Sustainable Competitiveness in Spanish Employee-Owned Firms

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Abstract

In this paper we analyze a special type of employee-owned firms, namely employee-owned limited liability firms (EOLLFs), which receive some tax and financial benefits to help increase job creation in a country affected by high unemployment rates. EOLLFs must comply with certain conditions to take advantage of those benefits. We argue that these conditions impose important limitations on their long-term growth and performance. We compare the evolution of EOLLFs with that of other independent closely-held private limited liability firms over a long period of time, which includes both economic upturns and downturns. We find that EOLLFs invest less, have lower capital and human resources, grow less and show lower performance than other independent closely-held private limited liability firms. We argue that regulatory restrictions derive in negative consequences that outweigh the positive effects expected by most authors in the relationship between employee-ownership and performance.

JEL codes: **L25, J54, L26.**

Keywords: **Employee-owned firms, performance, efficiency, unemployment**

1. Introduction

Huge unemployment is one of the key problems that arise whenever an economic crisis explodes in Spain. Over 1.8 million people were unemployed at the beginning of the last economic crisis, representing 8.26 percent of the active workforce. By mid 2013 the number of unemployed increased to 5.98 million people, with the share of unemployed in the active workforce being 26.26 percent[1]. This situation is not new in Spain since a similar scenario occurred in the economic crisis of the early nineties. Even in good times there is a high structural unemployment rate (Blanchard and Jimeno, 1995; Dolado and Jimeno, 1997; Hall, 1970; Koryukin, 2003; Krugman, 1994; Summers, 1986) that could be explained by several factors, among which the rigidity of the labor market should be highlighted (Hall, 1975; Nickell, 1997; Tasci and Zenker, 2011).

One of the solutions on which public authorities have relied in times of crisis, with high unemployment rates, is the support to the creation of employee-owned firms, which should help absorb the redundancies found in larger firms (Barlett et al., 1992; Hochner and Granrose, 1985; Logue and Yates, 1999; Park et al. 2004; Pérotin, 2006). Employee-owned firms, especially worker cooperatives, are more likely to be established when there is an economic downturn (Logue and Yates, 1999).

In this regard, the Spanish government has shown a remarkable interest in the support to employee-owned firms that adhere to the concept outlined by Ben-Ner and Byoung (1996)[2] and

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[1] According to the Labor Force Survey conducted by the National Satatistics Institute (INE). Available online at: http://www.ine.es/jaxi/menu.do?type=pcaxis&path=/t22/e308_mnu&file=inebase&L=0. Accessed: October 15, 2013.
[2] Ben-Ner and Byoung (1996) define employee-owned firms as firms in which the majority of employees own a majority of the stock.

Frohlich et al. (1998)[3]. As Morales-Gutiérrez et al. (2008) describe, there are two types of employee-owned firms in Spain: worker cooperatives and a special type of limited liability firms, namely employee-owned limited liability firms (hereinafter, EOLLFs). Our study focuses on the second type of firms (EOLLFs), identified in Spain as 'sociedades laborales'. An EOLLF is an intermediate type of firm between conventional capitalist firms and worker cooperatives. EOLLFs are limited liability firms subject to some conditions about the equity participation of employee-owners, which should jointly own more than 51 percent of total equity capital, but individually one shareholder could not own more than one third of total equity capital. Similarly, there is a limited percentage of yearly working hours attributable to non-owner employees. Furthermore, EOLLFs must retain part of the profits to create a special reserve. In return, EOLLFs were granted some special tax incentives in the specific regulation, contained in the act "Ley 4/1997, de sociedades laborales", passed in 1997. EOLLFs and worker cooperatives also obtain financial incentives from central and regional governments (e.g. loans at subsidized interest rates or reductions in social security charges for hiring new employees). But the main incentive is the possibility laid-off workers have to receive all unemployment benefits in one single payment if they become self-employed, or create or become a shareholder of an employee-owned firm.

From a theoretical point of view, economic theory would predict both positive and negative effects of employee-ownership on firm performance (Blasi et al., 1996). The existing empirical literature shows a remarkable international agreement that employee-ownership has non-univocal effects on firm performance (see Pérotin and Robinson, 2003 for a review).

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[3] Frohlich et al. (1998) define full employee ownership including not only full rights of economic return, but also full rights of governance and distribution.

In this study we aim to prove that the conditions imposed on EOLLFs to have access to tax and financial incentives could make them less competitive than other independent closely-held private firms in the long term. Therefore, we aim to analyze whether Spanish EOLLFs firms are less efficient than other independent closely-held private firms. The implications of our work are important to determine that the limitations related to the characteristics of employee-owned firms may result in possible pervasive long-term effects, which could derive in a lack of effect of policy measures designed to enhance employment creation.

We focus on a large representative sample of Spanish independent closely-held private firms, of which 29,046 chose to be included in the 1989 or 1997 regulation of employee-owned limited liability firms until 2002.

The rest of the paper is structured as follows. In the second section we describe the mixed evidence about the relationship between employee-ownership and performance and hypothesize about this relationship in the case of Spanish EOLLFs. In the third section we describe the sample and the methodology. In the fourth section we present our empirical results. In the last section we discuss the results and the implications. We also suggest some policy measures and conclude.

