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IMPACT OF THE SINGLE CURRENCY IN THE SPANISH ECONOMY USING A DYNAMIC MULTISECTORAL MODEL

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Abstract: Using a dynamic multisectoral model of the Spanish economy, we investigate the impact that the introduction of a single currency in Europe will have on the economy of Spain. We decompose the phenomenon in three sub-scenarios which we first analyse separately to better understand the effects of the global single currency scenario that includes all three at the same time. The three components studied are: 1) the reduction in transactions costs, 2) the financial integration, 3) the fixing of exchange rates in the area. All scenarios are compared with a baseline constructed under the assumption that the single currency process does not exist. Therefore, the study analyses the effects that the single currency will have on the Spanish economy, not the effects of Spain entering the European Monetary Union versus staying out. A brief excerpt of the results is presented in this paper.

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1. Introduction

In a few months from now the euro will be a reality. With this perspective, growing numbers of European companies are at last beginning to launch their preparations for the changeover to the new currency. However Spanish enterprises are not yet fully aware of the advantages they will gain from the euro, and so, as the deadline gets closer the interest in this subject grows. For this reason, the CEET has dedicated much effort to the analysis of the economic consequences for Spain of introducing a single currency in Europe.

The aim of this study is to evaluate the impact of the Single Currency in the 43 sectors in which the MIDE model divides the Spanish economy. The simulation will be approached by parcelling the Single Currency event into its substantial elements in order to run partial simulations that will allow us to fully interpret the global simulation that incorporates everything at the same time.

The basic divisions of the process considered for the partial simulations are the following:

1. Transaction Costs: the first scenario analyses the effects of the reduction in the costs derived from currency conversions within Europe.

2. Financial Integration: the Single Currency will induce a greater cohesion of European financial markets. This should be felt in a greater availability of capital and lower interest rates which are the basis for the second scenario simulated.

3. Changes in Exchange Rates: The exchange rate scenario which has been simulated consists of fix rates among Europe and appreciation with respect to third countries, mainly with the dollar and the yen.

Finally the global scenario for the Single Currency is constructed by introducing all of the above changes at the same time.

The base scenario, common to all simulations, is a neutral scenario constructed by extrapolation of all the latest trends in the economy. We are not trying to analyse the effects of Spain entering the European Monetary Union versus staying out, but are really interested in the impacts that introducing a single currency in Europe will have on an economy like Spain. In this sense, the base scenario describes a situation in which the Spanish Economy follows the upward trend recently started, with prices under control and low interest rates. The base scenario is not very important in this study, it is only the framework for introducing changes and comparing results. The real aim of our study is to analyse the differences in the impacts across sectors of each measure.

The projection period for this study is 1998-2002, and the measures of the third phase of the Single Currency process have been introduced in 1998 instead of 1999. This is to exploit the whole projection period instead of discarding the first year.

2. The Transaction Costs Scenario

During 1996, the CEET surveyed Spanish companies to find out about the costs they had for managing multiple currencies in Europe. Both quantitative and qualitative information can be extracted from this survey in order to measure transaction costs. This information, complemented with data for foreign trade by country of each sector allow us to build a measure of the reductions in transaction costs for each sector propitiated by the Single Currency.

The scenario has been built by introducing two changes in the base scenario:

1. Lowering the technical coefficients in row 34, banking and insurance, from 1998 on.

2. Lowering foreign prices in a 75% of the change experienced in domestic production prices when we introduce the first measure alone.

The following table shows the different reduction percentages applied to the coefficients in the row for banking and insurance. As already pointed out, this percentages are the result of processing the information from the survey and improving it with foreign data by country for each sector.

