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The dynamics and the competitiveness of the metal furniture sector in the "Distrito" of Aveiro

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The dynamics and the competitiveness of the metal furniture sector in the “Distrito” of Aveiro

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Abstract

In a context of globalization, competitiveness plays a prevailing role in the national, regional and local development, and depends progressively on companies' dynamics.

In order to overcome an increasingly aggressive competition, companies must anticipate the consumers' preferences, rely on more innovative, first-rate products and know both their internal and external markets extremely well.

In what concerns the metal furniture sector, new companies have been emerging and the existing ones have been expanding over the last few years in the “Distrito” of *Aveiro*. This sector has revealed a considerable competitive behaviour by creating job opportunities in this region and essentially by showing creativity and the will to innovate. Moreover, these companies are reaching international markets.

Thus, the purpose of this study is to analyse the dynamics and competitiveness of this sector.

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1 – Introduction

Organisations are no longer confined to national boundaries. Portuguese firms are nowadays facing strong competition, coming especially from European markets.

In order to compete in the European and in the global market, Portuguese entrepreneurs will need to be innovative. As Silva (2000) states, this is not an easy task, due to a business culture which is tradition-oriented and often lacks the sophistication of its counterparts in the European Union.

Over the last years, the metal furniture sector has revealed a considerable competitive behaviour in the “Distrito” of Aveiro. New firms were created, some of the existing ones expanded, creating job opportunities and showing creativity and the will to innovate. The purpose of this study is to analyse the dynamics and competitiveness of this sector.

It is important to point out that the aim of this paper is not to develop a mathematical model, but to analyse this sector’s reality. Therefore, the analysis was based on some indicators of competitiveness.

2 – Review of literature

The term competitiveness can be applied to nations, markets, industries and firms. This concept has been strongly debated for a long time, and economists have not yet devised a formal definition or theory of competitiveness. Neoclassical economists tend to associate competitiveness with external, market-based concepts such as comparative advantage, market distortions, and price (Hoff et al., 1997).

There are authors like Juran (1992) that suggest that any competitive analysis must include an evaluation of product features’ competitiveness and an evaluation of the process used to manufacture products.

Cook and Bredahl (1991) sustain that being competitive is the ability to deliver goods and services at the time, place and form sought by buyers, in both domestic and international markets, at prices as good as or better than those of potential suppliers, while earning at least opportunity costs on used resources.

According to Hoff, et al. (1997), “competitiveness means that customers will elect to purchase these goods and services over those available from other potential suppliers. The production and delivery of these goods or services is accomplished using

processes that ensure profitability, quality, and efficient use of scarce resources (particularly natural resources)”.

The problem that arises is how to measure competitiveness. Porter (1990) argues that the most important measure of national competitiveness is national productivity, defined to include improved product quality, technology, design and production efficiency. According to this author, in order to achieve competitive advantage, firms must lower their costs or differentiate their product through improved quality or service.

Martin et al. (1991) categorize determinants of competitiveness according to sources of influence. The authors define uncontrollable factors, including the natural environment, resources and climate; “quasi-controllable” factors, such as input prices and demand conditions; factors that can be influenced by governments, such as taxes, exchange rates and trade policy; factors that can be determined by firms, such as strategy, products, technology, training, research, development, combination of resources, quality, distribution channels and strategic alliances with customers and suppliers.

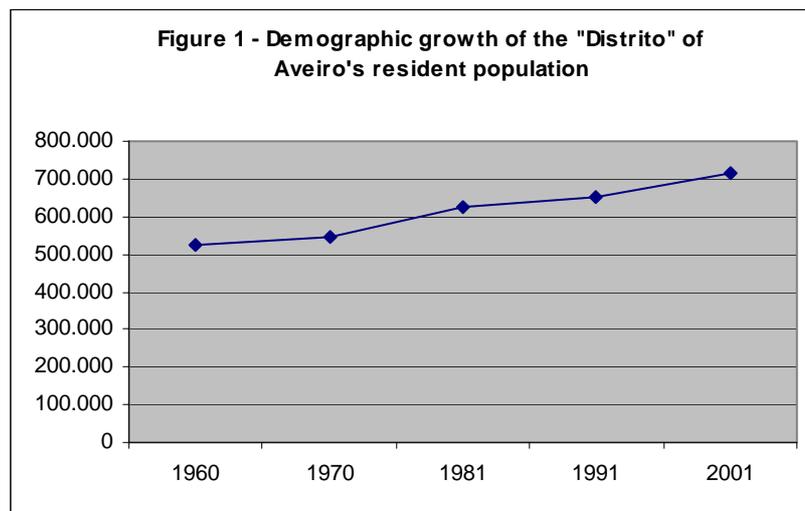
There are several authors (Ferraz, Kupfer and Haguenaer - 1997; Coutinho and Ferraz - 1995 and Possas - 1999) that defend an evolutionary approach, which explains the market’s dynamics through its historical evolution. These authors consider every factor as being important for determining the competitiveness of a particular market.

Based on some analysts’ recommendations and since there isn’t, still, a formal definition or theory of competitiveness, as mentioned earlier, some competitiveness indicators have been analysed. After characterising the metal furniture sector’s firms (size, location, creation date), one has analysed the firms’ capital stock, turnover, production, technology investments, relationship with suppliers, sales, exports, creation of employment and improvement of the workforce’s skills, product differentiation and quality improvements.

3 – Features of the “Distrito” of Aveiro

The “Distrito” of Aveiro, located at the core of Portugal, between the rivers Douro and Mondego, is divided into 19 “concelhos” dispersed by the NUTS III: Grande Porto, Tâmega, Baixo Vouga and Entre Douro e Vouga, along 2.799,6 sqKm.³

The attractiveness of this “Distrito” can be seen through the analysis of its resident population (Figure 1).



Source: *Censos*, INE

The data indicates that the population has been increasing in the “Distrito” of Aveiro since 1960, even though the Portuguese resident population has decreased between 1960 and 1970, due to the high level of emigration which occurred in this country, especially in the 1960s⁴. Between 1970 and 1981, there was an increase of around 78 thousand resident inhabitants in the “Distrito” and between 1981 and 1991, an increase of around 31 thousand individuals. More recently, from 1991 to 2001, the population increased again (the “Distrito” had in 2001 more 59 thousand individuals than in 1991). According to the last census, the “Distrito” of Aveiro had 713.575 resident inhabitants, being not only one of the most heavily populated “distritos” of our

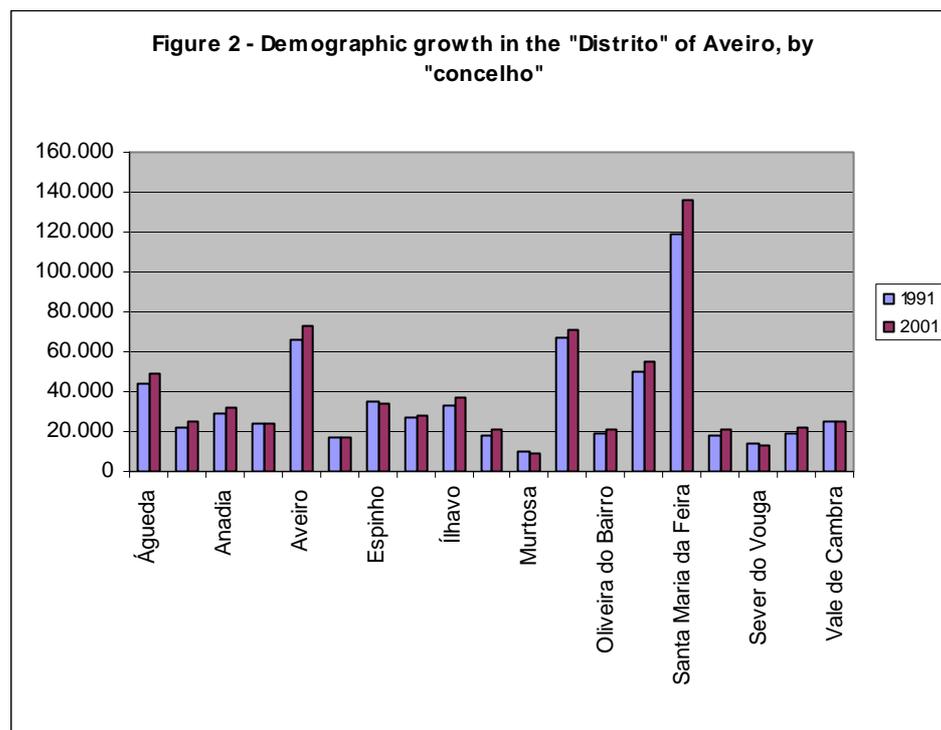
³ *Anuários Estatísticos Regionais – 2002*, INE.

⁴ Portugal registered a decrease of 217.919 individuals between 1960 and 1970 whereas the “Distrito” of Aveiro registered an increase of 20.638 during the same period of time.

country, but also the one with one of the highest population densities (254,9 inhab/sqkm)⁵.

This power to attract new inhabitants can be explained by the privileged location of the “Distrito” of Aveiro, by the quality of its soil (excellent for agricultural purposes), by its mild climate and by the development of its industry, fishing related activities and services⁶.

Nevertheless, this demographic trend didn't occur in the same way in every “concelho” (Figure 2).



