

Catching a Wave: The Formation of Co-operatives in Finnish Regions

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Abstract

This paper compares the formation rates of co-operatives and conventional firms in Finland using regional data. The Finnish co-operative “wave” that began in the mid-1990s provides a useful setting for testing the hypothesis that co-operative formation rates are higher in depressed economic conditions. The empirical results support this hypothesis. Co-operatives are formed more often in regions with high unemployment; in contrast, conventional firms are formed more often when unemployment is low and demand growth is high. Furthermore, the existence of dedicated advisory services boosts the formation of co-operatives. These results indicate that co-operatives may play a useful role in reducing unemployment and that the formation of co-operatives may be influenced by policy measures.

JEL Classification: L26; M13; P13

Keywords: Regional analysis of firm formation; co-operatives; Finland; unemployment and firm entry

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1 Introduction

This paper compares the regional determinants of entry for co-operative firms relative to conventional firms. The entry and growth of co-operative firms has recently attracted considerable attention (e.g. Perotin 2006; Podivinsky and Stewart 2007; Arando et al. 2009; Gagliardi 2009a,b). A salient question in the literature is the role of unemployment in the formation of co-operatives, as studies have found mixed results. For instance, Russell and Hanneman (1992), Staber (1993) and Arando et al. (2009) have not found that unemployment to be related to the formation of co-operatives, whereas Conte and Jones (1991) and Perotin (2006) have.

Considering conventional firms, the relationship between unemployment and firm entry has been even more studied. One important strand of this literature focuses on the effect of unemployment on firm entry using regional data (e.g. Audretsch and Acs 1994; Reynolds et al. 1994; Carree 2002; Santarelli et al. 2009); however, the results have been fairly mixed. One advantage of using regional data in studying the relationship between unemployment and firm formation is that it usually gives sufficient statistical power to analyse the underlying hypotheses, especially when panel data are available. An even more important reason for the use of regional data is the potential for addressing policy relevant questions; for instance, whether promoting new firm formation may accelerate employment creation and how this is linked with the regional characteristics (e.g. Fritsch and Schroeter 2011).

In the literature on co-operatives, one deficiency has been that the studies have not used regional data and therefore have not been able to utilize cross-sectional variation in unemployment rates. An important innovation of the present study is that it uses data from 78 Finnish labour market areas from an 11-year period (1995-2005). The results are contrasted with the determinants of conventional firm formation in the same regions over the same period.¹ These results provide

¹ I will use the term “conventional firm” to denote any firms that are not co-operatives.

useful information in determining whether particular enterprise forms may be more suitable in addressing the inequalities in regional economic performance.

Conversely, the literature on regional determinants of firm entry has not compared the determinants of entry across different legal forms. It would be interesting to see whether the result that the determinants of entry differ markedly across legal forms (Perotin 2006; Arando et al. 2009) stands when regional data are used.

There are several reasons why a study of new co-operatives would be of interest. Co-operatives, especially worker co-operatives, are an inherently democratic form of organization (Ellerman 1990; Dow 2003). The voting rights in co-operatives are divided equally according to the one member, one vote principle. Co-operative members are entitled to elect and dismiss their management. In worker co-operatives, this means that the workers who are under managerial authority also ultimately control that authority. This is probably the fullest expression of democratic relations in business. From a more instrumental perspective, co-operatives have been argued to be useful in employment creation (e.g. Estrin 1985; Ben-Ner 1988), although this point has been disputed (Staber 1993). In the context of the recent financial and economic turmoil co-operatives have been again promoted as a way of maintaining organizational diversity and to help to recover from the crisis (Birchall and Hammond-Ketilson, 2009; Borzaga et al., 2010). All this points out that there is a need for careful empirical research on the relationship between unemployment and co-operatives.

The efforts to analyse the reasons for co-operative formation have been hampered by the lack of data availability. The Finnish new co-operative wave that began in the late 1980s and which has produced more than two thousand co-operatives provides an excellent setting to test existing theories of co-operative entry. Further, data exist on both co-operative and conventional firm

formation, which allows for comparisons of the determinants of new entry at the regional level.

Most of the co-operatives formed during this wave have been worker co-operatives whereas prior to the 1990s these were almost unknown in Finland.

In section 2 I discuss the reasons why potential entrepreneurs would want to set up co-operatives instead of conventional firms, how unemployment is related to the propensity to set up conventional firms and co-operatives, and what earlier empirical studies have found. In section 3 I briefly describe the institutional background: the role of co-operatives in the Finnish economy, the legislation of co-operatives, and economic development in Finland around the sample period. In section 4 I discuss the formation rates of co-operatives and compare them to conventional firm formations, and co-operative formation rates elsewhere. In section 5 I describe the data, and in section 6 I present the regression results. Section 7 concludes.

2. Conceptual framework and earlier empirical work

2.1 Reasons behind the formation of co-operatives

Definitions of co-operatives are often somewhat elusive, because they exist in a wide variety of industries and legal definitions vary across different jurisdictions. In most European countries, there are large and established co-operatives that have been formed in the 19th and early 20th century in the fields of banking, insurance, retail trade, and food production. However, there are also smaller and entrepreneurial co-operatives that have emerged in recent decades. Finland is an important case but not unique; other examples where new co-operative formations have been common, especially in the social sector, include Italy (Borzaga and Tortia 2006) and Sweden (Pestoff 2009). A typical feature of co-operatives is the rule of “one member, one vote”, preventing concentration of control. Another common feature is that the division of surplus is related to the transaction relationship with the co-operative, rather than invested capital. Often this means that the surplus is divided equally among the members.

There has been very little work attempting to explain the formation of co-operatives in economic terms. However, Conte and Jones (1991) provided a useful theoretical framework for analysing the formation of co-operatives (see also Conte 1986). In their model, which is an extension of the model of entrepreneurial choice proposed by Kihlstrom and Laffont (1979), an individual chooses from three alternatives: being in wage labour, being a co-operative member, or being an entrepreneur. Among these three alternatives, risk is lowest for wage labourers, who receive a steady income stream (their wage). Co-operative members have a more variable income than wage labourers, whereas entrepreneurs have the most variable income and thus highest risk. On the other hand, entrepreneurs have also the highest expected income, because they can fully appropriate the residual revenue. Co-operative members share the returns and thus reap some residual returns, and their expected income is higher than that of wage labourers. None of the alternatives dominates any other in the sense that it would be better than either alternative in both dimensions (give higher expected income and lower risk). The choice of the individual depends on his or her degree of risk aversion.

More recent literature on entrepreneurship has stressed other determinants than attitudes to risk, such as liquidity constraints (Evans and Jovanovic 1989), non-pecuniary benefits (e.g. Hamilton 2000), learning from parents (e.g. Dunn and Holtz-Eakin 2000), and human capital (e.g. Kim et al. 2006). Especially relevant in this context is Hamilton's (2000) result that entrepreneurs have on average significantly lower lifecycle earnings compared to the situation they were in paid employment; he explains this by the non-pecuniary benefits derived from entrepreneurship, such as "being one's own boss". It is conceivable that similar considerations may extend to co-operatives, although people who are attracted by co-operative membership may well be rather different than those drawn to self-employment. It is hard to find solid empirical evidence on these issues, but some useful information can be gleaned from Borzaga and Tortia's (2006) study on the Italian social sector. Their results indicate that being a member of co-operative is associated

with higher job satisfaction than being in paid employment in the public sector. They further find that the sources of the satisfaction are related to a higher degree of influence over work conditions in co-operatives rather than in paid employment. Working in co-operatives is associated also with better relations with colleagues than in paid employment, although wages are lower in co-operatives. Thus co-operatives can be expected to attract persons that value participation in decision-making and especially good social relations with colleagues over pay. In contrast, co-operative members have to make compromises over issues of work conditions with colleagues, contrary to self-employed, who have the ultimate decision-making power. Thus persons valuing especially independence could be expected to be more likely to become self-employed rather than members of co-operatives.

