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the Net Effect of Productive Efficiency
and Growth Constraints

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Abstract

This paper investigates differences in behaviour and performance of listed Spanish family and non family firms. We find that family firms grow at a smaller rate, choose less capital intensive productive technologies and are more efficient in production than non family firms. However the economic profits, financial structure and cost of capital is the same in family and in non family firms. This evidence, in sharp contrast with other found in samples of listed US firms where family firms outperform in profits to non family ones, is interpreted in the context of institutional differences between the two countries, in particular higher technological capital and better protection of minority shareholders in US than in Spain.

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1. - INTRODUCTION

  This paper investigates how family ownership shapes the relations between preferences, behaviour and performance of firms. The study draws from institutional and transaction costs theories of ownership and governance that explain governance choices as the result of a process of transaction costs minimization within a framework of competition and natural selection; Demsetz (1983), Williamson (1985). Family ownership is viewed as a governance form subject to demands of efficiency similar to those corresponding to other forms of ownership, Pollak (1985). The empirical predictions of the analysis are tested with data from a sample of Spanish family and non family firms listed on the Stock Market that survive as listed during all the period 1990 to 2004. The results confirm one of the main predictions of transaction costs theory, namely that in the equilibrium of assignment of transactions to governance forms, no differences in economic profits are expected among alternative forms of ownership.

Since the path breaking study of Demsetz and Lehn (1985), several studies have provide evidence in support of the hypothesis from transaction costs theory that , controlling by the characteristics of the transactions that determine the choice of one governance or the other, no differences in profitability are expected among firms of different ownership structure; Cho (1998), Himmelberg et al (1999), Demsetz and Villalonga (2001). But there is also conflicting evidence. Among large US firms, for example, Holderness and Sheehan (1988) find that firms under family ownership create less economic value than non family firms, while McConaughy et al (1998), Anderson and Reeb (2003a,b) and Villalonga and Amit (2004) find that family ownership implies higher economic value of the firm. Thomsen and Pedersen (2000) find mixed evidence about the relation between the nature of the dominant shareholder, share of concentration and performance in a sample of large companies from 12 European nations.

We present additional evidence on family ownership and performance of firms from a country, Spain, with different institutional organisation than the US, and a period of time, the nineties, when Spanish firms have been subject to strong competition from inside and outside. Spain is a country that belongs to the so called French legal system and, as expected, ownership is highly concentrated even among larger firms listed on

the stock market, as those included in this study[1]. The analysis of ownership form and performance of firms in different institutional frameworks, will be important in order to isolate the effect of the institutional environment in the observed evidence on the relationship between ownership and performance, as the ownership structure it self will be shaped by the institutional environment.

Besides the additional evidence on ownership and performance of firms in different institutional and economic environments, the paper also makes what we believe is an important distinction in explaining economic performance of firms, namely differences in decision makers' preferences and differences in productive and competitive constraints. In this respect, differences in performance, profitability, of family and non family firms are broken down into the part due to differences in the objective function of those who make decisions in each of the firms, and differences in the constraints in the form of more or less productive efficiency in transforming inputs into outputs. Market competitive conditions are assumed the same for family and non family firms.

The main discourse of the paper is the following . Family ownership goes together with a strong preference for family control of the assets of the firm. To give up control implies a very high utility loss for the family up to the point that to keep control becomes an end in itself. In operational terms, the strong preference for control introduces a singular constraint in the choice set of family firms: total invested capital can not go beyond the amount that both, assures family control and assures appropriate diversification of total family wealth. In competitive product markets, the disadvantage created by the size-growth constraint would make impossible the survival of family firms with binding constraint, unless the preference for control that is behind the constraint is compensated with another advantage of family ownership. This advantage, if in fact exists, has to show up in the form of higher productive efficiency and it will be the net result of the transaction costs of contracting under family ownership. To our knowledge, the test of costs and benefits of family ownership in terms of growth constraint and higher total factor productivity is unknown in the literature.

The evidence from our sample of Spanish firms is consistent with the situation just described: Family firms listed on the Spanish Stock Market in 1990 are of similar age

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[1] The Spanish case also differs from the evidence observed in other European countries as UK, where family ownership among large firms shows a pattern similar to that in the US, in the sense that founding families are able to control the firm with small block holdings of shares; Franks, Mayer and Rossi (2004).

but of smaller size than the rest of listed firms. Surviving family firms, in the sense that remain listed 15 years later, have higher productive efficiency, measured in terms of total factor productivity, than surviving non family firms, but no evidence is found of differences in profitability between the two groups of firms. Family firms choose more labour intensive production technologies as a way to reduce the amount of invested assets and remain competitive, but the financial structure of both forms of ownership is similar.

Section 2 of the paper presents the theoretical background on the economic analysis of the family firm compared with the firms that do not face the growth/size constraint. Section 3 contains the description of the sample of firms, the methodology and the variables that will be used to test the assumptions and predictions from the theoretical analysis. Section 4 presents the results of the empirical analysis in the sample of Spanish firms. The conclusions contain a discussion and synthesis of the main results.

2.- THE BASIC THEORY AND BEHAVIOURAL MODEL.-

The most defining feature of the family firm is the will to maintain ownership and control of the company in the hands of a group of people who share family ties, together with the will to continue doing so in future generations, Pollak (1985), Casson (1999), Chami (1999).   The will to keep the control within persons who share family bonds, comes from the non pecuniary benefits of control obtained by the founder or their heirs, benefits that Demstez and Lehn (1985) call "amenities potential". Of course, the family owners of the firm will prefer more economic profits to less, but in general it is assumed that the monetary pay off needed to compensate the loss of control, and the loss of the amenities potential, is very high.

Family firms listed on a Stock Market can deviate from the firm under "managerial control" described by Berle and Means, in that the former will have a dominant shareholder which, either will manage the firm or will keep close control over manager's decisions. Since family firms are one particular case among firms with large shareholders, the costs and benefits of family ownership can be evaluated from the point of view of the cost and benefits of concentrated versus dispersed share ownership, Holderness (2003). But family owners differ from non family block holders in that the latter obtain only monetary benefits of control while family owners obtain also non pecuniary benefits, such as the amenities potential of Demsetz and Lehn (1985) and the satisfaction of transferring the firm to the descendants, Casson (1999). Non family

block holders will sell the shares as long as the price compensates dividends and the monetary equivalent benefits of control. Family block holders, on the other hand, price so high the non pecuniary benefits that nobody else is willing to pay for them. In other words, family ownership implies that those that control the firm value such control very high and all the decisions are subordinated to hold enough shares/power to effectively control the strategic decisions without the interference of other external shareholders[2].

Family firms will have to accommodate the path of growth to the availability of financial resources that maintain control within family boundaries. Large investment projects may need funding beyond the family wealth, beyond the debt/equity ratio that would imply a too high bankruptcy risk, beyond the desired level of concentration of risk in the family portfolio of assets, or a combination of them. In these situations the investment will have to be postponed or fractioned over a longer period of time. As a result of this, family firms will have similar financial structure and similar cost of capital to the non family but the financial constraints will be more binding in the former than in the later[3].

If family ownership introduces a constraint that non family ownership can avoid, then family ownership can not outperform in terms of profits to non family firms, unless the governance advantages exclusive of family ownership overcome the limitations imposed by the constraint. In the family firm there are no agency costs since there is no separation between management and ownership or, if there is, ownership concentration is sufficiently high that management is subject to close supervision; Fama and Jensen (1983a,b), Ang et al (2000). But the advantages must go beyond those resulting from pure concentration of shareholdings, lower agency costs, since they accrue in principle

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[2] The constraint means that the owners of the family firm are not willing to trade off profits for releasing control. An alternative formulation of the preferences would be a utility function for the owner of the family firm increasing with profits and decreasing with size, as larger size implies that external investors come into the firm and family owners have to give up control. This utility function is in contrast with that of the manager who effectively controls a dispersed shareholders' company, which has been assumed to have a utility function increasing with profits and with the size of the firm; Williamson (1964).

