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M. Alejandro Cardenete[ab], M. Carmen Delgado[a] & M. Carmen Lima[a]

[a] Department of Economics, Universidad Pablo de Olavide, Seville, Spain

[b] European Institute of Public Administration, Maastricht, The Netherlands

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The Structural Funds in Andalusia for the Programming Period 2014–2020: Time for Tightening Belts

M. ALEJANDRO CARDENETE[*,**], M. CARMEN DELGADO[*] & M. CARMEN LIMA[*]

[*]Department of Economics, Universidad Pablo de Olavide, Seville, Spain, [**]European Institute of Public Administration, Maastricht, The Netherlands

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Abstract *During the period 2014–2020 it will be the first time since Spain joined the European Economic Community that the Southern region of Andalusia will not be considered as one of the Objective 1 priority areas for the European Regional Policy. This paper analyses the economic impact of the foreseeable withdrawal of an important amount of European Structural Funds in the region. Our point is to develop a dynamic general equilibrium model to assess, under different simulation scenarios, the effects of the removal of this funding on the main regional economic indicators, specially focusing on GDP growth, a key variable for the future of the region.*

1. Introduction

This paper aims to perform an analysis for assessing the impact on the Andalusian economy of the foreseeable partial withdrawal of European funds in the next multi-annual financial framework (MFF) 2014–2020 and, at the same time, drawing some practical recommendations from the economic policy point of view.

The main novelty of this paper is the construction of a dynamic general equilibrium (DGE) model for the region, which, once it is calibrated and the different simulation are defined, will allow interpreting the results of the impact on regional and sectoral indicators. To begin with, a static applied general equilibrium (AGE) model will be constructed to serve as a basis from which to tackle the later transformation into dynamics. To the best of our knowledge, this is the first DGE model built for this regional economy and opens a new path of research further from several previous partial or static approaches. One of the main points of the proposed methodology is the possibility

Correspondence Address: M. Carmen Lima, Department of Economics, Universidad Pablo de Olavide, Carretera de Utrera km 1, 41013 Sevilla, Spain. Email: mlimdia@upo.es

of getting more results from the microeconomic point of view than in econometrical models because we can extract some information at sectoral level as, for example, the response of sectoral output when assuming different investment policies.

The paper focuses on analysing the impact of the reduction of funds on the region's growth, an especially worrying issue during the current economic crisis, focusing on probable effects of the so-called cohesion policy. Note that Andalusia has been receiving structural aid since Spain joined the European Economic Community in 1985, this transfer being an important political instrument for regional growth and convergence.

The current context of huge economic crisis has obliged to rethink the cohesion policy under an extremely austerity framework. While negotiations about strategic guidelines are taking place, the European Commission has informed the regional administration about the possibility of joining a new category of regions, the transition ones. This would mean a considerable reduction in funding allocation but a better financing position than joining the second group of competitiveness regions. That is the reason why we consider of special interest at this moment to make a simulation exercise in order to assess the probable effects of this funds cut in terms of regional growth, in comparison with the current scenario. Making use of the capabilities of computable general equilibrium (CGE) models, we focus not only on aggregate results but also on some regional figures.

We address our applied exercise by designing two different scenarios: one named as optimistic and another defined as the realistic one, following the last available information about funding negotiations between European institutions and regional and national administrations. The results show that, if we compare the first scenario in which the amount of funds received is similar to that provided in the on-going period with the second one of 30% cut in the total amount, this expected reduction of funds will mean a 2.2% loss in regional growth rate at the end of the period of study if we maintained the current pattern of investment (80% devoted to capital investments and 20% to labour investments). Furthermore, if we changed the initial distribution of funds between capital and labour to a more intensive investment in labour (50% for capital and another 50% for human capital promotion) then the regional growth rate would behave even better. This would mean an additional reduction in this indicator, reaching a 2.5% fall when addressing the partial removal of funds. In fact, the higher the Funds allocated to labour are, the better growth rates the regional economy gets. Although the new figure changes may not seem very significant, this tendency has not been detected in previous works and can mean a new challenge in the convergence path for Andalusia.

The structure of this work is as follows. Section 2 includes some information about the European Regional Policy and the classification of the Andalusian economy as a priority region in what concerns fund reception. Section 3 describes the main characteristics of the AGE model elaborated for this region, while Section 4 presents the databases used in the analysis. Once the different simulation scenarios are detailed in Section 5, Section 6 reflects the results obtained. Finally, Section 7 offers some conclusions that may be useful for the policy-maker.

2. Background

Given the depth of the present economic crisis, the need to maintain both the current "Andalusian cheque" associated to regional cohesion policies and the subsidies to Andalusian agriculture has brought to the fore the debate on the effects of the European funds on

the region and the preoccupation about the impact of a possible partial withdrawal of those funds in the following years.

The European Structural Funds are the object of complex negotiations around the so-called "Financial Perspectives", the budgetary framework that will govern the European Regional Policy during the 2014–2020 period. An indefatigable effort is being required during those negotiations to overcome the reluctance shown by the main "net contributors" countries, against any agreement involving an increase of the European budget items allocated to interregional solidarity. Therefore, these countries aim to reaffirm their position in tune with the austerity policies prevalent at the national and supranational levels in present and, probably, future years.

In effect, the current effort to find a path towards an economic recovery that can guarantee economic growth and, consequently, the generation of employment is dealing with a series of coordinated structural adjustment and budget and policies cuts especially in the Southern Eurozone countries.

In Spain, the virulence of the economic crisis has provoked a set of structural reforms that are very difficult to implement and has disclosed an indisputable protagonist: unemployment. If we focus on the so-called Okun's Law (1962), an empirical observation that relates unemployment to losses in a country's production, several studies determine that a real GDP growth rate of around 2.5% is required in Spain and, consequently, in the region of Andalusia. These figures would allow for a reversion in the unfavourable situation in the labour market, would stop the employment destruction process and would finally reduce the unemployment rate (for a deeper analysis if Okun's law for the Spanish regions, see Ballesteros *et al*. (2012)). Of course, Okun's law is approximate because factors other than employment affect output. However, this requirement points to the imperative consolidation of the economic reactivation as a necessary condition to reduce unemployment and makes it difficult to accept a cut down of the European funding that could easily contribute to a higher contraction of the economic activity. However, this juncture could lead to a logical reinforcement of the principle of concentration of the European support in the poorest European regions and countries.

The situation is particularly hard in Andalusia, where the last data collected by the *Active Population Survey*, published by the *National Statistics Institute* at the third quarter of 2012, reflect a regional unemployment rate of 35.42%. This rate is among the highest at the regional level and ten points above the already worrying national unemployment rate, which has reached 25.02% on the same date, and ranks as the highest one in the European Union.

For more than 25 years, Andalusia has received European Regional Policy funding, because of its classification as an Objective 1 region. The requirement for a region to enter this category was to have a GDP per capita below 75% of the European average. Andalusia's structural weaknesses, mainly associated with its problems of territorial articulation and its evident deficiencies in basic infrastructures, fully justified its inclusion in this category. This way, in the successive 1989–1993, 1994–1999, 2000–2006 programming periods and in the current 2007–2013 period, Andalusia has continuously been the recipient of privileged funding while other Spanish regions progressively stopped complying with the above-mentioned requisite.

