FIRM SIZE AND CAPITAL STRUCTURE: EVIDENCE USING DYNAMIC PANEL DATA

VÍCTOR M. GONZÁLEZ
FRANCISCO GONZÁLEZ

FUNDACIÓN DE LAS CAJAS DE AHORROS
DOCUMENTO DE TRABAJO
Nº 340/2007

De conformidad con la base quinta de la convocatoria del Programa de Estímulo a la Investigación, este trabajo ha sido sometido a evaluación externa anónima de especialistas cualificados a fin de contrastar su nivel técnico.

ISBN: 84-89116-07-5

La serie **DOCUMENTOS DE TRABAJO** incluye avances y resultados de investigaciones dentro de los programas de la Fundación de las Cajas de Ahorros.
Las opiniones son responsabilidad de los autores.

Firm size and capital structure: Evidence using dynamic panel data

Víctor M. González*†
University of Oviedo
School of Economics and Business

Francisco González*
University of Oviedo
School of Economics and Business

Abstract

This paper suggests that the validity of the trade-off (TOT) and pecking-order (POT) theories in explaining financing decisions varies among small, medium and large firms. Using dynamic panel data tests in a sample of 3,439 Spanish firms over the period 1995-2003, results are partially consistent with both explanations but suggest a greater validity of pecking-order predictions for small firms. In small firms, the negative influence of profitability and the positive influence of investment opportunities and of intangible assets on firm debt predicted by the POT are heightened. However, no differences are observed between small and large firms in their speed of adjustment to the target leverage as suggested by the TOT.

JEL classification: G32.
Keywords: capital structure, small firms, panel data, trade-off theory, pecking-order theory.

* Financial support provided by the Regional Government, Project IB05-183, and by the Spanish Science and Technology Ministry (MCT) - ERDF, Project SEC2002-04765 are gratefully acknowledged.
† Corresponding author: Víctor M. González Méndez, Department of Business Administration, University of Oviedo. Avenida del Cristo s/n, 33071. Oviedo. Spain. Tel.: +34985102826. e-mail: vmendez@uniovi.es.

Firm size and capital structure: Evidence using dynamic panel data

1. Introduction

The finance literature offers two competing but not mutually exclusive models of financing decisions: the trade-off theory (TOT) and the pecking-order theory (POT). This paper analyzes whether the validity of both theories to explain capital structure varies among small, medium and large firms. The empirical analysis is carried out on a sample of Spanish firms using dynamic panel data over the period 1995-2003.

The TOT posits that firms maximize their value when the benefits that stem from debt (the tax shield, the disciplinary role of debt or the reduction of free cash-flow problems, and the fact that debt suffers less from informational costs than outside equity) equal the marginal cost of debt (bankruptcy costs, and agency costs between shareholders and bondholders). Additionally, as adjustment costs may exist that are an impediment to achieving the optimal capital structure, the existence of a partial adjustment to optimal leverage is suggested within the TOT.[1] Results consistent with a partial adjustment to the target leverage are obtained for US firms (Marcus, 1983; Jalilvand and Harris, 1984; Auerbach, 1985; Fischer *et al*., 1989; Shyam-Sunder and Myers, 1999; Fama and French, 2002; Flannery and Rangan, 2006), for French and German firms (Kremp *et al*., 1999), for Spanish firms (Miguel and Pindado, 2001), for Swiss firms (Gaud *et al*., 2005), and for UK firms (Ozkan, 2001).

The POT, developed by Myers and Majluf (1984) and Myers (1984), focuses on the information asymmetries existing between firm insiders and outsiders. In these models, managers use private information to issue risky securities when they are overpriced. Investors are aware of this asymmetric information problem, and they discount the firm's new and existing risky securities when new issues are announced. Managers anticipate these price discounts, and may forego profitable investments if these must be financed with new risky securities. To avoid this distortion of investments decisions, managers prefer to finance projects with retained earnings, which involve no asymmetric information problem as with risky debt. Accordingly, the firm will fund all projects using retained earnings if possible. If there is an inadequate amount of retained

earnings, then debt financing will be used. As a result, variation in a firm's leverage is driven not by the trade-off model's costs and benefits of debt, but rather by the firm's net cash flows (cash earnings minus investment outlays), and the POT predicts that debt typically grows when investment exceeds retained earnings and falls when investment is less than retained earnings. Thus, if profitability and investment outlays are persistent, the POT predicts that, when investment is maintained fixed, leverage is lower for more profitable firms, and given profitability, leverage is higher for firms with more investments. Unlike the TOT, in the POT there is no leverage target that firms seek to achieve in each period; the optimum debt varies from one period to another with profitability and the investment opportunities in the firm.

Both theories of capital structure are not mutually exclusive because the POT may be considered as nested in the TOT. The POT is built on the assumption that asymmetric information problems, which are only one of the costs considered in the TOT, overwhelm the remaining forces that determine optimal leverage in the trade-off model. However, if asymmetric information problems do not fully overpower other factors, the TOT partially survives. Thus, the partial survivorship of the TOT, even when the asymmetric information problems indicated by the POT are important drivers of the firm's financing decisions, may explain the attaining of results that are partially consistent with both hypotheses. The evidence provided by recent empirical research coincides in underscoring the partial validity of both explanations, but differ when indicating which one is predominant. Whereas Shyam-Sunder and Myers (1999) and Fama and French (2002) obtain results that are consistent with the predominance of the POT, Flannery and Rangan (2006) suggest a greater validity of the TOT. However, Frank and Goyal (2003) and Leary and Roberts (2005) obtain evidence that is favourable to both theories without highlighting the predominance of either.

In this paper, we extend the previous evidence analyzing whether the validity of both theories is related to firm size and, therefore, whether it varies among small, medium and large firms. The importance of firm size in explaining differences in the validity of the TOT and the POT would arise from the greater information asymmetries existing in small firms, which might lead to a greater weight of the pecking order explanations in this type of firm. To analyze how the validity of both theories varies with firm size, we study two aspects: 1) Since both theories propose different determinants of debt, we

shall analyze whether the determinants of firm leverage vary across firm size in a way that is consistent with the predictions of one or other of the two theories, and 2) we also analyze whether the prediction of the TOT that firms have a target leverage has a different validity among the three groups of firms. The greater (lesser) the validity of this prediction in one type of firm, the greater the empirical support this would provide for the TOT (POT) in this type of firm. Unlike previous studies, this paper considers not only quoted firms but also non-publicly traded firms, providing evidence about the speed of adjustment to the target leverage of the latter group of firms.

To account for dynamic processes in firm leverage, we use the generalized-method-of-moments (GMM) estimators developed by Arellano and Bond (1991) for dynamic panel data. This generation of GMM models has the market advantage that it is specifically designed to handle autoregressive properties in the dependent variable (firm leverage) when lagged values are introduced as explanatory variables and endogeneity in the explanatory variables (other firm specific characteristics) must be controlled for.

The results of the paper indicate that the TOT and the POT are complimentary in explaining capital structure decisions in Spanish firms. Consistent with the TOT, firms have a target leverage and will have a higher leverage ratio, the greater the tax benefits of debt due to interest deductibility. However, consistent with the POT, leverage is positively related to growth opportunities and intangible assets in the firm, and negatively related to the firm's profitability. Moreover, our results support the hypothesis that the greater information asymmetries in small firms lead to a greater validity of the prediction of the POT in these firms, since the positive influence of investment opportunities and of intangible assets and the negative influence of profitability predicted by the POT are heightened in small firms. Moreover, the paper also shows that small firms have a similar speed of adjustment to the target leverage compared to large firms.

The rest of the paper is structured as follows. Section 2 discusses the influence of firm size in capital structure and the hypotheses tested in the paper as regards the validity of the TOT and the POT across firms of different sizes. Section 3 describes the characteristics of the database and the methodology, while Section 4 discusses the empirical results. Finally, Section 5 presents some conclusions.

2. Firm size and capital structure theories: Hypotheses

A large number of papers have suggested that firm size is positively related to leverage ratio. The rationale for this belief is the evidence provided by Warner (1977) and Ang *et al*. (1982) that the ratio of direct bankruptcy costs to firm value decreases as said value increases, suggesting that the impact of these costs on the borrowing decisions of large firms might be negligible. It is also argued that larger firms are more diversified (Titman and Wessels, 1988), have easier access to the capital markets, and borrow at more favorable interest rates (Ferri and Jones, 1979). Larger firms with less volatile benefits also have a greater likelihood of being able to fully use tax shields from interest payments, increasing the expected tax benefits of debt (Smith and Stulz, 1985). For small firms, the conflicts between creditors and shareholders are more severe because the managers of such firms tend to be large shareholders and are better able to switch from one investment project to another (Grinblatt and Titman, 1998). Informational asymmetries between insiders in a firm and the capital markets are higher for small firms. According to these arguments, most empirical studies in fact report a positive sign for the relationship between size and leverage (Rajan and Zingales, 1995; Booth *et al*., 2001; Frank and Goyal, 2003; Gaud *et al*., 2005).

Although the influence of size on firm debt has been widely analyzed, no study has been carried out to ascertain whether the validity of the TOT and the POT varies with firm size. However, arguments exist that suggest that size is related to the information asymmetry problems that the POT rests on. Larger firms usually have lower information asymmetries. Larger listed firms are required to submit information to the stock exchange and financial analysts monitor these firms on a regular basis, whereas small non-listed firms are only required to produce a straightforward annual report once a year and are rarely monitored by analysts. Credit rating agencies also monitor the solvency of large firms and reduce information asymmetries between the firm and outside investors. The exposure of large listed firms reduces the information opacity for these firms compared with smaller, non-listed firms. To derive our hypotheses, we assume that with no information asymmetry the POT does not survive and only the TOT applies and that the greater the information asymmetry, the greater the validity of the propositions of the POT. Thus, if information asymmetries decrease with firm size, the

validity of the POT will be greater in small firms. This argument leads us to establish our main hypothesis in the paper as follows:

H.1. *The validity of the predictions of the POT (TOT) concerning the determinants of a firm's leverage is negatively (positively) related to firm size and will thus be greater (lesser) in small firms.*

In order to test this hypothesis, we first analyze how the two theories differ as regards the determinants of firm leverage, and secondly how both theories differ with respect to the existence of a leverage target in the firm.