[3] It can be argued that family owners can increase growth and size of the family by increasing leverage and/or not diversifying their personal portfolio of assets. This would imply higher risk exposure both for the firm and for the owners' personal wealth. Under this condition the cost of capital of the family firm would be higher than that of the less leveraged and well diversified ownership form. Besides, high leverage increases the risk of bankruptcy and beyond some point banks can refuse to provide more debt financing.

to any type of block holder, family, bank, individual person or other company, and be limited strictly to family ownership[4].

On the one positive side, family relations reinforce the cohesion and trust among partners and, at times, workers, Pollak (1985), Chami (1999); they increase the level of commitment to bringing off the managerial project, as the success of the business also implies that of the family name, Lyman (1991), Brokaw (1992), and they lengthen the time horizon of decisions, as it is hoped that future generations will continue to push the prosperous firm that has been passed on to them , James (1999), Stein (1989). All this may entail a better management of family firms compared with non family ones, as they function with less supervision costs, with greater ability to generate trust and confidence in third parties and with more long-term vision.

On the negative side, family owners are often more entrenched in relation to non family block holders, Gomez-Mejia et al (2001), which may delay beyond the optimal point the substitution of family shareholders by better qualified professionals in the management positions of the firm, Burkart et al (2003). Additionally, concentration of ownership does not prevent from other governance problems due to conflicts of interests between family members or distortion of incentives due to altruism or kinship behaviour; Chami (1999), Schultz et al (2001)[5].

Since family firms are quite extended in many countries of all levels of economic development and among firms subject to strong product market competitive conditions, it must be true that the costs and benefits of family ownership often translate into a net competitive advantage. It may be argued that the survival condition of family firms is

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[4] Of course if family firms solve the agency problem of separating management from ownership in a more effective way than other types of large shareholders then this is an additional advantage. Here we just assume that the entrenchment possibilities due to large shareholdings compensate the lower agency costs of concentration of ownership in the same way for family than for non family block holders.

[5] It has been argued that family ownership leads to minority shareholders expropriation, Faccio et al (2001), Ang et al (2000), among others. However it is unclear that this expropriation is higher or lower in family firms than in other firms with large shareholders. Moreover rational minority shareholders can anticipate the expropriation and discount it from the price they pay for the shares when the firm goes public; if this is the case the agency costs of going public will be faced by the owner of the firm not by the external investors, Jensen and Meckling (1976). Legal protection of minority shareholders rights may reduce agency costs over all but does not change the prediction that whatever the cost are, they will be paid by the dominant shareholder, as long as investors are rational and anticipate the risk of expropriation before buying the shares.

not determined by the non negative profit constraint but by the non negative utility condition, where utility depends both on profits and on non pecuniary benefits. So family firms could be less profitable than non-family firms but still continue operating in competitive markets. Profitability alone would then be insufficient to explain performance and survival of family firms and the comparison with non family firms would be distorted.

We believe that the comparison of family and non family firms listed on the Stock Market is more suitable for the purpose of evaluating the comparative efficiency of ownership forms since listed firms issue shares to be held by minority non family shareholders. External shareholders will only buy the shares of the family firms if they get a monetary return that compensates the opportunity cost which is equal to the return they can obtain in non family firms of equal risk. Therefore among listed family firms survival is conditioned by obtaining a level of profitability at least equal to the cost of invested capital, similar to the constraint faced by firms of other form of ownership.

Since this paper concentrates the analysis on behaviour and economic performance of listed family and non family firms, we formulate the following three basic hypothesis that are expected to hold for family firms that survive in a competitive environment.

Hypothesis 1.- Surviving listed family firms face a growth/ size constraint that limit their expansion, compared to the growth possibilities of non family firms.

Hypothesis 2.- Surviving listed family firms are more efficient in production than non family firms.

Hypothesis 3,- Surviving listed family firms obtain the same economic profits as non family ones.

The first hypothesis takes into account that the strong preference for control forces to keep a growth path compatible with such preference. The second is based on the prediction that competition only allows the survival of more constrained firms if they compensate such constraint by other advantages. Finally, hypothesis three comes directly from transaction costs theory in that competition among governance forms forces rational, utility maximising behaviour.

2.1.- Behavioural model of the family firm.-

Our interest now is in deriving behavioural implications from the preferences of family ownership combined with the hypothesis above. To do so we postulate a simple profit maximising model with a technological constraint for the non family firm and with a technological and financial constraint for the family firm. The technology, represented by the production function augmented by the effects of ownership in transaction and agency costs, can be different for the two types of firms. The predicted behaviour of the family firm derived in this section will assume that the three hypothesis above actually hold and they will be introduced as part of the model. The appendix contains a more formal presentation of the analysis that here is maintained in a more intuitive way.

Family (F) and non family (NF) firms produce output, to be sold to the market, with two inputs, labour L and capital K. Output and input prices are assumed to be the same for the two kinds of firms since they are considered part of the same inputs and products markets. The productive technology is represented by the neoclassical production function $Q = F(K,L; O))$ where index O captures the effect of ownership on productive efficiency and can take two values, F, family, and NF, no family ownership. $F ( )$ is an increasing and concave function in K and L for all values of O (non increasing returns to scale).

From Hypothesis 1, H1, the family firm faces a constraint of the form $K \leq \bar{K}$, where $\bar{K}$ is the limit of invested capital compatible with family control and, at the same time, allows for family wealth diversification up to the point that the cost of capital of family and non family firms is the same. From this constraint we can define the *shadow price of capital* as the increase in the maximum profit that is obtained from a marginal increase in the optimal level of capital. For the family firm with binding capital constraint the shadow price will be the change in profit due to a marginal change in $\bar{K}$.

The production function can take different forms that the empirical evidence will help to identify. For example $F(K,L;O) = A(O)G(K,L)$ would indicate that the ownership form only affects the parameter A, the level of Total Factor Productivity, TFP. The shape of the production function is the same for the two forms of ownership. On the other hand $F(K,L,O) = A(O)G(K,L;O)$ will indicate that the production function can be different in both, the level of TFP and the shape of the production function. Implicit in H2 is the hypothesis that in both formulations of the production function $A(F) \geq A(NF)$, that is the

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productive efficiency in terms of TFP is higher or equal to the surviving family firms than for the non family ones..

Finally, if p is the price of output, w the cost of labour and c the cost of capital, H3 is formulated as $ROA(F) = (pF(K,L;F) – wL)/K = ROA(NF) = (pF(K,L;NF) – wL)/K$, for the values of the variables in their profit maximizing solution. If markets are competitive, both rates of return, $ROA(F)$ and $ROA(NF)$, will also be equal to the cost of capital, c.

Within these constraints, we summarize the consequences of profit maximizing behaviour of family and non family firms in the following proposition formally proved in the Appendix.

>   ***Proposition.***
>
>   – *The profit maximizing combination of labour and capital of family firms and non family firms imply that the capital per employee of the family firm is less or equal to that of the non family firm, and strictly lower if the capital constraint is binding.*
>
>   - *In competitive product markets the shadow price of capital is zero for non family firms and family firms with non binding constraint, and positive for family firms with binding constraint. Under imperfect competition and market power, so firms earn positive economic profits, the shadow price of capital of the non family firm will be negative. Family firms will have a shadow price higher than non family.*

We now present the intuition of this result with the help of Figure 1.

Lines MM' and RR' show, respectively, the marginal return of capital and the average return on invested capital for a non family firm as a function of the amount of capital invested, K, and for a given amount of labour employed, L*. Line FF' shows the average rate of return as a function of invested assets for the family firm. We assume that the marginal return is the same for the two firms to clarify the exposition. The profit maximizing solution implies to choose the value of $K=K^*$ where marginal return on capital is equal to the marginal cost c. This is also the point where the economic value of invested assets is maximized. If the product market is competitive economic profits

will be zero and the economic value of invested assets will just be equal to their replacement costs. Under these conditions in the profit maximizing solution average return on invested capital will be equal to marginal return and equal to the cost of capital. Figure 1 represents this solution for the non family firm with invested assets K^*.