In this last seven-year period, Objective 1 regions have changed their name to Convergence regions. The Spanish regions that currently belong to this category are Galicia, Castilla-La Mancha, Andalusia and Extremadura, the latter being the only one still complying

with the below-75% requisite for the next programming period. In fact, the region of Andalusia was around this threshold in the present period but it was finally considered among the Convergence regions because of the disposable data in those years. This justifies the strong commitment of the region with various initiatives to improve competitiveness and the increase of its investment in R&D&I during the present period, in line with the requirements of the second objective of the European Structural Funds, namely Regional Competitiveness and Employment.

The rest of the original priority regions have also left the list and have formed two different groups. On the one hand, the group of the so-called "phasing out" regions, the ones that abandoned the category gradually: despite their still having a GDP which is below 75% of the EU-15 income, they are not poor in relation to the EU-27 average. On the other hand, there are the "phasing in" regions, the ones subject to the "growth effect". Having belonged to the priority intervention group, they have experienced a dynamic reaction that has allowed them to improve their income level independently from the set of countries (EU-15 or EU-27) considered in the calculation. The rest of Spanish regions benefit from the second objective and receive a significantly lower financial aid. There is also a third and residual group called European Territorial Cooperation. In a parallel way, new regions belonging to countries in Central and Eastern Europe have enrolled the group of priority needs.

Going over evaluation and impact assessment literature on Structural Funds, although this is quite a new line of research, we can highlight some interesting works on it. At the European level, Midelfart-Knarvik and Overman (2002) outline that Structural Funds expenditures have notably promoted location of industry, by attracting industries that are intensive in research and development. They study the specific case of Ireland, where Structural Funds even reinforced comparative advantage. In a similar line of inquiry, Bradley *et al*. (2003) adapted the HERMIN macroeconomic model for Ireland, Portugal, Greece and Spain, important recipients of regional aids. Beugelsdijk and Eijffinger (2005) analyse convergence among EU member states for period 1995–2001 and develop some ideas about efficiency of Structural funding. They point out the existing relation between aggregate growth and internal cohesion.

Furthermore, Le Gallo and Dall'Erba (2008) have analysed the evolution of labour productivity disparities among 145 European regions over 1975–2000, according to the concepts of sigma and beta-convergence and addressing a sectoral analysis. They detected that inequality in productivity levels between core and peripheral regions persist and emphasize how convergence speeds and the nature of spatial effects vary from one sector to another. Crescenzi and Rodríguez-Pose (2012) revisit the question of to what extent transport infrastructure endowment has contributed to regional growth in the EU between 1990 and 2004. The results indicate that infrastructure endowment should be complemented by other variables related to social patters, innovation or immigration.

This issue has been also studied for the Spanish economy by De la Fuente (2003). The author evaluates the structural funding contribution to output growth and employment in the Objective 1 regions group, by means of a growth model. His results support the idea that European funds can be considered as a good contributor to per capita income. Other regional overviews can be found in Sosvilla (2003) for Canary Islands, Sosvilla and Herce (2003) for Madrid and Sosvilla *et al.* (2006) for Castilla La Mancha—among others—following the HERMIN model. Focusing on Andalusia, Sosvilla *et al.* (2004) worked with a regionalized HERMIN model for 1989–2006 and detected an important contribution to

real convergence of regional policy. In a later study, Sosvilla and Murillo (2005) captured supply side effects of Community Support Framework (CSF) 1994–1999 by cointegration techniques and time series. The results confirmed that European facilities had reduced the gap between the Andalusian economy and its more developed neighbours.

The previous models were based on econometric techniques. If we look at multi-sectoral models, our methodological approach, we can find linear as well as not linear general equilibrium models on this issue. Going over the first ones, Morillas *et al.* (1999) captured European funding externalities by means of input–output tables for period 1989–1993, Lima and Cardenete (2005) developed an impact analysis using three social accounting matrices (SAM) for Andalusia while Cámara (2006) presented a linear multiplier model for Madrid.

Although SAM type models allow us to capture a wider range of effects than traditional input–output models, we have gone a step further building a more sophisticated CGE model. Through the application of static general equilibrium modelling methodologies to the region of Andalusia, in Lima and Cardenete (2008), it is shown that satisfactory results were achieved regarding the impact of the structural funds received and managed in the region during the nineties. For 2000–2006 period, these funds contributed to a relevant extent to the generation of regional GDP as well. In terms of efficiency, the investment on physical infrastructures (European Regional Development Fund (ERDF)) contributed to the growth of the regional GDP to a greater extent than the funds aimed at stimulating employment and human capital formation (European Social Fund (ESF)) or at financing agricultural structures (the already extinct EAGGF-G). The positive behaviour previously described, added to the already mentioned statistical effect, has resulted in the takeoff of Andalusia from the tail group and in its reaching a GDP per capita that represents 81.2% of the EU-27 average, according to the latest Eurostat data.

To illustrate the importance of this funding in the region we can list some of the infrastructures that were financed in previous CSF. Some of these physical infrastructures covered specific deficit that limited the regional growth and have deeply contributed to regional articulation as for example the high-speed train, some of the universal exposition—EXPO'92—infrastructures, freeways and new roads, new accesses to Seville city as capital of the region, investments in the construction of seaports in the province of Cádiz, reforms in the airports of Seville, Málaga and Almería, Technological Park of Málaga, International Centre of Tourist Services in Marbella, water and energy infrastructures for the towns in Seville close area, the Sea Sciences College in Cadiz University, new industrial lands in most of the capitals, water infrastructures, etc., (for more information about this regional economy and its convergence experience, see Lima *et al*. (2010)).

In Table 1, we can see some figures about regional growth in the last CSF finished, and comparisons with Spain and the EU-15. A convergence path is also shown in Figure 1 for the same period.

This table shows that Andalusia has grown 0.5% over the Spanish GDP figure in yearly average terms and nearly 1% in comparison with the EU-15 data, reflecting a solid pattern of growth before the current economic crisis.

As regards regional convergence, the region is progressively reducing its gap in nominal GDP with respect to the Spanish economy. In fact, from more than 25% points at the beginning of the study period, we have moved to around 23 at the end.

Table 1. Nominal GDP per capita growth rate (ppp); Andalusia versus Spain and EU-15. Period of study: CSF 2000–2006

Growth rate	Andalusia	Spain	EU-15
2001/2000	4.6	3.9	3.8
2002/2001	4.7	3.7	3.3
2003/2002	2.2	1.6	1.0
2004/2003	5.0	4.3	4.1
2005/2004	3.8	3.8	2.8
2006/2005	4.5	4.2	4.2
Average	4.1	3.6	3.2

Source: Lima *et al.* (2010).