2.1. Determinants of debt ratio under the TOT and the POT

As potential determinants of firm leverage we consider the same variables as Rajan and Zingales (1995) have shown to influence firm leverage in 7 countries: non-debt tax shield, profitability, growth opportunities and intangibility of assets.[2] As the TOT and the POT differ in the predicted influence of each variable on firm leverage we may discriminate between the two theories by empirically analyzing which type of prediction is consistent with the data. In fact, we focus on analyzing whether the influence of each variable on firm leverage varies across firm size according to the TOT or to the POT. Table 1 summarizes the predictions of the TOT and POT regarding the influence of each variable on firm leverage, which we shall go into below.

a) Non-debt tax shields

The TOT predicts that companies have an incentive to take debt because they can benefit from the tax shield due to interest deductibility. However, if firms have non-debt tax shields (NDTS), such as depreciation and investment tax credits, they have a lower incentive to use debt from a tax shield point of view and hence use less debt (DeAngelo and Masulis, 1980; Graham, 2000). Thus, the trade-off explanation predicts a negative coefficient for NDTS in the equation explaining firm leverage.

In our paper, NDTS have been measured as the earnings before taxes minus the ratio between the taxes paid and the tax rate, as in Titman and Wessels (1988), Miguel and Pindado (2001) and Saa-Requejo (1996). Other papers, such as Ozkan (2001), have used the ratio of annual depreciation expense to total assets as a proxy for non-debt tax

shields. However, it should be noted that this ratio could also be a proxy for the tangibility of the assets, and may thus lead to confounding effects.

b) Profitability

In the TOT, a positive relationship between a firm's profitability and debt is expected because taxes, agency costs and bankruptcy costs push more profitable firms towards higher leverage. More profitable firms should prefer debt to benefit from the tax shield. Moreover, when firms are profitable, all things being equal, they increase their free cash flow and the marginal benefit of using debt to discipline managers. Finally, an increase in profitability reduces the likelihood of firm bankruptcy and the cost of financial distress originated by the use of debt. Thus, all these reasons lead the TOT to predict a positive relationship between profitability and debt.

According to the POT, the contrary relationship is expected when firms prefer using internal sources of financing first, then debt and finally external equity obtained by stock issuing. According to this argument, firms passively accumulate retained earnings, becoming less levered when they are profitable, and accumulate debt, becoming more levered when they are unprofitable. All things being equal, the more profitable the firms are, the more internal financing they will have, and therefore we should expect a negative relationship between leverage and profitability. This negative relationship is one of the most systematic findings in the empirical literature. Harris and Raviv (1991), Rajan and Zingales (1995), and Boot *et al*. (2001), among others, have highlighted that the debt ratio is inversely related to profitability.

In our study, profitability (PROF) is estimated as earnings before interest and taxes (EBIT) plus depreciation expenses and provisions (non-cash deductions from earnings) divided by total assets (Ozkan, 2001; Miguel and Pindado, 2001; Gaud *et al*., 2005).

c) Growth opportunities

The trade-off model predicts that, controlling for the profitability of assets in place, firms with more investment opportunities have less leverage because: (1) Greater investment opportunities in the firm are associated with a lower free cash flow and less need for the disciplinary role of debt over manager behaviour (Jensen, 1986); (2) Firms with growth opportunities have more agency conflicts between stockholders and

bondholders because shareholders in these firms have stronger incentives to underinvest and greater possibilities of risk-shifting substitution (Myers, 1977, Smith and Warner, 1979); (3) Finally, as the value of growth opportunities is close to zero in the case of bankruptcy, the cost of financial distress associated with the use of debt will be higher in firms in which the investment opportunities represent a greater percentage of the current value of the firm (Myers, 1984; Harris and Raviv, 1991). All these reasons lead the TOT to predict a negative relationship between investment opportunities and debt in the firm. These arguments are consistent with firms using equity to finance their growth (Jung *et al*., 1996) and with firms with less growth prospects using debt because of its disciplinary role (Jensen, 1986; Stulz, 1990).

In contrast, the POT predicts a positive marginal relation between leverage and growth opportunities because investment opportunities originate strong financing needs and, all things being equal, will lead to the issuing of more debt. Moreover, as information asymmetries with respect to investment opportunities are higher than with respect to assets in place, the POT predicts a higher preference for debt relative to equity in firms with greater growth opportunities.

Following Titman and Wessels (1988), growth opportunities (GROWTH) has been measured in this paper as the growth rate of total assets. Since non-publicly traded firms are considered, we cannot use the market-to-book value of assets to proxy growth opportunities, as in Flannery and Rangan (2006), Gaud *et al*. (2005) or Rajan and Zingales (1995).

d) Intangibility of assets

According to the TOT, intangibility of assets has an impact on the borrowing decisions of a firm for at least two reasons: 1) intangible assets have a lower value than tangible assets in the case of bankruptcy and thus increase the cost of financial distress associated with the use of debt, and 2) the agency costs between stockholders and creditors are greater when the firm does not offer tangible assets as collateral because the probability of risk-shifting by shareholders is solely limited to the assets that are not offered as collateral. Consistent with these arguments, most of the previous evidence highlights a negative relation between intangible assets and the level of debt (Rajan and Zingales, 1995; Kremp *et al*., 1999; Frank and Goyal, 2003).

From the POT perspective, firms with more intangible assets are more subject to information asymmetries and will therefore issue debt rather than equity when they need external financing (Harris and Raviv, 1991). For this reason, *ceteris paribus* profitability and investment opportunities, the TOT predicts a positive relation between intangibility of assets and firm leverage.

We proxy the intangibility of assets (INTANG) as the ratio between intangible assets and total assets. This variable was used by Titman and Wessels (1988) as an indicator that is negatively related to the collateral value.

Given that our basic hypothesis forecasts a greater validity of the POT in smaller firms and that the POT and TOT differ in the predicted influence for profitability, growth opportunities, and asset intangibility on firm leverage, we may extend hypothesis H.1. as follows:

> *H.1.a. The greater predominance of the predictions of the POT in smaller firms leads to forecasting a greater negative influence of profitability and a greater positive influence of investment opportunities and of intangible assets on firm leverage in this type of firm.*

2.2. Target firm leverage and adjustment costs

The existence of a target firm leverage that firms wish to maintain in each period is the other difference between the TOT and the POT. Under the TOT, there exists an optimum level of indebtedness resulting from compensating benefits with the costs of debt. As the determinants of the costs and benefits of debt, examined in the previous section, are relatively stable over time, the firm's optimum indebtedness will also be stable. However, the existence of adjustment costs impede a complete adjustment and hence the standard framework adopted for testing the TOT is a partial adjustment model in which the change in leverage partially absorbs the difference between target leverage and lagged leverage.

In contrast, under the POT there exists no target leverage that firms aim to maintain in each period, but rather the leverage varies from one period to another depending on the profitability and investment opportunities in the firm. Thus, higher earnings, *ceteris*

paribus investment opportunities, increase the possibilities of retaining benefits and result in less leverage. Higher investment opportunities, *ceteris paribus* earnings, result in higher leverage.

The different predictions of the TOT and the POT concerning the existence of a target leverage mean that our main hypothesis (H.1) a propos a greater validity of the POT in small firms may be extended in the following way:

H.1.b. The greater predominance of the predictions of the POT in smaller firms leads to forecasting a lower or non significant speed of adjustment to the target leverage in this type of firm.

3. Econometric specification and database

3.1. Methodology

The empirical model proposed in this paper accounts for the potentially dynamic nature of a firm's capital structure. Dynamic models of capital structure suggest that firms will periodically readjust their capital structures toward a target ratio that reflects the costs and benefits of debt financing found in the static trade-off models. The model tests whether there is a leverage target and if so, what the adjustment speed is with which a firm moves toward its target. The form of the target adjustment model states that changes in the debt ratio ($D_{it} - D_{it-1}$) partially absorb the difference between target leverage (D_{it}*) and lagged leverage (D_{it-1}):

$$\left(D_{it} - D_{it-1}\right) = \alpha\left(D_{it}^{*} - D_{it-1}\right) \qquad [1]$$

where the transaction costs that impede a complete adjustment to the target leverage are measured by the coefficient α, which varies between 0 and 1 and is inversely related to adjustment costs. Solving the firm leverage:

$$D_{it} = \alpha D_{it}^{*} + \left(1 - \alpha\right)D_{it-1} \qquad [2]$$

On the one hand, if transaction costs are zero, i.e. α=1, D_{it}=D_{it}* and firms automatically adjust their debt level to the target level. On the other hand, if α=0, D_{it}=D_{it-1}, which implies that transaction costs are so high that firms do not adjust their debt level. The

adjustment process is a trade off between the adjustment costs towards a target ratio and the costs of being in disequilibrium.

As the target debt is unobservable, we model it as a linear function of the determining factors of capital structure reviewed in the previous section (non-debt tax shields, profitability, growth opportunities and intangible assets) obtaining: [3]

$$D_{it}^{*} = a_0 + a_1 NDTS_{it} + a_2 PROF_{it} + a_3 GROWTH_{it} + a_4 INTANG_{it} + \mu_{it} \quad [3]$$

where D^{*}_{it} is the target leverage of firm i in year t and its explanatory variables are the non-debt tax shields (NDTS), profitability (PROF), growth opportunities (GROWTH) and the intangibility of the firm's assets (INTANG).

