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Entry, exit, and the business cycle: Are cooperatives different?

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The paper revisits the question of why there are so few labor-managed firms in capitalist economies. Using new data on France, we present a comparative empirical examination of entry and exit among worker cooperatives and conventional firms. We estimate identical equations explaining annual entry and exit flows for the two groups of firms and test for the equality of the coefficients estimated. We find that cooperative creations are more countercyclical, but the effect of the business cycle on exit is the same for both groups of firms. Other factors influencing entry include organizational density and suggest that support structures are important for cooperative entrepreneurship. *Journal of Comparative Economics* **34** (2) (2006) 295–316. Leeds University Business School, Maurice Keyworth Building, The University of Leeds, Leeds, LS2 9JT, UK.

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1. Introduction

A traditional explanation for the small number of labor-managed firms in capitalist economies is that structural weaknesses cause such firms to disappear, and the theoretical literature has been dominated by models explaining exit, e.g., Vanek (1977) and Ben-Ner (1984). However, the evidence available from Ben-Ner (1988a), Staber (1989) and Pérotin (2004) suggests that

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labor-managed firms survive rather better than conventional firms (Bonin et al., 1993). Another possibility is that too few labor-managed firms are created, and a small number of studies have looked at entry, including Conte and Jones (1991), Staber (1993), and Russell (1995). This paper takes up the issue again by examining the determinants of both entry and exit among worker cooperatives and conventional firms in France. In particular, we investigate whether differences between the two groups of firms are more marked in relation to entry or to exit. Until now, empirical analyses of entry or exit of labor-managed firms have relied on comparisons of mean creation and hazard rates with conventional firms' or on analyses of worker cooperatives alone. The paper uses new data on aggregate entry and exit flows for both conventional and cooperative firms. The available series are short, but they allow us to conduct multivariate analyses of both entry and exit for both types of firms over the same period.

The French cooperative movement is a particularly well-suited case for looking at these issues. The movement has had a continuous presence since its inception in the mid-19th century and individual worker cooperatives (*sociétés coopératives de production* or SCOPs) often show remarkable longevity. The oldest SCOP currently trading was created in 1882 and 16 of today's SCOPs were created before World War I. This record may be due to the fact that SCOPs, like Italian and Spanish cooperatives, are immune to the main exit processes identified in the theoretical literature, namely, self-extinction by underinvestment and degeneration to the capitalist form, as discussed in Pérotin (1999). Yet SCOPs represent a minute proportion of all French firms, with about 1700 firms employing around 36,000 people out of a total of some 2.5 million firms in France. Problems with firm creation, rather than dissolution, may explain the limited incidence of labor-managed firms even in countries where issues of structural viability have been resolved.

An influential model proposed by Ben-Ner (1988b) suggests that labor-managed firms are created primarily in recessions and exit in recoveries, when membership in an employee-owned firm no longer provides greater benefits than conventional employment. The idea that labor-managed firm creation is countercyclical is supported by empirical evidence on worker cooperative creations in Israel and in the US, as Russell and Hanneman (1992), Russell (1995) and Conte and Jones (1991) report, although not by the evidence for Atlantic Canada provided by Staber (1993). Less empirical evidence is available on cooperative exit, which was found to be related ambiguously to the business cycle by Russell and Hanneman (1992) and unrelated to recessions by Staber (1989). However, ambiguous relationships between entry, exit and business cycle variables have also been observed for conventional firms in several countries, as Reynolds and Storey (1993) discuss. Key issues therefore are to what extent cooperative and conventional entry and exit are counter-cyclical and whether the effect of the cycle is the same for both groups.

Over the last two decades, annual exit rates among SCOPs have been comparable to those of conventional French firms, with an average 10% of cooperatives and 11% of conventional firms exiting annually from 1979 to 2002.[1] Entry rates show less convergence, with an average annual rate of 15% for SCOPs and 12% for conventional firms over the same period. Cooperative flows have also been less stable than conventional ones, especially for entry, which varies between 7 and 35% for SCOPs over the period compared with 10 and 14% for conventional firms. For exit, the corresponding ranges are 5 to 18% for cooperatives and 9 to 15% for conventional firms. Historically, SCOP creations seem to have occurred in waves. Several creation waves coincided with periods of social unrest and political change, i.e., the 1830 and 1848 revolutions, the Paris

[1] These are the author's computations based on CG-SCOP (1983–2004) Cordellier (2000), and INSEE (1990, 1999–2005a).

Commune, strikes in 1893–1894 and 1905–1906, the Popular Front government in 1936, and the late 1960s, in addition to the end of each of the two World Wars. However, similar phenomena may affect conventional firms, for which waves of entry follow the end of a large disequilibrium situation, such as the end of World War II in the US, according to Caves (1998).

Immediate connections with the business cycle are difficult to establish from what is known of the historical record. The waves of cooperative creation did not generally happen during recessions in France. High formation phases took place during growth periods in the late 1860s, the mid-1890s and post-World War II, before recessions in 1848, from 1867 to 1870 and from 1968 to 1971, and immediately after recessions in the mid-1890s and from 1905 to 1910.[2] Not much is known about historical patterns of cooperative exit in France beyond the fact that a wave of closures seems to have followed each creation wave. Looking at the recent decades, for which we have data on a continuous period including at least one creation wave in the late 1970s and early 1980s, allows us to examine the respective roles of business cycle and other factors in cooperative entry and to analyze the extent to which any business cycle effects are mirrored in the determinants of cooperative exit.

In order to compare the determinants of entry and exit among cooperatives and conventional firms, we estimate identical equations explaining annual numbers of entering and exiting firms by business cycle and other factors for each group of firms and test for the equality of the coefficients estimated for the two groups. While more than thirty years of recent data are available on SCOP creations and closures, only two decades are available for conventional firms. For both entry and exit, the empirical analysis therefore proceeds in two steps. First, we examine the determinants of cooperative flows on the longer period. Then, we use the shorter series to compare and test for differences in the determinants of cooperative and conventional firm flows.

The theory concerning entry is discussed in the next section. The data and the estimation procedures are presented in section three. Section 4 discusses the results regarding entry. Section 5 covers both the theory and the specification regarding exit; the corresponding results are presented in Section 6. The results are summarized and policy implications are drawn in the concluding section.

2. The theory of firm creation

The standard theory of entry and entrepreneurship suggests that cooperative entry is determined partly by the same set of factors as conventional entry. Additional hypotheses contrast the expected effects of the business cycle on the two types of entry or, in other cases, apply to cooperatives only, with no expected relevance to conventional entry.

Conventional entry, whether by newly-created firms or by existing firms entering new markets, is usually modeled as a function of the difference between the profit expected following entry, which depends on risk, and costs related to entry barriers (Geroski, 1995). In the entrepreneurship literature, this net profit becomes an argument in the utility function of the would-be entrepreneur. When considering whether to create a new firm, i.e., becoming self-employed, or to seek employment with an existing firm, the individual entrepreneur bases the choice on income (Audretsch, 1995). Expected income from creating a firm depends on the risk of bankruptcy and wealth loss to the individual entrepreneur, among other factors. Expected income from wage employment depends on unemployment risk and on the return on alternative investment if the

[2] Lévy-Leboyer and Bourguignon (1990) provide extensive information on French growth in the 19th century.

entrepreneur has some wealth. The utility optimization framework can also be used to take into account non-pecuniary factors, such as a preference for independence as in Burke et al. (2000) and risk aversion as in Cressy (2000).

