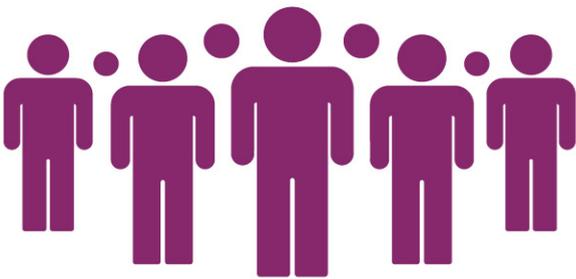


What do we really know about worker co-operatives?

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Executive summary

The idea that employees can run their own firms might sound unrealistic to some. This study looks at international data on worker-owned and run businesses in Europe, the US and Latin America and compares them with conventional businesses. It also reviews international statistical studies on the firms' productivity, survival, investment and responsiveness.

It finds that worker co-operatives represent a serious business alternative and bring significant benefits to their employees and to the economy. There are thousands of worker-run businesses in Europe, employing several hundred thousand people in a broad range of industries, from traditional manufacturing to the creative and high-tech industries.

Because worker co-operatives are owned and run by them, employees in worker-owned co-operatives have far more say in the business, from day-to-day concerns through to major strategic issues.

The largest study comparing the productivity of worker co-operatives with that of conventional businesses finds that in several industries, conventional companies would produce more with their current levels of employment and capital if they behaved like employee-owned firms.

When market conditions change worker cooperatives review wages first and keep employment more stable. In a downturn worker co-operatives drop wages rather than reducing their workforce. When business picks up they are ready to respond and can make up for lost pay because employees enjoy a share of profit.

The main findings from the analysis and review are:

- Worker co-operatives are larger than conventional businesses and not necessarily less capital intensive
- Worker co-operatives survive at least as long as other businesses and have more stable employment
- Worker cooperatives are more productive than conventional businesses, with staff working "better and smarter" and production organised more efficiently
- Worker co-operatives retain a larger share of their profits than other business models
- Executive and non-executive pay differentials are much narrower in worker co-operatives than other firms

Introduction

The idea that employees can run firms sounds unrealistic to many people. Even if they accept that businesses owned and managed by their employees exist, most people still think of those enterprises as unlikely businesses.

Worker co-operatives have traditionally been viewed as small, specialised and undercapitalised organisations. It is commonly thought they thrive in unusual conditions and cannot possibly constitute a serious alternative to conventional firms. This view has long been shared by many economists studying labour-managed firms on the basis of economic theory and relatively limited empirical observation.

In the last two decades data on large, representative samples or whole populations of worker co-operatives and conventional firms have become increasingly available. As a result, a growing number of international economic studies present comparative analyses of the two types of firms with extensive information on the firms' characteristics and behaviour.

In this paper, information provided in these studies and other aggregate data is used to examine whether received ideas about worker co-operatives seem verified. International findings about pay and employment behaviour, productivity, investment and firm survival among conventional businesses and worker co-operatives are also reviewed. It is argued that together, these different types of evidence suggest that common ideas about worker co-operatives should urgently be revised.

For the purposes of this paper, a worker co-operative is defined as a firm that has the following characteristics¹: all or most of the capital is owned by employees (members) whether individually and/or collectively (capital ownership arrangements vary); all categories of employees can become members²; most employees are members; in accordance with international co-operative principles, members each have one vote, regardless of the amount of capital they have invested in the business; and members vote on strategic issues in annual general meetings and elect the chief executive officer.

1 In this paper I use interchangeably the terms "worker co-operative", "labour-managed firm" and "employee-owned firm" unless otherwise specified in the text.

2 By this definition, a law practice for example is not a worker co-operative even if all the lawyers are partners, unless the other staff categories, such as secretaries, cleaners, etc can also be members. This is an important difference with the view proposed by Hansmann (1990).

Beyond this basic participation in the affairs of the firm, the level of democracy in the day-to-day activities of the firm varies from one co-operative to another. For example, very large co-operatives tend to have less direct and more representative democracy (as large countries do). The worker co-operatives looked at in this paper normally are for profit, though profit aims may be mitigated to various degrees by other aspects of members' interests including for example employment, social or ethical considerations and goals, etc.

Worker co-operatives represent a very small proportion of all firms in most countries. However, they are more numerous than is usually thought. At least 25,000 can be found in Italy, about 17,000 (employing some 210,000 people) in Spain, 2,600 (employing 51,000 people) in France and about 500 to 600 in the UK³.

In the following section, descriptive statistics about the size of worker co-operatives and their industry distribution in comparison with those of other businesses are presented. International evidence about compared firm creation and survival patterns, capital intensity and investment is summarised in the next section. And findings on the compared productivity, employment and pay adjustments of labour-managed and other firms are briefly reviewed in the penultimate section.