Incorporating Eq. (3) into Eq. (2) and considering that estimations were carried out with panel data, we get:

$$\begin{aligned} D_{it} = {} & \alpha a_0 + (1-\alpha) D_{it-1} + \alpha\, a_1 NDTS_{it} + \alpha\, a_2 PROF_{it} + \alpha\, a_3 GROWTH_{it} + \\ & + \alpha\, a_4 INTANG_{it} + \sum_{t=1995}^{2003} Y_t + \sum_{j=1}^{n} I_j + \gamma_i + \mu_{it} \end{aligned} \quad [4]$$

where $\sum_{t=1995}^{2003} Y_t$ is a set of dummy time variables for each year capturing any unobserved firm-invariant time effect not included in the regression. We also include industry dummy variables according to SIC codes ($\sum_{j=1}^{n} I_j$) to capture any industry effect not included in the explanatory variables, γ_i is the firm effect, which is assumed constant for firm i over t; and μ_{it} is the error term.

In the estimations, we apply the generalized-method-of-moments (GMM) estimators developed for dynamic models of panel data by Arellano and Bond (1991). This methodology is specifically designed to address three econometric issues relevant to the present paper: (i) the presence of unobserved individual effects (in the present case, firm-specific effects). The individual effects are eliminated by taking first-differences of all variables; (ii) the autoregressive process in the data regarding the behaviour of leverage ratio (i.e. the need to use a lagged-dependent-variables model to capture the dynamic nature of the capital structure decisions); and (iii) the likely endogeneity of the

explanatory variables. The panel estimator controls for this potential endogeneity by using internal instruments, i.e. instruments based on lagged values of the explanatory variables.

The consistency of the GMM estimator depends on the validity of the instruments. To address this issue, we consider two specification tests suggested by Arellano and Bond (1991). The first is a Sargan test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process. This test confirms the absence of correlation between the instruments and the error term in our models. The second test examines the hypothesis of lack of second-order serial correlation in the first difference residuals (m_2). In our models, this hypothesis of second-order serial correlation is always rejected. Although there is first-order serial correlation (m_1) in the differentiated residuals, it is due to the first difference of models.

3.2. Database

The partial adjustment model of firm leverage described in Equation [4] is estimated in a sample of non-financial Spanish firms over the period 1995-2003. The financial data were obtained from SABI, which is a database that contains financial information on 144,982 public limited companies. Secondly, financial firms (SIC 6000-6999) were excluded, as their financing decision follows other determinants, the number of firms after application of this criterion being 102,250. Finally, firms with less than 10 employees were removed from the sample (these are considered as micro-enterprises according to European Union criteria), resulting in the figure of 26,369 firms and 65,331 firm-year observations. After eliminating those observations in which it was not possible to estimate the dependent and explanatory variables, the number of observations was 24,827. Since we apply the GMM first difference estimator with one lag of the dependent variable in the empirical analysis, firms with fewer than two consecutive years of data must be excluded. Finally, the number of firms included in the sample was 3,439. The complete sample consists of 16,284 firm-year observations.

As a measure of firm leverage, we use the ratio between the book value of debt (both long term and short term) and the book value of total assets. This measure provides a good indication of financial leverage, since total liabilities also includes items like

accounts payable, which may be used for transactions purposes rather than for financing (Rajan and Zingales, 1995) and has been used, among others, by Flannery and Rangan (2006). Since we test the model on firms that do not quote on the stock market, we cannot use a market value of leverage as other authors do, e.g. Gaud *et al*. (2005) and Rajan and Zingales (1995). Flannery and Rangan (2006) report evidence that the results do not present any changes across a range of different definitions for leverage, including market-valued debt ratios.

We have split the sample into small, medium and large enterprises applying the criteria of firm size defined by the European Union in the Commission Recommendation of 3rd April 1996 (96/280/EC).[4] A small firm is defined as an enterprise that has fewer than 50 employees but more than 10, and has either an annual turnover not exceeding seven million euros or an annual balance-sheet total not exceeding five million euros. Medium-sized firms are defined as enterprises that have between 50 and 249 employees, and have either an annual turnover not exceeding 40 million euros, or an annual balance-sheet total not exceeding 27 million euros. Firms that exceed these limits are considered large firms.

In Table 2 we can observe that for the total sample the mean leverage ratio is 29.54% with an average profitability of 10.82% and a mean growth rate of total assets of 10.97%. However, these values vary according to firm size. Large firms show a higher leverage ratio, profitability and growth rate of assets than small firms. The differences in these variables among small, medium and large firms are likewise significant when using a t-test such as the Wilcoxon signed-rank test in Panel B of Table 2. The differences in NDTS and INTANG between small and large firms are also significant according to the two tests.

Table 3 reports the correlation matrix. According to most of the previous empirical evidence, debt ratio correlates positively with firm size and negatively with the amount of non-debt tax shield in the firm. Moreover, the negative correlation of firm debt with profitability and the positive correlation with growth opportunities and intangible assets would be consistent with the predictions of the POT. In the next section, in order to test how the validity of the TOT and the POT varies across firm size we apply a multivariate analysis incorporating confounding effects that have so far been omitted in the mean difference and correlation analysis.

4. Results

Table 4 shows the results of the partial adjustment model [4] for the whole sample of firms. Column (1) contains the estimates of the basic model without controlling for size, while columns (2), (3) and (4) control for three different size measures, namely, the natural logarithm, respectively, of total assets, sales and the number of employees. In all the estimates, we control for the industry by introducing a dummy variable for each industry, and for time effects by including a dummy variable for each year. All the variables are considered endogenous and are estimated in first differences, except the industry dummies. The coefficients of time and industry dummies are not reported in the tables to save space.

The results partially support both the TOT and the POT. We obtain two results consistent with the predictions of the TOT. First, NDTS has a negative coefficient in column (2), suggesting that the existence of non-debt tax shields reduces the tax-advantage from debt and thus also reduce the use of debt for the firms. Second, the positive and statistically significant coefficients of $DEBT_{t-1}$ suggest that the firms have a target leverage to which they partially adjust in each period.

Our results show that the value of the coefficient that accompanies the variable $DEBT_{t-1}$ takes values of around 0.60, which implies values of α of approximately 0.40. Previous evidence has shown values of α ranging between 0.79 for Spain and 0.14 for the Swiss market. Miguel and Pindado (2001) find an α of 0.79 for a panel data set for 133 Spain companies, Shyam-Sunder and Myers (1999), Jalivand and Harris (1984) and Auerbach (1985) a value of 0.59-0.70 for the USA, Kremp *et al*. (1999) a value of 0.53 for German firms and a value of 0.28 for France, Ozkan (2001) a value of 0.52-0.57 for a panel data set for 390 UK companies and Gaud *et al*. (2005) a value of 0.14-0.29 for the Swiss market.

Since α close to one indicates a fast adjustment of the current capital structure to the target or optimal capital structure, according to the results of Miguel and Pindado (2001) transaction cost are not very high for Spanish firms.[5] The lower speed of adjustment in our sample compared with Miguel and Pindado (2001) may be originated by two aspects. First, contrary to Miguel and Pindado (2001) we consider not only large and publicly traded firms, but have also taken smaller and non-publicly traded firms

into account in the analysis. Due to the fact that adjustment costs for smaller firms could be unusually large, this could explain the results (Flannery and Rangan, 2006). However, subsequent results show that there are no differences between the adjustment speed to target leverage of small and large firms. Second, since in Miguel and Pindado (2001) all the variables are scaled by the replacement value of capital, measured as the replacement value of fixed assets plus the replacement value of inventories plus the book value of the rest of assets, and in our paper all the variables are scaled by the book value of assets, this could be the determinant of the difference of the estimated α. Most papers also use book total assets in order to scale the variables, thus making our results more comparable with the rest of the international evidence (Ozkan, 2001; Gaud *et al*., 2005; Flannery and Rangan, 2006).

While the negative coefficient of NDTS and the existence of a partial adjustment to the target leverage are favorable to the arguments of the TOT, the negative coefficient of PROF and the positive ones of GROWTH and INTANG are consistent with the predictions of the POT. Under the POT, higher profitability increases the possibility of retaining earnings and reduces the needs of debt whereas greater growth opportunities, all else being equal, increases the needs of debt. Moreover, as intangible assets originate greater information asymmetries than tangible assets, the preference for debt relative to equity would increase with the percentage of intangible assets in the firm under the POT.

These results in Spanish firms constitute greater support for the POT than is generally found in prior studies for other countries. Although studies in other countries coincide in reporting a negative relation between profitability and debt, they differ in their findings in that the intangibility of assets and growth opportunities are usually negatively associated with firm leverage (Titman and Wessels, 1988; Rajan and Zingales, 1995; Fama and French, 2002; Frank and Goyal, 2003; Flannery and Rangan, 2006; Gaud *et al*. 2005). The greater support obtained for the POT compared to other studies is consistent with the inclusion in the present study of small firms, if the POT has more validity in this type of firm.

Moreover, our results are consistent with those of Miguel and Pindado (2001) for Spanish publicly traded firms. These authors found an inverse relationship between cash-flow and debt, and a direct relationship between investment and debt, in support of

the POT when indicating that cash-flow is preferred to the use of debt, and debt is preferred to equity issues as proposed by the POT.

Firm size, measured by LN(TA) and LN(EMP), has the traditional positive impact on leverage that has been documented in many empirical studies for other countries (Rajan and Zingales, 1995; Fama and French, 2002; Frank and Goyal, 2003; Flannery and Rangan, 2006; Gaud *et al*. 2005).

