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An Econometric Case Study of Mondragon**

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## ABSTRACT

### **Efficiency in Employee-Owned Enterprises: An Econometric Case Study of Mondragon\***

We provide the first econometric study of efficiency for a member of the Mondragon group of worker cooperatives. Eroski is a retail distribution chain and, most unusually, there are two distinct types of hypermarkets: (i) cooperatives with significant employee ownership and voice; and (ii) GESPAs with modest employee ownership and limited voice. For supermarkets the chain includes conventional firms with no employee ownership as well. Our key data are a panel of monthly observations from February 2006 through May 2008, a total of 9,800 observations for supermarkets and 2,150 for hypermarkets. By estimating first difference models we find that hypermarket stores with cooperative ownership grow sales significantly faster than GESPA stores. For supermarkets overall we find no significant difference in performance among the three types of stores. However, for a particular segment of the supermarket called SUPERMARKET CITY (a subgroup of small supermarkets for which having “better customer service” employees is particularly important), cooperatives are found to outperform conventional stores. To investigate mechanisms that help explain why cooperatives are better performers we provide additional evidence that takes account of the role of the more extensive opportunities for employee involvement and training, and stronger economic incentives that exist in cooperatives. Finally, while cooperative members are better paid than their peers in comparable firms, individual-level data also show that job satisfaction is actually lower for workers in cooperatives than for GESPA workers. Though this may be a simple reflection of high worker expectation in cooperatives, cooperatives may well be indeed a “high-stress work system.” The overall assessment of cooperatives will need to be nuanced.

JEL Classification: J54, D21

Keywords: employee ownership, producer cooperatives, labor managed firm, productive efficiency, Mondragon, shared capitalism

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# **Efficiency in Employee-Owned Enterprises: an Econometric Case Study of Mondragon**

## **I INTRODUCTION**

The recent economic crisis has stimulated much interest amongst researchers and policy makers concerning the possibilities of alternative ways to structure economic organizations. One option is shared capitalism, characterized by a variety of financial participation programs (such as profit sharing, gain sharing, employee ownership, and broad-based stock options), all of which make workers significant stakeholders of the firm (Kruse, Freeman and Blasi, 2010). Perhaps the most powerful form of shared capitalism is an enterprise in which workers are majority owners, with responsibility for key strategic decisions, such as worker cooperatives.

Mondragon is often considered the most successful example of such employee-owned enterprises in the world. Founded in 1956 with some 25 workers in the Basque Country of Spain, Mondragon was originally a group of mainly industrial worker-owned enterprises. Subsequently the group has grown to include firms in other areas, notably retail and finance, and it extends across Spain, Europe and the globe. By 2008, Mondragon comprised about 250 cooperatives, subsidiaries and affiliated organizations, including 73 manufacturing plants overseas, altogether employing almost 100,000 (see <http://www.mcc.es/>.)

There has been a long-standing interest by diverse scholars on various matters concerning the Mondragon cooperatives (e.g., Johnson and Whyte, 1977, Bradley and Gelb, 1982). Since these early studies, Mondragon has continued to grow -- by some estimates Mondragon represents the seventh largest consortium in Spain (e.g., Arando et al., 2011) Moreover, facts such as *no* job losses ever having been sustained by cooperative members, including during the present economic crisis, help explain why other studies of Mondragon have continued to appear

regularly (e.g., Joshi and Smith, 2008). At the same time, a conspicuous characteristic of the vast bulk of the published literature on Mondragon cooperatives is that there have been few if any applied studies that use standard hypothesis-testing methods. Thus on one of the key questions of interest to economists, the efficiency of the Mondragon cooperatives compared with conventional firms, most published work has been restricted to comparisons using efficiency indicators that are quite aggregated, for example comparisons at an industrial or overall group level between cooperatives and conventional firms (e.g., Thomas and Logan, 1982.)

The limited nature of the research on Mondragon cooperatives contrasts with the more general literature concerning employee owned firms. The first econometric studies of the performance of firms in which there is substantial/majority employee-ownership firms (EOFs), often considered as producer co-operatives (PCs) or labor managed firms (LMFs) appeared more than 30 years ago (e.g., Jones and Backus, 1977.) Work has continued to flow including influential studies of the U.S. plywood cooperatives (Craig and Pencavel, 1995) and, more recently, on worker cooperatives in Uruguay (Burdin and Dean, 2009.). There is also a growing literature that usually focuses on more modest examples of employee ownership, including the shared capitalism literature for the US (e.g., Kruse, Freeman, and Blasi, 2008), European countries (e.g., Pendleton and Robinson, 2008 for the U.K), transition economies (e.g., Estrin et al, 2009) and Japan (e.g., Jones and Kato, 1995.) As well as the issue of comparative performance, this broader literature, notably the “High-Performance-Workplace-Practices” literature, considers other matters including the mechanisms that underpin performance differences (e.g., Ichniowski and Shaw, 2003.)

However, the issues that are examined concerning employee owned firms are still not definitively settled. Thus while the meta analysis by Doucouliagos (1995) concludes that the

balance of evidence demonstrates better performance by PCs compared to participatory capitalist firms, other assessments, including Bonin et al. (1993:1305) and Dow (2003:184) are not so sanguine. Concerning the performance of PCs, this ambivalence is particularly apparent when evaluation is restricted to studies that endeavor to make comparisons between PCs and conventional firms within the same industry (for a review, see, e.g., Dow, 2003:184.) By providing new evidence for a Mondragon case on comparative performance and underlying mechanisms we also contribute to many of these debates.

Our study is facilitated because we are fortunate to have access, for the first time, to two types of primary data. Most important we have data for the *population* of stores in the Eroski retail chain, with Eroski by far the largest employer within the Mondragon group today. By using these new panel data we provide the first econometric study of efficiency for any Mondragon cooperative. Moreover, growth in the chain has resulted in there being large numbers of individual stores that have three distinct categories of employee ownership, ranging from significant (the cooperatives), through limited (known as GESPA) to zero (conventional stores). Cooperatives also have large numbers of workers who are not (yet) members and in GESPA stores many workers choose not to become members. These panel data enable us to contrast the impact on efficiency of both cooperative and limited employee ownership with conventional ownership and also to investigate the potential importance of some of the key mechanisms that might account for differences in performance. In addition we have individual level data for workers in cooperatives and GESPA stores that allow us to examine issues surrounding job satisfaction.

Our method is an insider econometrics case study (for a review of this and closely related methods see Ichniowski and Shaw, 2003 and Jones and Kato, 2011). The overwhelming bulk of

the literature on EOFs, especially majority EOFs, has adopted a firm-level approach. While this is a valuable method, as is widely recognized there are potential problems with this empirical strategy including issues surrounding measurement error, endogeneity and omitted variables. The case study approach enables more thorough investigation of the ramifications of important institutional realities in cooperatives, e.g. the co-existence of member and non-member workers, issues which typically are not afforded central attention in larger firm-level studies. Thus by providing what is apparently the first econometric case study of a firm with substantial employee ownership, potentially we provide a valuable complement to the body of findings derived from firm level studies, as well as a contribution to a literature that is of growing importance.

The plan of this paper is as follows. The next section highlights key institutional features of our case and uses new data to provide descriptive statistics. In the third part we review key theoretical and empirical literature in areas of interest. In the main section of the paper we first describe the first difference approach that is the basis of our estimating framework as well as our econometric findings. We follow this by providing additional evidence that relates to some of the mechanisms that underpin our key empirical findings on comparative performance. We also analyze new data on job satisfaction for workers in cooperatives and GESPA's. In the final section we offer concluding remarks and discuss the implications of our study.