Source: *Censos – 2001*, INE

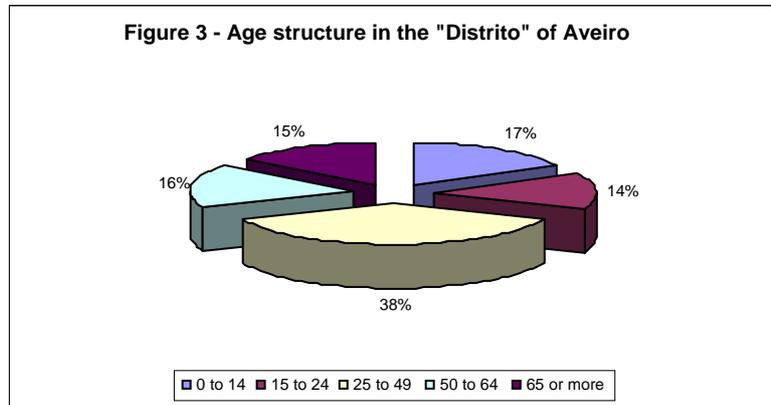
The highest population growth rates between 1991 and 2001 occurred in the “concelhos” of Santa Maria da Feira (14,6%), São João da Madeira (14,4%), Vagos (15,5%), Mealhada (13,6%), Oliveira do Bairro (13,4%), Ílhavo (12%), Albergaria-a-Velha (12%) and Águeda (11,3%).

The “concelhos” with more people are Santa Maria da Feira, Aveiro, Ovar, Águeda and Oliveira de Azeméis. These figures can be explained through the dynamics and the importance of industry in these areas.

⁵ The “concelhos” with the highest population density are São João da Madeira (2.637 inhab/sqKm) and Espinho (1.597,2 inhab/sqKm). The “concelhos” with the lowest population density are Arouca (73,8 inhab/ sqKm) and Sever do Vouga (101,7 inhab/ sqKm).

⁶ Neves, Amaro, et al. (1989) – p. 20.

The age structure of the “Distrito” of Aveiro is similar to the national one, being the highest proportion of people (38%) between 25 and 49 years old, 17% between 0 and 14, 16% between 50 and 64, 15% over 65 years old and 14% between 15 and 24 (Figure 3).

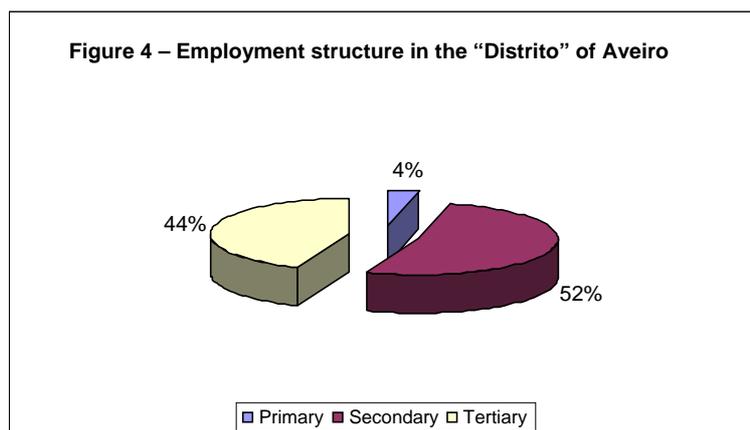


Source: *Anuários Estatísticos Regionais - 2002*, INE

As far as the industrial evolution is concerned, industry was not very important in the “Distrito” of Aveiro in the nineteenth century – the number of firms was very low, prevailing rudimentary workshops, later replaced by factories. New industries emerged in the 60s (Caetano, 1985).

The choice of the “Distrito” of Aveiro to establish some industries seems to result from the combination of several factors, such as good accessibilities (Aveiro’s harbour, IP5 (Aveiro-Vilar Formoso), IC2 (Porto-Coimbra), A1 (Porto-Lisboa), railway), trained workforce in some industrial areas, and the existence of industrial clusters formed through the gathering of firms that are somehow related to each other upstream and downstream.

One can stress the importance of industry in the “Distrito” of Aveiro by evaluating the employment structure of the “Distrito” (Figure 4).



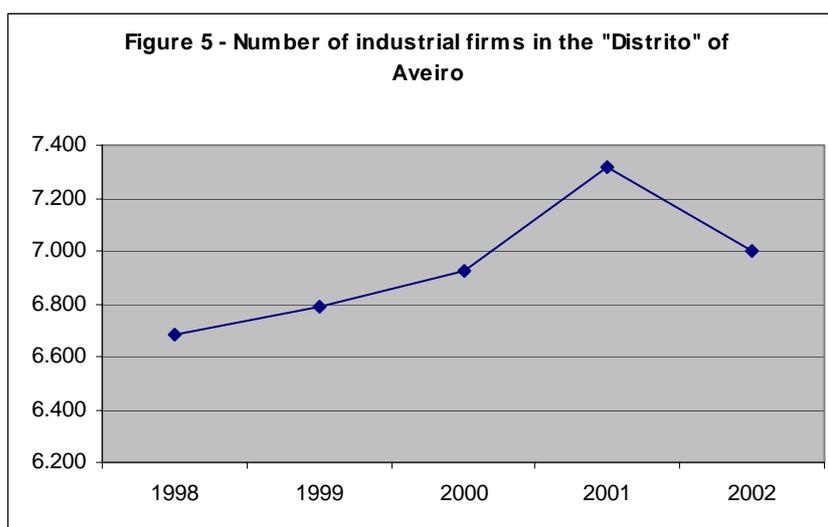
Source: *Censos – 2001*, INE

From the 337 thousand active employed individuals of the “Distrito” of Aveiro, 52% worked in the secondary sector, 44% in the tertiary sector and 4% in the primary sector. It should be emphasised that the proportion of people involved in the tertiary sector in this “Distrito” is substantially lower than the national proportion (at a national level, the majority of the population is involved in the tertiary sector), stressing, once more, the importance of industry in the “Distrito”.

The employment structure is not the same in every “concelho” of the “Distrito”. One can see that the proportion of the population involved in the secondary sector is higher in the north-centre of the “Distrito”. In fact, in Águeda, Castelo de Paiva, Santa Maria da Feira, Ovar, São João da Madeira, Sever do Vouga, Oliveira de Azeméis, Vale de Cambra, Arouca and Albergaria-a-Velha more than 50% of the active employed individuals work at this sector⁷.

When one looks at the evolution of the manufacturing enterprises in the “Distrito” of Aveiro, it is possible to see that they have increased until 2001, decreasing in the following year, due to the economic crisis (Figure 5).

⁷ One must refer that in some of the “concelhos” of the “Distrito”, the process of industrialisation became significant only with the post-war period with the nationalist industrial development, maintaining a high rate of growth during the 1960s. Some of these “concelhos” were even considered to be (relatively) predominantly agricultural, like Águeda (Pires, 1983).



Source: AIDA

From a total of 6.998 industrial firms located in the “Distrito” of Aveiro, 28,7% are located in the “Concelho” of Ílhavo, 17% in Oliveira do Bairro, 9% in Águeda and 6,6% in Aveiro. These four “concelhos” alone assemble 61,3% of the total number of industrial firms of the “Distrito”⁸.

Looking at the sectors of the manufacturing industries, one concludes that 17,8% belong to the fur and leather sector (the shoe industry of São João da Madeira and Santa Maria da Feira is a very important contribution to this figure), 17,6% manufacture metallic products (except machinery and equipment), 12,3% are included in the cork industry (being a large percentage of the firms located in Santa Maria da Feira), 10% manufacture wood products (except furniture), 9,7% belong to the food and beverage industries and 6,2% belong to the furniture and other manufacturing industries – in which the metal furniture sector is included (“CAE”⁹ 36). From the “concelhos” of the “Distrito” of Aveiro, Águeda is the most specialised in metal working industries. In this “concelho”, the sectors *metallic products (except machinery and equipment)* and *furniture and other manufacturing industries* represent, respectively, 33,3% and 11,4% of the manufacture industries of the “concelho”.

Another feature one should analyse is the number of workers in the manufacturing industries in the “Distrito” of Aveiro. Looking at the way they have evolved, one can conclude that, similarly to what happened to the number of

⁸ *Anuário – 2002*, AIDA.

⁹ Classificação das Actividades Económicas (INE).

manufacturing industries in the “Distrito”, the number of workers increased from 1998 to 2001, and decreased from 2001 to 2002, according to the “Associação Industrial do Distrito de Aveiro” (AIDA)¹⁰. The “concelhos” that employ more people are Santa Maria da Feira, Oliveira de Azeméis and Águeda.

Although there has been a decline in the employment rate in most of the “Distrito”’s sectors from 2001 to 2002, there was a slight increase in the number of workers employed in the sector *furniture and other manufacturing industries*.

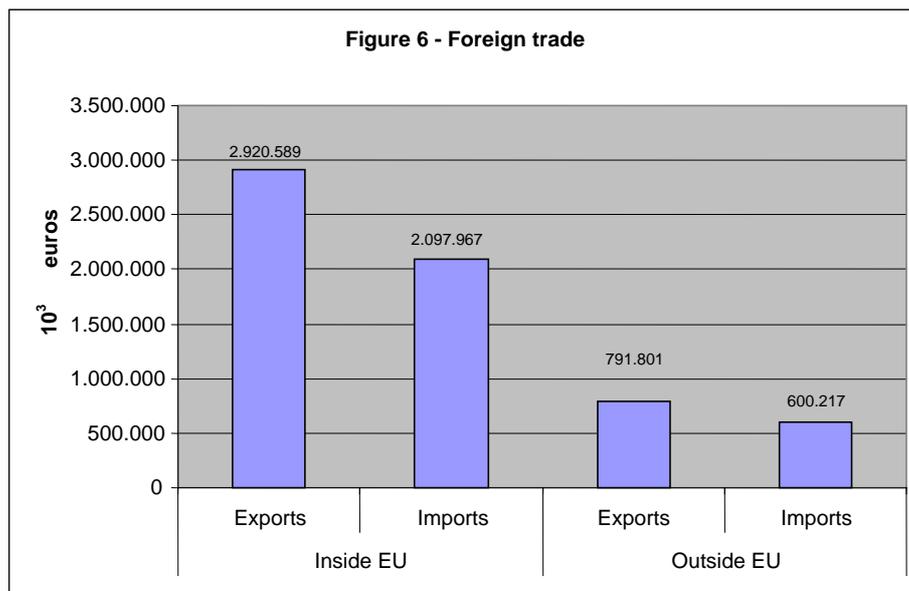
The “concelho” that employs more workers in this sector is, undoubtedly, Águeda. In this “concelho”, almost 55% of the employees work with *metallic products (except machinery and equipment), furniture and other manufacturing industries and non-metallic mineral products*.

