ISSN 0871-2573

The Impact of the 92 Single Market on the Regional Allocation of Industrial Labor in Portugal

por
Pedro Telhado Pereira
Maria do Carmo Seabra
Universidade Nova de Lisboa
Faculdade de Economia
Fevereiro de 1992
Working Paper nº 179

Faculdade de Economia
Universidade Nova de Lisboa
Travessa Estêvão Pinto
Campolide
1000 Lisboa
Tel:⇒⇒⇒ 351 1 693624
Fax:⇒⇒⇒ 351 1 3871105

Fevereiro de 1992

The Impact of the 92 Single Market on the Regional Allocation of Industrial Labor in Portugal

Pedro Telhado Pereira*
Maria do Carmo Seabra*

Abstract

Starting from a characterization of the current situation of the Portuguese manufacturing industry, and from an evaluation of the probable impact of 1992 on that situation, a methodology for the assessment of the regional impact of 1992 in Portugal was designed.

The result of the application of this methodology indicates that in several regions of Portugal there will be significant labor migration, particularly towards the European countries.

1. The Impact of 1992

1992 will affect the Portuguese manufacturing industry mainly through the liberalization of labor movements (capital movements are already liberalized). As the real wage in Portugal is about 60% of the average in the EC countries, people will begin to emigrate (see Barosa and Pereira, 1989, and Pereira, 1989).

The large flows of Portuguese emigrants in the late 60s and early 70s show that the monetary evaluation of the costs of moving is traditionally low for the Portuguese worker. Hence, the existing

* Universidade Nova de Lisboa. We tank Vasco Santos for very helpful suggestions in the early stages of this work. The usual disclaimer applies.

wage differential is enough to promote emigration. As the dispersion of wage levels between industries is lower in the EC partners than in Portugal, we expect emigration to be particularly strong among the lower paid workers.

Together with the increase in the inflow of capital, the outflow of labor will create a pressure for real wages to increase. This pressure will be stronger at the lower wage levels.

Simultaneously with the 92 single market, a crisis in the Portuguese textile industry is expected to develop. Increased international competition, together with the probable end of the Multifibers Agreements and the negotiations of the GATT, will probably lead a large number of textile companies to bankruptcy, thus creating unemployment. As will be seen below, textile employment accounts for 30% of total manufacturing employment in Portugal. This industry is highly geographicaly concentrated as well. The unemployment generated in this sector will have two effects: i) pressures towards the increase in real wages generated by total integration will be attenuated, slowing down the pace of convergence[1] of real wages in Portugal to average EEC real wages and ii) incentives to emigrate will be reinforced.

2. Characterization of the Portuguese manufacturing industry[2]

In order to assess the regional impact of the predictable changes in industry, the Portuguese industrial sectors were classified

---

[1] Surely, this convergence will be incomplete as there is a monetary value in the well being of not moving.

[2] We selected all the manufacturing sectors which employed more than 7000 workers or had a value added greater than 7 billions escudos in 1987. With these two criteria, twenty sectors, accounting for 80% of the value added of the manufacturing industry, were initially selected. The classification used was CAE, the system used in Portuguese statistics.

according to two criteria, i) its degree of vulnerability to increases in labor costs, and ii) the degree of elasticity of its demand.

The degree of vulnerability to increases in labor costs was measured by three indicators:

i) The average wage rate in the sector, obtained by dividing the total amount of wages paid by the total number of workers. As previously mentioned, the lower this value is, the greater the probability is for an increase in labor costs within the industry.

ii) The proportion of labor costs in the value of the total output. The larger this proportion is, the greater the increase will be in final prices due to an increase in the average wage rate, and hence the more vulnerable the sector is.

iii) The proportion of labor costs in total value added. The larger this value is, the more difficult it becomes to accomodate wage increases in profits decreases, and hence the more vulnerable the sector is.

For each sector, indicators i) to iii) were calculated, and the ordering of the sectors according to the inverse degree of vulnerability was assessed for each indicator.

In figures I and II the twenty sectors initially selected are plotted according to the orderings resulting from criteria i) and iii) and i) and ii) respectively. The dotted lines represent the order number corresponding to the average of the manufacturing industry. For instance, the furniture industry is shown in both figures to be very sensitive to wage increases. It pays very low wages and labor costs have a significant weight in value added and output value. On

the opposite corner, chemicals show high wages and low dependence of technology on labor input.

The degree of elasticity of demand was measured by the weight of the sum of exports and imports in the value of total output. The higher this ratio is, the more elastic is demand, if the weight of the Portuguese trade in international trade is small[3]. In turn, the more elastic demand is, the more difficult it will be for an industry to accommodate increases in labor costs in higher prices. The elasticity of demand was thus taken as a "proxy" for the external vulnerability, and the twenty sectors were ordered according to this measure.

In figures III and IV the industries are plotted according to their degree of elasticity of demand and their degree of vulnerability to wage increases. To allow a two-dimensional plot, the second characteristic was constructed as the sum of the order numbers of each sector in criteria i) and iii) in figure III and i) and ii) in figure IV. As before, the dotted lines represent the position of the manufacturing industry as a whole.

The more vulnerable sectors are located in the lower left quadrant, while the less vulnerable are in the top right quadrant. With this information the following sectors were eliminated from further analysis: Beer, Animal Feeds, Paper and Dairy Products (as they appear in both figures in the non-vulnerable region); Bread and Graphics (as they show a very small elasticity of demand, allowing one to expect increases in labor to be accommodated in higher prices).

After this selection, 68.3% of the total employment in manufacturing and 56.8% of the total value added remained under

---

[3] The only sector where Portugal is a large country in international trade is cork.

study. The analysis was further detailed for the subsectors which employed more than 3,000 workers.

In table I a summary of the selected subsectors of the Portuguese manufacturing industry is presented. Each industry is described by the indicators of vulnerability to wage increases and elasticity of demand mentioned above, by a proxy for the gross profit rate and by measures of industrial and regional concentration. The figure shows that the main industries in Portugal are strongly dependent on low wages and very exposed to international competition.

3. Regional Analysis

Mainland Portugal is administratively divided into eighteen regions (see map I). The regional analysis was conducted at this level of disaggregation.

The distribution of total employment is shown in map II. It can be seen that the regional imbalance is very large, with five coastal regions accounting for 70% of total employment. In turn, these five regions are responsible for 71% of total value added.

The analysis of the regional effects of 1992 started from the detailed characterization of the industry, as referred to above. The localization of the different industries was analyzed whenever the number of workers in that particular industry in a specific region was greater than 300 and there were more than two firms in the region[4]. With these restrictions, the industries analyzed - the vulnerable ones - accounted for 55.2% of the employment and 40.2% of the value added in the Portuguese manufacturing sector, in 1987.

[4] When the number of firms is equal to or less than two, data is not published.

These industries were classified along the lines described in figures I and II. We considered "very vulnerable" the activities in which the following conditions were simultaneously met: i) average wages were lower than the national average; ii) the weight of the labor costs on the value of total output was above the Portuguese average and iii) the degree of openness, measured by the weight on the value of total output of exports plus imports was greater than 50%.

The description of the regional situation results from the sum, region by region, of the values of the employment in vulnerable industries.

The regional disaggregation of the employment in "very vulnerable" activities is shown in map III. It can be seen that 260,617 workers, corresponding to 42% of the employment in the manufacturing industry, were employed in "very vulnerable" industries. These industries were particularly concentrated in the regions of Porto and Braga. In fact, these two regions accounted for nearly 50% of the "very vulnerable" employment.