Conventional entry is expected to depend positively on incumbent firms' expected profit and on demand growth, which increases expected profit as in, e.g., Dunne et al. (2005). It should depend negatively on the presence of entry barriers and on long-term real interest rates. Entry may also have a positive or negative relationship with unemployment, which increases the pool of potential entrepreneurs by lowering the opportunity cost of entrepreneurship but also lowers their wealth and increases their aversion to risk and credit barriers to entry, as Cressy (2000) discusses. Industry-level barriers to entry are not relevant here because our investigation uses aggregate data.

The determinants of aggregate conventional entry can be summarized in functional form as $Entry = E(\pi, g, u, r)$, where π is the expected profit for incumbent firms, g is demand growth, u is unemployment and r is the long-term real interest rate.

Existing studies often find growth to have a significant impact on entry using industry, regional, or aggregate data (Reynolds and Storey, 1993) but the effect is not always positive, especially at the aggregate level as in, e.g., Highfield and Smiley (1987). Unemployment has been found to have a positive and significant effect on firm creation using French data but the results for other countries are mixed, as Audretsch (1995), Reynolds and Storey (1993), and Hamilton (1985) report.

The hypotheses concerning cooperative entry, to which we now turn, involve different degrees of risk aversion and tastes for non-pecuniary rewards among the relevant potential entrepreneurs, as well as higher overall entry barriers.

For a given membership size, cooperatives may be created for the same reasons as conventional firms. However, as Ben-Ner (1987) points out, an entrepreneur may not want to share the expected profit from a firm creation idea, as would be the case in a cooperative. Choosing the cooperative form implies splitting profit and power with present and future cooperative members and, in the case of SCOPs, also sharing profit with all future employees having more than six months employment with the company.

Many conventional entrepreneurs actually share profit and power with individuals or institutions whose contribution they need. For example, entrepreneurs that need finance or a client base in a particular market or an essential skill they lack enter into partnerships with providers of capital and other inputs. Not having access to the capital market or to cheap bank finance, cooperative founders may need each other for funding and collateral, as suggested by Walras (1865). Other cases may include pre-constituted groups, as in the case of worker buyouts, or individuals with skills appropriate for an industrial setting who value independence, or individuals with non-managerial skills.[3] In most of these cases, cooperative entrepreneurs are likely to have a lower level of wealth and, therefore, be more risk averse than individual entrepreneurs and more vulnerable to unemployment.

Interdependent cooperative founders with limited personal wealth or non-managerial skills fit the model of Conte and Jones (1991). In this model, labor-managed firm entrepreneurs have no access to the capital market, as is common in models of individual entrepreneurship. The prospective cooperative founder chooses among several possibilities, namely, employment in a

[3] Dow (2003) discusses Williamson-type arguments regarding specialized human and physical asset ownership and labor-managed firms.

conventional firm, setting up a conventional firm, or creating a cooperative. Risk aversion implies that the cooperative form, in which members split losses as well as profits, becomes more attractive relative to the individual enterprise as the risk of bankruptcy increases. Employment in a conventional firm offers a fixed income and would be preferred to fluctuating cooperative income having the same mean level. However, conventional employment becomes less attractive as the risk of unemployment increases or as conventional firm wages decrease. The predicted effect of business cycle variables on cooperative entry is therefore ambiguous but the implication is that cooperative entry is more likely to be countercyclical than conventional entry.

Additional factors may make cooperative entry more countercyclical than conventional entry. If prospective cooperative entrepreneurs are less wealthy and more vulnerable to unemployment than individual entrepreneurs, recessions are likely to make cooperatives especially attractive to them. In addition, these characteristics imply that cooperative entrepreneurs should prefer cooperative employment when the risk of job cuts increases in conventional firms, because cooperatives offer the possibility of substituting fluctuating wages for alternating periods of employment and unemployment. In contrast, conventional employment requires bearing employment risks without decision power, resulting in potential exposure to moral hazard on the part of investors. Ben-Ner (1988b) notes that recessions offer opportunities for cooperative takeovers to rescue failing conventional firms. However, this type of entry is actually more common among conventional firms than among cooperatives in France, so that this factor may not make cooperative entry comparatively more countercyclical.[4]

Conte and Jones (1991) consider the possibility that individuals with a preference for participation may be more likely to create democratic businesses. People who favor economic democracy belong to a broad spectrum of political currents in France. However, interest in the cooperative form, as opposed to less egalitarian forms of employee ownership, is probably more widespread among individuals supporting the political Left. Left-wing administrations do not necessarily subsidize the cooperative movement but they may set up supportive agencies. In addition, tendering for some government contracts may become more accessible to cooperatives when the Left is in power. More generally, the proportion of potential cooperative entrepreneurs in the population may grow when people feel more confident about human nature and equality and question the status quo, and as a result vote for the Left. It is also like that cooperatives will generally appear more legitimate when politics shift to the Left and information about them is more readily available, so that cooperative-specific barriers to entry are lower. Such barriers include the higher credit and expert advice costs that may result from negative prejudices and lack of information about cooperatives discussed in Conte (1986), Bonin et al. (1993) and Bowles and Gintis (1994).

Legitimacy may also be conferred by the density of existing cooperatives. The organizational ecology literature, e.g., Carroll (1984) and Carroll and Hannan (1989), argues that, as the number of organizations of a given form grows, the form is regarded as more legitimate and this legitimacy in turn results in more organizations of the same kind being created. However, if there is a limit to the number of organizations of a particular kind that a given environment can support,

[4] From 1997 to 2001, 84% of entering SCOPs were created from scratch and 7% formed as rescues of failing conventional firms, as reported in CG-SCOP (1983–2004). In contrast, 64% of all firm creations were from scratch and 20% came from rescues of failing firms in the same period, with the balance being mergers and takeovers of sound existing firms, as reported in Rieg (2003). Ben-Ner (1988a) observes that nearly half of SCOP creations result from rescue operations of failing conventional firms or cooperative takeovers of sound conventional firms, also called conversions, but this statistic is due to the fact that the share of rescue takeovers in firm creation peaked in the period covered by his data.

increasing competition for resources causes more closures as the size of the movement continues to grow so that it may become more difficult to set up new organizations of that form. Therefore, a quadratic relationship between population size, or density, and the creation of organizations of the same type is likely. This relationship was verified in the case of Israeli cooperatives by Russell and Hanneman (1992, 1995).[5] Density may affect cooperative creations in France through the office of the CG-SCOP that screens and assists new projects. The size of this office is fixed in the short-run but ultimately depends on the size of the movement that supports the CG by its contributions. The CG also advises existing SCOPs and fulfills the normal duties of a trade and lobbying organization. While a larger movement would result in more resources to advise prospective foundings, new and existing SCOPs are in competition for these resources.