TABLE 1: PERCENTAGE REDUCTIONS IN SECTORIAL DEMANDS FOR BANKING AND INSURANCE SERVICES

1.- Agriculture, forest. & fish	13,8
2.- Coal & lignite	14,7
3.- Coke products	16,5
4.- Petroleum products	11,1
5.- Electric & oth. util.	11,4
6.- Metal mining & proc.	13,3
7.- Nonmetal mining & prod.	18,5
8.- Chemicals	13,0
9.- Metal products	13,1
10.- Agric. & indust. mach.	18,9
11.- Off mach, comput, instr.	20,2
12.- Elect.& electronic prod.	20,1
13.- Automotive vehicles	22,5
14.- Other transport equip.	16,6
15.- Meat & oth. animal prod.	16,3
16.- Dairy Products	15,2
17.- Other food products	13,2
18.- Beverages	14,0
19.- Tobacco products	8,6
20.- Textiles & apparel	19,6
21.- Shoes & leather prod.	18,9
22.- Wood & furniture	19,6
23.- Paper & publishing	19,5
24.- Rubber & plastic prod.	20,5
25.- Other mfg. products	17,6
26.- Construction	22,5
27.- Repairs & reconstruct.	2,3
28.- Wholesale & ret. trade	11,3
29.- Rest., cafes & hotels	2,3
30.- Interior transport	6,0
31.- Maritime & air transp.	22,5
32.- Oth. transport serv.	7,3
33.- Communications	0,6
34.- Banking & insurance	1,0
35.- Business services	3,1
36.- Commerc. & resid. rents	0,0
37.- Priv. educ. & research	0,0
38.- Priv. health services	0,0
39.- Cult. & oth. services	1,5
40.- Pub. adminsitration	0,0
41.- Pub. education	0,0
42.- Pub. health services	0,0
43.- Domest. & oth. services	0,0

CEET estimations

The aggregate results of this scenario are very favourable for the Spanish economy. Reductions in transaction costs are translated into lower prices which stimulate domestic demand with production growing and imports dropping.

TABLE 2: AGGREGATE RESULTS IN FINAL DEMAND
Average annual percentage growth rates for the period 1998-2002 and deviations
Constant prices

	Average annual growth Period 1998-2002	Deviation of transactions cost scenario
Private interior consumption	**3,84**	**0,98**
Public consumption	**0,02**	**0,00**
Gross fixed capital investment	**7,36**	**0,69**
Equipment goods	9,09	0,41
Construction	6,09	0,91
Domestic demand	**3,91**	**0,79**
Exports of goods & services	**9,45**	**0,28**
Exports of goods (fob)	10,33	0,35
Exports of services	9,54	0,29
Imports of goods & services	**8,86**	**-0,26**
Imports of goods (cif)	8,98	-0,11
Imports of services	8,49	-1,87
Gross Domestic Product	**3,59**	**1,04**

First column: average annual percentage growth rate for the period 1998-2002. Baseline scenario
Second column: Deviations from the former

Results in table 2 are shown in percentage deviations from the average growth rates of the base scenario in period 1998-2002 which are shown in the first column.

Demand for private consumption shows the strongest positive impact, and the consumption categories which are mostly responsible for this result are those that have higher price elasticities in their consumption equations: furniture, clothing and footwear, and leisure.

Public consumption is not affected because it is constrained by the hypothesis of stagnant public expenditure implicit in the base scenario. Increases in investment demand are mainly caused through construction. Exports also receive a positive impact while imports drop. The final result in GDP is an average annual growth rate more than one point higher than that of the base scenario, which is a strong impact.

TABLE 3: AGGREGATE RESULTS IN OUTPUT

Average annual percentage growth rates for the period 1998-2002 and deviations

Constant prices

	Average annual growth Period 1998-2002	Deviation of transactions cost scenario
1. SECTORAL OUTPUT VALUE		
Total output goods & services	**2,88**	**0,29**
Agriculture	2,43	0,53
Industry	2,89	0,60
Construction	3,86	0,47
Private services	3,37	-0,06
Public services	0,18	0,05

First column: average annual percentage growth rate for the period 1998-2002. Baseline scenario
Second column: Deviations from the former

Table 3 shows the results in output. Impacts are positive in all main sectors but private services. This result is due to the effects in banking services which, as we will see later, are strongly negative.

2. Financial Integration Scenario

The integration of European financial markets will produce a scenario of greater availability of capital and lower interest rates. Both elements are easily translated in terms of changes in variables in the MIDE model, but as a difference to the previous scenario, in this case we do not have any measure to precise how much should we change the affected variables. Therefore, we will use reasonable figures.

To approximate the economy's availability of monetary funds, investment equations in MIDE model include a lag of the rate between monetary supply and GDP. To simulate financial integration, this term has been steadily increased in 15% through a period of three years. On the other hand, interest rates have been reduced in 0,75 points each year. To implement this in the model, besides reducing the interest rate variable, something had to be done with the financial costs for sectors which did not react in our model to the decrease in interest rates. In the Spanish I-O table which is the base of MIDE model, these costs are included in the capital income or gross profits component of industry value added. We obtained data on the weights of financial costs in capital income by industry and calculated the appropriate reductions in the capital income terms by industry as a consequence of reductions in interest rates.