The estimation of the model [4] depending on firm size is reported in Table 5. We classified firms in small, medium and large firms following the criteria of firm size applied by the European Union. The first three columns in Table 5 show the results obtained separately for each group of firms.

In accordance with the results reported above, the coefficient associated with the variable $DEBT_{t-1}$ is positive and statistically significant and takes similar values regardless of firm size. The variable NDTS is shown to be explanatory of firm leverage, in line with the predictions of the trade-off theory, in the case of small and medium firms. That is to say, smaller-sized firms are the ones that use debt for tax reasons, while the decision to take on debt in large firms responds to a lesser degree to tax reasons. The remaining variables, PROFIT, GROWTH and INTANG, present coefficients consistent with the pecking order theory, especially for small firms. The variable PROFIT presents negative coefficients in line with the fact that firms with higher profitability use less debt due to the greater possibility of using retained earnings. The positive coefficients of GROWTH for small firms is consistent with the fact that greater growth opportunities, *ceteris paribus* profitability, increases the needs for debt, and the positive coefficient of INTANG supports the prediction of the POT that firms with more intangible assets are subject to higher information asymmetries and that they will issue debt rather than equity if the retained earnings are not enough. The greater positive influence of intangible assets and growth opportunities and the greater negative influence of profitability on the debt ratio in the case of small firms, compared to medium and large firms, would be consistent with the predominance of the predictions of the POT in small firms.

In order to analyze whether there are statistically significant differences in the determinants of leverage across firms of different size, we define interaction terms of

firm size with each explanatory variable in columns (4) and (5) of Table 5. In fact, we define a dummy variable, SMALL, that takes a value of 1 for small firms and 0 otherwise, which interacts with the remaining explanatory variables. In this specification, the coefficients of the interaction terms ($DEBT_{t-1}$*SMALL, NDTS*SMALL, PROFIT*SMALL, GROWTH*SMALL and INTANG*SMALL) indicate the differences in the respective explanatory variable in small firms with respect to the remaining firms. On the other hand, the coefficients of the explanatory variables now show the influence that they have on firm leverage for those firms that are not small in size. Thus, in column (4) we compare small firms versus medium and large firms and in column (5) we exclude medium firms in order to capture the differences between small and large firms.

The results of columns (4) and (5) do not indicate differences in the adjustment speed to the target leverage between small and large firms, as the coefficients of $DEBT_{t-1}$*SMALL are not statistically significant. However, the coefficients of NDTS*SMALL are negative and statistically significant, revealing that the tax benefit of debt is more important in small than in large firms in determing the leverage ratio.

The remaining interaction terms present coefficients that are consistent with the hypothesis of a greater validity of the predictions of the POT in small firms. The coefficients of GROWTH*SMALL and INTANG*SMALL are positive and statistically significant, whereas the coefficients of GROWTH and INTANG are not statistically significant. These results indicate that growth opportunities and intangible assets are positively related to firm leverage, as predicted by the POT, only in small firms. Also consistent with a greater validity of the POT in small firms, we observe that the negative influence of profitability on leverage is heightened in small firms since PROF*SMALL has negative statistically significant coefficients.

5. Conclusions

This paper analyzes whether the validity of the trade-off theory and the pecking order theory to explain firm capital structure varies with firm size. To do so, we apply a dynamic model partial adjustment to the target leverage in a panel database of Spanish firms over the period 1995-2003. In the empirical analysis, we control for the specific firm characteristics not explicitly incorporated as explanatory variables and for the

potential endogeneity of the explanatory variables using the GMM first difference estimator. Results are partially consistent with both explanations in Spanish firms. Consistent with the TOT, firms have a target leverage which they adjust to in each period, using more debt as the tax advantages of debt grow. Consistent with the POT, firm leverage is positively related to investment opportunities and the percentage of intangible assets, and negatively related to profitability.

Furthermore, our results indicate that the predominance of the TOT and the POT varies across firm size. The positive relationship of firm leverage with investment opportunities and intangible assets and the negative relation with firm profitability are stronger in small firms than in medium and large firms. This evidence is consistent with the hypothesis that higher information asymmetries in small firms originate greater validity of the pecking order theory in this type of firm. Despite the greater validity of the pecking order predictions in small firms, there are no differences in the adjustment speed to the target leverage across firms with a different size, and all types of firms have a similar adjustment speed of around 40% (α=0.4) of the target leverage. These results highlight the convenience of controlling for firm size when testing the validity of explanatory theories of firm capital structure.

[1] For an in-depth review of the literature on capital structure, see Harris and Raviv (1991).
[2] Booth *et al*. (2001) suggest that the same determinants of capital structure prevail in ten developing countries, and Harris and Raviv (1991) indicate that the financial literature coincides in highlighting these variables as the determinants of firm leverage. Sogorb-Mira (2005) also uses these variables for a sample of Spanish SME.
[3] The same framework has been used in prior studies such as Miguel and Pindado (2001), Ozkan (2001), Flannery and Rangan (2006) and Gaud *et al*. (2005).
[4] This criteria is the one in force during the period covered by our study. On 6th May 2003 the Commission adopted a new Recommendation (2003/361/EC) regarding the definition of SMEs which replaced Recommendation 96/280/EC as from 1st January 2005. We have found that the results do not vary with the new classification of firm size.
[5] Since public debt has higher transaction costs than private debt (bank debt), the small transaction costs have been explained by the lower public debt ratio for Spanish firms.

References

Ang, J.S.; J.H. Chua and J.J. McConnell (1982): "The administrative costs of corporate bankruptcy: A note". *Journal of Finance* 37, pp. 337-348.

Arellano, M. and S. Bond (1991): "Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations". *Review of Economic Studies* 58, pp. 277-297.

Auerbach, A.S. (1985): "Real determinants of corporate leverage". In: Friedman, B.M. (ed.) *Corporate capital structures in the United States*. University of Chicago Press, Chicago.

Booth, L.; V. Aivazian; A. Demirguc-Kunt and V. Maksimovic (2001): "Capital structure in developing countries". *Journal of Finance* 56, pp. 87-130.

DeAngelo, H. and R. Masulis (1980): "Optimal capital structure under corporate and personal taxation". *Journal of Financial Economics* 8, pp. 3-29.

Fama, E.F. and K.R. French (2002): "Testing trade-off and pecking order predictions about dividends and debt". *The Review of Financial Studies* 15 (1), pp. 1-33.

Ferri, M. and W. Jones (1979): "Determinants of financial structure: a new methodological approach". *Journal of Finance* 34, pp. 631-644.

Fischer, E.O.; R. Heinkel and J. Zechner (1989): "Dynamic capital structure choice: theory and tests". *Journal of Finance* 44 (1), pp. 19-40.

Flannery, M.J. and K.P. Rangan (2006): "Partial adjustment toward target capital structures". *Journal of Financial Economics*, 79 (3), pp. 469-506.

Frank, M. and V.K. Goyal (2003): "Testing the pecking order theory of capital structure". *Journal of Financial Economics* 67, pp. 217-248.

Gaud, P.; E. Jani; M. Hoesli and A. Bender (2005): "The capital structure of Swiss companies: An empirical analysis using dynamic panel data". *European Financial Management* 11 (1), pp. 51-69.

Graham, J.R. (2000): "How big are the tax benefits of debt?". *Journal of Finance* 55, pp. 1901-1940.

Grinblatt, M. and S. Titman (1998): *Financial markets and corporate strategy*. International edition (Boston: McGraw-Hill).

Harris, M. and A. Raviv (1991): "The theory of capital structure". *Journal of Finance* 46, pp. 297-355.

Jalilvand, A. and R.S. Harris (1984): "Corporate behavior in adjusting to capital structure and dividend targets: an econometric study". *Journal of Finance* 39, pp. 127-145.

Jensen, M. (1986): "Agency cost of free cash flow, corporate finance and takeovers". *American Economic Review* 76 (2), pp. 323-329.

Jung, K.; Y. Kim and R. Stulz (1996): "Timing, investment opportunities, managerial discretion, and the security issue decision". *Journal of Financial Economics* 42, pp. 159-185.

Kremp, E.; E. Stöss and D. Gerdesmeier (1999): "Estimation of a debt function: evidence from French and German firm panel data" in A. Sauvé and M. Scheuer (eds), *Corporate Finance in Germany and France* (Frankfurt-am-Main and Paris: Deutsche Bundesbank and Banque de France)..

Leary, M. and M. Roberts (2005): "Do firms rebalance their capital structure?". *Journal of Finance* 60 (6), pp. 2575-2619.

Marcus, A.J. (1983): "The bank capital decision: a time series-cross section analysis". *Journal of Finance* 38 (4), pp. 1217-1232.

Miguel, A. de and J. Pindado (2001): "Determinants of capital structure: new evidence from Spanish panel data". *Journal of Corporate Finance* 7, pp. 77-99.

Myers, S. (1977): "Determinants of corporate borrowing". *Journal of Financial Economics* 5 (2), pp. 147-175.

Myers, S. (1984): "The capital structure puzzle". *Journal of Finance* 34, pp. 575-592.

Myers, S. and N. Majluf (1984): "Corporate financing and investment decisions when firms have information that investors don't have". *Journal of Financial Economics* 13 (2), pp. 187-221.

Ozkan, A. (2001): "Determinants of capital structure and adjustment to long run target: Evidence from UK company panel data". *Journal of Business, Finance & Accounting* 28 (1), pp. 175-198.

Rajan, R.G. and L. Zingales (1995): "What do we know about capital structure? Some evidence from international data". *Journal of Finance* 50 (5), pp. 1421-1460.

Saá-Requejo, J. (1996): "Financing decisions: lessons from the Spanish experience". *Financial Management* 25 (3), pp. 44-56.