3 The estimate for Italy was communicated to the author by Alberto Zevi in 2012. The estimate for Spain includes the *cooperativas de trabajo asociado* (16,664 is given for 2012 by the Confederation of Spanish worker co-operatives in COCETA (n.d.) but not *sociedades laborales*, in which employees own at least 51.01% of the capital but voting is proportional to capital. In 2013 there were 11,322 *sociedades laborales* (Ministerio de Empleo y Seguridad Social 2014). The French figure is for 2013 and includes 2,040 *sociétés coopératives et participatives* or SCOPs and 212 *sociétés coopératives d'intérêt collectif*, or SCICs (CG Scop 2014). The UK estimate includes firms that identify themselves as workers' co-operatives and other employee-owned firms that meet the definition provided in this paper.

New descriptive evidence on the characteristics of worker co-operatives

Are worker co-operatives smaller than other firms?

Perhaps the most common received idea about worker co-operatives is that they must be small. It is often thought worker co-operatives must be financially constrained, and a small size is sometimes regarded as a condition for workplace democracy to function. Standard economic theory also predicts that labour-managed firms that pursue maximum profit per member will be smaller than conventional firms in the short run (though not in the long run). In this view, labour-managed firms do not have the same incentives to grow indefinitely as conventional firms, as maximum profit per member may be independent of scale (Vanek 1970, Schweickart 1996).

People will also commonly remark that very large worker co-operatives are extremely rare. The worker co-operative group the Mondragon Corporation in Spain does employ some 80,000 people around the world⁴, and the employee-owned John Lewis Partnership in the UK (which operates slightly differently) counts more than 93,000 partner-employees, but these two cases may just be exceptions⁵.

What is not widely understood is that most firms actually are very small. Among the firms that have at least one employee, around 90 per cent have less than 20 employees in the UK (93.7 per cent) the US (89.6 per cent) and France (90.4 per cent) and less than 10 employees in Spain⁶. Large firms are very rare. Only 0.3 per cent of the firms that have employees have 500 employees or more in the UK and the US, 0.2 per cent in France and 0.1 per cent in Spain.

Where we have data for workers' co-operatives we observe that the co-ops are actually larger than other firms. Pencavel et al (2006) use data covering 2,000 worker co-operatives and 150,000 other firms in Italy, observed over 13 years. They find

4 Only 40.3% of Mondragon's employees are members, though the percentage is considerably higher in the birthplace of the group in the Spanish Basque country (Mondragon's rapid growth in the last two decades has resulted in a current structure that includes 289 non-co-operative subsidiaries and 110 co-operatives; the group has engaged in a "cooperativization" process for some of the non-co-operative parts of the group (see Mondragon Corporation 2015).

5 The John Lewis Partnership has more than 93,000 permanent employees or "partners" but has a unique constitution organising the sharing of power between senior management and the other employees (see John Lewis Partnership, 2015).

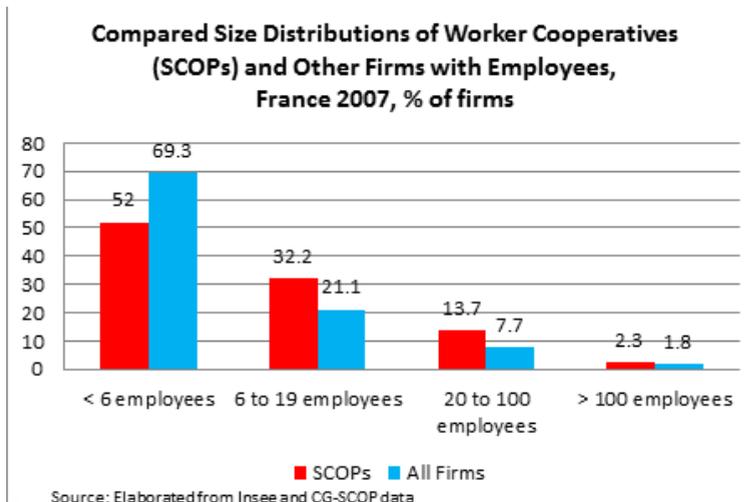
6 Unless otherwise specified, aggregate figures in this section come from the author's computations from data provided respectively for the UK by the ONS (2015) concerning 2014 and for large firms by BIS (2012) concerning 2012; for the US by the US Census Bureau (2015) for 2012; for France by Insee (2015) for 2013 except for the share of firms with less than 20 employees, which concerns 2007; and for Spain by INE (2015) for 2014.

that both the average and the median numbers of employees are larger for the co-operatives than for the other firms (for example, in 1994, the last year for their sample, average employment was 284 in the co-operatives and 228 in the other firms, and median employment 153 and 72 respectively in the two groups of firms).

Similarly, the data presented by Craig and Pencavel (1992) on the plywood industry in the US Pacific Northwest indicates that worker co-operatives are larger than the other firms. On average over all years in their sample, firms employed 233 people in the industry, but among these the co-ops employed 257 on average. In Spain, firms with employees had 9.2 on average in 2014, but worker co-operatives were reported to have 12.6 employees on average⁷.