2. Employee-ownership and performance: theoretical predictions, empirical evidence and expected effect in the case of Spanish EOLLFs

2.1 <u>Diversity of employee-ownership schemes and their expected effect on performance</u>

Tannenbaum (1983) states that employee ownership is not a simple concept. There are many forms of employee ownership, each consisting of different facets of ownership and control. Based on previous literature, Pierce et al. (1991) suggest that the ownership construct is

multidimensional, comprising the rights to possession of a share of financial value, to exercise control on the owned asset and to receive information about the owned asset. They argue that each of these rights might be more or less present in certain ownership contexts. In this way, we could find different schemes where all of these rights are present or not. For instance, in the case of symbolical ownership granted to employees through some Employee Stock Ownership Programs (hereinafter, ESOPs), we could find that only the right to possession of a share of financial value is present whereas the two remaining rights may increase as the ownership stake held by employees grows. In contrast, in the case of worker cooperatives employee-owners usually enjoy the three rights highlighted by Pierce et al. (1991). Between these two extreme cases there is a plethora of intermediate schemes where access to these rights might change significantly.

The wide differences among schemes might explain the conflicting predictions found in theory about the impact of employee-ownership on performance (Blasi et al., 1996). On the positive side, Ben-Ner and Jones (1995) state that the introduction of an ESOP is expected to exert net positive effects on individual and collective behavior. Several reasons could explain this view. We should first highlight the alignment of interests between employees and owners. The interest-alignment effects will develop a sense of loyalty of employees to their firm, which will lead to an increased interest in the business (Park et al., 2004) and in how it competes with other firms (Ya-Ting, 2003), and will reduce or eliminate conflict (Barlett et al., 1992; Ben-Ner, 1988; Park. et al., 2004). The alignment of interests will lead to fewer layoffs and lower quit rates and, hence, a greater accumulation of firm-specific human capital (Barlett et al., 1992; Park. et al., 2004). According to Frohlich et al. (1998), performance should be better than in conventional firms because workers become dual stakeholders, as both workers and owners.

They have incentives to work voluntarily harder to maximize performance (Winther and Marens, 1997) and to monitor the performance of co-workers, since mutual supervision could be tougher than that of a strict foreman (Pierce et al., 1991). Hence, there should be a reduction in agency costs (Gamble, 1998). The mitigation of agency costs also occurs, especially in worker cooperatives, because worker-owners are likely to be much better informed than ordinary workers about actions taken by managers (Craig and Pencavel, 1995).

The positive effect of employee financial participation could be closely related to worker participation in decision-making (Robinson and Wilson, 2006; Pendleton and Robinson, 2010). Park et al. (2004) argue that if employee-owners are excluded from decision-making the firm might not benefit from improved attitudes and worker effort. Fakhfakh et al. (2011) highlight the complementarity between the financial component of employee stock ownership and the participation in governance. Based on previous literature (e.g. Ben-Ner and Jones, 1995; Conte and Svejnar, 1990; Levine and Tyson, 1990), they anticipate stronger positive effects on productivity if participation in both ownership and governance is present in the same firm.

Regarding the negative side, the first issue to be mentioned is the "free-rider" or "1/n" problem (Alchian and Demsetz, 1972). An employee-owner may have an incentive to shirk because while he will profit from the full utility from shirking he obtains only 1/n of the extra profit from his additional effort. Since all employees in the firm share the same incentive, an employee-owned firm is essentially an inefficient organization (Park et al., 2004). Furthermore, there would not be an agent with incentives to monitor the performance of each individual worker-owner (Barlett et al., 1992). In addition, based on game theory, the "Prisoner's Dilemma" logic implies that even though employee-owners can get more income or profit if all of them work cooperatively, each of them will not cooperate because he can get more utility

when he shirks while other employees work hard (Weitzman and Kruse, 1990). Blasi et al. (1996) argue, however, that this problem is lessened in small companies, where "n" is small.

There are also conflicting theory predictions when employee participation in both ownership and decision-making are present in a firm. Blair et al. (2000) argue that worker-owners may have difficulty in arriving at decisions because of the circularity of collective decision-making. As a result, they could not act efficiently when urgent decisions are to be made in day-to-day decision making. In addition, in the case of worker cooperatives, it may be harder for them to have access to key resources, such as external financing (Craig and Pencavel, 1995), suppliers or workers (Staber, 1993), or legal, organizational and financial expertise (Ben-Ner, 1988). From a financial perspective, Craig and Pencavel (1995) affirm that employee-owned firms are inherently risky institutions because workers have tied most their wealth and their labor incomes to the same asset. If they work for a conventional firm they could invest their wealth in other assets.

On top of that, Park et al. (2004) also recall some neoclassical economic theories, which predict that employee ownership is an unstable form and tends to disappear over time or to degenerate to conventional capitalist firms. Among the causes for degeneration in worker cooperatives, they highlight the desire to maximize current income at the expense of investment or the preference to hire new employees rather than adding new members.

In sum, we agree with Blasi et al. (1996) that theory provides no conclusive predictions about the relationship between employee ownership and economic performance. This statement is also supported by mixed evidence found in the literature, even though Conte and Kruse (1991) and Pérotin and Robinson (2003) affirm that the effect is either positive or neutral in most cases.