Shyam-Sunder, L. and S.C. Myers (1999): "Testing static tradeoff against pecking order models of capital structure". *Journal of Financial Economics* 51, pp. 219-244.

Smith, C.W. and R. Stulz (1985): "The determinants of firm's hedging policies". *Journal of Financial and Quantitative Analysis* 20, pp. 391-405.

Smith, C.W. and J.B. Warner (1979): "On financial contracting: an analysis of bond covenants". *Journal of Financial Economics* 7, pp. 117-161.

Sogorb-Mira, F. (2005): "How SME uniqueness affects capital structure: Evidence from a 1994-1998 Spanish data panel". *Small Business Economics* 25, pp. 447-457.

Stiglitz, J. (1972): "Come aspects of the pure theory of corporate finance: bankruptcies and takeovers". *Bell Journal of Economics and Management Science* 3, pp. 458-482.

Titman, S. and R. Wessels (1988): "The determinants of capital structures choice". *Journal of Finance* 43, pp. 1-19.

Warner, J.B. (1977): "Bankruptcy costs: some evidence". *Journal of Finance* 32, pp. 337-348.

Table 1
Summary of predictions of the trade-off and pecking order theories

	Predictions on firm leverage	
Variable	TOT	POT
Non-debt tax shields (NDTS)	-	
Profitability (PROF)	+	-
	a) Higher tax benefits b) Greater reduction of free cash flow conflict c) Lower bankruptcy costs	a) Higher possibilities of retaining earnings
Growth opportunities (GROWTH)	-	+
	a) Greater reduction of free cash-flow conflict b) Higher conflicts between bondholders and shareholders c) Higher costs of financial distress	a) Higher information asymmetries b) Higher financing needs
Intangible assets (INTANG)	-	+
	a) Higher costs of financial distress b) Higher conflicts between bondholders and shareholders	a) Higher information asymmetries

Table 2
Summary statistics of the dependent and independent variables

The table presents the summary statistics of the dependent and independent variables for the sample. DEBT is the ratio between the book value of debt (both long term and short term) and the book value of total assets; NDTS is the earnings before taxes minus the ratio between the taxes paid and the tax rate; INTANG is the ratio between the intangible assets and total assets; PROFIT is estimated as EBIT plus depreciation expenses and provisions (non-cash deductions from earnings) divided by total assets; GROWTH is the growth rate of total assets. In Panel B, the t-test and Wilcoxon's signed-rank test are estimated. ***, ** and * represent the significance at the 1%, 5% and 10% level, respectively.

Panel A: Descriptive statistics

Variables		Mean	Standard deviation	First Quartile	Median	Third Quartile
		(1)	(2)	(3)	(4)	(5)
DEBT (%)	Total sample	29.54	21.00	12.51	27.97	42.89
	Small firms	26.51	21.35	9.09	23.98	39.59
	Medium firms	29.68	20.65	13.29	28.09	42.93
	Large firms	30.93	21.31	13.30	29.51	44.59
NDTS (%)	Total sample	0.26	13.75	0.00	0.14	1.41
	Small firms	-0.06	15.65	-0.04	0.01	0.88
	Medium firms	0.16	15.83	0.00	0.16	1.48
	Large firms	0.64	6.30	0.00	0.19	1.52
PROFIT (%)	Total sample	10.82	15.36	6.00	10.32	15.88
	Small firms	8.53	16.23	4.39	8.83	13.83
	Medium firms	11.04	17.15	6.26	10.65	16.18
	Large firms	11.65	10.26	6.28	10.59	16.16
GROWTH (%)	Total sample	10.97	28.49	-2.30	6.74	19.09
	Small firms	6.43	27.46	-5.59	3.52	14.79
	Medium firms	10.47	26.30	-2.26	6.54	18.48
	Large firms	14.40	32.41	-0.56	9.05	22.27
INTANG (%)	Total sample	4.50	8.43	0.17	1.17	4.71
	Small firms	4.59	9.21	0.09	1.02	4.66
	Medium firms	4.63	8.46	0.20	1.22	4.89
	Large firms	4.19	7.91	0.17	1.14	4.33

Panel B: Mean differences

	Small vs. medium (1)		Small vs. large (2)		Medium vs. large (3)	
	t-test	Wilcoxon test	t-test	Wilcoxon test	t-test	Wilcoxon test
DEBT	-6.819***	-5.899***	-8.466***	-8.282***	-3.352***	-2.742***
NDTS	-0.618	-5.986***	-2.191***	-6.991***	-2.568***	-2.672***
PROFIT	-6.824***	-7.514***	-8.815***	-8.106***	-2.596***	-2.289***-
GROWTH	-6.641***	-6.897***	-11.078***	-11.695***	-7.170***	-5.964***
INTANG	-0.195	-0.452	1.838**	1.653*	2.988***	0.329

Table 3
Correlations

The table presents the correlation matrix. DEBT is the ratio between the book value of debt (both long term and short term) and the book value of total assets; LN(TA) is the natural logarithm of total assets; LN(SALES) is the natural logarithm of sales; LN(EMP) is the natural logarithm of the number of the firm's employees; NDTS is the earnings before taxes minus the ratio between the taxes paid and the tax rate; INTANG is the ratio between the intangible assets and total assets; PROFIT is estimated as EBIT plus depreciation expenses and provisions (non-cash deductions from earnings) divided by total assets; GO is the growth rate of total assets. ***, ** and * represent the significance at the 1%, 5% and 10% level, respectively.

	DEBT	LN(TA)	LN(SALES)	LN(EMP)	NDTS	PROF	GROWTH
LN(TA)	0.1144***						
LN(SALES)	0.0148**	0.8337***					
LN(EMP)	0.0338***	0.7064***	0.7834***				
NDTS	-0.01611***	0.0066*	0.0280***	0.0108**			
PROF	-0.01792***	0.0478***	0.0393***	0.0196***	0.0600***		
GROWTH	0.0401***	0.1208***	0.0612***	0.0496***	0.0116***	0.0361***	
INTANG	0.1538***	-0.0392***	-0.0502***	-0.0197***	-0.0011	0.0164***	0.0343***

Table 4
Determinants of firm leverage

Regressions are estimated using the Arellano and Bond (1991) GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the ratio between the book value of debt (both long term and short term) and the book value of total assets. As explanatory variables, we include one lag of the dependent variable ($DEBT_{t-1}$). NDTS are the non-debt tax shields measured as the earnings before taxes minus the ratio between the taxes paid and the tax rate. INTANG is the ratio of intangible to total assets. PROF is the firm's profitability measured as earnings before interest and taxes (EBIT) plus depreciation expenses and provisions (non-cash deductions from earnings) divided by total assets. GROWTH measures the growth opportunities as the growth rate of total assets. Firm size is measured by three different variables: the natural logarithm of total assets, LN(TA), the natural logarithm of sales, LN(SALES), and the natural logarithm of employees, LN(EMP). The regressions are estimated for the period 1996-2002 and firm-specific fixed effects are controlled for. Year and industry dummy variables were included for all the estimations but are not reported. T-statistics are between brackets. ***, ** and * represent the significance at the 1%, 5% and 10% level, respectively.

	Predicted sign					
	TOT	POT	(1)	(2)	(3)	(4)
INTERCEPT			0.0113**	0.0068	0.0110*	0.0061
			(2.01)	(1.21)	(1.90)	(0.97)
DEBTt-1	+		0.6382***	0.5942***	0.6357***	0.6429***
			(26.30)	(23.36)	(29.56)	(23.85)
NDTS	-		-0.0343	-0.1207**	-0.0268	-0.0311
			(-0.59)	(-1.98)	(-0.45)	(-0.49)
PROF	+	-	-0.1544***	-0.0743	-0.1226**	-0.1045*
			(-2.76)	(-1.25)	(-2.03)	(-1.65)
GROWTH	-	+	0.0497**	0.0321**	0.0300	0.0211
			(2.32)	(2.02)	(1.32)	(0.96)
INTANG	-	+	0.0905	0.0538	0.1133*	0.0979**
			(1.46)	(0.82)	(1.79)	(1.42)
LN(TA)	+	+/-		0.1974***		
				(4.42)		
LN(SALES)	+	+/-			-0.0065	
					(-0.48)	
LN(EMP)	+	+/-				0.0236*
						(1.85)
Time dummies			Yes	Yes	Yes	Yes
Industry dummies			Yes	Yes	Yes	Yes
m_1			-9.57***	-11.06***	-9.71***	-8.51***
m_2			-0.23	-0.53	-0.10	0.79
Sargan Test			152.77	160.22**	155.30	152.50
# observations			16284	16284	16246	14242
# firms			3439	3439	3430	3308

Table 5
Firm size and determinants of leverage

Regressions are estimated using the Arellano and Bond (1991) GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the ratio between the book value of debt (both long term and short term) and the book value of total assets. As explanatory variables, we include one lag of the dependent variable ($DEBT_{t-1}$). NDTS are the non-debt tax shields measured as the earnings before taxes minus the ratio between the taxes paid and the tax rate. INTANG is the ratio of intangible to total assets. PROF is the firm's profitability measured as earnings before interest and taxes (EBIT) plus depreciation expenses and provisions (non-cash deductions from earnings) divided by total assets. GROWTH measures the growth opportunities as the growth rate of total assets. SMALL is a dummy variable that takes the value of 1 if it is a small firm according to EU criteria and 0 otherwise. The regressions are estimated for the period 1996-2002 and firm-specific fixed effects are controlled for. Year and industry dummy variables were included for all the estimations but are not reported. T-statistics are between brackets. ***, ** and * represent the significance at the 1%, 5% and 10% level, respectively.