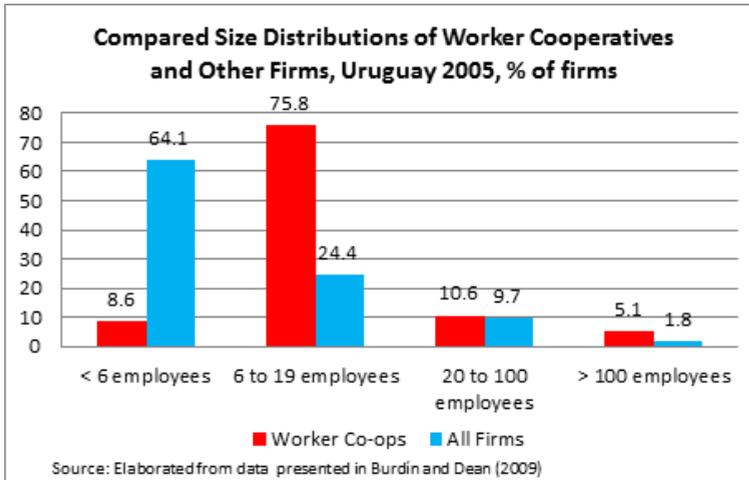
For France and Uruguay, we can compare the size distributions of worker co-operatives and firms generally. Data on all firms in Uruguay provided in Burdín and Dean (2009) is used, together with data available from the French statistical office Insee on firms with at least one employee and from the French worker co-operative federation CG Scop. This information is presented in Figure One (France in 2007) and Figure Two (Uruguay in 2005). In both cases, it is clear that a lower share of worker co-operatives are micro-firms than of other firms. The co-operatives are more often found in the larger size groups.

Figure One



7 The averages are for firms registered with the Seguridad Social system (Ministerio de Empleo y Seguridad Social 2014). Only about half of worker cooperatives belong to this system, with the others operating under a different regime (autónomos). However, the figure for total employment in worker cooperatives given by COCETA (n. d.) seems to use the average size for Seguridad Social worker cooperatives.

Figure Two



A more detailed breakdown of the population of French firms by size group, available for 2006, shows the difference persists if we select a higher cut-off point for firm size. Among French firms with at least one employee, 0.04 per cent had 2000 employees or more that year. This proportion was 0.05 per cent among French worker co-operatives (see Figure Three). Given the small number of worker co-operatives, such a percentage represents a very small number of firms, which is why it is very rare to see a large worker co-operative.

For the same reason, the percentage of large worker co-operatives may vary more than that of large firms generally from year to year, and if we had data for other years we may well find that the percentage of large firms was sometimes higher among conventional firms. However, worker co-operatives clearly seem to be larger than conventional firms overall, principally because there are proportionally fewer micro-firms among the co-operatives.

The most recent information for France (for 2013, shown in Table One) shows that the pattern remains the same, with a considerably larger proportion of worker co-operatives than of firms in general in the larger size groups. The percentage of worker co-operatives with 250 employees or more is more than twice that of other firms with 250 employees or more.

Figure Three

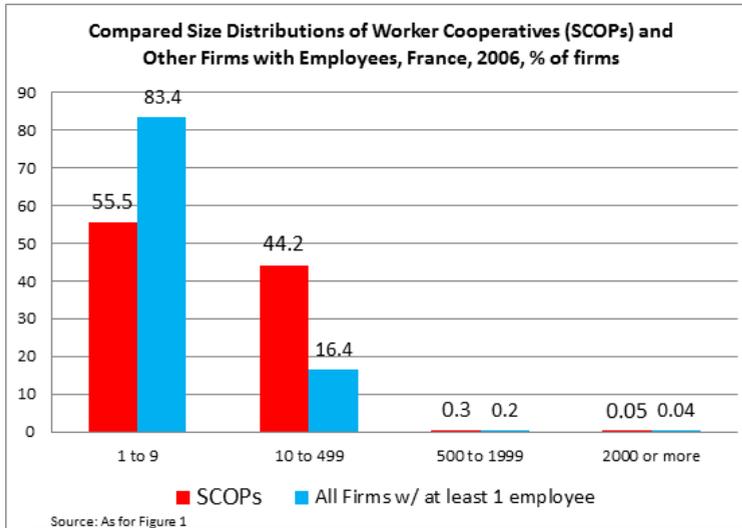


Table One: Compared size distributions of worker co-operatives (SCOPs) and other firms with employees, France 2013 (%)

	1-9 employees	10-49 employees	50-249 employees	250 employees or more
SCOPs	64.1	27.6	7.2	1.1
All firms with employees	82.9	14.2	2.4	0.5

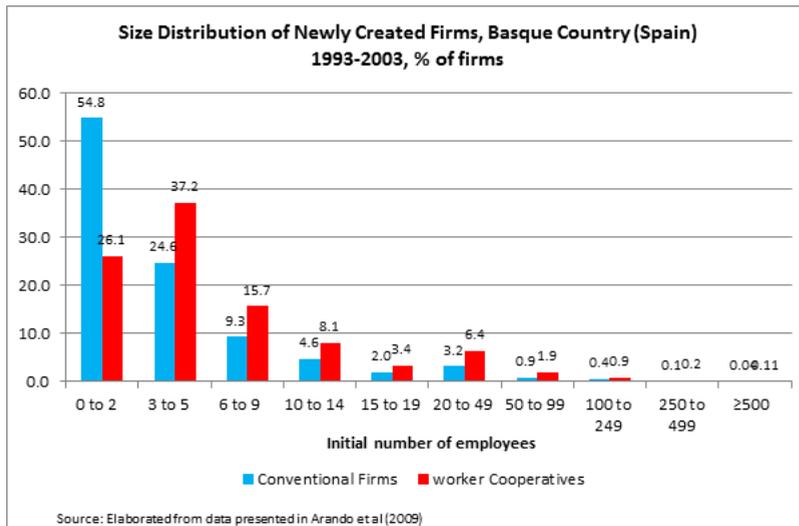
Source: Author's computations from Insee and CG Scop data