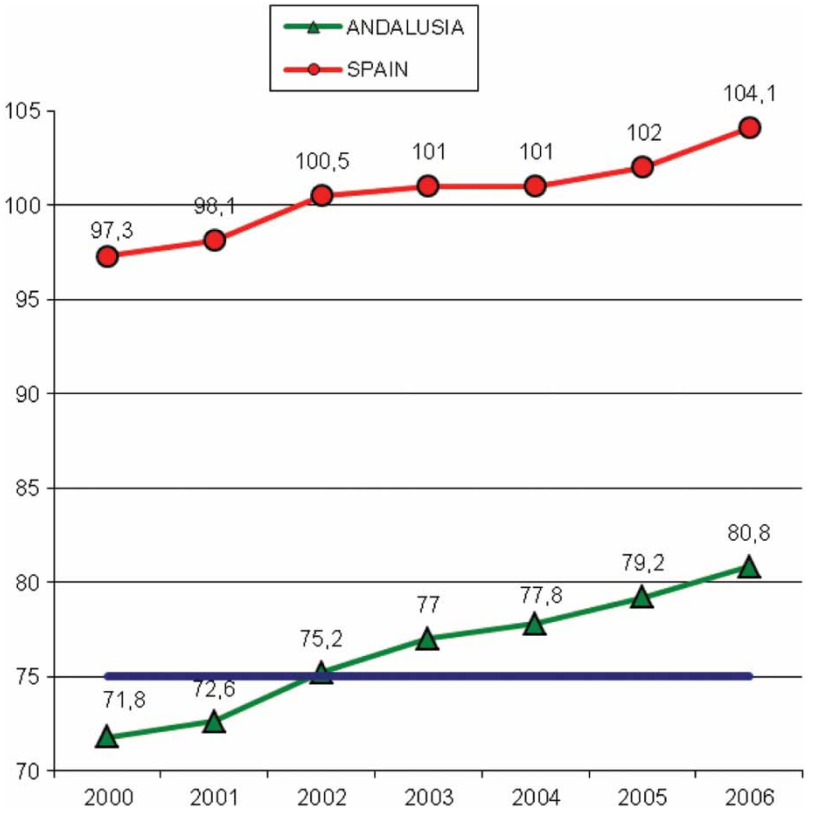

Figure 1. Convergence path for Andalusia and Spain with respect to EU average through nominal GDP (EU-27 = 100). Period of study: CSF 2000–2006.
Source: Lima *et al.* (2010).

3. AGE Model

AGE models analyse the effect of economic policy actions on a specific economy, in terms of satisfaction of the requirements of welfare and technological feasibility and considering

the restrictions associated with the available resources. This way, these models are capable of capturing the chain of interrelations generated by certain exogenous shocks on the agents and markets and, in general, on the whole economy, fine-tuning their nature better than the results provided by partial models.

AGE models are built upon the general equilibrium theories developed by Walras (1874) who expressed as set of mathematical equations the simplest problem of general equilibrium in an exchange economy. Wald (1951) made a model without joint production, the most important hypothesis being that the demand functions satisfy the so-called "weak preference axiom reveals". Later these models were improved by Arrow and Debreu (1954) who demonstrated the existence of equilibrium. In a further step, McKenzie (1959) made a formalization of the Walrasian theory and worked on a linear production model, proving the existence of this equilibrium for a model with assumptions made about demand functions, rather than directly on the preferences. Given the important mathematical foundations of these theories, potent algorithms capable of obtaining equilibrium solutions were required to develop models such as those of Shoven and Whalley (1972) and Whalley (1975, 1977) or Shoven (1976, 1977), among others, that presented AGEM as a tool allowing the assessment of public policies and the implementation of comparative statics exercises. Scarf (1984) has made much of the computational development possible.

General equilibrium models have been traditionally used to analyse the effects of changes in economic policies. The choice of the functional forms that will reflect the behaviour of the economic agents usually depends on the use given to the model elasticities. Most frequently, the functional form chosen is that which will better allow the incorporation of the key parameter values (for instance, prices and income elasticities). This is the main reason why "convenient" functional forms as the Cobb–Douglas, Constant Elasticity of Substitution, Linear Expenditure System, Translog, Generalized Leontief or other flexible forms are most often used.

Regarding the calculation of the parameter values that define the functional relations, two are the main methods to obtain these values: determinist calibration processes and econometric estimation. The first method is also the most frequently used and the one applied in this work. The reason is that this method reduces the levels of variability in the definition of initial values of variables, parameters and elasticities. The assumption is that the economy, represented by an empirical database, is in equilibrium under the existing fiscal policy; this is called "benchmark equilibrium". The model parameters are thus calculated so that they reproduce the empirical data as an equilibrium solution for the model. No statistical test can contrast the specification of the resulting model.

In practice, the data used for the calibration, which represent the benchmark equilibrium, are obtained from the National Accounts and other information provided by governmental institutions. These data (the flows of goods, services and income for a specific or reference period) must be compiled and organized so they can be operative. One of the most consistent ways to do it is through the elaboration of a database called SAM. A SAM includes data on the transactions between companies, the initial allocation of the different consumers and the amounts of consumption goods and services demanded by them, the decomposition of the value added by productive sectors, the taxes and transfers between government and private agents, the transactions of the economy with the foreign sector, etc. The compatibility of the information sources is achieved by implementing a

hierarchy. Input–output tables or the National Accounts are usually at the top of that hierarchy. In this case, the 2005 SAM for Andalusia is used and updated for year 2013 by applying the cross entropy method, for which GDP, value added and sector production data are required.

After explaining what an AGE model is, the next section will comment on some of the characteristics of the model applied in this work. It is a model that reflects the economic interactions that take place between consumers/families, producers/companies, the government and the foreign sector.

3.1. *Static Model*

A static general equilibrium model, like the one proposed by Cardenete and Sancho (2003), is taken as the basis for this work. In this case, the model used is formed by 25 productive sectors obtained from an aggregation of the input–output tables for Andalusia in 2013, where the domestic production Xd_j of each sector uses as factors the production of the other sectors:

$$Xd_j = \min\left(\frac{X_{1j}}{a_{1j}}, \frac{X_{2j}}{a_{2j}}, \ldots, \frac{X_{25j}}{a_{25j}}, \frac{\mathrm{VA}_j}{v_j}\right) \quad j = 1, 2, \ldots, 25. \tag{1}$$

In this equation, X_{ij} represents the amounts of good i required for the domestic production of good j; a_{ij} are the equivalents to technical coefficients in the framework of input–output analysis; VA_j stands for the value added of sector j and v_j is the minimum amount of value added required to produce one unit of good j.

On the following nesting level, the regional value added of each sector j ($\mathrm{VA_j}$) is the result of combining the primary factors (labour, L, and capital, K) by using a Leontief fixed coefficients technology:

$$\mathrm{VA}_j = \min\left(\frac{K_j}{k_j}, \frac{L_j}{l_j}\right) \quad j = 1, 2, \ldots, 25 \tag{2}$$

Total production Q_j is the result of combining domestic production Xd_j with the equivalent imports Xrow_j, which are considered imperfect substitutes of domestic production, following the already mentioned Leontief technology. In particular, the production of sector j is given by:

$$Q_j = \min(Xd_j, \mathrm{Xrow}_j) \quad j = 1, 2, \ldots, 25. \tag{3}$$

The government is an agent that taxes the transactions between the other economic agents to obtain public revenue (R), has an influence on the consumers' disposable income (DPI), makes transfers to the private sector (TPS) updated by a consumer price index (cpi), and demands goods and services GD_j, at sectoral prices (P_j). The difference between revenues and payments represents the deficit or surplus of the administration.