When analysing the unemployment rate, one can outline that it is relatively low (5,6%) when compared to the national unemployment rate (6,1%). The “Concelho” of Águeda is the one with the lowest unemployment rate (only 2,9%)¹¹, being this figure an indicator of this “Concelho”’s dynamics.

As far as foreign trade is concerned, one can say that the “Distrito” of Aveiro exports more than it imports, either to EU countries or to other foreign countries (Figure 6). At a national level, the opposite happens: Portugal imports almost twice as much as it exports.

¹⁰ *Anuário – 2002, AIDA.*

¹¹ *Anuários Estatísticos Regionais – 2002, INE.*



Source: *Estatísticas do Comércio Internacional – 2002*, INE

In order to explain the importance of the metal furniture sector in the “Distrito” de Aveiro, one must compare the number of firms related to this sector (which include the subsectors 36110 – Chairs and seats, 36120 – Office and business furniture and 36142 – Metal furniture for other purposes) established in this “Distrito” with the overall number of firms that work with metal furniture. Looking at Table 1, one can see that most of the firms linked to the subsectors being studied, are located in the “Distrito” of Aveiro (81,5% in the case of *metal furniture for other purposes*, 55,3% in the case of *chairs and seats*, and 48,6% in the case of *office and business furniture* .

Table 1 – Number of firms of the subsectors 36110, 36120 and 36142

Subsectors	Portugal	“Distrito” of Aveiro	%
36	1.211	433	35,8
36110	132	73	55,3
36120	74	36	48,6
36142	54	44	81,5

Sources: INE and AIDA

From the 153 firms working in the subsectors mentioned above in the “Distrito” of Aveiro, 87 are companies. These employ 4.665 workers (51,8 % in subsector 36110, 34% in 36120 e 14,2% in 36142). In 2002, the capital stock comprised 38,5 million euros, and the turnover approximately 326,5 million euros (Table 2).

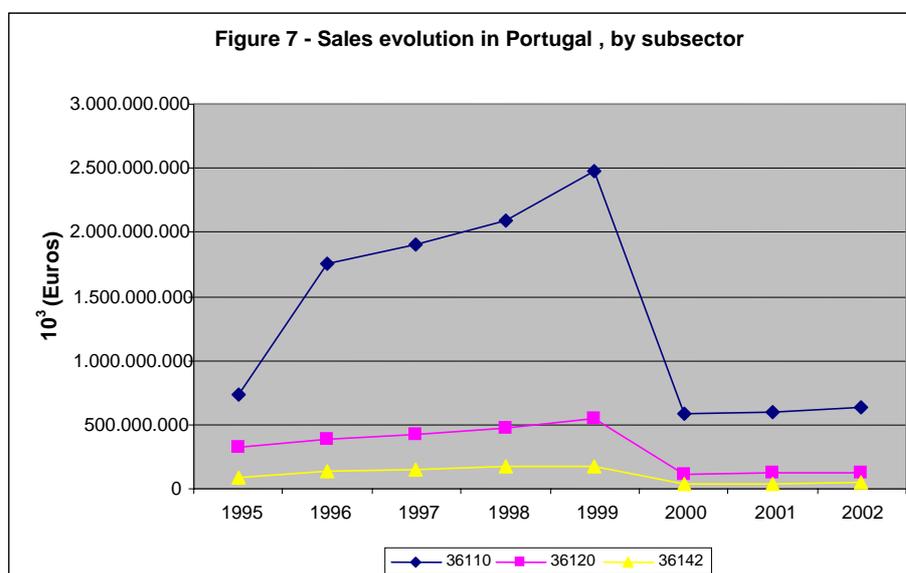
Table 2 – Characteristics of subsectors 36110, 36120 and 36142 in the “Distrito” of Aveiro

Subsector	Firms	Companies			
		Nº	Turnover (euros)	Workers	Capital stock (euros)
36110	73	28	209.510.981	2.417	18.514.426
36120	36	34	88.754.369	1.586	17.618.369
36142	44	25	28.283.532	662	2.379.519

Source: INE

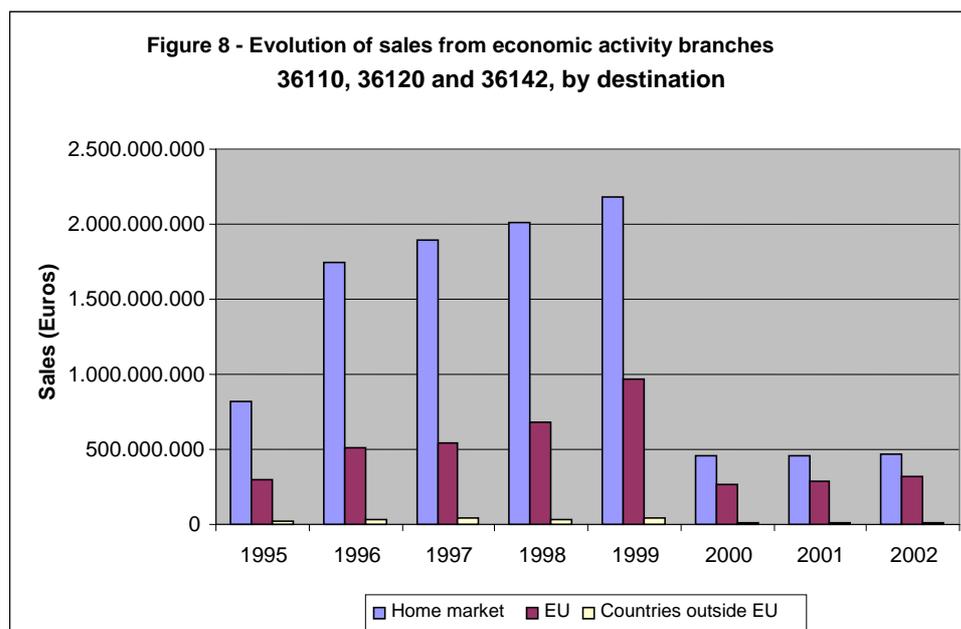
Note: Economic data from 2001 and physical data from 2002

The sales of the subsectors in analysis rose from 1995 to 1999, and decreased from 1999 to 2000, once again reflecting the economic crisis. Nevertheless, these subsectors seem to have slowly started to recover from it after 2000 (Figure 7).



Source: *Estatísticas da Produção Industrial*, INE

These subsectors sell mainly to the home market, even though, in the last years the gap between the sales to EU countries and the sales to the home market has been diminishing (Figure 8).



Source: *Estatísticas da Produção Industrial*, INE

The subsector with the highest export rate is *36110* – Chairs and seats (45,8% of its sales go to EU countries and 0,6% to other countries). The two other subsectors export much less: subsector *36120* sells 14,8% of its goods to EU countries and 7,4% to other countries; in the subsector *36142*, the percentage of sales to EU countries is 14,3% and to other countries 2,5%¹².

4. Field work

4.1. Methodology

A questionnaire to the firms of the metal furniture sector of the “Distrito” of Aveiro took place from March to May 2004.

In order to choose which firms to inquire, one started from a provisional list of 109 firms, which resulted from the review of three lists from different sources (AIDA – Associação Industrial de Aveiro, AIA – Associação Industrial de Águeda, and Abimota¹³). These three lists had some firms that had already ceased their activity and

¹² *Estatísticas da Produção Industrial*, INE.

¹³ Associação Nacional das Industrias de Duas Rodas, Ferragens, Mobiliário e Afins.

others that were not included in the subsectors that were relevant to this study. We found out later that most of them only produced wood furniture.¹⁴

From the provisional list, 68 firms were contacted. From these, three had closed and were thus excluded from the list. The final list had, therefore, 65 firms, 35 of which were contacted directly and 30 by mail. From these, only 30 answered, being therefore 30 the size of our sample. One might argue that this sample reflects, *a priori*, what is happening in the metal furniture sector in the “Distrito” of Aveiro.

Since a sample is a part of the population, selected according to a rule or plan (Rudio, 1983) the sample was chosen in order to represent the population, based on the criteria referred by Ghiglione & Matalon (1997) e Grima (1999), namely the criteria related to dimension and randomness.

There were also several contacts with the inquired firms, in order to check if all the questions were clear to them.

4.2. Results

The purpose of this questionnaire was to gather some generic information regarding the metal furniture firms (their size, location, capital stock, turnover), some information on the firms’ production (variation of production, suppliers, technology) and some information on their sales (variation of sales, exports). In order to improve their competitiveness, firms must add value to their products. Due to that fact, one tried to evaluate their investment in human capital, product differentiation, quality improvements, technology investments, and marketing investments and to assess the customers’ level of satisfaction and the firms’ environmental concerns.

One should refer first to the type of firms that were inquired. As Table 3 shows, most firms belong to the subsector 36120 – Office and business furniture (40,7%), 36142 – Metal furniture for other purposes (40%) and 36110 – Chairs and seats (13,3%).

¹⁴ Including firms from the subsector 36130 – Kitchen furniture.