In map IV the weight of the employment in "very vulnerable" activities in the total manufacturing employment of the region is shown. In Braga and Castelo Branco almost 80% of the manufacturing employment is in "very vulnerable" activities. In five other regions, namely Guarda, Porto, Coimbra, Leiria and Aveiro, more than 40% of manufacturing employment is in a fragile situation.

It should be noted that the purpose of this analysis is to identify the industrial regional problems that are to be expected as a result of 1992, and not to address the situation of regional imbalances in Portugal. Consequently, it should not come as a suprise that the less-developed regions of Portugal (Vila Real, Bragança and Beja) appear on the map with no "very vulnerable" employment. In

fact, the total employment in these three regions is less than 4% of the total employment in Portugal, as can be seen in map II. Consequently, vulnerable industries are either nonexistent, or have an insignificant dimension. As a result, their situation will not be adversely affected by 1992 as far as industry is concerned.

The social problems are not measured exclusively by the weight of vulnerable employment in the manufacturing employment, as the possibility exists for workers to move out of this sector. It is important, therefore, to know the weight of vulnerable employment in the total employment of the region. This is a better indicator of the capacity of the regional economy to absorb the unemployment which may occur in fragile industries.

In map V the percentage of the employment in vulnerable industries in overall employment is presented. This map shows that the possible emigration from the region of Aveiro generated by 1992 will probably be a deeper social problem than may otherwise be expected. On the other hand, Coimbra appears to be in a better situation, as the employment in manufacturing activities represents is a smaller percentage of total employment in the region.

4. Conclusions

In map VI we present the vulnerability by region of the industry to the effects of 1992. This vulnerability results from both the vulnerability to wage increases and the elasticity of demand. The map shows that in Braga, for instance, more than 30% of the labor force is working in industries which would be unable to adapt to increases in wages.

In the present context, what is the probability that these wage increases will in fact occur?

The openning up of the European labor market will by itself induce some emigration, due to the wage differential mentioned above. However, the present and predictable situation of the Portuguese textile industry can lessen the short-run impact on real wages of emigration. The unemployment generated in this sector will induce pressures toward a decrease in real wages, which in turn will be translated into more emigration, accompanied by a smaller increase in real wages throughout the economy. The period of real convergence will be enlarged, allowing the other sectors identified as being vulnerable to increases in real wages to keep their comparative advantage for some further number of years.

In the regions where these sectors are concentrated, emigration will be less than it would be in the absence of this second effect. On the other hand, in the districts where the textile sector is concentratred (see Map VII), namely Castelo Branco and Braga, the emigration flows will be reinforced.

In summary, Braga and Castelo Branco are the regions in which we expect the outflows of workers to have a higher weight in the active population. Guarda and Porto will suffer large outflows too, but to a lesser degree.

References

Barosa, J.P. and Pereira, P.T., 1989, "Economic Integration and Labour Flows: The European Single Act and its Consequences", WP 129, FEUNL, Lisbon

Pereira, A.M, 1989, "Trade-off Between Emigration and Remittances in the Portuguese Economy", WP 129, FEUNL, Lisbon

FIG. 1

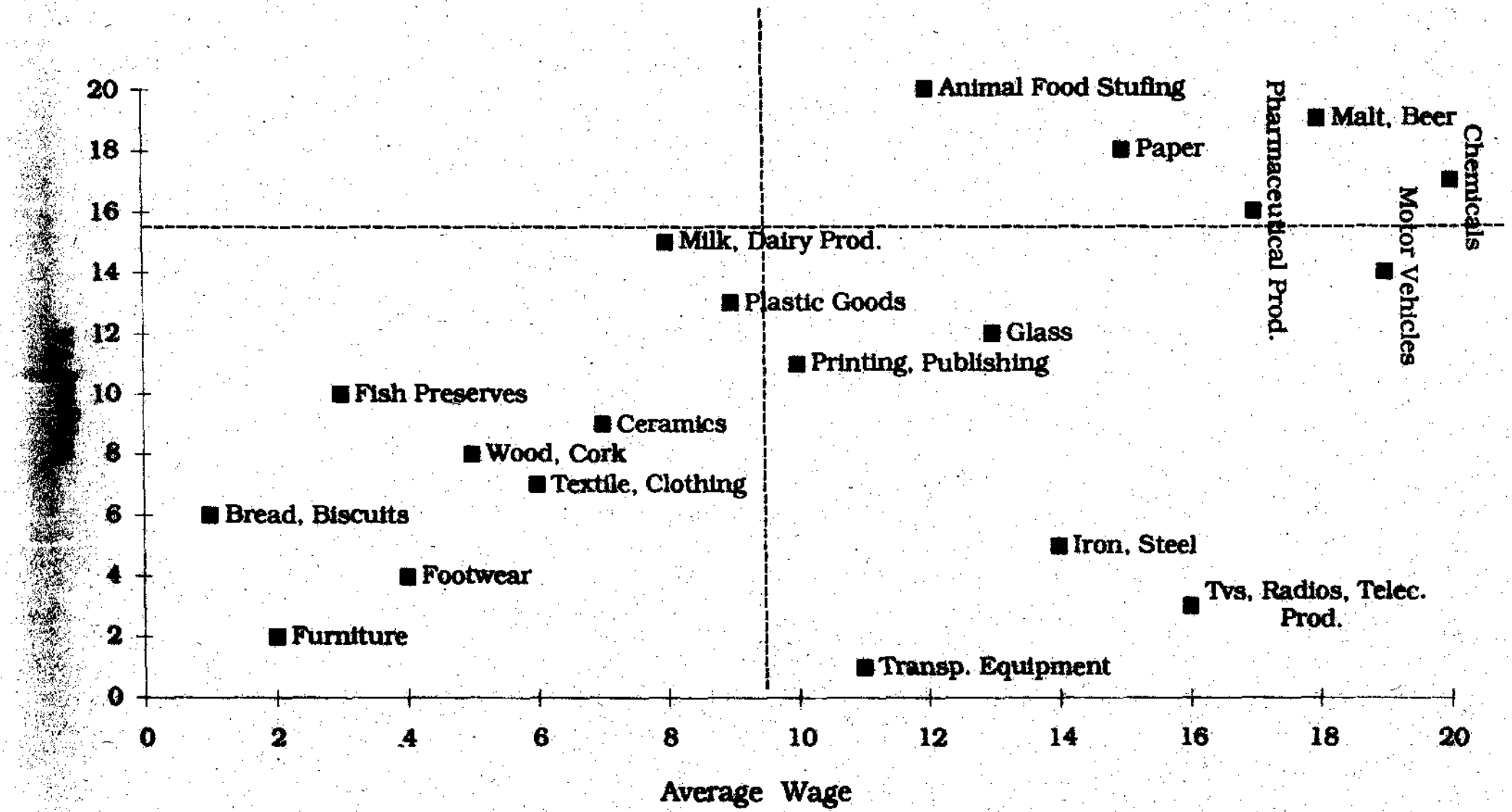

Animal Food Stufing
Malt, Beer
Paper
Chemicals
Pharmaceutical Prod.
Motor Vehicles
Milk, Dairy Prod.
Plastic Goods
Glass
Printing, Publishing
Fish Preserves
Ceramics
Wood, Cork
Textile, Clothing
Bread, Biscuits
Iron, Steel
Footwear
Tvs, Radios, Telec. Prod.
Furniture
Transp. Equipment
0
2
4
6
8
10
12
14
16
18
20
Average Wage