In our model there is constant activity level of public spending and the deficit is endogenously determined; hence, PD is given by:

$$\mathrm{PD} = R - \mathrm{TPS}\,\mathrm{cpi} - \sum_{j=1}^{n} \mathrm{GD}_j P_j. \tag{4}$$

The foreign sector is added fully between the different areas of trade (Rest of Spain, Europe and Rest of World).

$$\text{PDRW} = \text{prw} \sum_{j=1}^{n} \text{IMP}_j - \text{TRW} - \text{prw} \sum_{j=1}^{n} \text{EXP}_j, \tag{5}$$

where IMP_j represents imports of foreign goods sector j, EXP_j exports of sector j and TRW transfers. The deficit or surplus of the foreign sector is given by PDRW.

Final demand includes several sectors. On the one hand, demand sectors unconsumed, investment and exports, and on the other hand, demand for consumer goods of families. In our case we will have 25 types of goods—identified with the productive sectors—and a consumer.

The representative consumer demands consumer goods at present. The rest of their disposable income is their saving. The consumers' purchases are financed primarily with revenue from the sale of factor endowments.

$$\begin{aligned} \text{YDISP} &= \text{Gross income} - \text{Total direct taxes} \\ \text{YDISP} &= w\,L + r\,K + \text{cpi TPS} + \text{TRW} - \text{DT}\big(r\,K + \text{cpi TPS} + \text{TRW}\big) \\ &\quad - \text{DT}(w\,L - \text{LF}\,w\,L) - \text{LF}\,w\,L. \end{aligned} \tag{6}$$

where w and r are the prices of labour and capital, respectively, and cpi, as previously shown, an index of consumer prices. Therefore, each consumer is maximizing the utility that report consumer goods DC_i and savings DSAV subject to the budget constraint of disposable income.

$$\begin{aligned} &\text{Max}U(\text{DC}_i, \text{DSAV}) = \prod_{j=1}^{\text{n}} DC_i^{\alpha} + DSAV^{\beta} \\ &s.t.\ \text{YDISP} = (1 - \text{DT})(r\,\text{K} + cpi\ \text{TPS} + \text{TRW}) - (1 - \text{DT} + \text{DT LF} - \text{LF})w\,L, \end{aligned} \tag{7}$$

where α and β are the coefficients of participation for different consumer goods and savings, respectively.

In relation to investment and savings, savings are considered an exogenous component (DSAV), thus allowing investment to be defined endogenously (DI) and pinv being the price of investment. In the equilibrium situation, it is necessary to guarantee the macroeconomic equality between savings at the aggregated level and the total investment of the economy:

$$\sum_{j=1}^{n} \text{DI}_\text{i}\text{pinv} = \text{DSAV pinv} + \text{PD} + \text{PDRW}. \tag{8}$$

Finally, it is important to state that the two factors labour and capital are considered as used at full capacity. In addition, the levels of activity of both the government and the foreign sector are assumed to be fixed, allowing relative prices, the levels of activity of the productive sectors, and public and foreign deficits to function as endogenous variables.

The result is a vector of prices of goods and factors, of levels of activity and taxes so that they satisfy the above-described conditions. The AGE model here presented follows the traditional Walrasian equilibrium doctrine (Scarf & Shoven, 1984; Ballard *et al*., 1985;

Shoven & Whalley, 1992a, 1992b) now enlarged to include the public and the foreign sectors.

3.2. *Dynamic Model*

In static models, the analysis is made through comparative statics exercises. These models are appropriate when the analytical focus is on reaction to a onetime shock or event in which dynamic macroeconomic issues like inflation and changing investment patterns have only secondary interest. However, in some empirical applications it may be interesting to generate a temporal path for the endogenous variables. With this objective, dynamic or multi-period models are developed.

These models incorporate dynamic growth aspects through changes in the capital stocks. There are different approaches to the dynamic AGE model. The most frequent specification in the literature on DGE takes as a starting point the Ramsey (1928) growth model with its infinite-lifetime consumer, later on improved by Cass (1965) and Koopmans (1965). However, overlapping generations' models can also be found.

It was not until 1973 that the work of Scarf and Hansen (1973) contributed to the strengthening of the DGE models. Nevertheless, it was Johansen (1974) who, in a very simple manner, developed the first model, which represented the dynamics of Norwegian economy. Another of the pioneers in using this dynamic analysis was Harberger (1962), who examined the impact of a tax with a two-sector model.

From the 1990s onwards dynamic AGE models became more frequently used and they allowed analysing different economic policy problems regarding issues such as foreign trade, price control, optimal taxation or even the climate change.

Some dynamic CGE applications lack a comprehensible justification of why they are designed as dynamic instead of single-period models. In fact, they do not show an explicit interest in intertemporal aspects—neither in their analytical focus nor in their specific model design, but the literature also contains multiple examples of reasonable dynamic CGE applications.

Go (1994) highlights the intertemporal trade-offs of tariff reforms when examining the sensitivity of investment and growth to external shocks and adjustment policy. Few applications show explicit interest in specification of intertemporal aspects of the development process as, for example, the multi-sectoral CGE with overlapping generations and intertemporal optimization presented by Keuschnigg and Kohler (1995). Alike, Abbink *et al*. (1995) demonstrate under which assumptions a simple static CGE model can be changed to a dynamic CGE specification and compare the two versions. Therefore, it is possible to mention the works of those like Azis (1997) who uses a static and a dynamic framework, thereby focusing on both the economic objectives of the study as well as the differences of its results in relation to the different methodological approaches.

Dynamic CGE models are extremely useful for simulating the overall economic development path of an economy or an entire region as, for instance, demonstrated by Adams and Park (1995). Their CGE approach to modelling development paths provides a dynamic, sequenced, CGE model that emphasizes the implications of Vernon's product cycle for modelling trade and economic development in East and Southeast Asia. Other growth-oriented models focus more on trade and assess, for example, the appropriateness of an export-oriented growth strategy with respect to the volume and structure of foreign

trade and its influence on macroeconomic variables like growth in GDP, inflation, interest rates and the distribution of income (Gibson and Van Seventer 1996). Diao *et al*. (1998) construct a dynamic AGE model of a small, open economy to investigate the transition path and convergence speed of out-of-steady state growth paths in response to trade policy shocks.

Dynamic CGE has been used also in climate change topics in works like those of Blitzer *et al*. (1994), who developed a DGE model for Egypt in order to analyse the restriction of carbon dioxide emissions in the country. Bye (2000) analysed an environmental tax reform and the possibilities of a double dividend with a dynamic Ramsey model for Norway, while Jensen (2000) used a Ramsey model to analyse the taxes on carbon dioxide in Denmark. Dissou *et al*. (2002) made an important advance as well by introducing monopolistic competition in a Ramsey-type model for carbon dioxide emissions in Canada.