## **II. The Case, Institutional Framework and Descriptive Statistics**

Our case is the Eroski chain which is headquartered in Northern Spain. The Eroski group is a diversified company with different activities including sport and leisure outlets though its core businesses are supermarkets and hypermarkets, which are the focus of our investigation.

Both supermarkets and hypermarkets stores sell similar items, although there is some variation in the range of items sold, since the outlets are of different size ranging from floor space of 1950 sq.m. to 12, 853 in hypermarkets and 162 to 2500 sq. m. for supermarkets. Smaller supermarkets carry a product assortment essentially in the food area that is a subset of the product mix offered by larger stores. Each hypermarket is divided into three basic divisions-- food, clothing and domestic goods. A key strategy is to sell rather standard products to a wide range of customers with all items in stock on display, and self-service is the main form of service in most departments. For the bulk of employees the main tasks are to receive goods, shelve items, and maintain the appearance of their department. In departments such as specialized foods it appears that customers are apt to call on the expertise of sales clerks more often than in other departments such as basic foods.

The overwhelming bulk of these retail outlets are in Spain (2398 of 2441), with the remainder in France and Andorra, though amongst those 2398 units it is the 109 hypermarket stores and 705 supermarket stores that are at center stage. Total employment in 2007 was 50, 587 and on the basis of total retail space Eroski was the third largest retail chain in Spain in that year.<sup>1</sup>

To enrich our understanding of the institutional realities at the case we read various materials that the company provided and we also made repeated visits to the firm headquarters where we have had extensive discussions with senior personnel. Many of these personnel had made frequent and recent visits to branch stores and thus had intimate knowledge of these branches. We have also spent considerable time on field trips including multiple visits to outlets

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<sup>1</sup>To allow for adjustment costs, in our study we will focus on hypermarket and supermarket stores that have been part of the Eroski chain for at least 6 months. There is no newly acquired store in our sample of stores for which we have reliable data over the period of February 2006-May 2008.

of this company in the Basque region as well as different areas of Spain; during each of these visits we interviewed the store manager and employees.

The retail chain began operations in Northern Spain in 1969. Most of the cooperatively owned stores are in the Basque region and in these cooperatives employees have substantial employee ownership. To sustain growth in the chain (and with an eye to becoming a leader in retailing throughout Spain), in 1997 Eroski began to acquire or open stores in other parts of Spain. Some of these stores are cooperatives. In others, known as GESPA, employee members have ownership stakes, though they are more modest than in cooperatives. Other stores remain as conventional firms. Hence, from the perspective of the extent of employee ownership, there are three distinct types of store. In turn, these ownership differences result in considerable differences in the structure and functioning of stores in the three categories.<sup>2</sup>

These differences are most apparent for worker-members in Eroski **cooperatives** who, compared to workers elsewhere in Eroski, have unusual opportunities to participate in both ownership and decision-making. Equally it is important to realize that, usually, there are non-member workers in the workforce. While many of these “non-members” are prospective members on probation, they also include workers on temporary contracts. In the main it appears that workers on temporary contracts are quite low skilled, in such positions as cashiers. As is shown in the descriptive statistics reported in Table 1 in hypermarkets this non-member workforce in Eroski cooperatives, averages about 24% of the total workforce and is somewhat higher in supermarkets.

Effectively all coop workers who work under permanent contracts are expected to

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<sup>2</sup> We should also note that Eroski, as are other MCC cooperatives, is supported by a web of institutions (see, e.g., Joshi and Smith, 2008; Arando et al, 2011).

become members and, as such, significant worker owners. While there is no fixed probationary period, at some point (usually not less than six months) the immediate supervisor of the candidate for membership, after soliciting opinions of other coop workers, makes a recommendation with the ultimate decision concerning membership being made by the store's manager. In selecting prospective members, a key requirement is the willingness and ability of the candidate to commit to a substantial capital contribution, a sum that currently is about 6000 Euros which in 2009 amounted to about 30% of the average annual remuneration in an Eroski store<sup>3</sup>. While this initial stake remains substantially individually owned, about 20 % of it is allocated to collectively owned reserves. The member's stake receives an interest rate that is related to, though usually set above, the market rate --in 2008 it was 8%. Over time, as Eroski makes profits, these individual stakes grow as distributions from surpluses are credited to these individuals' capital accounts.<sup>4</sup> From Table 1 we see that in hypermarkets the average size of these stakes was quite considerable having grown to 33,295 Euros and in supermarkets to more than 26,000 Euros by March of 2008.

Cooperative members also have opportunities to participate in decision-making in ways substantially beyond those available to workers in other Eroski stores. Thus worker-members are able to attend the AGM (Annual General Meeting), though the large number of members requires that this is done on a representative basis. More importantly perhaps, worker-members are able to be elected to the Governing Council (the Board of Directors) and the Social Council (the body responsible for determining many matters of interest to workers, such as working

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<sup>3</sup> However the capital contribution requirement is not as onerous as it appears since it can be spread over 5 years. In addition, possibilities exist for some new members to use previously paid unemployment premia towards these stakes, since cooperative members are guaranteed job security.

<sup>4</sup> For more detail on these features of Mondragon cooperatives, see Thomas and Logan, 1982 and Bradley and Gelb, 1982 and Arando et al. (2011)

conditions.). At the same time, the potential influence of worker members in Eroski cooperatives is necessarily circumscribed since, unlike in manufacturing cooperatives, there is another large group of members in Eroski, namely consumer-members. The Governing Council comprises equal numbers of representatives for worker- and consumer-members. Finally cooperative members participate in joint labor-management meetings at the store level. From Table 1 we see that, as a proportion of scheduled working hours spent in such meetings per month (INVOLVE) averaged 0.24 percent for workers in COOP Hypermarket stores.

The understandings and implicit policies concerning job security and remuneration are potentially of crucial importance to the functioning of cooperatives. A key incentive for workers to want to become and to remain as coop members is job security—no coop members have ever been laid off.<sup>5</sup> In addition, cooperatives have wage structures that are much more compressed and more flexible than in firms outside the group. Thus the norm is for coop members in non-managerial positions to receive a premium of at least 20% over their outside counterparts. Also the internal wage differences are compressed, with the usual ratio of top-bottom not exceeding 5:1.<sup>6</sup> As such top managers tend to receive lower earnings than do managers in conventional retail stores (by some estimates about 30% below outside rates.)

Turning to the Eroski stores known as **GESPA**, as in cooperatives individuals can become members and have individual ownership stakes though membership in GESPA which requires a capital stake that is about half as large as in a coop, about 3,000 Euros. This represents about 25% of the average annual earnings for workers in a GESPA store. However, and unlike in

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<sup>5</sup> There have been occasional instances of store closures. In such instances members are always offered comparable employment in nearby Eroski stores.