The mixed evidence found in the literature could be caused by differences in employee-owned firms across studies in aspects such as objective functions, ownership arrangements and incentive structure (Barlett et al., 1992). We do not aim to provide an extensive review of the empirical findings in the literature, which is available in many reviews and meta-analyses (e.g. Blasi et al.,1996; Doucouliagos, 1995; Kruse and Blasi, 1997; Levine and Tyson, 1990; Megginson and Netter, 2002; Pérotin and Robinson, 2003). Nevertheless, it is important to differentiate between two types of studies found in the literature: those that compare the change before and after the adoption of a financial employee participation scheme and those that compare employee-owned firms with conventional capitalist firms. Since our study should be classified in the second group, we highlight some empirical evidence found in this type of studies. Barlett et al. (1992) find higher labor and capital productivity than comparable private firms in Italian cooperatives. Based on an experimental methodology, Frohlich et al. (1998) find that workers in (full) employee-owned firms showed higher productivity than those of conventional firms. In contrast, Doucouliagos (1995) finds that the weighted average correlation for the association between worker ownership and productivity in cooperatives is close to zero, and becomes negative when the French data is excluded. Blasi et al. (1996) report significant positive differences in labor productivity growth in listed firms with low employee participation, but the results become negative as the percentage owned by employee-owners grows.

2.2 EOLLFs in Spain and their expected relative performance when compared with conventional limited liability firms

Worker cooperatives are the most significant example of self-managed companies in Spain (Morales-Gutiérrez et al., 2008), with active presence in most industrial sectors, as is frequent

in other countries (e.g. in the US, see Logue and Yates, 1999). Morales-Gutiérrez et al. (2008) also highlight that over thirty years the increase in the number of newly created cooperatives is usually associated with economic downturns.

Since the 1960s, however, regulators in Spain defined a special type of limited liability firms: EOLLFs. Until 1986, EOLLFs were only mid-size industrial companies that were taken over by their employees in times of crisis. The Spanish experience was representing the ideas of Russell (1988), who affirms that full employee ownership is infrequent and mostly found under unique circumstances such as closures and divestitures. In 1986 and 1989 new regulations were passed also authorizing the creation of new EOLLFs without limitations of size and activity sector, but the minimum equity capital required (60,000 euros) lead to a limited number of companies being established. Finally, regulation passed in 1997 ("*Ley 4/1997, de Sociedades Laborales*") created a stable framework and limited minimum capital requirements to allow the creation of micro-companies to enhance self-employment. As shown in Table 1, there was a sharp increase in the number of EOLLFs being created since that year when compared with the number of newly established worker cooperatives.

The table also shows that the number of both newly-established EOLLFs and worker cooperatives significantly decreases since 2003. Part of this reduction could be attributed to the economic upturn recorded in Spain in those years, which reduced the need to resort to self-employment initiatives (Ben-Ner, 1984; Miyazaki, 1984). Interestingly, the number of newly created EOLLFs still shows a decreasing trend since the beginning of the financial crisis, despite the huge increase in the unemployment rate. In particular, when the Spanish unemployment rate was hitting the 26 percent level in 2012, the number of new EOLLFs was

even smaller than the figure recorded in 2011. In contrast, the number of new worker cooperatives registered stabilized during the crisis and increased in 2012.

[Insert Table 1 around here]

EOLLFs are limited liability firms that must comply with both the general regulation of limited liability firms and their specific regulation. The initial equity capital must amount to at least 3,000 euros and the initial minimum number of shareholders should be three and at least two of them should be workers. Regarding the specific regulation, employee-owners must retain at least 51 percent of the shares and no individual shareholder can own more than one third of the total equity capital. In addition, depending on the number of employee-owners, non-owner workers cannot represent more than 15-25 percent of total working hours per year. The income of EOLLFs is taxed at the same rate as that of conventional limited liability firms. EOLLFs, however, are required to retain part of the profits to create a special reserve that cannot be distributed as dividend.

Regarding the benefits, EOLLFs are exempt from taxes levied when the firm is established, increases its capital or receives a mortgage loan. They can be eligible to receive subsidies per unemployed worker hired. They can also have access to subsidized loans and subsidies to cover up to 75 percent of the cost of external management consultancy services. In addition, they are also eligible to take advantage of most incentives regional governments approve for worker cooperatives.

As stated before, there are both positive and negative predictions from theory and mixed results in the empirical literature about employee-ownership and performance. Based on the description of EOLLFs, designed by the Spanish regulators to enhance job creation, we aim to discern whether this model leads to the creation of competitive firms in the long run. Table 1

(Panel A) shows that EOLLFs are not playing a relevant role in the present economic crisis, when the creation ex-novo or via the sale of an existing firm to its employees are the main origins of employee-owned firms (Ben-Ner and Byoung, 1996).