Table 3 – Subsectors of the firms

Subsector	Frequencies	%
36110	4	13,3
36120	14	40,7
36142	12	40,0
Total	30	100,0

Source: *Questionnaire*

As one can observe from Table 4, and bearing in mind the criteria of number of workers for statistical reasons¹⁵, most of the responding firms (60,7%) are small, 21,4% are SME, 14,3% are micro firms and 3,6% have more than 250 workers.

Table 4 – Firm's size

	Frequency	%
Micro firms	4	14,3
Small firms	17	60,7
SME	6	21,4
Big firms	1	3,6
Total	28	100,0

Source: *Questionnaire*

Almost all of the inquired firms are located in the “Concelho” of Águeda (24 firms), as one can see in Table 5, and the others are located in the “concelhos” of Oliveira do Bairro (2), Estarreja (1), Oliveira de Azeméis (1), Ovar (1) and São João da Madeira (1).

This concentration of questionnaires in the “Concelho” of Águeda can be explained by 2 factors: firstly, 41,3% of the firms from the provisional list are from this “concelho”¹⁶; and secondly the firms located at other “concelhos” were contacted by mail, since they were geographically more distant, being the number of answers consequently very low.

¹⁵ According to the European definition, through the European Commission's recommendation n° 96/280/CE, *SME* are firms with less than 250 workers and whose annual income doesn't exceed 40 million euros or whose total annual balance doesn't exceed 27 million euros. *Small firms* are those with less than 50 workers and with an income lower than 7 million euros (or a balance lower than 5 million euros) and *micro firms* are those with less than 10 workers.

¹⁶ The distribution of firms by “concelho” in the provisional list was the following: Águeda (41,3%); Albergaria-a-Velha (0,9%); Anadia (2,8%); Aveiro (1,8%); Espinho (0,9%); Estarreja (2,8%); Ílhavo (5,5%); Oliveira de Azeméis (4,6%); Oliveira do Bairro (4,6%); Ovar (8,3%); Santa Maria da Feira (19,3%); São João da Madeira (2,8%) and Vale de Cambra (4,6%).

Table 5 – Firm location

“Concelho”	Frequency	%
Águeda	24	80,0
Estarreja	1	3,3
Oliveira de Azeméis	1	3,3
Oliveira do Bairro	2	6,7
Ovar	1	3,3
S. João da Madeira	1	3,3
Total	30	100,0

Source: *Questionnaire*

Looking at some features (Table 6), one can state that the inquired firms employ 1.637 people, their capital stock comprises almost 21,2 million euros and their turnover around 92,2 million euros. It is interesting to observe that most firms stated that they have actually received more (around 105 million euros), in 2003, than their turnover. This fact is certainly related to the need faced by most firms to overcome this less favourable conjuncture, demanding late payments from their customers before selling new merchandise. These payments in arrears are usually waiting for a court resolution.

Table 6 – Some features

	Value	Frequency
Capital stock (thousand euros)	21.234	29
Turnover in 2003 (thousand euros)	92.117	26
Receivings in 2003 (thousand euros)	104.994	19
Number of workers	1.637	28

Source: *Questionnaire*

The foundation date of the inquired firms (Table 7) is not chronologically homogeneous. It was more intense after the seventies, reaching its highest point from 1985 to 1989. One should also notice that 4 firms are relatively recent (2 of which were formed after 1999), which shows a certain dynamism in this sector.

Table 7 – Foundation date

Foundation date	Frequency	%
1945 a 1949	1	3,3
1950 a 1954	0	0,0
1955 a 1959	0	0,0
1960 a 1964	0	0,0
1965 a 1969	2	6,7
1970 a 1974	6	20,0
1975 a 1979	3	10,0
1980 a 1984	5	16,7
1985 a 1989	7	23,3
1990 a 1994	2	6,7
1995 a 1999	2	6,7
2000 a 2004	2	6,7
Total	30	100,0

Source: *Questionnaire*

From 2000 to 2003, there has been a decrease in production for 50% of the respondents. 35% stated that production grew during that period and 15% said that there was no change in production (Table 8). It is clear that this “less favourable” *scenario* is a result of the economic crisis that has affected the Portuguese economy these last few years.

Nevertheless, this crisis doesn’t seem to affect all firms in the same way. Looking at Table 8, one can see that 7 producers of chairs and seats had a null or positive variation in production.

Table 8 – Variation of production, by subsector

	Variation of production				Total
	Positive	Negative	Null	DA	
Chairs and seats	1	2	0	1	4
Office and business furniture	6	5	1	2	14
Metal furniture for other purposes	2	6	3	1	12
Total	9	13	4	4	30

Source: *Questionnaire*

When one looks at the origin of the sector’s raw materials, there is a clear predominance of suppliers from the “Distrito” of Aveiro. In fact, all the respondent firms confirm to have suppliers from this “Distrito” and half of them say they buy 61% of their raw materials there.

Twenty five firms state to have suppliers outside the “Distrito” of Aveiro, but only 3 say they buy more than 61% of their raw materials there.

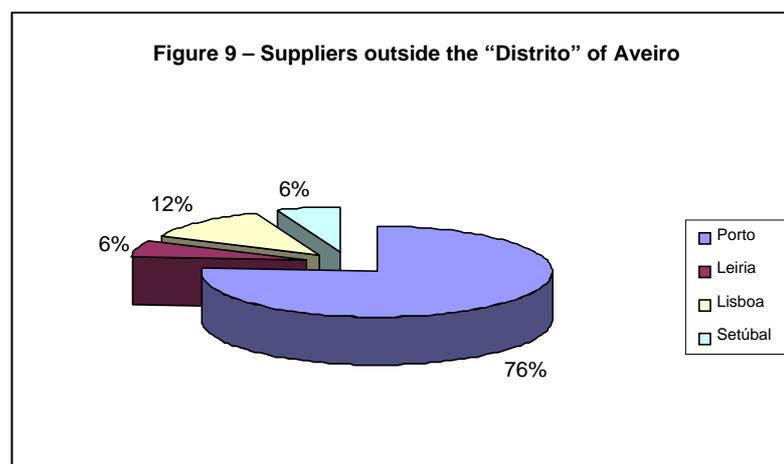
Fifteen choose to buy a small part of their raw materials abroad, not exceeding, in most cases, 20% of the raw materials used in production (Table 9).

Table 9 – Suppliers

	Suppliers (%)					Total
	< 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	
“Distrito” of Aveiro	2	6	5	10	4	27
Other “Distritos”	10	7	5	2	1	25
Abroad	11	3	1	0	0	15
Total	23	16	11	12	5	

Source: *Questionnaire*

Apart from those from the “Distrito” of Aveiro, most suppliers are from the following “distritos”: Porto (76%), Lisbon (12%), Leiria (6%) and Setúbal (6%) (Figure 9)¹⁷.

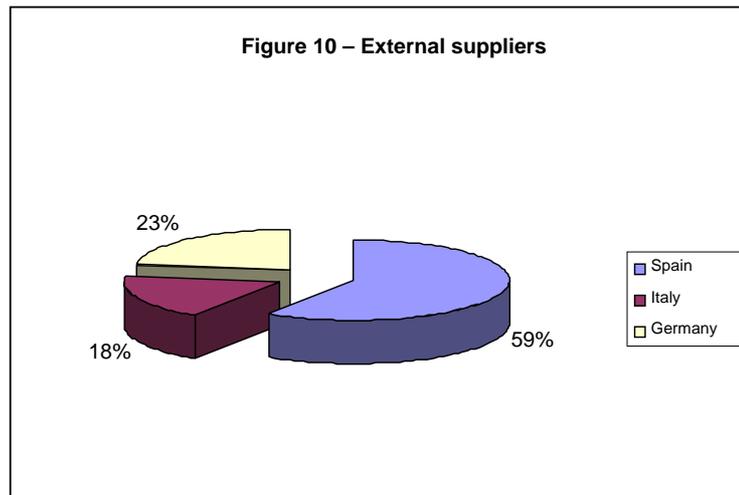


Source: *Questionnaire*

Most external suppliers are from Spain (59%), Germany (23%) and Italy (18%) (Figure 10)¹⁸.

¹⁷ From the 30 firms of the sample, only 17 were taken into account in this analysis, since 2 did not answer, 9 said they had suppliers outside the “Distrito” of Aveiro, but did not say where they are located, 1 said that 100% of its raw materials were bought in the “Distrito” of Aveiro and 1 only had suppliers from the “Distrito” of Aveiro and from abroad.

¹⁸ From the 30 firms from the sample, 15 were taken into account in this analysis, since 2 did not answer, 1 had foreign suppliers but did not specify them, 1 bought 100% of its raw materials in the “Distrito” of Aveiro and 11 had only national suppliers.



Source: *Questionnaire*

As one would expect, all the inquired firms work with metallurgy (Table 10). The majority (77%) also package and finish their products.

Table 10 – Technological processes

	Frequency
Joinery	10
Metallurgy	30
Tapestry	3
Polyurethane injection	3
Finishing	15
Assembly	23
Packing	23
Other ¹⁹	5

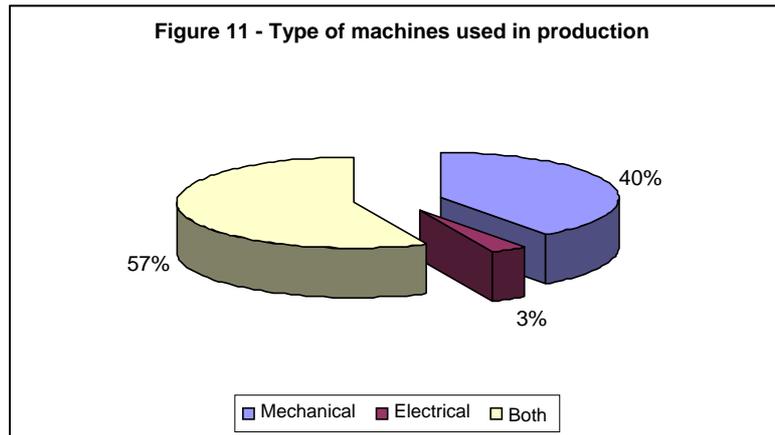
Source: *Questionnaire*

Forty seven percent of the inquired firms subcontract some technological processes, especially, joinery, polyurethane injection, and finishing²⁰.