<sup>6</sup> There are some strategic positions for which the gap is higher, sometimes approaching within-business differences of 8:1. Still these differences are much more compressed than in comparable capitalist retail chains.

cooperatives, not all permanent workers in Eroski stores are required/expected to become members. In particular, when the stores were acquired, existing workers were not obliged to become members. However, new workers who are offered permanent contracts are expected to become members. These individual membership stakes earn an interest rate determined in a similar way to individual stakes of coop members. Over time, as Eroski makes profits, these individual stakes grow as distributions from surpluses are credited to individuals' capital accounts. However reflecting lower initial levels and shorter average life—the first GESPA began in 1997, whereas cooperatives have existed since 1969—as of March 2008 the average individually owned stake in GESPA was substantially less than in Eroski cooperatives. Thus from Table 1 we see that in GESPA hypermarkets this STAKE averaged only a little over 2,500 Euros.<sup>7</sup> Membership in GESPA, as with membership in cooperatives, provides what is effectively 100% job security—no GESPA members have ever been laid off, and in the few instances of GESPA store closures, members have always been offered alternative employment nearby. However, while GESPA members are able to be elected to the Social Council, they are ineligible to attend the AGM or serve on the Board. As such the scope and nature of a member's opportunities to participate in control and membership in a GESPA is substantially below that for members in cooperatives. Indeed in many interviews we heard views expressed that GESPA membership was widely regarded as a “second class” form of membership. Hence, unsurprisingly, as we see from Table 1, membership levels in GESPAs were much lower than in COOPs—averaging almost 61%. Also participation in joint labor management committees was

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<sup>7</sup> The average stake of 2,500 Euros is actually lower than the amount of the initial capital contribution required for GESPA membership (3,000 Euros). This seemingly anomalous finding is largely due to the fact that the initial capital contribution required for GESPA membership can be spread over five years, and that as a result of the relatively young age of GESPA stores many GESPA members have not completed their required capital contribution.

much less developed (from Table 1 we see that average INVOLVE in GESPA was only about one tenth as large as in COOPs.)

From the perspective of employee ownership, all **stores with conventional ownership** in the Eroski chain, and unlike other Eroski stores, do not provide opportunities for employee ownership or special structures through which employees can participate in decision making. At the same time it is important to emphasize that all of these stores represent acquisitions of what were capitalist firms. As such many workers in these stores had worked for the previous capitalist owners. Now they experience working as part of a cooperative chain one feature of which is for *all* workers in all stores to be subject to key features of the same set of HR policies. The language contained in various internal company documents and the associated institutional arrangements strongly suggests that by working in a store within a coop chain, the lot of these continuing workers might be expected to have improved --arguably they are subject to better working conditions and better treatment by managers than previously. For example, the workers in these conventional stores are encouraged to participate in meetings and there are policies concerning meetings between employees and supervisors and annual development discussions even though they cannot, as in other stores in the group, become owner-members. Also there is a raft of policies that encourage training and skill formation.<sup>8</sup>

So far as wage setting and employment are concerned in stores with conventional ownership, all workers (including non-members in cooperatives and GESPA and workers in

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<sup>8</sup> The need for such policies emerges from our discussions with managers at the chain who emphasized that the firm's way of operating, or a key part of its competitive strategy, was that employees' discretionary effort mattered for company performance. Employees are needed for more than just being there, and high turnover of employees is not desirable. This is reflected in the company's written HRM strategy which emphasizes skill development of employees and the management capabilities of supervisors, and also career development and job rotation. These issues were also raised in our discussions with management members, suggesting genuine commitment to the HRM strategy. This perspective applies to all types of stores.

these conventional firms,) receive no less than the wage rates that are set out in the collective agreement that is negotiated by the retail workers trade union and which applies to all retail workers.

Based on the preceding discussion we believe that our case is a good one in which to test propositions in three related areas. Our key interest is in comparative performance, especially how cooperatives will perform compared to conventional firms (with no employee ownership). We are also interested in how well cooperatives perform compared to firms with modest degrees of employee ownership. The second question concerns mechanisms--if there are productivity differences, what accounts for these differences? For example, what will be the impact of varying degrees of employee ownership and participatory practices (which vary across the three types of stores) on organizational performance? Third, what are the implications of these differences in organizational form for worker outcomes? While we know that cooperative members receive higher earnings than their peers in conventional stores, what is the situation concerning job satisfaction among workers in different stores? In the next section we review theoretical and empirical work emerging from different literatures that relates to these questions.

### **III. Theory and Previous Empirical work**

In this section our review of theoretical and empirical evidence in two areas is interwoven with references to the previous discussion of key institutional features at Eroski so that we end up with specific predictions for different types of stores

#### **(1) Comparative Performance**

For majority EOFs, the **economic theory of the LMF** yields conflicting predictions about the productivity effects of worker participation in ownership and is thus inconclusive

concerning the expected comparative performance of EOFs and conventional firms.<sup>9</sup> Much of the early influential theoretical work (e.g., Vanek, 1970) argued that co-operative firms would generate very strong incentives for labor resulting in high technical efficiency of labor. By contrast other studies were more pessimistic concerning the expected performance of PCs. Alchian and Demsetz (1972) and Jensen and Meckling (1979) argue that productivity will be lower in a cooperative because efficient monitoring of workers requires the monitor to be the claimant on the firm's profits and that the cost of monitoring increases with the number of monitors. Another influential paper is Holmstrom (1982) who argues that effort level is expected to be beset with free-rider problems and thus sub-optimal when work takes place in teams (as is expected to be the case in manufacturing PCs). These pioneering theoretical papers have elicited a voluminous amount of responses and theoretical objections. Thus Macleod (1988) shows how, in a repeated game framework, effort supply in LMFs need not be below that in conventional firm. Others point to different benefits of PCs. Thus cooperatives are expected to be more productive than conventional firms because incentives (financial participation), peer group pressure (horizontal monitoring) and the close identification of cooperative members with the firm will elicit greater effort from workers (Jones and Svejnar, 1985; Fitzroy and Kraft, 1987). Subsequent work (reviewed in Bonin et al. 1993; Dow, 2003) also recognized that predictions are more nuanced once it is recognized that “real world” LMFs may not have 100% membership.

Turning to the empirical literature,<sup>10</sup> often the relative performance of conventional firms and PCs has been estimated by comparing subsample means of measures such as value added per

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<sup>9</sup> See Bonin, Jones, and Putterman (1993), Jones and Pliskin (1991) and Dow (2003) for surveys.

<sup>10</sup> One general point to note is that studies of technical efficiency in retailing, are thin on the ground. For cooperatives, an early investigation of British retail cooperatives is Jones (1987). So far as studies of the impact of HR on business performance in retailing is concerned prior work include Ben-Ner et al. (1999) and Jones, et al.,( 2006, 2009).

worker using data on both conventional firms and cooperatives.<sup>11</sup> Most econometric evidence has been obtained from samples exclusively of producer cooperatives.<sup>12, 13,14</sup> A few studies have estimated production functions using data on both conventional firms and cooperatives.<sup>15</sup> Amongst these perhaps most noteworthy is Craig and Pencavel (1995) who carefully gathered data for plywood cooperatives and conventional firms in the Pacific Northwest in that industry. The authors estimate separate Cobb Douglas production functions for several types of firms including cooperatives and conventional firms. They find that cooperatives are between 6 and 14% more efficient than the principal conventional firms though there is little difference between the efficiency of the unionized and classical mills. More recently Jones (2007) also assembles data for conventional firms and PCs in the same industry, namely the Italian construction sector. However no evidence is found that cooperatives are more efficient than conventional firms.<sup>16</sup> In sum, it would seem that a reasonable conclusion based on the research to date for majority EOFs is that there is no strong evidence that either cooperatives or conventional firms have a sizeable and persistent significant edge in performance over other organizational forms. Equally it is

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<sup>11</sup>For example, George (1982).

<sup>12</sup> Some exceptions are Jones (1987), Lee (1988), Berman and Berman (1989), Estrin (1991) and Craig and Pencavel (1995).

<sup>13</sup>For example, see Defourney, Estrin, and Jones (1985), Estrin, Jones, and Svejnar (1987), and Jones and Svejnar (1985).

