, DB and DD;

¹⁴ EU industrial structure 2009. Performance and competitiveness. European Commission Enterprise and Industry, 2009.

Table 4

Sectoral specialization index 1995-2007, at section level

		1999	2006
A	Agriculture and forestry	6.24	5.13
DC	Textiles, clothing, leather and footwear	2.58	4.26
DF	Manufacture of coke, refined petroleum products and nuclear fuel	3.14	3.2
DA	Manufacture of food products and beverages	2.73	3.19
DB	Manufacture of textiles	2.24	3.07
DD	Wood and wood products	3.82	2.55
C	Mining and quarrying	3.25	1.77

Source: EU industrial structure 2009. Performance and competitiveness. European Commission Enterprise and Industry, 2009, p.62.

b. Also, Romania is referred to¹⁵ as:

b1. the most specialized country in the sections: "mining and quarrying" and "textiles, clothing, leather and footwear", and the second most specialized in "recycling waste and scrap and water supply";

b2. Most specialized NUTS 2 regions (expressed as a percentage of non-financial employment of business sector): the second most specialized region in "Textiles, clothing, leather and footwear" is North East Region; in "Electricity, gas and steam" the South West Oltenia region; in "Waste and scrap recycling and water supply" the South West region, while the third most specialized region in "Mining and quarrying" is South West Oltenia region, in "Textiles, clothing, leather and footwear" the North West region and in "Furniture and other products" the North West region.

Using Database EIMBusiness_PolicyResearch2009 we calculated (by relation 1) the apparent productivity performance for Ro and EU 27 average for 2008 by the NACE REV.1 divisions and firm dimension types.

From the set of 173 divisions included in the mentioned database only 13 values of apparent productivity for Ro are higher than the EU27 average (Figure 1) - the Romanian relative performance is obvious in the sector C (10 divisions), namely "Mining and quarrying".

The main results of our model are represented by the economic structure of Romania projected on the 2020 horizon, by NACE Rev.1. section level, simulated in the four scenarios (Scenario Min_Min; Scenario Med_Med; Scenario Max_Max and Scenario Med[EU27]_ Med[EU27] - see Figure 2). The four scenarios are compared for the indicators obtained at the extremes of the series, namely 2020 and 2008, in terms of absolute changes in the apparent productivity, gross value added calculated at price factors (estimated at current 2008 prices, millions of euro), number of employed persons and number of enterprise units. The economic structural change is assured by Scenario Med[EU27]_ Med[EU27]. The value added is assured by the G,D,I and K sections sustained by an important increase in labor productivity in section C, followed by labor force layoff. Although in all scenarios the 2020 tendency is to decrease the employment in section D in Scenario Med[EU27]_ Med[EU27], the increase of

