Institutional Complementarities in the performance of UK and French Cooperative Firms:

A Comparative Analysis

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Abstract

This thesis attempts to identify institutional arrangements that allow cooperative firms to overcome the underinvestment problem identified in the theoretical literature. The comparative institutional analysis focuses on internal and external financial arrangements that provide cooperative firms with equity and debt capital respectively, and is conducted in two different institutional environments, the UK and France. In each context, cooperative firms are separated into successful and struggling forms, depending on their performance, as captured in their turnover, size and dissolution rates. Using the concept of institutional complementarities, the empirical investigation examines the effects of internal and external financial arrangements on the creation and growth of the successful and struggling cooperative firms in the UK and France. Annual regional entry flows are used for the entry models for the periods 2005-2015 and 2006-2014 respectively for the UK and France. Firm-level panel data are used for the growth models for the periods 2008-2016 for the UK and 2007-2016 for France.

The findings regarding the effect of external financial arrangements on the growth of cooperative firms are consistent with previous studies on Italian cooperatives, which indicate that the growth of cooperative firms is greater in provinces with relatively higher local financial development. The finding regarding the effects of internal financial arrangements on the growth of cooperatives also align with propositions derived from the literature on the hybridization of cooperative firms, which shows that the integration of features of capitalist firms into traditional cooperative forms has helped these firms mitigate some of their chronic problems and increased their chances of survival. Cooperative firms that are able to reach high hybridization levels are successful because they overcome the underinvestment problem by the utilization of internal financial arrangements, while

cooperative firms that present low hybridization levels are much more dependent on supportive external financial arrangements and tend to struggle. Furthermore, this research contributes to the literature by providing evidence for the importance of the development of the legislative framework around worker cooperative firms.

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1 Introduction

Nowadays, cooperative firms[1] seem to establish their economic influence in many economies throughout the world, while in addition to their economic contribution in world's economy, they are important in development context as well. According to the 2017 World Co-operative Monitor report, when looking at a sample of 2,379 cooperative firms using data from 2015, 1,436 of them exceed $100 million in turnover, while the top 300 firms form an aggregate turnover of $2,164.23 billion for 2015. In several economies, cooperative firms are observed to be a lever for decreasing poverty, increasing social welfare, and supporting community health (Pérotin 2013; Herbel et al. 2015), by increasing their members' income, supporting collective agreements, and giving focus on local communities. Two outstanding cases based on their rich cooperative history, their current strong cooperative sectors, and the different characteristics of their institutional environments, are the UK and France. Cooperative sectors in both these countries are traced back to the 19th century and have grown through the years, acquiring currently a significant place in these countries' economies, while they are characterized by different types of

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[1] In economics terms, the traditional form of cooperative firm is defined as the organization in which one membership corresponds to one vote against the traditional capitalist firm in which one share corresponds to one vote (Hansmann 2013). Between these two poles, there are several organizational forms which are considered as cooperative firms, even though they have deviated from the traditional model. Thus, by cooperative firm, this research refers to the organization which is considered to be jointly owned and democratically controlled by its members, since this definition includes both traditional and non-traditional cooperative forms.

market systems and legal frameworks (Hall and Soskice 2001). In the UK – where competitive market structures and common law system coexist – the cooperative sector has achieved an annual turnover of over £30 billion in each of the last five years until 2015, with the number of cooperative firms exceeding 6,500, and memberships exceeding 13 million in 2017 (Cooperatives UK surveys 2017). In France – where non-market relationships structures and civil law system coexist – more than 22,000 cooperative firms are reported to exceed €306.9 billion in turnover for 2014, with 26 million members (Coop FR survey 2016).

The topic regarding the efficient performance of cooperative firms within different countries has already been discussed extensively in the literature and has been object of some dispute in comparative and new institutional economics (Furubotn 1976; Jensen and Meckling 1979; Williamson 1980; Bonin et al. 1993; Dow 2003). However, there are still contradictions between pessimistic theoretical predictions for the inefficient operation of cooperative firms and the empirical evidence providing insights for the successful operation of several cooperative firms, which need to be furtherly examined.

1.1 The Empirical puzzle

Within the economics of organization literature, the prevailing view is that the organizational form of the cooperative firm is a relatively inefficient form, compared to its capitalist competitors, because of its peculiar property rights structure (Furubotn 1976; Jensen and Meckling 1979; Williamson 1980). This peculiarity arises from the nature of cooperative firms, which focus on the joint ownership and democratic control of the firm by its members. Because of the inefficiencies that are associated with joint ownership and control, cooperative firms are expected to make up a small percentage of a nation's total

economic activity and operate at a small-scale of production over the long term. Although there are a considerable number of researchers that reject the ex-ante superiority of the capitalist firm (Putterman 1984; Ben-Ner and Jones 1995; Dow 2003), the prevailing view in the economics literature proposes that disadvantages of cooperative firms, which arise from the joint ownership and control, lead to inevitable free-riding, which results in chronic underinvestment. In addition, the risk for external investors and potential lenders is increased because of the property rights structure of cooperative firms that restricts shareholders' control over their investments. Furthermore, members of cooperative firms, which are close to the traditional cooperative model, are limited as to how diversified their investments can be. These issues, in addition to the potentially low initial capital endowments of the members (Bowles and Gintis 1994), create a critically unfavourable financial environment for cooperative firms. This unfavourable financial environment limits the capital resources and investments of the firm and, by extension, negatively affects the entry and growth of these type of firms.

Against the pessimistic theoretical predictions, cooperative firms are observed to be a sustainable organisational form, which thrives in several sectors and countries (Bonin et al. 1993; Fakhfakh et al. 2012; Zamagni 2012). In addition to these empirical researches, according to the 2017 World Co-operative Monitor report, the top 300 cooperative firms are considered to have enough internal and external finance to support their sustainable growth, something which is depicted in the high value of the turnover they achieve. Relative to the whole world economy, the sum of the cooperative firms and the social economy is reported to contribute around 7% of the world's GDP and employment (Schwettmann 2014). At the same time, agricultural cooperatives are reported to market more than 50% of the world agricultural output (Bibby and Shaw 2005).

However, according to the 2017 World Co-operative Monitor report, when looking at smaller cooperative firms, issues arise regarding access to internal capital and long-term debt. These two financial restrictions create barriers for these small cooperative firms to enter the market and grow, not to mention sustaining their growth levels. Although, the problematics raised in the report refer mainly to the size of these cooperative firms, size on its own cannot explain much without looking at the reasoning behind the sustainability of these small sizes. For example, Cook and Chaddad (2004) explain the survival and thriving of agricultural cooperatives through a hybridisation process that cooperative firms follow, which allows them to seek capital more efficiently. This hybridisation process refers to the changes implemented by cooperative firms in their protype characteristics, so that some of their features approach these of capitalist firms and, by extension, allow them to be more flexible in financing their operation (Chaddad and Iliopoulos 2013). Thus, several other qualitative characteristics of cooperative firms need to be considered regarding their effects on the operation of cooperative firms, as well as the characteristics of the economies in which these organisations operate. The discordance between reality and theoretical predictions and the differentiations within the cooperative sector call for an in-depth investigation of the reasons that have allowed several types of cooperative firms to operate on such a large scale and play a significant role in the economic activity, and others to struggle and operate on smaller scales.

1.2 Research Questions

Against the backdrop of these discordances and differentiations, this research proposes a comparative institutional analysis for the investigation of the factors that have allowed cooperative firms to operate on such large economic scales in the UK and France. This

comparative analysis examines the interaction between several types of cooperative firms and institutional arrangements within the different institutional environments of the UK and France for the periods 2008-2016 and 2007-2016 respectively for the growth models, and for the periods 2005-2015 and 2006-2014 respectively for the entry models.

This research hypothesises that the solution fundamentally depends on the development of institutional arrangements, which support financially cooperative firms and allowed cooperative firms to access capital faster, more efficiently, and at lower costs. More precisely, a set of institutional arrangements will be examined, and the extent to which institutional complementarities play an explanatory role will be assessed. Briefly, the concept of institutional complementarities is grounded in the idea that the coexistence of specific institutional arrangements within certain institutional environments create multiple and unique equilibria for the operation of different types of organizational forms. In this sense, equilibria, which would otherwise seem inefficient or unsustainable, can now exist and be successful. The institutional complementarities approach employed by this research is Aoki's (2001) approach, which understands the aforementioned equilibria as not necessarily Pareto-optimal and Pareto-rankable. The preference on the definition of Aoki (2001) is based on the fact that this research intents to examine the effectiveness of the interdependencies between specific organizational forms and specific institutional arrangements. In this way, interdependencies should be allowed to arise as either positive or negative, and this is something that only Aoki's (2001) approach allows. In the work of Gagliardi (2009), for example, who explored the institutional complementarities between local financial development and cooperative firms in Italy, greater local financial development was showed to facilitate the growth of cooperative firms more than the growth of non-cooperative firms, suggesting a positive complementarity between local financial development and the growth of cooperative firms. Following the logic of Gagliardi (2009),

this research attempts to explore the complementarities between the performance of cooperative firms within the institutional environments of the UK and France, and specific internal and external financial institutional arrangements. By internal financial arrangements (i.e. shareholders' funds growth), this research refers to institutional arrangements that enable cooperative firms to raise capital in the form of equity, while by external financial arrangements (i.e. local financial development, building societies' loans, cooperative banks' loans, credit unions' loans) this research refers to institutional arrangements that enable cooperative firms to raise capital through debt. This distinction allows for the examination of the different levels of difficulties that cooperative firms are facing when raising equity and debt capital. Moreover, an additional dimension added concerns the distinction between successful and struggling cooperative firms. In the first category agricultural and retailers enterprise cooperatives, employee trusts, and retail consumer cooperatives are included, while the cooperative form representing struggling cooperatives is worker cooperatives. This distinction is based on the performance of each cooperative form in turnover, and on its sustainability rate in the UK and France. The reason for the categorisation of different cooperative forms into successful and struggling occurred for examining the different levels of difficulties that different cooperative forms face when accessing equity and debt capital.

The aforementioned analysis of cooperative firms will occur through the examination of both entry and growth models for the UK and France. This comparative analysis will look at the interdependences between institutional arrangements and different cooperative organisational forms in the UK and France. More specifically, whether, and to what extent, different types of cooperative firms are dependent on institutional arrangements for accessing equity and debt capital. Analytically, the research questions that this thesis investigates are the following:

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i.   Whether, and to what extent, the growth of struggling cooperative firms depends on equity capital compared to the growth of successful cooperative firms in the UK and France. In other words, whether there are complementarities between internal financial arrangements and the growth of successful and struggling cooperative firms in the UK and France.

ii.   Whether, and to what extent, the creation and growth of struggling cooperative firms depends on debt capital compared to the creation and growth of successful cooperative firms in the UK and France. In other words, whether there are complementarities between external financial arrangements and the creation and growth of successful and struggling cooperative firms in the UK and France.

1.3 Findings

The core idea of the results of this research is that successful and struggling cooperative firms indeed differ, and, as a result, cooperative firms should not be studied as one group of firms altogether. Instead, focus should be given on the organizational characteristics, of each type of cooperative firm, that affect the interdependencies between these cooperative firms and the other institutional arrangements with which they coexist. This study has focused on the ways in which different cooperative forms access equity and debt capital in order to deal with the underinvestment problem hypothesized in the theoretical literature of cooperative firms.

The main findings derived from the econometric analysis of the UK and French data show that regarding the internal financial arrangements, and more specifically shareholders' funds growth, there is a negative complementarity between the effect of internal financial

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arrangements on the growth of cooperative firms and the struggling cooperatives in the UK and France. This result shows that struggling cooperatives depend less on internal financial arrangements for boosting their growth rates when compared to successful cooperatives. This seems to suggest that struggling cooperative firms have difficulties in accessing and developing internal financial arrangements in order to overcome the underinvestment problem.

When looking at the interactions between external financial arrangements and cooperative firms' performance, the results are not as straightforward as in the case of internal financial arrangements. Firstly, when looking at the entry of the UK cooperative firms, there are both positive and negative complementarities between the effects of external financial arrangements on the entry of UK cooperative firms and the struggling cooperative firms. Positive complementarities prevail in the case of credit unions' loans, showing that struggling cooperative firms are more dependent on credit unions' loans during their entry process compared to successful cooperative firms, while negative complementarities arise in the cases of local financial development showing that struggling cooperative firms are less dependent on this institutional arrangement during their entry process compared to successful cooperative firms. On the other hand, in the entry models for the French case, some external financial arrangements were found to exert a negative effect on the entry of successful cooperative firms while some others displayed a positive impact on the struggling cooperative firms. More specifically, the entry of agricultural enterprise cooperatives shows a tendency to negatively depend on local financial development, while the entry of worker cooperatives is positively dependent on cooperative banks' loans.

In the growth analysis for both the UK and France, the results regarding the complementarities that arise are clearer. In most of the cases in the UK, the complementarities between the effects of external financial arrangements on the growth of

cooperative firms and the struggling cooperative firms are positive, showing that struggling cooperative firms are more dependent on debt for boosting their growth compared to successful cooperative firms. However, there are a few specifications where some of these complementarities are negative. In the case of France, a similar picture is presented where, in the majority of the specification, the complementarities between the effects of external financial arrangements on the growth of cooperative firms and the struggling cooperative firms are positive, while in one specification these complementarities are negative.

The differentiations in the complementarities are explained by the different characteristics of the external financial arrangements that this research examines. More specifically, some external financial arrangements are considered favourable to cooperative firms because of some characteristics of their lending criteria, while others are considered statutory supportive to cooperative firms. This distinction sometime may have differentiated the interactions between these external financial arrangements and different types of cooperative firms, both at the entry and growth levels.

Regarding the cross-country differences, it has already been stated that, in the case of internal financial arrangements, there is widespread agreement. For the external financial arrangements in the entry models, stronger complementarities arise in the UK, while France presents weak or no signs of complementarities. In the growth models, the majority of specifications in both countries agree for the positive complementary role of external financial arrangements on the growth of struggling cooperative firms. The discordances that exist in a few specifications need further theoretical and empirical research for their complete explanation and understanding.

Finally, the complementarities in the UK are presented as more consistent and frequent compared to the case of France. One of the factors for this behaviour may be the fact that in France, there is a more developed legislative framework around cooperative firms compared

to the UK, which could, in some cases and up to a point, bridge the gap between successful and struggling cooperative firms.

The identification of institutional arrangements that are supportive of the operation of cooperative firms could provide useful insights to promoters of the cooperative sector regarding the reasoning behind the sustainability of cooperative firms and regarding the process of hybridisation that cooperative firms have to follow in the UK and France in order to survive and grow. However, the results should be carefully considered, since the framework of institutional complementarities is based on the idea of the uniqueness of each institutional equilibrium, and thus there is no a priori reason to assume that institutional transplants will produce similar results in different contexts. Nevertheless, there is good reason to believe that the complementarities between cooperative firms and the financial institutional arrangements identified in this research could improve our understanding of the performance of these types of firms in other contexts as well.

1.4 Thesis Structure

The rest of this research is structured as follows. Chapter 2 provides a detailed presentation of the theoretical and empirical literature regarding the debate for the efficiency of the cooperative firm, and the importance of institutional analysis. In Chapter 3, the methodology through which the cooperative firms of interest in the UK and France were identified is presented, the theoretical framework with which these firms are analysed is developed, and the hypotheses of this research are demonstrated. Chapter 4 illustrates the econometric models used in the empirical work, by providing the econometric specifications of the entry and growth models, and by presenting the data analysis, description, and summary statistics. Chapter 5 presents the results of the econometric analysis for the entry and growth models

for both the UK and France. In Chapter 6, the results of this research are summarized and extensively discussed regarding their economic importance, and the comparative analysis between the results observed in the UK and France is developed. Finally, Chapter 7 concludes and provides information about the limitations of this research and potential further research developments around the topic of this thesis.