<sup>14</sup> Using estimates of how the productive efficiency of firms varied with respect to measures of financial and decision making participation, the authors of these studies estimated the efficiency of a typical cooperative relative to a firm with no worker participation. Since the samples of cooperatives often exhibited considerable variation over both firms and time in the degree of worker participation, the estimated productivity effects might be reliable. However, other things remaining the same, one would prefer a sample of both conventional firms and cooperatives since the variance of the prediction errors is lower for observations that are similar to those in the sample than for atypical ones.

<sup>15</sup> George (1982), Jones (1987, 2007), Conte and Svejnar (1988), Lee (1988), Berman and Berman (1989), Estrin (1991) and Craig and Pencavel (1995). But only the papers by Jones, Lee, Estrin, Craig and Pencavel (1995) have focused on the relative technical efficiency of cooperatives.

<sup>16</sup> For Mondragon cooperatives, the only econometric study is Martin (2000). This unpublished study reports findings for a few firms (in machine tools) that do not yield a clear picture.

apparent that there is a need for more targeted research. For example, the most frequently cited comparative study is probably that of Craig and Pencavel (1995). However, while the quality of the data the authors use is most impressive arguably the robustness of the findings are somewhat diminished by the relatively small size of the data set (170 observations for 34 mills), and the use of a problematic measure of capital in the production function estimates. Also not all studies have taken into account key features of the institutional realities, such as the variation in membership amongst firms.

While economic theory is ambiguous and empirical findings are unclear, based on that literature together with our knowledge of the institutions at Eroski (as discussed in section II), we make the following prediction concerning the performance of Eroski co-ops. Even though the formal arrangements in Eroski cooperatives are somewhat short of what is envisaged in the pure theory case of the LMF, Eroski cooperatives do provide high levels of ownership and participation as well as substantial job security for members. Compared to non-members, front line workers benefit from receiving wage premia and high levels of training. We expect that these arrangements will lead to a more committed and motivated workforce who would expend more discretionary effort and work harder and smarter than the workforces in GESPA or conventional stores so that cooperatives are expected to display much higher levels of efficiency. Another source of performance advantage of cooperatives might stem from the possibility that high levels of peer monitoring in cooperatives would lead one to expect coop labor forces to have fewer layers of supervisors than in conventionally owned stores.<sup>17</sup>

For firms with minority EO and/or more limited employee involvement a body of

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<sup>17</sup> Agirre et. al (2010) argue that organizational commitment in cooperatives facilitates market orientation which leads to better results.

theoretical and empirical literature suggests that an individual change in organizational design, such as modest employee ownership, is expected to be sufficient to produce *sustained* benefits to the firm.<sup>18</sup> By contrast other literature argues that, for sustained benefits, *complementary* measures are needed. An individual initiative when introduced alone may be insufficient to lead to persistent gains. For example, employees might need more sharing of enterprise rewards through financial participation, such as employee stock ownership to accompany teams lest their commitment to teams becomes undermined (Milgrom and Roberts, 1995, Ben-Ner and Jones, 1995, and Kato and Morishima, 2002) The empirical literature often reports that the productivity-enhancing effects of individual practices introduced alone may be short-lived since initiatives lack a complementary mechanism, such as also delegating power to front-line workers (e.g., for quality circles, Levine, 1995 and Jones and Kato, 2011). By contrast, and broadly speaking, the empirical literature also finds evidence in support of such complementarities (e.g., between employee ownership and employee involvement, such as the shared capitalism studies of Freeman et. al, 2008, or for Japan Kato and Morishima (2002) or for UK firms, Pendleton and Robinson (2008).<sup>19</sup>

While economic theory for firms with minority ownership and control is ambiguous and empirical findings are unclear, our knowledge of the institutions at Eroski (as discussed earlier in section II) and that literature leads us to make the following prediction concerning performance in Eroski GESPAs. While GESPAs do provide a reasonable level of employee ownership and job security for members, the extent of employee involvement and financial participation is

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<sup>18</sup> See for example reviews in Blinder (1990) and in Blair and Kochan (2000).

<sup>19</sup> However, it is also important to recognize that there do not appear to be any studies that have investigated these propositions *within* a business that is a cooperative and part of an elaborate set of institutions outside the firm.

rather modest. In addition, front line workers in GESPA stores do not enjoy the wage premia that coop members receive. Also GESPA workforces tend to suffer from more divisions than do coop workforces because of lower membership ratios—not all permanent workers accept the offer of membership. For reason such as these, the synergies between ownership and participation, especially compared to coop members, are muted and we would not expect GESPA stores to do nearly as well as cooperatives. Furthermore, while some of the institutional arrangements might be expected to result in worker members expending more discretionary effort and working harder and smarter than workforces in conventional stores, these feelings of being “second class members” might undermine such forces. Hence we have no strong expectations concerning GESPA performance compared to conventional stores.

## **(2) Mechanisms**

While as we have indicated above, the literature in the LMF tradition does draw attention to mechanisms that might account for underlying differences in performance (such as the role of peer monitoring), since the more recent literature on High Performance Work Systems (HPWS) addresses this topic more forcefully we will lean on that literature to guide this part of our empirical work. It points to the real possibility of an establishment boosting its performance by adopting a variety of complementary new work practices (often called High Performance Work Practices) and tapping into the ability of frontline workers to produce valuable local knowledge through their collective efforts; and dealing with local shocks autonomously through collaboration among themselves. Such diverse HPWPs are expected to be especially potent within a majority EOF. The following three key elements of the HPWS are often emphasized<sup>20</sup>

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<sup>20</sup> See, for instance, Kochan and Osterman, 1994, Appelbaum, et. al. 2000 and Boning, Ichniowski and Shaw, 2007. In addition, the literature sometimes stresses a synergy between the use of

First, in the HPWS, front-line workers will be given **opportunities** to exert discretionary effort, acquire useful local knowledge, and share it with their co-workers, and higher-level managers. The importance of providing such opportunities is self-explanatory. After all, a key objective of the HPWS is to tap into frontline workers' discretionary effort and ability to produce valuable local information and deal with local shocks. Without such opportunities, there will not be any performance gain.

Providing workers with such opportunities to produce useful local knowledge and share it with management is not sufficient. Obviously if the interest of workers is not aligned with that of the firm, workers will have little **incentive** to put forth effort and produce performance-enhancing local information and share it with management. The interest alignment between workers and the firm in cooperatives is fostered by two types of human resource management policies: (i) financial participation schemes (such as employee ownership) by which the financial wellbeing of workers is more tied to the final success of the firm; and (ii) information sharing mechanisms through which management shares important information with workers, and fosters their loyalty and commitment to the firm.<sup>21</sup>

The third element concerns the matter of **ability** and skills development. Even if frontline workers are given an opportunity to produce valuable local knowledge and share it with management AND have the appropriate incentive to do so, such useful local information may never be generated or shared widely in the firm in the absence of appropriate ability and skill of workers. As such, careful screening, recruitment and sustained training are often an integral part

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information and communication technologies and the HPWS (e.g., Black and Lynch, 2004). Unfortunately we do not have data on the use of such technologies.

<sup>21</sup> In addition, job security, which is a central feature at Mondragon, can be an important necessary condition for the High Performance Work System to function optimally. For the importance of job security in the participatory employment system such as the Japanese system, see for example Levine (1995) and Carmichael and MacLeod (1993).

of the High Performance Work System.