Even in conditions when the formation rates of co-operatives are unusually high, such as the Finnish case that is discussed in this paper, it remains true that many more entrepreneurial firms are set up than co-operative firms. In terms of the Conte and Jones (1991) model, this suggests that the desire for higher income and being the sole residual claimant dominates over the co-operative arrangement where both residual revenue and risk are shared. Alternatively, it may be the case that potential entrepreneurs value independence more than the arrangement where decisions have to be shared with co-entrepreneurs. A complication in setting up a co-operative is that it requires the joint effort of several individuals sharing the same goals (Dow 2003). From a collective choice point of view, it is much easier for an individual to set up a firm as a sole proprietorship or single-owned joint-stock company, and hire the necessary resources from the market, rather than share control rights. Hansmann (1996) has argued that the collective choice problems are the most important reason why worker co-operatives remain very rare compared to investor-owned and entrepreneurial firms.

2.2 The effect of unemployment on the formation of conventional firms

Before investigating how the formation of co-operatives is related to unemployment, it is useful to review the literature on unemployment and formation of conventional firms. The so-called “push” hypothesis of entrepreneurial entry states that unemployed workers are induced to set up firms because their prospects in wage labour are unfavourable (e.g. Storey 1991). A corollary of this hypothesis is that at the aggregate level, higher levels of unemployment should be associated with higher levels of firm formation. However, the economic conditions that are characterized by high levels of unemployment may be otherwise unfavourable to firm formation; notably, they are usually associated with lower levels of aggregate demand. The so-called “pull” hypothesis of firm formation says that new firms are formed when potential entrepreneurs perceive market conditions to be favourable. High unemployment is not associated with buoyant market conditions, thus this hypothesis posits a negative correlation between unemployment and firm formation.

The difficulties of disentangling these “push” and “pull” effects is probably a major reason why the empirical results concerning the relationship between unemployment and firm formation have been inconclusive. Another reason for the disparity of results in early studies was that the types of data used in empirical estimations were often quite different, as discussed in Storey (1991). However, in Reynolds et al. (1994) the determinants of firm formation were analysed for six different countries and for two different dependent variables, and the results still differed: around one-half of the coefficients showed a positive and significant relationship, whereas there was also a negative relationship (for Italy), the remaining coefficients being insignificant. This lack of conclusive results, regardless of comparable methodology across countries, may reflect institutional differences. Kangasharju (2000) used a similar methodology using data for Finland for late 1980s and early 1990s, and reported evidence of a positive relationship in cross-sectional regression, but a mixed relationship when he used a fixed effects panel estimator. Ritsilä and Tervo (2002), using individual level data from around the same period, modelled the probability of becoming self-employed. They found that the regional unemployment rate had no statistically significant

association with the decision to become self-employed, whereas personal unemployment was found to have a positive and statistically significant relationship.

Subsequently, Audretsch and Fritsch (1999), using data for West Germany from late 1980s, demonstrated that the impact of regional unemployment differed across industries, and that the positive “push” effect of unemployment into firm formation operated mostly in industries with low capital intensity. However, Carree et al. (2002), using data for US service industries with low capital intensity, found little relationship between unemployment and firm entry. Santarelli et al. (2009) suggested another reason for inconclusive results may be that some studies have used net entry as the dependent variable, while others focus on gross entry. They found a *negative* relationship between regional unemployment and regional (gross) firm entry in Italy, but also a negative relationship between regional unemployment and regional firm exit, which translates into a *positive* relationship between unemployment and net entry.

2.3 Effects of unemployment on the formation of co-operatives

Similar issues around push and pull hypotheses of unemployment have informed the arguments of formation of co-operatives. The deterioration of labour market conditions during downturns may well push individuals to form co-operatives, whereas low demand conditions associated with unemployment reduce the incentives to form co-operatives. Therefore, it is difficult to predict what may be the overall effect of economic conditions on co-operative formations. However, the attractiveness of co-operative entrepreneurship relative to individual entrepreneurship may increase², for the following reasons: 1) the availability of external finance is reduced during downturns, and this induces individuals to combine their forces; 2) the risk of bankruptcy is higher, and individuals may reduce their individual risk by sharing it; 3) the upside gains to be reaped are likely to be more moderate when economic conditions are depressed, so the incentives to set up

² This means that even though at any point in the economic cycle more entrepreneurial firms are likely to be established than co-operatives, the ratio of co-operatives formed over entrepreneurial firms formed should be higher in economic downturns rather than upturns.

entrepreneurial firms are lower (Conte and Jones 1991; Perotin 2006). Conversely, in buoyant economic conditions, when external finance is more readily available and business prospects are good, the formation rates of co-operatives relative to entrepreneurial firms should decline.

The early empirical literature examining the relationship between unemployment and co-operative entry was inspired by the notion that co-operatives were supposedly formed more often during recessions, and that their creation might provide a solution to the problem of unemployment. Many of these studies explicitly referred to the context of the oil crises of the 1970s (e.g. Estrin 1985; Ben-Ner 1988). However, the first statistical analyses of the determinants of co-operatives' formation rates, using time-series analysis, often failed to provide clear-cut support for the hypothesis. Staber (1989), using data for Atlantic Canada and for a variety of different co-operative formations over a 48-year period, found no evidence that more co-operatives had been set up during periods of recession (for agricultural co-operatives, the relationship was negative). In another paper Staber (1993), using data over 70-year period, found no evidence that more worker co-operatives had been established in Atlantic Canada during recessions or periods of high unemployment. Russell and Hanneman (1992), contrary to their expectations, found a negative relationship between unemployment and the founding of worker co-operatives in Israel over a period of 38 years. More recently, Perotin (2006) found that unemployment and the formation of worker co-operatives in France are positively related, whereas GDP growth and worker co-operative formation are negatively related. For conventional firms the relationships are exactly the opposite, and this suggests that the determinants of co-operative formation differ markedly from conventional firms.

In sum, empirical analyses based on time-series analyses have so far provided rather contradictory evidence. Problems with this type of analyses include the difficulties of controlling for other confounding events, and also relatively small number of observations yielding insufficient statistical power.

There are fewer studies that have combined cross-sectional observations to time-series analysis in studying the relationship between unemployment and co-operative formation. Conte and Jones (1991) is the earliest such study. Using historical data from US states, they found a positive relationship between unemployment and the formation of worker co-operatives. More recently, Arando et al. (2009) compare the formation of co-operatives to limited-liability and publicly traded companies in 20 regions of the Basque country and within 17 industries. They find an insignificant coefficient for regional unemployment rate, whereas they find that the establishment of limited liability companies is positively related to unemployment whereas that of publicly traded companies is negatively related to unemployment. They also find a negative relationship between co-operative formation and GDP growth in the Basque country, suggesting that the formation of co-operatives may be countercyclical.

3 Institutional description

Finland has traditionally had a very strong co-operative sector. The first Finnish co-operatives were established several decades later than in many other Western European economies, the first ones at the turn of the 20th century, but development was so rapid that by 1920 the number of co-operatives relative to the population was higher in Finland than anywhere else, with the possible exception of Denmark (Gide 1922). The role of co-operatives in the Finnish economy has remained strong ever since. In 2008 the market share of consumer co-operatives in the retail trade was over 40%, and the market share of co-operative banks in retail banking was over 35%. In food production, the largest producers are co-operatives. One of the largest enterprises in forestry in the world is a Finnish co-operative, Metsäliitto, which was in 2004 also the largest agricultural producer co-operative in Europe. When the International Co-operative Alliance (ICA) compiled statistics on the 300 largest co-operatives in 2004, Finland topped the list both in terms of sales relative to GDP and number of co-operatives relative to population (Jones and Kalmi 2009). However, one important type of co-operative remained for a long time underdeveloped, namely

worker co-operatives. While worker co-operatives have been relatively rare anywhere, in Finland they were virtually non-existent until the mid-1990s.

Under Finnish business legislation, co-operatives are rather distinct from other legal entities, such as joint-stock companies, partnerships or sole proprietorships. The residual revenues are divided by criterion other than ownership of capital. This criterion is determined by the type of transaction of the controlling group. In worker co-operatives the revenues are distributed in relation to work input. Measures for this may be, for instance, hours worked or outside billing. Purchasing co-operatives divide their residual in relation to purchases, marketing co-operatives in relation to products sold, etc. A fixed interest is typically paid to capital investments. However, decision-making follows a different pattern: Voting power is divided equally among members.