2 Literature Review

In this chapter, the existent literature around cooperative will be discussed. More specifically, section 2.1 will look at the origins of the debate regarding the relative efficiency of cooperative firm compared to the capitalist firm. Section 2.2 looks at the evolution of this debate through new institutional economics, where focus is given to issues related with the property rights structure of cooperative firms. More specifically, the issues that are identified in the literature and discussed in section 2.2 are: the free rider problem, the horizon problem, the common property problem, the non-transferability problem, the principal-agent problem, members' risk aversion, and marker costs. Many of these of issues combined compose the underinvestment problem for cooperative firms. In section 2.3, a review of a specific part of the corporate finance literature is presented. This part discusses the importance for firms accessing equity capital compared to debt capital for their investments, and the problematics that are created in cases where debt finance considerably exceeds equity finance in a firm. Having identified the problematics that arise in the theoretical literature, section 2.4 examines the results of the existent empirical works around cooperative firms. These works propose that features of cooperative firms related to employment, productivity and business cycle adjustments, provide these types of firms with advantages that counteract some of their disadvantages against capitalist firms, and allow them to survive and operate in several countries and sectors. However, most of the empirical literature focuses on features that cooperative firms have embraced in order to survive disregarding their underinvestment problem, instead of dealing with it. Recent developments in organizational and institutional economics provide explanations regarding

the ways that cooperative firms have found in order to overcome some of their property rights issues and manage their underinvestment problem. These developments are discussed in section 2.5 and include approaches discussing hybridization processes of cooperative firms, macro-level complementarities between cooperative firms and the characteristics of the institutional environments in which they operate, and micro-level complementarities between cooperative firms and other institutional arrangements with which they interact.

2.1 Origins of the Debate

The first part of this chapter discusses the literature that debates whether the conventional firm is superior to the cooperative firm. The roots of this dispute trace back to the comparative economic systems debate about the relative merits of capitalism and socialism. Ward (1958) attempted to shift the centre of attention to Market Syndicalism, a system which is similar to the Yugoslavian worker cooperative of that time. The Yugoslavian worker cooperative was in its base a traditional worker cooperative, but without autonomy in its pricing system, and with State participation in the decision-making. This analysis comes as a response to the rejection of the efficiency of the centralized economy, and as an alternative for implementing democracy in workplace.

According to Ward (1958), worker cooperatives face a framework of perfect competition within which the dividend of each worker is maximized by producing only one product. The main conclusion of this analysis is that the output level supplied by worker cooperatives is inversely related to changes in the price of the output and positively related to the changes in fixed costs. It is through this analytical framework that the idea that an increase in demand reduces employment and does not achieve Pareto-efficient allocation of resources arose. However, at the zero-profit level of output, conventional and cooperative

firms were shown to be identical and the allocation in the long-run proved to be efficient.

In addition to Ward (1958), Domar (1966) claims that if there is moderate labour shortage within a firm or freedom to hire workers for wages, then the paradox of the decrease in output and employment in the case of an increase in the price of output, disappears. Thus, the production function of worker cooperatives will be the same as that faced by conventional firms. Further analysis by Dreze (1976) shows that if the wages are the same in both worker cooperatives and capitalist firms, then their size will be the same, and therefore, when there is no market failure, worker cooperatives and capitalist firms will behave in the same way.

By contrast, Vanek (1969) discusses the relative efficiency of worker cooperatives on the basis of a microeconomics model and also defines the special dimensions of worker cooperatives, which give this type of firms economic and social advantages compared to conventional firms. In this way, a primary institutional dimension is added to the analysis of cooperative firms. These special dimensions are related to heterogeneity as an advantage of pluralism, fair income distribution, increased motivation, proper quality, and intensity of work. According to Vanek (1969), the competitive advantages of worker cooperatives, which consider the special dimensions of these types of firms, are easily applicable in small-sized firms. Although Meade (1972) agrees with Vanek (1969) that the most efficient worker cooperative size would be small, he admits that there are countervailing powers that may support the efficiency of bigger worker cooperatives. More specifically, there are cases where the cost per worker observably decreases as the size of the firm increases, while the income per worker observably increases as the size of the firm decreases. Finally, Meade (1972) concludes that the two main reasons for the scarcity of worker cooperatives are, first, the difficulty of effectively managing large numbers of workers, and the inability of workers to diversify their investment and thus lower their risk. These two factors explain why worker

cooperatives are primarily found in industries with low-risk fluctuation demand products and labour-intense industries. Further support to the issues identified in Meade's (1972) analysis, emerges from Dreze (1976), who agrees with most of the issues concerning market failures that are related to the operation of worker cooperatives (i.e. low risk diversification and stock market elimination through membership problems).

2.2 The New Institutional Economics Literature

After the 1960s, the debate discussed in the previous section was transformed and found a new place within the new institutional economics literature and the discussion on the nature of the firm. In the following subsections, the most prevalent issues discussed in the literature are presented. These issues are mainly focused on illustrating the inefficiencies of cooperative firms, when looking at their property rights structures. More specifically, conventional firms are considered to be more efficient in dealing with the free-ride problem, the principal-agent problem and the control problem. In addition, conventional firms are not facing problems that arise from the peculiar property rights structure of some cooperative forms such as the horizon problem, the common property problem, and the non-transferability problem. Finally, conventional firms are expected to bear risk more efficiently and minimise market costs when compared to cooperative firms. Altogether, these inefficiencies underpin the underinvestment problem that plagues cooperative firms and, in the literature, explain the relative scarcity of cooperative firms.

2.2.1 The Free-Rider Problem

The free-rider problem is an issue that arises in all types of firms. In general, the free-rider problem arises in situations where the exploitation of a common source occurs by an agent who uses this source more than his/her fair share or in situations where an agent offers less than his/her adequate share of cost to use this source. In the case of worker cooperatives, this problem can occur at a couple of different points: firstly, within the production process when team production is required, and secondly when investment decisions are made.

In regard to the production process, if a task is undertaken by more than one worker, then measuring the productivity of each individual becomes extremely difficult, and, as a result, workers can be tempted to shirk (Alchian and Demsetz 1972). Workers who tend to shirk on a team project at the expense of the workers who make sure the project is completed, are considered one of the aspects of the free-riding problem in cooperative firms. Within the literature, there are two main reasons why cooperative firms are unable to find a solution to this problem, and these concern managers' incentives and the wealth endowments of the members of the firm.

The role of the manager as monitor who must supervise the production process, and therefore reduce the team members' inclination to shirk, is revealed as an important aspect of the firm, according to Alchian and Demsetz (1972). While supervising the production process, the manager must observe the performance of each individual and, by extension, motivate the workers through providing incentives, different management schemes and organisational arrangements in the workplace, to maximize their productivity and reduce their inclination to shirk. The manager, in order to be motivated to run the firm efficiently, is assigned as the residual claimant of the production. In the case of worker cooperatives, while shirking in team production is minimized through horizontal monitoring, issues arise

regarding the shirking tendencies of the manager. If the manager is not the residual claimant, then he/she is unincentivized to maximize the profits of the firm, and this will result in a pareto non-optimal outcome, leaving worker cooperatives with inefficient economic results.

The second obstacle that worker cooperatives face in effectively dealing with the free-rider problem is the limited wealth endowments of workers (Holmstrom 1982). Holmstrom (1982) supports that the free-rider problem can be addressed through incentives and penalties, which require bonuses and fines, respectively. Such economic methods of enforcement require the ability of the firm to exceed or fall short of its budget targets, and as a result, limited endowments constrain the ability of the firm to apply these methods effectively. Holmstrom (1982) and Rusell (1985) support that this difficulty can be overcome by using only the bonus system in the firm. However, in order for the company to provide these bonuses, the principal of the company must be able to bear the cost of exceeding the budget. In other words, a firm could effectively deal with the free-rider problem only if the principal could absorb the difference from the targeted budget (Holmstrom 1982). This would only be possible through the separation of ownership from labour, and thus, it is difficult for worker cooperatives to overcome shirking, and by extension, the free-rider problem (Holmstrom 1982).

In defence of worker cooperatives, Russell (1985) proposes that the optimal solution for the free-rider problem could be cooperation as in worker cooperatives there is sufficient motivation for the members to cooperate with one another. Advantages include higher motivation, lower levels of supervision required, higher quality products, and limited conflict between ownership and labour (Ben-Ner 1988a). Furthermore, Elster (1989) focuses on the idea that shirking, and by extension, the free-rider problem, can be eliminated through the intense mutual monitoring of workers in a worker cooperative. The production activities, which are difficult to monitor directly, are better organised and processed in

worker cooperatives, since group incentives from profit-sharing schemes can increase the efficiency of firms at these levels (FitzRoy and Kraft 1986). Similarly, Bowles and Gintis (1993) support that participation and residual claimancy effects are correlated with increased productivity, while the mutual monitoring effect is correlated with lowered supervision costs. The drawback to these solutions is that, as the size of the firm increases, the gains from mutual monitoring and participatory management decrease (Ben-Ner 1988a). Therefore, only small worker cooperatives can exploit these advantages.

The second case where the free-rider problem is prevalent is in the financial decisions of the firm's members, and it can be viewed in two ways. Firstly, if an investment is made by a specific number of members and then new members enter the firm, without contributing the same investment, there may be issues in the calculation of the returns for each old and new member, relative to the market valuation of the stocks of a cooperative firm, and to the transferability of membership. These latter issues will be discussed extensively later in this chapter. The second situation in which the free-rider problem occurs is in the financial decisions of the firm. These problematic decisions are mainly observed in the producer cooperatives and relate to the product market prices. In the case of agricultural cooperatives, the prices that cooperative firms may be able to achieve through concentrated market power may be exploited by other non-members in the market. Through this exploitation, the incentives for new farmers to join the cooperative decrease. If the number of new members decreases, the growth of investment levels will decrease as well and, as a result, underinvestment issues will start to develop.

2.2.2 The Horizon Problem

The horizon problem is probably one of the most discussed issues relating to cooperative firms in the literature. The horizon problem prevails mainly in the case of worker cooperatives, and it is constituted as a result of a lack of long-term investments in a company, induced by the non-perpetuality of members claims in the cash flows of a firm (Jensen and Meckling 1979). When the horizon problem occurs in a cooperative firm, it embodies one of the most important components of the underinvestment problem that this type of firm can face.

More specifically, in worker cooperatives, investments are financed by members directly or by debt for which the members are liable, and members who are retiring or would like to leave the cooperative, receive payments from the firm. Thus, the decision for the horizon of an investment is affected by the time period that each worker plans to stay in the firm. Workers who do not intend to remain in the firm in the long-term, would support short-term or no investments, in contrast to workers who plan to stay in the firm in the long-run, and would prefer the best investment, even if these investments' returns are far into the future. These conflicts among members can end in inaction, which limits the investments in a directly democratic worker cooperative. Considering the high exit costs that arise from this situation, the number of members willing to join the firm would fall and, consequently, the investment levels of the firm will be even further limited. In the case of cooperative firms, and more specifically in that of worker cooperatives, this is an even larger problem because the market for membership in a cooperative firm is either weak or non-existent (Jensen and Meckling 1979). Considering the aforementioned characteristics of cooperative firms, and assuming that efficiency is positively related to the minimization of investment

distortions within a firm (Grossman and Hart 1986), cooperative firms should be considered a relatively inefficient organisational form.

Solutions to the horizon problem for cooperative firms are connected to the marketability of their memberships and to the availability of internal capital. Firstly, if the members of cooperative firms can liquidate the returns of a long-term investment through the sale of their membership, then it would be easier for them to agree to long-term investments even if they do not intend to remain in the firm for a long period of time. Consequently, the better the market for memberships, the easier it is for cooperative firms to overcome the horizon problem (Jensen and Meckling 1979). Secondly, the existence of internal capital accounts can work as a solution for the horizon problem of cooperative firms since it allows members to receive compensation when exiting the firm (Ellerman 1986).

2.2.3 The Common-Property Problem

The common-property problem relates to issues such as unsynchronised entry and exit of members of cooperative firms and the closed form of the firm. Since, in worker cooperatives, the amount of dividends received by each worker upon exit are directly affected by the returns of a project, and by the number of workers needed to complete this project, there may be cases where non-pareto optimal projects will be preferred for the sole reason that they increase the returns of fewer workers (Jensen and Meckling 1979). This issue arises mainly in worker cooperatives because in any other type of firm, the cost of an additional worker is simply wages and not dividends of the profit.

A solution to the common-property problem can be that of allowing worker cooperatives to hire non-member workers. Employed managers can decide on the level of employment flexibility in this case (Elster 1989). However, when worker cooperatives are

allowed to hire non-members, they tend to partly lose their cooperative character. Continually hiring non-member workers may also slowly alter the cooperative characteristics of the firm, until it ends up increasingly resembling and functioning as a conventional firm (Ben-Ner 1984).

2.2.4 The Non-Transferability Problem

Similar to the horizon problem, the main obstacle that cooperative firms face is the non-transferability of the members' residual claims. The difficulty of transferring memberships in a worker cooperative represents the non-transferability problem (Jensen and Meckling 1979). There is no market for employee claims, since remuneration of a membership's value is very difficult, and this affects worker cooperatives by limiting their managers' efficiency as well as members' investment diversification.

Starting with the assumption that the performance and efficiency of a manager is depicted in the market values of a membership, then, if there is no market for memberships, the manager will be unincentivized to monitor employees efficiently and push them towards high levels of productivity. Thus, non-transferability of memberships would decrease the efficiency of monitoring of management, and by extension, the efficiency of the firm's production.

Secondly, the non-marketability of memberships will disallow members to diversify their investment and force them to keep all their capital within the firm. Within the literature, there are several arguments that relate the rarity of cooperative firms with concerns about the workers' portfolio diversification (Dow and Putterman 2000). Elster (1989) considers an undiversified portfolio too costly for a firm, since it increases the uncertainty and the risks for existing and future members of worker cooperatives (Jensen and Meckling 1979).

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In fact, the inability of workers to diversify their investment has been considered a reason for observing worker cooperatives in industries with low risk fluctuation demand products and in labour-intensive industries (Meade 1972).

The disadvantages discussed in this section can be overcome by the development of financial markets. In the case that there is a well-structured stock market for the memberships of worker cooperatives, then these types of firms could behave efficiently (Dow 2003).

2.2.5 The Control Problem

Within the literature, arguments related to the rarity of cooperative firms significantly concern decision-making issues (Dow and Putterman 2000). The most prevalent of these is the control problem, which arises because of the delay in decision-making, stemming from differences in the opinions of the workers who sit on the board of the firm regarding the management (Jensen and Meckling 1979). Democratic capacities are constrained in this case and are an obstacle to the growth of cooperative firms (Bowles and Gintis 1993).

More specifically, heterogeneity between the members of cooperative firms increases decision-making costs. Increased divergence in preferences occurs because of the democratic decision-making that requires the unanimous agreement of members (Holmstrom 1999). The non-synchronised entry and exit of the cooperative members discussed in the previous section increases this heterogeneity problem in cooperative firms. Giving voice to heterogeneous groups can be very costly for the firms and can potentially neutralise the advantages that arise from participatory management. Potential disagreements may be related to the horizon of an investment and the trade-offs between size of the firm and the dividends of the members. As the number of members increases, decision-making

costs increase even more since disciplining members into one goal becomes even more difficult (Meade 1972). As long as these types of disagreements increase the costs of decision-making, they end up decreasing the efficiency of the firm (Jensen and Meckling 1979).

Moreover, costs in decision-making arise because of changes which intensively interrupt the function of cooperative firms since they increase tension between members (Holmstrom 1999). Although in cooperative firms there are strong conflicts between the members regarding the targets of the firm, in other organisational forms like capitalist firms the shareholders are supposed to limit conflicts for the sake of maximising their dividends (Hansmann 1988). Thus, the difficulties faced by cooperatives are observed less frequently in capitalist firms where adjustments to changes happen much faster and are easier (Holmstrom 1999). As a result, the reason why worker cooperatives are rare is the heterogeneity in the interests of the members (Hansmann 1999).