Our expectation is that opportunities for employee involvement and training will be more extensive and economic incentives more powerful in cooperatives compared to other organizational forms and that, in turn, these differences in key mechanisms will help to account for differences in organizational performance.

#### IV. INSIDER ECONOMETRIC EVIDENCE

##### (1) Do COOP stores outperform other stores?

To capture the performance effects of differences in ownership structure, we estimate the following first-difference model:

For hypermarkets,

$$(1) \Delta \ln Q_{it} = \beta_L \Delta \ln L_{it} + \beta_c \text{COOP}_i + \beta_m \Delta \text{MARKET}_{it} + \beta_y \text{YEAROPENED}_i \\ + \text{additional controls} + \Delta \varepsilon_{it}$$

For supermarkets,

$$(2) \Delta \ln Q_{it} = \beta_L \Delta \ln L_{it} + \beta_c \text{COOP}_i + \beta_g \text{GESPA}_i + \beta_m \Delta \text{MARKET}_{it} + \beta_y \text{YEAROPENED}_i \\ + \text{additional controls} + \Delta \varepsilon_{it}$$

where  $\Delta$  indicates the first difference between month  $t$  and  $t-1$ ;  $Q_{it}$  is output (real sales) in store  $i$  in month  $t$ ;  $L_{it}$  is employment (measured by the number of full-time equivalent workers) in store  $i$  in month  $t$ ;  $\text{COOP}_i$  is a dummy variable taking a value of 1 if store  $i$  is a coop store, 0 otherwise; and  $\text{GESPA}_i$  is a dummy variable taking a value of 1 if store  $i$  is a GESPA store, 0 otherwise. In addition to labor ( $L$ ), store space is often considered crucial capital input ( $K$ ) in retail service production (see, for instance, Jones, Kalmi and Kauhanen, 2006). For all Eroski stores during the time period under study, however, month to month variations of store space are

zero and hence in our first-difference model,  $\Delta \ln K_{it} = 0$ .

Note that during the period of time under study no store changed its ownership type, and that  $COOP_i$  and  $GESPA_i$  are time-invariant. In essence, we are estimating the effect on sales growth (which is equal to  $\Delta \ln Q_{it}$ ) as opposed to the level of sales ( $Q_{it}$ ) of ownership types. The extensive field research that we conducted at Eroski (in particular, repeated interviews with our key informant as well as multiple managers) led us to believe that sales growth is indeed a primary business goal of Eroski. Our focus on sale growth as a key performance measure is consistent with what Eroski uses to gauge each store's performance.

To make sure that the estimated coefficients on  $COOP_i$  and  $GESPA_i$  are capturing the pure employee ownership effects, we include a number of controls. First and perhaps most important, a store located in a rapidly growing market with rising population and average household income will naturally experience a faster growth of sales. If a disproportionately higher proportion of COOP stores are located in such rapidly growing markets as compared to other stores and we fail to control for such a location effect, we will not be able to separate the performance effect of COOP from the location effect. To control for such differences in the store location's market condition, we include  $\Delta MARKET_{it}$  where  $MARKET_{it}$  is monthly market index in month  $t$  for the area which store  $i$  serves. The monthly market index is provided by the Spanish National Statistical Institute, and is considered one of the most authoritative market indicators in Spain.

Second, we consider  $YEAROPENED_i$  = the year store  $i$  was opened. We have been told by our informants at Eroski that due to the standard lifecycle model of retail stores, younger stores tend to grow faster than older stores.  $YEAROPENED_i$  will control for such a lifecycle effect as well as any cohort effects of individual stores.

Third, we also include constant (to capture an Eroski-wide time trend which is common to all Eroski stores regardless of its ownership types), monthly dummy variables (to capture seasonality of retail sales), and year dummy variables (to control for year time effects) as additional controls.<sup>22</sup>

Finally, as in the case of any fixed effect/first-difference model, our first-difference model controls for unobserved time-invariant heterogeneity of stores that may be correlated with the level of real sales.

Table 2 reports the OLS estimates of Eq. (1).<sup>23</sup> For hypermarkets, as shown in the first column, the estimated coefficient on COOP is positive and significant at the 5 percent level, confirming that COOP stores grow faster than GESPA stores, *ceteris paribus*. The size of the estimated coefficient suggests a plausible growth rate advantage of COOP stores over GESPA stores, i.e., on average each month COOP stores grow faster than GESPA stores by 0.2 percentage points (or 2.4 percentage points per year). The estimated coefficients on the control variables have the expected signs and are statistically significant. Specifically, the estimated coefficient on  $\Delta \ln L_{it}$  is positive and significant at the 1 percent level, and the size of the coefficient implies that the output elasticity of labor in the underlying Cobb-Douglas production function is a little over 0.5. We also find the estimated coefficient on  $\Delta \text{MARKET}_{it}$  to be positive and significant at the 1 percent level, confirming that a store located in a rapidly growing market with rising population and average household income will experience a significantly faster growth of sales, and hence that it is important to control for the market conditions of the store

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<sup>22</sup> We also consider a full set of interaction terms involving monthly dummy variables and year dummy variables. Our main results change little with the use of such a full set of interaction terms though there is slight efficiency loss. These as well as all other unreported results are available upon request from the corresponding author.

<sup>23</sup> All standard errors are clustered at individual store levels.

location. Finally, the estimated coefficient on  $YEAROPENED_i$  is positive and significant at the 5 percent level, suggesting that young stores indeed grow faster than old stores. This finding is consistent with the lifecycle model of retail stores as expounded by our informant at Eroski.

As shown in the second column of the table, for supermarkets, we find no evidence for the growth rate advantage of COOP stores -- the estimated coefficient on COOP is very small (actually negative) and highly insignificant. Our failure to find any significant difference in sales growth between COOP and GESPA stores for supermarkets did not surprise our key informant at Eroski who pointed out the large heterogeneity of stores in supermarkets as a possible reason for the finding. He then suggested us to focus on a particular subgroup of supermarkets, called Supermarket City. Supermarket City is essentially a group of supermarket stores that are smaller than other supermarkets and are still somewhat reminiscent of intimate, small neighborhood groceries. As such, having “better customer service” employees is particularly important for Supermarket City. A major strength of COOP stores lies in the fact that COOP helps employees develop a sense of ownership and hence makes them more committed employees who are willing and capable of providing closer and helpful attention to their customers. Such a COOP advantage is probably more relevant to Supermarket City than other supermarkets. In short, we are more likely to detect a positive performance effect of COOP in the market segment of Supermarket City.

The last column of Table 2 reports the results for Supermarket City. Reassuringly the estimated coefficient on COOP is now positive and statistically significant at the 5 percent level. The size of the estimated coefficient implies a considerable 0.7 percentage-point growth rate advantage enjoyed by COOP stores in the market segment of Supermarket City over conventional stores in the same market segment (note that there is no GESPA store in this market

segment).

## **(2) How do COOP stores outperform other stores?**

Our earlier discussion of the theoretical literature drew attention to the potential role of various mechanisms within cooperatives that might help to account for a productivity edge. In this section we highlight the role of three key elements. First are opportunities for employee involvement. From the discussion in section II we saw that diverse opportunities existed for employee involvement in Eroski cooperatives. In measuring the extent of variation in employee involvement opportunities across different types of stores we use  $INVOLVE_i$  (the monthly average for store  $i$  during the time period under study of the proportion of scheduled work hours spent on joint labor-management meetings). We use the monthly average during the entire time period under study to gauge the extent of employee involvement opportunities at each store, for it is implausible that the strength of employee involvement at each store changes from month to month.