In summary, cooperative entry may be determined by the same factors as conventional entry, although the direction of the expected effects is different. In addition, cooperative entry may be affected by the political cycle and organizational density. Hypotheses regarding the determinants of entry of both types of firms can be expressed as $Entry = E(\pi, g, u, r, P, D, D^2)$, where P, D and D^2 represent political cycle and density factors that are expected to affect cooperative but not conventional entry.

3. Specification of firm entry, data, and estimation methods

In order to test the hypotheses from the previous section, we relate data on annual entry flows for each type of firm to a stock market share index, GDP growth, the unemployment rate, real long-term interest rates, a dummy variable indicating the political affiliation of the Prime Minister in office, and organizational density and its square.

Entry flows are the aggregate numbers of newly registered firms every year from 1971 to 2002 for SCOPs and from 1979 to 2002 for all firms in France.[6] For comparison purposes, the population of French firms can be taken to be only conventional firms because the SCOP population represents around 0.05% of the total population of firms and statistics for the total population are rounded to the nearest 1000. We therefore use the terms conventional firms and all firms interchangeably in the remainder of the paper.

For SCOPs, entry flows include all firms recorded as trading as worker cooperatives for the first time in a given year. For both groups of firms, entry figures cover all industries and origins. SCOP entry includes creations from scratch, rescues of failing conventional firms, and conversions of sound conventional companies into SCOPs. Similarly, overall firm entry includes entirely new firms, new subsidiaries of existing ones, and new firms resulting from mergers and takeovers of existing firms.[7] Although our overall hypotheses apply to all forms of entry,

[5] Conte and Jones (1991) test for linear density effects at different levels of aggregation, i.e., federal, state, and industry, for US cooperatives and find a positive effect for two of the three levels.

[6] A firm is defined as a trading legal entity with autonomous decision-making, including self-employed individuals as well as companies, producing goods and services in one or more establishments and registered as trading in France. All registrations enter the Sirene database, which is used by the French Statistical Office, INSEE, to compute entry and exit flows. The inclusion of self-employed individuals who do not have employees in the statistics widens the size gap between conventional and cooperative creations. In 1998, the average conventional creation resulted in 2.2 jobs, including 1.1 employees, as reported in Thirion and Demoly (2003) compared with 6.7 jobs in the average new SCOP in that year as computed from CG-SCOP (2003).

[7] Entering subsidiaries include new businesses created by existing firms but not new establishments of existing firms that are not set up as separate firms. INSEE (Counot and Mulic, 2004) indicates that, in 1994 and 1998, 7 to 8% of non-rescue conventional firm creations in industry and services were partly or fully owned by existing businesses. A takeover

the inclusion of entry other than from scratch introduces some heterogeneity, especially among conventional firms. Scale constraints are likely to be greater in takeover operations. New conventional firms created as subsidiaries, as well as a share of the creations resulting from takeovers, are set up by existing businesses, which will be less constrained financially than individual entrepreneurs but may also require higher expected returns to enter.[8]

The variables chosen to test our hypotheses include standard explanatory variables used in studies of aggregate entry; exact definitions and sources can be found in A. Real GDP growth is used to reflect demand growth; this variable is expected to have a positive effect on conventional entry but may have either a positive or a negative effect on SCOP entry. The aggregate unemployment rate may have a positive or negative effect on both types of entry, with a greater expectation that the effect is positive in the case of SCOP entry. Real long-term interest rates are expected to have a negative effect on both types of firm creation. The expected profitability of incumbent firms is usually proxied by a measure of past profitability. We prefer to use a stock market share index because it is more forward looking and should reflect the present value of the future profit streams if capital markets are efficient. This variable is expected to have a positive coefficient in the conventional entry equation, but may have either a positive or negative effect on SCOP entry, depending on whether it reflects profit prospects for cooperatives or risk in conventional employment.[9]

The political cycle variable is a dummy taking the value one when the Prime Minister belongs to the French Socialist Party, reflecting the results of parliamentary elections. The variable's coefficient is expected to be positive for SCOP creations and to have no significant effect on conventional creations. Density is measured by the number of SCOPs trading in October of the previous year and the total number of firms in industry and services at the end of the previous year. For SCOPs, density is expected to have a positive coefficient and density squared should have a negative one. Whether this variable should have any significant effect on conventional entry is unclear.

Following the literature on entry, the explanatory variables have been lagged by one year (except for density which is measured in the previous year) in order to reflect the duration of the process of firm creation, which responds to signals perceived some time before the firm is actually created. The length of the lag used in existing studies varies; Schwalbach (1987) uses averages of the previous five years, whereas Highfield and Smiley (1987) use a one-year lag.

results in an entry only if a new company is created in the process. If no new firm is created, e.g., if one of two existing firms takes over the other one without setting up a new company, no entry is registered. Firms that disappear as such after being taken over or merging with other firms are regarded as exiting.

[8] Available data do not allow us to disaggregate entry flows by entry mode. Agarwal and Audretsch (2001) point out that this type of heterogeneity is present in other studies. Another potential source of heterogeneity lies in the fact that the data cannot be disaggregated by industry. However, this deficiency is less problematic, in that disaggregation by industry might not improve greatly our ability to account for entry, although it would increase the sample size. In his review of the empirical literature on entry, Geroski (1995) notes that cross-industry differences in entry do not persist very long, despite stable cross-industry differences in profitability, and that most of the total variation in industry entry over time is within-industry rather than between-industry variation, so that time-varying features of markets that do not necessarily differ across industries are more likely to explain entry.

[9] Alternative estimations were carried out with a measure of profit for existing firms given by the share of profit in value added, which is available for the last two decades from French National Accounts (INSEE, 2005b). The results of these alternative estimations are broadly consistent with the estimates that use the stock market index. We do not report them in detail but comment on certain interesting differences. The full set of results is available upon request from the author.

Table 1
Variables means

	1979–2002	1971–2002
SCOP Entry	166.96	138.28
All Entry (1000s)	263.46	n.a.
SCOP Exit	128.79	104.31
All Exit (1000s)	245.96	n.a.
GDP growth	2.15	2.52
Unemployment	9.73	8.22
Left in government	0.63	0.47
Share index	10,121.04	8,928.09
Interest rate	4.80	3.79
Density (SCOPs)	1,259.00	1,068.06
Density (all firms, 1000s)	2,235.29	n.a.

A one-year lag corresponds to anecdotal evidence concerning the time individual entrepreneurs take to set up a firm in France.[10]

The means of these variables are presented in Table 1 for two periods: 1979 to 2002, which is the period for which entry and exit flows are available for both conventional and cooperative firms, and a longer period from 1971 to 2002, for which information on entry and exit flows is available for SCOPs only. SCOP entry averaged 167 and 138 annually for the two periods, respectively. A distinct wave of creations occurred in the late 1970s and early 1980s, followed by a much smaller one in the mid-1990s. Total entry averaged 263,000 over the second period. This later, shorter period was marked by high unemployment at 9.7% on average, high real interest rates averaging 4.8% as high nominal interest rates combined with low inflation, and low growth at 2.2% on average.