FIG.2

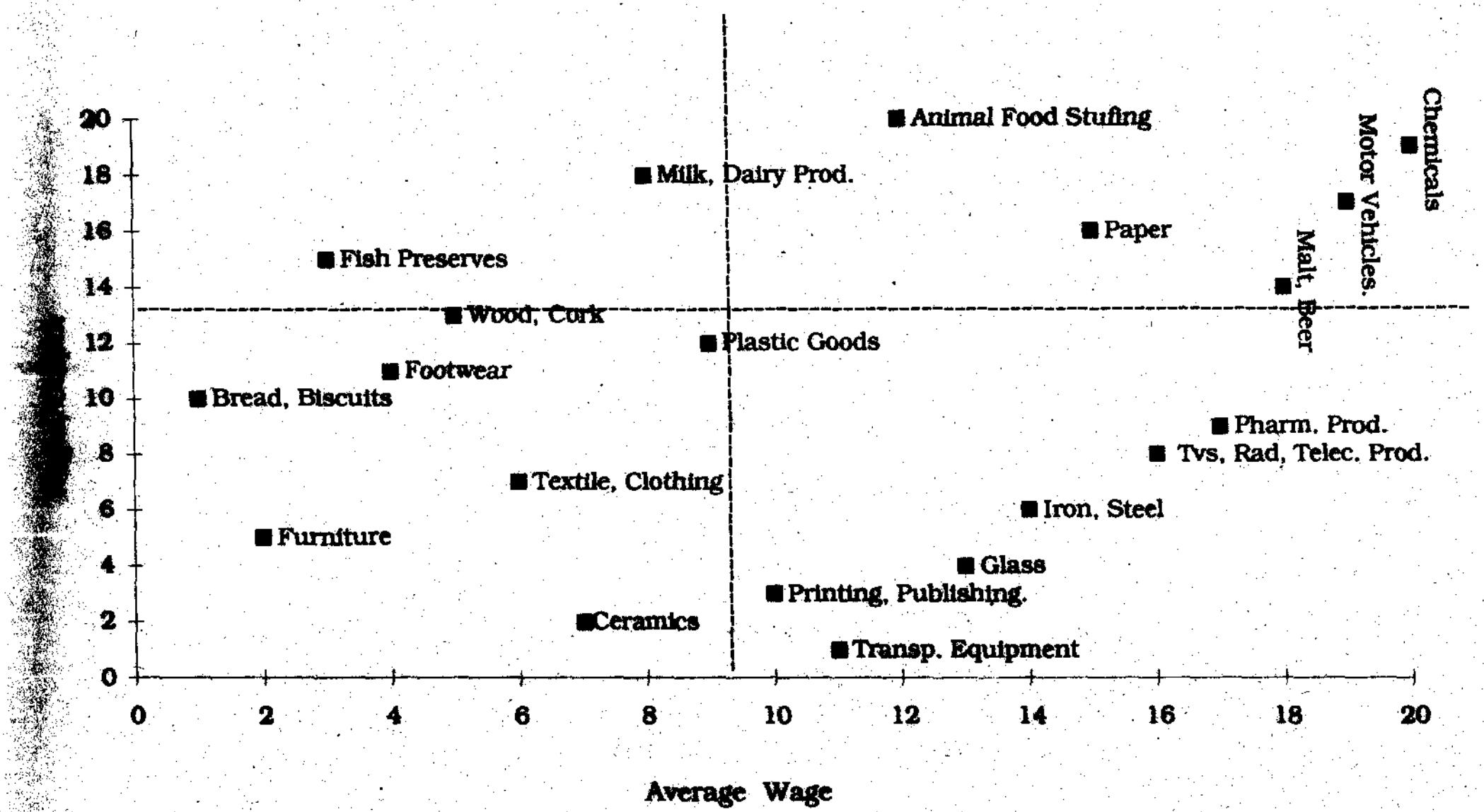

Chemicals
Motor Vehicles.
Malt, Beer
Paper
Animal Food Stuffing
Milk, Dairy Prod.
Fish Preserves
Wood, Cork
Plastic Goods
Footwear
Bread, Biscuits
Pharm. Prod.
Tvs, Rad, Telec. Prod.
Textile, Clothing
Iron, Steel
Furniture
Glass
Printing, Publishing.
Ceramics
Transp. Equipment
0
2
4
6
8
10
12
14
16
18
20
Average Wage