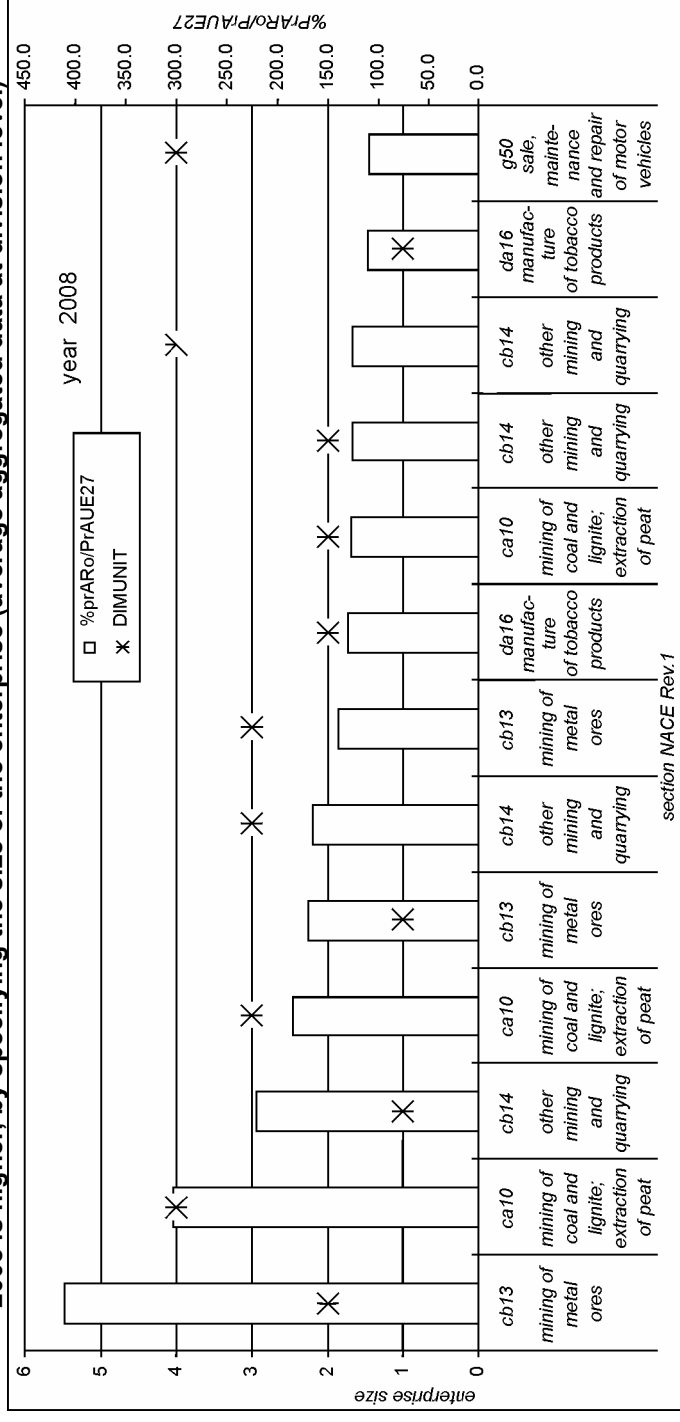
¹⁵ Aleksandra Stawińska (coord.), European Business, Facts and Figures, Eurostat, Statistical Books, European Commission, 2009, p. 23.

employment in sections K and G by over 150000 jobs and also in F by more than 50000 jobs is anticipated. This service economy structure is based in the mentioned scenario on the significant increase in number of units in the same sections K and G - mainly increasing the microenterprise type of SMM. Based on the average dynamic annual index (Figure 3) we could compare the dynamic index as annual average in the 2020/2008 period for each variable (Lpr, VA, NrPOc, NrUnits) in any of the four scenarios. In both Scenario Min_Min and Scenario Med_Med the section dynamics is higher for increasing the employment, but only in section C is followed by the apparent productivity decreasing. In Scenario Max_Max, the employment increasing only in sections K and H is possible, sustained by a very low dynamics, below 1.005%. In this case, the "higher" dynamics should occur in sections C and D for the apparent productivity. In terms of unit number (number of firms), section D exhibits the lowest dynamics. Scenario Med[EU27]_ Med[EU27] offers the prospect for the highest dynamics (1.15%) of the apparent productivity in section C, followed by labor force layoff (0.85%). In sections D and E the apparent productivity is increasing by a dynamic index over 1 (and less than 1.05%) coupled with labor force layoff (more accentuated in section E). Sections K (with the highest level of annual average increase dynamics for employment, coupled with the lowest dynamics of the apparent productivity), H, G and F offer a perspective of increasing employment dynamics.

We select the Scenario Med[EU27]_ Med[EU27] in relation to the best performance for the employment average annual growth rate (Table 4) 0.66% (sections C-K). The employment annual growth is assured in sections K (by a 4.4% annual growth rate), H (with 2.51%) and G (1.28%). In this scenario, the second best growth of VA performance is obtained, by 1% per year, sustained by sections I (by 4%), K (by 3.4%) G (2.6%), H (2.3%), D (2.2%), and with a decreasing growth contribution of VA in section C (by -3.9%). To sustain such performance, the acceleration of the number of units' dynamics is visible, with an annual growth rate (sections C-K) of 1.42%. Sections C, D, E, F should register a decreasing annual growth rate of the number of units and sections K, H, G should register positive rates.