Three estimations were performed. One uses SCOP data for the longest period available, i.e., 1971 to 2002, and the other two use SCOP and overall entry data, respectively, for the period in which data for all firms are available, i.e., 1979 to 2002. Since annual entry numbers are count data, taking as a small number of positive discrete values, the entry equations have been estimated by the Poisson Maximum Likelihood (ML) method. Creation levels are assumed to result from a count process so that they are independently Poisson distributed conditional upon the values of the explanatory variables. Hence, in each period, the log of the expected number of creations is a linear function of the independent variables. Formally, annual creation levels y_i are assumed to be observations of independently Poisson distributed discrete variables with parameters λ_i such that:

$$\lambda_i = \exp(\boldsymbol{x}_i'\beta), \tag{1}$$

where $\boldsymbol{x}_i'$ is the vector of exogenous variables associated with observation i and β is a vector of unknown parameters to be estimated. The parameter λ_i is the expected number of creations so that the elements of β represent semi-elasticities. If y_i has a Poisson distribution, its variance is equal to its mean λ_i so that heteroskedasticity is built into the model because the mean and, therefore, the variance are functions of the regressors.

[10] In response to comments, we experimented with different lag lengths. These changes did not alter the results significantly, but yielded less successful estimations.

If the assumption of mean-variance equality is not met, the Poisson ML estimator remains consistent but it may become inefficient. Moreover, with high levels of over-dispersion, the standard errors of the estimated coefficients are inconsistently estimated, as Cameron and Trivedi (1990, 1998) discuss; however, Cox (1983) and Gouriéroux et al. (1984) argue that a little over-dispersion poses no problem. Although the estimator performs well with small samples, dispersion tests suffer from small-sample bias (Cameron and Trivedi, 1998). Given the short length of our series, we use a small-sample test correction proposed by Dean and Lawless (1989) to test for mean-variance equality.[11] Mean-variance equality is rejected for all three equations.[12] Since the Poisson ML estimator remains consistent in this situation, and alternatives such as the Negative Binomial estimators are sensitive to incorrect variance specification and cannot handle under-dispersion, we choose to use the Poisson ML estimator together with robust standard errors that do not require specifying the variance function of y_i, as suggested by Cameron and Trivedi (1998).[13] Another alternative to the Poisson ML estimator is Ordinary Least Squares (OLS) with a semi-log specification because there are no zeros in our dependent variable series. We present OLS estimations with White heteroskedasticity-robust standard errors.

Serial correlation is often absent in count data. We test for this problem in the Poisson ML estimations for up to three lags and with Pearson residuals as proposed by Cameron and Trivedi (1998) and with a Box–Ljung test.[14] The hypothesis of no serial correlation is accepted in all cases.[15] Durbin–Watson statistics for the OLS estimations all fall in the inconclusive zone, suggesting the possibility of positive first-order autocorrelation. However, the pattern of significance of the coefficient estimates is preserved when we correct for autocorrelation, so that only the OLS estimates with heteroskedasticity-robust standard errors are presented.

4. Empirical results on the determinants of firm entry

The equation estimated for SCOPs over the longer period is presented in Table 2. The magnitude of the coefficients estimated by the two methods is quite similar. The signs of the business cycle variables suggest that SCOP entry is countercyclical. A one percentage point increase in unemployment results in a 10% increase or more in cooperative creations. However, the effect of growth is not statistically significant. The stock market share index may have a small negative effect on SCOP creations in that a one-thousand point increase from the mean value of about 8900 results in a 1 to 2% drop in SCOP creations. Thus, our results confirm that perceived risks associated with conventional employment in downturns are a more powerful factor of cooperative creations than are profit prospects, although this coefficient is not significantly different from

[11] The test statistic used is T_b from Dean and Lawless (1989). The distribution of this statistic is approximately standard normal, and Dean and Lawless show that the test performs well with sample sizes of 10 or 20.

[12] For the cooperative equation estimated on the longer period, $T_b = 15.25$. The same statistic is 7.90 for the cooperative equation over the shorter period and -78.46 for the overall entry equation.

[13] The robust standard errors come from the equivalent estimator to White's robust variance estimator for the Poisson ML case given in Cameron and Trivedi (1998).

[14] The Box–Ljung statistics is a small sample test (Cameron and Trivedi, 1998). The statistic for this test, T_{BL}, is a function of $\hat{\rho}_k$, the estimated autocorrelation coefficient for lag k, and has a χ^2 asymptotic distribution with m degrees of freedom, where m is the number of lags autocorrelation is tested for. This statistic can be found in Mittelhammer et al. (2000).

[15] We find that $\hat{\rho}_k$ is not significantly different from 0 for $k = 1$ to 3 in all three equations. The statistic T_{BL} is equal to 4.89 for the SCOP equation on the longer period and 2.51 on the shorter period; it is 2.56 for the conventional firm equation.

Table 2
Determinants of SCOP Entry, 1971 to 2002

	Poisson ML			OLS (dependent variable: Log creations)	
Constant	0.30	(1.09)	[0.38]	0.07	[0.09]
GDP growth$_{-1}$	-0.02	(1.35)	[0.43]	-0.46×10^{-2}	[0.10]
Unemployment$_{-1}$	0.10	(4.82)***	[1.70]*	0.14	[1.89]*
Left in government$_{-1}$	0.14	(3.20)***	[1.36]	0.13	[1.13]
Share index$_{-1}$	-0.18×10^{-4}	(3.45)***	[1.76]*	-0.13×10^{-4}	[1.27]
Interest rate$_{-1}$	-0.17	(12.32)***	[6.00]***	-0.16	[5.89]***
Density	0.94×10^{-2}	(14.87)***	[5.60]***	0.93×10^{-2}	[5.40]***
Density^2	-0.43×10^{-5}	(15.40)***	[6.12]***	-0.44×10^{-5}	[4.50]***
	Pseudo R^2 (McFadden) 0.69			Adj. R^2 0.80	
	Pseudo R^2 (dev. based) 0.81			DW 1.07	
	Autocorrelation no				
	Over/under-dispersion yes				

Notes. The asymptotic t-statistics in parentheses have a standard normal distribution. The t-statistics in square brackets are based on standard error estimates that are robust to mean-variance inequality (Poisson estimates) or heteroskedasticity (OLS estimates).

* Statistical significance at the 10% level.
*** Statistical significance at the 1% level.

zero in the OLS estimation. Higher interest rates have the expected negative effect; an increase of one percentage point causes a 16 to 17% decrease in SCOP creations.

The density of cooperatives has the expected quadratic effect; the size of the SCOP population acts as a legitimizing and resource-generating factor until competitive pressures develop. The net impact of density remains positive at the mean; 10% more SCOPs are associated with 2.2% additional new cooperatives. However, this effect becomes negative at a density of 1093 SCOPs, which is below the current density of about 1700. Density effects may actually be more complex. If we include a cubic term, the estimated effect is again positive at current densities possibly because the CG-SCOP expanded once the movement reached a certain scale. However, these results confirm the impact of competition for resources at the creation stage and the importance of support structures. The presence of the Left in government is associated with an increase of 13 to 14% in SCOP creations but this coefficient may not be statistically significant.