Although collective decision-making could be considered costly for a cooperative firm, there are cases where these costs are minimized through participatory productivity advantages if democracy is ideologically preferred (Elster 1989). In the case of Mondragon, for example, the Catholic and Basque background of the workers worked as a homogeneity factor and allowed the firm to facilitate the advantages of a democratic governance (Ben-Ner 1984).

In general, considering the issues discussed above, cooperatives with higher confidence in internal changes and appropriate use of voice, will have an increased chance of surviving and thriving. More specifically, other solutions proposed for cooperative firms to deal with the control problem are related with agenda control, restrictions to voters' options, homogeneity of voters' interests, and the limitations on firms' size (Benham and Keefer 1991). Moreover, solutions to the control problem could arise from the implementation of

rules and from the management obedience to the agreed upon goals of cooperative firms. Finally, implementation of hierarchical organizational structures within the company could allow the decisions of the firm to be made by managers elected by the members in order to serve their interests. Within the literature, it has been claimed that in most of the cases, the higher the hierarchy level in a firm the higher levels of efficiency this firm achieves (Williamson 1980). Thus, cooperative firms, which could implement these hierarchical structures without losing their cooperative characteristics, can achieve high efficiency levels that will allow them to take on an alternative organizational form in cases where market inefficiencies occur (Benham and Keefer 1991). In particular, Benham and Keefer (1991) support that worker cooperatives do become competitive if they manage to overcome decision-making issues, and the best-known examples is Mondragon, a case where most of the solutions discussed above have been adapted.

2.2.6 The Principal-Agent Problem

Another cause of transaction costs within an organisation is the principal-agent problem. In this case, the problem arises due to the contradictory interests of shareholders and managers. More specifically, managers focus on maximising the value of the company in terms of sales, while shareholders focus on maximising the profits of the firm from which dividends are paid. In this sense, the shareholders of a firm, in order to keep the managers within the target of wealth maximization, need to reduce their returns up to a point. The costs of keeping the managers faithful to the wealth maximization target of the firm can be reduced through managerial rewards and competition among managers (Furubotn and Pejovich 1972).

The characteristics which lower the controversy that arises from the principal agent

problem are less prevalent in cooperative firms, where managerial rewards are lower, and market valuation may be limited if there is no market for the cooperative firms' shares. For example, in worker cooperatives, workers can appropriate the residuals of the production process and consume it into non-investment goods, while limiting managers' power to make investment decisions. This characteristic can be considered important for the operation of the company since it is connected to the underinvestment problem that arises when profits are not reinvested in the firm (Furubotn and Pejovich 1972).

In some cases, though, worker cooperatives may be able to manage this issue. Considering that the managers of worker cooperatives need to serve the interests of the members of the firm, if workers exert an intense and direct control of management, then it would be more difficult for managers to not follow the principles of the firm. Thus, worker cooperatives can be expected to increase in industries where this level of control is possible and acceptable by the managers (Hansmann 1999).

2.2.7 Risk Aversion

A further obstacle to the functioning of worker cooperatives is workers' high levels of risk-aversion (Ben-Ner 1988a; Elster 1989; Altman 2015). Risk aversion is one of the components of the underinvestment problem observed in cooperative firms. The root of this problem for workers can be found in their typically low wealth endowments and in their lack of managerial skills (Dow and Putterman 2000).

Workers may be sceptical when it comes to investments that require all or most of their limited wealth. This is an additional characteristic for not allowing workers to diversify their investments and thus increases the risk of joining a cooperative firm. Moreover, low endowments are a clear issue when the creation of a firm includes high costs for its

establishment (Ben-Ner 1988b). This is a reason for expecting to find cooperatives more often in labour-intensive industries with low capital requirements (Putterman 1993).

Another hypothesis is that workers prefer not to take on any managerial responsibilities as long as they are pleased with their earnings and working conditions (Ben-Ner 1988b). However, the incentives, which arise from the participation in decision-making, may intrigue workers and balance the previous discouragement (Elster 1989).

The decision about the size of the firm also depends on the level of risk-aversion of the workers and the ability of the worker cooperative to raise external funds that will decrease the investment risks (Miyazaki 1984). On the one hand, small size involves the problem that the risk is spread between a lower number of agents, however, if worker cooperatives remain large in the long-run, then they will be governed with less success because of issues related to the common property problem. If cooperative firms prefer to increase their size by lowering the number of members, then the cooperative culture of the firm can be expected to decrease and thus in the long-run, this reduction may end up in the complete dissolution of the cooperative character of the firm (Miyazaki 1984).

Considering these issues, Bowles and Gintis (1994) support that worker cooperatives will prevail more frequently if there is a wealth redistribution in favour of the workers within society, or if credit markets grant worker cooperatives easier access to capital.

2.2.8 Market Costs

When discussing market costs, the focus is placed on costs related to market power, and the ex-post market power or lock-in effect. In addition to these costs, asymmetric information plays a significant role in increasing contracting costs (Hansmann 1999). According to Hansmann (1988), ownership of the firm should be given to the organizational form in

which the patrons will achieve the minimization of market contracting costs. This is an alternative presentation of providing firm's ownership to the patrons who are the most expensive to employ. These patrons can be capitalists, customers, workers, etc. (Hansmann 1988). The costs for employing capital through contracts is much higher than employing other inputs for most products, and as a result the minimisation of costs calls for the ownership to be given to capitalists patrons who own the most expensive input (Hansmann 1988).

However, in some cases, where either market failures are observed, or there are imperfections in the firm's product, other organizational forms may arise such as consumer or producer cooperatives (Hansmann 1988). For example, there are advantages for smaller farmers who obtain market power and voice through their cooperation with other farmers within agricultural cooperatives, while at the same time, they can decrease their costs and create economies of scale (Altman 2015).

2.3 The importance of equity capital: A Corporate Finance Contribution

The literature discussed in the previous section focuses on the problems that cooperative firms face in achieving the required levels of investment in order to compete with their capitalist counterparts. Most of the issues raised in the new institutional economics literature are relating the underinvestment problem that cooperative firms face to their difficulty in accessing equity capital through shareholders' participation in the firm. The importance of the ability of a firm to raise equity capital against debt capital is a topic that has been discussed thoroughly in the corporate finance literature. This section will focus on some of the empirical literature relating to the additional inefficiencies that are caused in the operation of a firm by the difficulty in raising equity capital and by its necessity for

substituting this essential equity capital with debt capital. These inefficiencies apply to the specific situation of cooperative firms as well, giving additional theoretical insights regarding the underinvestment difficulties that this type of firms face.

In general, one of the topics studied by the corporate finance literature concerns the ways in which firms choose to finance their operation. The two main categories of financing are debt and equity. Each firm chooses to finance its operations by deciding the most appropriate mix of debt and equity that fits its needs and capacities. Within the literature it is suggested that this decision between debt and equity affects the operation of the firm in several ways.

More specifically, Opler and Titman (1994) observe that firms with high levels of debt are keen in losing market shares easier compared to firms with lower levels of debt. During negative economic shocks, such as economic recessions or several other shocks to the profitability of the firm, firms whose financing is debt focused are suggested to struggle more. Firms with high levels of debt are observed to exceed higher losses in their turnovers compared to firms with lower debts (Opler and Titman 1994; Campello 2003). Khanna and Tice (2000) suggest that during a negative economic shock to the profitability of a firm, if this firm has high levels of leverage, then it would be expected to reduce its investment levels in order to maintain its cashflow level in order to avoid potential liquidity issues. Furthermore, Zingales (1998) studies the way in which high levels of debt can affect the level of competition of a company and its survival in general. Zingales (1998) suggests that higher levels of debt are causing underinvestment problems in firms, which are accompanied with decreased levels of competitiveness of the firm. This decreased level of competitiveness is proposed by Chevalier and Sharfstein (1996) to be due to the fact that firms with higher debt capital are not able to be aggressive in price changes. After testing his hypothesis for the US Motor Carrier Industry for the 1976-1985 period, Zingales (1998)

observed that higher levels of debt are indeed associated to decreasing investments, and that the higher the leverage of a firm the less the investments in these companies. The problematics that arise because of the lower levels of investments increase even further at periods of negative economic shocks. Both in the researches of Zingales (1998) and Chevalier and Sharfstein (1996) it is supported that during economic downturns, firms with high level of debt capital are observed to struggle even further and this reduces their survival prospects as they lose market shares. This argument is in line with Opler and Titman (1994). The idea that high leveraged firms are more passive, tend to move towards plant closures easier, and also to decrease their investment is supported by Kovenock and Phillips (1997) as well.

To sum up, the evidence from this literature suggests that firms with high levels of debt are inflexible in responding efficiently to negative economic shocks. Availability and access to equity provides firms with higher levels of freedom in their economic decisions, and as a result allows them to adapt to economic changes in the most efficient way. This adaption can be related either with the levels of prices, or the levels of investments. In general, the effects of the debt/equity ratio on firm's operation should be considered as context specific. In this sense, differentiations in the decision for the debt and equity levels of a firm can arise due to differentiations in the sectors in which each firm operates, the size of each firm, the country in which each firm operates, the phase in the economic cycle, and so on.

2.4 The Empirical Evidence

Although the theoretical predictions about the performance and viability of cooperative firms are quite pessimistic, a large body of empirical work shows that cooperative firms have found ways to disregard their difficulties, survive, and in some cases succeed. For

example, Fakhfakh et al. (2012) show that when looking at French data from 1987-2004, worker cooperatives are not smaller than conventional firms and they grow at the same rate as conventional firms do. This observation is related to theoretical propositions about other cooperative forms that seem to be presented as efficient as non-cooperative firms. More specifically, Altman (2015) supports that the costs of agricultural cooperatives are presented as neither lower nor higher when compared to the cost of their non-cooperative counterparts, meaning that the inefficiency discussion should not be relevant in the case of agricultural cooperatives.

The rest of this section will focus on three main categories that are discussed extensively in the empirical literature around cooperatives firms and propose alternative characteristics of cooperative firms that allow them to compete with their non-cooperative counterparts by providing them with specific advantages. These categories refer to the employment, productivity, and business cycle behaviour of cooperative firms.

2.4.1 Employment

Starting with the category related to employment issues which includes topics related to wages as well as the pure employment discussion of the firm, it has been observed that in many cases around the world, the sustainability levels of cooperative firms do not fall below the sustainability levels of conventional firms. More specifically, according to Alves et al. (2016), when looking at data on conventional firms and worker cooperatives in Uruguay from 1996 to 2009, worker cooperatives have higher sustainability rates in jobs compared to conventional firms. In research of North-Central Italy, Emilia Romagna and Toscana for the period 1985-1986, Bartlett et al. (1992) noted that in worker cooperatives there exist higher sustainability rates compared to non-cooperatives since there is low member exit.

More specifically, in worker cooperatives, the rates of creation and destruction of jobs in regard to hired workers are much higher compared to the rates observed for member-workers. Moreover, worker cooperatives are less flexible in hiring and firing processes during crises. Although this is something that makes this type of firm less flexible, in terms of workers' welfare it is beneficial to both society and the workers themselves. There are also no strikes and other relative production interruptions in this type of stable working environment. Ben-Ner (1984) also supports that worker cooperatives are better able to appease their members in difficult economic situations without frictions compared to conventional firms.

Regarding the discussion about the wage peculiarities that exist in cooperative firms, conventional firms present a negative relationship between wages and employment, while in the case of worker cooperatives this relationship is positive. Furthermore, worker cooperatives choose to adjust to shocks through prices adjustments, while conventional firms choose employment adjustments (Craig and Pencavel 1992; Pencavel and Craig 1994; Burdin and Dean 2009). These results can be seen in several cases in the literature, such as in Uruguayan data for the period 1996-2005 and for the US Plywood industry for the period 1968-1986. Additionally, in Italian data for the period 1982-1994, cooperatives were found to provide lower wages compared to their conventional counterparts (Pencavel et al. 2006). However, this last result is contradicted by Bailly et al. (2017) when looking at French data for 2010 in which case, wages in conventional firms are lower compared to those of worker cooperatives. Finally, in regard to managerial benefits and the motivation of managers, data from North-Central Italy, Emilia Romagna and Toscana for the 1985-1986 period show that fewer managers are employed in worker cooperatives while at the same time these managers receive lower payments compared to the payments managers receive when employed in conventional firms (Bartlett et al. 1992).

2.4.2 Productivity

Upon examination of the empirical works that focus on the productivity of cooperative firms, the main conclusion is that workers' participation increases productivity. Doucouliagos' (1995) meta-analysis shows that apart from the possibility of the existence of a positive relationship between collective workers' ownership and productivity, no other participation form shows evidence of an increase in productivity. This is an outcome supported by the findings of Fakhfakh et al. (2012) as well, who find French worker cooperatives to be at least as productive as their conventional counterparts for the period 1987-2004. After examining data for French worker cooperatives for the period 2006-2012, Dethier and Defourny (2015), support that profit sharing in worker cooperatives improves the performance of those firms. More specifically, worker cooperatives created through the transformation of a conventional firm show more effective productivity increases than cooperative firms which are created from the very beginning as cooperatives. Finally, when looking at French worker cooperatives for the period 1978-1979, Defourny et al. (1985) argue that in order for the participatory beneficial effects to be observed, cooperative firms must first be given time to develop.

2.4.3 Business Cycle

A widely accepted feature of worker cooperatives is that their operation follows a counter-cyclical order (Kalmi 2013; Arando, Peña, and Verheul 2009; Ben-Ner 1984; Ben-Ner 1988b). One of the arguments that supports this feature relates to the uncertainty that has to do with jobs in capitalist firms during an economic recession. According to this perspective, during an economic recession, the level of job uncertainty is high, while the chances of

finding a new job are relatively low. Meanwhile, as unemployment rates are already high, workers have even fewer chances of finding a job (Ben-Ner 1984; Pérotin 2006). In the Finnish cooperative sector in the mid-1990s, the number of worker cooperatives tended to increase when unemployment increased, while the entry for conventional firms remained stable (Ben-Ner 1988b; Kalmi 2013). Another argument, which refers to the proposed anti-business cycle behaviour of cooperative firms, relates this behaviour to the level of wages that are offered during an economic recession. According to this position, wages are reduced during an economic recession, and thus, the returns for workers in worker cooperatives exceed the level of wages in capitalist firms. High levels of unemployment and lower alternative wages increase the possibility of workers buying out a dissolved company instead of choosing to be employed by a conventional firm (Ben-Ner and Jun 1996). However, since worker cooperatives can generally act as a firm overall, the creation of worker cooperatives may be independent of the business cycle (Staber 1993). Recently, Dethier and Defourny (2015) support a similar idea by identifying that a crisis does not seem to affect the performance of cooperatives.

During economic expansion, more jobs are created, unemployment falls rapidly, and wages increase. Hence, workers typically prefer earning wages as workers in a capitalist firm rather than earning dividends as members in a worker cooperative (Conte 1986). However, the fact that in other cases cooperatives are observed to be created in situations where there exists an increase in the standard of living and dissolved when a crisis arises, decreases the strength of the previous theoretical proposition (Ben-Ner 1988b).

The idea that the countercyclical behaviour of worker cooperatives can be considered a benefit for the economy of a sector or a country, comes from the need for organisational diversification. When an economic crisis occurs, in order for the economy to absorb the shocks of this crisis with the lowest costs, the organisational forms need to have several

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diversified characteristics. In this way, cooperative firms could be considered as an organizational form that will absorb these shocks easier than capitalist firms because of the specific characteristics discussed above (Stiglitz 2009).

2.4.4 Remaining Issues

Although the empirical evidence shows that cooperative firms have indeed in many cases found ways to achieve satisfying outcomes, which correspond to those of their non-cooperative counterparts, very little is being said about how cooperative firms have managed to overcome the property rights issues discussed in the theoretical literature that constitute the underinvestment problem. Moreover, cooperative firms continue to have persistent problems addressed in the empirical literature and discussed below.