Table 4 shows aggregate effects in final demand of the financial integration scenario. The first column shows average growth rates in the base scenario. The other three columns show results in deviations from these average rates. We can first see the results of only increasing capital availability, then the results of only lowering interest rates, and finally the results of the whole scenario.

TABLE 4: AGGREGATE RESULTS IN FINAL DEMAND
Average annual percentage growth rates for the period 1998-2002 and deviations
Constant prices

	Average growth rate / period 1998-2002	Deviation of capital availability scenario	Deviation of interest rate scenario	Deviation of fin. integration scenario
Private interior consumption	**3,84**	**0,06**	**1,50**	**1,56**
Public consumption	**0,02**	**0,00**	**0,00**	**0,00**
Gross fixed capital investment	**7,36**	**0,63**	**0,65**	**1,29**
Equipment goods	9,09	0,57	0,20	0,76
Construction	6,09	0,68	1,01	1,69
Domestic demand	**3,91**	**0,21**	**1,09**	**1,30**
Exports of goods & services	**9,45**	**0,00**	**0,26**	**0,25**
Exports of goods (fob)	10,33	0,00	0,31	0,31
Exports of services	9,54	0,00	0,28	0,28
Imports of goods & services	**8,86**	**0,08**	**-1,11**	**-1,03**
Imports of goods (cif)	8,98	0,09	-0,99	-0,90
Imports of services	8,49	-0,01	-2,67	-2,68
Gross Domestic Product	**3,59**	**0,19**	**1,64**	**1,83**

First column: average annual percentage growth rate for the period 1998-2002. Baseline scenario
Rest of columns: deviations of alternative scenarios

Domestic demand shows positive impacts in all three situations, and these impacts are due to both private consumption and investment. Exports show no impact through the increase in capital availability and some positive impact due to the reduction in interest rates. Imports are stimulated due to the greater availability of capital while the impact if lower interest rates is negative.

The lowering of interest rates has the most important positive effect on the Spanish economy of all scenarios simulated for this study. The decrease in the price of money is mainly traduced into a decrease in financial costs of sectors which is translated in lower prices. This reduction in prices affects the whole economy positively. Demand rises and imports are substituted by domestic output which has become more competitive.