As shown in Table 1, for both hypermarkets and supermarkets, COOP stores allow for much more employee involvement than other stores. For instance, the proportion of scheduled working hours spent on joint labor-management meetings at the store level per month ( $INVOLVE$ ) was on average 0.24 percent for COOP Hypermarket stores as opposed to only 0.02 percent for GESPA Hypermarket stores. Likewise, the average  $INVOLVE$  was 0.44 percent for COOP stores in the market segment of Supermarket City as opposed to negligible 0.002 percent for conventional stores in the same market segment. As such, it is plausible that COOP stores outperform other stores in part by providing their employee owners with more opportunities to produce useful local knowledge and respond effectively to local shocks.

The second mechanism is incentives for workers to take advantage of employee

involvement opportunities. From our earlier institutional discussion we believe that  $STAKE_i$  = average stake of employee owners (monthly average of store  $i$  during the time period under study) represents the most important part of financial incentives at Eroski, though clearly other incentives exist, such as annual distribution of surplus.<sup>24</sup> Table 1 shows that workers in COOP hypermarket stores have a stake in their firm that is more than thirteen times as big as that of the average member-worker in a GESPA hypermarket store. (Unsurprisingly for supermarket stores in the segment of Supermarket City, employees in conventional stores have no stake in the firm). Again, the HPWS literature suggests that employees in COOP stores have stronger incentives to take advantage of employee involvement opportunities; produce valuable local knowledge; and respond quickly and effectively to local shocks without invoking lengthy formal involvement of supervisors. It follows that COOP stores outperform other stores.

In addition to  $STAKE_i$ , our data provide yet another dimension of the overall strength of incentives,  $MEMBER_i$  = proportion of workers who are COOP or GESPA members (monthly average of store  $i$  during the time period under study). While  $STAKE$  captures the intensity of incentives (how big a deal it is for the average employee owner to help her store outcompete its competitors),  $MEMBER$  measures the scope of incentives (what proportion of the total labor force in the store has some stake in the firm). As shown in Table 1, COOP stores tend to have considerably higher proportions of employees with some stake in the firm.

The third crucial feature is the emphasis on training and skill formation in cooperatives.

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<sup>24</sup> Individual ownership stakes receive a return that is more or less guaranteed--an interest rate reflecting market rates. Also, if there is a surplus (profit) part of this is distributed to owners as a bonus which is also proportional to  $STAKE$ . There is, however, another relatively small part of the surplus that goes to workers-- a kind of profit sharing, which is not proportional to  $STAKE$ . In sum, it is safe to assume that most of the annual distribution of surplus that goes to members is proportional to  $STAKE$  (in their role as capital providers), and that  $STAKE$  will measure the strength of financial incentive for employees accurately.

Fortunately our data allow us to construct  $\text{TRAINING}_i$  = proportion of scheduled hours spent on training in general (monthly average of store  $i$  during the time period under study). Table 1 shows a somewhat mixed picture. For hypermarkets, COOP stores on average devote less time to training than GESPA stores whereas for supermarkets in the Supermarket-City segment, COOP stores on average devote more time to training than conventional stores. However, our data do not provide information on the amount of HPWS-relevant training (such as problem solving; team work; customer relations). This measurement issue makes it somewhat difficult to interpret the results on training.

Specifically, we estimate the following first-difference model:

$$(3) \Delta \ln Q_{it} = \beta_L \Delta \ln L_{it} + \beta_h \text{HPWP}_i + \Delta \text{MARKET}_{it} + \text{YEAROPENED}_i \\ + \text{additional controls} + \Delta \varepsilon_{it}$$

For  $\text{HPWP}_i$ , as discussed above, we consider  $\text{INVOLVE}_i$ ,  $\text{STAKE}_i$ ,  $\text{MEMBER}_i$ , and  $\text{TRAINING}_i$ . Table 3 shows the OLS estimates of Eq. (3) for the Hypermarket segment. Overall the results are supportive of predictions drawn from the HPWP PARADIGM. All estimated coefficients have the expected positive sign and two of them are statistically significant at the 1 percent level ( $\text{INVOLVE}_i$ , and  $\text{STAKE}_i$ ).

As shown in Table 4, the estimates of Eq. (3) for a subgroup of City Supermarket stores are less precise and mostly insignificant although the estimated coefficient on  $\text{MEMBER}_i$  is close to being statistically significant at the 10 percent level.<sup>25</sup>

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<sup>25</sup> We also estimated a fully nested version of Eq. (3) with all four HPWP variables considered simultaneously. The results, which are available upon request, turned out to be quite robust to the use of such a fully nested specification although the estimates are slightly less precise due to multicollinearity as expected.

## **V. Worker Outcomes and the Role of Job Satisfaction**

Though the main objective of the paper is to investigate the effect on organizational performance of cooperatives, we will provide suggestive evidence on the effects on worker outcomes (especially job satisfaction) of cooperatives. What cooperatives imply for worker outcomes is an important research question in its own right. However, a study of the implications of cooperatives for worker outcomes will also provide potentially valuable insight on the nature and sustainability of cooperatives as a high performance work system.

In the literature on HPWS, there is an ongoing debate over the consequences of HPWS for worker outcomes. While some argue that HPWS produces gains for both firms and workers (e.g., Appelbaum, et. al, 2000), Godard, (2001 and 2004) argues that HPWS may make work more intense and stressful, thus resulting in more worker discontent. There is also a literature that argues that in organizations with well developed systems providing for employee involvement, work expectations are apt to be unrealistically high. For example in their cross national study of the extent of employee involvement in Europe in the 1970s, International Research Group (1981) found that worker satisfaction with arrangements in countries with well developed formal arrangements for employee participation (such as in Yugoslavia) was lower than in many places with more rudimentary schemes.

While the available empirical work is rather limited, there appears to be a similar division in the literature concerning majority EOFs and cooperatives. Most studies have investigated the US plywood cooperatives. Thus while Greenberg (1986) finds higher levels of job satisfaction in the cooperatives, Long (1982) finds no relationship between ownership stake and job satisfaction. While Rooney (1984) finds evidence of lower injury rates among workers in majority EOFs, by contrast Rhodes and Steers (1981) find no differences in accident rates and

Grunberg and Greenberg (1996) find a poorer safety record in cooperatives. To some degree this murky picture emerging from previous work on job satisfaction and related outcomes in cooperatives reflects the use of what are tiny and apparently non-representative samples.

For the case of Eroski, we do know that worker-members in cooperatives receive substantially higher earnings compared to their peers in other stores within Eroski. At the same time we have no clear cut predictions as to what to expect to find concerning job satisfaction. While many of the features of cooperative membership, such as high levels of employee involvement and high wages can be expected to lead to high levels of job satisfaction, such owner-workers may also work harder and be subject to higher levels of stress than others. They are also apt to have much higher levels of expectations from working in cooperatives (than do workers elsewhere), expectations which, in certain circumstances, may be easily frustrated.

To investigate the implications of differences in organizational structure for job satisfaction, we are fortunate to have access to micro data for *all* workers in Eroski hypermarkets (n=4328). These data were collected from a worker s survey conducted in all Eroski hypermarkets (including both COOP and GESPA stores) in 2008. On a 5 point scale, workers are asked to assign a numerical value to their level of satisfaction (with 5 being the most satisfied) in response to each of 68 questions concerning various aspects of working lives and work environment.