First of all, worker cooperatives are indeed smaller in size compared to conventional firms (Ben-Ner 1988a). This is a widespread proposition in the theoretical literature that is focused on several issues observed in the property rights structure of worker cooperatives, discussed in section 2.1. Another issue faced by cooperatives is low accumulated capital, due to the underinvestment problem and because of the limited supply of capital (Defourny, Estrin, and Jones 1985). Furthermore, problems in cooperatives related to high cost of capital persist because of the lack of investment and imperfect competition in the market for their shares. Although cooperative firm memberships have become easier to transfer, there is still low diversification in the investment of workers in worker cooperatives, while issues with external financial sources continue to persist. These results are supported by Berman and Berman (1989) who analysed data from 1958 to 1977 regarding the operation of Plywood manufacturing in the US. Moreover, according to Craig and Pencavel (1992), who examine the same industry and companies for the period 1968-1986, the fact that labour is

connected to capital provision increases the riskiness in cooperative membership and under-evaluates the shares in the company. While studying the UK manufacturing worker cooperatives for the period 1980-1985, Podivinsky and Stewart (2007) also identified risk as a persistent problem for worker cooperatives. More recently, Belloc (2017) shows that when looking at Italian data for the period 2003-2007, the main issues of worker cooperatives are mainly related to the heterogeneity of the workforce, the difficulty in monitoring, and the uncertainty of profits.

Although the problems discussed above are presented as persistent when looking at cooperatives, different theoretical approaches in institutional economics are trying to give answers to how several of these issues have been overcome or avoided within different institutional environments and when cooperative firms interact with several other institutional arrangements. The following section will focus on a discussion of these issues and their solutions through the presentation of the institutional analysis around cooperative firms in more recent years.

2.5 Recent Developments

Although there are several disagreements within the literature about the cooperative firm, and whether this type of firm is more or less efficient than its capitalist counterpart, it is broadly recognised that institutional support is very important for the performance of cooperative firms. In cases where there is special institutional treatment for cooperative firms that influences the economic environment within which they operate, the growth of this type of firms is positively affected (Jensen and Meckling 1979). More specifically, focus has been placed on several ways in which institutions can interact with a cooperative firm. For example, Ben-Ner (1988s) supports that the disadvantages which were previously

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discussed regarding cooperative firms could be overcome through state intervention, initiatives of political movements and philanthropists, and the creation of umbrella organisations through trade unions and other cooperatives. Altan (2015) proposes that for the proper operation of a cooperative firm, what is needed is an institutional environment that can provide equal opportunities for both cooperative and non-cooperative firms so that the choices for the creation of different organisational forms will be equally available to potential entrepreneurs or workers. When looking at Finnish cooperative firms, Kalmi (2013) identifies that specialised consulting services are especially needed to support cooperative firms. Consulting services are mainly provided by support organisations that have accumulated resources and knowledge that could help cooperative firms succeed.

Special focus has been placed on the significance of a strong legislation framework which should be focused on the development of financial regulations that would support cooperative firms. These institutional interventions are supposed to allow cooperative firms to overcome legal obstacles that increase the uncertainty around them (Hansmann 2013). In cases where changes need to be implemented in the organisational characteristics of cooperatives firms, a flexible and specialised legislative framework is needed so that this type of firm is able to achieve high levels of sustainability (Bijman and Iliopoulos 2014). With stronger legislation in favour of cooperative firms, more and different legal forms can be created, enticing potential agents to create a cooperative firm (Arando, Peña, and Verheul 2009). In countries where supportive institutional and legal structures exist, worker cooperatives are much more prevalent (Conte 1986).

In the last few decades, several theories have been developed regarding the way in which institutional arrangements and institutional environments affect the performance of cooperative firms. When focusing on the underinvestment problem of the cooperative firm, the institutional arrangements that affect the sustainability of cooperative firms could be

divided into internal and external financial arrangements that allow these types of firms to deal with their capital requirements. Internal financial arrangements, such as shareholders' funds, correspond to institutional arrangements that provide cooperative firms with equity capital, while external financial arrangements, such as local financial development, credit unions, cooperative banks, and building societies, correspond to institutional arrangements that provide cooperative firms with debt capital. Internal financial arrangements are especially impacted by legislation that affects cooperatives. Since the level of legislation development for this type of firm may facilitate or hinder organisational changes, it can be considered as one of the effects of the institutional environment on the performance of cooperative firms. External financial arrangements, on the other hand refer to external institutional financiers who in some ways act more favourably toward cooperative firms than to non-cooperative firms.

The first of the following subsections focuses on the theorisation regarding hybridisation, which is mainly focused on modifications of the property rights structure of cooperative firms. The second subsection is looking at the theoretical framework of institutional complementarities and its relationship with the performance of cooperative firms. Sub-section 2.5.2.1 focuses on the dependence of changes to the property rights structure of cooperative firms on the institutional environment considered. Furthermore, external financial arrangements are discussed in subsection 2.5.2.2, where the focus is placed on the analyses in which the interaction between cooperative firms and specific financial arrangements play a key role in dealing with the underinvestment problem. Within each institutional environment different financial arrangements are likely to play a role.

2.5.1 Hybridization

While data about cooperative firms show that, in some cases, this type of firms overcome the issues that are supposed to make it inefficient, the empirical analyses mentioned in previous sections lack solutions for the issues of property rights. In order for these latter issues to be understood and for solutions to be provided, several researchers have employed the theoretical concept of hybridisation to address the functioning of cooperative firms.

The case of the cooperative firm has been identified by Chaddad (2012) as a "true hybrid"[2] since it incorporates instruments of both markets and hierarchies. The general idea behind the theoretical concept of hybridisation is that within a very complex socioeconomic environment — which continuously and rapidly changes — organisations and institutions must implement certain changes to their prototype forms, which will allow for more flexibility, and will give cooperative firms a better chance of surviving and thriving (Chaddad and Iliopoulos 2013). This flexibility extends the options for tools that these organisations and institutions can use in order to overcome several problems that they are faced with, including property rights issues.

Looking more closely at the case of cooperative firms, the main problem that arises concerning property rights issues and exists in the prototype form of this type of firms is the underinvestment problem. Thus, cooperative firms are in need of a property rights system that will deal with their property rights issues, in order for them to overcome their underinvestment problem. Since this flexible property rights system cannot be developed within the scope of the traditional cooperative firm (one member-one vote), a solution can

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[2] According to Williamson (1980), the two polar cases for the organization of production are markets and hierarchies. In the first case, none of the transaction costs of the production process are internalised, while in the second case, all of the transaction costs of the company are internalised.

be found when these cooperative forms are hybridized. As a result, according to this part of the literature, what allowed specific types of cooperative forms to survive, thrive, and play a significant role in the economic activity of their countries is their ability to implement internal organisational changes that will provide them easier and faster access to capital (Chaddad and Cook 2004; Bijman and Iliopoulos 2014). In other words, what differentiates the new cooperative organisational models from their prototype forms is the way that the ownership rights of the former are given to different economic agents. Figure 2.1 represents the variety of cooperative forms identified by Chaddad and Cook (2004). Having the traditional cooperative firm and the investor-owned firm as the two polar cases, several other cooperative forms arise as hybrid models of these two cases.

More specifically, Chaddad and Cook (2004)—two of the pioneers of this proposition—attribute the root of the problems with the property rights structure of agricultural cooperative firms (i.e. free-rider problem, horizon problem, and portfolio problem) to the non-transferable and redeemable nature of the ownership rights of this type of firm, and to the fact that the distribution of the profits is based on the membership proportion and not on the proportion of the investment. In this way, the investment risk seems too high for members to bear, and the underinvestment problem remains. In order for investments to increase, the membership restrictions need to be relaxed so that members have an incentive to invest more money in the firm. By reducing specific restrictions in the property rights structure of cooperative firms, they align some of their features to these of capitalists firms, so that accessibility to specific internal financial institutional arrangements will become easier. More freedom needs to be given to the managers regarding their decision-making abilities and the way they run the firm. In order for this to be possible, members need to

Figure 2.1: Representation of The Figure for The Alternative Cooperative Forms from Chaddad And Cook (2004)
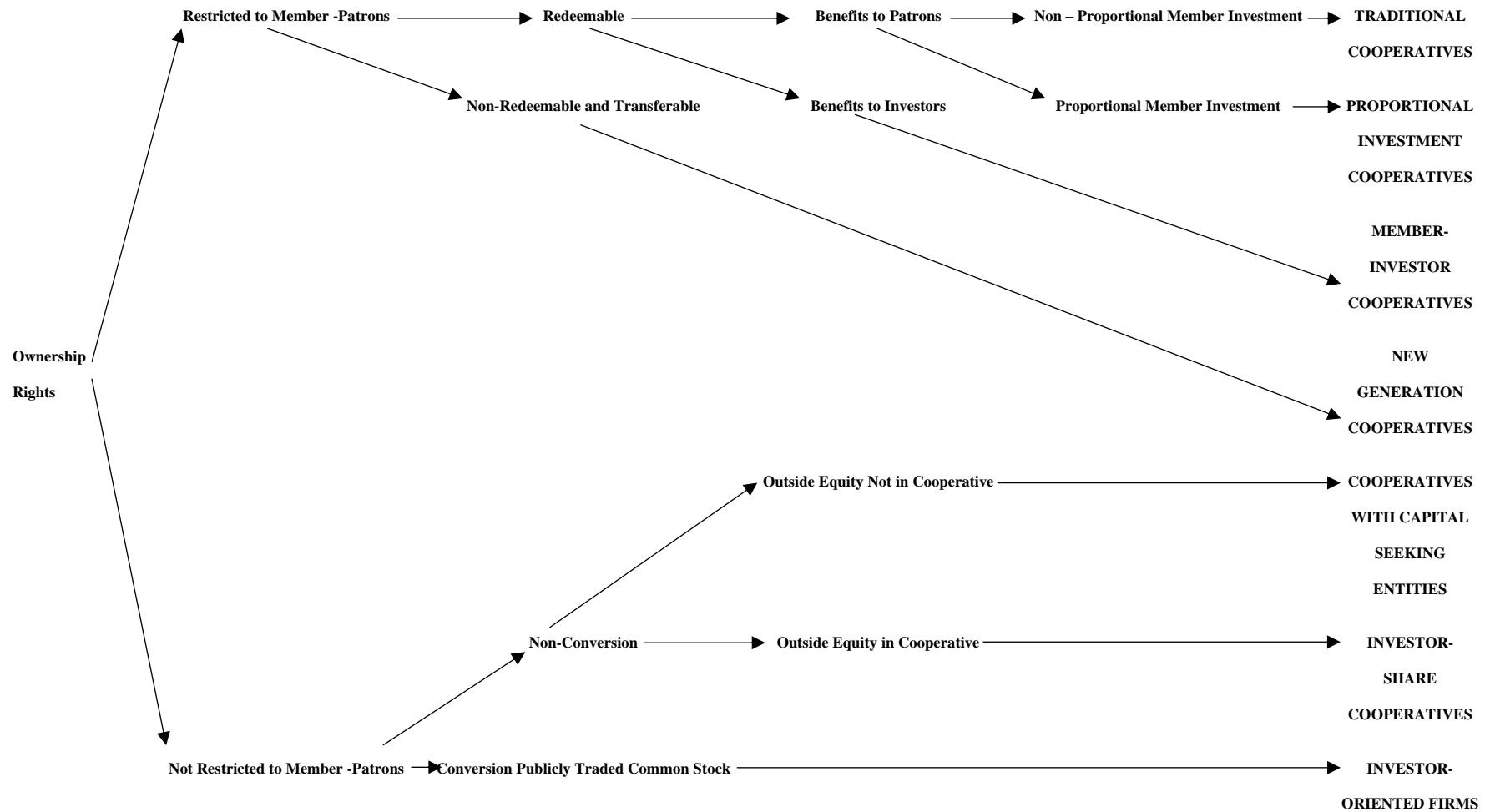
trust the management of the cooperative firm so that the management disturbance by the members will be decreased. Finally, cooperative firms should move toward the adaptation and development of financial tools that will be innovative in the way they manage the relationship between investment funds and ownership rights (Bijman and Iliopoulos 2014). Examples of these tools, which Chaddad and Cook (2004) consider to be internal institutional arrangements, are high levels of shareholder funds (mainly from ordinary shares), the creation of financial subsidiaries (or becoming part of a big group as subsidiaries), and the creation of strategic alliances with companies related to their products. Allowing shareholders to hold ordinary shares in cooperative firms (less than 51% most of the times) is a way to keep the cooperative character of the firm up to a significant point and allow for equity to be raised in an easier way. Subsidiaries, as an institutional arrangement, are observed in retail and agricultural cooperatives. In the literature, it is supported that subsidiaries allow cooperative firms to raise funds by providing shares of the subsidiary to non-member shareholders, while keeping the purity of cooperative principles within the parent company (Chaddad and Cook 2004). The strategic alliances refer to specific agreements and arrangements between cooperative firms and other organisations for continuous support in several operational modes.

2.5.2 Institutional Complementarities

As already discussed in the previous sub-section, specific organizational changes in the property rights structure of cooperative firms, allowed some types of cooperative firms to overcome various issues related to their underinvestment problem, by improving their financial prospects. In section 2.5.2, this research looks at the importance of the

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interdependences between cooperative firms and other institutional arrangements within different institutional environments. This discussion is conceptualized through the development of the idea of institutional complementarities.

2.5.2.1 The Theoretical Framework

The theoretical framework of institutional complementarities that is employed in this research refers to the concept of institutional complementarities provided by Aoki (2001) as linkages that expand the institutional equilibria in the economy. Importantly, Aoki (2001) presents the idea of institutional complementarities through an equilibrium perspective, an idea that suggests a short-term or long-term sustainability of a state of interactions. Within the framework of Aoki (2001), the existence of an institution is not necessarily the result of a unique equilibrium of interactions, but instead the formation of an institution can be the outcome of multiple different equilibria, depending on the other institutions with which it coexists, and the institutional environment in which it prevails. The interdependences that form each of these multiple equilibria are defined as institutional complementarities. An institutional complementarity exists between two or more institutions if their co-existence produces an outcome different than the one produced by each of them separately. In this sense, these interdependencies may be either positive or negative. Moreover, the Pareto optimality of the final outcome is not presented as a prerequisite in the approach of Aoki (2001), while at the same time multiple Pareto non-rankable equilibria may arise. A parametrical depiction of the theoretical complementarity would be as follows: Starting with the simplistic consideration of the existence of two domains (A, B), which are not strategically interacting, two agents (χ, ψ), and two payoff functions (u, v). Agent χ has

to choose between two different endogenous rules ζ^* and ζ^{**} while agent ψ has to choose between endogenous rules ω^* and ω^{**}. Then, it is assumed that:

$$u(\zeta^*; \omega^*) - u(\zeta^{**}; \omega^*) \geq u(\zeta^*; \omega^{**}) - u(\zeta^{**}; \omega^{**}), \quad (1)$$

$$v(\omega^{**}; \zeta^{**}) - v(\omega^*; \zeta^{**}) \geq v(\omega^{**}; \zeta^*) - v(\omega^*; \zeta^*), \quad (2)$$

The two pure strategies in Nash equilibria that arise in the above equations are ζ^*/ω^*, and ζ^{**}/ω^{**}, showing that these sets of rules are forming complementarities. The Pareto sub-optimal idea of this equilibria is based on the fact that even if ζ^{**}/ω^{**} produces a higher outcome than ζ^*/ω^*, if for specific historical reasons ζ^* already exists in the domain A, then the best option for the domain B will be ω^*. Following a similar logic, there may be cases in which for agent χ the outcome of ζ^*/ω^* produces a higher outcome than the one of ζ^{**}/ω^{**}, while the inverse could hold for agent ψ. In this case, the two options are not mutually Pareto rankable.