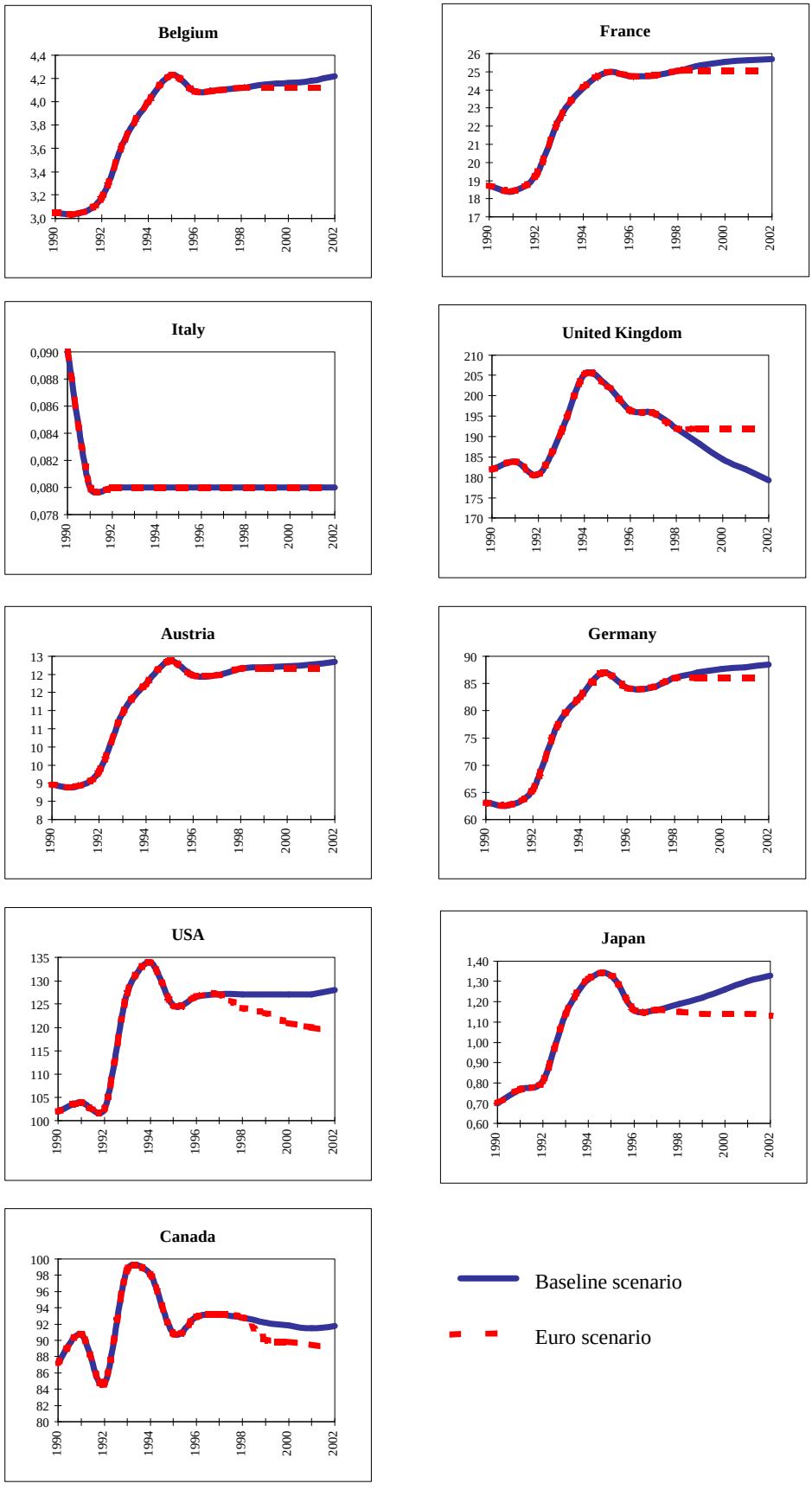
The final impact in GDP is positive. Its average growth rate in the financial integration scenario is higher in 1,83 points to the base scenario rate.

4. Changes in Exchange Rates

Exchange rates play their role in MIDE model mostly through the international prices which enter into import and export equations and into the construction of their prices.

The scenario simulated for this study has been constructed by fixing exchange rates within Europe from 1998 and appreciating this European block of currencies with respect to the rest of currencies, mainly the dollar and the yen. Figure 1 shows exchange rates for the main currencies in this scenario compared with the values in the base scenario.

Figure 1: Value in Pesetas of Each Country's Currency



The results of introducing these changes in exchange rates are much lower than those obtained in the previous simulations. Table 6 presents the aggregate results in final demand. The first column contains average growth rates in the base scenario and the second shows the deviations from those rates that take place when European exchange rates are fixed and there is a slight appreciation of the euro with respect to third countries' currencies.

TABLE 6: AGGREGATE RESULTS IN FINAL DEMAND

Average annual percentage growth rates for the period 1998-2002 and deviations

Constant prices

	Baseline scenario	**Exchange rates scenario**
Private national consumption	3,71	-0,04
Public consumption	0,02	0,00
Gross fixed capital investment	7,36	-0,01
Equipment goods	9,09	0,02
Construction	6,09	-0,03
Exports of goods & services	9,45	-0,12
Imports of goods & services	8,86	0,50
Gross domestic product	3,59	-0,28

The fixing of rates within Europe produces trivial effects, and this is due to the fact that the hypothesis contained in the base scenario for exchange rates already depicts a very stable behaviour of all European currencies. Once we include the hypothesis of appreciation of the euro, we get more significant results, but still lower than in the other scenarios. This is due to the low magnitude of the changes introduced in all exchange rates.

The appreciation of the euro has negative effects since it contributes to make foreign products cheaper than domestic. The final impact in GDP is a reduction of almost 0,3 percentage points in its average annual growth rate.

5. Single Currency Scenario

The Single Currency scenario has been composed by introducing all of the above changes at the same time. This is the real scenario for the euro process, but the previous exercises help us to better interpret the overall results. In what follows, results for the global scenario will be shown together with the partial impacts of the described sub-scenarios.

