THE MACROECONOMIC IMPACT EVALUATION OF THE COHESION STRUCTURAL FUNDS

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1. Hermin Model

The quantitative estimate of the macroeconomic impact of Structural and Cohesion Funds (CSF), in 2007-2013, were considered long-term influences of cohesion policy and to stimulate the supply potential. This whereas short-term demand effects (Keynesian) occur as a consequence of political decisions to increase revenue and expenses related to cohesion policy initiatives, and through multiplier effects, it spreads to all components of domestic consumption (the total investment, consumption private imports, etc..) and the output component's internal and national income.

To examine this prospect, the ex-ante, using a model of type HERMIN. HERMIN model was implemented first for the Romanian economy in an ACE-PHARE research project during 1997-1998 and was later developed for the Ministry of Public Finance in 2002-2003. Version model, used in monitoring the NDP's, adapted to the specificities of the Romanian economy to meet the requirements stipulated in the guidelines while conducting trials ex-ante impact of structural funds.

The advantage of using this type of model is able to quantify the effects of FSC on the economy not just by summation of the effects, but the inclusion of spillover effects and externalities. The structural model is one based on micro-economic fundamentals: supply side includes the incorporation of the main mechanisms that affect the productive potential FSC (direct externalities on output time). Included are also indirect externalities of production factors (capital and labor).

However, we must look with caution within this model, as also of any such instruments, especially in the Romanian economy, where statistics are not very appropriate econometric estimates, given the specificity of the analysis period, but the small size of series time or no data for important variables, such as those relating to capital and types of investment (investment in infrastructure, machinery and equipment, etc..).

HERMIN is an annual model, multi-sectoral, including:
- T sector - manufacturing (goods sold on foreign markets);
- The N - services market (non-marketable products on foreign markets);
- The sector - agriculture; Sector G - government services (or non-market).

2. Hermin Model Structure

The Hermin model can best be viewed as consisting of three main blocks: a **supply** side, which is treated separately for each of the four sectors, one side of one side of the **absorption** and **distribution of income**. In the conventional Keynesian model HERMIN underlying mechanisms. Thus, sub-components of the distribution of income and expenditure generates income-expenditure mechanisms HERMIN standard model.

However, the model has neo-classical features associated primarily with sub-component of aggregate demand. Therefore, production in manufacturing is not simply determined by demand. It is influenced also by price and cost competitiveness, as firms search for minimum cost production locations. In addition, applications in manufacturing factors (T) and market services (N) are derived using a CES production function in which the ratio capital / labor is sensitive to relative factor prices.

Corresponding to the three methods of national accounts definition of GDP (on the *production* side, the side of *expenditure* and *revenue* side), the model HERMIN:

❖ offer is given to the production of four sectors: manufacturing (OT), market services (ON), agriculture (OA) and public (or non-market) (OG);

❖ the expenditure side, disaggregation include: private consumption (CONS), public consumption (G), investments (I), stock changes (DS), exports (X) and imports (M);

❖ The National income is determined by supply side and disaggregated elements of public and private sector.

Long-term effects of cohesion policy are felt in the economy mainly through **three mechanisms:**

➢ *increased stock and quality of physical infrastructure,* which is an input for productive private sector activity;

➢ *increased stock and quality human capital* through investment in training, which is also a factor in private sector productivity growth;

➢ *financial assistance* for private sector companies to stimulate investment initiatives, increase research-innovation, development of management and marketing, etc.., Leading eventually to higher productivity and reduced trade cost factors of production and capital costs.

To capture the impact of structural and cohesion funds, the model used included the mechanisms of direct externalities (the output) and indirect (on inputs).

As the labor market plays a major role in policy transmission mechanisms, special attention was paid to modeling the sector, taking into account the wage policy and labor market regulations (taxation, etc..) Influencing the results of negotiations and wage and employment indicators employment and participation rates of employment. In addition, the model was so designed that it can draw attention to the crowding out policy, for example where public spending can cause a negative effect on private sector activity by higher rates of taxation, interest rates, and constraints on labor market.

The model was run under two scenarios, scenarios considered "standard" in impact assessments: baseline scenario ("the Funds) - FSC expenditure at the level set in NDP;

❑ *Scenario 1 ("no funds") - it is assumed that the NDP will not FSC expenses* (costs will remain at the pre-accession funds).

❑ Are included but for the entire period 2007-2020, pre-accession funds equivalent to the level of 2006. The data used refers to commitments in terms of absorption rates of 100%.