Pagano (2011) develops even further the equilibrium perspective of institutions and presents the concept of interlocking complementarities. This concept focuses on the backscratching character of two or more institutional arrangements, which results in a progressive institutional stability. In other words, not only the choice of one institution supports another, but the second institution progressively supports the operation of the first. Thus, after some time periods, this interdependence creates a situation where any other institutional arrangement seems inefficient, something that makes the sustainability of the current institutional arrangements firm.

Another interpretation of institutional complementarities stems from Boyer (2005) who identifies the concept of institutional complementarities as a Pareto-improving form in the

economic activity and suggests that two institutions are complementary if the effect of their conjunction is greater than the effect of each of them separately. More specifically, if the outcome of institution A is I(A) and the outcome of institution B is I(B), then an institutional complementarity exists if the outcome of conjunction I (A, B) is greater than the added values of I(A) and I(B). This idea could be understood as a more simplistic interpretation of Aoki's (2001) theorisation of institutional complementarities. However, the important difference is the incorporation of the Pareto-improving concept that is not a requirement in Aoki's theory.

Moving a step forward, Deeg (2007) accepts the improving character of institutional complementarities and furthers the analysis by separating complementarities into two forms: supplementarity and synergy. In the former, an institution improves the results of another institution by improving some of its deficiencies, whereas in the latter, the coexistence of two institutions in different subsystems supports a purpose through the development of incentive structures.

In order for the research questions of this thesis to be addressed, the institutional complementarity approach developed by Aoki (2001) is employed. The reasoning for this decision is related to the fact that the core focus of the work is the investigation of the effectiveness of the interdependencies arising between cooperative firms and specific institutional arrangements. To understand an interdependency, it is important to adopt a framework that does not take into account only Pareto-efficient and Pareto-rankable outcomes, as it is important to interpret it through both its positive and negative aspects. The negative aspect of a complementarity is even more relevant for this research, since the struggle of some types of cooperative firms, in terms of specific performance outcomes (i.e. low survival rates, low turnover, small size), is examined empirically. In this sense, this research is not looking only on the institutional arrangements that present positive

interdependences with cooperative firms, but it also looks at the negative interdependencies that contribute to the observed struggle of some types of cooperative firms.

2.5.2.2 Institutional Complementarities Applications

The notion of institutional complementarities has been extensively used in the macro-level analysis of institutional economics. The most known analytical framework which focuses on the characteristics of institutional environments as for their effects on the development of several institutional arrangements, usually in relation to a national level analysis, is the Varieties of Capitalism analytical framework. Within this analytical framework, national economies are grouped into categories according to the specific characteristics of their markets and legislation frameworks. The characteristics of the institutional environments in Varieties of Capitalisms studies are related to financial markets, the internal structure of each country's domestic firms, the country's industrial relations, education and training systems, and inter-firm relations. The groups that refer to markets' characteristics look at how firms organise their activities in every country (Hall and Soskice 2001; Hall and Gingerich 2009), while those that refer to the legal systems look at the sets of legislation principles that have been developed in every nation (La Porta et al. 2008; Siems and Deakin 2010). In this way, the analytical framework of Varieties of Capitalism focuses on understanding the distinctions between legal frameworks in terms of macro-level complementarities that exist in each country and examines how the feasible changes to the property rights structures of an institutional arrangement depend on each distinctive institutional environment. The Varieties of Capitalism approach provides very important tools for explaining the diversity observed in institutional arrangements and institutional

environments. The viability of an institutional arrangement does not only depend on its own characteristics but on the characteristics of the socio-economic context in which it operates, as well.

One of the categorisations that the present research uses for distinction purposes between the UK and France, is that of liberal market economies (LMEs) and coordinated market economies (CMEs) (Hall and Soskice 2001; Hall and Gingerich 2009)[3]. The choice of the UK (LME) and France (CME) as countries of interest in this work came from the distinctions identified in the Varieties of Capitalism analytical framework, for which both countries could be characterised as benchmark institutional environments.

In LMEs, hierarchies and competitive market structures are the main coordination mechanisms for the firms, while supply and demand conditions determine economic outcomes. The financing criteria are mainly based on the current profitability and productivity of firms promoting in this way high risk and short-term investments in the economy. Wages and managerial compensations are considered to be mainly determined by market competition. In this way, importance is given to the mobility of labour forces. LMEs are considered to support human capital investments in general and transferable skills. Moreover, LMEs seem to support employment adjustments in order for firms to respond to fluctuations of the economy. Thus, during periods of economic shocks, unemployment would be the main volatile variable in LMEs, while wages would remain relatively stable.

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[3] Several other distinctions have been made from different authors; for example, Amable (2003) recognises five different models of capitalism as follows: market-based economies, social-democratic economies, Asian capitalism, Continental European capitalism, and Southern European capitalism. Nonetheless, the main idea always remains the same; the characteristics of the institutional environment interact with domestic institutional arrangements and/or other characteristics of the institutional environment in ways that establish multiple institutional equilibria.

Enforceable contracts and market relationships are used in LMEs to manage inter-firm relations. In this sense, market valuation, and private contracts between institutional social partners are the determinants of the companies' internal organizational environment.

In the case of CMEs, coordination is achieved through non-market relationships, while economic outcomes are determined by strategic interactions between the actors of the economy. Regarding the financial criteria in CMEs, the focus is placed on the sustainability and long-term credibility of the firm. Low risk and long-term investments are preferred in this group of countries. Wages, managerial compensations, and industrial relations in general are the result of coordination between the institutional social partners, and incentives schemes provided to workers and managers. Furthermore, CMEs are suggested to support specific skills investment in human capital, since high skilled labor force is provided with more responsibilities and work autonomy. Finally, there is consensus that CMEs respond to economic fluctuations through price adjustments. During economic shocks, wages may face higher fluctuations in expense to stable unemployment rates.

Since the establishment of the Varieties of Capitalism analytical framework, several questions have been raised regarding the long-term consistency of the categorisations made in this framework and in dynamic models. The fact that countries are continually changing legislations and focus of their policies raises plenty of questions regarding the coherence of the Varieties of Capitalism analytical framework. These questions are answered through empirical works (Hall and Gingerich 2009) that show the existence of trends which are attributed to the categorisations made by Hall and Soskice (2001), and by theoretical works (Amable 2016) that focus on the ways in which countries' institutional environments are hybridised as the years go by. Amable (2016) focuses on the hierarchy of the institutions that form a complementarity. There are different levels of importance when discussing the complementary institutional arrangements in a country. In this way, some less important

characteristics can be discarded while, at the same time, the core and most important characteristics that form the complementarities remain the same. As a result, through a hybridization process, countries adapt over the years to a continuously changing world economy but, at the same time, are able to sustain some basic characteristics in their institutional environments, which allow them to remain consistent with the theoretical categorisations presented in the Varieties of Capitalism literature.

Another characteristic that distinguish the institutional environments of the UK and France is their legal systems. In general, common law countries (UK) base their economic functionality on contractual relationships, while civil law countries (France) rely on regulatory arrangements for the financial organization of their economy. When looking at the effects that legal systems have on the performance of the institutional arrangements focus is given on the level of protection that legislation provides to shareholders against the exploitation of their interests by managers or other members of the firm in which shareholders intend to invest. La Porta et al. (2008) support that higher level of protection provided to shareholders are positively related with higher levels of equity capital available in the market. This protection may arise from the legislation of legal forms that provide shareholders more rights in the decision making of the firm, or through other legislation that is related to tax incentives or investment protection in general. These legislations may include lower dividends taxes and regulations for priority claims in the event of a bankruptcy. Furthermore, a more developed legislation framework works towards reducing the agency and transaction costs in financial transactions between borrowers and lenders (Easterbrook and Fischel 1990), increasing in this way the availability of both equity and debt financing in the economy. This higher availability of equity results in supporting higher levels of investments in the whole economy. Finally, importance is given to the speed with which a legal issue may be resolved. The longer it takes for a legal case to be resolved, the

higher the transaction costs would be for a lender. An appropriately designed legislation framework should decrease the delays in legal proceedings and as a result decrease the transaction costs of investments in the economy.

According to La Porta et al. (2008) common law countries are observed to have a greater financial development (La Porta et al. 2008) in comparison to civil law countries, while at the same time they provide shareholders with higher levels of flexibility. Another distinguishing characteristic of common law countries is the speed with which legal issues are resolved, because of the importance of the contracts in their economies. On the other hand, civil law provides firms with a more developed legislative framework around them compared to the one existing in the common law countries (Cracogna et al. 2013). In this way, the uncertainty for potential lenders to provide firms with debt or equity capital is decreased. Moreover, the strong regulations that already exist in civil law countries, may, on the one hand increase the time of legal proceedings, but on the other hand, provide an a-priori more concrete framework for shareholders and firms to interact.

During the last years there has been a criticism to the approach of "Legal Origins" that strictly categorizes countries into common and civil law legal systems (Siems and Deakin 2010). This criticism in not based on a complete deviation from the principles of some common characteristics that are found in countries with the same legal origins, but on the fact that there are differentiations observed between countries with the same legal origins, and as a result a strict twofold categorization would be inappropriate (Siems 2016). Recently, importance is given on the hybridization process that has been observed in the last years. Both common and civil law countries have been observed to incorporate into their legal systems characteristics from the alternative legal system in order to create better conditions for financial development. For example, the UK has allowed for some significant regulations to be incorporated in its institutional environment, while France has given focus

on strengthening the importance of contracts in economic activity. Thus, although there are still some similarities between legal systems of several countries, which are rooted in their legal origins, there is a tendency for convergence, especially in the economically strong economies. In this spirit, Siems (2016) proposes a new taxonomy of four clusters ('European Legal Culture', 'Mixed Legal Systems', the 'Rule by Law' and the 'Weak Law in Transition') for categorizing the varieties of legal systems.

In the context of this research, it can be argued that the combination of the UK liberal market economy with the common law system provides an uncertain but more flexible institutional environment for UK cooperative firms, while the French coordinated market economy combined with the civil law system provides a more certain but stricter institutional environment for French cooperative firms. In this way, the explanation of cooperative firms' performance differentials within a country, but also across countries, are defined by their ability to adapt to the institutional environments in which they operate.

2.5.2.3 Institutional Complementarities and the Cooperative Firm

The previous sub-section discussed the importance of the institutional environment in which firms operate. From that discussion it follows that feasible changes to the property rights structures of cooperative firms critically depend on the characteristics of the institutional environments in which they operate, and more specifically, depend on the type of capitalism and legal system they operate in. The present sub-section intends to present the empirical work around institutional complementarities that is related specifically to cooperative firms. In this way, insights will be given regarding the interdependences that have been identified in the literature between cooperative firms and other institutional arrangements with which

these types of firms interact in several economies.

Theoretical and empirical parts of complementarities between cooperative firms and institutional arrangements have been discussed thoroughly by Gagliardi (2009), who was the first to incorporate the theoretical idea of institutional complementarities into an empirical analysis for cooperative firms in Italy. The data used for that research correspond to the observations of both cooperative and non-cooperative SMEs in the manufacturing sector of Italy for the period 1995-2003. The logic behind the research of Gagliardi (2009) takes into consideration the hypothesised thirst of cooperative firms for external financial help, because of the property rights characteristics that do not allow them to raise their equity significantly when compared to non-cooperative firms' ability to raise internal funds. The results of the study show that local financial development allowed Italian cooperative firms to overcome some of their underinvestment issues and grow through the years. In particular, cooperatives operating in provinces with more a more developed banking market tend to grow more than conventional firms.

Apart from the extensive analysis of Gagliardi (2009), other authors have also proposed external institutional arrangements as an important tool for cooperative firms to solve their underinvestment problems. According to Podivinsky and Stewart (2007), who studied British worker cooperatives in manufacturing for the period 1981–1985, external financial arrangements can be a solution to the financial difficulties that these types of firms face. Moreover, Defourny et al. (1985) support a similar idea for cooperative firms to overcome their underinvestment problem, citing the case of Mondragon, which successfully dealt with its underinvestment issues through cooperation with local cooperative banks. Finally, Pérotin (2006) identifies that external support can be especially important for worker cooperatives. In her analysis, support organisations are proposed as a solution to the uncertainty problem that is found in this type of firm.

3 Research Context: The UK and French Cooperative Sectors

Having examined the literature on cooperative firms, it is quite obvious that there is considerable variation among the forms that a cooperative firm can take. This diversity is not only limited to different cooperative forms (e.g. enterprise, consumes, worker cooperatives), but it expands to differentiations within cooperatives of the same classifications, as shown by Chaddad and Cook (2004) for the case of agricultural cooperatives. The internal potential institutional solutions for underinvestment which were discussed in the previous chapter are not observed in all the forms of cooperatives. An important observation from the institutional analysis is that when the new hybrid form of cooperative firm is studied in the literature, only consumer and agricultural cooperatives are showed to incorporate changes in institutional arrangements through hybridization to overcome underinvestment. However, in the case of cooperative firms which are closer to the traditional cooperative model, the implementation of these internal institutional arrangements does not seem to be applied easily. More specifically, the development of external financial institutions, such as local financial development, buildings societies, and credit unions, could possibly play a supportive role for the sustainability of worker cooperatives. Thus, in the cases where internal financial arrangements seem difficult to be implemented, other institutional arrangements prevail in order for cooperative firms to deal with their underinvestment issues.

Considering this observation, it could be argued that cooperatives, such as agricultural and retail cooperatives, which have achieved high hybridization levels are those focused on overcoming their underinvestment issues through internal financial arrangements, while those with low hybridization levels – worker cooperatives in the present work – are those

which would be in higher need of supportive external financial arrangements in order to raise enough capital for their successful operation. Since many of cooperative hybrid forms have been established in the last few decades, further focus needs to be placed on all the different forms of cooperative firms that arise within economies, in order to understand the differentiations that distinguish the operation and success of each type of cooperative form.

This chapter moves towards a deeper understanding of these forms by presenting some salient facts about the performance of cooperative firms within the institutional environments of the UK and France. Focus is placed on identifying and analysing the organizational forms of both successful and struggling cooperative firms in the UK and France, in order to look deeper at the characteristics that differentiate successful cooperative forms from struggling ones. After identifying successful and struggling cooperative forms in the UK and France, this chapter conceptualizes their development through the analytical framework of institutional complementarities in order to shed light on how the interactions occurring between these different types of cooperative firms and specific external and internal financial arrangements they face, on one hand, and with the institutional environments in which they are embedded, on the other hand, lead to differentials in the economic performance of the cooperative forms examined. Through an in-depth analysis of these interactions, this research formulates theoretical models for understanding and explaining the levers of entry and growth of different types of cooperative firms, while considering the interaction effects that stem from the existence of institutional complementarities that prevail in each country.

The remainder of this chapter is organised as follows. In Sections 3.1 and 3.2, the UK and French cooperative sectors are examined in detail to identify both successful and struggling cooperative firms. In Section 3.3, the success and struggle of these firms is

conceptualized using the theoretical framework of institutional complementarities. Finally, section 3.4 presents the hypotheses of this research.

3.1 The Case of the UK Cooperative Sector

The roots of the UK cooperative sector can be traced back to the 19th century. Since that time, cooperative firms in the UK managed to serve not only the interests of their members, but most importantly achieve the deepening of the cooperative culture in British society. Today, British universities, schools, and other types of organizations can be observed as supporting and being supported by the cooperative sector. These institutions focus on the transfer of the idea of cooperation to future generations and support new and existing ventures relative to the cooperative sector. Some of the services these organizations provide for the cooperative sector are lobbying and research, in addition to providing business advice. This environment has sustained a cooperative sector that is consistent with some of the most successful cooperative firms in the world, and more importantly has implemented cooperative firms as important players in the UK and world economies. More specifically, according to the 2017 report of Co-operatives UK, 0.7% of UK employment corresponds to jobs provided by cooperative firms, while the turnover of the UK cooperative sector in 2017 exceeded 1% of the whole UK economy's GDP.