FIG.3

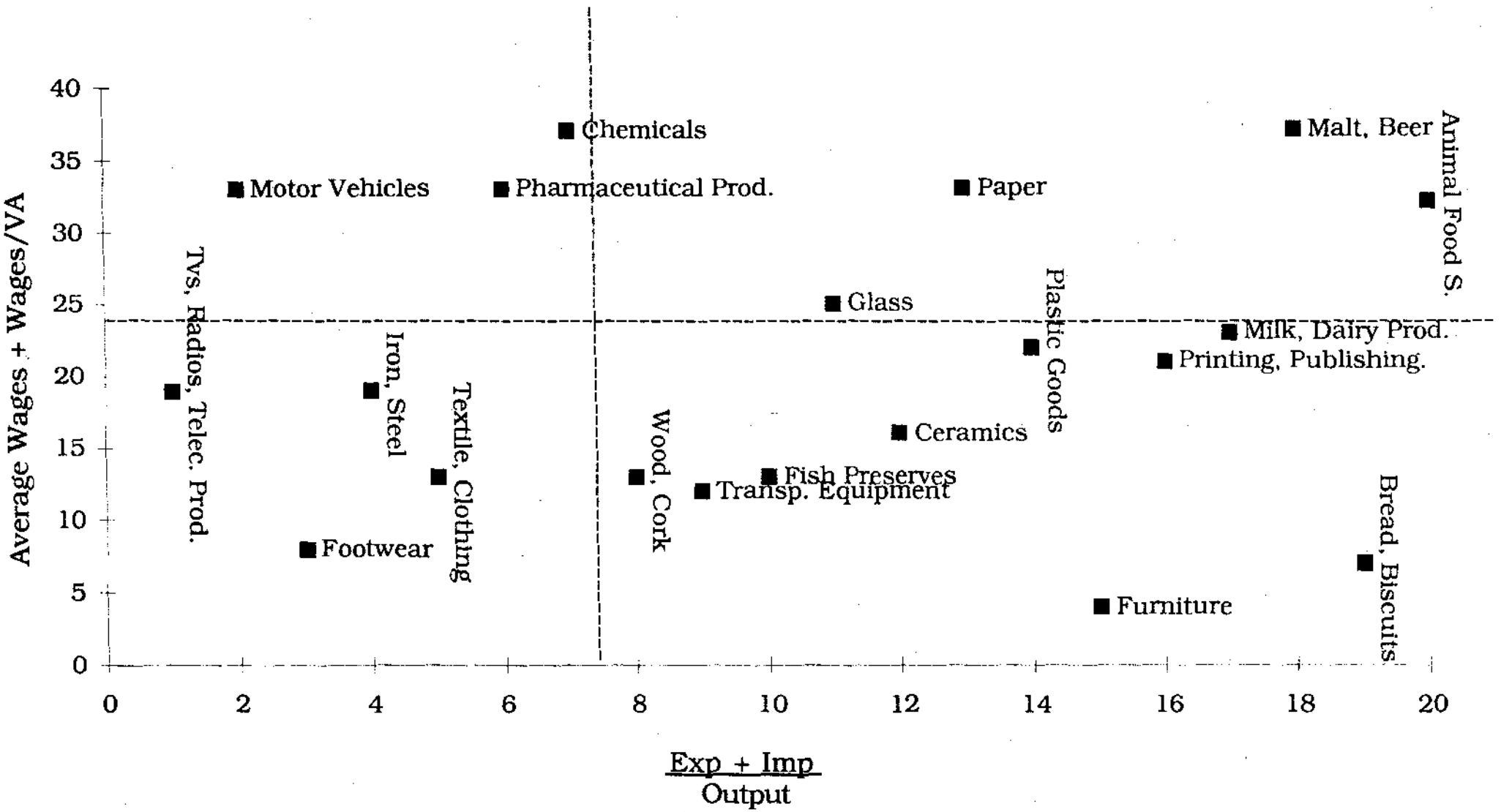
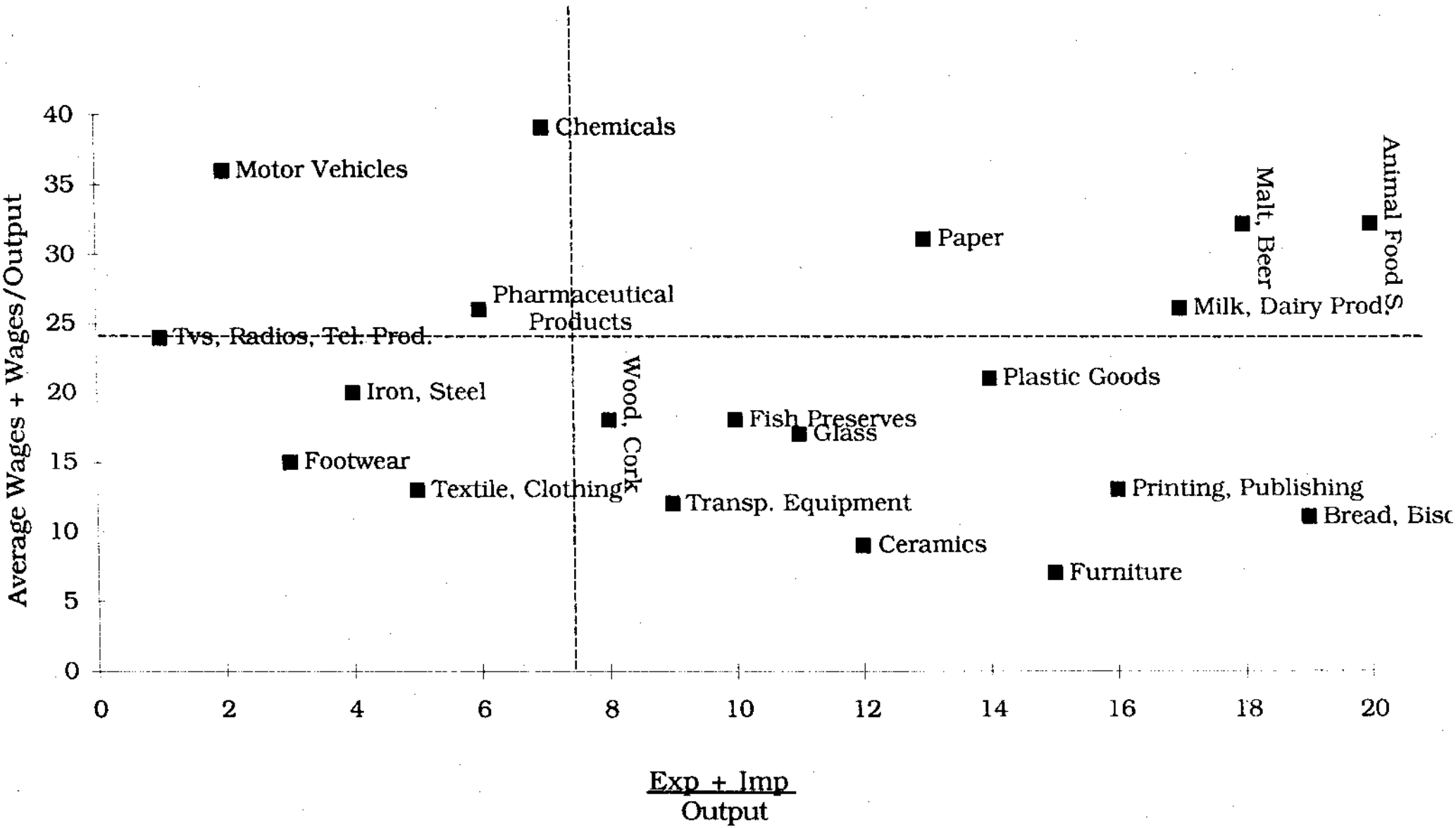
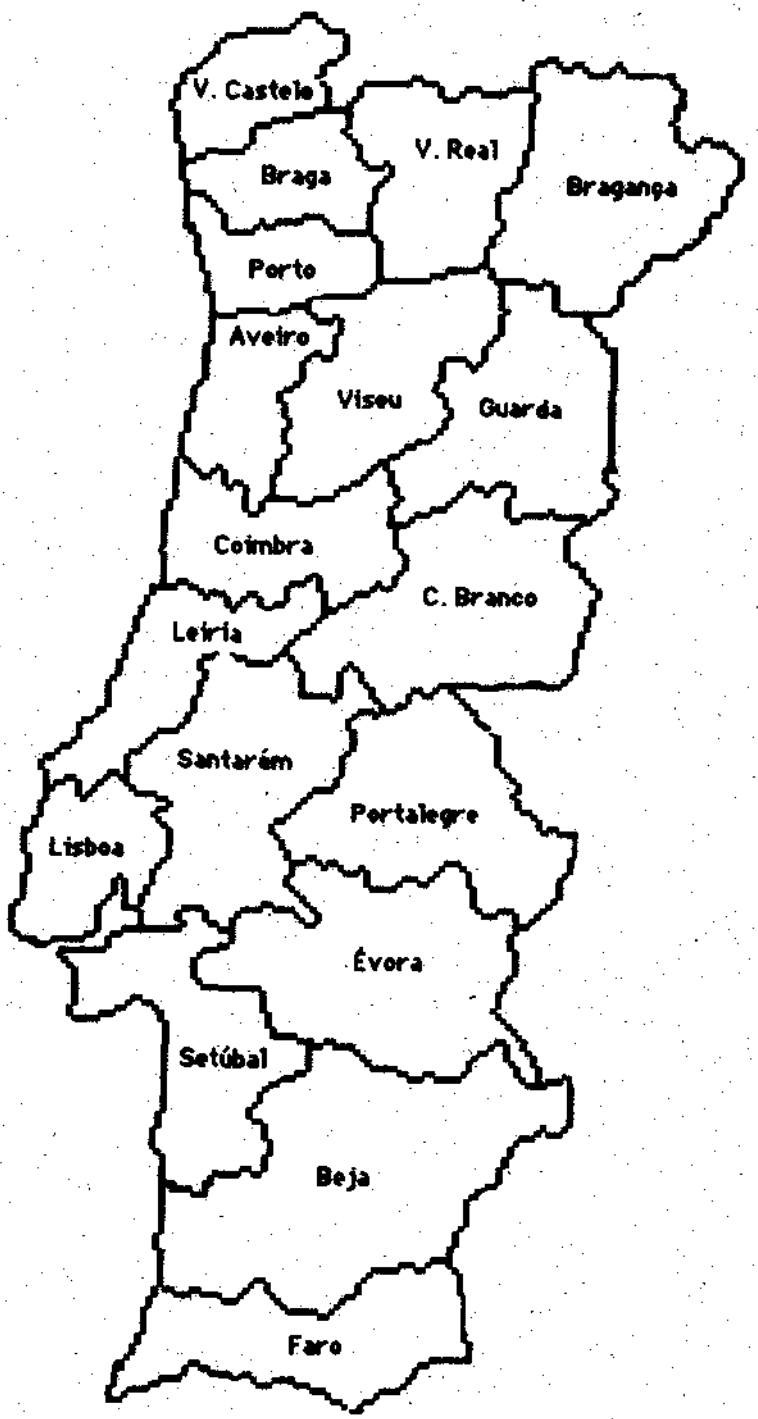