Table 1 also shows that the average number of employee-owners is around three people since the existing 1997 regulation was passed. Ben-Ner and Byoung (1996) find that firms with over a few dozen employees are mostly formed via employee buyouts. Therefore, we can interpret from these data that the majority of EOLLFs were created ex-novo and mostly as a self-employment tool. In fact, one of the main incentives to creating an EOLLF is the possibility unemployed workers have to receive immediately all unemployment subsidies to create the firm. We agree with Barlett et al. (1992) that wage levels show less stable time profiles in employee-owned firms than in other private firms. In this vein, since the corporate tax rate of EOLLFs is the same as that applied to conventional limited liability firms, employee-owners would tend to distribute potential profits by increasing the salaries of employee-owners in good times, thus eliminating the possibility of increasing the equity base via retained earnings to fund investments. Hence, it is unlikely that unemployed workers that become employee-owners can commit substantially more equity capital than that committed when the firm was established. Regarding external capital, even ignoring the limit EOLLFs have to attract money from non-employee investors, Logue and Yates (1999) highlight the scarcity of friendly equity capital in employee-owned firms, which is a barrier to their development. We may conclude, then, that EOLLFs are relatively undercapitalized, thus sharing one of the negative aspects Barlett et al. (1992) recall in the case of worker cooperatives.

We would then expect that EOLLFs focus mostly on labor-intensive industries, where rapid growth could be possible with an extended use of non-owner workers. We argue, however, that the limitation imposed on the maximum relative importance of the working hours

of the latter also limits the possibility to hire non-owner workers intensively to get advantage of growth opportunities. In addition, employee-owned firms find it difficult to attract workers (Staber, 1993) and to have access to advisory services (Ben-Ner, 1988).

As a result, we argue that most EOLLFs created lack the necessary financial (Craig and Pencavel, 1995; Logue and Yates, 1999), labor (Staber, 1993) and organizational and advisory (Ben-Ner, 1988) resources to grow to a competitive size. Most EOLLFs do not profit from scale economies nor have easy access to foreign markets. In this regard, Estrin and Jones (1992) find evidence that degeneration is mostly present in younger, smaller cooperatives and is principally caused by underinvestment. Blasi et al. (1996) report significant negative differences in labor productivity growth (i.e. sales per employee) in firms with high employee participation. Doucouliagos (1995) finds a negative weighted average correlation for the association between employee ownership and productivity in cooperatives in his meta-analysis when the French data is excluded. Hence, we argue that EOLLFs are not expected to be as productive and competitive as conventional limited liability firms.

3. Data and methodology

3.1 Sample description

The sample was created by filtering limited liability firms in the Amadeus database by the required label (i.e. "sociedades laborales"), because all EOLLFs must include it in their official names. The process of identification was developed in February 2012, selecting only those established before 2003. We chose this year for two reasons. First, 2002 was the peak year in the creation of EOLLFs. Second, we aim to analyze the evolution of EOLLFs with a long-term perspective, including both "good" and "bad" years, until 2010. We were able to identify 5,878

EOLLFs,[4] out of the 29,046 EOLLFs created between 1994 and 2002 (see Table 1, Panel A), of which 16.855 were active in 2002 (see Table 1. Panel B). Since we include total factor productivity as dependent variable, we need at least three consecutive observations to estimate that variable. Therefore, we only include 3,775 EOLLFs for which we have at least three consecutive observations, with data available until 2010.

We created a second dataset by randomly filtering data on 40,000 closely-held limited liability firms that were available in the Amadeus dataset between January and June 2008, before the economic crisis started. From this dataset, we found 3,079 independent (e.g. excluding corporate subsidiaries), closely-held private limited firms for which we could have at least three consecutive observations and data up to 2010.

Therefore, the sample used in this work is composed of 6,854 firms, 3,775 of which are EOLLFs, whereas the remaining 3,079 are conventional closely-held, independent private limited liability firms, representing the control group. The control group is not matched, as found in other similar studies (e.g. Barlett et al., 1992; Blasi et. al., 1996).

Table 2 reports the distribution of sample firms across industries and regions. EOLLFs are more concentrated on less developed regions, such as Andalusia and Castile-La Mancha, whereas conventional limited liability firms are more present in highly-developed areas, such as Madrid and Catalonia. Similarly, there is a remarkable disparity in the distribution by industry. Table 2 shows that a high portion of conventional limited liability firms belong to the *Manufacturing* category (45.96%), whereas EOLLFs are mostly concentrated in services such as *Wholesale and retail trade, repair of motor vehicles and motorcycles* (29,78%), *Construction*

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[4] Amadeus does not acquire data on all existing companies. Many recently established micro-enterprises are not included initially. So firms that disappear in their first years of existence are usually missing in the Amadeus database.

(20.5%) and *Professional, scientific and technical activities* (6.73%), with a significant 22.86%

also concentrated on *Manufacturing*.

[Insert Table 2 around here]

3.2 <u>Empirical methodology</u>

In order to test whether EOLLFs show significant differences in their performance with that of

conventional closely-held, independent private limited liability firms, we resort to an empirical

model in which we analyze several dependent variables reflecting different aspects of firm

performance. As independent variables we include a dummy variable taking value 1 for

EOLLFs (d_EOLLFs), Age and Size (measured by total assets) both expressed in logarithms, to

control for differences between firms in both groups. Finally, year, region and industry

dummies are also included to control for fixed effects.