Worker co-operatives could be larger because they are created larger, or because they grow faster and/or survive longer than conventional firms. Arando et al (2009) present data from the Basque Country (Spain) that suggest that worker co-operatives are created larger than other firms (see Figure Four). In Spain as a whole, worker co-operatives were created with four members on average in 2013, which is likely to be substantially higher than the average new firm's employment (56.7 per cent of all firms with employees had one or two employees in Spain in that year⁸ and many firms are created with only one employee).

⁸ Figures computed from data provided by INE (2015) and Ministerio de Empleo y Seguridad Social (2014). Data from the same source indicate that the initial average number of members for newly created *sociedades laborales* is identical to that of worker cooperatives. However, the average size of all *sociedades laborales* (six people) is smaller than that of worker cooperatives, perhaps because the cooperatives are older on average—the *sociedad laboral* is a recent business form, which only took off in the late 1990s.

The reason for the difference in creation size is unlikely to be that co-operatives are more often set up by employees taking over the firm they work for. This origin seems less common among worker co-operatives than among other firms. In many countries the law specifies, or specified until recently, a minimum number of members for creating a worker co-op. This, and the fact that a co-operative is a collective enterprise, may explain the difference in initial size with conventional firms.

Figure Four



Are worker co-operatives found in different industries from other firms?

Another commonly held idea is that worker co-operatives are only suited to particular industries (for example, industries with low capital intensity or low capital requirements). It is often thought that labour-managed firms will not thrive in other industries because, for example, worker co-operatives may have limited access to capital. It is also possible that employee control is better suited to industries in which skills are most important to firm performance (yet at the same time, many people seem to think few co-operatives will be found in high-tech industries, where skills are often essential).

In practice, worker co-operatives can be found in most industries. Figure Five shows the compared distributions of conventional firms and worker co-operatives by broad sector using data presented by Burdín and Dean (2009) for Uruguay in 2005. The distributions are clearly different, with proportionately more co-ops

than conventional firms in transport and services, and less in manufacturing. The sector distribution of the two groups of firms also is different in France (Figure Six). However, there worker co-operatives are more often found in manufacturing and less often in services than other firms. So the differences vary across countries.