Other important differences also exist between co-operatives and joint stock companies. Co-operatives have no legally set minimum capital, while joint stock companies had a minimum capital of €8.000 at the time of our data collection. But this does not mean that the co-operatives would not have equity capital: in practice, co-operatives must have a certain level of it in order to operate.³ However, the €8.000 minimum equity capital may discourage the formation of joint-stock companies especially in adverse economic conditions and lead instead to the formation of a co-operative. Another important difference is that co-operatives must have several founders. Until 2002, co-operatives required at least five members: after a change in legislation this has been decreased to three. More typically, however, co-operatives have seven to ten members. The reason why many co-operatives have seven or more members is that persons owning less than 15% of an enterprise are not regarded as entrepreneurs and do not lose their unemployment protection.⁴

³ Due to the problems of asymmetric information, it is not possible for co-operatives to operate solely on debt financing. In such a case the debtors would bear all the operational risk while the co-operative members would reap all the potential gains, giving them incentives to choose excessively risky projects. For an applicable model see Bowles and Gintis (1993).

⁴ However, this rule applies to co-operatives and joint-stock companies alike.

In Finland, the starting point of the co-operative “wave” has often been identified as coinciding with the Great Finnish Depression in the early 1990s. Prior to the economic crisis that began in 2008, this was the most severe depression in any OECD country since World War II. In 1990-1993 the unemployment rate soared close to 20% and GDP plummeted by 14% (Kiander and Vartia, 1996). This is consistent with the observation that co-operatives waves elsewhere have often coincided with depression, as with America’s Great Depression in the 1930s (Conte and Jones 1991) or the 1975 oil crisis in Western Europe (Ben-Ner 1988). However, it is worth noting that the formation of co-operatives and especially worker co-operatives actually accelerated only in 1994-1995, when the economic recovery was already well under way, although the national unemployment rate remained high (over 10%) throughout the 1990s. Between 1993 and the subprime crisis of 2008, the Finnish economy was among the fastest growing among the OECD countries.

The increase in the formation of co-operatives took place even though there were no strong public policy measures supporting it. As will be explained later on, many regional projects promoting co-operatives were partly funded by public sources, because they were seen having the potential of reducing unemployment; however, there were no centralized public policy programmes to specifically promote the establishment of co-operatives. In Finland, there is a system of regional public advisory services promoting firm formation; however, often these advisors do not have sufficient familiarity with co-operatives to suggest their formation, even when that would be the best option; instead, the advice is focused on more ‘standard’ forms (joint-stock companies, partnerships and proprietorships). Therefore, the role of private initiatives and individuals dedicated to co-operatives was crucial in launching the relevant advisory services.

4. Formation rates of co-operatives

For the present research I have used data on co-operative formation from the Finnish Co-operative Confederation Pellervo, originally obtained from the Finnish National Board of Patents and Registrations. All co-operative formations from 1988 to 2005 are included. This compares favourably to earlier literature that has mainly relied on various unofficial records of co-operative supporting organizations.

Table 1 presents the formation rates of co-operatives in three groups: 1) infrastructure co-operatives; 2) worker co-operatives; and 3) other co-operatives. The first group includes co-operatives that are geared towards improving elements in the infrastructure of their members, but are not engaged in independent business and do not trade with outsiders. By far the largest group of infrastructure co-operatives are water co-operatives. These take care of the water supply in rural areas that are outside of municipal infrastructure networks. Other infrastructure co-operatives include antenna co-operatives and pier co-operatives. It is characteristic of all these co-operatives that they operate in rural areas where the municipal infrastructure is deficient. Such co-operatives are not included in the regression analysis below because I wanted to focus on co-operatives' business aspect.

[TABLE 1 AROUND HERE]

Worker co-operatives are rather diverse. They include co-operatives that provide low-skill services, such as cleaning and household work, or repairs and maintenance. Co-operatives are also becoming popular in the social sector. Kindergartens or homes for the elderly are organized as co-operatives and run by their employees. Among the university-educated, co-operatives have become common for instance in the information technology, education and cultural sectors as well as various other professional domains (e.g. architecture, translating, consulting). It is worth noting that

virtually all worker co-operatives operate in the service sector; there are no worker co-operatives in the Finnish manufacturing sector. In addition, almost no co-operatives have been formed through employee buy-outs: nearly all of them have been created *de novo*.

The third group is equally diverse. It includes various co-operatives that bear resemblance to more traditional types, for instance, marketing co-operatives in the food sector (especially in organic products) or co-operatives that purchase agricultural inputs. However, these work typically on a much smaller scale than their long-established counterparts in the traditional co-operative sector. A fairly common group of co-operatives are marketing co-operatives for handicraft production. Another example are tourist co-operatives, which are joint enterprises of entrepreneurs in the tourism sector. There have also been changes in the types over time. In the early 1990s, food purchase co-operatives and financial co-operatives, typically trading on the stock markets, were common, but their popularity waned after the recession.

Only a handful of co-operatives had been established during the few decades preceding 1988.⁵ Between 1988 and 1993 most co-operatives that were established were infrastructure co-operatives. The rate of establishing infrastructure co-operatives has remained quite stable throughout the period, although since 2003 it seems to have increased to a new and higher level. Only 10 worker co-operatives were established before 1994, but since then the number increased sharply, peaking in 1997 when 153 worker co-operatives were formed. After 2000 the rate of formations decreased somewhat and less than 100 new worker co-operatives were established annually. The remaining category, non-worker and non-infrastructure co-operatives were more common than worker co-operatives until 1994, after which their formation rates, too, increased and surpassed those of infrastructure co-operatives; however, in later years they decreased below the formation rates of infrastructure co-operatives. Overall, formation rates were relatively stable until 1995 after which formations increased sharply, reaching a high point in 1998 when 264 co-

⁵ The previous wave of co-operative formation took place mostly from the 1900s through 1920s.

operatives were formed (including 129 worker co-operatives). The formation rates dipped in 2001 and 2002 but increased again in 2003. Altogether 2632 co-operatives were formed from 1988 to 2005, of which 1115 were worker co-operatives, 752 infrastructure co-operatives, and 765 other co-operatives (various co-operatives owned by customers or suppliers).

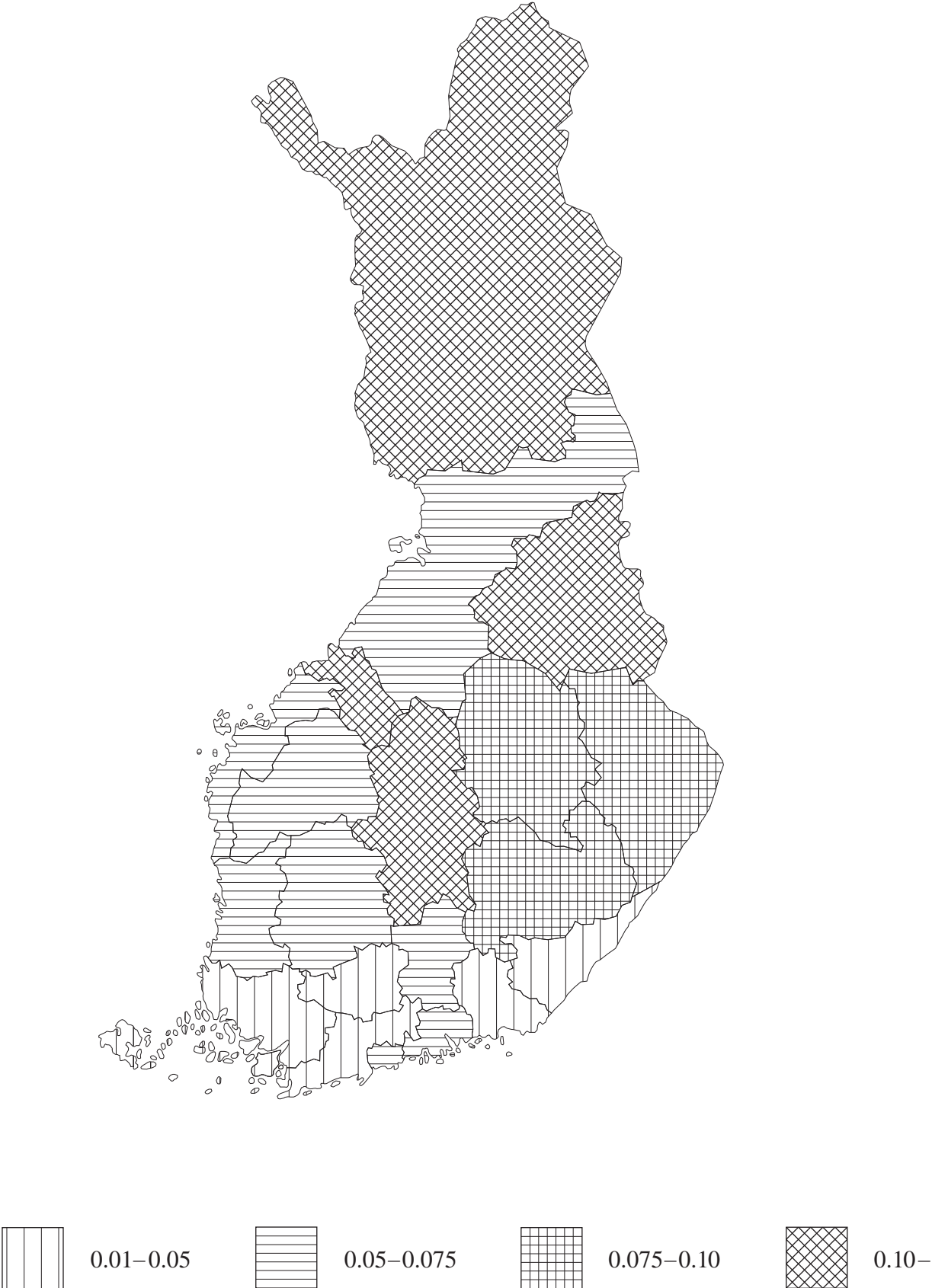
The Pellervo data also include information on co-operative exits, but, these data appear unreliable. For instance, only 7 co-operatives are said to exit before 1999, although by that time 985 new co-operatives were formed. Such a low rate of exit is somewhat implausible. One explanation might be that inactive firms may have remained in the register. They are also removed from the register fairly sporadically, which means that the timing of exit does not necessarily reflect the time when operations ceased, but rather the clean-up efforts of the register authorities. However, there is some evidence for Finland that co-operatives may be more resilient than other types of enterprises.⁶ Karjalainen (2009), citing evidence released from Statistics Finland, shows that between 2003 and 2008 only 0.03% of existing co-operatives disappeared through bankruptcy, whereas the corresponding figure for joint-stock companies was 0.86%. While bankruptcies of co-operatives are rare, the most typical reasons for their exit are inactivity – the co-operative never really gets out of ground or the operations gradually wane –or the co-operative is merged with another enterprise. In some cases (albeit rarely) co-operative is transformed into a joint-stock company.