	Predicted sign						
	TOT	POT	Small	Medium	Large	Small vs. medium and large	Small vs. large
			(1)	(2)	(3)	(4)	(5)
INTERCEPT			-0.0065 (-0.45)	0.0097 (1.38)	0.0062 (0.73)	0.0109** (2.17)	0.0021 (0.27)
DEBTt-1	+		0.5261*** (15.15)	0.5363*** (18.29)	0.5302*** (16.49)	0.5804*** (26.55)	0.5806*** (23.69)
NDTS	-		-0.1577*** (-3.74)	-0.2328*** (-3.90)	-0.0211 (-0.31)	-0.0154 (-0.32)	-0.1179* (-1.75)
PROF	+	-	-0.2842*** (-4.45)	0.0870 (1.47)	-0.3395*** (-4.97)	-0.1442*** (-3.05)	-0.2598*** (-4.65)
GROWTH	-	+	0.0760*** (6.97)	-0.0329 (-1.36)	0.0402** (2.33)	0.0149 (1.02)	0.0027 (0.20)
INTANG	-	+	0.6174*** (8.12)	0.1342* (1.65)	0.0004 (0.00)	0.0738 (1.27)	0.1076 (1.50)
DEBTt-1 * SMALL						-0.0005 (-0.02)	0.0287 (1.23)
NDTS * SMALL						-0.3692*** (-4.56)	-0.4252*** (-4.49)
PROF * SMALL						-0.1868*** (-2.87)	-0.2008*** (-3.16)
GROWTH * SMALL						0.1118*** (6.27)	0.1008*** (6.73)
INTANG * SMALL						0.2289*** (2.77)	0.2237*** (2.76)
Time dummies						Yes	Yes
Industry dummies						Yes	Yes
m_1			-5.03***	-8.62***	-9.21***	-9.33***	-11.62***
m_2			1.12	-0.59	1.00	-0.25	1.24
Sargan Test			164.59**	137.75	135.59	287.58	271.06
# observations			1958	7976	3454	16155	6175
# firms			706	1941	950	3418	1651

FUNDACIÓN DE LAS CAJAS DE AHORROS

DOCUMENTOS DE TRABAJO

Últimos números publicados

159/2000 Participación privada en la construcción y explotación de carreteras de peaje
Ginés de Rus, Manuel Romero y Lourdes Trujillo

160/2000 Errores y posibles soluciones en la aplicación del *Value at Risk*
Mariano González Sánchez

161/2000 Tax neutrality on saving assets. The spahish case before and after the tax reform
Cristina Ruza y de Paz-Curbera

162/2000 Private rates of return to human capital in Spain: new evidence
F. Barceinas, J. Oliver-Alonso, J.L. Raymond y J.L. Roig-Sabaté

163/2000 El control interno del riesgo. Una propuesta de sistema de límites
riesgo neutral
Mariano González Sánchez

164/2001 La evolución de las políticas de gasto de las Administraciones Públicas en los años 90
Alfonso Utrilla de la Hoz y Carmen Pérez Esparrells

165/2001 Bank cost efficiency and output specification
Emili Tortosa-Ausina

166/2001 Recent trends in Spanish income distribution: A robust picture of falling income inequality
Josep Oliver-Alonso, Xavier Ramos y José Luis Raymond-Bara

167/2001 Efectos redistributivos y sobre el bienestar social del tratamiento de las cargas familiares en el nuevo IRPF
Nuria Badenes Plá, Julio López Laborda, Jorge Onrubia Fernández

168/2001 The Effects of Bank Debt on Financial Structure of Small and Medium Firms in some European Countries
Mónica Melle-Hernández

169/2001 La política de cohesión de la UE ampliada: la perspectiva de España
Ismael Sanz Labrador

170/2002 Riesgo de liquidez de Mercado
Mariano González Sánchez

171/2002 Los costes de administración para el afiliado en los sistemas de pensiones basados en cuentas de capitalización individual: medida y comparación internacional.
José Enrique Devesa Carpio, Rosa Rodríguez Barrera, Carlos Vidal Meliá

172/2002 La encuesta continua de presupuestos familiares (1985-1996): descripción, representatividad y propuestas de metodología para la explotación de la información de los ingresos y el gasto.
Llorenc Pou, Joaquín Alegre

173/2002 Modelos paramétricos y no paramétricos en problemas de concesión de tarjetas de credito.
Rosa Puertas, María Bonilla, Ignacio Olmeda

174/2002 Mercado único, comercio intra-industrial y costes de ajuste en las manufacturas españolas.
José Vicente Blanes Cristóbal

175/2003 La Administración tributaria en España. Un análisis de la gestión a través de los ingresos y de los gastos.
Juan de Dios Jiménez Aguilera, Pedro Enrique Barrilao González

176/2003 The Falling Share of Cash Payments in Spain.
Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey
Publicado en "Moneda y Crédito" nº 217, pags. 167-189.

177/2003 Effects of ATMs and Electronic Payments on Banking Costs: The Spanish Case.
Santiago Carbó Valverde, Rafael López del Paso, David B. Humphrey

178/2003 Factors explaining the interest margin in the banking sectors of the European Union.
Joaquín Maudos y Juan Fernández Guevara

179/2003 Los planes de stock options para directivos y consejeros y su valoración por el mercado de valores en España.
Mónica Melle Hernández

180/2003 Ownership and Performance in Europe and US Banking – A comparison of Commercial, Co-operative & Savings Banks.
Yener Altunbas, Santiago Carbó y Phil Molyneux

181/2003 The Euro effect on the integration of the European stock markets.
Mónica Melle Hernández

182/2004 In search of complementarity in the innovation strategy: international R&D and external knowledge acquisition.
Bruno Cassiman, Reinhilde Veugelers

183/2004 Fijación de precios en el sector público: una aplicación para el servicio municipal de suministro de agua.
Mª Ángeles García Valiñas

184/2004 Estimación de la economía sumergida es España: un modelo estructural de variables latentes.
Ángel Alañón Pardo, Miguel Gómez de Antonio

185/2004 Causas políticas y consecuencias sociales de la corrupción.
Joan Oriol Prats Cabrera

186/2004 Loan bankers' decisions and sensitivity to the audit report using the belief revision model.
Andrés Guiral Contreras and José A. Gonzalo Angulo

187/2004 El modelo de Black, Derman y Toy en la práctica. Aplicación al mercado español.
Marta Tolentino García-Abadillo y Antonio Díaz Pérez

188/2004 Does market competition make banks perform well?.
Mónica Melle

189/2004 Efficiency differences among banks: external, technical, internal, and managerial
Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso

190/2004 Una aproximación al análisis de los costes de la esquizofrenia en españa: los modelos jerárquicos bayesianos
F. J. Vázquez-Polo, M. A. Negrín, J. M. Cavasés, E. Sánchez y grupo RIRAG

191/2004 Environmental proactivity and business performance: an empirical analysis
Javier González-Benito y Óscar González-Benito

192/2004 Economic risk to beneficiaries in notional defined contribution accounts (NDCs)
Carlos Vidal-Meliá, Inmaculada Domínguez-Fabian y José Enrique Devesa-Carpio

193/2004 Sources of efficiency gains in port reform: non parametric malmquist decomposition tfp index for Mexico
Antonio Estache, Beatriz Tovar de la Fé y Lourdes Trujillo

194/2004 Persistencia de resultados en los fondos de inversión españoles
Alfredo Ciriaco Fernández y Rafael Santamaría Aquilué

195/2005 El modelo de revisión de creencias como aproximación psicológica a la formación del juicio del auditor sobre la gestión continuada
Andrés Guiral Contreras y Francisco Esteso Sánchez

196/2005 La nueva financiación sanitaria en España: descentralización y prospectiva
David Cantarero Prieto

197/2005 A cointegration analysis of the Long-Run supply response of Spanish agriculture to the common agricultural policy
José A. Mendez, Ricardo Mora y Carlos San Juan

198/2005 ¿Refleja la estructura temporal de los tipos de interés del mercado español preferencia por la liquidez?
Magdalena Massot Perelló y Juan M. Nave

199/2005 Análisis de impacto de los Fondos Estructurales Europeos recibidos por una economía regional: Un enfoque a través de Matrices de Contabilidad Social
M. Carmen Lima y M. Alejandro Cardenete

200/2005 Does the development of non-cash payments affect monetary policy transmission?
Santiago Carbó Valverde y Rafael López del Paso

201/2005 Firm and time varying technical and allocative efficiency: an application for port cargo handling firms
Ana Rodríguez-Álvarez, Beatriz Tovar de la Fe y Lourdes Trujillo

202/2005 Contractual complexity in strategic alliances
Jeffrey J. Reuer y Africa Ariño

203/2005 Factores determinantes de la evolución del empleo en las empresas adquiridas por opa
Nuria Alcalde Fradejas y Inés Pérez-Soba Aguilar

204/2005 Nonlinear Forecasting in Economics: a comparison between Comprehension Approach versus Learning Approach. An Application to Spanish Time Series
Elena Olmedo, Juan M. Valderas, Ricardo Gimeno and Lorenzo Escot

205/2005 Precio de la tierra con presión urbana: un modelo para España
Esther Decimavilla, Carlos San Juan y Stefan Sperlich

206/2005 Interregional migration in Spain: a semiparametric analysis
Adolfo Maza y José Villaverde

207/2005 Productivity growth in European banking
Carmen Murillo-Melchor, José Manuel Pastor y Emili Tortosa-Ausina

208/2005 Explaining Bank Cost Efficiency in Europe: Environmental and Productivity Influences.
Santiago Carbó Valverde, David B. Humphrey y Rafael López del Paso

209/2005 La elasticidad de sustitución intertemporal con preferencias no separables intratemporalmente: los casos de Alemania, España y Francia.
Elena Márquez de la Cruz, Ana R. Martínez Cañete y Inés Pérez-Soba Aguilar