The two equations estimated for the shorter period are presented in Table 3. The pattern of significance of the coefficients in the SCOP equation changes slightly compared with the longer-period estimation, although the signs are identical and most of the estimated coefficients have the same order of magnitude.[16] Unemployment affects cooperative creations more significantly over the longer period, while growth may play a more significant role over the last two decades, a period of more stable unemployment.

Cooperative creation is clearly countercyclical in the short period as in the longer one. In the later period, a one percentage point increase in growth is associated with an 8 to 9% decrease in SCOP creations and a one percentage point increase in unemployment could be associated with a 5% increase in SCOP creations. In contrast, a one percentage point increase in growth results in a 3% increase in the number of conventional firms created and a one percentage point

[16] Likelihood ratio and Chow tests confirm that the effects change between the 1970s and the later period.

Table 3
Compared determinants of Entry, 1979 to 2002

	SCOPs					All Entry				
	Poisson ML			OLS (dep. variable: Log creations)		Poisson ML			OLS (dep. variable: Log creations)	
Constant	2.84	(6.11)***	[2.82]***	3.19	[3.57]***	−5.39	(0.88)	[1.15]	−4.56	[1.04]
GDP growth$_{-1}$	−0.08	(4.84)***	[1.85]*	−0.09	[2.04]**	0.03	(2.52)**	[2.42]**	0.03	[2.33]**
Unemployment$_{-1}$	0.05	(2.17)**	[0.90]	0.04	[0.84]	−0.02	(1.40)	[2.32]**	−0.02	[2.27]**
Left in government$_{-1}$	0.17	(3.70)***	[1.66]*	0.13	[1.31]	−0.10	(3.26)***	[3.49]***	−0.10	[3.54]***
Share index$_{-1}$	-0.21×10^{-4}	(4.09)***	[2.09]**	-0.18×10^{-4}	[1.84]*	0.28×10^{-5}	(0.75)	[0.85]	0.32×10^{-5}	[0.91]
Interest rate$_{-1}$	−0.15	(8.87)***	[4.64]***	−0.15	[4.57]***	0.02	(1.42)	[2.56]**	0.02	[2.77]**
Density	0.53×10^{-2}	(5.90)***	[2.87]***	0.47×10^{-2}	[2.69]***	0.98×10^{-2}	(1.74)*	[2.27]**	0.90×10^{-2}	[2.25]**
Density^2	-0.24×10^{-5}	(6.01)***	[2.84]***	-0.21×10^{-5}	[2.67]***	-0.21×10^{-5}	(1.70)*	[2.22]**	-0.20×10^{-5}	[2.20]**
	Pseudo R^2 (McFadden) 0.52			Adj. R^2 0.53		Pseudo R^2 (McFadden) 0.15			Adj. R^2 0.49	
	Pseudo R^2 (dev. based) 0.71			DW 1.82		Pseudo R^2 (dev. based) 0.65			DW 1.66	
	Autocorrelation no					Autocorrelation no				
	Over/under-dispersion yes					Over/under-dispersion yes				

Notes. The asymptotic t-statistics in parentheses have a standard normal distribution. The t-statistics in square brackets are based on standard error estimates that are robust to mean-variance inequality (Poisson estimates) or heteroskedasticity (OLS estimates).

* Statistical significance at the 10% level.
** Statistical significance at the 5% level.
*** Statistical significance at the 1% level.

increase in unemployment could be associated with a 2% decrease in conventional creations, although this coefficient may not be statistically significant (which would confirm the possible ambiguity of the unemployment effect). Interest rates are still negatively related to cooperative entry as expected. However, interest rates have a positive impact on the entry of conventional firms; a one percentage point increase in interest rates is associated with 2% more conventional creations, possibly reflecting the accumulation of assets required before investing in a start-up firm.

In this later period, density again has the expected quadratic effect on cooperative entry; the coefficient becomes negative at around 1100 SCOPs and a 10% increase in the number of existing cooperatives at the mean density is associated with a drop in creations of more than 9%. Interestingly, the same type of overall density effect is observed for the entry of conventional firms, but at the mean density the effect remains positive. Conventional entry grows by 9.2% if density is 10% higher, perhaps reflecting the overall capacity of the economy to sustain new firms, as might be argued by organizational ecology theory (Geroski, 2001).[17] The density effect becomes negative at around 2,330,000 firms, which is slightly below the current density of conventional firms.

Unexpectedly, profit potential measured by the stock market share index has no statistically significant effect on conventional firm creations. However, an increase of 1000 points in this index is associated with a 2% decrease in cooperative creations. The presence of the Left in government may still have the expected positive effect on SCOP creations with a 17% increase but it also has an unexpected negative and significant effect on overall entry, decreasing it by 10%. The impact of a having the Left in government disappears if the share of profit in value added, which averages 39.6% over the period, is substituted for the stock market share index. For both types of creations, this profit variable has strongly significant coefficients with the same signs as those of the share index. A one percentage point increase in the share of profit in value added is associated with a 17% decrease in SCOP creations and with a 7% increase in conventional entry. Over this later period, the Left variable is negatively correlated with the share of profit in value added but positively correlated with the stock market share index and with growth, so that this result suggests that the presence of the Left in government influences entry of the two types primarily through its impact on past capital and labor income shares rather than through legitimation effects or profit prospects as hypothesized.[18]

To summarize these results, SCOP entry is countercyclical, unlike entry as a whole, and it is affected by increased risks associated with conventional employment. The political cycle may influence both types of entry, but in opposite ways, and in a more basic way than was hypothesized. Organizational density has a non-monotonic impact on both cooperative and conventional entry. Likelihood-ratio tests performed on the Poisson estimates and Chow tests performed on the OLS estimates presented in Table 3 confirm that the business cycle variables have significantly

[17] Deletion of the density variables leaves the estimated coefficients for the other variables unchanged with the exception of the coefficient for unemployment, which becomes insignificant. This result is consistent with the possibility that density is a scaling variable reflecting the overall capacity of the economy to sustain new firms, which may depend positively on unemployment as a source of potential entrepreneurs and may cancel out the negative effect of unemployment on entry. We find no evidence of a cubic density effect on conventional entry.