Because I have reservations on the accuracy of the exit measure, I do not use exit of co-operatives either as a dependent or independent variable. However, exits have been taken into account when constructing the measure of co-operative density.

Figure 1 shows the regional distribution of co-operative formation in 1995-2005, relative to 1,000 persons in labour force. For demonstration purposes, I use a rougher regional classification system than in the analysis: a division into 21 regions (*maakunta*) instead of 78 regions (*seutukunta*)

⁶ Such evidence is consistent with research from other contexts showing that co-operatives have better survival propensities than conventional firms; see Ben-Ner (1988) and Perotin (2004).

Figure 1. Regional distribution of co-operative formation rates:
number of co-operatives formed per 1,000 persons in labour force in 1995–2005, annual averages



Note: Formations of infrastructure co-operatives are not included

is used in the regression analysis. The figure shows that the formation rates of co-operatives tend to be lowest in southern and south-western areas of the country, the wealthiest and economically most active, and are the highest in the central, eastern and northern areas, regions characterized by relatively high unemployment and lower than average per capita income.

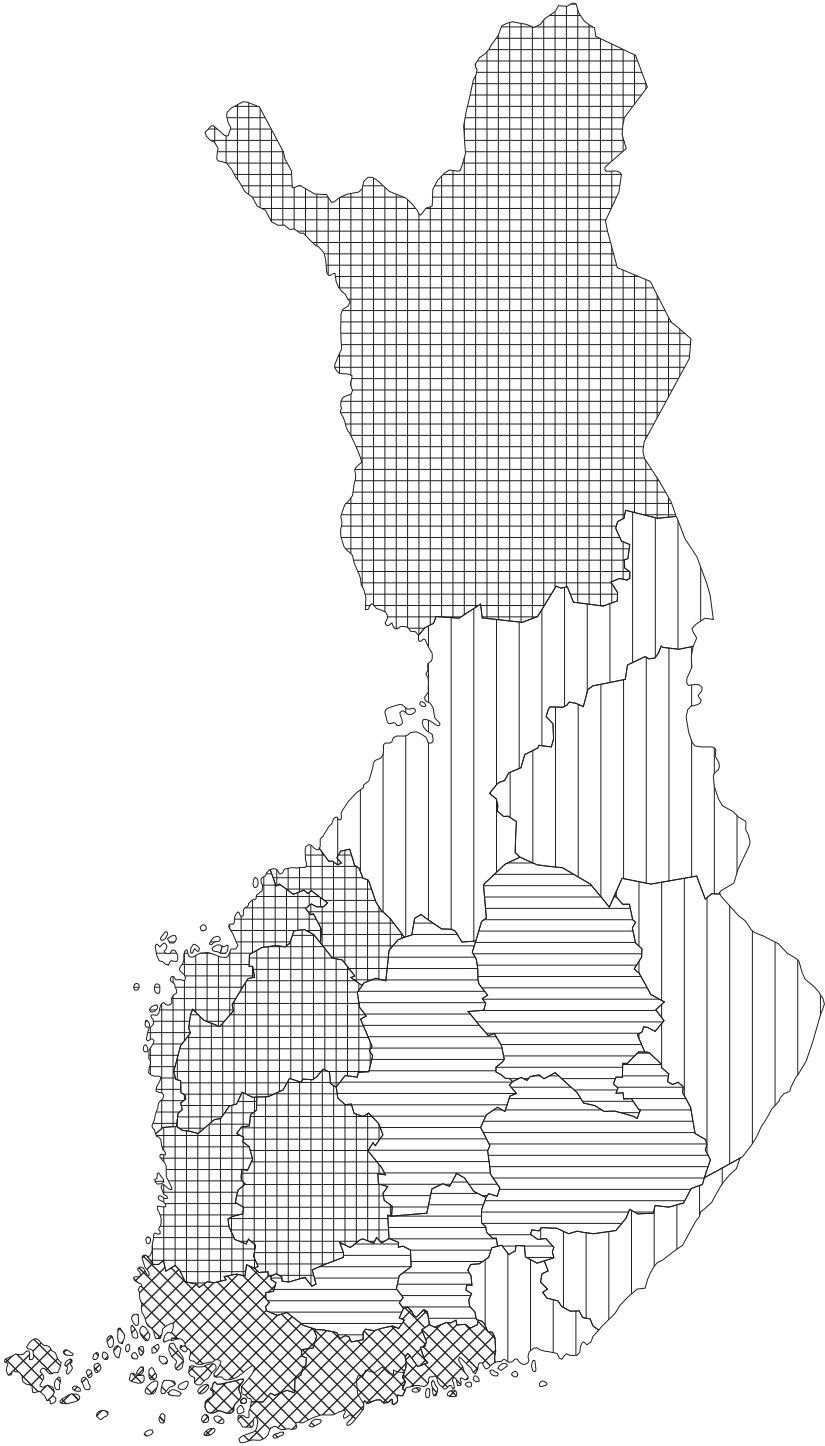
For comparison, Figure 2 presents the regional distribution of conventional formation also in the 1995-2005 period, relative to 1,000 persons in labour force.⁷ The regional pattern of conventional firm formation is quite different from co-operatives: formation rates of conventional firms are the highest in southern and south-western areas, and lowest in some of the economically depressed regions where the formation rates of co-operatives were high, especially Kainuu and North Karelia in eastern Finland. However, there are also some similarities across the founding rates: for both conventional firms and co-operatives, the founding rates are relatively high in Lapland (the most northern area of Finland), and low in south-eastern parts of the country.

[FIGURE 1 AND FIGURE 2 AROUND HERE]

The formation rates of co-operatives in Finland are relatively high compared to those reported in other studies; in particular, in per capita terms they are many times higher than those reported for the UK in Podivinsky and Stewart (2007), for France in Perotin (2006), for Atlantic Canada in Staber (1989), and for Israel in Russell and Hanneman (1992). However, the formation rates of worker co-operatives in the Basque Country of Spain in 1993-2003, as reported in Arando et al. (2009), are similar or even higher than those of Finland. With the exception of Arando et al. (2009), other studies have not received their data on co-operatives from official sources, so it is possible that they have underestimated the formation rates. This may be especially true of those

⁷ The source for these data is Statistics Finland; the data source is described below in section 5.