Figure Five

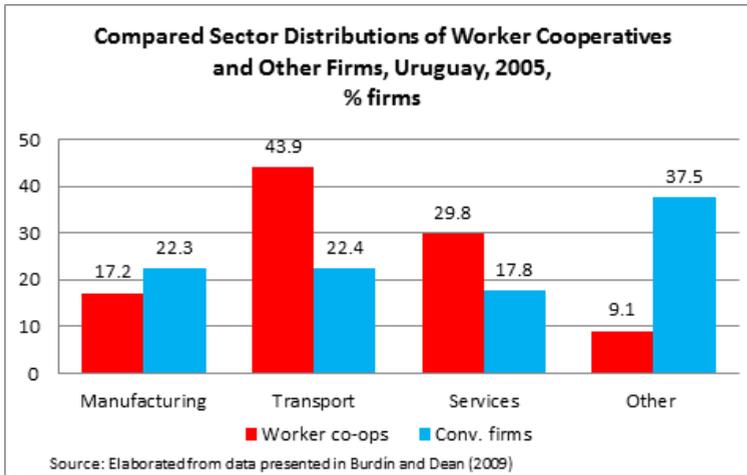


Figure Six

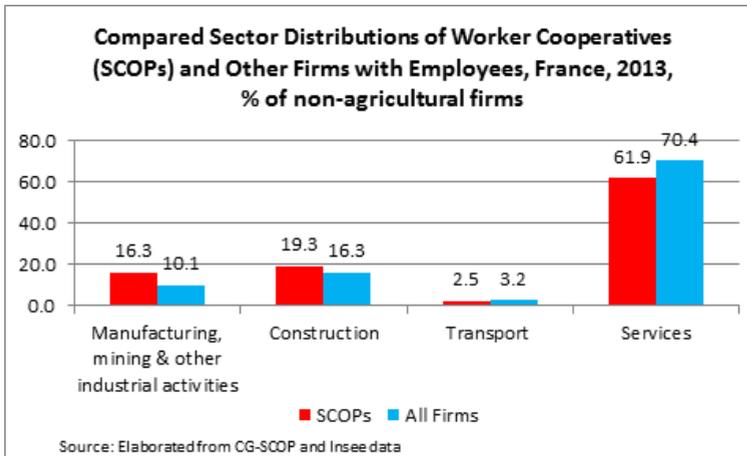
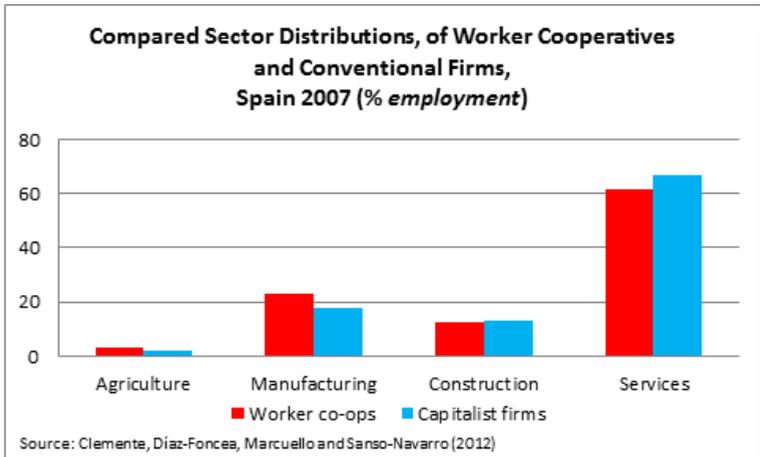


Figure Seven shows the compared shares of employment in each of the broad sectors between Spanish worker co-operatives and conventional firms, based on the data presented by Clemente et al (2012) for 2007. This graph is not directly

comparable with the charts for Uruguay and France, which use the share of firms rather than employment, because the average scale varies across sectors. However, it suggests that the two groups of firms have quite similar sectoral distributions in Spain.

Figure Seven



The industry distribution of firms observed at a given time comes from the distribution of firm creations across industries and the extent to which they survive in each industry. Arando et al (2009) provide data on the industry distribution of newly created firms in the Basque Country in Spain, which show some differences between worker co-operatives and other firms in manufacturing (a greater share of co-ops than of other firms) and some services, but no or little difference in the proportions of new firms to be found in construction or financial services (see Figure Eight).

Data presented by Podivinsky and Stewart (2007) for the UK in the period 1976 to 1985 shows a different pattern again, with a comparatively higher share of labour-managed firms created in manufacturing but a lower share in construction than the corresponding proportions of conventional firm creations (see Figure Nine).

Figure Eight

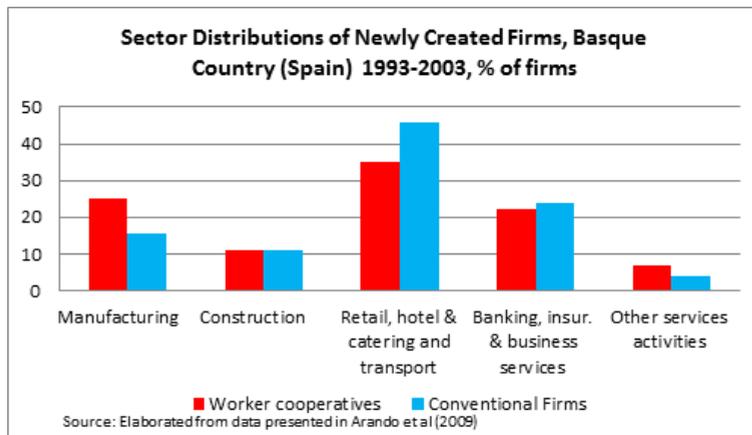
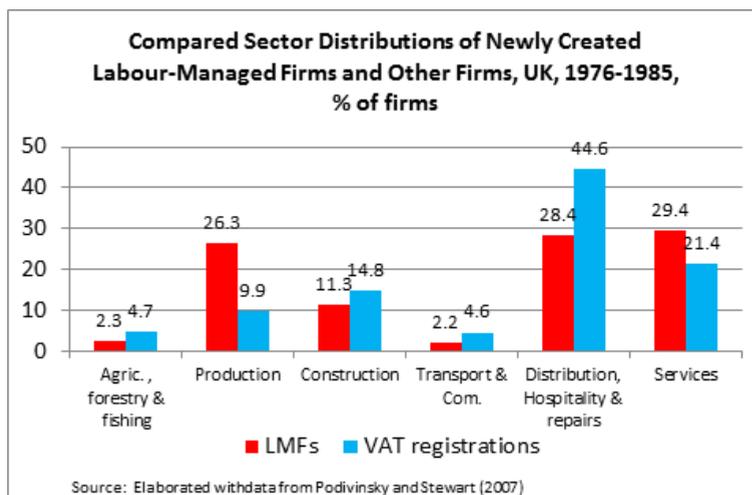


Figure Nine



If worker co-operatives were only suited to a small group of special industries, we would expect a clear pattern common to different countries in the ways worker co-operatives' distribution across industries compares with that of other firms. The absence of any such pattern suggests the differences between the two groups are more complex. One way to investigate the role of different factors in creating these patterns is to look at the effect of industry characteristics on firm creation and survival for worker co-operatives and other firms.