Average Wages + Wages/VA
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
14
16
18
20
Exp + Imp
Output
Chemicals
Motor Vehicles
Pharmaceutical Prod.
Paper
Malt, Beer
Animal Food S.
Glass
Plastic Goods
Milk, Dairy Prod.
Printing, Publishing.
Tvs, Radios, Telec. Prod.
Iron, Steel
Textile, Clothing
Wood, Cork
Ceramics
Fish Preserves
Transp. Equipment
Footwear
Furniture
Bread, Biscuits

FIG.4


Average Wages + Wages/Output
Exp + Imp
Output
Chemicals
Motor Vehicles
Paper
Malt, Beer
Animal Food S.
Pharmaceutical Products
Milk, Dairy Prod.
Tvs, Radios, Tel. Prod.
Plastic Goods
Iron, Steel
Wood, Cork
Fish Preserves
Glass
Footwear
Printing, Publishing
Textile, Clothing
Transp. Equipment
Bread, Bisc
Ceramics
Furniture
0
5
10
15
20
25
30
35
40
0
2
4
6
8
10
12
14
16
18
20

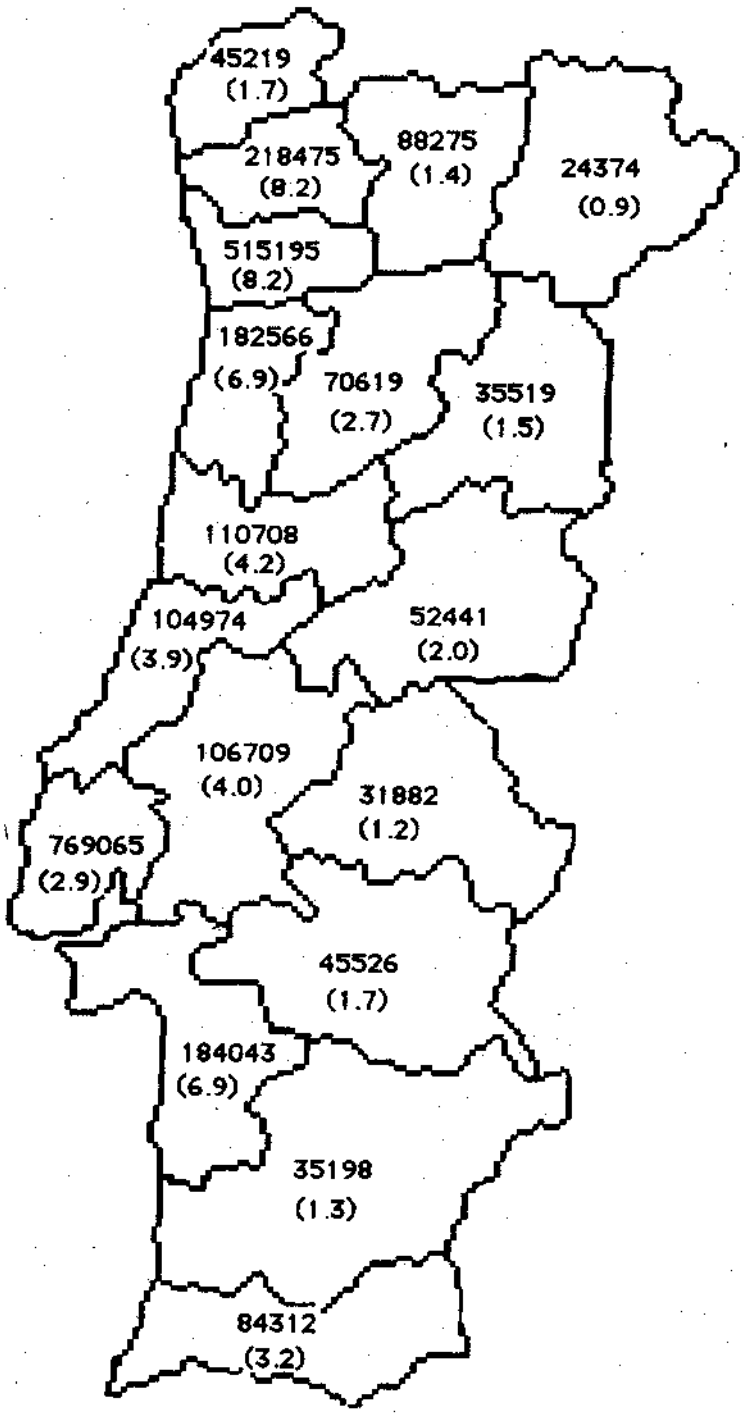
MAP I

ADMINISTRATIVE DIVISION OF PORTUGAL



MAP II

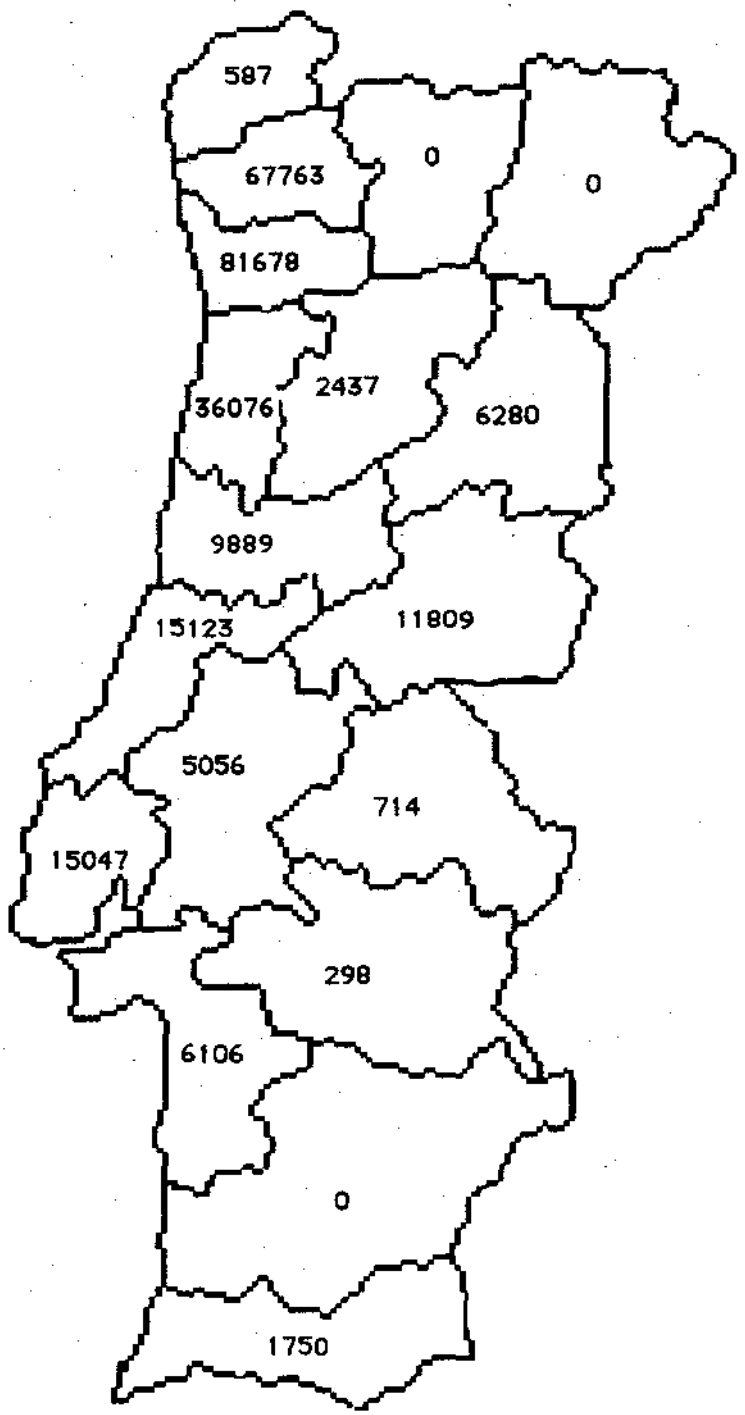
TOTAL REGIONAL EMPLOYMENT



Note: numbers in parenthesis are the percentage of employment in the region in total employment in Portugal.