TABLE 7: AGGREGATE RESULTS IN FINAL DEMAND
Average annual percentage growth rates for the period 1998-2002 and deviations
Constant prices

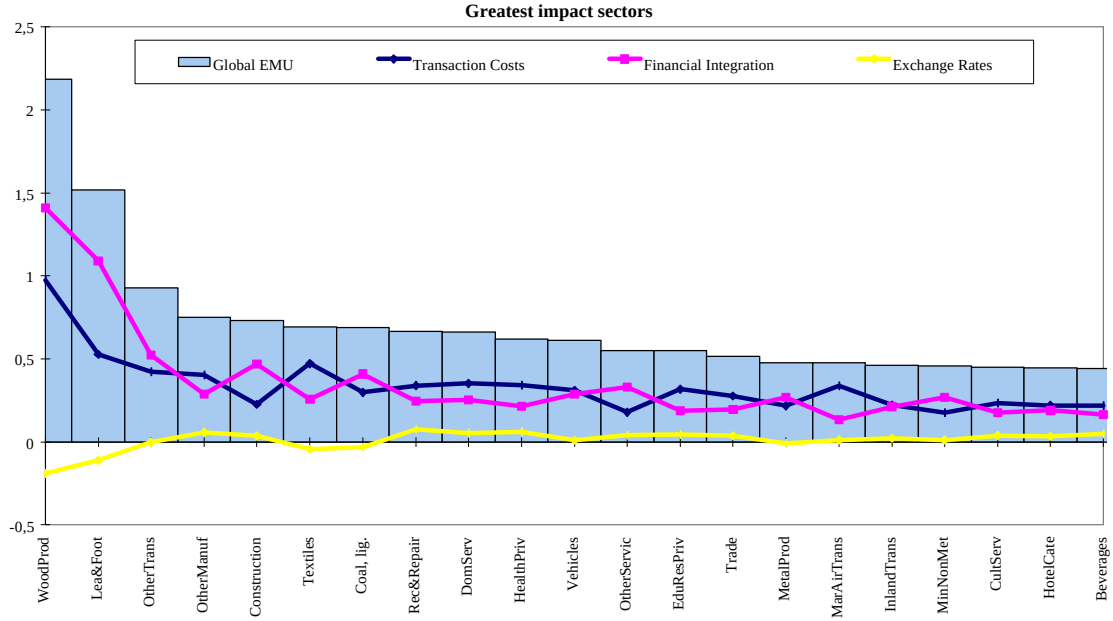
	Baseline scenario	Deviation of transactions cost scenario	Deviation of fin. integration scenario	Deviation of exchange rates scenario	Deviation of global scenario
Private national consumption	3,71	0,98	1,56	-0,04	**2,50**
Public consumption	0,02	0,00	0,00	0,00	**0,00**
Gross fixed capital investment	7,36	0,69	1,29	-0,01	**1,99**
Domestic Demand	3,91	0,79	1,30	-0,03	**2,08**
Exports of goods & services	9,45	0,28	0,25	-0,12	**0,42**
Imports of goods & services	8,86	-0,26	-1,03	0,50	**-0,88**
Gross domestic product	3,59	1,04	1,83	-0,28	**2,65**

First column: average annual percentage growth rate for the period 1998-2002. Baseline scenario
Rest of columns: deviations of alternative scenarios

Table 7 shows the aggregate results in final demand. According to these aggregates the final impact of the Single Currency is very favourable for the Spanish economy. GDP grows at an average annual growth rate higher in 2,65 points to that of the base scenario. This is a very important impact which is the final outcome of positive effects coming from the reduction in transaction costs and from the financial integration and slight negative effects coming from the changes in exchange rates.

The financial integration is the sub-scenario which shows the stronger results, and the exchange rates scenario is the one with the weakest.

FIGURE 2: SECTORAL IMPACTS
Deviations of average percentage growth rates of output in 1998-2002
Greatest impact sectors



Aggregate results hide different behaviours across sectors which are very interesting. Figure 2 shows the results in output for the sectors with strongest positive impacts, and Figure 3 shows the rest of sectors. Wood, leather and shoes, other transports and construction are the sectors that show higher positive effects in their outputs. On the

other side, Banking and Insurance shows the strongest negative effect in its output as a consequence of the reduction in its intermediate demands. Banking is the real looser of this scenario because one of its traditional markets is substantially reduced.