[18] The profit variable is the only one that clearly affects conventional entry in that specification; essentially, it summarizes the determinants of entry. In the SCOP equation, this variable picks up all the negative effects on cooperative entry with which it is correlated, including growth, the effect of unemployment on wealth, and interest rates. Although these variables now have a lower effect, the counter-cyclicality of cooperative entry and its relationship with organizational density are confirmed.

different effects on the two types of entry and that the two equations are significantly different overall.[19]

5. The theory and empirical specification of firm exit

Exit is much less well understood than entry. Conventional firms are thought to exit when the present value of future profits no longer exceeds the opportunity cost of operating the firm. Thus, conventional exit may depend on market conditions affecting expected profits, which are typically represented by growth and indicators of current profits. The opportunity cost of keeping the firm in operation includes returns on alternative investments as well as income from wage employment and unemployment. These factors are included with industry characteristics in the few existing empirical analyses of gross exit at the aggregate level, e.g., MacDonald (1986), Audretsch (1991) and Mayer and Chapell (1992). However, this literature yields few clear empirical results, which is not surprising since exit rates are very stable. In addition, aggregate exit data combine several different phenomena because firms exit for different reasons and firms of different ages are vulnerable to different circumstances. Recent studies using establishment and firm-level data, e.g., Agarwal and Audretsch (2001), Disney et al. (2003), and Dunne et al. (2005), highlight the role played by factors such as the conditions under which firms were created, their interaction with the industry life-cycle, and firm age and size. In practice, conventional firm exit includes not only bankruptcies and liquidations but also mergers and takeovers, which may occur in less dramatic situations.[20]

Including recent entry in the regression equation is a way of taking into account the proportion of young firms in the population; these firms have higher exit rates regardless of market conditions, as Boeri and Bellmann (1995) and Disney et al. (2003) report. However, available data do not permit separating out mergers and takeovers. Agarwal and Audretsch (2001) note that this is a common problem in empirical studies of exit. The corresponding heterogeneity principally affects conventional exit because mergers and takeovers are negligible among SCOPs over the sample period. The heterogeneity affecting the SCOP population is mainly related to the fact that SCOPs of different ages and of different origins have different hazard profiles, as Pérotin (2004) demonstrates.[21]

Given our results on SCOP creations, three questions of interest are suggested: first, whether market conditions matter for SCOP survival and, in particular, whether cooperatives exit in re-

[19] The likelihood ratio test statistic for a model in which all estimated parameters are different compared to a model in which all parameters are the same in the two equations is T_{LR} is equal to 258.81 (this statistic has a χ^2 distribution with 8 degrees of freedom under the null hypothesis that all parameters are the same). The statistic T_{LR} is equal to 107.66 (with 2 degrees of freedom) when the alternative hypothesis 1 is that all parameters are the same except for those of the business cycle variables. The corresponding F-statistics in Chow tests carried out on the OLS estimations are 4.72 and 5.59.

[20] In our data, a merger or takeover may result in no exit if, for example, one firm becomes owned by another but still exists as a separate firm. However, a merger or takeover may result in one exit if a firm that is taken over ceases to exist as a separate firm and becomes a division of another firm, or even in two exits if two firms merge to form a new, different firm, in which case the data will also register an entry. We had to compute the last four years of conventional exit flows from density and entry. The gain in information from having four extra years should outweigh any distortion that may be introduced into the series from this computation because the conventional entry, exit and density figures tally in most years, with only small discrepancies in both directions.

[21] Unfortunately, the data cannot be disaggregated by industry. Given the stability of inter-industry differences in profitability, this limitation may be less severe than the heterogeneity due to exit modes.

coveries, second, whether the political cycle and density have any impact on exit; and finally, whether exit echoes entry in previous years.

Like other types of worker cooperatives in Southern Europe, SCOPs are immune to the self-extinction by under-investment hypothesis found in Vanek (1977). Although the bulk of SCOPs' capital is owned collectively by cooperative members, the French cooperative statute imposes an annual profit plowback and prohibits appropriation of collectively-owned capital by the members, even in case of firm closure (CG-SCOP, 2003). Estrin and Jones (1992, 1998) present empirical evidence confirming the absence of under-investment tendencies among SCOPs. Similarly, the type of degeneration described by Ben-Ner (1988b) does not apply to SCOPs, which have no incentive to hire non-member workers because they share profit with non-members as well as members, as Pérotin (1999) discusses. According to Ben-Ner's model, cooperatives may exit during recoveries because increased and shared profit may be associated with increased uncertainty, which raises the attractiveness of conventional employment with a fixed income. However, in times of rising profit, cooperative members are unlikely to wind down their firm simply to obtain a fixed income elsewhere. Nonetheless, cooperatives lose some of their comparative advantage when jobs are no longer at risk in conventional firms so that those members who can command a higher wage in less egalitarian structures may leave for conventional employment.

Whether SCOPs will exit much in recessions is also unclear. In addition to the X-efficiency advantage that they may have over conventional firms, as suggested by the evidence presented in Doucouliagos (1995) and, particularly for France, in Estrin and Jones (1995), cooperatives may weather recessions by cutting wages and preserving employment, saving on labor turnover costs in the process. To cooperative members, the opportunity cost of keeping the firm in operation is more likely to be unemployment compensation if they are more vulnerable to unemployment than conventional entrepreneurs. Cooperative members may therefore accept lower profit than ordinary investors before closing down. For these reasons, cooperative failure rates may be lower throughout the business cycle and recessions may have an ambiguous effect on exit, because profit prospects are reduced but unemployment increases so that the cost of operating the firm goes down.

The political cycle should affect cooperative closures unambiguously, for reasons that are symmetric to the ones examined for entry. Similarly, density is expected to have a symmetric effect to what was hypothesized for entry. Finally, the level of SCOP births should affect future closures, which is due in part to competition for CG-SCOP resources. A potentially more important effect is related to population dynamics. Creation booms should be reflected in increased numbers of closures in the following years because booms lead to a population with a high proportion of young firms, which have higher failure rates. Among SCOPs, the highest death rates are found in the third year, i.e., at age two, in the period under study, as Pérotin (2004) reports, so that more entry at time $t-2$ should increase exit at time t.

In the empirical analysis that we present in the next section, exit is allowed to depend on growth, unemployment, a stock market share index, interest rates, the presence of the Left in government, density and its square, and entry lagged by two years. As is customary in the exit literature, variables other than entry are not lagged. As Shapiro and Khemani (1987) remark, the exit lag is thought to be shorter than the entry lag, so that contemporary market conditions should be used; Disney et al. (2003) and Dunne et al. (2005) also use this strategy. Variable definitions are the same as in the entry section, except for the lags. As with entry, alternative equations are estimated in which a profitability variable is substituted for the share index. Any differences are described in the next section.

6. Estimation and empirical results for firm exit

This analysis uses the same techniques and follows the same format as the analysis of entry in Section 4. Equations explaining annual exit are estimated by Poisson ML and by OLS with a semi-log specification and White standard errors. We begin with a SCOP-only estimation over the longest period for which data are available and continue with shorter-period estimations for cooperative and conventional exit. Tests for serial correlation performed on the ML estimations for up to three lags lead us to accept the hypothesis of no autocorrelation in all cases. The OLS estimation for cooperatives over the longer period shows no evidence of first-order autocorrelation, although the estimations on the shorter period may be affected by positive first-order autocorrelation, as the Durbin-Watson statistic falls in the inconclusive region. As with entry, correction for serial correlation preserves the significance pattern of the estimated coefficients in all cases so that only heteroskedasticity robust t-ratios are reported. The SCOP equation for the shorter period does not exhibit any over- or under-dispersion but the longer period estimation and the conventional exit equation do. We report t statistics using robust standard error estimates together with the uncorrected t statistics as we did for the entry equations.[22]

The results are presented in Tables 4 and 5. In all cases, the estimated coefficients are significant less often than in the entry equations, which is consistent with previous empirical work on exit. In addition, the magnitudes of the estimated coefficient are slightly less stable across estimation methods.