As far as the type of equipment used in production is concerned, 57% of the inquired firms say they use both mechanical and electrical equipment and 40% say they only work with mechanical machines (Figure 11). The kind of equipment used will, of course, influence the choice of the workers, as one will see later on.

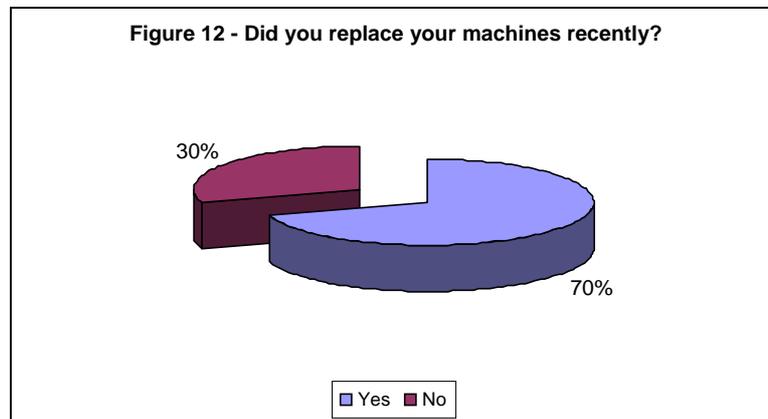
¹⁹ “Other” technological processes refer to painting and welding.

²⁰ Data taken from the questionnaire.



Source: *Questionnaire*

When asked if they had replaced their equipment recently, 70% of the inquired firms answered positively, which shows a will to innovate and compete (Figure 12).



Source: *Questionnaire*

The sales' behaviour was a bit different from that of production. From 2000 to 2003, the number of firms with a null or positive variation of sales was higher than the number of firms with a negative variation (Table 11). The average variation was +6%²¹.

Data shows us that even though the economic crisis has affected most national industries, due to a decrease of sales motivated by a retraction in consumption, some of the metal furniture sector firms have, somehow, been able to overcome this crisis, even though some firms have suffered heavy decreases in their sales.

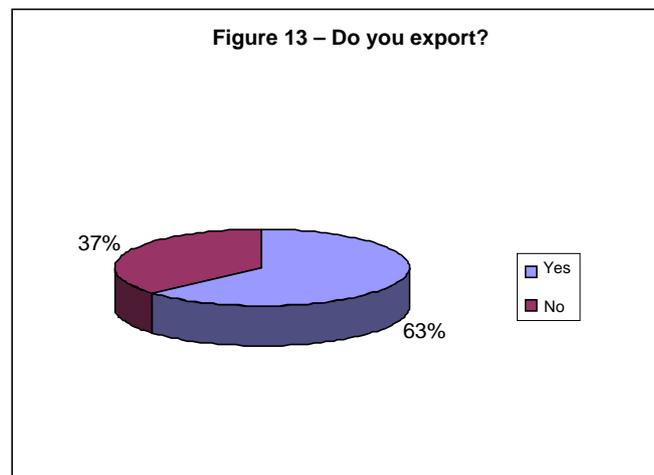
²¹ Data taken from the questionnaire.

Table 11 – Variation of sales

	Variation of sales							Total
	Positive		Negative		Null		DA	
	Frequency	%	Frequency	%	Frequency	%		
Chairs and seats	1	9,1	1	8,3	1	33,3	1	4
Office and business furniture	6	54,5	6	50,0	1	33,3	1	14
Metal furniture for other purposes	4	36,4	5	41,7	1	33,3	2	12
Total	11	100,0	12	100,0	3	100,0	4	30

Source: *Questionnaire*

When asked if they exported their goods, 63% responded affirmatively (Figure 13).



Source: *Questionnaire*

Nonetheless, most firms export only a small part of their production. From those who answered positively to the question above, 2 export between 21 and 40% of their sales, 3 between 41 and 60% and 1 more than 61% (Table 12). Analysis shows that firms that produce office and business furniture and metal furniture for other purposes are the ones that export the most.

Even if the majority of sales are destined to the home market, this tendency seems to be changing, since 6 firms admit that they used to sell all their products internally and now they sell them abroad as well.

Table 12 – Exports, by subsector

	Percentage of sales that are exported						DA	Total
	< 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%			
Seats and chairs	3	1	0	0	0	0	4	
Office and business furniture	11	1	1	1	0	0	14	
Metal furniture for other purposes	9	0	2	0	0	1	12	
Total	23	2	3	1	0	1	30	

Source: *Questionnaire*

The main destinies of these firms' products are Europe and former Portuguese colonies, mainly Spain (according to 6 firms), France (2), Angola (2), Cape Verde (2), Mozambique (2), Holland (1) and England (1)²². One should stress that 6 firms export almost all their goods to a single country (either to Angola or to Spain). According to the results these are the “favourite” destinations of more than 81% of the exported goods (Table 13).

Table 13 – Percentage of sales that are exported, by destiny

	Percentage of sales that are exported					Total
	< 20%	21 to 40%	41 to 60%	61 to 80%	81 to 100%	
Angola	0	0	0	0	2	2
Cape Verde	0	0	1	0	1	2
Spain	2	0	2	0	2	6
France	0	1	1	0	0	2
Holland	1	0	0	0	0	1
England	0	0	0	0	1	1
Mozambique	0	0	2	0	0	2
Total	3	1	4	0	6	16

Source: *Questionnaire*

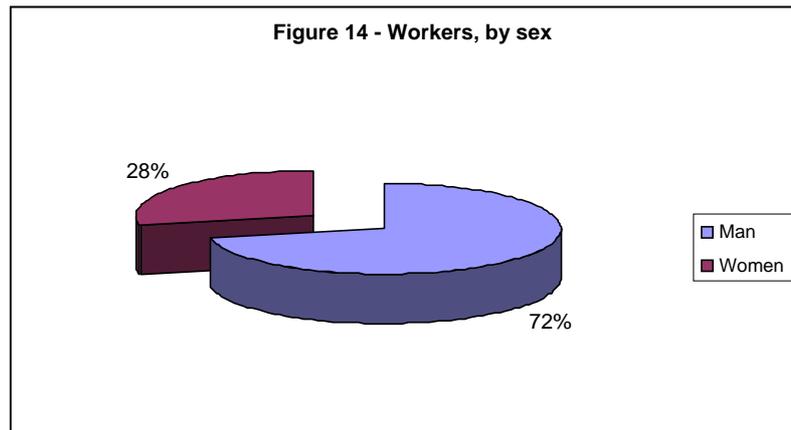
Since the objective of this paper is to assess, as referred to before, the dynamics and competitiveness of the firms that produce metal furniture in the “Distrito” of Aveiro, one will now look closely at their ability to adapt to increasingly demanding consumers and to tougher competition, through the improvement of their workforce's skills, product differentiation and quality improvements at all levels.

According to Gassmann (1995), investment is important, not only the physical investment, but also the investment in human capital.

²² From the 30 firms that comprise the sample, 11 only sell to the home market and 3 did not answer.

In order to evaluate the investment in human capital, one has analysed some issues related to human resources – age structure, level of formal education, on-the-job training, type of labour contract, professional qualification, rotation of workers, and so on.

The firms' workforce is mainly composed by men (72% are males), which is not strange, given the “hard” chores involved in this kind of activity (Figure 14)²³.

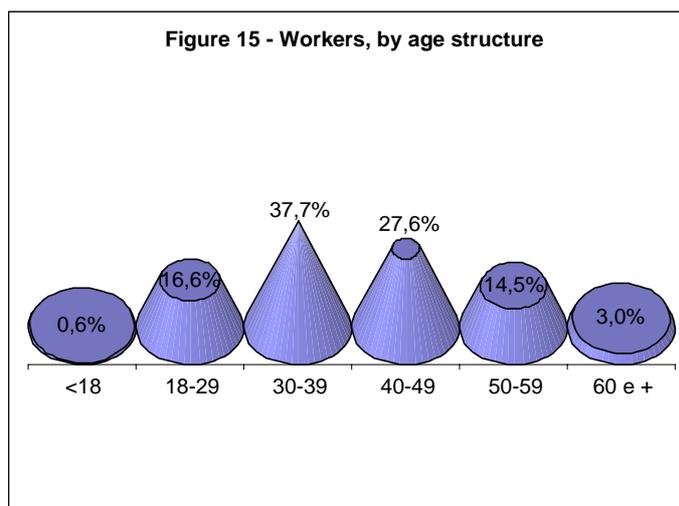


Source: *Questionnaire*

Looking at the workers' age, one found out a quite mature workforce, since 45,1% are over 40 years old and, from this percentage, 3% are over sixty. 16,6% of the workers are between 18 and 29 years old, 37,7% between 30 and 39 and 0,6% under 18 (Figure 15)²⁴. The differences found in the age structure may be related to the specificities of the sector in study. Older workers, which have worked almost all their lives in this sector, have a high knowledge of the techniques that are used. On the other hand, younger workers have, probably, a higher capacity of learning how to work with the new equipment that firms are buying, as one has seen before.

²³ Only 28 questionnaires were analysed here, since two firms did not answer to any of the questions related to human resources. These 28 firms employ 1.637 people.