210/2005 Contribución de los efectos tamaño, book-to-market y momentum a la valoración de activos: el caso español.
Begoña Font-Belaire y Alfredo Juan Grau-Grau

211/2005 Permanent income, convergence and inequality among countries
José M. Pastor and Lorenzo Serrano

212/2005 The Latin Model of Welfare: Do 'Insertion Contracts' Reduce Long-Term Dependence?
Luis Ayala and Magdalena Rodríguez

213/2005 The effect of geographic expansion on the productivity of Spanish savings banks
Manuel Illueca, José M. Pastor and Emili Tortosa-Ausina

214/2005 Dynamic network interconnection under consumer switching costs
Ángel Luis López Rodríguez

215/2005 La influencia del entorno socioeconómico en la realización de estudios universitarios: una aproximación al caso español en la década de los noventa
Marta Rahona López

216/2005 The valuation of spanish ipos: efficiency analysis
Susana Álvarez Otero

217/2005 On the generation of a regular multi-input multi-output technology using parametric output distance functions
Sergio Perelman and Daniel Santin

218/2005 La gobernanza de los procesos parlamentarios: la organización industrial del congreso de los diputados en España
Gonzalo Caballero Miguez

219/2005 Determinants of bank market structure: Efficiency and political economy variables
Francisco González

220/2005 Agresividad de las órdenes introducidas en el mercado español: estrategias, determinantes y medidas de performance
David Abad Díaz

221/2005 Tendencia post-anuncio de resultados contables: evidencia para el mercado español
Carlos Forner Rodríguez, Joaquín Marhuenda Fructuoso y Sonia Sanabria García

222/2005 Human capital accumulation and geography: empirical evidence in the European Union
Jesús López-Rodríguez, J. Andrés Faíña y Jose Lopez Rodríguez

223/2005 Auditors' Forecasting in Going Concern Decisions: Framing, Confidence and Information Processing
Waymond Rodgers and Andrés Guiral

224/2005 The effect of Structural Fund spending on the Galician region: an assessment of the 1994-1999 and 2000-2006 Galician CSFs
José Ramón Cancelo de la Torre, J. Andrés Faíña and Jesús López-Rodríguez

225/2005 The effects of ownership structure and board composition on the audit committee activity: Spanish evidence
Carlos Fernández Méndez and Rubén Arrondo García

226/2005 Cross-country determinants of bank income smoothing by managing loan loss provisions
Ana Rosa Fonseca and Francisco González

227/2005 Incumplimiento fiscal en el irpf (1993-2000): un análisis de sus factores determinantes
Alejandro Estellér Moré

228/2005 Region versus Industry effects: volatility transmission
Pilar Soriano Felipe and Francisco J. Climent Diranzo

229/2005 Concurrent Engineering: The Moderating Effect Of Uncertainty On New Product Development Success
Daniel Vázquez-Bustelo and Sandra Valle

230/2005 On zero lower bound traps: a framework for the analysis of monetary policy in the 'age' of central banks
Alfonso Palacio-Vera

231/2005 Reconciling Sustainability and Discounting in Cost Benefit Analysis: a methodological proposal
M. Carmen Almansa Sáez and Javier Calatrava Requena

232/2005 Can The Excess Of Liquidity Affect The Effectiveness Of The European Monetary Policy?
Santiago Carbó Valverde and Rafael López del Paso

233/2005 Inheritance Taxes In The Eu Fiscal Systems: The Present Situation And Future Perspectives.
Miguel Angel Barberán Lahuerta

234/2006 Bank Ownership And Informativeness Of Earnings.
Víctor M. González

235/2006 Developing A Predictive Method: A Comparative Study Of The Partial Least Squares Vs Maximum Likelihood Techniques.
Waymond Rodgers, Paul Pavlou and Andres Guiral.

236/2006 Using Compromise Programming for Macroeconomic Policy Making in a General Equilibrium Framework: Theory and Application to the Spanish Economy.
Francisco J. André, M. Alejandro Cardenete y Carlos Romero.

237/2006 Bank Market Power And Sme Financing Constraints.
Santiago Carbó-Valverde, Francisco Rodríguez-Fernández y Gregory F. Udell.

238/2006 Trade Effects Of Monetary Agreements: Evidence For Oecd Countries.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano.

239/2006 The Quality Of Institutions: A Genetic Programming Approach.
Marcos Álvarez-Díaz y Gonzalo Caballero Miguez.

240/2006 La interacción entre el éxito competitivo y las condiciones del mercado doméstico como determinantes de la decisión de exportación en las Pymes.
Francisco García Pérez.

241/2006 Una estimación de la depreciación del capital humano por sectores, por ocupación y en el tiempo.
Inés P. Murillo.

242/2006 Consumption And Leisure Externalities, Economic Growth And Equilibrium Efficiency.
Manuel A. Gómez.

243/2006 Measuring efficiency in education: an analysis of different approaches for incorporating non-discretionary inputs.
Jose Manuel Cordero-Ferrera, Francisco Pedraja-Chaparro y Javier Salinas-Jiménez

244/2006 Did The European Exchange-Rate Mechanism Contribute To The Integration Of Peripheral Countries?.
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano

245/2006 Intergenerational Health Mobility: An Empirical Approach Based On The Echp.
Marta Pascual and David Cantarero

246/2006 Measurement and analysis of the Spanish Stock Exchange using the Lyapunov exponent with digital technology.
Salvador Rojí Ferrari and Ana Gonzalez Marcos

247/2006 Testing For Structural Breaks In Variance Withadditive Outliers And Measurement Errors.
Paulo M.M. Rodrigues and Antonio Rubia

248/2006 The Cost Of Market Power In Banking: Social Welfare Loss Vs. Cost Inefficiency.
Joaquín Maudos and Juan Fernández de Guevara

249/2006 Elasticidades de largo plazo de la demanda de vivienda: evidencia para España (1885-2000).
Desiderio Romero Jordán, José Félix Sanz Sanz y César Pérez López

250/2006 Regional Income Disparities in Europe: What role for location?.
Jesús López-Rodríguez and J. Andrés Faíña

251/2006 Funciones abreviadas de bienestar social: Una forma sencilla de simultanear la medición de la eficiencia y la equidad de las políticas de gasto público.
Nuria Badenes Plá y Daniel Santín González

252/2006 "The momentum effect in the Spanish stock market: Omitted risk factors or investor behaviour?".
Luis Muga and Rafael Santamaría

253/2006 Dinámica de precios en el mercado español de gasolina: un equilibrio de colusión tácita.
Jordi Perdiguero García

254/2006 Desigualdad regional en España: renta permanente versus renta corriente.
José M.Pastor, Empar Pons y Lorenzo Serrano

255/2006 Environmental implications of organic food preferences: an application of the impure public goods model.
Ana Maria Aldanondo-Ochoa y Carmen Almansa-Sáez

256/2006 Family tax credits versus family allowances when labour supply matters: Evidence for Spain.
José Felix Sanz-Sanz, Desiderio Romero-Jordán y Santiago Álvarez-García

257/2006 La internacionalización de la empresa manufacturera española: efectos del capital humano genérico y específico.
José López Rodríguez

258/2006 Evaluación de las migraciones interregionales en España, 1996-2004.
María Martínez Torres

259/2006 Efficiency and market power in Spanish banking.
Rolf Färe, Shawna Grosskopf y Emili Tortosa-Ausina.

260/2006 Asimetrías en volatilidad, beta y contagios entre las empresas grandes y pequeñas cotizadas en la bolsa española.
Helena Chuliá y Hipòlit Torró.

261/2006 Birth Replacement Ratios: New Measures of Period Population Replacement.
José Antonio Ortega.

262/2006 Accidentes de tráfico, víctimas mortales y consumo de alcohol.
José Mª Arranz y Ana I. Gil.

263/2006 Análisis de la Presencia de la Mujer en los Consejos de Administración de las Mil Mayores Empresas Españolas.
Ruth Mateos de Cabo, Lorenzo Escot Mangas y Ricardo Gimeno Nogués.

264/2006 Crisis y Reforma del Pacto de Estabilidad y Crecimiento. Las Limitaciones de la Política Económica en Europa.
Ignacio Álvarez Peralta.

265/2006 Have Child Tax Allowances Affected Family Size? A Microdata Study For Spain (1996-2000).
Jaime Vallés-Giménez y Anabel Zárate-Marco.

266/2006 Health Human Capital And The Shift From Foraging To Farming.
Paolo Rungo.

267/2006 Financiación Autonómica y Política de la Competencia: El Mercado de Gasolina en Canarias.
Juan Luis Jiménez y Jordi Perdiguero.

268/2006 El cumplimiento del Protocolo de Kyoto para los hogares españoles: el papel de la imposición sobre la energía.
Desiderio Romero-Jordán y José Félix Sanz-Sanz.