In this work, a simple Ramsey model will be presented. The model behaves differently depending on whether or not it is in the so-called stationary state. The stationary state is defined as a situation in which the different amounts (capital, product, investment, etc.) grow at a constant rate. This analysis starts from a situation in which, according to the information available, the economy is in a stationary state in the basis period.

In the dynamic version, the representative consumer maximizes the current value of the utility of his/her lifetime as follows:

$$\text{Max} \sum_{j=1}^{n} \left(\frac{1}{1+\rho}\right)^{t} U(c_t), \tag{9}$$

where t represents the time periods, ρ is the intertemporal discount factor, U is the utility function and c_t denotes consumption during period t. The consumer is confronted with several restrictions. First of all, the total product of the economy is divided between consumption and investment, I_t. Second, the capital depreciates at rate δ. Third, investment cannot be negative. These restrictions may be expressed as follows:

$$c_t \leq F(k_t, l_t) - I_t, \tag{10}$$

$$K_{t+1} = K_t(1-\delta) + I_t, \tag{11}$$

$$I_t \geq 0, \tag{12}$$

where K stands for capital and F represents the production function. To solve the utility maximization problem the following first-order conditions are obtained:

$$P_t = \frac{(1/1+\rho)^t \partial U(c_t)}{\partial c_t}, \tag{13}$$

$$\text{PK}_t = (1-\delta)\text{PK}_{t+1} + 1 + \frac{P_t \partial F(K_t, L_t)}{\partial K_t}, \tag{14}$$

$$P_t = PK_{t+1}, \tag{15}$$

where P_t, PK_t and PK_{t+1} are the values of the corresponding Lagrange multipliers. These may be interpreted, respectively, as the price of the product, the current price of capital and the future price of capital.

In order to quantify the value of the investment in the stationary state growth path, it is required to describe the evolution of capital and labour in time. Thus, assumptions regarding the growth rate, g, the capital depreciation rate, δ, and the interest rate, r, are required. When the initial labour force is L_0, employment in moment t is:

$$L_t = L_0(1+g)^t. \tag{16}$$

or, in an equivalent expression,

$$L_t = (1+g)L_{t-1}. \tag{17}$$

The evolution of capital is given by Equation (11). If in the basis period an economy is in the stationary state growth path, all the amounts (capital, labour, production, consumption) will grow at the rate (g). The capital growth equation can be thus represented as:

$$K_{t+1} = (1+g)K_t. \tag{18}$$

In addition, a constant interest rate (r) is considered so that all future prices (including those of labour and capital) will be, in their current value:

$$P_{t+1} = \frac{P_t}{1+r}. \tag{19}$$

Capital may be bought or rented. Therefore, the implementation of the dynamic involves two prices for capital: the purchase price, PK, and the rental price, RK. Hence, the total value of capital (VK) is:

$$\mathrm{VK_t} = \mathrm{K_t RK_t}. \tag{20}$$

Now it is necessary to consider the first-order conditions for capital and investment. They may be rewritten as:

$$\mathrm{PK}_t = (1-\delta)\mathrm{PK}_{t+1} + \mathrm{RK}_t \tag{21}$$

and

$$\mathrm{PK}_{t+1} = P_t. \tag{22}$$

Equation (22) may be rearranged by using Equation (19) for PK:

$$\mathrm{PK}_t = (1+r)P_t. \tag{23}$$

Substituting Equation (23) for PK_t and Equation (22) for PK_{t+1} in Equation (21), the result will be:

$$(1+r)P_t = (1-\delta)P_t + \mathrm{RK}_t. \tag{24}$$

Consequently, the equation for the rental price of the capital is:

$$\mathrm{RK}_t = (\delta - g)P_t. \tag{25}$$

The following rule for investment in the stationary state is derived from Equations (11) and (18):

$$I_t = (\delta + g)K_t. \tag{26}$$

4. Database: SAM and European Structural Funds

SAMs are meant to represent the whole set of transactions made in an economy during a specific period of time. It is an important database organized as a double-entry table that gathers the economic and social information concerning the transactions made between all the economic agents.

The use of SAMs was first introduced by Stone (1962) when he published a SAM for the UK. However, given their usefulness to show the intersectoral relations and income distribution of an economy, the first SAMs were elaborated with the purpose of starting poverty reduction programmes in developed countries.

A SAM gathers relevant economic and social information about all the economic agents manifested in their transactions during a specific period of time. These transactions describe production, distribution and income use and accumulation operations, both within the economy itself and with the rest of the world. A SAM enlarges the information contained in input–output tables, because, in addition to including that information, it integrates all flows between the value added and the final demand. Therefore, a SAM reflects the circular flow of income in an economy.

In this work, the 2005 SAM for Andalusia has been updated to year 2013 by using matrix projections that allow making simulations with a larger time scope. An updating cross entropy methodology has been applied, for which GDP, GVA and sector production data have been required. The structure of the SAM accounts, which have been divided into 25 productive branches and 12 accounts corresponding to the institutional sectors, is given in Table 2.

The data concerning the European funds have been taken from the Integrated Operative Programme for Andalusia 2007–2013, developed by the Department of Economy and Taxation of the Andalusian Regional Government (2007).

5. Simulations and Alternative Scenarios

Given that there is not a final position on the amounts that are to be allocated to Andalusia during the next multi-annual programming period, three initial scenarios are set out based on certain statements of the European Parliament. In particular, in June 2011, the Parliament firmly rejected freezing the European budget after 2013 and fixed a 5% reasonable margin for growth so that initiatives such as the 2020 strategy, the new tasks contemplated in the Treaty of Lisbon or the consolidation of regional convergence could be successful. In addition, by focusing on the cohesion policy, the European Parliament asked the European Commission to propose the establishment of an intermediate category for those regions having exceeded the threshold of the 75% of the European GDP per capita but still presenting values that are below 90% of the European average. The aim was to facilitate these regions, as literally specified by the report, "a clearer status and more security in their development".

Table 2. Structure of the SAM for Andalusia in 2013

1	Agriculture	20	Construction
2	Stockbreeding	21	Trade
3	Fishing	22	Transport and communication
4	Extractive industries	23	Other services
5	Oil refining and nuclear waste treatment	24	Sale-oriented services
6	Production and distribution of electric energy	25	Non-sale-oriented services
7	Production and distribution of gas, water steam and water	26	Labour
8	Water capture and treatment	27	Capital
9	Mining and iron and steel industry	28	Consumption
10	Construction materials	29	Gross capital formation
11	Chemical industries	30	Social security contributions paid by employers
12	Metal manufactures	31	Indirect taxes
13	Machinery	32	Tariffs
14	Vehicles	33	VAT
15	Other transport elements	34	Direct taxes
16	Food	35	Social security contributions paid by employees
17	Textiles and leather	36	Public sector
18	Wood manufactures	37	Foreign sector
19	Other manufactures		

Source: Own elaboration.