Figure 2. Regional distribution of firm formation rates:
number of new firms formed per 1,000 persons in labour force in 1995–2005, annual averages



6–8



8–9



9–10



10–

studies that have tried to identify co-operative formation over a long period. However, none of the studies indicate the possibility of serious underestimation. Further, since formation rates are known to vary considerably over time, the choice of period obviously matters. The period from 1945 to 1988 in Finland was a time of very low activity in co-operative formation, and had those years be included, the overall average for Finland would have been much lower. Moreover, many of the studies analysing statistically the co-operative formation rates have not included the recent two decades; perhaps the formation rates would be more comparable if data from the same period were used. Nevertheless, the Finnish co-operative formation rates appear to be comparatively high.

5. Data and empirical analysis

In the empirical analysis I compare the determinants of co-operative formation with the determinants of conventional firm formation. Other types of data were matched to the co-operative data: first, the data on entry and exit of conventional firms, based on the Register of Enterprises and Establishment data from Statistics Finland. The data source is not identical to the source of the co-operative data, and the Statistics Finland data have somewhat stricter criterion for inclusion; for instance, the firms must have some sales and employ at least half a person full time. The number of conventional firms was obtained by deducting the number of co-operatives from the total number of firms.⁸ The data on conventional firm entries were available only from 1995 onwards, thus being shorter than the data on co-operative formation. Therefore, we only compare firm entries for years 1995-2005.

Second, I use regional data from Statistics Finland, originally from the level of municipalities (452 in 1995). Due to municipal mergers, the number of municipalities had decreased to 434 in 2005. From the municipal level, the data were aggregated to regional level.

⁸ Even though the sources are different, this can be expected to matter little for the results, for two reasons: 1) co-operatives are likely to meet the sales and employment criteria; 2) because the number of co-operative formation relative to conventional firm formation is small, the impact of deducting co-operatives from the overall number of firms is negligible.

There were 78 regions throughout the observation period.⁹ All the explanatory variables have been lagged by one year and thus they come from the period 1994-2004. These form balanced data of 858 observations.

Three dependent variables that are used in the analysis: the formation rate of conventional firms, that of co-operatives, and that of worker co-operatives. All the rates are comprised of the formation counts per 1,000 persons in the labour force. Note that worker co-operatives are a subset of all the co-operatives, and it is used separately to maintain comparability with much of the prior research. The correlation coefficient between the formation of conventional firms and co-operatives (both normalized with labour force) is -0.13 , and the correlation between formation rates between worker-owned co-operatives and other non-infrastructure co-operatives is 0.10 . These correlations are unsurprising, but neither of them is particularly large. Despite the relatively high formation rates of co-operatives, they amount to only 0.65% of the level of conventional firm formation.

The key explanatory variables are unemployment and demand growth. Demand growth is proxied by population growth which is standard in the literature on regional firm formation (e.g. Keeble and Walker 1994; Reynolds et al. 1994). Both variables come from Statistics Finland.

Even though the main interest is on the issues of unemployment and demand growth, it is useful to include other explanatory variables. Their inclusion potentially reduces the concern of omitted variable bias, as well as decreases the share of unexplained variation in the regression analysis. These variables were chosen based on their use in the previous literature, either for

⁹ Although some municipalities have switched the administrative regions during this period, these changes have been ignored in the aggregation process. Thus if municipality X belonged to region Y in 1995 and to region Z in 2005, it has been assigned to region Z throughout. If municipality A belonged to region B in 1995, but during the observation period was annexed to municipality C in region D, then A has been assigned to region D throughout the period it has been observed. In other words, the composition of regions does not vary over time.

conventional firm formation or co-operative formation, and also partly on data availability.¹⁰ With the exception of the measures on co-operative density and co-operative advisory services, the data source for the independent variables is Statistics Finland.

First, I control for the industrial structure in the region. Co-operatives are traditionally strong in the countryside, where they have had a significant presence in agricultural, food processing, and forestry, banking and retail co-operatives. Due to their increased familiarity, it is possible that co-operatives are more likely to be formed. In regions with a strong manufacturing sector fewer formations of new firms are expected to occur (Armington and Acs, 2002), and this may extend to co-operatives as well.

According to Reynolds et al. (1994) two variables have been relatively successful predictors of firm creation: population density and percentage of managers in the workforce. I have no data on the latter, but population density data are available. Population density is predicted to have a positive effect on conventional firm formation, while its effect on co-operative formation is unclear. These data are from Statistics Finland.

The impact of density (number of specific firms in existence) on firm formation has been one of the most studied aspects of firm entry, especially concerning co-operative formation. For conventional firms there is strong evidence that firm entry is positively correlated with the presence of small firms in the area (e.g. Reynolds et al. 1994; for supportive evidence for Finland, see Kangasharju 2000). The usual explanation of this result is that certain areas are embedded with entrepreneurial culture. For co-operatives, many studies have successfully fitted a non-linear specification of density: the lagged density of co-operative firms is a positive and significant predictor of formation, while squared density is negative and significant (Staber 1989; Simons and

¹⁰ In some cases, variables potentially of interest were excluded because of the issues of data availability. Such include social capital (no good proxies available on regional basis), density of bank branches (exist only for 4 years out of 11), and human capital, because the educational classifications change in the middle of data period.

Ingram 2004; Perotin 2006; Arando et al. 2009).¹¹ These findings are usually interpreted in the organizational ecology framework of Hannan and Freeman (1989): co-operatives are viewed as more legitimate organizations when there are more of them, but after some point the competition for scarce resources lowers the formation rates.

How the presence of other firms affects co-operative density is less often studied. Simons and Ingram (2004) included a measure of corporation density in their analysis and found that it had a negative effect on the founding of Israeli worker-owned agricultural co-operatives. They argue that this reflects ideological competition between the two types of organizations.

In this study I model density in two ways, as follows. The presence of small firms is measured by the number of establishment relative to the number of income earners within the region. Both variables were taken from Statistics Finland data. The density of co-operatives was calculated from the Pellervo data. The measure includes only new co-operatives. The density of co-operative firms was calculated by summing up individual entries beginning from 1988 and then adjusting for co-operative exits. As with small firm density, the number of co-operatives in the area was divided by the number of income earners. As mentioned above, the data on co-operative exits may not be completely reliable, and therefore the co-operative densities may be measured with error.¹² Therefore, I check the robustness of the results by excluding the density variable from the regressions.

¹¹ The precise way density is modelled varies across studies. Staber (1989), Simons and Ingram (2004), and Perotin (2006), who all use time-series data define density as the number of firms, while Arando et al. (2009) use as their measure of co-operative density the number of co-operatives relative to the total number of firms in the region. In this study, the measure of density which is most consistent with the overall approach and dependent variables is the number of specific type of firms relative to labour force within the region. However, alternative definitions of density do not affect the coefficients of the main variable of interest, namely unemployment.

¹² Another challenge is that the co-operative densities, as defined here, exclude co-operatives formed before 1988. Most of the co-operatives established prior to 1988 have existed for decades, or at least are successors of co-operatives that were established in the early part of 20th century. Because there have been many merger waves among the Finnish co-operatives, the mature co-operatives tend to be of completely different size (much larger) than the more recent co-operatives; therefore the densities of the two groups are not really comparable.

Finally, I include a measure for the presence of regional advisory services. While support structures are usually regarded as essential for co-operative formation (e.g. Conte 1986; Smith 2003; Halary 2006), their presence is seldom modelled in the empirical analysis of co-operative formation.¹³ A number of co-operative advisory projects have been set up in several areas of Finland, usually by co-operative activists. The funding for those projects has been from competitive public tenders (e.g. from the European Social Fund). The limited duration of such projects and the fact that they are run at different times in different parts of the country generate a variation in their existence, allowing for testing the hypothesis that the support structures matter for co-operative formations. There are also regions where no such projects have ever been initiated. The projects are largely exogenous in the sense that their set-up is dependent on the presence of co-operative activists, and they are not centrally co-ordinated. Since I am interested in regional variation, I have included in this measure only regional projects and not national ones such as those organized by the Pellervo Society. The information on these projects was collected in several ways: by reading existing documentation at Pellervo, by interviewing local activists, and by telephone interviews. As a result of these extensive interviews, I learned that advisory services had been provided in approximately half of the Finnish regions.¹⁴ The duration of the projects has varied between 3 and 8 years, so in none of the regions has a project run throughout the whole period of observation. My interviews also revealed that co-operative activists have at times also provided advisory services free of charge or with only nominal compensation. Since it is impossible to form a coherent picture of the occurrence of such services, I have included only publicly funded advisory projects here.