Consider now the case of a family firm. The amount of invested capital that the family owner can finance, without loosing the control of the firm and keeping a diversified personal portfolio of investments, is $\overline{K}$. For this level of investment the cost of capital of the family and non family firm will be the same as the risk premium is also the same under optimal shareholders' wealth diversification (the assumption we maintain along the paper). If the locus of return on investment and capital K were the same for the two firms then the family firm could not get external finance since external shareholders would not earn the competitive cost of capital. The family firm will survive only if the family owners can finance all the assets and are willing to compensate economic losses with the pecuniary benefits of control.

But suppose that the family firm is more efficient in transforming inputs into outputs because it has lower agency costs or better implication of the management team in the success of the company, line FF'. Now family ownership can still attract external finance since at the invested assets $\overline{K}$ the two firms earn the same rate of return and pay the same cost for their finance. The family firm compensates the negative effects of the size constraint with more efficient production activity. Non family firms capture all the gains from size but their higher agency costs imply lower productive efficiency.

Notice also that, at the profit maximizing solution, the slope of average return on investment to the total assets of the firm will be positive for the family firm and null for the non family one. This means that in the family firm the return on the last unit of capital invested is above marginal cost so an additional unit of capital invested would produce positive economic profits and value (positive shadow price of capital).

Of course, it could happen that the family that owns the firm has enough wealth to diversify their portfolio of investments and invest up to K^* in the family firm. In this case the family firm will outperform non family firms. We rule out this solution as part of a long run equilibrium since if management and ownership costs of family firms are lower, family firms should grow in size taking over non family firms up to the point where the advantages are exhausted. At this point family firms would be larger in size

than non family firms and would be found in more proportion in sectors with larger scale economies in production. This prediction is not supported by the existing empirical evidence[6].

The exposition can be easily extended to the situation where firms have market power. Now the profit maximising value of K is higher than the value that maximises the average rate of return. In the point where marginal cost of capital equals marginal productivity of capital the average return is above the cost of capital and the firm earns positive economic profits. At this point the slope of the average rate of return of the firm is negative[7].

Other behavioural choices.-

Implicit in the exposition above is that the productive technology of family and non family firms differs only in terms of TFP, *A(O)*. However, one way to make the capital constraint less binding consists in using productive more labour intensive technologies and save capital and financing needs. As the technology becomes more labour intensive, similar inputs and output prices will imply a profit maximising input mix with relatively less capital per unit of labour. In the neoclassical production function, more labour intensive technology means that, for a given elasticity of output to changes in labour, the more labour intensive it is the lower elasticity of output to capital.

Not all technologies are equally competitive and, in some industries, the competitive viable technologies to choose from may be a reduced set and all of them with high capital requirements. If this is the case, a low number of family firms would be expected in this industry. But in sectors with more opportunities to differentiate the product and many and diverse market niches, family firms will find opportunities to be competitive with limited amount of capital investment. This implies, firstly, that the relative number

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[6] None of the existing studies finds that family firms are of larger size than non family firms, and in most of them family firms are of smaller size than non family firms. Only Villalonga and Amit (2004) find that the size of family firms is equal to the size of non family ones.

[7] Figure 1 can also be used to illustrate the behaviour of a managerial firm with positive preferences for profits and size, Williamson (1964). The indifference curve of the manager of the firm will be tangent to the production possibility set in a point beyond K^*, the profit maximizing amount of invested capital. If the production possibility frontier is the same for all firms, the managerial firm will be larger and will earn lower return on investment than the shareholder controlled one, because of its preferences for size. However implicit in agency theory is that agency and transaction costs will lower the productive efficiency of the manger's controlled firm and this implies lower production possibilities than for the shareholders controlled one. In the managers' controlled firm all predictions go in the direction of lower profitability but for different reasons, preferences for size and lower productive efficiency because of agency costs.

of surviving family firms will not be uniform across industries but rather family firms will find more opportunities to survive in sectors with more labour intensive technologies. Second, within an industry, if feasible, family firms are more likely to produce with more labour intensive technologies than non family firms. These include industries with high rates of technological innovation, which in the early stages are highly labour intensive. In these companies the asset base is knowledge that is kept proprietary using patents or by keeping a technology lead.

Financial decisions can also be a way to soften the size constraint by family firms. Debt is a substitute of equity finance with no decision rights as long as the debt services are satisfied. Family firms can be inclined to use debt finance to sustain growth without loosing control but, at the same time, if the risk of financial distress is too high then firms will stop using debt because the likelihood of having to transfer the decision rights to the debt holders (bankruptcy) becomes too high. On the other hand, the cost of debt and equity is likely to increase as the firm becomes more leveraged and higher cost of capital will create a competitive disadvantage. These conflicting forces may help to explain why the empirical evidence on whether family firms are more leveraged than non family firms or not, is mixed[8]. Our hypothesis, in line with the main assumption that family firms limit growth to keep risks and cost of capital under control, is that leverage, debt composition and cost of debt are all the same in family and non family firms [9].

3. – SAMPLE OF FIRMS, METHOD AND VARIABLES

3.1.- Sample of firms.-

The comparison of performance and behaviour of family and non family firms is done with a sample of Spanish firms that are listed on the Spanish Stock Exchange. We start with all non financial and non regulated firms (for example banks and energy producing firms are excluded from the analysis) listed in 1990, and select as a sample for the study all family and non family firms listed in 1990 that continue on the Stock

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[8] Mishra and McConaughy (1999) find that family firms are less leveraged than non family firms but Anderson and Reeb (2003) do not find differences in the financial structure of family and non family firms. Both papers referred to US firms. Schulze el al (2003) find a U shaped relation between use of debt and dispersion of ownership within family firms in high growth industries, which is interpreted in terms of response to agency problems of family ownership.

[9] See Shleifer and Vishny (1986). Firms may substitute shareholders in performing the diversification although the evidence seems to indicate that more diversified firms have lower economic performance than less diversified ones; Villalonga (2004). Anderson and Reeb (2003b) find lower diversification among listed US firms under family ownership than among non family ones.

Market in the year 2004. There are 150 firms in 1990 of which only 53 continue listed 15 years later, 29 under family ownership and 24 under non family ownership. Selected companies are grouped in seven industry sectors, the same used by the Spanish Stock Exchange.

A listed company is considered a family firm if the sum of the shareholding (direct and indirect) held by shareholders of the same surname is the largest block holder among all other block holders of shares in the company. This is a more restrictive definition of family firm than in other papers such as Anderson and Reeb (2003) and Villalonga and Amit (2004), where a firm is considered a family firm if the founding owner and/or her heirs occupy significant positions in the board of directors or in the management of the company. The reason we associate family ownership with dominant block holding is that in the sample of firms shareholdings are highly concentrated and it is not realistic to assume that the firm is under family control if there are other dominant shareholders even though family founders have minority shareholdings and/or are members of the board of directors. In this situation, ownership, management and control of the firm by the dominant shareholder will go together and the distinction made by Villalonga and Amit (2004) in this respect, does not apply in our sample.

The sources of information used to identify the shareholders and their respective shareholdings are mainly the files of the Spanish National Commission for the Stock Market, completed with other non official files such as Maxwell Directory and company records. In Spain, listed companies have to report to the National Commission the names and shareholdings of shareholders with blocks of shares of 5% or more and any holdings for those that seat in the board of directors. Evidence will also be provided on the evolution of shareholdings concentration over time for the firms in the sample.

This sample of firms has several advantages for the purpose of this paper. First, the groups of family and non family firms are almost matched samples in the sense that they have had similar external opportunities to finance their growth since they are all above a certain size and are open to external sources of equity. The two groups have been subject to the same external shocks during the period under study, so we can see if the ownership form affects the survival possibilities of firms, besides short-term economic performance.

Second, to open share ownership to non-family members through public offerings is the last resort of family firms to finance growth before selling the block of control.

Therefore listed family firms are likely to be the least affected by the growth constraint and if the constraint appears to be binding even among them, one can be quite sure that the constraint will limit the strategic choices of all family firms. Third, listed family firms will have to make sure that non family shareholders receive a return on their investment at least equal to the opportunity cost of capital. Family owners may trade off pecuniary returns in exchange of the non pecuniary benefits and amenities of control, but when the firm has external shareholders the trade off will be limited by the constraint that expected economic return of the investment is at least equal to the cost of capital; otherwise the firm will not be able to get external finance. Listed family and non family firms face a similar minimum profitability constraint and for this reason the comparison of economic performance between family and non family firms makes more sense among listed firms than among non listed ones, where less economic profits of family firms may not imply less economic efficiency when we take into account their higher non pecuniary benefits of control[10].