Regarding the last news on regional policy, institutions agree that Europe needs to put its economy back on a sustainable growth path. In June 2012, the European Parliament adopted its position on cohesion policy reforms proposal tabled by the European Commission. It seems that the main objective of the reform is based on enhancing efficiency by allowing for greater flexibility to achieve objectives at the regional level. On the other hand, the recourse to conditionalities—specially at the macroeconomic level—seems to be up for discussion and is causing a great controversy. In the Kicking off Open Days 2012 in October, the EU council president highlighted the importance of local and regional authorities in national reform programmes for growth and jobs. He also added that he would be pushing for an agreement on the MFF at the emergency European Council summit before the end of the year, warning that "a failure would mean a failure for jobs".

Andalusia could thus benefit from belonging to the new intermediate category. Obviously this would mean an important reduction in the final amount received, with the corresponding negative effect on regional growth. Under this perspective, two scenarios have been designed for the simulation in this work:

(1) *Optimistic scenario*: structural funding is maintained at the same amount as in the present period 2007–2013.
(2) *Realistic scenario*: loss of a third part of the resources available in the present 2007–2013 period.

Under these premises and considering that the use of structural funds is not a homogeneous input, we have decided to develop some kind of sensitivity analysis, trying to capture different returns of investments in capital and labour. This will mean the study

of eight subscenarios (four for the optimistic case and four for the realistic one) that will incorporate different ratios of investment. We will depart from the current distribution where the majority of funds are devoted to infrastructures (80% for capital and 20% for labour) and will progressively move to a more equilibrated share (50% for capital and 50% for labour). This way, we can assess the evolution of growth rates depending on the type of investment.

The idea of working with the improbable optimistic scenario is to the object of comparing the results of the expected reduction on the amount of funds with the one we would have obtained if the share for Andalusia would not have been reduced. In Tables 3 and 4 you can find the corresponding figures for each simulation proposed.

6. Main Results

This section presents the results obtained in the simulations. The simulations are made for macroeconomic indicators such as GDP and regional output and assuming that the economy grows at an annual 0.8% rate, in accordance with the average forecasts of The Economist—Economist Intelligence Unit (www.eiu.com).

Undoubtedly, the present situation of economic instability and the high volatility of the financial markets, the strict fiscal discipline rules and the grave uncertainties regarding the evolution of the real economy make it especially difficult to establish behaviour assumptions and to predict the future evolution of any economy, whether Andalusian, Spanish or European. Given that the model used in this work is fed with these forecasts on the evolution of the economy during the seven-year period under study, and that these forecasts are continuously revised, it is reasonable to think that the robustness of the results would increase if the economic situation became clearer for the next few years. At the moment the economic recovery seems to be still far and the forecasts for the following years are very conservative. Caution is a must in a period such as this one.

In the following tables, we develop four subscenarios within optimistic and realistic scenarios, depending on the distribution of funds between capital and labour: (50% capital, 50% labour), (60% capital, 40% labour), (70% capital, 30% labour) and (80% capital, 20% labour). Remember that the optimistic scenario assumes that the amount of funds received in the present seven-year period will be maintained in the next programming period while in the realistic scenario a one-third reduction is applied to the amount of funds allocated to Andalusia in the current period.

Tables 5 and 6 show the evolution of GDP for 2014–2020 and the corresponding variation rates with respect to the base year under two different simulation scenarios: the so-called optimistic scenario and the realistic one. The model shows that GDP increases along the whole period in both cases and if we calculate the variation rate between the last year of the study (2020) and the base year (2013), regional GDP reaches up to 6.01% in the realistic scenario and 6.15% in the optimistic one. This would mean a difference of 2.2% in regional growth rate if we compare one case and the other.

When analysing the four investment subscenarios, it is possible to observe how increasing the funds allocated to labour results in a GDP that registers a slightly better behaviour. This is perhaps due to the characteristics of the regional economy, very labour intensive, able to absorb these increases with the corresponding positive effect on GDP. In fact, if we compared again the data in the last column in both simulations and we allowed for a change in the current investment patterns to an egalitarian investment in labour and

Table 3. Distribution of the European funds in the optimistic scenario (in thousand euros)

	Year	2014	2015	2016	2017	2018	2019	2020
	Amount of the funds	2,264,117	2,937,825	2,936,401	2,960,603	2,838,203	2,864,207	2,889,191
1.1	Capital (50%)	1,132,059	1,468,913	1,468,201	1,480,302	1,419,101	1,432,103	1,444,595
	Labour (50%)	1,132,059	1,468,913	1,468,201	1,480,302	1,419,101	1,432,103	1,444,595
1.2	Capital (60%)	1,358,470	1,762,695	1,761,841	1,776,362	1,702,922	1,718,524	1,733,515
	Labour (40%)	905,647	1,175,130	1,174,560	1,184,241	1,135,281	1,145,683	1,155,676
1.3	Capital (70%)	1,584,882	2,056,478	2,055,481	2,072,422	1,986,742	2,004,945	2,022,434
	Labour (30%)	679,235	881,348	880,920	888,181	851,461	859,262	866,757
1.4	Capital (80%)	1,811,294	2,350,260	2,349,121	2,368,482	2,270,562	2,291,366	2,311,353
	Labour (20%)	452,823	587,565	587,280	592,121	567,641	572,841	577,838

Source: Own elaboration from the Integrated Operative Programme for Andalusia in 2007–2013.

Table 4. Distribution of the European funds in the realistic scenario (in thousand euros)

	Year	2014	2015	2016	2017	2018	2019	2020
	Amount of the funds	1,516,959	1,968,343	1,967,389	1,983,604	1,901,596	1,919,019	1,935,758
2.1	Capital (50%)	758,479	984,172	983,694	991,802	950,798	959,509	967,879
	Labour (50%)	758,479	984,172	983,694	991,802	950,798	959,509	967,879
2.2	Capital (60%)	910,175	1,181,006	1,180,433	1,190,162	1,140,958	1,151,411	1,161,455
	Labour (40%)	606,783	787,337	786,955	793,442	760,638	767,607	774,303
2.3	Capital (70%)	1,061,871	1,377,840	1,377,172	1,388,523	1,331,117	1,343,313	1,355,031
	Labour (30%)	455,088	590,503	590,217	595,081	570,479	575,706	580,727
2.4	Capital (80%)	1,213,567	1,574,674	1,573,911	1,586,883	1,521,277	1,535,215	1,548,606
	Labour (20%)	303,392	393,669	393,478	396,721	380,319	383,804	387,152

Source: Own elaboration from the Integrated Operative Programme for Andalusia in 2007–2013.