²⁴ From the 30 firms of the sample, only 27 answered this question properly. These 27 firms employ 1.564 people.



Source: *Questionnaire*

The low percentage of workers between 18 and 29 years old is probably related to the fact that most of these young people were born in a more favourable social-economic context than their parents, and look for better and less harsh job opportunities.

On the other hand, very few people have been recruited in the last few years, as one will see, which also contributes to the ageing of the sector's workers.

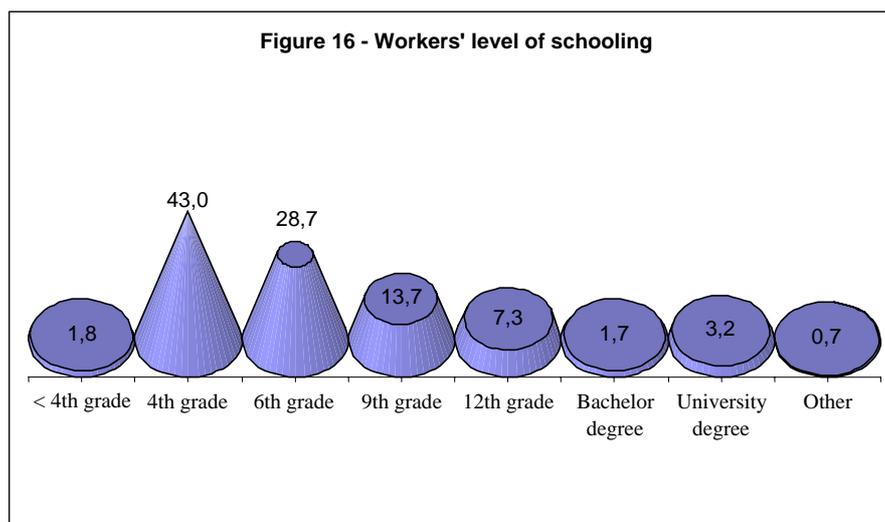
Figure 16 presents the workers' level of schooling²⁵. There are many individuals (44,8%) with less than the 6th grade, which is a very high figure, if one thinks that the minimum level of schooling is now the 9th grade. If one crosses these data with the workers' ages, an explanation is found, since — a few years ago — the minimum level of schooling was the 4th grade.

The percentage of workers with less than the 9th grade of schooling is 73,5%. 13,7% of the workers have the 9th grade, 7,3% have the 12th degree and 4,9% have a higher education degree.

Another conclusion can be taken: there are a lot of workers that drop out of school before completing the minimum schooling level. In fact, this is a characteristic of our country: Portugal has a very high level of school abandon compared to the EU²⁶ figures.

²⁵ From the 30 firms of the sample, only 25 answered this question properly. These 25 firms employ 1.514 people.

²⁶ Portugal is now trying to reverse this situation, by creating a *National Plan to Prevent School Abandon* (PNPAE – Plano Nacional de Prevenção do Abandono escolar), resulting from a joint action of the Ministry of Education and the Ministry of Social Security and Work (March 2004).



Source: *Questionnaire*

The results indicate that this sector favours long term relations with employees, in order to take advantage of their knowledge and, consequently, of their ability to work with the type of equipment used (there are still many firms that only use mechanical equipment). However, this tendency may change, if one takes into account the increasing concerns with innovation and design, which may lead to the acquisition of new production equipment and to the use of complex computer programmes. As a result, more professionals with higher levels of education²⁷ tend to be hired.

According to Gassmann (1995), it is necessary to have a better trained workforce, not only in formal education, but also on-the-job, in apprenticeships.

The inquired firms have shown concern with their workers' training. Of those who said they have replaced their machines recently²⁸, all of them said to have given training to their workers, mainly in the firm (all except one stated that no formation was given to their employees inside the firm's facilities)²⁹. The employees have also received formation from institutions like IEFP³⁰, and from firms that sold the equipment.

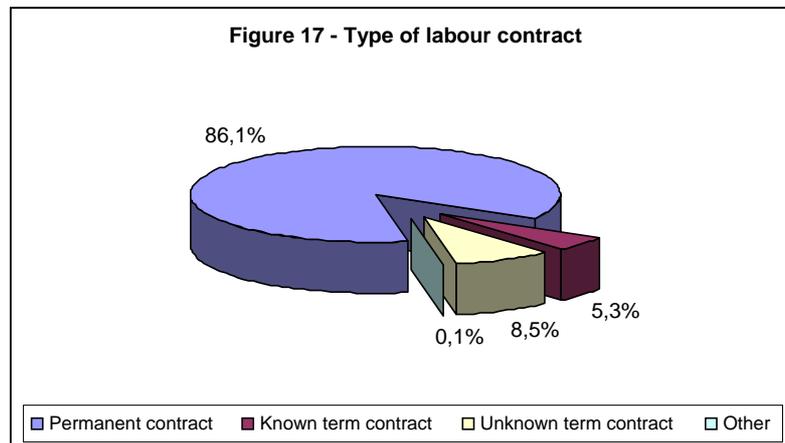
²⁷ Though, many times, these are the entrepreneurs' sons or daughters.

²⁸ Figure 12.

²⁹ Data from the inquiry.

³⁰ Instituto de Emprego e Formação Profissional.

The type of labour contract established between the firms and their employees is quite stable. As shown in Figure 17³¹, 86,1% of the employees have a permanent contract with their employers. This is – certainly – a good explanation for some of the workers' advanced age, since job security usually originates loyalty towards the employers.

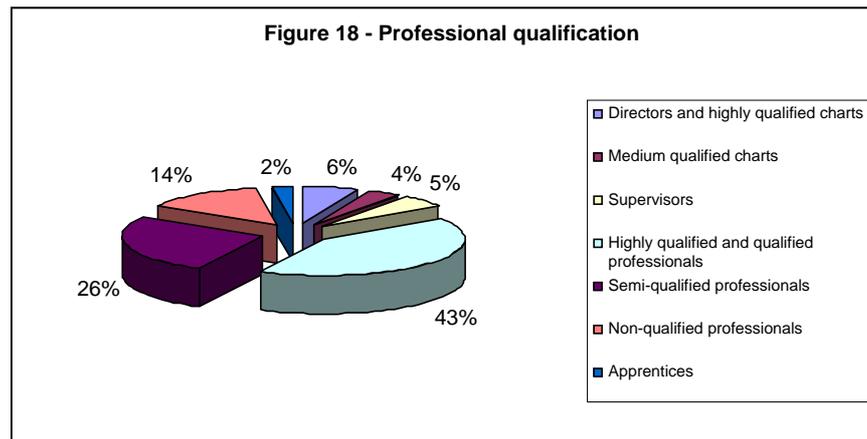


Source: *Questionnaire*

Figure 18 shows us the professional qualification of the inquired firms' workers. There is a high percentage of highly qualified and qualified professionals (43%), followed by semi-qualified professionals (26%) and non-qualified professionals (14%).

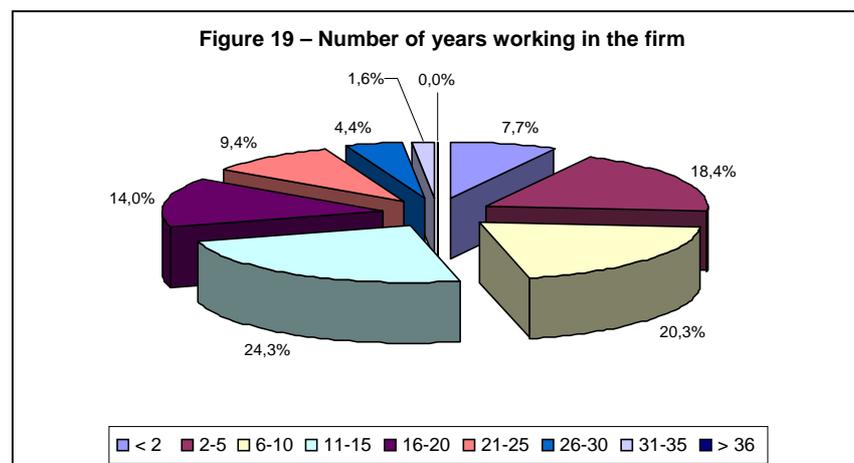
One should also stress the low percentage of medium charts (4%) and supervisors (5%). These figures were quite expected, since these firms prefer semi-qualified and non-qualified professionals for non complex chores, and highly qualified and qualified professionals for more difficult chores. Usually, more complex chores are oriented by the entrepreneur and by older, and more experienced, employees.

³¹ From the 30 firms of the sample, only 25 answered this question properly. These 25 firms employ 1.531 people.



Source: *Questionnaire*

Looking at the number of years in the firm (Figure 19), one can see that the majority of employees has been working in the same firm for at least 6 years (73,9%), and 15,3% of the employees for more than 20 years!³² Data seems to indicate that this sector's firms offer stability to their employees, allowing them to work in the same place almost all of their working lives. Of course that this stability also explains the age average in the sector: workers keep their jobs until retirement age.