Figure 1

NACE Rev.1 divisions for which the apparent productivity performance of Romania as against the EU average for 2008 is higher, by specifying the size of the enterprise (average aggregated data at division level)



Source: Calculated by authors using Database EIMBusiness_PolicyResearch2009.

Figure 2
Simulations for apparent productivity, gross value added calculated at price factors (estimated at 2008 current prices, million euro), number of employed persons and number of enterprise units; absolute variation between 2008 and 2020 at section level of aggregation for the 4 scenarios

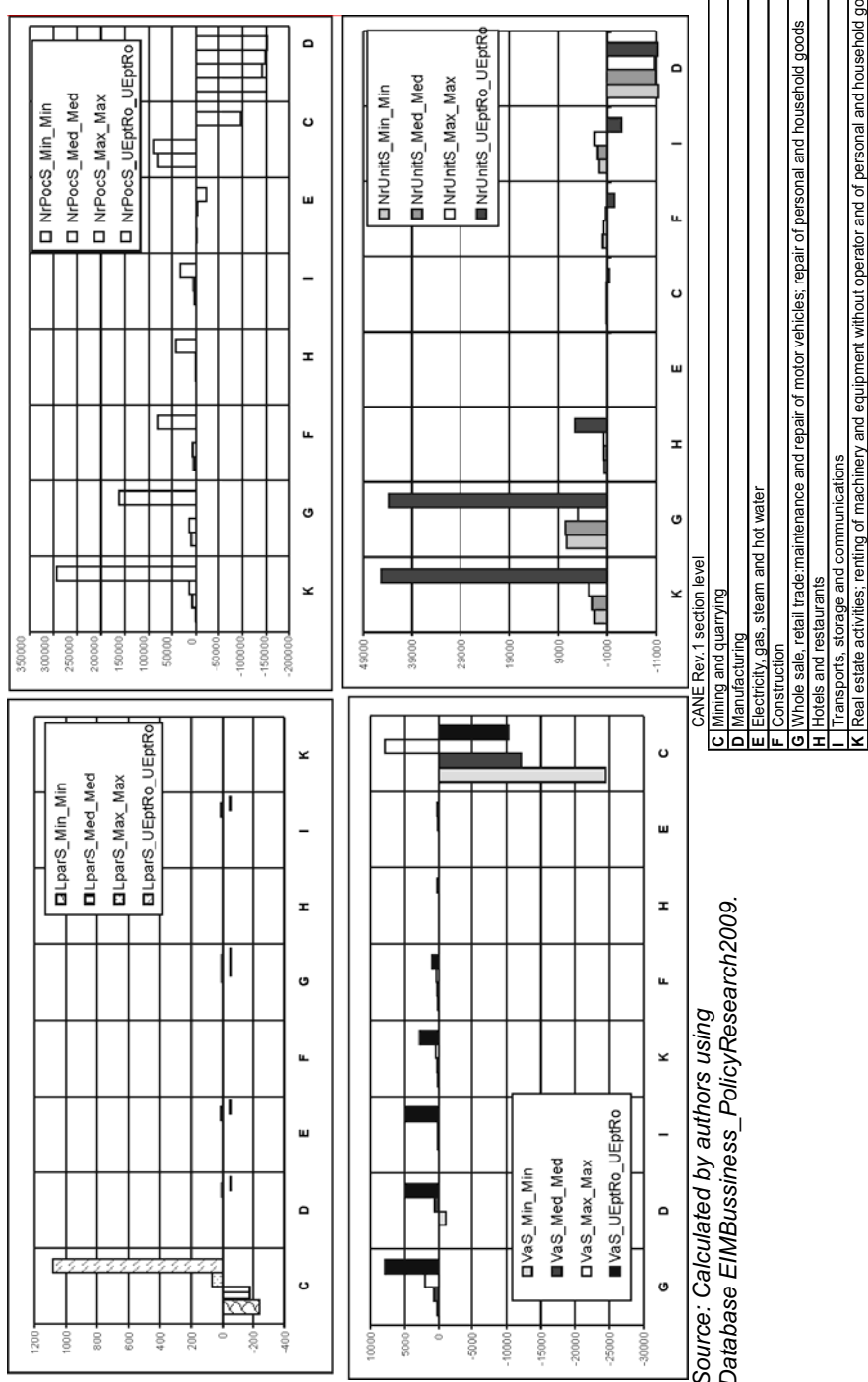
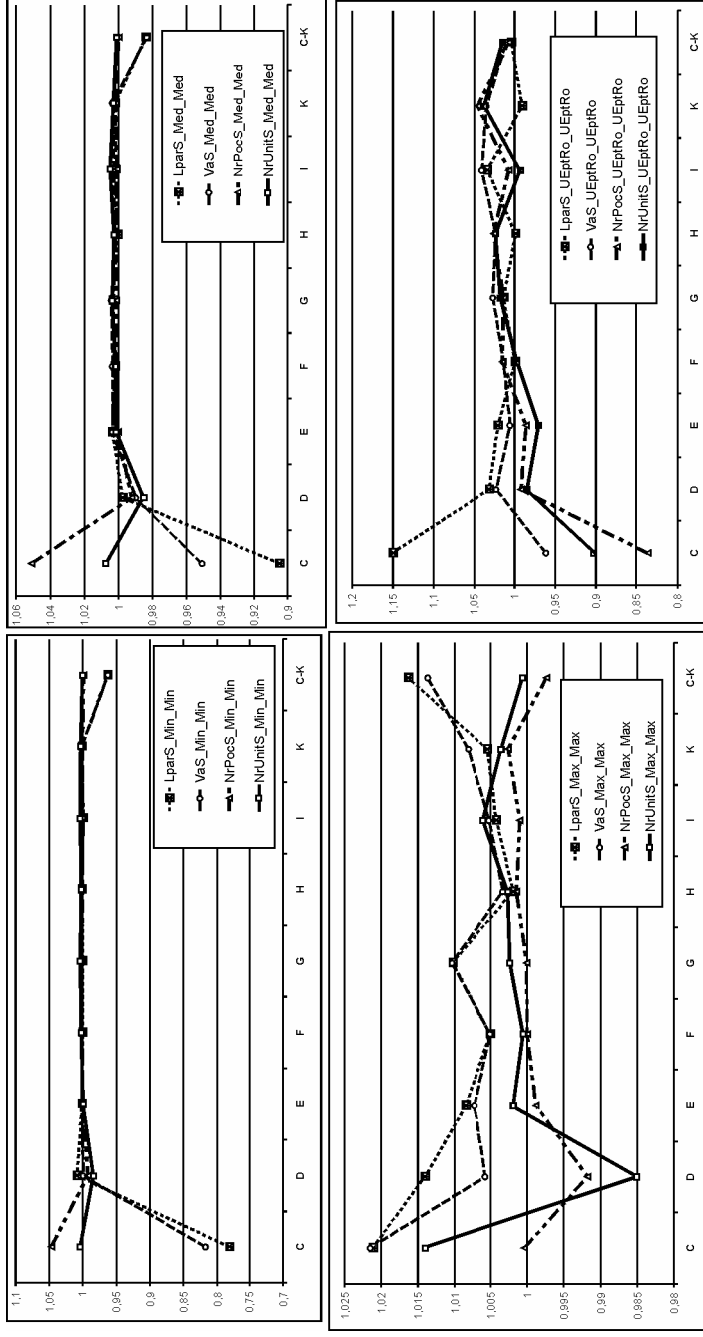