Finally, share ownership of listed Spanish firms is highly concentrated in line with the dominant form of ownership in countries with a legal system of French origin, Crespi and García-Cestona (2001). This means that the comparison between family and non family firms will be a comparison between firms with different dominant shareholders (a bank, a foreign firm, the State, other Spanish firms, individuals,..). In USA and UK shares concentration varies widely across listed firms and the comparison between family and non family firms may end up being a comparison between firms with a significant shareholder, the family, and firms with dispersed shareholdings. Finally, listed family firms can be considered for the most part as independent firms. Pyramids and complex cross shareholdings are not frequent among Spanish listed family firms, so the shareholding rights are very close to actual voting rights.

3,2.- Productive efficiency, technology and input mix

The productive efficiency of each firm in the sample will be measured in terms of TFP obtained from the estimated production function. With the notation of section 2,

$$\text{Pr}oductive\,Efficiency = TFP = A(O) = \frac{Q}{G(K,L;O)}$$

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[10] In their analysis of the efficiency of family ownership Schultze et al (2001) and Gomez Mejía et al (2001) ignore the non pecuniary benefits of control as part of the utility received by owners and managers of family firms.

This measure of productive efficiency has significant advantages over partial productivity measures (output per employee for example) such as those used in Hill and Snell (1989) and in McConughy and others (1998), since, for example, output per unit of labour can be higher in one firm compared to the other because the former uses more capital per unit of labour, not because it is more efficient in production.

We further assume that the production function is of the family of Cobb Douglas functions $Q = A K^{\alpha} L^{\beta}$ where A, α and β are positive parameters. The value of A gives a measure of *TFP* while α and β are the elasticity of output to capital and to labour respectively. Family and non family firms will be allowed to have different technologies in terms of different parameters of the production functions, elasticity α and β. The assumption of higher productive efficiency for the family firm implies that the parameter A satisfies the condition $A_F > A_{NF}$.

From the Cobb Douglas specification of the production function the actual model to be estimated is formulated as follows,

$$Ln\left(\frac{Q}{L}\right) = a + \alpha \, Ln\left(\frac{K}{L}\right) + \delta \, LnL + \gamma FAa + \eta FALn\left(\frac{K}{L}\right) + \varphi FALnL + CV \qquad (1)$$

Where *FA* is a dummy variable that takes the value of 1 if the firm is a family firm and zero otherwise; $a = LnA$ is the estimation of the log of *TFP*; $\delta = \alpha + \beta - 1$ is a measure of the scale economies in the production function so that $\delta = 0$ implies constant returns to scale, $\delta > 1$ increasing returns and $\delta < 1$ decreasing returns. Finally *CV* means control variables, in particular dummy variables that control for industry and time effects.

The coefficients of the variables multiplied by *FA* allow for differences in the production function of family and non family firms. For example, a positive and significant estimated value for γ will be consistent with the hypothesis of higher productive efficiency of family firms and the estimated value of η will indicate differences in the elasticity of output to capital between family and non family firms. For example, a negative estimated value implies lower elasticity of capital, and less capital intensity, of family firms, compared to the non family ones.

The data needed to estimate model (1) is obtained from the accounting statements, balance sheets, income statement and annual reports, submitted by listed firms to the

Spanish National Exchange Commission, as part of their official reporting obligations. Output Q will then be measured in monetary units as the value added (difference between the value of what is produced and the value of the intermediate inputs bought outside) at constant prices of 2002. The value added is deflated with the price index of the industry to which the firm belongs. Capital input and services K will be measured by the total Assets net of short term finance without explicit interest costs (ie accounts payable) at the end of the year. Labour services L will be measured by the total number of employees of the company also at the end of the year.

The comparison of the capital to labour ratio of family and non family firms will be made directly from the comparison of the ratio *Assets/Employees* of the two groups of firms.

3.3.- Growth/size constraint

To test the hypothesis that preferences for control limit the growth rate of family firms compared to that of non family ones, we postulate a simple relation between size (Assets), age (T), and average growth rate (g),

$$Assets_T = Assets_0 \, (1+g)^T$$

Where $Assets_T$ are the current total assets of the firm (in year 2002) and $Assets_0$ are the unknown assets when the firm was created in year 2002-T. Taking logs we have $Ln\,Assets_T = Ln\,Assets_0 + T\,Ln\,(1+g)$. Therefore from the empirical model,

$$Ln\,Assets_T = a + b\,T + c\,FAT \qquad (2)$$

We can test the hypothesis that family firms are subject to a growth constraint by testing that the growth rate in invested assets of family firms is lower than that corresponding to non-family firms. In terms of the model in equation (2) this implies that,

$$(c+b) = Ln\,(1+g_F) = g_F < b = Ln\,(1+g_{NF}) = g_{NF}\,.$$

Of course the hypothesis that the average growth rate is lower for family firms than for non family ones is equivalent to show that average size of family firms is lower than average size of non family ones of equal age.

The size/growth constraint has implications for the behavioural model in the sense that, if the constraint is binding, in the optimal profit maximizing solution the shadow price of size is positive for the family firm and zero for the non family firm in competitive

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product markets, and always larger for the former than for the later in the presence of market power and extraordinary profits. Therefore the value of the shadow price of size provides complementary information about the binding constraint for family firms.

To estimate the shadow price we formulate a model that attempts to describe the locus of return on assets ROA, and invested capital K.

$$ROA = a + b\,Ln\,K + \lambda\,FA\,Ln\,K + CV \qquad (3)$$

It is straight forward to show that the slope of ROA to changes in capital K is equal to b/K for the non family firm and to $(b+\lambda)/K$ for the non family firm. Therefore, from the Appendix, b and $(b+\lambda)$ are the unknown shadow prices The assumptions from section 2 are that b is non positive and λ is non negative. Return on assets ROA will be measured by profits before interest income and taxes divided by Assets, and capital K by the net Assets of the firm. Control variables will include time and sector dummies and the Assets/Employees ratio to account for possible differences in production technology of family and non family firms.

4.3.-Profitability and financial variables

The profitability of firms will be measured in terms of accounting profits. Although firms in the sample are listed in the Stock Market, the market based measures of performance are excluded because many of the firms are highly illiquid, their free float is negligible, and market prices can be highly influenced by few transactions.

Return on assets, ROA is the main measure of profitability considered in the analysis. To control for possible differences, due to risk premium, in the cost of capital of firms, tests of differences in ROA between family and non family firms will take account of differences in their respective cost of debt. In any case this will consist in testing for differences in ROA controlling for industry and time period effects and controlling for the average cost of debt for the firm, our proxy for the cost of capital. The other two performance measures are defined as $\left(\dfrac{ROA}{r} \right)$ and $\left(\dfrac{ROA}{r} + \dfrac{Intangible\ Assets}{Total\ Assets} \right)$. The ratio between ROA and cost of capital is a proxy for the Tobins' q ratio when the firm is in a steady situation. If the firm has profitable growth opportunities tied to intangible assets, the proxy for the q ratio includes a relative measure of these intangibles. As in the case of ROA, the comparison of the proxy of the q ratio between family and non family firms will control for industry and time effects. .

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For the financial variables, the hypothesis to be tested are that, the cost of debt, *r*, the debt to assets ratio, *Debt/Assets*, and the composition of the debt, proportion of long term debt over total debt, *LTDeb/Debt,* are equal for family and for non family firms, when properly controlling for non ownership effects on financial decisions. More formally, we regress the financial variable using the dummy variable FA as explanatory variable, together with time and industry dummies and the null hypothesis is that the coefficient of FA is non statistically significant. In the case of long term debt over total debt, the fixed assets over total assets ratio is added to the list of control variables.