Table 5. Optimistic scenario: evolution of GDP 2014–2020 and variation rates (in thousand euros)

Year	2013	2014	VR(%) 2014/ 2013	2015	VR(%) 2015/ 2013	2016	VR(%) 2016/ 2013	2017	VR(%) 2017/ 2013	2018	VR(%) 2018/ 2013	2019	VR(%) 2019/ 2013	2020	VR(%) 2020/ 2013
1.1 GDP (50% capital, 50% labour)	150,205,058	151,929,399	1.1480	153,275,535	2.044	154,498,112	2.858	155,728,004	3.677	156,933,295	4.479	158,178,857	5.309	159,435,553	6.145
1.2 GDP (60% capital, 40% labour)	150,205,058	151,922,253	1.1432	153,268,323	2.039	154,492,051	2.854	155,720,676	3.672	156,925,911	4.474	158,171,416	5.304	159,428,053	6.140
1.3 GDP (70% capital, 30% labour)	150,205,058	151,917,440	1.1400	153,261,038	2.035	154,483,501	2.848	155,713,277	3.667	156,919,693	4.470	158,165,150	5.299	159,421,740	6.136
1.4 GDP (80% capital, 20% labour)	150,205,058	151,911,393	1.1360	153,253,682	2.030	154,476,086	2.843	155,705,808	3.662	156,912,184	4.465	158,157,585	5.294	159,414,120	6.131

Source: Own elaboration.

Table 6. Realistic scenario: evolution of GDP 2014–2020 and variation rates (in thousand euros)

Year	2013	2014	VR(%) 2014/ 2013	2015	VR(%) 2015/ 2013	2016	VR(%) 2016/ 2013	2017	VR(%) 2017/ 2013	2018	VR(%) 2018/ 2013	2019	VR(%) 2019/ 2013	2020	VR(%) 2020/ 2013
2.1 GDP (50% capital, 50% labour)	150,205,058	151,755,831	1.032	153,058,538	1.900	154,280,590	2.713	155,509,965	3.532	156,727,046	4.342	157,974,677	5.173	159,232,240	6.010
2.2 GDP (60% capital, 40% labour)	150,205,058	151,752,261	1.030	153,053,737	1.897	154,275,751	2.710	155,506,305	3.529	156,723,358	4.340	157,969,723	5.169	159,227,247	6.007
2.3 GDP (70% capital, 30% labour)	150,205,058	151,748,670	1.028	153,047,706	1.893	154,270,881	2.707	155,501,396	3.526	156,718,415	4.336	157,965,978	5.167	159,222,227	6.003
2.4 GDP (80% capital, 20% labour)	150,205,058	151,745,059	1.025	153,044,040	1.890	154,265,976	2.704	155,496,455	3.523	156,713,443	4.333	157,960,970	5.164	159,218,427	6.001

Source: Own elaboration.

Table 7. Optimistic scenario: evolution of regional output for 2014–2020 and variation rates (in thousand euros)

	2013	2014	VR (%) 2014/ 2013	2015	VR (%) 2015/ 2013	2016	VR (%) 2016/ 2013	2017	VR (%) 2017/ 2013	2018	VR (%) 2018/ 2013	2019	VR (%) 2019/ 2013	2020	VR (%) 2020/ 2013
1.1 Agriculture (50% capital, 50% labour)	10,263,020	10,315,990	0.516	10,342,374	0.773	10,359,848	0.943	10,377,352	1.114	10,392,758	1.264	10,410,400	1.436	10,428,321	1.611
Food (50% capital, 50% labour)	34,534,074	34,676,072	0.411	34,728,305	0.562	34,750,410	0.626	34,772,472	0.690	34,787,363	0.733	34,809,616	0.798	34,832,654	0.865
Other services (50% capital, 50% labour)	32,599,088	32,660,278	0.188	32,684,433	0.262	32,737,399	0.424	32,790,865	0.588	32,851,560	0.774	32,905,788	0.941	32,959,742	1.106
1.2 Agriculture (60% capital, 40% labour)	10,263,020	10,315,502	0.511	10,341,884	0.768	10,359,439	0.939	10,376,860	1.109	10,392,265	1.259	10,409,907	1.431	10,427,826	1.606
Food (60% capital, 40% labour)	34,534,074	34,674,429	0.406	34,726,659	0.558	34,749,037	0.622	34,770,824	0.686	34,785,715	0.729	34,807,966	0.793	34,831,004	0.860
Other services (60% capital, 40% labour)	32,599,088	32,658,727	0.183	32,682,882	0.257	32,735,587	0.419	32,789,309	0.584	32,850,000	0.770	32,904,226	0.936	32,958,177	1.102
1.3 Agriculture (70% capital, 30% labour)	10,263,020	10,315,173	0.508	10,341,390	0.764	10,358,862	0.934	10,376,364	1.104	10,391,851	1.255	10,409,492	1.427	10,427,411	1.602
Food (70% capital, 30% labour)	34,534,074	34,673,323	0.403	34,724,997	0.553	34,747,100	0.617	34,769,160	0.681	34,784,326	0.725	34,806,577	0.789	34,829,614	0.856
Other services (70% capital, 30% labour)	32,599,088	32,657,682	0.180	32,682,359	0.255	32,735,320	0.418	32,788,784	0.582	32,849,213	0.767	32,903,437	0.934	32,957,387	1.099
1.4 Agriculture (80% capital, 20% labour)	10,263,020	10,314,760	0.504	10,340,890	0.759	10,358,361	0.929	10,376,026	1.101	10,391,513	1.252	10,409,154	1.424	10,427,073	1.598
Food (80% capital, 20% labour)	34,534,074	34,671,933	0.399	34,723,318	0.548	34,745,420	0.612	34,768,027	0.677	34,783,197	0.721	34,805,448	0.786	34,828,485	0.853
Other services (80% capital, 20% labour)	32,599,088	32,656,370	0.176	32,681,315	0.252	32,734,275	0.415	32,787,220	0.577	32,847,643	0.762	32,901,864	0.929	32,955,810	1.094

Source: Own elaboration.

Table 8. Realistic scenario: evolution of regional output for 2014–2020 and variation rates (in thousand euros)