As to the dependent variables used in this analysis, we consider, first, the investment rate,

measured by the ratio between investment in fixed assets and total assets. We then consider

both production inputs, i.e. capital (measured by fixed assets in logarithms) and labor

(measured by payroll expenses in logarithms and by the number of employees in logarithms)

and production output (measured by sales in logarithms).

Secondly, we compute firm profitability by considering the ratio between sales and capital

employed (i.e. total assets net of total current liabilities) and ROCE (measured by EBIT on

capital employed).

Finally, we focus on firm productivity by analyzing both partial (labor and capital)

productivity measures and total factor productivity (TFP). We estimate labor and capital

productivity growth measures as the ratio between logarithms of sales and payroll expenses and

the ratio between logarithms of sales and fixed assets, respectively. However, partial

productivity measures are subject to important criticism. Unlike TFP, labor and capital productivities are only partial measures of firm productivity. In particular, even if there is no improvement in productive efficiency, labor and capital productivities increase when other production inputs are used more relative to labor and capital inputs, respectively. In other words, partial productivities are valid measures of firm efficiency only if the proportion of each productive input remains constant.

In contrast, TFP measures the residual growth in a firm's output not accounted for by the growth in inputs (namely labor and capital), given the production technology in place in the firm's industry. More specifically, to estimate TFP we resort to the GMM-system (GMM-SYS) estimator developed by Blundell and Bond (2000). In accordance with Van Biesebroeck (2007), we estimate TFP separately for each industry. Then, in the final step, the residuals of the production function are used to estimate firm's TFP growth. Chemmanur et al. (2011) and Croce et al. (2013), among others, follow this procedure to estimate TFP.

To take advantage of the panel structure of our data, we estimate our models by using a generalized least square robust random effects estimation procedure. Endogeneity may be an issue, since EOLLFs and closely-held, independent private limited liability firms may be characterized by unobservable differences that the random effect estimation fails to control. We explicitly control for the endogeneity concern by implementing a Hausman and Taylor (1981) estimation procedure. This approach is an extension of a random-effects estimator in which some of the covariates are allowed to be correlated with the unobserved individual-level random effect η.

Finally, as is customary in this type of analysis, some transformations have to be performed for the accounting ratio before a meaningful parametric model can be estimated. In particular, in estimating the investment rate, the amount of investments are normalized by the

beginning-of-period-t stock of total assets, while sales on capital employed and ROCE are both normalized by the beginning-of-period-t stock of capital employed. Because firms in our sample can be relatively young and small, this value is sometimes close to zero, producing extremely skewed and leptokurtic distributions of the variables. The presence of these outliers could severely bias our results. To avoid this problem, we winsorize all variables with a 1 percent cut-off for each tail (Dixon, 1960). In other words, for each variable we calculated the values corresponding to the 1st and 99th percentiles of the variable's distribution and assigned these values to all of the observations that fall beyond them. This approach is useful because it reduces the impact of outliers, without the loss of observations than would occur if outliers were deleted. Furthermore, it has been extensively used in the literature (Cleary, 1999, 2006; Bertoni et al., 2010; Croce et al., 2013) and, specifically, in other papers about employee-owned firms (e.g. Blasi et al., 1996).

3.3 Descriptive statistics

Some interesting insights on the characteristics of EOLLFs and control group firms in our sample can be gained by looking at descriptive statistics in Table 3, reporting mean values of the variables used in the regression models.

[Insert Table 3 around here]

The mean investment rate is 0.106 for EOLLFs, which is significantly higher than that of control group firms. It is also interesting that both inputs and output of production function are lower in EOLLFs than in control group firms. Profitability measures show mixed results.Sales on capital employed is significantly higher in EOLLFs than in control group firms, whereas ROCE is significantly lower. This could be explained by the tendency of employee-owners to increase their wages to avoid paying corporate taxes and devoting part of the net income to

reserves. As to productivity measures, EOLLFs show lower labor productivity and TFP, while they report significantly higher capital productivity than control group firms. This would suggest a size effect, which should be controlled in the multivariate analyses.

4. Results

In Table 4 we show random effects estimates of our models. After controlling for industry, region, size and age, we find that EOLLFs invest 4.5 percent less and have significantly lower capital and employees than other closely-held, independent private limited liability firms. Similarly, sales growth is also lower, albeit with a coefficient that is marginally significant. Since there could be endogeneity concerns in our random effects estimates, as robustness check we also estimate the coefficients using the Hausman-Taylor (1981) methodology. In Table 5 we find that the negative coefficients are even greater and all of them significant at the highest level. In the last column we also find that sales growth is significantly lower in EOLLFs. Hence, we find that inputs and outputs in EOLLFs are significantly lower than those found in conventional limited liability firms.

In Table 6 we show random effects estimates of different performance measures. We find negative coefficients for EOLLFs in all performance measures: sales on capital employed, return on capital employed, labor productivity, capital productivity and total factor productivity. In all cases the coefficients are negative and significant at the highest level. In Table 7 we add Hausman-Taylor estimates on the same models. We find that sales and return on capital employed are negative and significant, with the coefficients being even greater than those reported in Table 2. The coefficients related to productivity, however, are negative but not significant. Therefore, we also find a significantly lower performance, which is only partially, confirmed when we focus on productivity.