MAP III

EMPLOYMENT IN VERY VULNERABLE ACTIVITIES

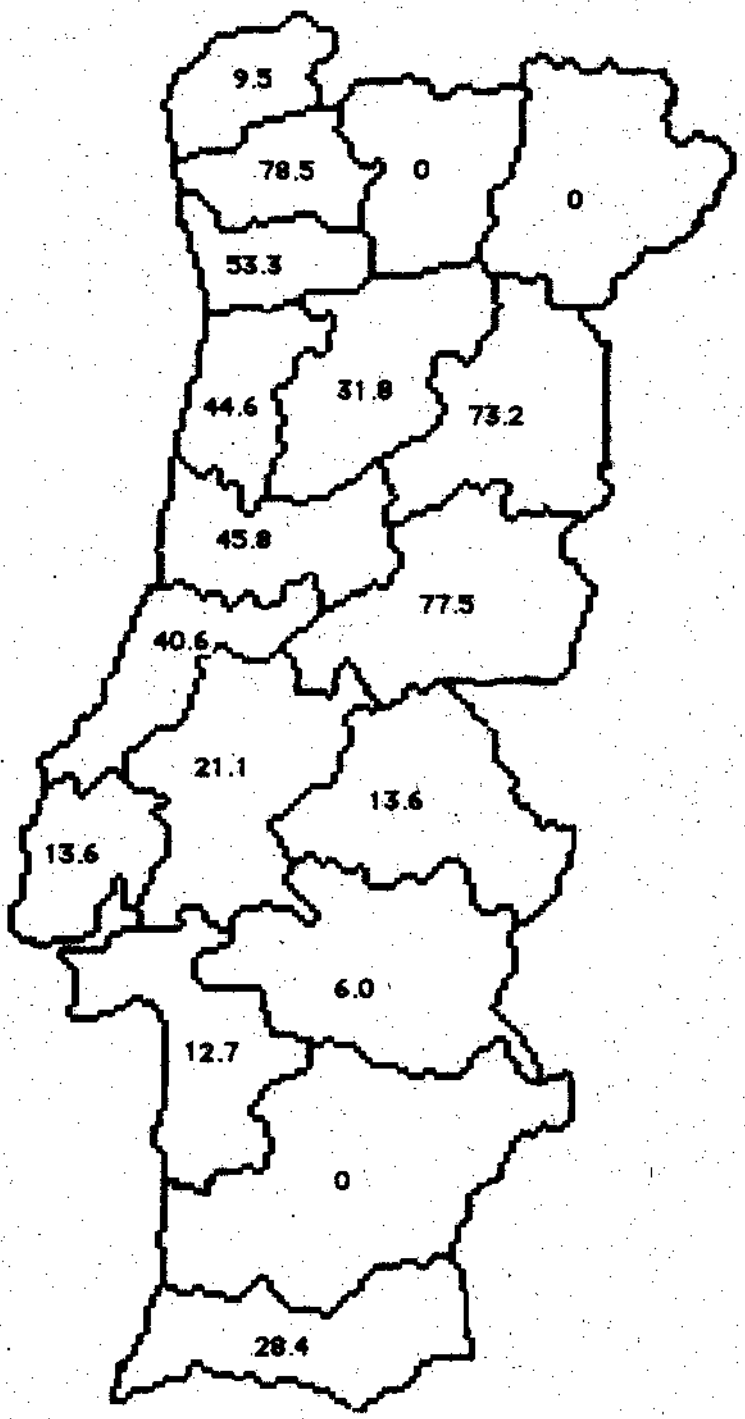


Inland Portugal: 260,617 employees, 42% of the total employment in manufacturing

Note: Average wage lower than the national average for the manufacturing sector.
Weight of the wage costs on the value of total output larger than the average.
Weight of exports+imports in total output larger than 50%