Table 1 presents descriptive statistics, mean and median, of the variables used in the analysis, for family and for non family firms. It also shows the statistics and level at which the null hypothesis of equal means and equal medians between family and non family firms, are rejected. This preliminary evidence confirms that family firms are of smaller size and produce with lower volume of assets per employee than non family firms. The mean of ROA and of the ratio of intangible over total assets is higher in family firms, while family firms use relatively less long term debt than non family. For the rest of variables no differences are detected between the two groups. Notice, however, that from the observed differences nothing can be said yet about the effect of ownership in explaining them since we don't control for other sources of differences, for example industry effects [11].

4.- RESULTS.-

4.1.- Survival and shares' concentration in listed family and non family firms

The samples of listed Spanish firms that qualify for the analysis in 1990 consist on 150 companies. Out of them 57 (38%) have a family as the dominant shareholder, and 93 (62%) are firms with non family ownership. Table 2 shows these numbers distributed by industries. Fifteen years later, in 2004, only 53 firms out of the 150 remain listed (35%). Of them 29 are family firms and the rest non-family that is, the proportion of family firms within the firms that remain listed is now 51%, compared with the initial

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[11] It may be of interest to compare our sample with that of Anderson and Reeb (2003) for the USA. Their sample size is 319 firms from the S&P 500 and covers the period 1993 to 1999. Around 33 per cent of the firms have members of the founding family in management or board positions. Non family firms are larger than family (average assets of 16.433 millions and 9,560 millions of dollars, respectively) but also 12 years younger, on average, for a total of 78 years. In our sample the proportion of family firms is larger, 38%, their average size is smaller, 67 millions of euros, and their age is younger, 47 years. Villalonga and Amit (2004) report also around one third of family firms in their Fortune 500 sample, although they do not observe differences in size between the two groups.

38%. Very few of the remaining listed firms change in ownership from family to non family or vice versa; two family firms change to non family and five of the surviving as listed non family firms change to family firms during the period. The evidence indicates that family firms are able to remain listed in higher proportion than non family firms are. Moreover among those firms that have been liquidated or are inactive, 13 (14% of the total no family firms in 1990) are non family and 3 (5% of the total) are family firms. In the sample of Spanish listed firms, family ownership does not imply lower likelihood of surviving as a listed firm than non family ownership. This evidence has to be evaluated taking into account the evolution of the firms during a fifteen year period with two complete economic cycles and with a process of liberalisation and openness of the Spanish economy to international competition..

The evidence presented in Table 3 confirms the high level of shareholdings concentration in Spanish listed companies, independently of the control group considered, Families, National Companies, Foreign Investors, Financial Institutions, and State. In all control groups the larger shareholder has, on average, at least 28% of the shares. Among family firms the average percentage of shares held by the largest shareholder, the family owner, is 49,2 in 1990 and 46,8 % in 2004[12]. If we count the shares held by the five largest shareholders then the lowest average percentage of shares, in 1990, is 35,8%, in the group of firms where the main shareholder is a foreign firm. Concentration remains very stable over time, although the overall trend in concentration is increasing. Surviving firms as listed in the sample appear to have found the optimal ownership structure and remain in it.

The conclusion about concentration and stability of the ownership structure of listed Spanish firms, family and non-family, is also clear from Table 4 that shows the shares held by the control group and by the rest of the significant shareholders in 1990 and in 2004. The percentage of shares up to 100 would be, approximately, the free-float of shares in each group. This fraction is very low and, if any, it has decreased over time, even though the expansion of the Spanish Stock Market during this period of time. This development has had to do mainly with the privatisation of old public and regulated

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[12] These figures are again in sharp contrast with those of Anderson and Reeb and Villalonga and Amit in their S&P and Fortune 500 samples where average shareholdings of family members in family firms are 18 and 16% respectively.

monopolies till the point that, in 2004, none of the listed firms is under State control. The evidence on concentration of ownership is relevant for the purposes of our research since the comparison between family and non-family firms should be free from the possible effects of differences in concentration. The reason is that, contrary to what may happen in the US, in Spain the concentration of shareholding is fairly similar in family and in non family firms and the differences in the effects of ownership, if there are any, will have to be attributed to the characteristics of the control group and not to the effect of differences in concentration.

4.2.- Technology, production efficiency and input mix

This section presents the results of the tests of hypothesis concerning productive technology, input mix and TFP. Table 5 presents the results of estimating equation (1) on productive technologies and total factor productivity for family and non family firms. The first column shows the estimation assuming that the production technologies are the same for the two forms of firm ownership. Column two allows for differences in all the coefficients of the production function between family and non family firms. In this column, the parameters that allow for differences in the coefficients of the production function for family and for no family firms are all statistically significant so the hypothesis of equal technologies for the two groups of firms can be rejected.

Notice that, since the coefficient of the variable log of Employees is negative, the underlying technology for the two types of firms shows decreasing returns to scale. Second, the elasticity of output to capital for the non family firms is 38,4%, a number similar to that obtained with data for larger samples of Spanish companies[13]. On the other hand, the elasticity of output to labour is 51,9%, also consistent with estimations from other data sources. For family firms, the elasticity of output to capital is only 22,3% (0,384 – 0,161) while the elasticity of output to labour is similar to the elasticity in non family firms, 51,3%. The empirical evidence confirms that family firms produce with less capital intensive technologies than non family firms.

Second, in column 2 the constant term for the family firm (coefficient of the dummy variable FA) is significantly higher than the constant term for the non family one. This confirms that the total factor productivity (TFP) of the family firm is above the TFP of

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[13] For example, in the large data base on non financial Spanish firms Central de Balances, the share of gross profits to value added has been between 36% and 41%.

the non family firm, that is, it confirms that family firms are more efficient in transforming inputs into outputs than non family ones, within their respective production functions.

Preliminary evidence that family firms produce with a combination of labour and capital where capital per employee is lower than in non family firms, was already presented in Table 1. However, to properly account for industry and time effects the variable Assets/Employees is modelled as a function of the dummy variables FA, INDUSTRY and TIME. The econometric estimation of the model (OLS) gives a coefficient of -464,3 for the variable FA, with t statistic equal to (-5,9)   significantly different from zero at p value of 0.001 or less. Therefore, the new test confirms that family firms produce with less amount of assets per employee than non family firms.

4.3 Growth and size constraint

Table 6 presents the results of the test of the behavioural prediction that family firms are of smaller size than non family firms because they grow at a lower rate over time (estimation of equation (2)). First we see that, controlling for industry effect, the coefficient of the dummy variable FA is negative and statistically significant which implies that family firms have lower amount of invested assets than non family firms (column 1). The conclusion is similar when we control with age, column 2, something expected taking into account that both types of firms, family and non family, are of similar age (see Table 1). The final column of Table 6 explains the differences in age in the last year of the sample period as a result of differences in the rate of growth, lower in family than in non family firms (coefficient of the variable *FAAge* negative and statistically significant). In fact, the average implicit long term rate of growth for the family firms is halve the rate of non family ones (0,02 and 0,04 respectively).

Another testable implication of the size constraint faced by family firms is that for these firms the shadow price of invested capital will be higher than for non family firms. Table 7 presents the results of estimating equation (3) designed to test the hypothesis on shadow prices that comes out in the Proposition. The model of equation (3) gives the locus of return on capital and size of firms in the sample. The first column shows the estimation of shadow price assuming the same technology for the two types of firms. Column 2 controls for the effect on profitability of the capital intensity and allows for differences in the effects between family and non-family firms. In this column, the negative coefficient of the variable *Log Assets* in the group of non-family firms

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indicates that the hypothesis of market power for these firms can not be rejected. On the other hand, the positive and significant coefficient of the variable *FaLogAssets* confirms the hypothesis that the shadow price of the family firms is higher than that for non-family firms. In this case, since from the estimated values $b+\lambda >0$, the shadow price of the family firm is positive.

4.4.-Profitablity and financial variables

The main results of the comparison between profitability of family and non family firms are presented in Table 8. The relevant variable for the conclusions about such comparison is the dummy variable FA, and the statistical significance of its estimated coefficient. In all cases the coefficient is non statistically significant so the null hypothesis of equal profitability between the two groups of firms could not be rejected. Notice also that the coefficient of the variable cost of debt is positive and significant in column 1, consistent with what it could be expected if firms with higher cost of capital have a higher cut off point in marginal return of investment projects (and higher average return).