	2013	2014	VR (%) 2014/ 2013	2015	VR (%) 2015/ 2013	2016	VR (%) 2016/ 2013	2017	VR (%) 2017/ 2013	2018	VR (%) 2018/ 2013	2019	VR (%) 2019/ 2013	2020	VR (%) 2020/ 2013
2.1 Agriculture (50% capital, 50% labour)	10,263,020	10,304,131	0.401	10,327,640	0.630	10,345,171	0.800	10,362,731	0.972	10,379,013	1.130	10,396,878	1.304	10,414,939	1.480
Food (50% capital, 50% labour)	34,534,074	34,636,167	0.296	34,678,779	0.419	34,701,125	0.484	34,723,429	0.548	34,741,309	0.600	34,764,353	0.667	34,787,909	0.735
Other services (50% capital, 50% labour)	32,599,088	32,622,608	0.072	32,655,741	0.174	32,708,403	0.335	32,761,564	0.498	32,819,365	0.676	32,872,765	0.840	32,926,147	1.003
2.2 Agriculture (60% capital, 40% labour)	10,263,020	10,303,887	0.398	10,327,314	0.626	10,344,843	0.797	10,362,485	0.969	10,378,767	1.128	10,396,549	1.301	10,414,609	1.477
Food (60% capital, 40% labour)	34,534,074	34,635,346	0.293	34,677,683	0.416	34,700,029	0.481	34,722,606	0.546	34,740,485	0.598	34,763,255	0.664	34,786,811	0.732
Other services (60% capital, 40% labour)	32,599,088	32,621,833	0.070	32,655,224	0.172	32,707,884	0.334	32,760,787	0.496	32,818,586	0.673	32,872,243	0.838	32,925,625	1.002
2.3 Agriculture (70% capital, 30% labour)	10,263,020	10,303,642	0.396	10,326,905	0.622	10,344,515	0.794	10,362,156	0.966	10,378,437	1.125	10,396,301	1.299	10,414,279	1.474
Food (70% capital, 30% labour)	34,534,074	34,634,521	0.291	34,676,306	0.412	34,698,925	0.477	34,721,502	0.543	34,739,381	0.595	34,762,425	0.661	34,785,706	0.729
Other services (70% capital, 30% labour)	32,599,088	32,621,054	0.067	32,654,961	0.171	32,707,364	0.332	32,760,266	0.494	32,818,063	0.672	32,871,460	0.836	32,925,099	1.000
2.4 Agriculture (80% capital, 20% labour)	10,263,020	10,303,395	0.393	10,326,656	0.620	10,344,184	0.791	10,361,906	0.964	10,378,187	1.122	10,396,051	1.296	10,414,111	1.472
Food (80% capital, 20% labour)	34,534,074	34,633,690	0.288	34,675,470	0.409	34,697,814	0.474	34,720,663	0.540	34,738,544	0.592	34,761,588	0.659	34,785,143	0.727
Other services (80% capital, 20% labour)	32,599,088	32,620,270	0.065	32,654,182	0.169	32,706,841	0.331	32,759,484	0.492	32,817,279	0.669	32,870,674	0.833	32,924,052	0.997

Source: Own elaboration.

capital, regional growth would behave better and, consequently, we would reach a higher positive difference in regional growth rate, up to 2.5% among the two simulation scenarios. This figure would mean a higher fall of regional growth within the partial removal of funds scenario.

As a conclusion, our model outlines that GDP growth would be smaller as a result of the funds cut in the new framework and that losses in growth could be smoothly increased if we progressively moved to a more labour-intensive policy in the regional economy for the coming years.

Sectoral output is presented for each scenario (optimistic and realistic) with the variation rate between the different years and the base year (2013) in Tables 7 and 8.

Table 7 shows the evolution of the regional output in three sectors selected as representative of the Andalusian economy during the 2014–2020 period in the so-called optimistic scenario. This table shows that the sectoral output increases over the period, the highest growth registered being in primary sector, "Agriculture", followed by "Other Services" and industry of "Food". We can focus on the variation rate between the different years and the base year (2013). When comparing the four subscenarios, it is possible to observe how, changing again the percentages Funds allocated to labour, the regional output increases in all sectors, but especially in the "Agriculture" sector.

Table 8 shows the evolution of regional output in the same sectors selected as representative of the Andalusian economy during the 2014–2020 period in the realistic scenario. A similar behaviour is registered, although with smaller figures. It seems that agriculture potentialities can be better exploited in the Andalusian economy in the coming years.

7. Conclusions

We can conclude this analysis by underlining that the results obtained through the application of a dynamic AGE model methodology on the Andalusian economy in the 2014–2020 period reveal the relevant contribution of the European Structural Funds and their potential repercussion on the regional development during the seven years that are the object of this study. All these results, summed to the ones obtained for previous years, show the remarkable impulse experienced by the Andalusian economy due to the reception of European funds and the positive and relevant impact on the economic growth of the region both in past and coming years.

The reason to focus on the issue of Structural Fund reception in Andalusia under the next EU framework still to be approved is the consideration that this region has been classified in a transitional situation, about to enter a new phase. New and different guidelines determine the objectives to be achieved under the new category of Regional Competitiveness and Employment. On the one side, the "learning effect" derived from the management of funds in previous periods encourages optimism in relation to the change of scenario and should be considered an asset to be made the most of in future years. However, on the other side, the probable "adaptation or dependence effect" should be taken as an alert because those funds have contributed to a remarkable generation of growth in previous years and their foreseeable cut down, as shown by the forecasts made in this work, is going to have a clear impact on the region's economy.

The results presented show how the GDP grows with the reception of European funds to a greater or lesser extent depending on the scenario and subscenario analysed. Thus, if an optimistic scenario and a more labour-intensive subscenario are analysed, the regional

growth will be higher due to receiving the total amount of funds and due to the characteristics of the regional economy. Therefore, investing in labour-intensive actions in the new multi-annual framework would result in more positive effects on the regional economy. Although the figures do not change dramatically, a new stage of development seems to be close. This could mean that at the same time as the Andalusian economy is leaving the group of Objective 1 regions (regions of Convergence), it is also registering some of the characteristics of the Objective 2 (Regional competitiveness and employment category) during the transition, which would have a very positive reading in terms of it convergence path, following the theoretical patters that are the basis of the European cohesion policy.

According to the above-specified arguments, this work agrees with the radical need for a change in the Andalusian productive model, for which it is essential to support those sectors that should lead the process, promoting specialization in high-quality production. This process can only succeed if and only if the patterns of productivity and competitiveness are improved and our simulations recommend focusing on human capital investments by means of the ESF rather than in a concentration of facilities in more infrastructures financed by the ERDF as in past years. An efficient use of the European Structural Funds could clearly contribute to this change of model, now that national and regional budgets are mainly devoted to public deficit and public debt reduction.

The complicated but necessary resizing of the productive sectors (the excessive outsourcing of the economy or the strong presence of the construction sector has left the relative development of the industry and the resulting loss of value added in the background), the uncertain capacity of the new labour legal framework to confront the new challenges and the relevant role that the Andalusian entrepreneurs have to play, given the limited expansion policies applied by the public sector, certainly stand in the way.

This work acknowledges that it is time for other regions with greater economic divergences to come to the fore. However, according to the philosophy that underlies the European Regional Policy, interregional solidarity is applied to achieve a further objective of stability that allows consolidating the process of economic integration and reinforcing a more competitive market. This work considers that Andalusia needs to advance in a non-dramatic way towards a new situation, something that could be achieved through the establishment of a period of transition in tune with the already mentioned precedents and with the opinion of the European Parliament. In this hypothetical scenario some budget items would be maintained under the objective of Convergence and linked to others focused on the improvement of Regional Competitiveness and Employment, thus making transition more easily tackled.

The changes that the region of Andalusia must confront in the present moment are many and not easy to digest due to their strong structural character. Therefore, this work deems necessary to maintain a financial distribution of the funds provided by the European Regional Policy that, although demanding in relation to the expected results, allows consolidating the recovery of the regional economy while avoiding the economic turbulences that could endanger the important progress made during the region's long process of convergence. Consequently, this work stands on the assumption that the second suggested scenario could represent an adequate combination between budget austerity and a firm commitment with the consolidation and enlargement of the objectives already achieved in Andalusia in terms of convergence.

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