3. Interpretation of results

The results of simulations aimed at:

✓ GDP at factor cost, by industry, services, government sector;

✓ **expenditure** (private consumption, public consumption, total investment);

✓ **labor market - unemployment and employment** (total, in industry and services);

✓ **growth rate** of wages (wage rate in manufacturing industry);

✓ **budget deficit**;

✓ **export and import**.

A comparison of the two scenarios (with and without input from structural funds) can interpret the difference between them as the macroeconomic consequences of the FSC. Additional hypothesis is that after 2013 in all scenarios, the funds return to the values of the pre-accession. Forecast period extends until 2020, may be relevant to long-term effects of structural funds.

The macroeconomic impact of the Structural Funds - The differences between values obtained in the cases „with funds" and „without funds" (%)

	2014	2015	2016	2017	2018	2019	2020
Public consumption (CONS)	8,26	7,72	7,48	7,13	6,75	6,61	7,08
Budget deficit (GBORR)	-9,74	55,21	-13,84	-7,21	-4,32	-5,00	-7,12
GDP calculated by expenditure met. (GDPE)	16,66	15,21	16,62	16,86	17,14	19,31	24,02
GDP at factor cost (GDPFC)	17,65	16,01	17,75	18,10	18,48	21,03	26,39
Investment (I)	12,47	11,13	14,79	15,21	16,18	18,92	25,15
Employment (L)	7,04	6,98	7,38	7,61	7,68	8,40	9,74
Employment in sector N (LLN)	4,50	4,45	4,40	4,40	4,34	4,28	4,21
Employment in sector T	23,96	23,75	26,20	27,33	26,73	30,09	36,27
Imports (M)	2,48	1,49	2,20	2,12	2,34	2,43	2,67
Output in N sector (ON)	18,09	15,24	16,72	16,19	16,66	18,72	24,59
Output in T sector (OT)	25,92	24,65	27,38	28,62	28,16	31,69	38,04
GDP Deflator (PGDPE)	-7,04	-8,72	-7,40	-7,38	-6,72	-7,16	-8,89
Unit cost of labour in N (ULCN)	-10,82	-12,32	-10,43	-9,85	-9,06	-9,56	-2,63
Unit cost of labour in T (ULCT)	-1,01	-3,96	-0,99	-0,88	0,26	1,30	2,49
Unemployment rate (UR)	-47,59	-45,68	-43,90	-42,24	-44,78	-47,27	-39,5
Average income in N (WN)	0,78	-3,27	0,14	0,34	1,68	2,97	4,46
Average income in T (WT)	0,56	-3,25	-0,07	0,13	1,38	2,55	3,82

Source: Hermin Model PND 2007-2013

As the table above, the injection of funds will, in 2020, GDP is over 25% higher. Most of this growth will be generated during the period 2007-2013 (during injection), especially during the start and end of the period covered by the NDP. In the scenario with the funds, the average annual growth rate of GDP (2007-2020) is 1.6 percentage points higher than in the scenario without funds.

For private consumption (CONS), small differences appear between the scenarios, the expected difference of only 0.52 percentage points from annual growth rates of actual consumption for the scenario "with structural funds.

Investments (I) will register high growth rates, with significant differences between scenarios (average 1.71 points over the period 2007-2020, for the scenario "with" funds). As a result, in 2020, investment will be around 25% higher due to the impact of structural funds. Interesting is that after an inevitable decline in 2014 the differences between the two scenarios (because of hypothesis elimination of structural funds), however, long-term effects of permanent growing until 2020 when the difference exceeds even last year of funding structural.

The labor market will also be significantly affected by the injection of funds, so in those 14 years of the

forecast period will be created over 550,000 jobs (net) in the scenario of funds, achievement compared with projected decrease population employed in the scenario "without". Annual growth rates are projected to -0.25% in scenario "no" funds, while the scenario "with" funds reached 0.42% per year. This will result in a net difference of population employed (L) at end of period (in 2020) almost 10% compared to scenario "no" funds. Moreover, the unemployment rate (UR) in 2020 will be about half the level that would be reached in the scenario without funds.

Both in industry and in services, real wages (WT and WN) will increase 3-4 times during the forecast period. Differences between scenarios in favor of the funds will peak between 2007 (4%) and 2013 (6%), after which they will begin to fade, however, to again become significant in 2020.

The injection of funds will significantly increase the budget deficit (GBORR) in years where production (2007-2013), because additional budgetary expenditure will increase by 13-18% in nominal terms, while revenues will grow moderately, by 10-15 %.