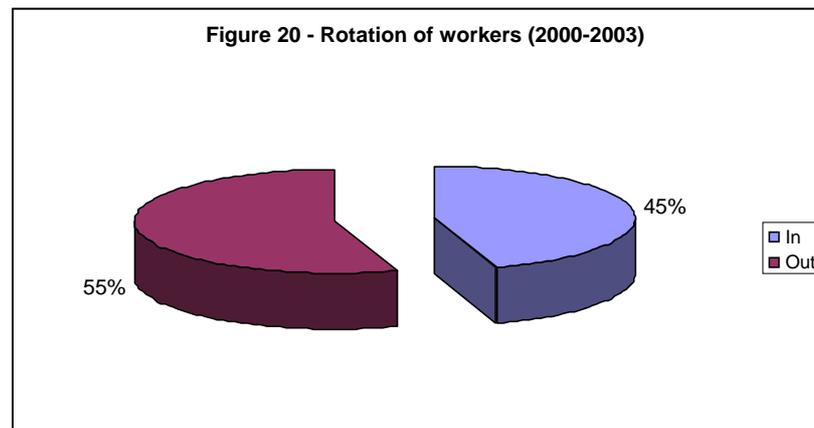


Source: *Questionnaire*

The analysis to the rotation of workers from 2000 to 2003 (Figure 20), allows one to stress that there has been a decrease in the number of people working in the inquired firms. In fact, over the last four years, 456 workers have left these firms and

³² From the 30 firms of the sample, only 26 answered this question properly. These 26 firms employ 1.527 people.

only 373 new workers were hired³³. This does not come as a surprise, bearing in mind the economic crisis that one has already referred to.



Source: *Questionnaire*

Nevertheless, from 2000 to 2001, the number of recruited workers (134 and 121, respectively) was higher than the number of workers that left the firms (92 and 118, respectively). However, this has changed in the following years: the entrance of workers in 2002 and 2003 (72 and 45, respectively) were inferior to the exits (128 and 118, respectively) (Table 14).

From the number of workers hired from 2000 to 2003, 24,5% came in on a permanent basis and 70,4% with known term contracts. Almost 5% of newcomers signed unknown term contracts, something which may derive from the present critical financial situation of some of the inquired firms, which fear more stable contractual relationships and prefer to test new workers before hiring them on a permanent basis, or from the need of extra workforce to satisfy some bigger sporadic orders. From the number of workers who left between 2000 and 2003, 53,5% had a permanent contract and 43,6% a known term contract.

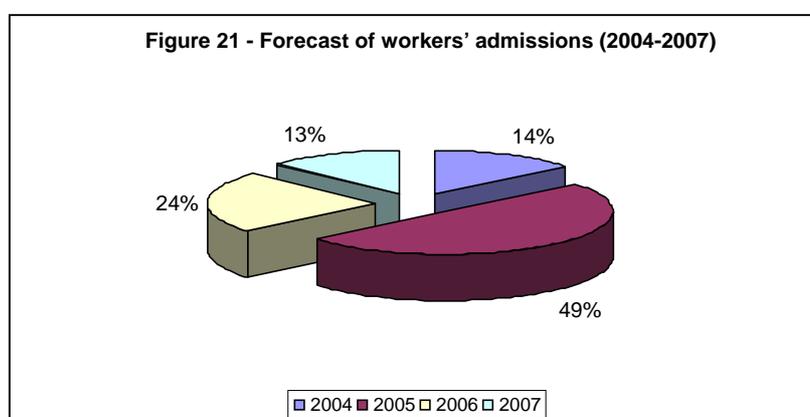
³³ From the 30 firms of the sample, only 21 answered this question. These 21 firms employ 1.426 people.

Table 14 – Rotation of workers, by type of labour contract

		Type of labour contract				Total
		Permanent contract	Known term contract	Unknown term contract	Other	
In	2000	26	105	3	0	134
	2001	35	82	4	0	121
	2002	18	47	5	2	72
	2003	12	28	5	0	45
Totais		91	262	17	2	372
Out	2000	43	48	1	0	92
	2001	61	54	3	0	118
	2002	77	47	4	0	128
	2003	63	50	4	1	118
Totais		244	199	12	1	456

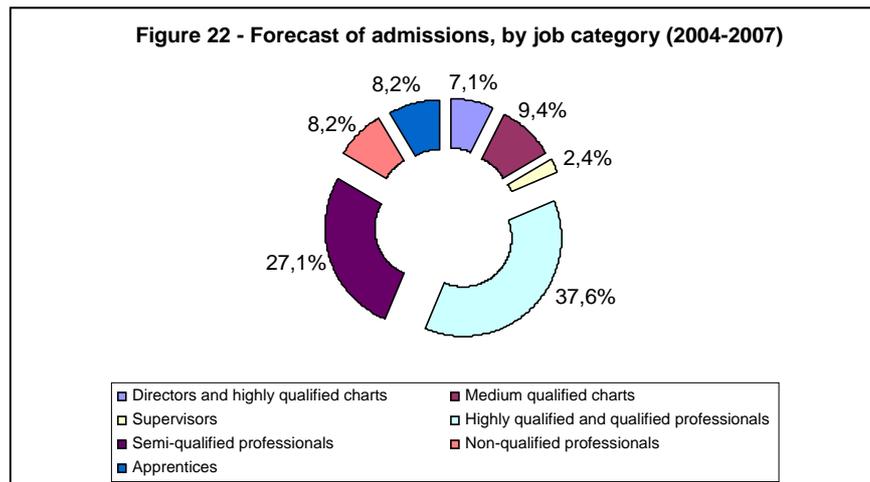
Source: Questionnaire

When asked to anticipate the number of workers to hire in the next four years, from the 22 firms that answered the question, 13 said they did not expect to hire anyone in the near future. The nine firms that mentioned the need to hire new employees in the next four years said they expected to admit 85 new workers (14% in 2004, 49 % in 2005, 24% in 2006 and 13% in 2007) (Figure 21).



Source: Questionnaire

Firms say they need to hire more 37,6% of highly qualified and qualified professionals and more 27,1% of semi-qualified professionals (Figure 22).



Source: *Questionnaire*

It should be stressed that 26,7% of the inquired firms did not answer this question and 43,3% did not know yet if they would be able to hire new employees in the near future. This data seems to indicate a lack of strategic management of human resources.

The ability to compete depends on the ability to innovate. Product innovation cannot be dissociated from product design. From the inquired firms, 25 say they have their own design (Table 15) and, from these, 66,7% use computer programs to design their products, mainly: *Autodesk Inventor*, *Autocad*, *Proengineer*, *Solid Works* and *Freehand*³⁴. These programs allow improvements in product design and a higher flexibility in the models created, satisfying the customers' tastes, and putting the firms in a more competitive position.

From the inquired firms, 53,3% stated to manufacture on demand and 26,7% stated they imported their design from abroad.

Table 15 – Product design

	Frequency	Total	%
Own design	25	30	83,3
Imports national design	2	30	6,7
Imports international design	8	30	26,7
On demand	16	30	53,3

Source: *Questionnaire*

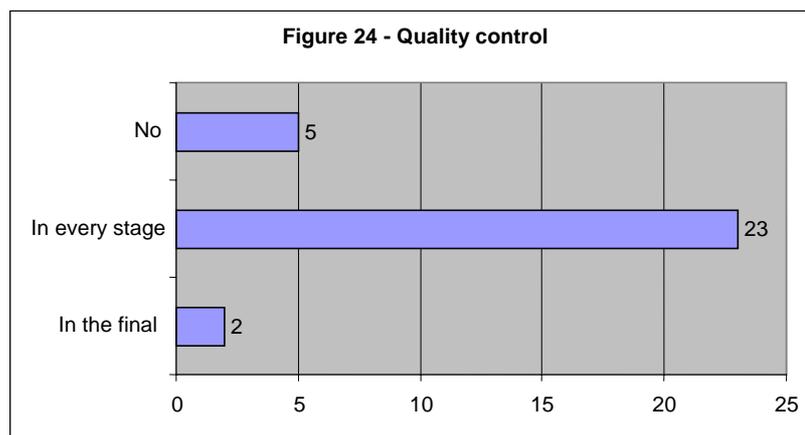
³⁴ Conclusions drawn from the questionnaire.

Another important indicator of a firm's competitive capacity is the quality of its products. When asked if they had a quality certificate, 47% said they had one, and 10% said they were involved in a certification process (Figure 23). Even if data shows some sensitivity towards quality issues, it is believed that firms should be more worried about getting a quality certificate, in order to guarantee the quality of their products and, consequently, a higher satisfaction of their customers.



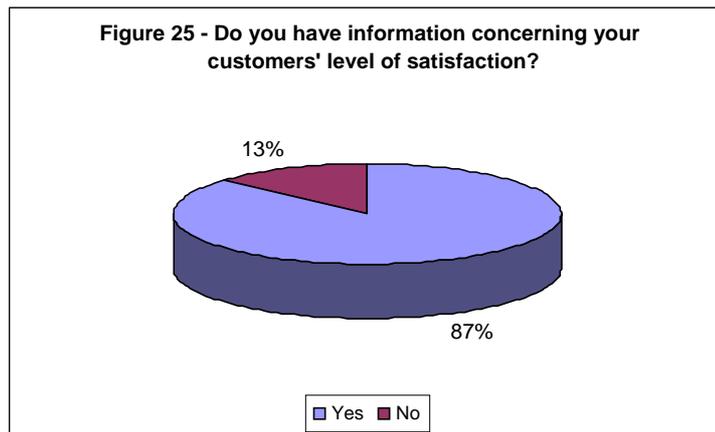
Source: *Questionnaire*

Even though 43% of the inquired firms do not have a quality certificate, almost all of them seem to worry about quality issues in every stage of their activity (Figure 24).