International findings on firm demography and investment

Firm creation and survival

Using UK manufacturing data for the early 1980s, Podivinsky and Stewart (2009) examine the factors that explain the proportion of new firms that are labour-managed in each industry. They find that, as predicted by theory, a lower share of newly created firms are worker co-operatives in industries that have high capital intensity and high risk (measured by the variance of profits in the industry).

Studying the effect of individual firm characteristics on the survival of worker-managed firms in Uruguay, Burdín (2014) attributes to issues of capital requirements the fact that the co-operatives' survival advantage over conventional firms is greater in services than in manufacturing and transport. However, he does not find that co-ops do less well in these sectors. In manufacturing and transport the risk of closure is the same in the two groups. Worker co-operatives survive longer than other firms overall when industry and starting wage, size and year of creation are taken into account, and this is due to their much lower closure risk (hazard), all else being equal, than conventional firms in services (Burdín 2014).

Burdín's (2014) finding is consistent with less rigorous evidence on other countries suggesting that labour-managed firms survive at least as well as other firms (see Dow 2003 for a review). It is not uncommon for worker co-operatives to survive well over a century. The aggregate data available for France (Table Two) show identical failure rates for the two groups of firms in the long run, and more volatile creation rates for labour-managed firms.

Table Two: Firm creation and failure rates in France

1979-1998	Birth rate*	Death rate**
Worker Co-operatives	0.16	0.11
All firms with employees	0.12	0.11
1993-2009		
SCOPs	0.1	n/a
All French firms	0.1	n/a

Source: Derived from CG Scop and Insee data

* Ratio of number of new firms in a given year to number of existing firms at the beginning of the year

** Ratio of number of firms disappearing in a given year to number of existing firms at the beginning of the year

Some of the differences between the industry distributions of labour-managed and other firms may also be due to historical factors that resulted in clusters of co-operatives set up in certain industries.

Podivinsky and Stewart (2009) observe that in the early 1980s labour-managed firm creation was more concentrated than firm creation in general in the UK. A higher proportion of co-operatives were created in the footwear and clothing industry and in paper, printing and publishing – two industries highlighted by Estrin et al (1987) as traditional for worker-managed firms in the UK. France also has traditionally had concentrations of worker co-operatives in printing and publishing following a historical tradition of anarchist co-ops – and in the construction sector as worker co-operatives benefitted from preferential treatment over government contracts.

With data on the Basque Country (Spain) Arando et al (2012) show that more worker co-operatives are formed in industries where more co-operatives exist. Pérotin (2006) finds a similar pattern in France: a larger number of worker co-operatives results in more being created. The paucity of information available in most countries about worker co-operatives creates barriers to entry, as entrepreneurs will often have little idea of what a co-operative is, or how to create one. Existing worker co-operatives provide an example and show to would-be entrepreneurs that labour-managed firms can be viable businesses.

Familiarity with labour-managed firms where more are in operation also accounts for some of the geographical distribution of worker co-operatives. Where there are labour-managed firms, local banks are more likely to be familiar with the business form and co-operatives themselves may form supporting agencies. In the US, Israel and Spain, creations of new worker co-operatives are positively related to the number of existing firms of the same type in the area (Conte and Jones 1991, Russell and Hanneman 1992, Russell 1995, Arando et al 2009, Arando et al 2012, Díaz-Foncea and Marcuello 2015).

Worker co-operative creations are also more clearly counter-cyclical than conventional firm creations in the US, Israel, France and Spain (Conte and Jones 1991, Russell and Hanneman 1992, Russell 1995, Pérotin 2006, Arando et al 2009, Díaz-Foncea and Marcuello 2015)⁹. Increased unemployment (Pérotin 2006, Arando et al 2009, Díaz-Foncea and Marcuello 2015) may create a greater pool of potential entrepreneurs out of necessity. It may also generate opportunities as redundancy payments and sometimes unemployment benefit may be used with some tax advantage to set up new firms in some countries, as for example in France and Spain at different times in the last few decades.

⁹ Udo Staber (1989) finds no evidence of counter-cyclicity for worker cooperative creations in Atlantic Canada, but the methodology used in that paper is less solid.

This being said, it does not seem that new co-operatives massively result from worker rescues of failing firms, as has been hypothesised (Ben-Ner 1988). Although rescue takeovers by employees are often widely publicised during recessions, this way of forming a co-operative appears relatively rare. At least in France, for which the data is available, creations resulting from rescue takeovers are less common for worker co-operatives than for other firms.

Table Three shows that over the period 1993 to 2001 the overwhelming majority of worker co-operatives newly formed in that country were created from scratch. The proportion of co-operatives resulting from a takeover, whether of a failing or a sound firm, was less than half that of French firm creations in general with that origin. Insee now use a different measure for firm creations from takeovers, which attributes a significantly smaller percentage of all new firms to takeovers. In 2014, despite the recession that followed the financial crisis in 2008, new worker co-operatives formed as a rescue of a failing conventional firm made up only 12 per cent of all new worker co-operatives in France.