5. Discussion and conclusions

EOLLFs were regulated to help reduce unemployment in Spain in times of crisis. Initially, they were created to allow workers to acquire existing industrial firms in receivership. Regulatory measures passed in 1986, 1989 and 1997 allowed the creation of EOLLFs ex-novo in any activity sector. This initiative led to a growing number of newly-created EOLLFs until 2003, which decreased steadily since then. This was to be expected due to the economic upturn. Ben-Ner (1984) and Miyazaki (1984) argue that the interest in employee-owned firms should be lower when there are alternative employment opportunities. Nevertheless, the reduction in the number of newly-created EOLLFs continued even after the crisis began in 2008. Only the number of newly established worker cooperatives increased in 2012, whereas the number of EOLLFs decreased again in that year.

In this paper we analyze growth and performance in EOLLFs in Spain over a long period of time. We predict that the rigid restrictions related to the presence of non-employee shareholders and non-owner employees impose important limitations on long-term growth and performance in EOLLFs. We aim to discern whether this model is sustainable as it is or needs to be revised. We compare the evolution of EOLLFs with that of other independent closely-held private limited liability firms over a long period of time, which includes both economic upturns and downturns.

After controlling for industry, region, size and age, we find that EOLLFs invest less, have lower capital and human resources, grow less and show lower performance than other independent closely-held private limited liability firms. These results are robust to endogeneity concerns. As hypothesized, the limitations imposed on EOLLFs imply that our results are not in line with most studies, which predict a positive or neutral effect of the relationship between employee participation and performance (Pérotin and Robinson, 2003). Only Blasi et al. (1996)

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find a negative relationship between employee participation and performance in ESOPs as the percentage of ownership of employees grows.

Our work contributes to the literature providing additional evidence on the relationship between employee-ownership and performance when regulatory restrictions derive in negative consequences that outweigh the positive effects expected by most authors.

One potential limitation in our study would be a possible survival bias in our sample of Spanish EOLLFs because in Amadeus we identified data on about a portion of the population of this type of firms, which tend to be those in existence until two to four years before the data collection effort. Nevertheless, even if this bias was present our results would become more robust because all our coefficients would become more significantly negative. A second limitation of our study is the difficulty to define a matched control group because we would need a reference year that would be required to do the matching by industry, size and age of the comparable firms. This could be possible, for instance, in studies where conventional firms would be transformed to employee-owned firms but not in our work.

Regarding policy implications, both the historical trend of newly created EOLLFs and our results indicate that some actions should be implemented as soon as possible. Some fiscal incentives (e.g. lower corporation tax rate) should be granted in the first years of operations to enhance the creation of firms in times of crisis and to incentivize retained earnings to help finance future investments. As regards the role of EOLLFs in good times, as a tool to incentivize the access of workers to property, there should be some flexibility in the capital and human resource requirements for a number of years (e.g. three to five years) to avoid the reluctance of employee-owners to go ahead with the necessary actions to get advantage of their growth opportunities. In this way, if they succeed in the growth process the degeneration to a conventional firm would at least imply that a new competitive firm was inserted in the

productive system. Nevertheless, if there is an economic downturn or the firm fails to grow significantly employee-owners would still retain the benefits of EOLLFs and would have more stable jobs.

For future research, it would be interesting to analyze the evolution of EOLLFs over time and compare their survival rate with that of conventional limited liability firms and the causes for failure or degeneration to conventional limited liability firms.

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Table 1. Worker cooperatives and employee-owned limited liability firms (EOLLFs) in Spain

Panel A. <u>Newly-established worker cooperatives and EOLLFs</u>

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of new firms																			
Cooperatives	2.560	2.393	2.140	1.890	1.426	1.401	1.983	1.926	1.703	1.500	1.353	1.020	761	711	572	656	698	633	733
EOLLFs	1.318	888	706	1.315	3.979	4.522	4.851	5.454	6.013	5.353	4.249	3.466	2.526	2.341	1.514	1.225	1.252	1.145	1.006
Number of member-owners																			
Cooperatives	13.491	12.449	10.463	9.375	7.447	6.870	8.483	7.790	6.631	5.727	5.211	4.648	3.014	2.891	2.463	2.632	2.673	1.635	6.716
EOLLFs	6.805	4.930	3.422	4.779	11.307	11.814	12.306	13.654	14.983	13.770	11.281	8.982	6.490	5.987	4.164	3.526	3.382	3.293	3.101
Member-owners per firm																			
Cooperatives	5,27	5,20	4,89	4,96	5,22	4,90	4,28	4,04	3,89	3,82	3,85	4,56	3,96	4,07	4,31	4,01	3,83	2,58	9,16
EOLLFs	5,16	5,55	4,85	3,63	2,84	2,61	2,54	2,50	2,49	2,57	2,65	2,59	2,57	2,56	2,75	2,88	2,70	2,88	3,08