FIGURE 3: SECTORAL IMPACTS
Deviations of average percentage growth rates of output in 1998-2002
Lowest impact sectors

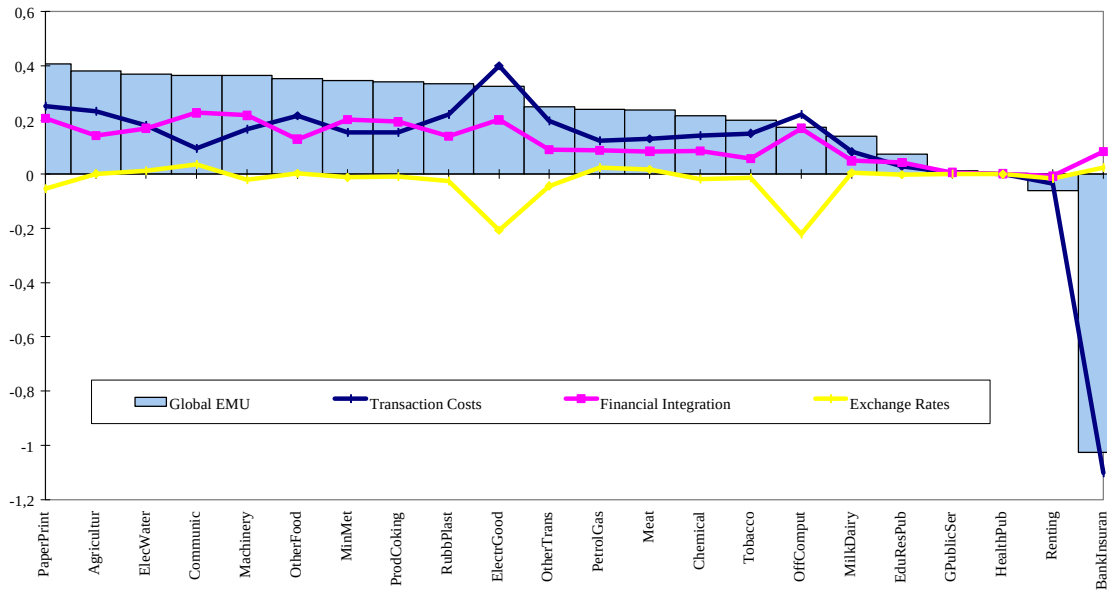


Table 8 shows the results of each scenario in sectoral output prices. This results are shown in terms of deviations form the average annual growth rate of the base scenario which is shown in the first column.

TABLE 8: EFECTS ON OUTPUT PRICES
Annual average growth rates in the period 1998-2002