Table Three: Firm creations by origin, France, 1997–2001 (% of firms)

	From scratch	Conversions of sound conv. firms	Rescues of failing conv. firms
Worker co-operatives	84.0	9.4	6.6
All firms creations	63.5	16.1	20.4

Source: Derived from CG Scop and INSEE data

Although they are created more counter-cyclically than other firms, worker co-operatives have not been found to close down in recoveries, as had been hypothesised by Ben-Ner (1988). In France at least, the effect of the business cycle on firm closures is the same among worker co-operatives and other firms (Pérotin 2006). More generally, as we have seen, the existing evidence suggests that labour-managed firms survive at least as well as conventional firms.

It should be noted, however, that much of the evidence on survival comes from countries where worker co-operatives are set up with constitutions that preclude the two forms of failures identified by economic theory – death by degeneration to the capitalist form (Ben-Ner 1984, Miyazaki 1984) or by under-investment (Furubotn and Pejovich 1970, Vanek 1977).

Degeneration occurs when the proportion of members among the co-operative's employees decreases until the firm is to all intents and purposes a conventional firm. It may happen if members that stay in the firm replace any member that leaves the firm with a non-member employee in order to keep more profit to themselves

(Ben-Ner 1984). There have been a number of cases of degeneration and of demutualisation (when the co-operative is turned into a conventional firm as it is floated on the stock market or sold to a conventional owner) in particular but not only in the US (see, e.g., Pencavel 2001, 2013). Provisions against these problems are present in the constitutions of most European worker co-operatives and were often introduced into co-operative law at the request of the co-operative movement¹⁰. Unsurprisingly, Estrin and Jones (1992) find no evidence of degeneration in France. The evidence available also does not support the other failure hypothesis proposed by economic theory--under-investment.

Capital intensity and investment

Several studies find that the average capital intensity (i.e. fixed assets per employee) in worker co-operatives is lower than that of conventional firms (Bartlett et al, 1992, Pencavel et al, 2006, Maietta and Sena, 2008). However, Pencavel et al (2006) find that in Italy the median capital per employee is higher in worker co-operatives¹¹. In addition, they find that the values of the ratio are more dispersed for the co-operatives, which have higher proportions of firms with both very low and very high levels of capital intensity than conventional firms.

In France, Fakhfakh et al's (2012) investigation by broad industry group shows conventional firms' capital intensity is higher than worker co-operatives' in three industry groups, but there is no statistically significant difference between the two types of firms in the four other industry groups.

The under-investment hypothesis predicts that worker co-operatives that are collectively owned by their employees and depend on internal finance will under-invest because members' property rights are truncated. When they leave the firm they do not keep a claim on future profit as they would with shares that appreciate in value and reflect the present value of future profit if capital markets are efficient (see Furubotn and Pejovich 1970, Vanek 1977).

One of the solutions proposed for this problem has been to require the co-operative to retain a minimum percentage of profit annually (Vanek 1977). Such a provision exists in French and Italian worker co-operatives and in the Mondragon group, in all of which a substantial proportion of capital is collectively owned. However, in

10 Examples of provisions against degeneration problems include the following: in the Mondragon worker co-operatives, at least 75 per cent of workers must be members; in France, profit is shared with non-members as well as members; and in Italy, tax incentives lead many worker co-operatives to distribute surplus in the form of wage increases--which also benefit non-members--and retain all the resulting profit in the firm (Alzola et al 2010). In France as in the UK, Italy and Spain, worker co-operatives also have traditionally had an "asset lock" by which in case of closure the net assets of the co-operative devolve to another co-operative, a co-operative institution or a charity.

11 Fifty per cent of firms have less capital per employee than the median value, and fifty per cent have more.

practice worker co-operatives plough back significantly more profit than required (Navarra 2013, Alzola et al 2010) perhaps as a form of insurance against job losses in downturns (Zevi 2005). This suggests that the hypothesised under-investment process itself does not apply in practice.

No evidence of under-investment has been found in French worker co-operatives (Estrin and Jones 1998) or in Italian ones (Maietta and Sena 2008). In all the industry groups looked at by Fakhfakh et al (2012) investment, measured as the annual growth of fixed assets, is either the same in both types of firms (three industry groups) or faster in the co-operatives (four industry groups). This pattern is confirmed by estimations of returns to scale, which show no evidence that labour-managed firms operate at a smaller, inefficient scale as the under-investment hypothesis would imply (Fakhfakh et al 2012).

Other international findings

Productivity

A handful of international studies have compared the total factor productivity of worker co-operatives and other firms, by estimating production functions¹². These studies concern groups of employee-owned firms that are set up quite differently, so that some of the financial incentives provided by co-operative organisation are much stronger in one group of co-operatives than in the others. In the plywood industry of the Pacific Northwest US (Berman and Berman 1989, Craig & Pencavel 1995) members have shares that appreciate in value and are partly tradable. In contrast, in Italy (Estrin 1991, Jones 2007) and France (Fakhfakh et al 2012) a large part of the capital is owned collectively by members, dividends on individual shares are low and shares are paid back at their nominal value, at most adjusted for inflation.