Panel B. <u>Active worker cooperatives and EOLLFs</u>

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of active firms																			
Cooperatives						9.455	9.901	10.255	10.690	10.357	10.280	10.192	9.841	9.505	8.568	7.869	7.509	7.501	6.549
EOLLFs	5.419	5.413	5.309	5.613	7.079	9.620	11.935	14.318	16.855	18.407	19.393	20.279	20.266	19.737	17.650	15.679	14.574	13.465	12.294
Number of employees																			
Cooperatives						98.832	103.591	105.526	109.634	110.065	105.777	108.867	107.575	104.635	96.183	89.333	90.218	84.458	81.742
EOLLFs	50.734	52.995	52.857	55.783	62.567	75.606	84.870	92.979	100.775	109.596	116.852	125.646	130.240	124.784	101.331	88.241	81.772	74.438	67.445

Table 2. Distribution of sample firms by region and industry

Panel A. Distribution by region

Region	Control group		EOLLFs	
	n.	%	n.	%
Andalusia	268	8.704%	795	21.060%
Aragon	98	3.183%	171	4.530%
Asturias	60	1.949%	104	2.755%
Balearic Islands	63	2.046%	34	0.901%
Canary Islands	71	2.306%	84	2.225%
Cantabria	21	0.682%	12	0.318%
Castile-La Mancha	92	2.990%	498	13.190%
Castile-Leon	116	3.770%	183	4.850%
Catalonia	843	27.379%	370	9.801%
Ceuta and Melilla	2	0.065%	3	0.079%
Valencia Region	314	10.198%	340	9.007%
Extremadura	33	1.072%	57	1.510%
Galicia	168	5.456%	212	5.616%
La Rioja	30	0.974%	18	0.477%
Madrid	542	17.603%	330	8.742%
Murcia	86	2.793%	203	5.377%
Navarra	70	2.273%	124	3.285%
Basque Country	202	6.561%	237	6.278%

Panel B. Distribution by industry

Industry	NACE Rev2	Control group		EOLLFs	
		n.	%	n.	%
Agriculture, forestry and fishing	1-3	62	2.014%	53	1.404%
Mining and quarrying	5-9	36	1.169%	4	0.106%
Manufacturing	10-33	1415	45.956%	863	22.861%
Electricity, gas, steam and air conditioning supply	35	12	0.390%	1	0.026%
Water supply, sewerage, waste management and remediation act.	36-39	24	0.779%	8	0.212%
Construction	41-43	288	9.354%	774	20.503%
Wholesale and retail trade and repair of motor vehicles	45-47	530	17.213%	1124	29.775%
Transportation and storage	49-53	109	3.540%	108	2.861%
Accommodation and food service activities	55-56	81	2.631%	202	5.351%
Information and communication	58-63	209	6.788%	81	2.146%
Financial and insurance activities	64-66	8	0.260%	13	0.344%
Real estate activities	68	24	0.779%	31	0.821%
Professional, scientific and technical activities	69-75	114	3.703%	254	6.728%
Administrative and support service activities	77-82	84	2.728%	106	2.808%
Education	85	11	0.357%	37	0.980%
Human health and social work activities	86-88	26	0.844%	30	0.795%
Arts, entertainment and recreation	90-93	38	1.234%	16	0.424%
Other service activities	94-96	8	0.260%	70	1.854%
Total		**3,079**		**3,775**	

Source: Classification of sample firms according to NACE rev 2 code and region reported in the Amadeus database.

Table 3. Descriptive statistics of the dependent variables used in the models

	Total sample	Control group	EOLLFs	EOLLFs vs. control group firms	
				diff.	*sign.*
Investment rate	0.081	0.066	0.106	0.040	***
Capital	12.717	13.838	10.947	-2.891	***
Labor	12.709	13.648	11.227	-2.421	***
Employees	2.887	3.584	1.786	-1.798	***
Sales	14.312	15.414	12.573	-2.841	***
Sales on Capital Employed	5.745	4.561	7.614	3.053	***
ROCE	0.121	0.135	0.100	-0.035	***
Labor productivity	1.128	1.132	1.123	-0.008	***
Capital productivity	1.143	1.127	1.168	0.040	***
tfpBB	0.970	1.482	0.161	-1.321	***

Description of variables: Investment rate represents investments in fixed assets on total assets. Capital represents fixed assets in logarithms. Labor: represents payroll expenses (in logarithms). Employees represents the number of employees (in logarithms. Sales, amount in logarithms. Return on capital employed (ROCE) is computed as earnings before interest and taxes over capital employed. Labor productivity represents the ratio between the logarithm of sales and the logarithm of payroll expenses. Capital productivity is measured as the ratio between the logarithm of sales and the logarithm of fixed assets. tfpBB represents total factor productivity estimated à la Blundell and Bond (2000).

Table 4. Inputs and output: Random effects estimations

	Investment rate		Capital		Payroll expenses		Employees		Sales	
d_EOLLFs	-0.045	***	-0.212	***	-0.666	***	-0.513	***	-0.782	***
	(0.010)		(0.050)		(0.040)		(0.030)		(0.040)	
Age	-0.019	***	-0.109	***	0.282	***	0.175	***	0.115	***
	(0.000)		(0.030)		(0.020)		(0.020)		(0.020)	
Size	-0.023	***	0.888	***	0.429	***	0.332	***	0.604	***
	(0.000)		(0.010)		(0.010)		(0.01)		(0.010)	
Industry dummies	Yes		Yes		Yes		Yes		Yes	
Region dummies	Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes	
N. obs	33158		33158		33158		33158		33158	
N. firms	6854		6854		6854		6854		6854	

Note: Random effects estimations. Dependent variables are: investment rate (measured by investments in fixed assets on total assets), capital (measured by fixed assets in logarithms), payroll expenses (in logarithms), Employees (in logarithms) and sales (in logarithms). The ratio "Investment rate" is winsorized at 1% level. Employee owned firms is a dummy variables taking value 1 for employee owned firms. Age and Size (measured by total assets) are expressed in logarithms. Standard errors in brackets.
***, ** and * indicate significance levels at 1%, 5% and 10%, respectively.