With regard to the financial variables, the hypothesis of equal means between family and non family firms is only marginally rejected for the leverage ratio, where the coefficient of Debt /Assets ratio is 4 percentage points lower for family firms, significantly different from zero at the 10 % level. Some of the differences that appear in Table 1 have to be attributed to factors different from ownership. Namely, in the case of composition of debt, once we control for the differences in the short versus long term composition of assets of family and non family firms, the differences in debt composition disappear. Family firms have proportionally more short term debt than non family firms because their proportion of short term assets is also higher.

5.- DISCUSSION AND CONCLUSION

Transaction cost theory predicts that controlling for the factors that determine the choice of one or other form of ownership should not affect performance. However some recent papers provide evidence that, among listed US firms, family ownership implies higher economic value than other forms of ownership.

One reason why some form of ownership may outperform others in a persistent way is that market competition is imperfect and firms can deviate from profit maximization without endangering their survival possibilities. Family firms earn higher profits

because they concentrate in profit maximization while non family ownership, for example firms under managerial control and high agency cost, are able to deviate from such behaviour and survive because external control mechanisms, such as product market competition or the market for corporate control, are not working effectively.

Another reason for differences in profitability can be that behind the most effective ownership form there is a resource in limited supply that is the true determinant of the sustainable competitive advantage. In fact, papers that compare family and non family firms tend to make a distinction on whether founding family members are at the top of the management team or out of it. It could happen that the entrepreneurial talent of the founder were impossible to replicate so family ownership, which goes together with the presence of the founder of the company in key positions of the company, just reflects the unique resource provided by the entrepreneur who founded the firm. Palia and Ravid (2002), Adams et al (2004) and Villalonga and Amit (2004) find that firms in which the founder occupies top management positions (CEO, President) are more valued by the market than other listed firms, specially if family control is in the form of shares' ownership. Peng and Jiang (2004) refer to networking and personal relations of family CEOs among Asian firms, to explain potential sources of superior economic performance of Asian family firms.

The two explanations of persistent differences in performance across ownership forms have different managerial and social implications since, in the first case, the explanation has to do with monopoly power and social inefficiency while, in the second, it has to do with differences in productive efficiency or with a better endowment of strategic resources correlated with differences in profitability.

The comparison between performance of family and non family firms in our sample of Spanish firms has some methodological advantages. First, the results should not be affected by differences in concentration of shares, since concentration is high in all firms, and the differences in performance, if any, can only be attributed to differences in preferences and/or in contracting costs of having one dominant shareholder, a family, or another (a bank, another firm, individuals). Among listed Spanish family firms no distinction can be made between family ownership, control and management, as Villalonga and Amit (2004) do, since family ownership always goes together with large block holdings.

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Second, our paper compares performance of family and non family firms in terms of total factor productivity. Productive efficiency can be a better measure than profits or shareholders value, because the governance form affects the costs of contracting, which combined with the state of the technological knowledge both determine the production possibilities of the firm. If family ownership provides governance advantages and has access to the same technological knowledge than firms under alternative ownership forms, family firms will be more efficient than non family firms in transforming inputs into outputs. But higher efficiency does not imply higher profits if family and non family firms operate under different competitive conditions in their respective product markets, or if the preference for control changes the profit maximising solution because the family firm has an additional constraint.

Equally important is that the private benefits of control, if any, will reduce accounting profits if they are materialised in perks' consumption or other private consumption of the assets of the firm. Accounting profits, dividends and market value of shares will all undervalue the true wealth created by the firm when the private benefits of control are important. Profits and market values of the shares of two equally productive firms under similar competitive conditions, can be different because in one firm there is more perks' consumption by the controlling group than in the other. The contribution to wealth creation by different forms of ownership is more properly evaluated using measures of productive efficiency since they are not affected by how profits are distributed among interested parties.

In the sample of listed Spanish family and non family firms over a 15 years time period studied in this paper, family firms are smaller in size, produce with less capital intensive production technologies and are more efficient in transforming inputs into outputs, than non family firms. However, they obtain the same return in invested assets, after controlling for differences in risk and cost of capital for each of the firms in the sample. This evidence is consistent with institutional theories of the firm that predict competition among governance forms for the transactions to be governed in order to minimize production and transaction costs. Surviving forms of ownership respond to rational choices so that, in the equilibrium, all advantages of one form over the other are exhausted and all of them show similar economic profits. In particular, family firms compensate the size-growth constraint they face in order to preserve control by family members within reasonable risk exposure, with higher productive efficiency.

The survival rate of family firms, as measured in the paper in terms of remaining listed on the Stock Exchange after 15 years, is higher than that corresponding to non family firms, which supports the premise that family firms are more reluctant to give control over the assets of the firm to other groups of shareholders, because family owners obtain non pecuniary benefits from such control that other shareholders are not willing to pay for it. But the number of family firms that stop being listed, and even disappear, is still quite large which implies that survival of family firm is still a relevant research topic.

We are not aware of other studies that compare the behaviour of family and non family firms and test the hypothesis of differences in productive efficiency and size constraints as we do in this paper, but evidence from the US for the same time period, finds that family firms are of equal size and more profitable and valuable than non family firms, Villalonga and Amit (2004). We think that the observed differences between the US and Spain have to do with two main institutional factors.

First, higher and more valuable entrepreneurial talent in the US than in Spain, probably because in the former country family firms represent in a higher proportion firms with endurable technological and commercial advantages resulting from R&D and marketing innovation. In many cases the entrepreneurial capital is unique and can not be replicated so it becomes a sustained competitive advantage that shows up in higher profits and value. Second, in the US family firms do not face the same growth constraint than family firms face in Spain because they are able to separate family control from family ownership and can dilute family shareholdings without loosing control. This is possible because minority shareholders rights are better protected in the Anglo-Saxon legal system of governance than in the French legal governance system, where to keep control requires to hold large share holdings.

If the thinking is correct the differences observed between firms of the two countries should disappear as more endowed Spanish entrepreneurs find their way towards world leading positions in their industries, as its the case with examples such as INDITEX, and as improvements in the governance system allow them to find ways to grow and spread the risks with many shareholders while keeping control of the firm.

Appendix: Proof of the Proposition

Proposition 1: **a) Perfect Competition**

The profit-maximizing problem of the family firm is formulated as follows

$$\underset{K,L}{Max} \quad pQ - wL - cK$$

$$\text{Subject to } Q = F_F(K,L)$$
$$K \leq \overline{K}$$

Where p is the price of output, w is the cost of labour and c is the user's cost of capital.

Let λ be the Lagrange multiplier of the capital constraint (shadow price of capital). If the constraint is binding at the optimal solution, the first order conditions, are as follows,

$$p\frac{\partial F_F}{\partial K} = c + \lambda \qquad (A.1)$$

$$p\frac{\partial F_F}{\partial L} = w \qquad (A.2)$$

Define Σ_K the elasticity of the output Q with respect to input capital K, and Σ_L the same elasticity with respect to labour L. It is straightforward to show that (A.1) and (A.2) imply,

$$\frac{K}{L} = \frac{w\Sigma_K}{(c+\lambda)\Sigma_L} \qquad (A.3)$$

Where the variables K, L and λ are evaluated at their optimum values.

The condition (A.3) for the non-family firm will be the same except for $\lambda = 0$ Therefore it is immediate that capital to labour ratios for family, F, and non family, NF, firms satisfy the condition $\left(\frac{K}{L}\right)_F < \left(\frac{K}{L}\right)_{NF}$, at their optimal values, as long as the elasticity Σ_K and Σ_L are similar for the two firms.

Define the average rate of return on capital for the family firm,

$$R_F = \frac{pQ - wL}{K}$$

The derivative with respect to K and assuming that L is fixed at the optimal value, gives

$$\frac{\partial R_F}{\partial K} = \frac{1}{K}\left[p\frac{\partial F_F}{\partial K} - R_F\right]$$

From the first order condition, (A.1), this can be written as

$$\frac{\partial R_F}{\partial K} = \frac{1}{K}\left[c + \lambda - R_F\right]$$

With all variables evaluated at profit maximizing values of K and L.