Figure 3

Variable Index Dynamic Average (Lpr, VA, NrPOc, NrUnits) for the four scenarios



Source: Calculated by authors using Database EIMBusiness_PolicyResearch2009"

$$\text{Dynamic Index}^1 : I_{\text{average annual } 2020/2002} = (I_{2020}/I_{2008})^{1/12} \quad (13)$$

¹ Biji Mircea, Biji Elena-Maria, Lilea Eugenia, Anghelache Constantin, *Tratat de Statistică, Editura Economică, 2002, p.426.*

Table 4

2008-2020 estimated annual average growth rate¹ of apparent productivity, value added at factor prices (at 2008 current prices), employment and number of units

$$R_{\text{annual average rate 2020/2008}} = (I_{\text{average annual pt2020/2008}} - 1) * 100, [\%] \quad (14)$$

Annual average rate or the development rate of Lpar

	LparS Min Min	LparS Med Med	LparS Max Max	LparS UEptRo UEptRo
C	-21.9	-9.5	2.1	15.0
D	0.8	-0.2	1.4	3.1
E	0.1	0.3	0.8	2.0
F	0.0	0.2	0.5	-0.1
G	0.0	0.3	1.0	1.3
H	0.1	0.0	0.2	-0.2
I	-0.1	0.2	0.4	3.3
K	0.1	0.2	0.5	-1.0
C-K	-3.67	-1.62	1.63	0.34

Annual average or the development rate of VA 2020_2008 section aggregation

	VaS Min Min	VaS Med Med	VaS Max Max	VaS UEptRo UEptRo
C	-18.25	-4.91	2.15	-3.90
D	-0.04	-1.02	0.58	2.20
E	0.10	0.33	0.72	0.50
F	0.12	0.34	0.51	1.30
G	0.10	0.42	1.04	2.60
H	0.09	0.22	0.33	2.30
I	-0.06	0.25	0.52	4.00
K	0.10	0.33	0.81	3.40
C-K	-3.78	-1.66	1.37	1.00

Annual average or the development rate for NrPoc 2020_2008 section aggregation

	NrPocS Min Min	NrPocS Med Med	NrPocS Max Max	NrPocS UEptRo UEptRo
C	4.62	5.10	0.04	-16.43
D	-0.84	-0.79	-0.82	-0.84
E	-0.04	0.01	-0.12	-1.47
F	0.08	0.11	0.00	1.40
G	0.08	0.11	0.01	1.28
H	-0.02	0.18	0.14	2.51
I	0.02	0.07	0.10	0.68
K	0.04	0.14	0.26	4.44
C-K	-0.11	-0.04	-0.26	0.66

Annual average or the development rate for NrUnit 2020_2008 section aggregation

	NrUnitS Min Min	NrUnitS Med Med	NrUnitS Max Max	NrUnitS UEptRo UEptRo
C	0.33	0.74	1.40	-9.72
D	-1.63	-1.52	-1.49	-1.61
E	-0.07	0.12	0.19	-3.04
F	0.19	0.15	0.05	-0.37
G	0.33	0.33	0.24	1.64
H	0.20	0.26	0.27	2.31
I	0.39	0.47	0.61	-0.79
K	0.24	0.29	0.36	3.69
C-K	0.06	0.09	0.06	1.42

Source: Calculated by authors using Database EIMBusiness_PolicyResearch2009.

¹ Idem, p.428.

4. Conclusions

In the context of a single market, of general interest sectors, of common interest sectors integrated into the EU, in order to meet the competitiveness requirements, the demands imposed by the knowledge economy as a response to the globalization process - along with its opportunities and dangers - a strategic study that aims at defining a coherent response strategy to the Europe 2020 goals from the perspective of the Romanian labor market is mandatory. This should happen in the context of a single market and by taking into consideration the process of demographic ageing.