Table 4
Determinants of SCOP Exit, 1971 to 2002

	Poisson ML			OLS (dependent variable: Log exit)	
Constant	2.48	(5.24)***	[2.33]**	1.97	[2.34]**
GDP growth	−0.03	(1.56)	[0.71]	−0.05	[1.44]
Unemployment	0.07	(3.40)***	[1.40]	0.12	[2.26]**
Left in government	-0.63×10^{-2}	(0.13)	[0.05]	0.06	[0.48]
Share index	0.53×10^{-5}	(0.66)	[0.17]	-0.23×10^{-5}	[0.08]
Interest rate	0.06	(2.60)***	[1.20]	0.01	[0.44]
Density	0.16×10^{-2}	(1.46)	[0.72]	0.25×10^{-2}	[1.24]
Density^2	-0.07×10^{-5}	(1.29)	[0.56]	-0.11×10^{-5}	[1.03]
Entry$_{-2}$	0.26×10^{-2}	(7.17)***	[2.65]***	0.21×10^{-2}	[2.21]**
	Pseudo R^2 (McFadden) 0.71			Adj. R^2 0.84	
	Pseudo R^2 (dev. based) 0.83			DW 2.18	
	Autocorrelation no				
	Over/under-dispersion yes				

Notes. The asymptotic t-statistics in parentheses have a standard normal distribution. The t-statistics in square brackets are based on standard error estimates that are robust to mean-variance inequality (Poisson estimates) or heteroskedasticity (OLS estimates).

** Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

[22] The statistic $\hat{\rho}_k$ is not significantly different from 0 for $k = 1$ to 3 in all three equations. The statistic T_{BL} equals 3.41 for the SCOP equation on the longer period and 6.63 on the shorter period; it equals 4.05 for the conventional firm equation. For the SCOP equations, T_b equals 8.42 on the longer period and 1.29 on the shorter period, for which we cannot reject the hypothesis of mean-variance equality. The statistic is −209.99 for the conventional exit equation.

Table 5
Compared determinants of Exit, 1981 to 2002

	SCOPs					All Exit				
	Poisson ML			OLS (dependent variable: Log exit)		Poisson ML			OLS (dependent variable: Log exit)	
Constant	6.58	(5.76)***	[2.68]***	6.08	[2.57]***	−13.34	(1.34)	[1.54]	−14.44	[1.56]
GDP growth	−0.04	(1.95)*	[0.74]	−0.03	[0.43]	-0.33×10^{-2}	(0.21)	[0.17]	-0.36×10^{-2}	[0.19]
Unemployment	0.06	(3.04)***	[1.43]	0.08	[1.91]*	−0.02	(1.05)	[1.13]	−0.02	[1.30]
Left in government	0.03	(0.45)	[0.18]	0.01	[0.08]	−0.05	(1.32)	[1.17]	−0.06	[1.27]
Share index	0.82×10^{-5}	(0.98)	[0.29]	0.11×10^{-4}	[0.42]	0.44×10^{-5}	(0.76)	[0.82]	0.36×10^{-5}	[0.68]
Interest rate	0.16	(4.84)***	[1.86]*	0.15	[1.80]*	0.02	(0.96)	[0.86]	0.02	[0.77]
Density	-0.62×10^{-2}	(2.76)***	[1.26]	-0.55×10^{-2}	[1.14]	0.02	(1.81)*	[2.07]**	0.02	[2.06]*
Density^2	0.26×10^{-5}	(2.70)***	[1.19]	0.23×10^{-5}	[1.02]	-0.37×10^{-5}	(1.82)*	[2.08]**	-0.39×10^{-5}	[2.05]*
Entry$_{-2}$	0.27×10^{-2}	(7.33)***	[2.57]**	0.27×10^{-2}	[2.53]**	0.25×10^{-2}	(2.15)**	[1.42]	0.23×10^{-2}	[1.33]
	Pseudo R^2 (McFadden) 0.33			Adj. R^2 0.17		Pseudo R^2 (McFadden) 0.19			Adj. R^2 0.28	
	Pseudo R^2 (dev. based) 0.49			DW 2.15		Pseudo R^2 (dev. based) 0.56			DW 1.79	
	Autocorrelation no					Autocorrelation no				
	Over/under-dispersion no					Over/under-dispersion yes				

Notes. The asymptotic t-statistics in parentheses have a standard normal distribution. The t-statistics in square brackets are based on standard error estimates that are robust to mean-variance inequality (Poisson estimates) or heteroskedasticity (OLS estimates).

* Statistical significance at the 10% level.
** Statistical significance at the 5% level.
*** Statistical significance at the 1 level%.

From Table 4, the equation estimated for SCOPs over the longer period suggests that at most three factors affect cooperative exit. A one percentage point increase in unemployment is associated with 7 to 12% more cooperative exits and 10% more cooperative births two years earlier, at the mean level of cooperative entry for the period, translate into about 4% more failures (100 more births result in 26% more failures). A one percentage point increase in the long-term interest rate may increase cooperative exit by 1 to 6%, but this coefficient is not always significantly different from zero.

The SCOP equation estimated over the shorter period in Table 5 shows almost identical effects for lagged entry and unemployment as in the longer period, but the interest rate and density variables have different and more strongly significant effects (since no over-dispersion is detected for the SCOP equation, the Poisson standard error estimates are reliable).[23] Neither growth nor unemployment is estimated to have any significant effect on conventional exit. In contrast, a one percentage point increase in unemployment is associated with a 6% increase in cooperative exit and a one percentage point increase in growth corresponds to a 4% decrease in cooperative exit, although this coefficient may not be statistically significant. The value of the stock market share index is not significantly related to either type of exit, but increases in the interest rate result in more cooperative closures, with 16% more closures associated with each percentage point. Overall, our results indicate that cooperatives behave rather like the conventional firm of economic theory, exiting in recessions and when interest rates are high. We find no sign of exit in recoveries on the part of SCOPs.

Neither the stock market share index nor the presence of the Left in government is estimated to have any effect on exit of either type of firm. However, lagged entry has a significant effect on cooperative exit and may also affect conventional exit. The density variables affect both types of exit. The estimated coefficient for lagged entry is about the same in the SCOP equations for both periods, but higher mean entry over the shorter period implies a different elasticity. In the shorter period, a 26 to 27% increase in exit is associated with a 60% increase in annual creations two years earlier rather than the 72% increase found for the longer period. This change is consistent with the finding in Pérotin (2004) that more recent cohorts of SCOPs have been surviving less well in their first two or three years than previous cohorts. For conventional firms, a 25% increase in exit may be associated with a growth in entry at $t-2$ of less than 40% of the average annual entry in the period, which is also consistent with evidence that SCOPs have higher survival rates than conventional firms at age 2 (Pérotin, 2004).