The assumptions of competitive conditions and that family firms and non-family firms earn in equilibrium the same rate of return, $R_F = R_{NF}$ (institutional equilibrium), imply $R_F = R_{NF} = c$.

Therefore,

$$\frac{\partial R_F}{\partial K} = \lambda / K > \frac{\partial R_{NF}}{\partial K} = 0$$

The marginal change in the average rate of return on invested capital as total capital increases is positive for the family firm with binding capital constraint and zero for the non constrained family firm. Of course if the capital constraint was not binding then the shadow price will be zero and the marginal changes would be equal to zero for the two firms.

Proposition 1: b) Market Power

The first order conditions (A.1) and (A.2) are now

$$p\frac{\partial F_F}{\partial K} = (c + \lambda)\left(\frac{\Sigma_p}{\Sigma_p + 1}\right) \tag{A.4}$$

$$p\frac{\partial F_F}{\partial L} = w\left(\frac{\Sigma_p}{\Sigma_p + 1}\right) \tag{A.5}$$

Where Σ_p is the elasticity of demand. Since $\Sigma_p / (\Sigma_p + 1)$ cancel out in the division, the capital labour ratio K/L is the same as in (A.3).

The derivative of R_F with respect to K gives now

$$\frac{\partial R_F}{\partial K} = \frac{1}{K}\left[\left(\frac{\Sigma_p + 1}{\Sigma_p}\right)p\frac{\partial F_F}{\partial K} - R_F\right]$$

Substituting the first order condition (A.4)

$$\frac{\partial R_F}{\partial K} = \frac{1}{K}\left[c + \lambda - R_F\right]$$

And for non family firm,

$$\frac{\partial R_{NF}}{\partial K} = \frac{1}{K}\left[c - R_{NF}\right]$$

With market power we assume that the firm earns extraordinary profits, i.e, $R_{NF} > c$ in the profit maximizing solution. On the other hand, from the institutional equilibrium condition, $R_F = R_{NF}$. Therefore

$$\frac{\partial R_F}{\partial K} = \frac{\partial R_{NF}}{\partial K} + \frac{\lambda}{K} > \frac{\partial R_{NF}}{\partial K}$$

$$\frac{\partial R_{NF}}{\partial K} = \frac{1}{K}[c - R_{NF}] < 0$$

Non family firms with market power will operate at a point where marginal increases in capital would produce a decrease in their average rate of return on invested capital. For family firms the change in average rate of return may be positive or negative depending on whether λ is greater or smaller than R_{NF} - c. In any case the change will always be larger for family than for non family firms.

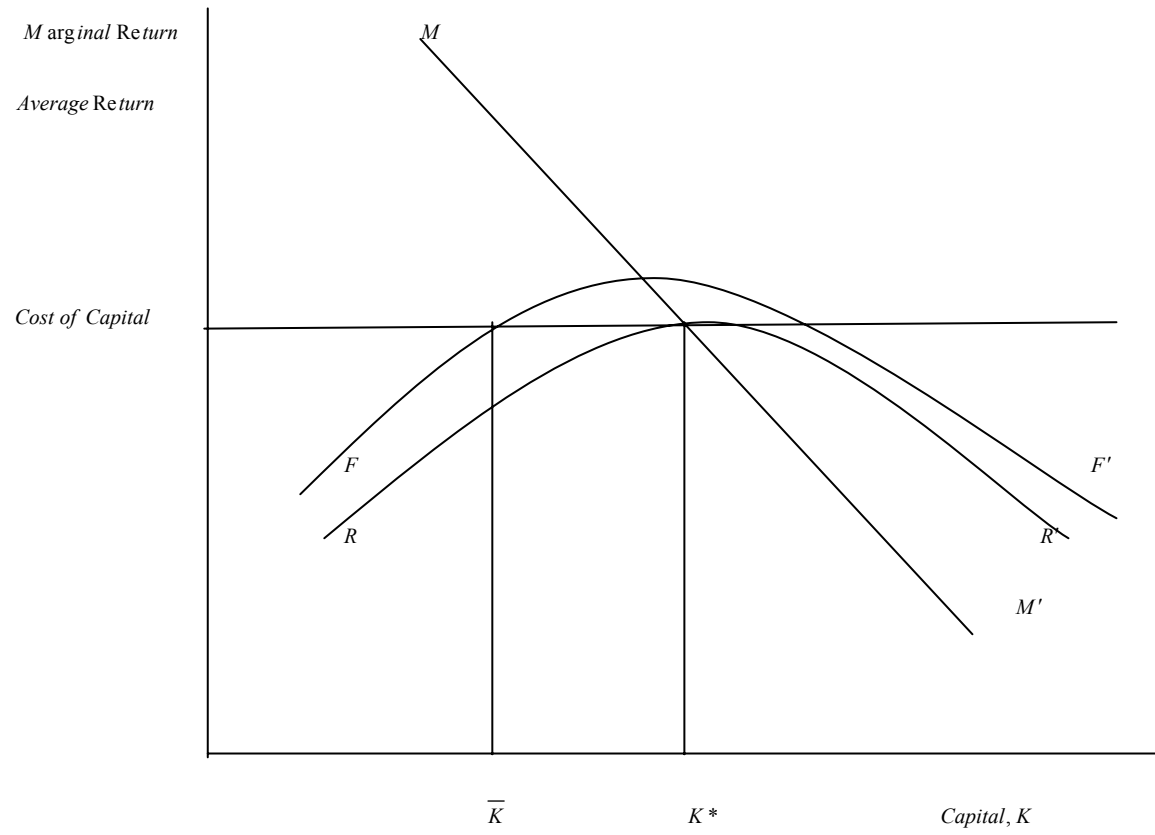Figure 1.- Profit maximizing decisions of family and non family firms.

M arginal Return

Average Return

Cost of Capital

M

F

R

F'

R'

M'

$\overline{K}$ *K* *   *Capital, K*

TABLE 1
DESCRIPTIVE STATISTICS OF SAMPLE FIRMS: MEAN AND MEDIAN VALUES OF VARIABLES

	Family		Non Family		t-student differ (means)	Kruskal Walis Test Chi-Square differ (medians)
	Mean	**Median**	**Mean**	**Median**		
Number of observations	**217**		**227**			
Sales♣	51,774	23,768	307,005	51,044	-2,6***	20,4***
Assets♣	67,238	34,331	1196,827	92,890	-3,2***	54,7***
Value Added ♣	15,086	6,410	229,558	19,436	-2,8***	49,6***
Employees	258	144	2246	179	-2,3***	7,2***
Firm Age	46,96	42,0	49,63	40,0	-0,4	0,04
ROA	0,111	0,082	0,085	0,078	2,5**	1,4
ROA / r	1,305	0,841	1,101	0,787	1,3	0,1
(ROA / r) + (Intangible Assets / Assets)	1,354	0,852	1,145	0,843	1,2	0,1
Assets / Employees	153,68	59,71	662,46	153,78	-6,2***	34,2***
Intangible Assets / Assets	0,043	0,005	0,019	0,005	4,0***	0,21
Fixed Assets / Total Assets	0,546	0,582	0,704	0,748	-5,4***	23,9***
Equity / Assets	0,702	0,742	0,676	0,692	1,2**	2,8*
Long Term Debt / Total Debt	0,550	0,584	0,617	0,672	-2,1**	19,0***
[r] Interest Expenses / Total Debt	0,121	0,088	0,124	0,091	-0,3	0,2

Note.- The sample consist of family and non-family Spanish listed firms in 1990 that remain listed in the year 2004. The number of firm-year observations totals 444 for the period 1993-2002. The source of information used is mainly the files of the Spanish National Commission for the Stock Market.
♣ Millions of Euros
*** $p \leq 1\%$; ** $p \leq 5\%$; * $p \leq 10\%$