Before looking at the performance of cooperative firms in the UK, it is important to clarify the characteristics of each UK cooperative form. The definition of these cooperative forms according to Co-operatives UK are presented in Table 3.1. Patrons of cooperative firms in the UK represent several actor of economic life. These patrons vary from worker and entrepreneurs to consumers and tenants. In some cases, other cooperative firms prevail

Member type	Description
Community of Interest	The members are individuals or organisations who have a common interest or characteristic that defines their membership, which may or may not be a geographical community.
Consumer	The members are individuals who purchase goods or services from the co-operative.
Co-operative	The members of the co-operative are themselves co-operatives.
Employee Trust	The members are employees with at least a 75% stake in ownership via a trust or similar legal entity.
Enterprise	The members are legal entities (excluding self-employed individuals) that use the cooperative to collectively support or conduct their business activities.
Multi-stakeholder	The membership is made up of multiple-member categories, including individuals and/or businesses who join the co-operative to collectively work towards a common goal.
Self-employed	The members are individuals who use the cooperative to collectively support or conduct their business activities.
Tenant	The members are individuals who rent directly or have shared ownership of a property or multiple properties.
Worker	The members are individuals who work for and share ownership of the co-operative.

Source: Co-operatives UK

as patrons of cooperative firms, as well. Moving on to the examination of the performance of cooperative firms, an overview of the UK cooperative sector in 2017 is summarized in the next two tables of this section. Table 3.2 looks at the analysis per sector of cooperative firms in the UK, and Table 3.3 considers the dispersion of cooperative firms based on their ownership classification as included in the Co-operatives UK database. The Industrial Sector Classification system used in this analysis is the one referred to in the Co-operatives UK dataset as Simplified Sectors and it categorizes cooperative firms according to the sector in which their patrons operate. The columns in all the tables of the UK case refer to the turnover of active cooperative firms in 2017 (Turnover), the number of active cooperative firms for at least one year during the period 2012-2017 (All), the number of active cooperative firms in 2017 (Active), and the number of cooperative firms dissolved during 2012-2017 (Dissolved).

Table 3.2: UK Cooperative Sector Analysis per Sector

Sector	Turnover	All	Active	Dissolved	Dissolved/All
Agriculture	7,362,117,507	541	432	109	*20.15%*
	20.81%	*6.63%*	*6.48%*		
Arts and Culture	4,976,085	200	153	47	*23.50%*
	0.01%	*2.45%*	*2.29%*		
Digital, Media, and Communication	22,469,195	187	135	52	*27.81%*
	0.06%	*2.29%*	*2.02%*		
Education	295,002,536	403	321	82	*20.35%*
	0.83%	*4.94%*	*4.81%*		
Energy and Environment	12,110,786	293	246	47	*16.04%*
	0.03%	*3.59%*	*3.69%*		
Finance	350,260,966	677	547	130	*19.20%*
	0.99%	*8.30%*	*8.20%*		
Food service, Accommodation, and Pubs	24,949,696	86	69	17	*19.77%*
	0.07%	*1.05%*	*1.03%*		
Health and Social Care	131,701,709	133	93	40	*30.08%*
	0.37%	*1.63%*	*1.39%*		
Housing	637,560,276	837	676	161	*19.24%*
	1.80%	*10.26%*	*10.14%*		
Manufacturing	136,052,349	93	74	19	*20.43%*
	0.38%	*1.14%*	*1.11%*		
Membership Associations, Social Clubs, and Trade Unions	436,502,654	2,937	2,394	543	*18.49%*
	1.23%	*36.01%*	*35.90%*		
Other	106,558,068	345	288	57	*16.52%*
	0.30%	*4.23%*	*4.32%*		
Professional and Legal Services	70,302,358	200	149	51	*25.50%*
	0.20%	*2.45%*	*2.23%*		
Retail	25,173,353,383	652	574	78	*11.96%*
	71.16%	*7.99%*	*8.61%*		
Sport and Recreation	603,092,182	535	491	44	*8.22%*
	1.70%	*6.56%*	*7.36%*		
Transport	7,667,221	38	27	11	*28.95%*
	0.02%	*0.47%*	*0.40%*		
SUM	35,374,676,971	8,157	6,669	1,488	*18.24%*
	100.00%	*100.00%*	*100.00%*		*(Average)*

All, Active, and Dissolved in units; Turnover in £. Source: CUK, 2017

Starting with the industrial analysis of the UK cooperative sector, Table 3.2 provides some intuitions regarding the sectoral dispersion of the cooperative firms. The two highest rates of turnover can be observed in Agriculture (20.81%) and Retail (71.16%) exceeding £7 billion and £25 billion respectively. When looking at the number of active cooperative firms, the only industry that is shown to have a significantly higher number of entities

compared to the rest of the sectors is the Membership Associations, Social Clubs, and Trade Unions in which there are over two thousand cooperative firms.

Table 3.3: UK Cooperative Sector Analysis per Ownership Classification

Ownership Classification	Turnover	All	Active	Dissolved	Dissolved/All
Consumer	13,802,057,397	3,726	3,083	643	*17.26%*
	39.54%	*52.72%*	*51.39%*		
Self-employed	24,079,724	285	255	30	*10.53%*
	0.07%	*4.03%*	*4.25%*		
Community of Interest	212,749,849	1,207	1,129	78	*6.46%*
	0.61%	*17.08%*	*18.82%*		
Worker	238,723,904	629	418	211	*33.55%*
	0.68%	*8.90%*	*6.97%*		
Enterprise	9,348,171,439	532	479	53	*9.96%*
	26.78%	*7.53%*	*7.98%*		
Tenant	58,446,996	170	155	15	*8.82%*
	0.17%	*2.41%*	*2.58%*		
Multi-stakeholder	1,003,257,686	463	429	34	*7.34%*
	2.87%	*6.55%*	*7.15%*		
Co-operative	28,665,786	30	27	3	*10.00%*
	0.08%	*0.42%*	*0.45%*		
Employee Trust	10,186,794,250	25	24	1	*4.00%*
	29.19%	*0.35%*	*0.40%*		
SUM	34,902,947,031	7,067	5,999	1,068	*15.11%*
	100.00%	*100.00%*	*100.00%*		*(Average)*

All, Active, and Dissolved in units; Turnover in £. Source: CUK, 2017

Table 3.3 presents the analysis of the forms of cooperatives of the UK cooperative firms and shows that consumer cooperatives (39.54%), enterprise cooperatives (26.78%), and employee trusts (29.19%) are the three major forms of cooperatives when looking at the

levels of turnover. The highest density of cooperative firms is observed under consumer cooperatives (51.39%), while community of interest cooperatives are a lagging second (18.82%). The highest dissolution rate is observed in worker cooperatives (33.55%). It is important to mention that worker cooperatives not only have the highest accumulated dissolution rate, but when examined further, they are observed as having the highest dissolution rates in most of the sectors in which they operate.

Tables 3.2 and 3.3 show that consumer cooperatives, enterprise cooperatives and employee trusts are the three types of cooperatives that form the highest turnover, while agriculture and retail are the two sectors with the highest turnover. These cases can thus be considered the most successful in the UK's cooperative sector. Contrarily, worker cooperatives seem to have struggled the most between 2012-2017 with a turnover of less than 1% and a high dissolution rate of 33.55%. Despite the low turnover for worker cooperatives, when compared to the whole cooperative sector, this organizational form remains of interest in the present research since it is the cooperative form most considered in the theoretical literature. This literature, as discussed in Chapter 2, is heavily critical of the viability of worker cooperatives due to the internal organizational characteristics that differentiate worker cooperatives from other cooperative forms, which do not allow them to perform as well as, or better than, other types of cooperative firms. Taking these points into consideration, the next three sub-sections discuss in depth each of the cases mentioned above while placing them into industrial classifications. Section 3.1.1 focuses on retail cooperatives, including consumer cooperatives and employee trusts.[4] Section 3.1.2

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[4] The employee trusts included in the models of this research, refer to employee trusts from several sectors. In short, employee trusts are observed in Manufacturing (8 – £106,934,424 turnover), Retail (2 – £10,026,200,000 turnover), Education (1 – £4,675,937 turnover), Professional and Legal Services (6 – £38,455,889 turnover), Other (1), Health and Social Care (2 – £10,000,000 turnover), Transport (1 – £528,000

discusses the case of enterprise cooperatives in agriculture, and section 3.1.3 examines worker cooperatives in the UK economy.

3.1.1 The UK Leader: Retail Cooperatives

Leading examples of a successful cooperative firm in the UK are those of the retail sector. Table 3.4 presents the performance of the retail sector, which had in 2017 more than £25 billion in turnover (71.16%), 491 (8.61%) active cooperative firms, and the second smallest dissolution rate (11.96%). The turnover of the UK's cooperative retail sector in 2017 amounted to more than 6% of sales for the whole retail industry. The highest shares in turnover belonged to The Co-operative Group and the John Lewis Partnership, which are two of the top retail companies in the UK, each accounting for more than £9 billion in turnover per year.

When examining the ownership specification breakdown of the retail cooperative sector in Table 3.4, it can be observed that there is a concentration of turnover in consumer and employee trust retail cooperatives. The John Lewis Partnership is one of the two firms that fall under the employee trust classification, while The Co-operative Group is considered a consumer cooperative. Significantly, worker cooperatives in the retail sector have a two and a half times higher dissolution rate (26.58%) compared to consumer cooperatives (10.19%), as well as the highest dissolution rate in retail.

turnover), and Digital, Media, and Communication (1). However, since the main representative of employee trusts is the John Lewis Partnership, which belongs to the retail sector, and since the number of the rest of the employee trusts is very small to perform a separate analysis, there is not a specific subsection in this chapter discussing employee trusts.

Table 3.4: UK Retail Cooperatives Analysis per Ownership Classification

Ownership Classification	Turnover	All	Active	Dissolved	Dissolved/All
Community of Interest	10,151,246	69	66	3	4.35%
	0.04%	10.87%	11.81%		
Consumer	13,174,108,705	373	335	38	10.19%
	52.33%	58.74%	59.93%		
Co-operative	-	0	0	0	-
	0.00%	0.00%	0.00%		
Employee Trust	10,026,200,000	2	2	0	0.00%
	39.83%	0.31%	0.36%		
Enterprise	1,837,893,012	27	23	4	14.81%
	7.30%	4.25%	4.11%		
Multi-Stakeholder	550,263	11	9	2	18.18%
	0.00%	1.73%	1.61%		
Self-employed	4,596,602	73	65	8	10.96%
	0.02%	11.50%	11.63%		
Tenant	-	1	1	0	0.00%
	0.00%	0.16%	0.18%		
Worker	119,797,754	79	58	21	26.58%
	0.48%	12.44%	10.38%		
SUM	25,173,297,582	635	559	76	11.97%
	100.00%	100.00%	100.00%		(Average)

All, Active, and Dissolved in units; Turnover in £. Source: CUK, 2017

3.1.2 The Success of UK Agricultural Cooperatives

Agricultural cooperatives are another successful cooperative case in the UK. Table 3.2 shows that agriculture is the second largest industrial sector in which cooperative firms operate, with over £7 billion in turnover in 2017 (20% of the whole cooperative sector) and over 400 companies. Around half of UK's farmers are members of agricultural cooperatives, while the turnover share of these companies within the UK agricultural sector was around 6% in 2017. Table 3.5 provides information regarding the ownership distinctions in the agriculture sector, in which 98% of the turnover and 86.24% of agricultural cooperatives are identified as enterprise cooperatives. The fact that agricultural cooperatives are concentrated under the enterprise cooperative form calls for a discussion of the agricultural enterprise cooperative form.

Table 3.5: UK Agricultural Cooperative Analysis per Ownership Classification

Ownership Classification	Turnover	All	Active	Dissolved	Dissolved/All
Community of Interest	1,332,278	29	27	2	6.90%
	0.02%	6.42%	6.63%		
Consumer	81,053,301	4	4	0	0.00%
	1.11%	0.88%	0.98%		
Co-operative	-	0	-	0	-
	0.00%	0.00%	0.00%		
Employee Trust	-	0	-	0	-
	0.00%	0.00%	0.00%		
Enterprise	7,197,631,178	393	351	42	10.69%
	98.86%	86.95%	86.24%		
Multi-stakeholder	77,514	6	6	0	0.00%
	0.00%	1.33%	1.47%		
Self-employed	-	1	1	0	0.00%
	0.00%	0.22%	0.25%		
Tenant	-	0	-	0	-
	0.00%	0.00%	0.00%		
Worker	322,629	19	18	1	5.26%
	0.00%	4.20%	4.42%		
SUM	7,280,416,900	452	407	45	9.96%
	100.00%	100.00%	100.00%		(Average)

All, Active, and Dissolved in units; Turnover in £. Source: CUK, 2017

Upon examination of the top agricultural cooperatives in the UK by this research, agricultural enterprise cooperatives were found to have accessed several internal financial institutional arrangements that could possibly have allowed them to overcome the underinvestment problem. These internal institutional arrangements refer to high levels of shareholder funds (mainly from ordinary shares), to the creation of financial subsidiaries (or to being part of a big group as subsidiaries), and to the creation of strategic alliances with companies related to their products. Taking into consideration the literature on hybrid cooperative firms, which suggests that in order for cooperative firms to overcome underinvestment issues they must introduce structural reforms to their property right structures that will allow them to access high levels of capital and investments, then UK agricultural cooperatives could be considered examples of the hybrid forms discussed in the literature surveyed in Chapter 2.

3.1.3 The Struggle of UK Worker Cooperatives

The form of cooperatives that appears to have struggled the most from 2012 to 2017 in the

UK is worker cooperatives. Worker cooperatives present much lower turnover in industries

Table 3.6: UK Worker Cooperatives Analysis per Sector

Sector	Turnover	All	Active	Dissolved	Dissolved/All
Agriculture	322,269	19	18	1	5.26%
	0.14%	3.26%	4.44%		
Arts and Culture	1,602,417	39	20	19	48.72%
	0.67%	6.70%	4.94%		
Digital, Media, and Communication	7,798,439	71	49	22	30.99%
	3.27%	12.20%	12.10%		
Education	1,339,488	80	50	30	37.50%
	0.56%	13.75%	12.35%		
Energy and Environment	854,184	12	5	7	58.33%
	0.36%	2.06%	1.23%		
Finance	146,000	2	2	0	0.00%
	0.06%	0.34%	0.49%		
Food service, Accommodation, and Pubs	96,427	20	12	8	40.00%
	0.04%	3.44%	2.96%		
Health and Social Care	18,455,034	36	22	14	38.89%
	7.74%	6.19%	5.43%		
Housing	392,237	12	8	4	33.33%
	0.16%	2.06%	1.98%		
Manufacturing	22,444,197	49	37	12	24.49%
	9.42%	8.42%	9.14%		
Membership Associations, Social Clubs, and Trade Unions	337,025	16	12	4	25.00%
	0.14%	2.75%	2.96%		
Other	43,511,208	42	30	12	28.57%
	18.25%	7.22%	7.41%		
Professional and Legal Services	20,370,027	89	71	18	20.22%
	8.55%	15.29%	17.53%		
Retail	119,797,754	79	58	21	26.58%
	50.26%	13.57%	14.32%		
Sport and Recreation	390,095	9	7	2	28.57%
	0.16%	1.55%	1.73%		
Transport	499,000	7	4	3	42.86%
	0.21%	1.20%	0.99%		
SUM	238,355,801	582	405	177	30.72%
	100.00%	100.00%	100.00%		(Average)

All, Active, and Dissolved in units; Turnover in £. Source: CUK, 2017

with very high skills requirements (e.g., low monitoring costs - relatively high managerial abilities). Moreover, in all the economic sectors in which worker cooperatives have a relatively significant presence either in terms of turnover or in number of firms, they are observed to have the highest dissolution rate, as previously mentioned.