The summary statistics of all variables are displayed in Table 2.

[INSERT TABLE 2 AROUND HERE]

¹³ With the exception of Conte and Jones (1991), who find a positive relationship between co-operative formation and the existence of specialized advisory services.

¹⁴ The existence of advisory projects has been measured at a higher level of regional aggregation (*maakunta*), since the projects typically take place at that level.

6. Model specification and results

In studies looking at regional firm formation, the dependent variable has typically been either number of firms formed in the given region relative to population or number of firms formed in the given region relative to stock of existing firms (see Reynolds et al. 1994; Kangasharju 2000). This approach transforms the dependent variable into a continuous variable and allows for the use of linear regression models. The situation becomes more complicated when one considers the formation of co-operative firms. In the formation of conventional firms, the count of firms formed in a particular year in a region is hardly ever zero. This is not true for co-operative formation. About a third of observations contain zero formations of co-operatives in a given region in a given year. In the presence of censored data where the dependent variable is limited from below, the use of the linear regression model leads to biased coefficients. Therefore I use the Tobit model that simultaneously estimates the linear prediction for the dependent variable as a function of independent variables, and the likelihood that the dependent variable will be greater than zero.

However, the Tobit model has certain limitations. Most importantly, there is no parametric estimator for a fixed effects Tobit model. A random effects Tobit estimator is available in standard statistical software, however without the option of correcting for the clustering of standard errors within regions,¹⁵ and therefore the validity of the standard errors coming from that model may be questionable.¹⁶ The random effects model also assumes no correlation between the region-specific effects and other covariates of the model. The fixed effects estimator would remove this problem, but, as noted, it is not available for the Tobit model.

¹⁵ That means implicit use of the implausible assumption that the error terms of the subsequent observations from the same region are not serially correlated.

¹⁶ The estimations were carried out using STATA statistical software.

Given these limitations, I report below the results that have been obtained from the pooled cross-sectional Tobit model, where the standard errors have been corrected for clustering. For comparison, I report the results from the random effects model in the Appendix. It turns out that the results from the pooled cross-section estimator and random effects estimator are similar concerning the main variable of interest, namely unemployment. Further, the use of cross-sectional models that utilize only between-unit (but not within-unit) variation is consistent with most of the literature on regional firm formation, and in this way increases the comparability of the results with earlier literature.

As discussed above, the dependent variable is the measure of firm (co-operative, worker co-operative, or conventional firm) formation relative to 1,000 persons in the labour force.¹⁷ I use a vector of independent variables, including the unemployment rate, population growth, percentage of labour force in agriculture, percentage of labour force in manufacturing, density of existing firms relative to the number of income earners, population density, density of co-operatives relative to the number of income earners, and presence of co-operative advisory services. All independent variables are lagged by one year. In addition, the specifications include year dummies (coefficients not reported in the tables).

The results are presented in Table 3. The table reports three parameter estimates: 1) the Tobit model coefficient; 2) the standard error of the coefficient; and 3) the marginal effect of a one-unit change in the independent variable on the expected value of the dependent variable, evaluated at the mean values of the independent variables. For the specification (3) in Table 3, where the results for conventional firm formation are given, only parameters 1) and 2) are reported, because there is no censoring of values in the specification (3) and therefore parameters 1) and 3) are identical in that specification.

¹⁷ Alternative measures of organizational formations (relative to the stock of existing firms or relative to population) give very similar results and they are available upon request.

The results for co-operatives in general are presented in column (1). They lend support to the notion that the level of formation of co-operatives is higher in areas with higher unemployment. In a region where unemployment is 1 percentage point higher than in an otherwise comparable region, the formation rate of co-operatives is 0.005 higher per 1000 workers. This result is statistically significant at the 1% level. Two other coefficients are marginally significant (at 10% level): the presence of advisory services for co-operatives, and the stock of existing new co-operatives. The existence of advisory services is associated with 0.015 more new co-operatives established per 1000 workers. In percentage terms, this is equivalent to 20% more formations, which can be viewed as significant. These results are consistent with the hypotheses that the presence of support structures and the presence of other new co-operatives increase formation rates. The results from specification (1) do not indicate that the formation of co-operatives would be related to demand growth: the coefficient of the proxy for it (population growth) is actually positive, although insignificant. There is no indication that the formation of co-operatives would be related to industrial structure, population density or the presence of other firms.

In the second column of Table 3 I report the determinants of worker co-operatives. Consistent with prior expectations, the coefficient for unemployment is positive and statistically significant. Other coefficients are also similar to the case of co-operatives in general, although the presence of advisory services is now significant at a 1% level (instead of 10%), and the estimated marginal effect is actually larger than for co-operatives in general. While the mean of worker co-operatives established is 0.036 per 1000 persons in the labour force, the presence of specialized advisory services increases this number by 0.017, or almost 50 per cent. This suggests that advisory services matter mostly for worker co-operatives rather than other types of co-operatives. This may be because worker co-operatives are still fairly uncommon, and general entrepreneurial advisory agencies do not usually give advice on their formation; rather, specialized agencies are required. In

contrast, co-operative density in the area does not receive a significant coefficient in this specification.

The third specification is for conventional firm entry. The coefficients relating to unemployment and demand growth are rather different than in the case of co-operative firms. The coefficient for unemployment is negative and significant at the 10% level. However, the size of the coefficient is still fairly small, being only slightly over 1% of the average of firms formed. The sign of the coefficient is contrary to most previous studies that found either a positive or zero coefficient for unemployment. However, the negative sign is consistent with recent research of Santarelli et al. (2009) on Italy.¹⁸ The coefficient of demand growth is positive and significant (at the 5% level), which is consistent with most previous studies, including Reynolds et al. (1994). A one percentage point increase in population growth is associated with 0.39 more firms formed per 1.000 workers. For the other coefficients, the correlation with the density of small firms is positive and significant, and the coefficient of workforce in manufacturing firms is negative and significant. Both of these results are consistent with prior expectations. Other variables are not statistically significant.

[TABLE 3 AROUND HERE]

As discussed earlier, the measure of co-operative density may be problematic. For robustness check, I estimated the same regression equations without the measure of co-operative density. This did not change the results in any discernible way; unemployment remained significant in every regression.¹⁹

For comparison, I report in the Appendix the results derived from the random effects Tobit model. Compared to the cross-sectional specifications, these also utilize information from the variation of independent variables over time. The results are very similar with respect to the main variables: both for co-operatives in general and for worker co-operatives the coefficient of

¹⁸ Similar to Santarelli et al. (2009), the measure is gross entry of firms, not net entry.

¹⁹ The results are available upon request.

unemployment is positive. Advisory services receive a positive coefficient in the specification for worker co-operatives. Finally, the results for conventional firm entry are similar to the cross-sectional models, including a negative and significant coefficient for unemployment, and a positive and significant coefficient for population growth.

In further robustness checks I used growth of per capita income as a proxy for demand growth. In unreported regressions I found that the results were similar to the reported results: Unemployment received a positive and significant coefficient for both specifications of co-operative entry, as well as a negative and significant coefficient for conventional firm entry.

7. Conclusions

The current economic and financial crisis may lead into the escalation of unemployment problem and requires new and innovative solutions. Promoting and maintaining organizational diversity, including co-operatives, may be one component in solving these problems. In this situation it is relevant to note that much of the earlier literature on the entry of co-operatives was motivated by the oil crisis of the 1970s and whether co-operatives could make a difference. Unfortunately, the results at that time remained rather mixed. While some scholars found support for the hypothesis that co-operatives emerged as a response to unemployment, other researchers found no such evidence. Recently, new papers have emerged that have improved the state of the literature by being able to compare the determinants of entry between co-operatives and conventional firms. However, few studies have still been able to use panel data and none of the earlier papers have been set explicitly in a regional context. The contribution of this paper is to apply the approach of regional entrepreneurship literature to the formation of co-operatives. Most importantly, I was able to utilize regional variation in unemployment rates and population growth in Finland in explaining the creation of co-operatives, and compare it to the formation of conventional firms.