In all cases, the findings imply that worker co-operatives organise production differently from other firms: the production function is not the same for the two groups. Two studies – Craig and Pencavel (1995) and Fakhfakh et al (2012) – apply both of the estimated production functions to the current inputs of each group of firms. Both studies find that on average overall firms can produce more with the technology of employee-owned firms. In other words, the way worker co-operatives organise production is more efficient. Fakhfakh et al (2012) show that in several industries conventional firms would produce more with their current levels of employment and capital if they adopted the employee-owned firms' way of organising

¹² Total factor productivity is the productivity of the firm taking into account the firm's capital as well as its labour. These studies estimate the difference in production between the two types of firms once the firms' employment, capital, industries and other relevant factors are taken into account.

production. In contrast, they find that worker co-operatives would always produce at least as much with their own technology as with conventional firms.

Employment and pay adjustments

Four studies compare the responses of employee-owned and other firms to changes in market conditions. Craig & Pencavel (1992, 1993) look at the plywood firms of the US Pacific Northwest in 1968-86; Pencavel et al (2006) examine a very large sample of Italian conventional and co-operative firms in 1982-94 in Italy; and Burdín and Dean (2009) study all firms (worker co-operatives and others) in Uruguay from 1996 to 2005. Despite the differences in co-operative constitutions between these countries, their findings are remarkably consistent.

Conventional firms are found to adjust employment in response to changes in product prices and to demand shocks (in the Uruguayan study they also adjust pay). Worker co-operatives adjust pay and not employment in response to product price changes (in Uruguay, only members' pay changes and the change is much greater than pay changes in conventional firms). In response to demand shocks, the co-operatives adjust pay more than employment, and their employment adjustment is slower and more limited than other firms. These findings imply that worker-managed firms may hire less than other firms in periods of growth, but importantly may also preserve jobs better in downturns.

It should be noted that no conclusion can be drawn from these results about the relative pay and employment levels in worker co-operatives and other firms, since pay includes profit in worker co-operatives. Anecdotal evidence also indicates that when business is bad worker co-operatives first draw from accumulated retained profits in order to preserve both jobs and pay before cutting pay in Italy and in France. Relative pay levels in the two sectors are therefore likely to depend on the stage in the business cycle.

This possible variability may explain the contradictory findings of the very few studies comparing pay in worker co-operatives and conventional firms, with some studies observing higher pay in the co-operatives (Bartlett et al 1992, Burdín 2015) and others equal hourly wages in the two groups of firms (Magne 2014) or lower pay in the co-operatives (Pencavel et al 2006, Clemente et al 2012). Burdín (2015) on Uruguay, Magne (2014) on France, and to a certain extent Clemente et al (2012) on Spain also observe that worker co-operatives are more egalitarian than conventional firms.

Conclusion

In the last two decades, the availability of large, comparative datasets has made possible systematic comparisons between worker co-operatives and other firms. In this paper this data has been used to revisit what were thought until now to be 'stylized facts' about worker co-operatives. The evidence presented in this paper paints a rather different picture from the received view of worker co-operatives as small, specialised, undercapitalised and rather unlikely businesses. We need to revise our view of worker co-operatives. Worker co-ops are larger than other firms and not necessarily less capital intensive, although they may be created more often than other firms in less capital intensive industries, all else being equal. They are present in most industries and differences in industry distributions with conventional firms vary from one country to another.

International evidence suggests that worker co-operatives survive at least as well as other firms, even in capital-intensive industries. Labour-managed firms are probably more productive and may preserve jobs better in recessions than conventional firms, creating more sustainable jobs. Promoting worker co-operatives could therefore improve local communities' employment, and therefore health and social expenditure and tax revenue (Pérotin 2014).

The most unusual feature of worker co-operatives – worker control – may be key in explaining the findings outlined here about productivity, investment, employment and pay. Employee control is thought to increase productivity, and in a labour-managed firm adjusting pay to preserve jobs makes sense for the employee-owners. Worker-members make the decision to adjust pay and they get the future profits (whereas it is more difficult for a conventional firm to elicit employees' agreement for pay cuts in exchange for job preservation, since the firm's owners have an incentive not to increase pay when business recovers).

A job in a worker co-operative probably is particularly valuable, since it is a job in which the employee has a say in decisions that affect employment risks. Employees' focus on job security may explain worker co-operatives' accumulation of collectively-owned capital by profit plough-backs well above the minimum required by law in Italy and France or specified in the co-operatives' constitution in Mondragon. Those reserves can be drawn on for preserving pay and jobs. As a result, worker co-operatives keep more profit in the firm than conventional businesses (Zevi 2005).

Some of the evidence presented in this paper concerns a small number of countries or particular phases in the business cycle and needs to be further replicated. However, it is consistent in suggesting that far from being a niche business form

only appropriate in special circumstances, worker co-operatives constitute a serious alternative – a high-performing firm type suited to all or a very broad range of industries, and possibly more sustainable than conventional businesses. However, worker co-operatives represent a very small part of the business sector because too few are created. In order to design strategies to overcome this obstacle we need to examine in more depth the successful experiences of Italy and Spain, where the worker co-operative sector reaches a different scale altogether than the UK and French sectors, employing hundreds of thousands of people.

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