To capture the level of overall worker satisfaction, following Bartel *et al.* (2003), we use employee responses to all 68 questions and produce an Employee Attitude Index (EAI) for each

individual worker.<sup>26</sup> The average EAI was 3.36 and 3.60 for workers in COOP and workers in GESPA respectively, suggesting that the overall level of job satisfaction is actually lower for workers in COOP stores than in GESPA stores.

To provide more rigorous evidence on the satisfaction gap between COOP and GESPA, we estimate the following equation:

$$(4) \text{EAI}_i = \alpha + \beta_1 \text{COOP}_i + \beta_2 \Delta \ln Q_i + \beta_4 \Delta \ln \text{MARKET}_i \\ + \beta_4 \text{YEAROPENED}_i + \beta_5 \text{MALE}_i + \beta_6 \text{BASQUE}_i \\ + \text{additional controls} + \varepsilon_i$$

where  $\text{EAI}_i$  = EAI of worker  $i$ ;  $\text{COOP}_i = 1$  if worker  $i$  works for a COOP store, zero otherwise;  $\Delta \ln Q_i$  = annual average of monthly sales growth rates during 2007 of the store for which worker  $i$  works;  $\Delta \ln \text{MARKET}_i$  = annual average of monthly growth rates of market index during 2007 of the store for which worker  $i$  works;  $\text{YEAROPENED}_i$  = year opened of the store for which worker  $i$  works;  $\text{MALE}_i = 1$  if worker  $i$  is male, zero otherwise; and  $\text{BASQUE}_i = 1$  if worker  $i$  filled out the questionnaire in Basque, 0 otherwise (each worker was allowed to fill out the questionnaire either in Spanish or in Basque). Additional controls include occupational dummy variables; tenure dummy variables; and worker status (temporary or permanent) dummy variables.

The OLS estimates of Eq. (4) are presented in Table 4. Column (i) confirms that the level of overall worker satisfaction is indeed significantly lower in COOP than in GESPA, after controlling for a variety of individual and store characteristics. Column (ii) shows the OLS estimates of Eq. (4) augmented by an interaction term involving both  $\text{COOP}_i$  and  $\Delta \ln Q_i$ . The

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<sup>26</sup> We experimented with alternative ways of capturing job satisfaction by constructing measures that use a narrower set of questions as well as a principal component analysis. Findings were largely insensitive to the use of such alternative measures.

estimated coefficient on the interaction term is positive and statistically significant at the 1 percent level, suggesting that the negative satisfaction effect of COOP is mediated when store performance (sales growth) improves. Or conversely the negative satisfaction effect of COOP will be amplified when store performance worsens.

One interpretation of these findings is that Eroski's COOP stores can be viewed as majority EOFs that employ key mechanisms that constitute a high-powered High-Performance Work System. These co-op stores are more efficient and COOP workers have bigger financial stakes and voice, and also receive higher wages. However, employee owners with high stakes in the firm are expected to go beyond routine work and to engage in a variety of problem solving activities. Consistent with the arguments of those who do not expect HPWPs to produce consistent gains for both firms and employees (e.g. Godard, 2001), such workplaces can be quite demanding and stressful. Interestingly in cooperatives, and in contrast to what has sometimes been found for conventionally owned firms with HPWPs, stress is highest when sales growth is relatively weak. An alternative interpretation of the finding is that by being significant stakeholders, COOP workers at Mondragon probably expect more from their work, resulting in high expectations and a higher likelihood of disappointment. Such workplace disappointment may be particularly acute when their hard work does not result in performance improvement.

In sum, our evidence on low job satisfaction in cooperatives points to a need for somewhat nuanced understanding of cooperatives as a HPWS.

## **VI. CONCLUSIONS**

Recent years have seen a massive growth in employee ownership around the world. A substantial volume of theoretical and empirical evidence has appeared that investigates the

performance of such firms, but it is inconclusive concerning the comparative performance of EOFs and conventional firms, as well as the comparative performance of firms with majority and minority EO. The evidence also shows how employee ownership has assumed a wide variety of forms, including the producer cooperative in which majority control and ownership is vested in the workforce. Amongst such labor managed firms, one example that has attracted close and sustained attention by researchers are the Mondragon cooperatives. In this paper, we are fortunate to use the first micro-econometric evidence for a Mondragon cooperative and, since stores fall into three distinct ownership categories, we are able to contribute to some of these debates.

By estimating first difference equations we find: (i) hypermarket stores with cooperative ownership outperform GESPA stores; (ii) for supermarkets, the picture is more nuanced. Small “city” supermarkets, those with cooperative ownership, are more productive than Eroski stores that are conventionally owned. However for larger supermarkets, conventional owned stores grow faster than both cooperatives and GESPA. These findings are supported by a series of robustness checks.

We also provide additional evidence that bears on the mechanisms that help to explain why cooperatives are better-performers. This evidence is consistent with those who argue that cooperatives are better performers because cooperative members work under institutional arrangements that differ from those facing workers in other firms. Specifically, compared to workers in other firms, cooperative members have opportunities for substantial employee involvement and training and also strong incentives because they have a large financial stake in the firm. Cooperative members also have unusual job security and they work in firms with earnings differences that are substantially more compressed than in comparable firms. We

attribute the failure to find an effect for more moderate combinations of employee ownership and employee involvement to the absence in GESPA of many of the factors that underpin the cooperative advantage.

Overall our findings tend to lend support to those who cast doubt on the unconditional supremacy of the Anglo-American shareholder model of corporate governance and advocate employee ownership and shared capitalism as a viable and possibly even superior alternative to the Anglo-American shareholder model. While it is unclear whether our findings apply equally to the retail industry in other countries, we do note that evidence for the potential importance of innovative work practices does exist for retailing elsewhere (e.g. for the UK, Jones, 1987 and for Finland, Jones et al. , 2009.) At the same time we do not believe that our findings imply that employee-owned enterprises are a universal panacea.

First, while cooperative members are substantially better paid than their peers in comparable firms, when we use individual-level data to investigate job satisfaction among workers in differing forms of organization we find that job satisfaction is lower for workers in cooperatives than for GESPA workers. Though this may be a reflection of high worker expectation in cooperatives, cooperatives may well be indeed a “high-stress work system”. The overall assessment of cooperatives will need to be nuanced.

Second, clearly there are limitations to our approach--econometric case studies cannot easily address concerns about selectivity and external validity (Jones et al., 2006). In the context of our study, compared to firms examined in other studies, many potentially important features of the cooperative model are apparently especially well developed among Eroski stores, such as the existence of high membership ratios and average ownership stakes that are far bigger than in other cooperatives outside Mondragon. The particular configuration of coop features available at

Eroski might help to explain our findings--the effects of cooperation that exist here than are more powerful than have been found in other cases. Likewise, even within Mondragon, we are not entirely sure that our findings are applicable to the industrial and banking sectors of Mondragon, cases to which we plan to investigate in future work.