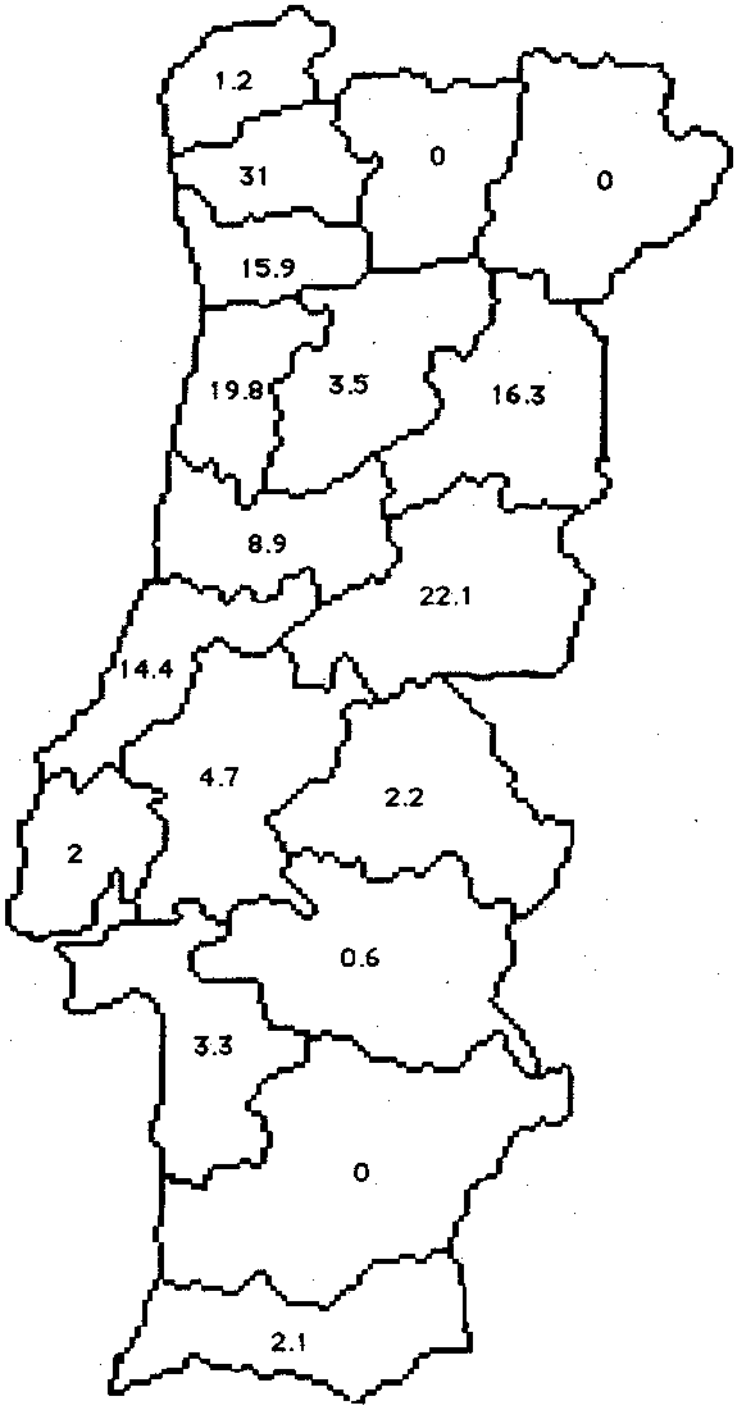
MAP IV

PERCENTAGE OF EMPLOYMENT IN VERY VULNERABLE ACTIVITIES IN MANUFACTURING EMPLOYMENT



MAP V

PERCENTAGE OF THE EMPLOYMENT IN VULNERABLE MANUFACTURING INDUSTRIES IN OVERALL EMPLOYMENT

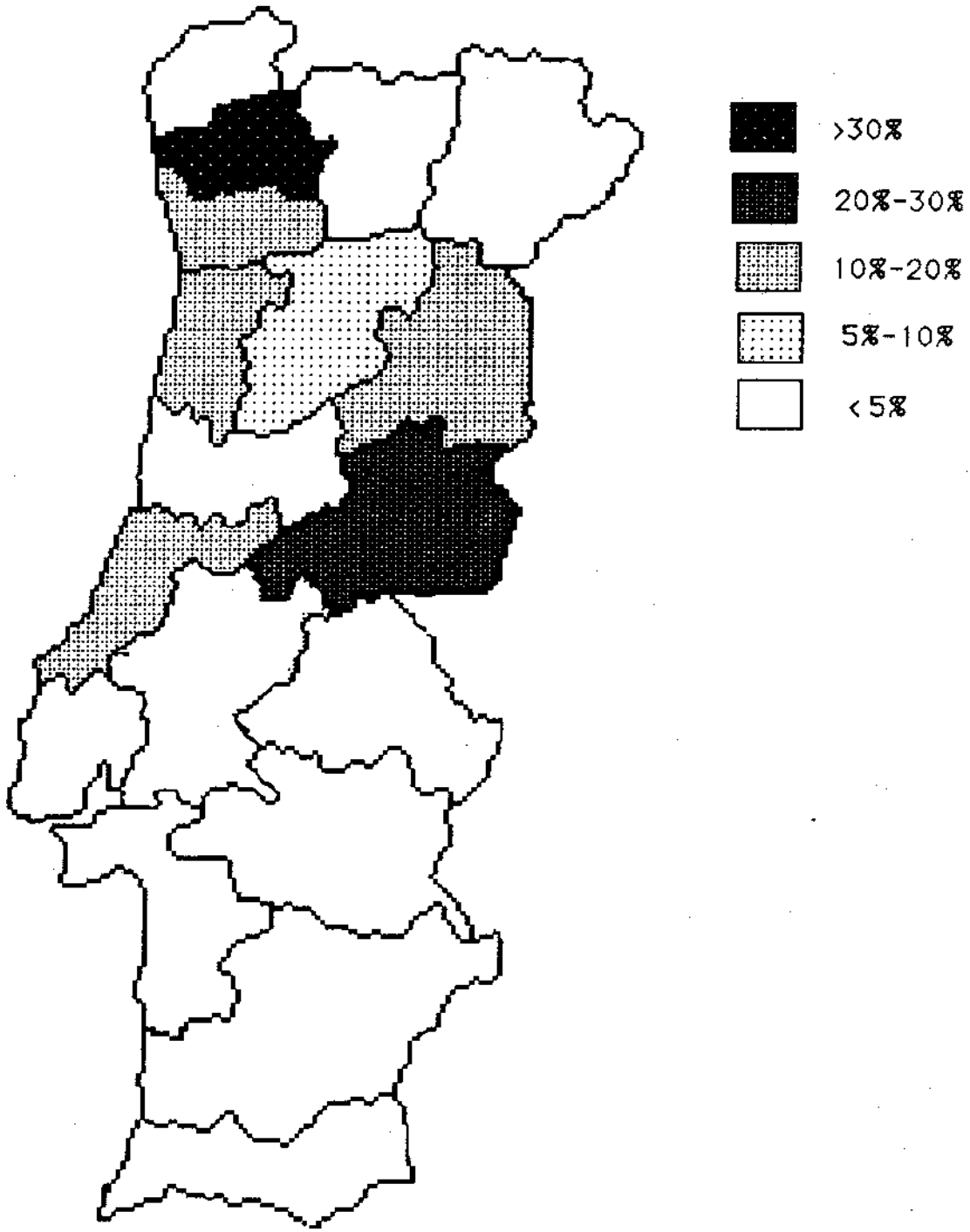


Inland Portugal: 9.8

Note: the data on overall employment is for the year of 1985, while the employment in vulnerable activities is from 1987. Nevertheless, we think that between these two years total employment has not undergone large changes.