More specifically, Table 3.6 shows that the levels of worker cooperatives dissolution rates sometimes exceed 50% and, on average, exceed 30%. These figures suggest that almost one third of the active UK worker cooperatives between 2012 and 2017 were dissolved. Regarding the economic performance of worker cooperatives, Table 3.6 indicates that the highest turnover is observed in Retail (50.26%), while the highest rate of active companies is in the "Professional and Legal Services" (17.53%), "Retail" (14.32%), "Education" (12.35%), and "Digital, Media and Communication" (12.10%) sectors.

3.2 The Case of the French Cooperative Sector

The case of the cooperative movement in France is one of the most significant (Pérotin 2006) in the history of cooperative firms. In its early years, the French cooperative movement was related to the left political movements for workers' autonomy and rights (Pérotin 2006). A dynamic cooperative movement with political characteristics, in combination with the civil law legal framework in France, allowed the cooperative organizational form to become established through specific legislations which considered to a certain degree the peculiarities of each type of cooperative firm. In 2014, cooperatives in France were employing more than 5% of the country's workforce, while the turnover of the cooperative sector corresponded to 10% of France's GDP.

Table 3.7: French Cooperative Firm Type Description

Member type	Description
User Co-Operatives: • **Consumer Cooperatives** • **School Cooperatives** • **Co-Owned Housing Cooperatives**	Members are users of the goods and services produced: • Customers/Consumers • Students with Help from Teachers • Owners
Co-Operative Banks	Members are customers, savers, or borrowers.
Business Co-Operatives[5]: • **Agricultural Co-Operatives** • **Co-Operative Fisheries** • **Co-Operatives of Small Business-Owners** • **Co-Operatives of Haulage Contractors** • **Co-Operatives of Retailers**	Members run their own businesses: • Farmers • Professional Fishermen • Organise Services in Common • Haulage Contractors • Independent Shop Owners
Worker Co-Operatives or Producer Co-Operatives	Members are employees, who are also majority shareholders.
Multi-Stakeholder Co-Operatives	Members are various stakeholders with shared objectives.

Source: Coop FR

Today, French cooperative firms can be observed under several legal forms and categories, grouped into five main categories according to Coop FR: User Cooperatives, Cooperative Banks, Business Cooperatives, Worker Cooperatives (or Producer Cooperatives), and Multi-Stakeholder Cooperatives. Table 3.7 provides a brief presentation of these cooperative forms.

Table 3.8 presents data per cooperative form of the sectors in the French cooperative economy for 2014. Among the cooperative forms presented in Table 3.8, the three champions of the French cooperative sector appear to be the agricultural co-operatives, the retailer cooperatives, and the cooperative banks.

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[5] For consistency purpose with the UK case, the French Business Co-operatives will be referred as Enterprise Co-operatives.

Table 3.8: French Cooperative Sector Analysis per Ownership Classification[6]

Classification	Active	Turnover
Agricultural co-operatives	2,750 co-operatives/consortia/SICAs 11,545 CUMAs	84.8
Artisan co-operatives	424	1.3
Transport co-operatives	23	0.145[1]
Retailer co-operatives	89	143.5
Fishing co-operatives[1]	134[1]	1.2[1]
Consumer co-operatives	35	1.372
Low-income housing co-operatives	175	0.649
School co-operatives	55,000	0.32
Worker co-operatives (SCOPs)	2,222	4.2
Community-interest co-operatives (SCICs)	408	0.142
Cooperative Banks:		
• **Groupe Crédit Agricole**	39 regional banks - 2,477 local banks - 11,300 branches	30.2[2]
• **Caisse d'epargne Banque Populaire**	35 regional banks - 8,000 branches	23.3[2]
• **Groupe Crédit Coopératif**	12 co-operative organisations - 117 branches	0.41[2]
• **Groupe Crédit Mutuel**	18 regional banks - 2,131 local banks - 3,167 branches	15.4[2]
SUM	22,517[3]	306.9
Notes: [1] **2012 figures; all other figures are from 2014,** [2] **Net banking income** [3] **Including local co-operative banks and agricultural equipment co-operatives but excluding school co-operatives.**		

Active in units; Turnover in billions €.

Agricultural cooperatives are not only important because of their high turnover (more than € 84 billion in 2014), but because of the shares of the whole sector that these types of firms have acquired. Agricultural cooperatives control 40% of the total French food industry, and they involve in their business 75% of all French farmers. When comparing the 2014 performance of French agricultural cooperatives with the 2017 performance of the UK agricultural enterprise cooperatives, it can be observed that French agricultural cooperatives

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[6] Sectoral survey of co-operative businesses, Coop FR, 2016

achieve around 12 times the turnover of their UK counterparts. In the case of retailer cooperatives, Table 3.8 shows their domination in turnover (more than € 143 billion), while at the same time they control 30% of the whole retail industry. The counterparts of retailer cooperatives in the UK are the retail enterprise cooperatives. When comparing the French and UK retail cooperative forms, French retailer cooperatives achieve around 80 times the turnover of their UK correspondents, while when comparing the French retailer cooperatives with the UK retail cooperative sector as a whole, the former are observed to be more than 5 times larger in size. Cooperative banks represent 60% of the retail banking in France with their net banking income exceeding € 65 billion and their members reaching 24 million. A relatively low performance is observed when comparing SCOPs with other French cooperative forms with number of businesses close or lower to those of SCOPs. Even though there are no data available on the dissolution rates of worker cooperatives, their relatively low performance is an indication that they can be considered as a cooperative form that could potentially struggle more compared to the other cooperative forms which are thriving in the French economy. When comparing SCOPs with their UK counterparts, it can be observed that SCOPs achieve around 15 times the turnover of worker cooperatives in the UK.

In order to compare cooperatives in the UK and France, a connection between successful and struggling cooperatives in these two countries needs to be identified. Agricultural cooperatives in France could be considered comparable to the UK agriculture enterprise cooperatives, since both these agricultural cooperatives are owned and controlled by farmers. In both the UK and France, this cooperative form is successful and dominates the cooperative sector. Regarding the comparability between consumer cooperatives in the UK and retailer cooperatives in France, although these two forms are not represented by the same class of patrons, they are both considered relative to the retail industry. Retail

cooperatives in the UK are cooperative firms active in the retail industry controlled by several different patrons' groups, whereas in the case of France, retailer cooperatives are considered as cooperatives formed by other retailers. Thus, in the case of the UK, a retail cooperative can be a worker, consumer, or enterprise cooperative, while in France, a retailer cooperative is considered as an enterprise cooperative only. The similarity with the UK retail sector on its own is not sufficient to consider these firms comparable for the scope of this analysis. However, this research aims to compare these firms with regard to the characteristics which affect their financial viability. Since this research focuses on the correspondence of successful and struggling cooperative forms, retailer and agricultural cooperatives in France are considered the corresponding successful cooperative forms. Cooperative banks will be used as an explanatory financial arrangement in this research, and for this reason they are not considered a cooperative form of interest. Regarding the correspondents of struggling UK worker cooperatives in the French context, SCOPs are considered as the appropriate cooperative form in France. This relative comparability provides a great opportunity for a country-level comparative analysis to be conducted.

The analysis presented in the following sub-sections for France is based on data available in the DIANE database, as there was limited information on the whole cooperative sector in Coop FR. Since the discussion that follows refers to samples of cooperative firms and not all the cooperative firms of the whole French economy, the limitations of the analysis are obvious, and the conclusions are very humble. The data extracted from DIANE is limited to companies considered active in 2016 and, as a result, there is no separate information available regarding active and dissolved companies between 2011 and 2016. By contrast, this information was available for the UK case. The data presented in Tables 3.9, 3.10, 3.11, and 3.12 correspond to active cooperative firms in France for 2016.

3.2.1 The French Leader: Retailer Cooperatives

As mentioned earlier in this research, French retailer cooperatives are considered the most successful cooperative type in France. Retailer cooperatives are observed to achieve the second highest turnover within the French cooperative sector behind financial cooperatives. Some of the most important company representatives are Leclerc, Système U, Krys, and Intersport according to Coop FR. Table 3.9 details the legal dispersion of retailer cooperatives in France.

Table 3.9: French Retailer Cooperatives Analysis per Legal Category

Legal Category	Active	Turnover
SA coopérative de commerçants-détaillants à conseil d'administration	64	11,769,901.39
	95.52%	*99.45%*
SA coopérative de commerçants-détaillants à directoire	3	64,768.696
	4.48%	*0.55%*
SUM	67	11834670.08
	100.00%	*100.00%*

Active in units; Turnover in thousands of €. Source: DIANE, 2016

Table 3.9 shows that companies and turnover are mainly concentrated under the legal category "SA coopérative de commerçants-détaillants à conseil d'administration". The fact that most of the companies are operating under the aforementioned legal category is not a surprise since a board of administration is required for the operation of such big companies. Table 3.9 also shows that 64 retailer cooperatives, which correspond to the 95.52% of the sample, operate under the "SA coopérative de commerçants-détaillants à conseil d'administration" legal category. When looking at the levels of turnover, this legal category incorporates 99.45% of retailer cooperatives which amounts to more than €11.5 billion.

3.2.2 The Success of French Agricultural Cooperatives

According to the World Co-operative Monitor of 2016, two French agricultural cooperatives are in the top 20 largest agricultural cooperatives in the world. Some of the biggest French agricultural cooperatives, according to the World Co-operative Monitor of 2016, are In Vivo (€7.52 billion), and Sodiaal (€7.20 billion). In the 2012 report, Terrena (€5.18 billion), and Tereos (€4.72 billion) are mentioned as well. Table 3.10 lists the legal categories of the sample of agricultural cooperatives examined in this research.

When observing the legal categories that agricultural cooperatives have chosen for their operation, most of them are under the "Société Coopérative Agricole" legal category which represents 82.04% of the sample and 1,603 companies. "Société coopérative Agricole" is the legal category that features the highest turnover as well, accounting for more than €31 billion and 71.24% of the turnover of all the agricultural cooperatives. While there are over

Table 3.10: French Agricultural Cooperatives' Analysis per Legal Category

Legal Category	Active	Turnover
Caisse de crédit agricole mutuel	1	241,860
	0.05%	*0.55%*
Coopérative d'utilisation de matériel agricole en commun (CUMA)	130	15,384.573
	6.65%	*0.04%*
Société coopérative agricole	1,603	31,276,624.39
	82.04%	*71.24%*
Union de sociétés coopératives agricoles	220	12,368,917.49
	11.26%	*28.17%*
SUM	1,954	43,902,786.45
	100.00%	*100.00%*

Active in units; Turnover in thousands of €. Source: DIANE, 2016

four times as many CUMAs as agricultural cooperatives in Table 3.8, in our DIANE sample, CUMAs make up only 6.65% of the agricultural cooperatives. This is a characteristic of the sample that weakens its explanatory power.

3.2.3 The Struggle of French SCOPs

In 2014, there were 2,222 French SCOPs and they exceeded €4 billion in turnover. Although this turnover looks high at a first sight, when looking at the relative performance of SCOPs compared to the performance of other cooperative firms, a level of underperformance is observed. This is an issue that has been identified in the UK worker cooperatives as well and raises questions regarding the potential of this cooperative form.

Looking more closely at the sample of SCOPs obtained from DIANE, Table 3.11 shows that the main industries in which SCOPs are observed are "Construction" (25.87%), "Manufacturing" (16.89%), and "Professional, Scientific, and Technical activities" (19.36%). The high number of firms is translated into superiority in turnover only in the cases of Construction (31.97%) and Manufacturing (30.83%). These two industrial sectors require labor intense production processes, while in the case of the "Professional, Scientific, and Technical Activities" sector, high education skills prevail. These are two characteristics that have been discussed in the literature as favourable for the development of worker cooperatives (Ben-Ner 1988a; Putterman 1993).

Finally, an interesting observation can be made from Table 3.12, in which the legal categories of SCOPs are presented. The SCOPs observed to be the more successful are those that have a board of directors. On the other hand, those that do not have a board of directors underperform significantly, even though they are much larger in number. This observation,

however, may be a result of the reverse causality phenomenon, meaning that SCOPs with

boards of directors are bigger in size and, as a result, have a much higher level of turnover.

Table 3.11: French SCOPs Analysis per Industry

Industry	Active	Turnover
Accommodation and Food Service Activities	32	6071.872
	2.48%	*0.33%*
Administrative and Support Service Activities	55	120659.353
	4.26%	*6.48%*
Agriculture, Forestry and Fishing	7	1819.349
	0.54%	*0.10%*
Arts, Entertainment, and Recreation	47	40520.543
	3.64%	*2.18%*
Construction	334	595111.36
	25.87%	*31.97%*
Education	72	72976.843
	5.58%	*3.92%*
Human Health and Social Work Activities	28	14164.853
	2.17%	*0.76%*
Information and Communication	84	33353.157
	6.51%	*1.79%*
Manufacturing	218	573961.143
	16.89%	*30.83%*
Mining and Quarrying	1	0
	0.08%	*0.00%*
Other Service Activities	24	7096.438
	1.86%	*0.38%*
Professional, Scientific and Technical Activities	250	134244.835
	19.36%	*7.21%*
Real Estate Activities	1	8245.716
	0.08%	*0.44%*
Transportation and Storage	32	73112.638
	2.48%	*3.93%*
Water Supply, Sewerage, Waste Management and Remediation Activities	5	10625.283
	0.39%	*0.57%*
Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	101	169469.142
	7.82%	*9.10%*
SUM	1291	1861432.525
	100.00%	*100.00%*

Active in units; Turnover in thousands of €. Source: DIANE, 2016

Table 3.12: French SCOPs Analysis per Legal Category

Legal Category	Active	Turnover
SA coopérative ouvrière de production (SCOP) à conseil d'administration	218	1387606.688
	16.89%	*74.55%*
SA coopérative ouvrière de production (SCOP) à directoire	2	0
	0.15%	*0.00%*
SARL coopérative ouvrière de production (SCOP)	1,071	473825.837
	82.96%	*25.45%*
SUM	1,291	1861432.525
	100.00%	*100.00%*

Active in units; Turnover in thousands of €. Source: DIANE, 2016

3.3 Conceptualization Through Institutional Complementarities

Having classified cooperatives as successful or struggling in both the UK and France, this research investigates the extent to which these firms are sustainable, as well as their internal differentiations and cross-country differences. Following Gagliardi (2009), the theoretical framework of institutional complementarities is used to examine the effects of specific institutional arrangements on the operation of cooperative firms. This section focuses on introducing the theoretical framework of institutional complementarities as a tool for understanding the interactions of different cooperative forms with specific internal and external financial arrangements. The specificity of this framework lies in the fact that it considers the importance of the interdependencies between institutional arrangements and institutional environments when looking at economic activity. In other words, not only do institutions matter but, more specifically, context matters.

This section begins with a presentation of several positions that exist in the literature regarding the nature of institutional complementarities at the micro and macro levels. The section then focuses on connecting this framework with the aim of this research, which is to look at whether and to what extent the differentiations in the performance of different cooperative forms can be explained by the existence of several institutional complementarities between these cooperative forms and specific internal and external

financial arrangements.