TABLE 2
NON FINANCIAL AND NON REGULATED SPANISH LISTED FIRMS IN 1990 AND THEIR SITUATION IN 2004

INDUSTRIES	Listed Firms in 1990	Non Active or Liquidated	Self Excluded by Public Offer	Merger or Acquired	Remained as Family Firms	Remained As Non-Family	Change to Family Firms	Change to Non-Family Firms	Percentage Excluded Firms	Percentage Remaining Firms	Percentage Remaining with Changes
		Firms no longer listed in 2004			Firms that remain listed in 2004						
Cement and Construction	21										
Family	5	0	1	0	4	X	X	0	20,0	80,0	-
Non Family	16	4	9	1	X	1	1	X	87,5	6,3	6,3
Commerce and Services	13										
Family	5	0	3	0	2	X	X	0	60,0	40,0	-
Non Family	8	0	7	0	X	0	1	X	87,5	-	12,5
Real State	27										
Family	13	1	7	0	4	X	X	1	61,5	30,8	7,7
Non Family	14	2	5	0	X	5	2	X	50,0	35,7	14,3
Manufacturing	80										
Family	30	2	15	0	12	X	X	1	56,7	40,0	3,3
Non Family	50	7	29	1	X	12	1	X	74,0	24,0	2,0
Transportation and Communication	9										
Family	4	0	2	0	2	X	X	0	50,0	50,0	-
Non Family	5	0	1	0	X	4	0	X	20,0	80,0	-
Total	150										
Family	57	3	28	0	24	X	0	2	54,4	42,1	3,5
Non Family	93	13	51	2	X	22	5	X	71,0	23,7	5,4

Source: Elaboration from Data of the Spanish Stock Exchange Commission

TABLE 3

SHAREHOLDING CONCENTRATION BY CONTROL GROUP OF NON FINANCIAL AND NON REGULATED SPANISH LISTED FIRMS IN 1990 THAT HAVE REMAINDED LISTED IN 2004
(In Percentages and Average for each Control Group)

CONTROL GROUP	1990			2004		
	Largest Shareholder	Three Largest Shareholder	Five Largest Shareholder	Largest Shareholder	Three Largest Shareholder	Five Largest Shareholder
Family Firms	49,2	65,1	66,5	46,8	66,4	74,6
Other Spanish Firms	31,5	46,8	50,6	28,0	44,3	51,1
Foreign Ownership	29,8	35,8	35,8	47,2	57,8	60,3
Financial Institutions	33,4	42,8	44,6	29,7	56,9	68,6
State Ownership	32,3	81,0	85,0	-	-	-

Source: Own Elaboration from Data of Spanish Stock Market Commission

TABLE 4

AVERAGE SHAREHOLDINGS OF MAIN CONTROL GROUPS IN NON FINANCIAL AND NON REGULATED SPANISH LISTED FIRMS IN 1990 THAT HAVE REMAINDED LISTED IN 2004
(In Percentage)

SHARE HOLDERS / CONTROL GROUP	1990					2004				
	Families and Individual Persons	Spanish Firms	Foreign Owners	Financial Institutions	State Ownership	Families and Individual Persons	Spanish Firms	Foreign Owners	Financial Institutions	State Ownership
Family Firms	54,2	8,0	3,6	3,1	-	54,9	18,7	3,8	4,0	-
Other Spanish Firms	2,5	37,5	7,3	8,5	-	6,5	39,7	4,1	4,7	-
Foreign Ownership	3,4	1,0	29,8	1,6	-	4,2	6,5	48,5	1,1	-
Financial Institutions	0,2	1,6	4,5	38,5	-	7,9	10,5	7,6	59,3	-
State Ownership	0,0	0,0	25,0	10,4	32,3	-	-	-	-	-

Source: Own Elaboration from Data of Spanish Stock Market Commission

TABLA 5

PRODUCTIVITY ANALYSIS

*Production function estimation for family and non family firms. The dependent variable is **Ln (Added Value / Employees)**. The first regression assumes the same function for family and non-family firm except for TPF. The second one allows for differences in production function for the two groups of firms. Control variables of time and industry dummies in all regressions although the coefficients are not reported. T-student in parenthesis.*

	Model 1 (Equal Elasticity)	Model 2 (Different Elasticity)
Constant ($Log\ A$)	4,551***	3,570***
	(13,6)	(8,6)
$Log\ (Assets/Employees)$	0,293***	0,384***
	(9,0)	(9,2)
$Log\ Employees$	-0,162***	-0,097***
	(-5,6)	(-2,7)
$FA * Log\ A$	-0,093	1,462***
	(-0,9)	(3,5)
$FA * Log\ (Assets\ /\ Employees)$	-	-0,161***
		(-3,2)
$FA * Log\ Employees$	-	-0,167***
		(-3,0)
Number of Observations	315	315
$\overline{R^2}$	0,60	0,60
F	22,4	22

*** $p \le 1\%$; ** $p \le 5\%$; * $p \le 10\%$

TABLE 6

GROWTH AND SIZE

The table presents the results from test for differences in size and growth between family and non-family firms. The dependent variable is Log Assets in year 2002.Model 1 tests for differences in size. Model 2 test differences in size controlling for age. Model 3 tests for differences in growth rate. In all models control variables of industry. T-student in parenthesis.

	Model 1	Model 2	Model 3
Constant	12,40[***]	11,0[***]	10,7[***]
	(20,1)	(14,2)	(14,1)
FA	-0,96[***]	-0,84[**]	
	(-2,0)	(-1,9)	
Age	-	0,03	0,04[***]
		(2,7)	(3,2)
*FA * Age*	-	-	-0,02[**]
			(-1,96)
Observations	51	51	51
$\overline{R^2}$	0,14	0,25	0,25
F	2,2[**]	3,1[***]	3,1[***]

[***] $p \leq 1\%$; [**] $p \leq 5\%$; [*] $p \leq 10\%$

TABLE 7

SHADOW PRICE OF CAPITAL

The table presents the estimation of the locus of ROA and total Assets of the firms. Model 1 only allows for differences in shadow price and assumes the same technology for the two types of firms. Model 2 controls for the effects on profitability of (Assets/Employees), and allows for differences in the effects in family and non-family firms. Control variables of time and industry dummies in all regressions although the coefficients are not reported. T-student in parenthesis.

	Model 1	**Model 2**
Constant	$0,176^{**}$	$0,194^{**}$
	$(3,6)$	$(3,3)$
Ln Assets	$-0,010^{**}$	$-0,010^{**}$
	$(-2,2)$	$(-2,1)$
$FA*Ln\ Assets$	$0,001$	$0,016^{***}$
	$(0,6)$	$(4,7)$
$Ln(Assets/Employees)$	-	$-0,001$
		$(-0,2)$
$FA*Ln(Assets/Employees)$	-	$-0,037^{***}$
		$(-5,0)$
Observations	426	338
$\overline{R^2}$	0,11	0,29
F	3,6	7,1

*** $p \leq 1\%$; ** $p \leq 5\%$; * $p \leq 10\%$

TABLE 8

DIFFERENCES IN PROFITABILITY AND FINANCIAL VARIABLES

Test of differences in profitability between family and non-family firms and test for differences in financial selected variables. Control variables of time and industry dummies in all regressions although the coefficients are not reported. T-student in parenthesis.

	Profitability : Dependent Variables			Financial : Dependent Variables		
	ROA	ROA/r	$(ROA/r)+Int/Assets$	$Debt/Assets$	$Debt\ Cost$	$LT\ Debt/Debt$
Constant	$0,06^{***}$	$1,06^{***}$	$1,03^{***}$	$0,32$	$0,09^{***}$	$0,34^{***}$
	$(2,9)$	$(3,0)$	$(2,7)$	$(6,8)$	$(3,2)$	$(4,1)$
FA	$0,01$	$0,22$	$0,20$	$-0,04^{*}$	$0,004$	$-0,02$
	$(1,1)$	$(1,4)$	$(1,2)$	$(-1,9)$	$(0,3)$	$(-0,7)$
Cost of Debt	$0,09^{***}$	-	-	-	-	-
	$(2,5)$					
Fixed Assets/Assets						$0,34^{***}$
						$(6,1)$
Observations	400	394	364	443	416	378
$\overline{R^2}$	$0,05$	$0,11$	$0,13$	$0,06$	$0,05$	$0,41$
F	$2,1$	$3,8$	$4,0$	$2,7$	$2,1$	$15,0$

*** $p \leq 1\%$; ** $p \leq 5\%$; $^{*}p \leq 10\%$

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