MAP VI

REGIONS GROUPED BY THE PERCENTAGE OF
TOTAL EMPLOYMENT AFFECTED BY 1992



MAP VII

PERCENTAGE OF EMPLOYMENT IN TEXTILE INDUSTRIES
IN MANUFACTURING EMPLOYMENT

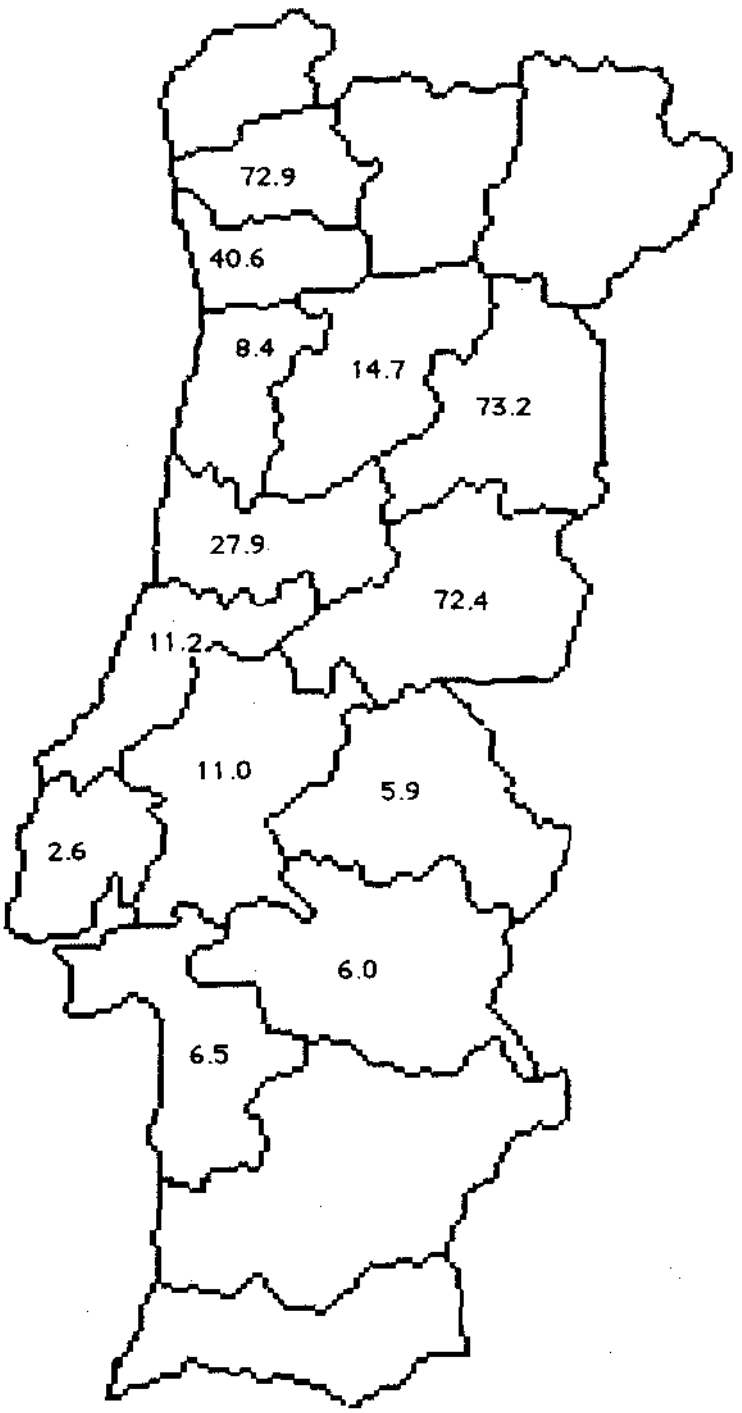


TABLE I

Summary of Industry Analysis

		Wages / Value-Added (1)	Average Wage	Wages / Output (1)	Gross Profit Rate (1) (2)	Regional Concentration (1) (3)	Industrial Concentration (VA, Employment) (4)	Imp + Exp / Output (1)	Sectoral Employment / Manufacturing Employment
311410* fish preserves		74	507	20,7	7	15 Faro	78,8 115	96,4	0,9
TEXTILES AND CLOTHING	321120 wool	58	625	24	17	49 C.Branco	142,6 132,5	46,3	3,3
	321130 cotton	47	596	18,5	21	50 Braga	292,3 230	42,3	11,5
	321300 knitting	52	562	16,8	16	17 Braga	93,4 86,4	80	5,2
	322020 clothing	61	549,3	21	14	24 C.Branco	90,9 100,6	171,6	8
	321410 carpets	49,4	635	18	19	2,2 Aveiro	104,1 80,8	57,2	0,5
	321510 jute	63	628	20,5	12	1,3 Porto	271,8 270	n.a.	0,5
324000 footwear		59,8	532	18	12	15 Aveiro	55,8 62,8	155,2	4,0
WOOD AND CORK	331110 lumber	67	489 23,1	19	10	13 Viseu	16	65	2
	331120 carpentry	52	487	20	17	9,8 Faro	9,2 10,3	29,5	1,2
	331910 cork	60	612	17	11	13,7 Faro 10 Aveiro	40 39,5	115,8	1,9

TABLE I

Summary of Industry Analysis

(continued)

	Wages / Value-Added (1)	Average Wage	Wages / Output (1)	Gross Profit Rate (1) (2)	Regional Concentration (1) (3)	Industrial Concentration (VA, Employment) (4)	Imp + Exp / Output (1)	Sectoral Employment / Manufacturing Employment
332010 furniture-making	70,3	470	28	12	3,8 Porto	14,7 21,9	53,6	1,7
351100 basic industrial chemicals	37	1431	68,1	12	3,5 Setúbal	257 66	101,1	0,9
351210 chemicals for agricultural purpose	49,7	1532,8	15,0	15	0,4 Lisboa ? Setúbal ? Porto	681 221	23,1	0,5
352230 pharmaceutical goods	47	1229,6	19,2	22	6,8 Lisboa	253,4 96,0	85,1	1,3
356000 plastics goods	51	801	17,6	32	9 Leiria	79,9 51,2	58,3	2,2
361000 ceramics	55	747	30,9	25	13 Leiria 10 Coimbra	168,7 124,5	94	2,4
362010 glass	52	1160	26,5	24	12,2 Leiria	999,3 450	69,3	1,1
369100 tile and brick products	54	614	28,9	24	6,1 Leiria 5,2 Santarém	49 44	18,2	1,8
371015 iron and steel works	51	1581	18,1	18	0,6 Porto ? Setúbal	2122 680,7	119,7	1

TABLE I

Summary of Industry Analysis

(continued)

	Wages / Value-Added (1)	Average Wage	Wages / Output (1)	Gross Profit Rate (1) (2)	Regional Concentration (1) (3)	Industrial Concentration (VA, Employment) (4)	Imp + Exp / Output (1)	Sectoral Employment / Manufacturing Employment
381200 tools and finished metal articles	54	646	25,1	21	2 Aveiro " Lisboa " Porto	90,3 75,8	17,1	1,7
381990 other metal articles	59	837	25,9	3	7 Leiria 3,3 Aveiro 4 Lisboa	60,5 42,5	71	2,1
383200 TVs, radios and telecommunications equipment	60	1222	20,2	13	3,8 Braga 3,9 Lisboa	656 324	222	2
384110 steel, shipbuilding and repair	>100	1185	57,5	<0	23,5 Setubal	770,9 747	41,5	2,4
384310 motor vehicles	49,4	1386	9,2	9	4,1 Setúbal	1148 409	170	0,8

Notes: (1) as a percentage.
(2) = 1-(wages+intermediate inputs)/output.
(3) percentage of the sector's employment in regional employment.
(4) upper number is in 10^6 PTE per firm, lower number is in employees per firm.

* number of CAE (see note 2)

nº 159 - CHAU, Fernando, "The end of month rule and liquidity risk: what the money market says", (Outubro, 1990).

nº 160 - BALEIRAS, Rui Nuno, "A tenure choice look at the Portuguese housing market in the eighties", (Outubro, 1990).

nº 161 - BELEZA, Luis Miguel e GASPAR, Vitor, "Males Públicos e o IPC: O Caso do Tabaco", (Novembro, 1990).

nº 162 - COURAKIS, Anthony S., ROQUE, Fátima Moura e FONTOURA, Paula, "The Impact of Protection on the Evolution of the Portuguese Pattern of Trade: 1974-86", (Dezembro, 1990).

nº 163 - FERREIRA, João da Silva, " A Revolução Financeira e a Gestão do Risco da Empresa Bancária", (Janeiro, 1991).

nº 164 BAGANHA Manuel P., CHOEN, Morris A., " The Stabilizing Effect of Distribution Center Inventory", (5, Dezembro, 1990)

nº 165 GASPAR, Vitor, PINHEIRO, Maximiano, " Co- Integração de série Macroeconómicas: Uma Aplicação à Função Consumo em Portugal", (Dezembro de 1990)

nº 166 BARROS, Pedro P., CABRAL, Luís M. B., " Foreign Entry and Domestic Welfare, With an Application to Portuguese Life-Insurance ", (Março 1991)

ÚLTIMOS WORKING PAPERS JÁ PUBLICADOS

nº 167 - CABRAL, Luis M. B. e RIORDAN, Michael H., "Learning To Compete And Vice Versa", (Março, 1991)

nº 168 - AMADO, Lígia e BARCIA, Paulo, "Reforço da Decomposição Lagrangena: Teoria das Aplicações" (Abril de 1991)

nº 169 - REIS, Jaime, "Monopoly Versus Competition in the Suplly of Money Under COnvertibility: Portugal, 1860-1890" (Maio de 1991).

nº 170 - PINHEIRO, Maximiano Reis, "A Smoothing-Splines-Like Estimator for Nonparametric Regression With a Linear Generalized Least Squares Interpretation" (Maio de 1991).