Table 5. Inputs and output: Hausman-Taylor estimations

	Investment rate		Capital		Payroll expenses		Employees		Sales	
d_EOLLFs	-0.615	***	-1.127	***	-1.413	***	-1.111	***	-1.645	***
	(0.040)		(0.130)		(0.060)		(0.060)		(0.090)	
Age	-0.108	***	-0.282	***	0.162	***	0.058	**	-0.031	
	(0.010)		(0.050)		(0.030)		(0.020)		(0.030)	
Size	-0.120	***	0.772	***	0.359	***	0.283	***	0.512	***
	(0.010)		(0.020)		(0.010)		(0.010)		(0.020)	
Industry dummies	Yes		Yes		Yes		Yes		Yes	
Region dummies	Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes	
N. obs	32710		32710		32710		32710		32710	
N. firms	6753		6753		6753		6753		6753	

Note: Hausman-Taylor estimations. Dependent variables are: investment rate (measured by investments in fixed assets on total assets), capital (measured by fixed assets in logarithms), payroll expenses (in logarithms), Employees (in logarithms) and sales (in logarithms). The ratio "Investment rate" is winsorized at 1% level. Employee owned firms is a dummy variables taking value 1 for employee owned firms. Age and Size (measured by total assets) are expressed in logarithms. Standard errors in brackets.
***, ** and * indicate significance levels at 1%, 5% and 10%, respectively.

Table 6. Performance: Random effects estimations

	Sales on capital employed		ROCE		Labor productivity		Capital productivity		TFP	
d_EOLLFs	-2.016	***	-0.077	***	-0.014	***	-0.038	***	-0.164	***
	(0.460)		(0.010)		(0.000)		(0.010)		(0.040)	
Age	-1.601	***	-0.035	***	-0.018	***	0.023	***	-0.177	***
	(0.290)		(0.010)		(0.000)		(0.000)		(0.020)	
Size	-1.118	***	-0.006	**	0.006	***	-0.034	***	0.107	***
	(0.100)		(0.000)		(0.000)		(0.000)		(0.010)	
Industry dummies	Yes		Yes		Yes		Yes		Yes	
Region dummies	Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes	
N. obs	33158		33158		33155		33158		33158	
N. firms	6854		6854		6854		6854		6854	

Note: Random effects estimations. Dependent variables are: sales on capital employed (measured by total assets net of total current liabilities), ROCE (measured by EBIT on capital employed), labor productivity (measured by the ratio between logarithm of sales and logarithm of payroll expenses), capital productivity (measured by the ratio between logarithm of sales and logarithm of fixed assets), TFP: total factor productivity estimated à la Blundell and Bond (2000). The ratios sales on capital employed and ROCE are winsorized at 1% level. Employee owned firms is a dummy variables taking value 1 for employee owned firms. Age and Size (measured by total assets) are expressed in logarithms. Standard errors in brackets.
***, ** and * indicate significance levels at 1%, 5% and 10%, respectively.

Table 7. Performance: Hausman-Taylor estimations

	Sales on capital employed		ROCE		Labor productivity		Capital productivity		TFP	
d_EOLLFs	-2.709	***	-0.199	***	-0.007		-0.015		-0.103	
	(0.860)		(0.040)		(0.010)		(0.010)		(0.080)	
Age	-1.784	***	-0.076	***	-0.016	***	0.026	***	-0.162	***
	(0.340)		(0.010)		(0.000)		(0.010)		(0.020)	
Size	-1.123	***	-0.016	***	0.008	***	-0.029	***	0.112	***
	(0.120)		(0.000)		(0.000)		(0.000)		(0.010)	
Industry dummies	Yes		Yes		Yes		Yes		Yes	
Region dummies	Yes		Yes		Yes		Yes		Yes	
Year dummies	Yes		Yes		Yes		Yes		Yes	
N. obs	32710		32710		32707		32710		32710	
N. firms	6753		6753		6753		6753		6753	

Note: Hausman-Taylor estimations. Dependent variables are: sales on capital employed (measured by total assets net of total current liabilities), ROCE (measured by EBIT on capital employed), labor productivity (measured by the ratio between logarithm of sales and logarithm of payroll expenses), capital productivity (measured by the ratio between logarithm of sales and logarithm of fixed assets), TFP estimated à la Blundell and Bond (2000). The ratios sales on capital employed and ROCE are winsorized at 1% level. Employee owned firms is a dummy variables taking value 1 for employee owned firms. Age and Size (measured by total assets) are expressed in logarithms. Standard errors in brackets. ***, ** and * indicate significance levels at 1%, 5% and 10%, respectively.