The catalyst of the recent wave of co-operative formation in Finland was the severe economic recession of the early 1990s. The formation wave provides a good testing ground for several hypotheses presented in the literature. The results indicate that the formation rate of co-operatives is higher in areas characterized by high unemployment. This suggests that becoming unemployed may be an important motivation to join a co-operative, and consistent with the argument of unemployment being a “push” factor for entrepreneurship. Furthermore, it is interesting this research has shown a negative relationship between unemployment and conventional firm formation. A further difference between the formation of co-operatives and conventional firms is that the formation of conventional firms correlates positively with demand growth (measured by population growth), whereas no significant correlation exists between demand growth and the formation of co-operatives. Therefore, co-operatives’ formation appears to be related to adverse economic conditions, whereas the formation of conventional firms is accelerated by buoyant economic conditions. Taken together, this result suggests that co-operatives may have a useful role in solving the unemployment problems associated with economic recessions, especially since conventional firms may not been able to absorb all unemployment workers due to their procyclical formation tendency.

Another factor that explains the formation of co-operatives is the existence of specialized advisory services. This relationship is especially strong for worker co-operatives. This may be due to the fact that worker co-operatives, unlike co-operatives in general in Finland, are a relatively new and unusual form of enterprise. Therefore especially the formation of worker co-operatives may require specialized advisory services. This result indicates that the formation of co-operatives can be influenced by public policy measures. Specialized advisory services are likely to be necessary to boost the formation of co-operatives, because many general regional entrepreneur agencies may not have enough expertise on co-operatives to give high-quality advice on this topic.

There is also evidence that, consistently with much prior research on density dependence among co-operatives, the existence of other co-operatives is positively related to co-operative entry. However, this latter result does not hold for worker co-operatives, neither does it stand in the panel (random effects) specification. This may also be due to the measurement problems regarding the variable of co-operative density.

The finding that co-operatives are set up disproportionately in regions with high unemployment suggests that co-operatives may be useful in alleviating the problem of unemployment in such regions. It should be considered whether the promotion of co-operatives should be targeted especially to regions with high unemployment. However, it would be necessary to conduct further research on the growth and survival of co-operatives compared to conventional firms in regional level to be able to draw firmer policy conclusions. This study did not aim to produce any quantitative estimations on how effective co-operatives are in alleviating unemployment. Even though the formation rates of co-operatives in Finland since the mid-1990s have been comparatively high internationally, these rates are still rather small compared to conventional firms. However, co-operatives are much larger at their inception, usually consisting of 7-10 entrepreneurs, instead of one as is typical with conventional firm entry.

An interesting further addition to the literature would be to study the formation of co-operatives at the individual level. One could contrast the characteristics of entrepreneurs who choose to join co-operatives with those who form conventional firms or those who become self-employed. This would also provide more direct evidence of the role of unemployment in co-operative formation.

References

- Arando, Saioa, Inaki Pena and Ingrid Verheul (2009): 'Market Entry of Firms with Different Legal Frameworks: An Empirical Test of the Influence of Institutional Factors', *International Entrepreneurship Management Journal* 5(1): 77-95.
- Armington, Catherine and Zoltan J. Acs (2002): 'The Determinants of Regional Variation in New Firm Formation', *Regional Studies* 36: 33-45.
- Audretsch, David B. and Zoltan J. Acs (1994): 'New Firm Startups, Technology, and Macroeconomic Fluctuations', *Small Business Economics* 6 (6): 439-49.
- Audretsch, David B. and Michael Fritsch (1999): 'The Industry Component on Regional New Firm Formation', *Review of Industrial Organization*, 15: 239-52.
- Ben-Ner, Avner (1988): 'Comparative Empirical Observations on Worker-Owned and Capitalist Firms', *International Journal of Industrial Organization*, 6 (1): 7-31.
- Birchall, Johnston and Lou Hammond Ketilson (2009): *Resilience of the Co-operative Business Model in Times of Crisis*, Geneva: International Labour Organization.
- Borzaga, Carlo, Sara Depedri and Ermanno Tortia (2010): 'The Growth of Organizational Variety in Market Economies: The Case of Social Enterprises', Euricse Working Paper 3 / 10, University of Trento.
- Borzaga, Carlo and Ermanno Tortia (2006): 'Worker Motivation, Job Satisfaction, and Loyalty in Public and Nonprofit Social Services', *Nonprofit and Voluntary Sector Quarterly*, 35(2): 225-48.
- Bowles, Samuel and Herbert Gintis (1993): 'The Democratic Firm: An Agency Theoretic Evaluation', in Samuel Bowles, Herbert Gintis and Bo Gustafsson (eds.): *Markets and Democracy: Participation, Accountability and Efficiency*, Cambridge, UK: Cambridge University Press.
- Carree, Martin A. (2002): 'Does Unemployment Affect the Number of Establishments? Regional Analysis for US States', *Regional Studies* 36(4): 389-98.
- Conte, Michael A. (1986): 'Entry of Worker Co-operatives in Capitalist Economies', *Journal of Comparative Economics*, 10(1): 41-7.
- Conte, Michael A. and Derek C. Jones (1991): 'On the Entry of Employee-Owned Firms: Theory and Evidence from US Manufacturing Industries, 1870 – 1960', Hamilton College Working paper 91 / 5.
- Dow, Gregory K. (2003): *Governing the Firm: Workers' Control in Theory and Practice*, Cambridge, UK: Cambridge University Press.
- Dunn, Thomas and Douglas Holtz-Eakin (2000): 'Financial Capital, Human Capital, and the Transition to Self-Employment: Evidence from Intergenerational Links', *Journal of Labor Economics* 18(2): 282-305.
- Ellerman, David P. (1990): *The Democratic Worker-owned Firms*, Boston, MA: Unwin Hyman.

- Estrin, Saul (1985): 'The Role of Producer Co-operatives in Employment Creation', *Economic Analysis and Workers' Management* 19(4): 345-84.
- Evans, David S. and Boyan Jovanovic (1989): 'An Estimated Model of Entrepreneurial Choice Under Liquidity Constraints', *Journal of Political Economy*, 97(4): 808-27.
- Fritsch, Michael and Alexandra Schroeter (2011): 'Why Does the Effect of New Business Formation Differ Across Regions?', *Small Business Economics* 36(3): 383-400.
- Gagliardi, Francesca (2009a): 'Financial Development and the Growth of Cooperative Firms', *Small Business Economics* 32(4): 439-64.
- Gagliardi, Francesca (2009b): 'Banking Market Structure, Creation and Activity of Firms: Early Evidence for Cooperatives in the Italian Case', *Annals of Public and Cooperative Economics* 80(4): 605-40.
- Gide, Charles (1922) *Consumer's Co-operative Societies*. New York: Alfred A. Knopf.
- Halary, Isabelle (2006): Co-operatives in Globalization: The Advantages of Networking, *Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, 9: 237-64.
- Hamilton, Barton H. (2000): 'Does Entrepreneurship Pay? An Empirical Study on the Returns on Self-Employment', *Journal of Political Economy*, 108(3): 604-31.
- Hannan, M.T. and J. Freeman (1989): *Organizational Ecology*, Cambridge, MA: Harvard University Press.
- Hansmann, Henry (1996): *The Ownership of Enterprise*, Cambridge, MA: Belknap.
- Jones, Derek C. and Panu Kalmi (2009): 'Trust, Inequality and the Size of Co-operative Sector: Cross-country Evidence', *Annals of Public and Co-operative Economics* 80(2): 165-95.
- Kangasharju, Aki (2000): 'Regional Variations in Firm Formation: Panel and Cross-Section Data Evidence from Finland', *Papers in Regional Science*, 79 (4): 355-73.
- Karjalainen, Mauno-Markus (2009): 'Osuuskunta jakaa myös riskit tehokkaammin', *Osuustoiminta* 101(4).
- Keeble, D. and S. Walker (1994): 'New Firms, Small Firms and Dead Firms: Spatial Patterns and Determinants in the United Kingdom', *Regional Studies* 28: 411-27.
- Kiander, Jaakko and Pentti Vartia (1996): 'The Great Depression of the 1990s in Finland', *Finnish Economic Papers*, 9 (1): 72 – 88.
- Kihlstrom, Richard E. and Jean-Jacques Laffont (1979): 'A General Equilibrium Entrepreneurial Theory Based on Risk Aversion', *Journal of Political Economy*, 87(4): 719-48.
- Kim, Philip H., Howard E. Aldrich and Lisa E. Keister (2006): 'Access (Not) Denied: The Impact of Financial, Human and Cultural Capital on Entrepreneurial Entry in the United States', *Small Business Economics*, 27(1): 5-22.