	Average rate period 1998-2002	Deviation of transactions cost scenario	Deviation of fin. integration scenario	Deviation of exchange rates scenario	Deviation of global scenario
1.- Agriculture, forest. & fish	2,63	-0,12	-0,10	-0,01	-0,22
2.- Coal & lignite	2,78	-0,19	-0,12	-0,01	-0,30
3.- Coke products	3,55	-0,23	-0,16	-0,01	-0,38
4.- Petroleum products	2,30	-0,05	-0,01	-0,05	-0,11
5.- Electric & oth. util.	4,79	-0,14	-0,32	-0,01	-0,47
6.- Metal mining & proc.	2,34	-0,10	-0,10	-0,01	-0,20
7.- Nonmetal mining & prod.	2,86	-0,13	-0,07	-0,01	-0,20
8.- Chemicals	2,38	-0,13	-0,08	-0,01	-0,21
9.- Metal products	2,92	-0,15	-0,11	-0,01	-0,25
10.- Agric. & indust. mach.	3,03	-0,14	-0,07	-0,02	-0,22
11.- Off mach, comput, instr.	2,42	-0,12	-0,07	-0,03	-0,21
12.- Elect.& electronic prod.	2,84	-0,13	-0,08	-0,02	-0,22
13.- Automotive vehicles	2,88	-0,15	-0,08	-0,02	-0,24
14.- Other transport equip.	2,64	-0,15	-0,06	-0,06	-0,27
15.- Meat & oth. animal prod.	2,85	-0,16	-0,15	0,00	-0,30
16.- Dairy Products	3,20	-0,17	-0,15	0,00	-0,31
17.- Other food products	2,72	-0,16	-0,14	0,00	-0,29
18.- Beverages	3,24	-0,21	-0,18	0,01	-0,37
19.- Tobacco products	4,97	-0,17	-0,08	-0,02	-0,26
20.- Textiles & apparel	2,75	-0,14	-0,09	-0,01	-0,23
21.- Shoes & leather prod.	2,81	-0,16	-0,11	-0,01	-0,27
22.- Wood & furniture	3,04	-0,12	-0,08	-0,02	-0,21
23.- Paper & publishing	3,29	-0,17	-0,10	-0,02	-0,28
24.- Rubber & plastic prod.	3,34	-0,19	-0,09	-0,02	-0,28
25.- Other mfg. products	4,41	-0,27	-0,18	-0,03	-0,46
26.- Construction	3,53	-0,21	-0,19	0,00	-0,38
27.- Repairs & reconstruct.	4,07	-0,27	-0,25	0,00	-0,49
28.- Wholesale & ret. trade	3,81	-0,29	-0,31	0,02	-0,54
29.- Rest., cafes & hotels	4,78	-0,29	-0,33	0,02	-0,57
30.- Interior transport	3,09	-0,11	-0,08	-0,01	-0,20
31.- Maritime & air transp.	3,13	-0,19	-0,17	-0,01	-0,35
32.- Oth. transport serv.	3,74	-0,15	-0,13	-0,01	-0,28
33.- Communications	2,85	-0,13	-0,17	0,00	-0,28
34.- Banking & insurance	3,75	-0,19	-0,12	-0,01	-0,31
35.- Business services	4,31	-0,31	-0,29	0,02	-0,56
36.- Commerc. & resid. rents	2,69	-0,19	-0,19	0,01	-0,35
37.- Priv. educ. & research	4,44	-0,28	-0,25	0,02	-0,49
38.- Priv. health services	5,38	-0,28	-0,27	-0,01	-0,54
39.- Cult. & oth. services	4,96	-0,30	-0,22	-0,01	-0,50
40.- Pub. adminsitration	3,35	-0,14	-0,09	-0,01	-0,24
41.- Pub. education	4,33	-0,22	-0,13	-0,01	-0,34
42.- Pub. health services	3,64	-0,16	-0,09	-0,01	-0,25
43.- Domest. & oth. services	3,92	-0,15	-0,09	-0,01	-0,24

First column: average annual percentage growth rate for the period 1998-2002. Baseline scenario
Rest of columns: deviations of alternative scenarios

The first two sub-scenarios exhibit general falls in output prices. On the other hand, the scenario on exchange rates has slight effects on production prices, and these effects are of both signs. The first two sub-scenarios dominate the final result for the Single Currency, and therefore, output prices fall for all industries.

This effect in prices is one of the most important and clear results we get. At the same time, it detonates a chain of effects displayed by the model. Lower prices stimulate final demands which in turn force producers to increase their outputs. The differences in the

effects across sectors depend on how sensitive are their prices to reductions in banking intermediate inputs or to reductions in financial costs and how elastic are their final demands to prices.

6. Conclusions

According to our research, the Single Currency will have a positive impact on the Spanish economy and the financial integration associated with the process is the main source of this result. In fact, it is the lowering of interest rates what is driving the strongest positive effects. Spain has traditionally lived with two digit interest rates, and the harmonisation of this figure with the rest of the Union brings about the most important favourable consequences to the real economy.

Most of the effects are produced through reductions in output costs which sectors translate differently into lower prices. The general reduction in prices detonates a whole chain of positive impacts in the economy.

Wood, Leather, Other transport equipment (different than automotive vehicles), and construction, are the sectors which show higher increases in output. On the other hand Banking and Insurance, and Renting are the only sectors with negative overall effects. Banking is highly affected in negative by the Single Currency, since it reduces substantially one of the traditional banking services markets and contributes to the narrowing of margins.

Among the three sub-scenarios simulated, the transaction costs and the financial integration have positive strong effects which are stronger in the latter. On the other side, the exchange rate scenario has a negative impact which is also much more insignificant than the previous two. This is due to the way in which changes in exchange rates have been simulated which means slight differences with the base scenario where the exchange rates across Europe are already pretty stable and European currencies slow a slow depreciation with respect to the dollar and the yen.

Therefore, we can conclude that Spain will certainly gain with the European Monetary Union process in which it is involved. However, the extent of this positive result for the real economy depends partly on how the new European currency is received by the international monetary markets.

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