269/2006 Banking competition, financial dependence and economic growth
Joaquín Maudos y Juan Fernández de Guevara

270/2006 Efficiency, subsidies and environmental adaptation of animal farming under CAP
Werner Kleinhanß, Carmen Murillo, Carlos San Juan y Stefan Sperlich

271/2006 Interest Groups, Incentives to Cooperation and Decision-Making Process in the European Union
A. Garcia-Lorenzo y Jesús López-Rodríguez

272/2006 Riesgo asimétrico y estrategias de momentum en el mercado de valores español
Luis Muga y Rafael Santamaría

273/2006 Valoración de capital-riesgo en proyectos de base tecnológica e innovadora a través de la teoría de opciones reales
Gracia Rubio Martín

274/2006 Capital stock and unemployment: searching for the missing link
Ana Rosa Martínez-Cañete, Elena Márquez de la Cruz, Alfonso Palacio-Vera and Inés Pérez-Soba Aguilar

275/2006 Study of the influence of the voters' political culture on vote decision through the simulation of a political competition problem in Spain
Sagrario Lantarón, Isabel Lillo, Mª Dolores López and Javier Rodrigo

276/2006 Investment and growth in Europe during the Golden Age
Antonio Cubel and Mª Teresa Sanchis

277/2006 Efectos de vincular la pensión pública a la inversión en cantidad y calidad de hijos en un modelo de equilibrio general
Robert Meneu Gaya

278/2006 El consumo y la valoración de activos
Elena Márquez y Belén Nieto

279/2006 Economic growth and currency crisis: A real exchange rate entropic approach
David Matesanz Gómez y Guillermo J. Ortega

280/2006 Three measures of returns to education: An illustration for the case of Spain
María Arrazola y José de Hevia

281/2006 Composition of Firms versus Composition of Jobs
Antoni Cunyat

282/2006 La vocación internacional de un holding tranviario belga: la Compagnie Mutuelle de Tram-ways, 1895-1918
Alberte Martínez López

283/2006 Una visión panorámica de las entidades de crédito en España en la última década.
Constantino García Ramos

284/2006 Foreign Capital and Business Strategies: a comparative analysis of urban transport in Madrid and Barcelona, 1871-1925
Alberte Martínez López

285/2006 Los intereses belgas en la red ferroviaria catalana, 1890-1936
Alberte Martínez López

286/2006 The Governance of Quality: The Case of the Agrifood Brand Names
Marta Fernández Barcala, Manuel González-Díaz y Emmanuel Raynaud

287/2006 Modelling the role of health status in the transition out of malthusian equilibrium
Paolo Rungo, Luis Currais and Berta Rivera

288/2006 Industrial Effects of Climate Change Policies through the EU Emissions Trading Scheme
Xavier Labandeira and Miguel Rodríguez

289/2006 Globalisation and the Composition of Government Spending: An analysis for OECD countries
Norman Gemmell, Richard Kneller and Ismael Sanz

290/2006 La producción de energía eléctrica en España: Análisis económico de la actividad tras la liberalización del Sector Eléctrico
Fernando Hernández Martínez

291/2006 Further considerations on the link between adjustment costs and the productivity of R&D investment: evidence for Spain
Desiderio Romero-Jordán, José Félix Sanz-Sanz and Inmaculada Álvarez-Ayuso

292/2006 Una teoría sobre la contribución de la función de compras al rendimiento empresarial
Javier González Benito

293/2006 Agility drivers, enablers and outcomes: empirical test of an integrated agile manufacturing model
Daniel Vázquez-Bustelo, Lucía Avella and Esteban Fernández

294/2006 Testing the parametric vs the semiparametric generalized mixed effects models
María José Lombardía and Stefan Sperlich

295/2006 Nonlinear dynamics in energy futures
Mariano Matilla-García

296/2006 Estimating Spatial Models By Generalized Maximum Entropy Or How To Get Rid Of W
Esteban Fernández Vázquez, Matías Mayor Fernández and Jorge Rodriguez-Valez

297/2006 Optimización fiscal en las transmisiones lucrativas: análisis metodológico
Félix Domínguez Barrero

298/2006 La situación actual de la banca online en España
Francisco José Climent Diranzo y Alexandre Momparler Pechuán

299/2006 Estrategia competitiva y rendimiento del negocio: el papel mediador de la estrategia y las capacidades productivas
Javier González Benito y Isabel Suárez González

300/2006 A Parametric Model to Estimate Risk in a Fixed Income Portfolio
Pilar Abad and Sonia Benito

301/2007 Análisis Empírico de las Preferencias Sociales Respecto del Gasto en Obra Social de las Cajas de Ahorros
Alejandro Esteller-Moré, Jonathan Jorba Jiménez y Albert Solé-Ollé

302/2007 Assessing the enlargement and deepening of regional trading blocs: The European Union case
Salvador Gil-Pareja, Rafael Llorca-Vivero y José Antonio Martínez-Serrano

303/2007 ¿Es la Franquicia un Medio de Financiación?: Evidencia para el Caso Español
Vanesa Solís Rodríguez y Manuel González Díaz

304/2007 On the Finite-Sample Biases in Nonparametric Testing for Variance Constancy
Paulo M.M. Rodrigues and Antonio Rubia

305/2007 Spain is Different: Relative Wages 1989-98
José Antonio Carrasco Gallego

306/2007 Poverty reduction and SAM multipliers: An evaluation of public policies in a regional framework
Francisco Javier De Miguel-Vélez y Jesús Pérez-Mayo

307/2007 La Eficiencia en la Gestión del Riesgo de Crédito en las Cajas de Ahorro
Marcelino Martínez Cabrera

308/2007 Optimal environmental policy in transport: unintended effects on consumers' generalized price
M. Pilar Socorro and Ofelia Betancor

309/2007 Agricultural Productivity in the European Regions: Trends and Explanatory Factors
Roberto Ezcurra, Belen Iráizoz, Pedro Pascual and Manuel Rapún

310/2007 Long-run Regional Population Divergence and Modern Economic Growth in Europe: a Case Study of Spain
María Isabel Ayuda, Fernando Collantes and Vicente Pinilla

311/2007 Financial Information effects on the measurement of Commercial Banks' Efficiency
Borja Amor, María T. Tascón and José L. Fanjul

312/2007 Neutralidad e incentivos de las inversiones financieras en el nuevo IRPF
Félix Domínguez Barrero

313/2007 The Effects of Corporate Social Responsibility Perceptions on The Valuation of Common Stock
Waymond Rodgers , Helen Choy and Andres Guiral-Contreras

314/2007 Country Creditor Rights, Information Sharing and Commercial Banks' Profitability Persistence across the world
Borja Amor, María T. Tascón and José L. Fanjul

315/2007 ¿Es Relevante el Déficit Corriente en una Unión Monetaria? El Caso Español
Javier Blanco González y Ignacio del Rosal Fernández

316/2007 The Impact of Credit Rating Announcements on Spanish Corporate Fixed Income Performance: Returns, Yields and Liquidity
Pilar Abad, Antonio Díaz and M. Dolores Robles

317/2007 Indicadores de Lealtad al Establecimiento y Formato Comercial Basados en la Distribución del Presupuesto
Cesar Augusto Bustos Reyes y Óscar González Benito

318/2007 Migrants and Market Potential in Spain over The XXth Century: A Test Of The New Economic Geography
Daniel A. Tirado, Jordi Pons, Elisenda Paluzie and Javier Silvestre

319/2007 El Impacto del Coste de Oportunidad de la Actividad Emprendedora en la Intención de los Ciudadanos Europeos de Crear Empresas
Luis Miguel Zapico Aldeano

320/2007 Los belgas y los ferrocarriles de vía estrecha en España, 1887-1936
Alberte Martínez López

321/2007 Competición política bipartidista. Estudio geométrico del equilibrio en un caso ponderado
Isabel Lillo, Mª Dolores López y Javier Rodrigo

322/2007 Human resource management and environment management systems: an empirical study
Mª Concepción López Fernández, Ana Mª Serrano Bedia and Gema García Piqueres

323/2007 Wood and industrialization. evidence and hypotheses from the case of Spain, 1860-1935.
Iñaki Iriarte-Goñi and María Isabel Ayuda Bosque

324/2007 New evidence on long-run monetary neutrality.
J. Cunado, L.A. Gil-Alana and F. Perez de Gracia

325/2007 Monetary policy and structural changes in the volatility of us interest rates.
Juncal Cuñado, Javier Gomez Biscarri and Fernando Perez de Gracia

326/2007 The productivity effects of intrafirm diffusion.
Lucio Fuentelsaz, Jaime Gómez and Sergio Palomas

327/2007 Unemployment duration, layoffs and competing risks.
J.M. Arranz, C. García-Serrano and L. Toharia

328/2007 El grado de cobertura del gasto público en España respecto a la UE-15
Nuria Rueda, Begoña Barruso, Carmen Calderón y Mª del Mar Herrador

329/2007 The Impact of Direct Subsidies in Spain before and after the CAP'92 Reform
Carmen Murillo, Carlos San Juan and Stefan Sperlich

330/2007 Determinants of post-privatisation performance of Spanish divested firms
Laura Cabeza García and Silvia Gómez Ansón

331/2007 ¿Por qué deciden diversificar las empresas españolas? Razones oportunistas versus razones económicas
Almudena Martínez Campillo

332/2007 Dynamical Hierarchical Tree in Currency Markets
Juan Gabriel Brida, David Matesanz Gómez and Wiston Adrián Risso

333/2007 Los determinantes sociodemográficos del gasto sanitario. Análisis con microdatos individuales
Ana María Angulo, Ramón Barberán, Pilar Egea y Jesús Mur

334/2007 Why do companies go private? The Spanish case
Inés Pérez-Soba Aguilar

335/2007 The use of gis to study transport for disabled people
Verónica Cañal Fernández

336/2007 The long run consequences of M&A: An empirical application
Cristina Bernad, Lucio Fuentelsaz and Jaime Gómez

337/2007 Las clasificaciones de materias en economía: principios para el desarrollo de una nueva clasificación
Valentín Edo Hernández

338/2007 Reforming Taxes and Improving Health: A Revenue-Neutral Tax Reform to Eliminate Medical and Pharmaceutical VAT
Santiago Álvarez-García, Carlos Pestana Barros y Juan Prieto-Rodriguez

339/2007 Impacts of an iron and steel plant on residential property values
Celia Bilbao-Terol

340/2007 Firm size and capital structure: Evidence using dynamic panel data
Víctor M. González and Francisco González