The coefficients of the density variables have the expected signs for cooperatives, suggesting that a higher density reduces exit by legitimizing cooperatives, up to the level at which competition for resources outweighs legitimacy effects, corresponding to about 1200 SCOPs in our study. For conventional firms, the estimated coefficients have the opposite signs, with the change in sign occurring at a density a little higher than 2,330,000 firms. A possible explanation for this opposite effect is that, for conventional firms, higher density means heightened competition, but at very high levels, buoyant market conditions may keep more firms in operation. The net effects at the sample means are positive for both groups of firms, but the estimated magnitudes may not

[23] A likelihood ratio test performed on the Poisson ML estimates suggests structural change between the beginning of the longer period and the shorter, more recent period, although this hypothesis is not supported by a Chow test on the OLS estimates.

be reliable given the uncertainty over the significance of the relevant coefficients, especially for conventional firms, and the possibility that the actual effect of density is more complex.[24]

The estimations presented in Tables 4 and 5 explain exit less effectively than our results in Section 4 explain entry, which is in keeping with the results in the existing empirical literature. However, we find no evidence that SCOPs exit in recoveries. Indeed, a likelihood-ratio test shows the difference between the estimated effects of the two business cycle variables on the two types of exit to be statistically insignificant, even though, taken as a whole, the equations are significantly different. A Chow test performed on the OLS estimates could not reject the hypothesis that the two equations were the same.[25]

7. Conclusion

Some French worker cooperatives have survived for considerably more than a century, and the movement has incorporated, in its statute, provisions that preclude the degeneration and self-extinction that have been conjectured to explain the small numbers of labor-managed firms in market economies. Yet worker cooperatives represent a tiny portion of all French firms, although the movement is sizeable by the standards of industrialized countries. Over the last few decades, entry rates have been rather higher among cooperatives than among French firms in general, while exit rates have been the same or slightly lower. However, the initial population of cooperatives was small and its overall size has stabilized. In this paper, we test the proposition that creation, rather than exit, is where labor-managed firms differ from conventional firms, in particular in their respective responses to the business cycle. We also investigate the influence of the political cycle and organizational density on cooperative creations.

The widespread belief that cooperative creations are more countercyclical than conventional firm entry is confirmed by our analysis. Cooperative creations respond to increases in the risks associated with conventional employment rather than to the prospects of growing profits. More cooperatives are created when unemployment rises and when growth is slower. Cooperative creations also increase when interest rates and profit prospects are lower. In contrast, conventional entry is associated positively with growth and negatively with unemployment, as expected, and it increases with past profitability. Moreover, the difference between the responses of the two groups to the business cycle is statistically significant.

[24] A 10% increase in organizational density, which amounts to about 130 firms in that period for SCOPs and 223,500 for firms in general, is associated with an estimated increase in exit of 4% among cooperatives and 77% among conventional firms in these estimations. However, we experimented with a specification including a cubic density term and found it to be relevant for cooperatives, for which increasing density decreases cooperative exits with this specification. Substituting the share of profit in value added for the stock market share index did not improve the clarity or significance of the results. The resulting estimated SCOP equation is very similar to the equation in Table 5 but with less strongly significant coefficients. The conventional equation estimation is much less successful due in part to the extra multicollinearity introduced with the use of the profit variable, which is highly correlated with conventional density variables.

[25] The likelihood ratio statistics for the null hypothesis that all parameters are the same versus the alternative hypotheses that all parameters are different, that the coefficients of the business cycle variables only are different, and that the intercept and coefficients of the other variables are different (with only those of the business variables being the same) are $T_{LR} = 30.93$, 5.01 and 20.06, respectively. The cooperative and conventional exit equations are therefore different but the difference comes from the coefficients of the other variables, those of the business cycle variables being the same for the two groups of firms. The F-statistic for the Chow test of equality of all the coefficients of the exit equation across firm types is 0.67.

The political cycle is found to affect both types of entry in opposite directions, although this result is probably due to the effect of the Left on past capital and labor shares of value added rather than to legitimation effects. Both types of entry respond to density in the way expected for minority and niche organizations. Initially, entry is supported by a higher density; beyond a certain density, entering firms complete with existing firms for resources, but the precise density effects appear to be more complex.

Although our findings on exit are less strong than on entry, they suggest that cooperative exit is not procyclical in France. Cooperative exit responds to the business cycle and to market conditions in the same way a conventional firm is thought to respond, with exit increasing when unemployment and interest rates rise. In contrast to our results for entry, no statistically significant difference is found in the effects of business cycle variables on exit between the two groups of firms. Increased organizational density may lead to greater competition among conventional firms but it limits cooperative exit, although the precise form of the density effect may be complex for exit as well.

Our findings for French cooperatives suggest that, once potential under-investment and degeneration issues are resolved, the main differences between labor-managed and conventional firms are found in entry, rather than exit, behavior. We find no difference in the way the business cycle affects the exit decisions of the two groups, but we do find significant differences in the process of firm creation. Thus, difficulties associated with entrepreneurship may represent a considerable obstacle to the spread of labor-managed firms. Collective entrepreneurship appears to be driven by necessity, i.e., spurred by unemployment and risks associated with conventional employment, in contrast to conventional entry, which is stimulated by growth but limited by rising unemployment. The role of cooperative density confirms the importance of support structures and suggests that enough resources must be invested in cooperative infrastructures in order to counter the effects of competition for resources. These structures would also foster cooperative entrepreneurship in periods of growth.

Clearly, the issue of exit due to structural weaknesses remains relevant for labor-managed firms; exit is especially important in countries that do not have a specific statute for democratic firms to ensure that viable forms are adopted by new entrants. However, several solutions to under-investment and degeneration are known so that some re-focusing of research may be necessary. Our findings need to be confirmed by research covering longer periods and other countries. The issues surrounding cooperative creation are relatively unexplored outside practitioners' circles; however, they may ultimately provide the key to understanding the reasons for the low incidence of labor-management in capitalist economies.

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Appendix A
Variable definitions and sources

SCOP Entry	Annual number of SCOPs created (including firms created from scratch, rescue takeovers and conversions of conventional firms). Source: CG-SCOP (1983–2004).
SCOP Exit	Annual number of SCOP closures. Source: CG-SCOP (1983–2004).
ALL Entry	Annual number of entering firms in France (including firms created from scratch—both independently and as subsidiaries of existing firms—and rescue-and non-rescue mergers and takeovers) in 1000s of firms. The numbers are calculated by INSEE using the SIRENE data base, which includes all (compulsory) business registration and deregistration. Sources: INSEE (1990, 1999, 2003), Cordellier (2000), Fabre (2005).
ALL Exit	Annual number of exiting firms in France (including liquidations as well as bankruptcies, mergers and firms taken over by other firms) in 1000s of firms. Sources: as for entry.
Density	For SCOPs, number of existing SCOPs on October 31 of the previous year; for all French firms, number of existing firms (1000s) on 31 December of the previous year. Sources: as for entry and exit.
GDP Growth	Real growth of GDP, 1990 prices. Source: INSEE (1990, 1999–2005a).
Unemployment	Annual rate of unemployment at time of labor force survey, ILO definition. Source: ILO (2005).
Share Index	French stock exchange (SBF) 250-industry share index, 1990 prices. Source: OECD (2003).
Interest Rate	Return on French public and semi-public sector bonds, deflated by the annual rate of price inflation. Source: OECD (2003).
Left in Government	Dummy variable taking the value 1 if the prime minister is a Socialist for more than 6 months of that year. Source: French Prime Minister's Office (Premier Ministre, 2003).

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