Benefits of using these funds will be felt more than the manufacturing (tradable goods in foreign markets), whose output (OT) will raise additional funds scenario with 38% in 14 years, in comparison with the service sector, where the ON is expected to further increase to around 25%.

The effects of these phenomena will increase relative to the scenario with the funds of unit labor costs in the T (ULCT) and its relative decline in the N (ULCN).

Exports were seen as being determined by international variables, so there is no difference between scenarios. By contrast, imports (M) will be higher (between 2.7% to 5% in 2020 and 2013) for scenario "with" scenario to "no" funds, although differences do not seem significant.

Even if all the model estimates Hermine used to calculate indicators as moderately stable, in 2009 overthrew all the records. Thus, a comparative analysis of the development level of achievement of key economic indicators, the level forecast by the model Hermine (with and without funds) shows that in the first two years of implementation of cohesion policy, GDP growth was within the estimated but 2009 was marked by a dramatic decrease.

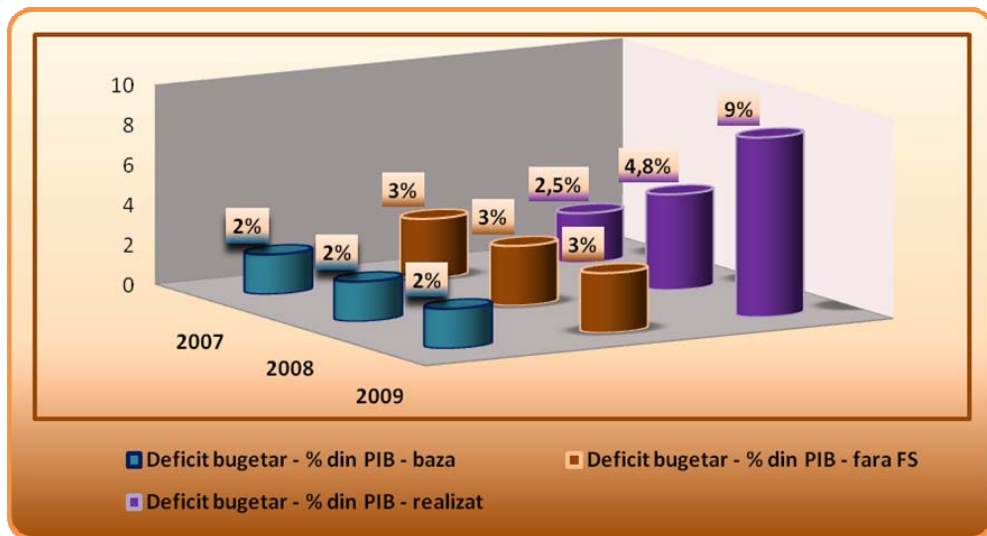**Comparison between the values of indicators, actual and estimated (with and without funds)**

INDICATORS		2007	2008	2009
GDP (growth %)	Estimated based	6,8	7,1	7,1
	Estimated without FS	6,1	6,4	5,6
	Achieved	6,2	7,1	-7,6
Exports (growth %)	Estimated based	17,5	17,6	16,6
	Estimated without FS	16,2	16,3	16,2
	Achieved	12,6	18,1	-6,1
Imports (growth %)	Estimated based	16,6	16,6	16,4
	Estimated without FS	15,1	15,1	13,7
	Achieved	27,5	12,9	-26,3
Budget deficit (% of GDP)	Estimated based	2	2	2
	Estimated without FS	3	3	3
	Achieved	2,5	4,8	9
Unemployment (mil. pers)	Estimated based	0,709	0,591	0,881
	Estimated without FS	0,315	0,765	0,644
	Achieved	0,367	0,403	0,625

Source: Calculations made using data from the monthly bulletins of the INS in 2006 - 2009

The same happened with other economic indicators, the budget deficit as the most suggestive, since it has 4.5 times higher values than those estimated by the model.

Actual budget deficit recorded in the period 2007-2009, compared to that estimated by the Hermin model

Source: Calculations made using data from the monthly bulletins of the INS in 2006 - 2009

The year 2009 was marked by a strong recession, affecting all the indicators analyzed, however, that Hermin model looked influences long-term cohesion policy and to stimulate the supply potential is included in the model 14 years, the 2007 to 2020, the results of these estimates may be considered relevant to the Romanian economy.

Being the most complete and comprehensive document on Romania's development strategy for 2007-2013, NDP priorities cover the main areas of activity in Romania, but also all possible funding sources to be used to achieve them. This is why the existing policy documents contain other priorities that contributed to the priorities NDP.

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