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Table 1 Summary Statistics

	Hypermarkets		Supermarkets				
	COOP	GESPA	All			SUPERMARKET CITY	
			COOP	GESPA	Conventional	COOP	Conventional
$\Delta \ln Q_{it}$	.0021048 (.166259)	-.0004499 (.234495)	.0042155 (.159047)	.0060926 (.169218)	.0053058 (.174939)	.0104688 (.182554)	.0019786 (.116191)
$\Delta \ln L_{it}$	.0003716 (.04335)	-.0016009 (.066897)	.0023519 (.09743)	.0039068 (.061481)	.0024821 (.087372)	.0068902 (.139007)	.0022351 (.102414)
$\Delta \text{MARKET}_{it}$	.0034202 (.115210)	.0035085 (.107146)	.002913 (.112875)	.003626 (.096741)	.003759 (.104789)	.0028605 (.115623)	.0012249 (.099853)
$\text{YEAROPENED}_i$	1995.48 (5.46753)	1999.904 (4.49017)	1998.405 (4.74845)	2000.626 (2.77468)	1999.364 (4.94237)	2000.18 (2.52702)	2002.053 (1.84229)
$\text{INVOLVE}_i$	.0024464 (.004767)	.0002408 (.000727)	.0033306 (.005705)	.0011858 (.003443)	2.23e-06 (.000126)	.0044161 (.008445)	.0000192 (.000332)
$\text{STAKE}_i$	33295.79 (8847.05)	2511.332 (1010.40)	26270.68 (8175.98)	865.6311 (201.354)	1.398661 (23.56457)	23030.07 (10545.04)	0 (0)
$\text{MEMBER}_i$	.7589575 (.073878)	.6075966 (.135189)	.7289384 (.118557)	.5180572 (.153238)	0 (0)	.6442763 (.1549173)	0 (0)
$\text{TRAINING}_i$	.0074278 (.01298)	.0080867 (.015204)	.0138549 (.038580)	.0102537 (.021452)	.0062481 (.053389)	.0108354 (.041531)	.0059075 (.012875)
N	675	1420	4747	703	8001	967	321

Sources: : Individual store-level monthly data from February 2006 through May 2008 provided by Eroski.

Note: Standard Deviation in parentheses.

Definitions of the Variable

$Q_{it}$ =real sales of store i in time t;

$L_{it}$ =number of all full-time equivalent workers working in store i in time t

$\text{MARKET}_{it}$ =monthly market index of the area served by store i in time t

$\text{YEAROPENED}_i$  = year in which store i was initially opened.

$\text{INVOLVE}_i$  = proportion of scheduled hours spent on joint labor-management meetings (monthly average of store i during the time period under study)

$\text{STAKE}_i$  = average stake of employee owners (average of all employee owners of store i as of March 2008)

$\text{MEMBER}_i$  = proportion of workers who are COOP or GESPA members (monthly average of store i during the time period under study)

$\text{TRAINING}_i$  = proportion of scheduled hours spent on training (monthly average of store i during the time period under study)

Table 2 Sales Growth and Ownership Types: Insider Econometric Evidence  
 Dependent variable= $\Delta \ln Q_{it}$

	Hypermarkets	Supermarkets	Supermarket City
$\Delta \ln L_{it}$	0.552*** [6.57]	0.265*** [4.96]	0.292** [2.03]
$\Delta \text{MARKET}_{it}$	0.645*** [9.92]	0.815*** [19.39]	1.165*** [5.90]
$\text{YEAROPENED}_i$	0.00016* [1.87]	0.0004** [2.36]	0.0002 [0.29]
$\text{COOP}_i$	0.0022** [2.94]	-0.0003 [-0.32]	0.0074** [2.63]
$\text{GESPA}_i$		-0.0001 [-0.10]	
N	2070	10994	1195
R-squared	0.852	0.404	0.311

Sources: : Individual store-level monthly data from February 2006 through May 2008 provided by Eroski.

Notes:

1. Absolute values of t statistics are in parentheses (t statistics are based on standard errors that are robust and clustered at the individual store level).
2. All models include constant and monthly dummy and year dummy variables.
3. For Hypermarket, all stores are either COOP or GESPA and hence the omitted reference category is GESPA. For Supermarket, there are COOP, GESPA and conventional stores and the omitted reference category is conventional stores. For Supermarket City only, there are only COOP and conventional stores and hence the omitted reference category is conventional stores.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$

Table 3 Sales Growth and HRM for Hypermarkets: Additional Evidence

Dependent variable= $\Delta \ln Q_{it}$				
	(i)	(ii)	(iii)	(iv)
$\Delta \ln L_{it}$	0.552*** [6.57]	0.576*** [6.53]	0.552*** [6.57]	0.552*** [6.57]
$\Delta \text{MARKET}_{it}$	0.645*** [9.92]	0.653*** [9.51]	0.645*** [9.92]	0.645*** [9.92]
$\text{YEAROPENED}_i$	0.00014 [1.61]	0.0002*** [2.71]	0.0001 [1.16]	0.00007 [0.87]
$\text{INVOLVE}_i$	0.558*** [2.84]			
$\text{STAKE}_i$		$6.2 \times 10^{-8}$ *** [2.74]		
$\text{MEMBER}_i$			0.0037 [1.01]	
$\text{TRAINING}_i$				0.255 [1.15]
N	2070	1889	2070	2070
R-squared	0.852	0.847	0.852	0.852

Sources: Individual store-level monthly data from February 2006 through May 2008 provided by Eroski.

Notes:

1. Absolute values of t statistics are in parentheses (t statistics are based on standard errors that are robust and clustered at the individual store level).

2. All models include constant and monthly dummy and year dummy variables.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$

Table 4 Sales Growth and HRM for Supermarket City: Additional Evidence  
 Dependent variable= $\Delta \ln Q_{it}$

	(i)	(iii)	(v)	(ii)
$\Delta \ln L_{it}$	0.292** [2.03]	0.292** [2.03]	0.292** [2.03]	0.292** [2.03]
$\Delta \text{MARKET}_{it}$	1.165*** [5.90]	1.165*** [5.90]	1.165*** [5.90]	1.165*** [5.90]
$\text{YEAROPENED}_i$	-0.0002 [-0.36]	-0.0002 [-0.27]	0.00003 [0.004]	-0.0002 [-0.29]
$\text{INVOLVE}_i$	0.151 [0.48]			
$\text{STAKE}_i$		$2.26 \times 10^{-8}$ [0.29]		
$\text{MEMBER}_i$			0.0069 [1.51]	
$\text{TRAINING}_i$				-0.047 [-0.67]
N	1195	1195	1195	1195
R-squared	0.311	0.311	0.311	0.311

Sources: Individual store-level monthly data from February 2006 through May 2008 provided by Eroski.

Notes:

1. Absolute values of t statistics are in parentheses (t statistics are based on standard errors that are robust and clustered at the individual store level).

2. All models include constant and monthly dummy and year dummy variables.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$

Table 5 Table 5 Worker Satisfaction and Ownership Types  
 Dependent variable=EAI<sub>i</sub>

	(i)	(ii)
COOP <sub>i</sub>	-.168*** [-6.92]	-.202*** [-7.63]
ΔlnY <sub>i</sub>	-4.853 [-1.54]	-7.937 [-2.44]
COOP <sub>i</sub> *(ΔlnY <sub>i</sub> )		24.206*** [3.46]
ΔlnMARKET <sub>i</sub>	34.335 *** [3.84]	35.971 *** [4.04]
ΔlnL <sub>i</sub>	10.453** [2.55]	10.692*** [2.61]
YEAROPENED <sub>i</sub>	.005*** [2.68]	.006*** [3.16]
MALE <sub>i</sub>	-.066*** [-2.64]	-.067*** [-2.65]
BASQUE <sub>i</sub>	-.109 [-1.45]	-.125* [-1.67]
OCCUPATION	Controlled	Controlled
TENURE	Controlled	Controlled
STATUS	Controlled	Controlled
N	4328	4328
R-squared	0.124	0.126

Sources: Employee Survey conducted by Eroski in 2008.

Notes:

1. Absolute values of t statistics are in parentheses
2. All models include constant.
3. See text for variable definitions.

\* p<0.10, \*\* p<0.05, and \*\*\* p<0.01