- Perotin, Virginie (2004): 'Early Cooperative Survival: The Liability of Adolescence', *Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, 8, 67-86.
- Perotin, Virginie (2006): 'Entry, Exit and the Business Cycle: Are Cooperatives Different', *Journal of Comparative Economics*, 34 (2): 295 – 316.
- Pestoff, Victor (2009): 'Towards a Paradigm of Democratic Participation: Citizen Participation and Co-Production of Personal Social Services in Sweden', *Annals of Public and Co-operative Economics*, 80(2): 197-224.
- Podivinsky, Jan M. and Geoff Stewart (2007): 'Why is Labour-Managed Firm Entry So Rare? An Analysis of UK Manufacturing Data', *Journal of Economic Behavior & Organization*, 63(1): 177-92.
- Reynolds, Paul, David J. Storey and Paul Westhead (1994): Cross-national Comparisons of the Variation in New Firm Formation Rates', *Regional Studies*, 28 (4): 443 – 456.
- Ritsilä, Jari and Hannu Tervo (2002): 'Effects of Unemployment on New Firm Formation: Micro-Level Panel Data Evidence from Finland', *Small Business Economics* 19: 31 – 40.
- Russell, Raymond and Robert Hanneman (1992): 'Cooperatives and the Business Cycle: The Israeli Case', *Journal of Comparative Economics*, 16: 701 – 715.
- Santarelli, Enrico, Martin Carree and Ingrid Verheul (2009): 'Unemployment and Firm Entry and Exit: An Update on a Controversial Relationship', *Regional Studies* 43(8): 1061-73.
- Simons, Tal and Paul Ingram (2004): 'An Ecology of Ideology: Theory and Evidence from Four Populations', *Industrial and Corporate Change*, 13(1): 33 – 59.
- Smith, Stephen C. (2003): Theory and Comparative Case Studies of Mondragon and La Lega with Implications to Developing and Transition Economies, in Laixiang Sun (ed.): *Ownership and Governance of Enterprises*, London: Palgrave MacMillan, 202-42.
- Staber, Udo (1989): 'Organizational Foundings in the Cooperative Sector of Atlantic Canada: An Ecological Perspective', *Organization Studies* 10(3): 381 – 403.
- Staber, Udo (1993): 'Worker Co-operatives and the Business Cycle: Are Co-operatives the Answer to Unemployment?', *American Journal of Economics and Sociology*, 52(2): 129-143.
- Storey, David (1991): 'The Birth of New Firms: Does Unemployment Matter?', *Small Business Economics*, 3: 167 – 78.

TABLES

Table 1: Co-operative formation total, by year

Year	Infrastructure co-operatives	Worker co-operatives	Other co-operatives	All
1988	18	3	15	34
1989	36	1	15	52
1990	55	0	21	76
1991	58	1	13	72
1992	43	1	13	57
1993	42	4	21	67
1994	33	25	17	75
1995	25	61	39	125
1996	28	84	60	172
1997	28	153	74	255
1998	37	129	98	264
1999	30	112	79	221
2000	52	135	73	260
2001	29	61	41	131
2002	37	72	33	142
2003	86	84	72	242
2004	60	99	41	200
2005	55	90	40	185
Total	752	1115	765	2632

Source: National Board of Patents and Registrations of Finland, author's calculations

Table 2: Summary statistics

Variable	Mean	Standard deviation	Minimum	Maximum
Co-operatives formed / 1,000 persons in labour force	0.075	0.095	0	0.657
Worker co-operatives formed / 1,000 persons in labour force	0.039	0.060	0	0.386
Conventional firms formed / 1,000 persons in labour force	9.06	2.39	4.14	31.33
Unemployment rate, %	16.37	5.60	1.66	32.94
Population growth, %	-0.44	0.95	-3.88	3.15
Proportion of agricultural workforce, %	11.98	7.75	0.16	37.93
Proportion of manufacturing workforce, %	20.50	8.23	1.89	41.86
Number of establishment relative to 1,000 income earners	55.43	8.94	35.60	96.18
Population density (inhabitants / square kilometre)	46.57	166.93	0.51	1279.91
Number of co-operatives relative to 1,000 income earners	0.26	0.23	0	1.51
Presence of co-operative advisory services	0.24	0.43	0	1

Table 3: The determinants of formation of co-operatives and conventional firms, Tobit cross-sectional estimates

	(1) Co-operatives formed per 1,000 persons in labour force	(2) Worker co-operatives formed per 1,000 persons in labour force	(3) Conventional firms formed per 1,000 persons in labour force
Unemployment rate	0.0083*** (0.0023) [0.0054]	0.0056*** (0.0021) [0.0026]	-0.115* (0.062)
Population growth	0.011 (0.0079) [0.0070]	0.011 (0.0084) [0.0052]	0.386** (0.154)
Agricultural population	0.00086 (0.0013) [0.00056]	-0.0012 (0.0011) [-0.00058]	0.012 (0.023)
Manufacturing population	-0.00039 (0.00099) [-0.00026]	-0.00057 (0.00080) [-0.00027]	-0.060*** (0.021)
Establishments / income earners	0.00075 (0.00072) [0.00049]	-0.00064 (0.0010) [-0.00027]	0.110*** (0.026)
Population / square kilometre	0.000012 (0.00034) [0.00]	0.000022 (0.000031) [0.000011]	-0.00028 (0.0016)
Co-operatives / income earners	0.085* (0.047) [0.055]	0.021 (0.036) [0.010]	1.063 (0.700)
Co-operative advisory services	0.022* (0.012) [0.015]	0.034*** (0.010) [0.017]	0.193 (0.124)
F-statistic	7.08***	4.77***	44.13***

Notes:

- 1) The cells give parameter coefficients, standard errors (in round brackets) and the marginal effect on the dependent variable.
- 2) Standard errors have been corrected for region-level clustering.
- 3) Significance levels: *** 1%; ** 5%; * 10%.
- 4) All explanatory variables have been lagged by one year.
- 5) The model includes year dummies.

Appendix: The determinants of formation of co-operatives and conventional firms, Tobit random effects estimates

	(1) Co-operatives formed per 1,000 persons in labour force	(2) Worker co-operatives formed per 1,000 persons in labour force	(3) Conventional firms formed per 1,000 persons in labour force
Unemployment rate	0.0091*** (0.0021) [0.0058]	0.0066*** (0.0018) [0.0031]	-0.081*** (0.027)
Population growth	-0.016 (0.095) [-0.010]	0.0064 (0.0078) [0.0030]	0.360*** (0.095)
Agricultural population	0.00074 (0.0013) [0.00048]	-0.0013 (0.0011) [-0.00059]	0.041** (0.018)
Manufacturing population	-0.0014 (0.0011) [-0.00087]	-0.00080 (0.00089) [-0.00037]	-0.043*** (0.016)
Establishments / income earners	0.00040 (0.0010) [0.00026]	-0.00057 (0.00085) [-0.00027]	0.099*** (0.014)
Population / square kilometre	0.000011 (0.000051) [0.00]	0.000019 (0.000040) [0.00]	0.00066 (0.00080)
Co-operatives / income earners	-0.064 (0.047) [-0.041]	-0.038 (0.032) [-0.018]	0.740** (0.365)
Co-operative advisory services	0.015 (0.012) [0.0099]	0.027*** (0.010) [0.014]	0.100 (0.121)
Wald Chi2	125.21***	88.81***	1003.94***

Notes:

- 1) The cells give parameter coefficients, standard errors (in round brackets) and the marginal effect on the dependent variable.
- 2) Significance levels: *** 1%; ** 5%; * 10%.
- 3) All explanatory variables have been lagged by one year.
- 4) The model includes year dummies.