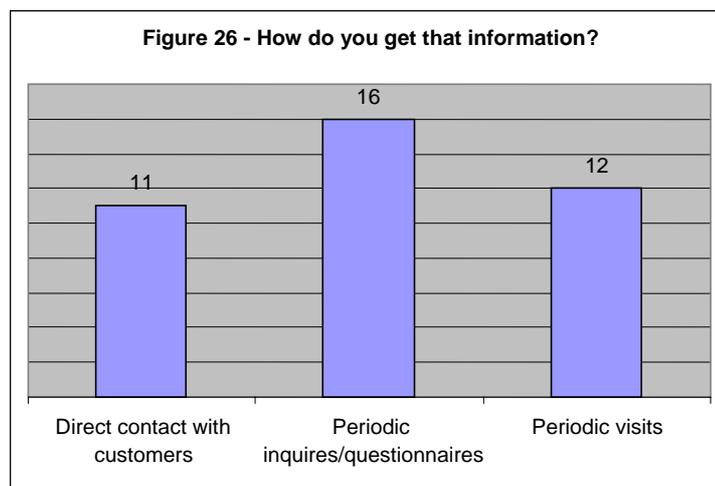


Source: *Questionnaire*

When questioned about their customers' level of satisfaction, most of the inquired firms (87%) stated they had information on that (Figure 25), obtained, essentially, through periodic inquiries/questionnaires (Figure 26).



Source: *Questionnaire*



Source: *Questionnaire*

According to 90% of the inquired firms, their customers are either satisfied or very satisfied with the firm's products and services. Only 3,3% state to have more or less satisfied customers, and none says to have any "not satisfied" customer (Table 16).

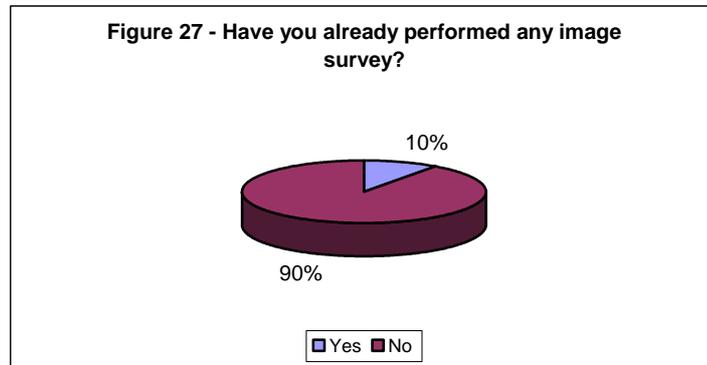
Table 16 – Degree of satisfaction

	Frequency	%
Not satisfied	0	0,0
Little satisfied	0	0,0
More or less satisfied	1	3,3
Satisfied	22	73,3
Very satisfied	5	16,7
DA	2	6,7
Total	30	100,0

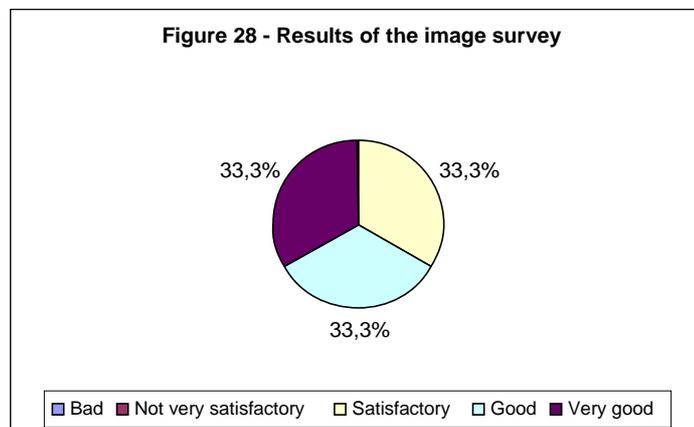
Source: *Questionnaire*

However, when asked if they had already performed an image survey, 90% of the inquiries, said that they had done none (Figure 27). The only 3 firms that studied

their image obtained the following results: satisfactory (1 firm), good (1) and very good (1) (Figure 28).



Source: *Questionnaire*



Source: *Questionnaire*

Firms that never carried out an image survey were asked to foresee the results they would get if such a study had been performed. All the firms, apart from one, said they expected to get positive results (Table 17).

Table 17 – Foreseen results if there had been an image study

	Frequency	%
Bad	0	0,0
Not very satisfactory	1	3,7
Satisfactory	16	59,3
Good	9	33,3
Very good	0	0,0
DA	1	3,7
Total	27	100,0

Source: *Questionnaire*

Since it is important to analyse if a firm's products are being well advertised either nationally or abroad, one asked the firms if they attended both national and international fairs. 80% of the firms said they attended national fairs and 83,3% said they attended international fairs (Table 18).

Table 18 – Attendance to national and international fairs

	Frequency	%
National fairs	24	80,0
International fairs	25	83,3
Total	30	100,0

Source: *Questionnaire*

However, the inquired firms seem to attend these fairs more to see new tendencies and to take some ideas to new products, than to show their products both nationally and internationally. Only 8 from the 24 firms that go to national fairs do it to exhibit their products and only 7 from the 25 firms that go to international fairs do it to exhibit their products (Table 19). All the firms that exhibit their products in fairs also visit them, except for one.

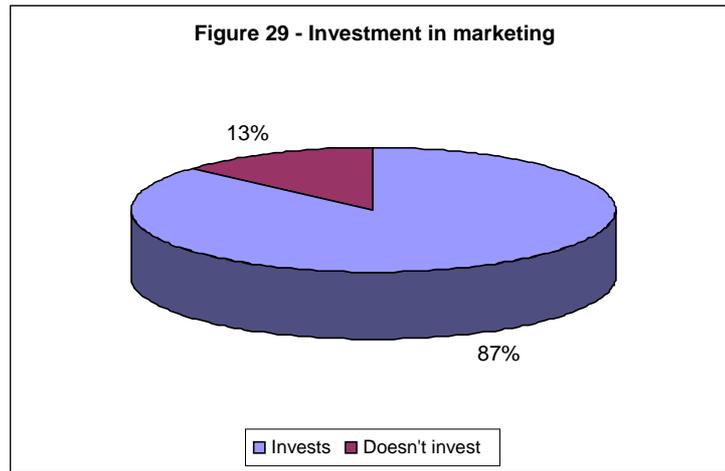
Table 19 – Type of attendance to fairs

	Frequency	%
Do you attend national fairs	24	100,0
As exhibitor	8	33,3
As visitor	21	87,5
Do you attend international fairs	25	100,0
As exhibitor	7	28,0
As visitor	24	96,0

Source: *Questionnaire*

In order to better assess the inquired firms' concern with their image, firms were asked if they divulged their products and the amount of money spent on marketing. It was possible to conclude that 87% of the inquired firms invest in marketing (Figure 29). The amount spent is, in average, around €132.472, ranging from €600 to €1.000.000³⁵.

³⁵ The average was calculated based exclusively on the respondent firms (from the 30 firms of the sample, the ones that did not invest in marketing (4) and the ones that did not answer (6) were not included).



Source: *Questionnaire*

The means more often used to advertise are catalogues and the internet, possibly because they are the least expensive. However, 20% of the respondent firms stated they advertise their products on TV, 36% in newspapers and 36% in magazines (Table 20). The less used advertising vehicle is the radio. Some firms also stated they advertise their products through outdoors, especially when supporting sports events.

Table 20 – Means used by firms to advertise

	Frequency	%
TV	5	20,0
Radio	4	16,0
Newspapers	9	36,0
Magazines	9	36,0
Catalogues	24	96,0
Internet	18	72,0
Other ³⁶	3	12,0
Total	25	100,0

Source: *Questionnaire*

Connected to a firm's image are certainly environmental concerns. The analysis of the results may lead to the idea that some concepts are still unknown. However, there seems to be a great concern in fulfilling all the environmental issues supervised and punishable by law, namely illegal discharges of residues (controlled annually by a compulsory presentation of the residues' maps).

³⁶ The word "Other" refer to *outdoors*.

5. Conclusion

The study has shown that the metal furniture sector, which is composed mainly of small and medium size enterprises, has a preponderant importance in the “Distrito” of Aveiro, due to the number of people that it employs, to the number of firms related to this sector established in the “Distrito” and to the growing quality of these firms. In fact, 20% of the firms that were inquired in this study were awarded the prize “PME Excelência” from IAPMEI (Instituto de Apoio às Pequenas e Médias Empresas e ao Investimento) in 2001 which is, of course, a good indicator of dynamism.

Moreover, the results indicate that most firms are geographically concentrated in the “Concelho” of Águeda, keeping strong connections, either upstream or downstream, with other firms. Most of this sector’s suppliers are from the “Distrito” of Aveiro. This gathering of firms in Águeda is related to the strong metallurgic tradition of this “concelho”.

Over the last few years, as a result of the less favourable economic conjuncture, this sector has suffered decreases in production and sales. Nevertheless, it has shown some signs of recovery – sales have slightly increased over the last year.

The analysis has also indicated that most of the sector’s production is sold to the home market, despite the fact that a significant number of firms export their products, namely to Spain, France and former Portuguese colonies (Angola, Mozambique and Cape Verde). In spite of that, the percentage of sales exported is not significant when compared to the amount sold. It is believed that entrepreneurs should try to conquer new markets, especially abroad. This could be done, for example, through the exhibition, in international fairs, of properly certified quality products, and through good marketing strategies.

The study has also demonstrated that firms that produce metal furniture employ people with a low schooling level, a situation which is not very different from the Portuguese reality. This scenario should change if Portuguese firms are willing to go further and overcome ferocious competition. Therefore, firms should seriously think of administering continuous training to their human resources within an overall politics of human development that should be pro-active instead of reactive.

The analysed firms have also shown some concern with product differentiation. Indeed, most of them publicise their products and design their own models, allowing increased production flexibility and a higher ability to adapt to their customers' tastes.

In short, this study has demonstrated that metal furniture firms have a quite dynamic and competitive profile. They have proved to be already sensitive to quality related issues and worried about their customers' satisfaction. Nonetheless, there is still a long way to go, namely in issues regarding quality certification, the training and qualification of workers and image projection abroad. These issues are critical in order to broaden horizons and to conquer higher market shares in an increasingly competitive world.

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