In building an employment strategy for Romania, the first step is the evaluation of existing resources, definition of characteristics but also the national regulatory options. In this study, we described some absolutely necessary aspects, brought to light by Europe 2020 Strategy. Achieving or getting near the employment target of 75% employment of the population aged 20-24 requires the support of employment growth rates of over 1.1% (can ensure more employment for people with low occupancy rate, of approximately 54.9%, the maximum for this category is 59.6% in case of achieving a sustained rate of annual employment growth of 1.662%). Achieving these rates imply significant changes in the economic structure, especially from the perspective of ensuring a globally competitive productivity (not just European). The best performance is suggested by the media_UE_media_UE module, where the annual rate of employment growth would be 0.66%, clearly insufficient to meet the employment target. This rate is close to the historical peak of employment growth rate of 0.7 (obtained in 2006) and offers the prospect for a target of 68.2% in 2020 – starting from an employment rate of 63.5% in 2009 (provisional data in April 2010, NCP).

From the perspective of Europe 2020, there is a mandatory logical demand for a structural adjusting of the European economies to the new paradigms. From this perspective, the challenge to Romania is more difficult, explained by its sectoral specialization (especially mining and quarrying, textiles, clothing, leather and footwear) sectors with low potential for creating value added through innovation; they are consuming resources, being energy-intensive² and, very important, they are not included in the set of sectors with high specialization, nor among the high-tech knowledge- intensive ones. By increasing productivity at high growth rates in the sustained strategic sectors the economic structure can be balanced or, in other words, it is not enough to achieve a high level of productivity (in terms of global competitiveness), but it is required that, in strategic terms, the economic sector create and sustain the performances targeted. Admitting that the future of Europe is described in terms of competitiveness growth through concentration and supporting an innovative economy, with a highly skilled workforce and low carbon dioxide emissions, we ask ourselves: where should be Romania's place in the economic equation of Europe? Is Romania's economy competitive enough to become

² European Competitiveness Report 2009, *European Commission - Enterprise and Industry, Commission Staff Working Document SEC (2009) 1657 final*, p. 202, *the negative indicator with the higher level is the one of energy intensity of economy (at 2007 prices by 287% more than in the European average Included in Set IG no.11/Environment.*

competitive in global terms? These questions are partially answered by the result of the four scenarios presented in this paper. A perspective on this question is provided by the results of the following four scenarios: minimum_minimum scenario; average_average scenario, maximum_maximum scenario; EU average_ EU average scenario. Operating within the parameters of the first three scenarios based on achieved performance (the reference year 2008) shows an “immovable” structure of the economy, more of a reflection of the trend of "natural" development. Neither the minimum_minimum, nor the maximum_maximum nor the average_average variants respond satisfactorily to the requirements of Europe 2020. The evidence that the operation and performance of national economy in the period 2002-2009 is affected by the structure is shown by the results of the projections provided by the EU average_ EU average Scenario 4.

The lucid and rational answer can be put forth only by *Romania's strategic option* in a crucial moment in which diversification of economic activity has become a dynamics in real time, by research recovery and stimulating innovation. Europe supports new research areas: health, knowledge-based bio-economy, environment and nanotechnology, new products and services (network infrastructure and services, robotic systems, electronic and photonic components and technologies for digital content, low carbon technologies, solutions for an aging society, adaptable and sustainable development of factories) aiming also to solve the challenges faced by society: climate change, energy supply, food supply, health, aging, etc. A viable strategic option for Romania is *to stimulate and support innovation and to achieve an efficient technology transfer between research and business.*

If Europe 2020 makes no secret of the future success recipe, it is certainly not yet too late for Romania to participate actively in the formulation of realistic goals and objectives. This can be achieved by means of constant effort and irreversibly undertaken, implemented and developed goals. The European experience has shown that strategic resource allocation and access to specialized tools generated by the necessary policies to achieve the agreed targets is strongly determined by the strategic consistency that ensures coordination and cooperation between MS.

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