As previously mentioned, there is a discordance between the theoretical predictions and empirical evidence regarding the sustainability of cooperative firms. While a large part of the theoretical literature supports the inability of cooperative firms to operate at a large scale and remain sustainable, in the UK and France the cooperative sector is observed to have had high levels of turnover over many years. However, after a detailed examination of the cooperative sectors in both these countries, it is clear that not all types of cooperatives are successful, but only certain categories stand out. More specifically, in the UK, agricultural enterprise cooperatives, retail consumer cooperatives, and employee trust cooperatives are observed to be sustainable and successful, while worker cooperatives seem to struggle in almost every industry. In the case of France, the cooperative forms with the highest turnover are the agricultural and retailer cooperatives, with SCOPs (worker cooperatives) performing relatively well, but much less successfully than the agricultural and retailer cooperatives. The behaviour and structure of successful cooperatives in both countries is referred to in the literature as the hybrid form. Worker cooperatives have a low or non-existent level of incorporating the hybridized structural changes, as opposed to the agricultural and retailer cooperatives. This behaviour results in lower performance levels. These characteristics of cooperative firms calls for a three-level analysis of the cooperative sector in the UK and France. First, this research will try to identify potential financial institutional arrangements that complemented the operation of cooperative firms and allowed them to thrive. Second, this research will try to uncover how worker cooperatives accessed financial sources differently compared to the more successful cooperative cases. A third level of analysis will focus on the effects of the institutional environment on the decisions of cooperatives regarding how to access capital. This last level is not examined in any of the hypotheses that are tested; it is instead used as a tool for the interpretation and understanding of the

differentiations in the results of the UK and France.

Figures 3.1 and 3.2 present the UK and French institutional environments as defined by some macro-level characteristics, and in which different types of institutional arrangements arise and interact with each other. The groups of institutional arrangements that this research considers are subcategorized into organizational and financial arrangements. The former refer to different cooperative forms, and the latter consider the different sources of capital. Financial arrangements refer to external and internal financial arrangements that allowed cooperatives to overcome their underinvestment problems. This last distinction allows this research to investigate the different effects that the property rights structures of cooperatives firms have on their ability to raise equity and access loans through debt. However, the complementary role of some institutional arrangements may not be observable just through the effect of an institutional arrangement on the operation of cooperative firms. In both the UK and French cooperatives, the accessibility of these external or internal financial institutional arrangements is affected by the characteristics of the institutional environment. These interactions are considered by cooperative organizations when it comes to accessing capital through equity or debt mechanisms. More specifically, the characteristics of the UK institutional environment presented in this research are the common law legal system and the liberal market economy system. The characteristics of the French institutional environment are the civil law legal system and the coordinated market economy system. The study of the effects that different legal systems and market organizations have on different institutional arrangements is important since the characteristics of the institutional environments provide the rules and the limits within which different organizational forms are created and grow. As a result, the success or struggle of the different cooperative forms of interest are affected by these rules.

Cooperative firms in the UK (Graph 3.1) are observed to either be successful and

sustainable or existing but struggling. Graph 3.1 shows that the successful cooperative organizational arrangements mostly contain some common organizational characteristics that separates them from the struggling cooperative organizational arrangements. These organizational characteristics include issues observed in the literature that are meant to cause or exaggerate the underinvestment problem of cooperative firms. The characteristics discussed here are the level of the diversification of members' investment, the level of hierarchy that exists within each organization, the level of homogeneity between the members of the cooperative firms and between the interests of the members, the availability of potential new members, and the transferability of the shares. In addition to these characteristics, a feature that is related to the complementarities that arise between specific sectors and cooperative firms operating in these sectors is examined.

Starting with the capability of members to diversify their investment, Figure 3.1 shows that in the cases of agricultural enterprise cooperatives, the members of retail consumer cooperatives and employee trusts are able to diversify their investment easily since they can have several other sources of income. More specifically, in the case of retail consumer cooperatives, members are just consumers who have a completely separate income flow and the membership in the cooperative is just an additional form of investment or income. In the case of employee trusts, members provide just a part of their wages which, in most cases, takes the form of a bonus from the company profits. In the case of worker cooperatives, since the product is a result of workers' labour and the investment can only be made through capital supply, for an investment to be made, the reinvestment of the whole income of

Figure 3.1: Institutional Complementarities within the UK Institutional Environment

UK Institutional Environment

UK Organizational Arrangements

Successful (Agricultural Enterprise Cooperatives/Retail Consumer Cooperatives/Employee Trusts)

Diversified Investment (Yes)
Hierarchy (Frequently)
Homogeneity in Members' Interests (Yes)
Members Pool (Big)
Sectorial Complementarities (Yes)
Tradable Residual Claims (Yes)

Struggling (Worker Cooperatives)

Diversified Investment (No)
Hierarchy (If big)
Homogeneity in Members' Interests (If small)
Members Pool (Small)
Sectorial Complementarities (in Services)
Tradable Residual Claims (Rarely)

UK Financial Arrangements

Internal (Equity)   **External (Debt)**

workers into the company is required.

The second characteristic that is observed in Figure 3.1 to differentiate successful from struggling cooperative firms is the positive economic returns that occur from the implementation of a hierarchical system within the firm. Within the literature it has been supported that higher levels of hierarchy can increase the organizational efficiency of a company (Williamson 1980). Large successful firms tend to implement higher levels of hierarchy which could have advantageous results for their performance, while worker cooperatives gravitate toward more hierarchical structures only when they become bigger. Thus, successful cooperative firms are keener to adopt hierarchical structures compared to struggling cooperative firms. Nonetheless, there may be reverse causality in this case, since firms naturally implement hierarchy as they become bigger. Homogeneity between the members intensifies in the case of successful cooperative forms when compared to struggling worker cooperatives. The idea is that, in the case of agricultural cooperatives, enterprises are interested in maximizing the returns of their product, and, in the case of retail cooperatives, consumers are interested in the services provided by the cooperative. In the case of worker cooperatives, focus is placed on several functions within the company and some disagreements may arise. For example, workers may disagree on choosing long-term investments versus short-term investments and vice versa. For some workers, long-term sustainability may be more important while for others higher short-term profits may be more important.

The number of members that can actually be incorporated into each cooperative is an important issue as memberships translate into capital. For retail consumer cooperatives and agricultural cooperatives in the UK, there is a large pool of members that can be selected from. However, worker cooperatives have a harder time attracting members because of the limited number of members available. The pool of consumers is much bigger than that of

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workers. Interestingly, in the literature, it has been supported that the success of consumer retail cooperatives is based on the loyalty of their members, which results in increased equity for the cooperative (Sodano and Hingley 2009). When looking at enterprise cooperatives, again, it is easier to add members since the enterprises provide their products when joining the cooperative, while in the case of a worker cooperative, the addition of a member means additional labour in the production process. This additional level of labour may not always be welcomed in a company because of a potential decrease in productivity. This last peculiarity of worker cooperatives limits the number of potential members for this type of firm in contrast with other cooperative forms.

The idea of tradable/non-tradable residual claims has been discussed earlier in this thesis and refers to the capability of cooperative firms to create a market for their memberships. If residual claims are easily tradable, then it will be easier for members to decide to join a cooperative and, as an extension, to provide the cooperative with capital. Specific characteristics of cooperative firms allow them to trade these residual claims easier compared to other forms. One characteristic that allows cooperative firms to trade their residual claims easier is the higher levels of internal capital endowments. In this case, the firm can bear the cost of the potential loss of a member until a replacement is found. The second characteristic is in regard to the members pool. The higher the number of potential members who want to join a cooperative, the easier it is for existing members to be able to sell their membership/shares to others. Both these characteristics are more prevalent in the cooperatives that are considered successful today. Consumer cooperatives and agricultural cooperatives feature both characteristics at a higher level than worker cooperatives, while in the case of employee trusts, whose members are workers, only the characteristic of the high internal capital endowments can be observed by the high turnover they achieve compared to worker cooperatives.

Finally, there are some sectorial complementarities that allow some cooperative forms to be more successful than others. For example, in the case of agricultural cooperatives, sectorial complementarities can be observed between small family farms, which face difficulties in realizing economies of scale and obtaining market power, and agricultural cooperatives, whose function is to bring together enterprises and, through cooperation, provide them with market power and lower costs. Another complementarity exists in the case of the retail sector where consumers come together to demand higher quality in the products they consume. In the case of worker cooperatives, there may be some sectorial complementarities between this cooperative form and service sectors because of the incentives that workers have for providing the best services to their customers (Zamagni 2012). This, for example, is the case of the John Lewis Partnership, which is an employee trust and is active in the UK retail sector.

After the above issues are considered, cooperative firms are moving toward financing their operation. As has been shown, it is much more difficult for worker cooperatives to raise internal capital compared to the other cooperative forms because of the limited wealth of their members, the limitations of the memberships, and the low diversification of their investments (Bowles and Gintis 1994; Ben-Ner 1988b; Putterman 1993). Since worker cooperatives face more problems related to raising capital for potential new members or potential shareholders, it would be expected that worker cooperatives are more dependent on external financial sources. However, external financial debt is relatively difficult for UK cooperatives to access, since, in the UK, finance is focused on short-term and highly profitable investments. Thus, capital sources are very difficult for these forms of cooperatives to raise, creating in this way an unfavourable environment in which to survive and thrive. Apart from the general difficulty in financing that worker cooperatives are faced with during the growth part of the business cycle, when a crisis rises, these difficulties may

become even more prevalent if the financial institutions limit their finance to companies. In this situation, worker cooperatives need to rely more on internal finance, a scenario that may be far from ideal for this type of firm because of their peculiar property rights structure. The relationships hypothesized here are that: i) there is positive complementarity between the performance of worker cooperatives and external financial arrangements, and ii) there is negative complementarity between the performance of worker cooperatives and internal financial arrangements.

When looking at Figure 3.2 and the French case, successful cooperatives are represented by two enterprise cooperatives: agricultural and retailer cooperatives. The organizational characteristics that are incorporated in the French enterprise cooperatives are the same as those identified in the case of the UK agricultural enterprise cooperatives. More specifically, the diversification in the investments of enterprise cooperatives members is low, hierarchy arises frequently because of size requirements, homogeneity between the members is achieved because of the common members' interest in maximizing profits, the pool of potential members is relatively big, the residual claims are relatively tradable, and sectorial complementarities are observed in agriculture and retail. Regarding the organizational characteristics of SCOPs, they are similar to the organizational characteristics of UK worker cooperatives. In detail, the diversification in workers' investments is low, hierarchies rarely exist and mainly when the size of the cooperative is large, homogeneity between the members may be weak, the member pool is limited by workers' endowments and firms' labor requirements, the residual claims are difficult to trade, and sectorial complementarities are observed in manufacturing and construction. Considering these elements for both successful and struggling cooperatives in France, the complementarities that arise in France would be expected to follow the same behaviour as

Figure 3.2: Institutional Complementarities within the French Institutional Environment

French Institutional Environment

French Organizational Arrangements

Successful (Agricultural Cooperatives/Retailers Cooperatives)

Diversified Investment (Low)
Hierarchy (Frequently)
Homogeneity in Members' Interests (Yes)
Members Pool (Big)
Sectorial Complementarities (Yes)
Tradable Residual Claims (Yes)

Struggling (SCOPs)

Diversified Investment (No)
Hierarchy (If big)
Homogeneity in Members' Interests (If small
Members Pool (Small)
Sectorial Complementarities (in Services)
Tradable Residual Claims (Rarely)

French Financial Arrangements

Internal (Equity)   **External (Debt)**

in the UK: a positive complementarity would be expected to exist between the performance of SCOPs and external financial arrangements, while a negative complementarity would be expected to arise between the performance of SCOPs and internal financial arrangements.

When comparing the complementarities that exist in each country, there are some important differences that need to be considered. France is a coordinated market economy and a civil law country, while the UK is liberal market economy and a common law country. This distinction affects crucially the financial criteria used by financial institutions, and by extension the investment that would be supported and prioritized in each economy. Since in the UK the main financial criteria used are the current profitability and productivity of firms, then, risky and short-terms investments are more likely to be supported. In France, instead, where the financial criteria are the sustainability and the long-term credibility of the firm, it could be argued that low risk and long-term investments are likely to prevail more frequently. The comparison of these two market economies proposes that the French financial environment is more supportive to cooperative firms compared to the UK financial environment. This is because, in the literature, cooperative firms are presented as firms which are focused on their long-term sustainability at the expense of higher short-term profitability. Regarding the characteristics that prevail in the institutional environments because of their legal systems, the civil law system has allowed French cooperatives to achieve a strong legislative framework regarding these types of firms, with clear definitions and characteristics for each type of cooperative form. In the UK, a much weaker legislative framework existed until 2014, when a new legal structure for cooperative firms was created. The weaker UK legislation framework allows for flexibility in shareholders' investment decisions through less strict legal forms. Moreover, shareholders' participation in firms is benefited by fast legal proceedings which reduce the transaction costs of shareholders' investments. The high speed in legal proceedings is due to the importance of contracts in

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the UK. On the other hand, the existence of a complete and strong legislative framework in France provides cooperative firms a secure environment since it alleviates some of the uncertainty that surrounds these types of firms. In addition to reduced uncertainty, a more developed legislative framework can also provide financial tools for cooperative firms. In this sense, a more certain investment environment is developed for shareholders so that they can increase their investments in firms in general, and in cooperative firms in specific. In France, for example, the legislation that allows members-investors to join a firm could be considered as a law that facilitates the financial operation of a cooperative.

3.4 Hypotheses

Having identified the focus of this research and the theoretical framework within which the work is conducted, the following three hypotheses emerge:

A)   The entry of struggling cooperatives depends more on the development of external financial arrangements than the entry of successful cooperatives.

In other words, positive complementarities are expected to be observed between the effects of external financial arrangements on the entry of cooperative firms and worker cooperatives in particular, both in the UK and France.

B)   The growth of struggling cooperatives depends less on the development of internal financial arrangements than the growth of successful cooperatives.

In other words, negative complementarities are expected to be observed between the effects of internal financial arrangements on the growth of cooperative firms and, in particular, worker cooperatives both in the UK and France.

C) **The growth of struggling cooperatives depends more on the development of external financial arrangements than the growth of successful cooperatives does.**

In other words, positive complementarities are expected to be observed between the effects of external financial arrangements on the growth of cooperative firms and worker cooperatives in particular, both in the UK and France.

The first and third hypotheses come as a result of the difficulties that struggling cooperatives face in developing internal financial arrangements and as a result of their low initial wealth endowment. As cooperatives face problems in raising capital from internal financing sources, they will tend to depend more on external financial arrangements for their operation. The struggling cooperative firms face issues with external lenders because of the peculiar property rights structure that governs them. As a result, they would tend to approach financial institutions that do not discriminate them based on those peculiarities. In contrast to struggling cooperatives, successful cooperatives would either be less dependent on external financial arrangements because of the development of internal financial arrangements and higher equity levels, or they could access mainstream financing channels since they would have already validated their financial credibility in the market over the years.

The idea for the second hypothesis stems from the fact that the development of internal financial arrangements in struggling cooperatives arises more difficultly compared to the development of these arrangements in successful cooperatives. The main reason for the lower utilisation of internal financial arrangements by struggling cooperatives is the fact that the aims of workers/members are frequently difficult to bridge - if not contradicting. According to the literature, a high level of homogeneity between the members is needed for

struggling cooperative firms to overcome such issues. Moreover, the decision for the development of internal financial arrangements has to be profitable for all the members and for a long time. The level of wages, investment returns, stock values, and within-work cooperation are only a few of the factors that a worker cooperative needs to consider before developing internal financial arrangements. On the other hand, in non-worker cooperatives, wages are not a priority, stock values and investment returns increase as internal financial arrangements are developed, and a potential distortion from the addition of new members can be limited to the decision-making level of the firm at which the majority is making the decisions.

4 Modelling Cooperatives' Performance

This research work looks at cooperatives' entry and growth in order to investigate the existence of complementarities that could arise between different cooperative forms and specific internal and external financial arrangements and understand whether and how these complementarities can explain the success or struggle of different types of cooperative to achieve and sustain high levels of turnover. This analysis will be carried out for both the UK and France in order for a comparison to be made between different institutional environments and the complementarities that may arise in each country. The years covered by this empirical analysis of the growth of the firms correspond to the 2008-2016 period for the UK and the 2007-2016 period for France, while for the entry models this analysis corresponds to the 2005-2015 and 2006-2014 periods respectively for the UK and France[7].

This section will present the models used for the investigation of the existence of complementarities. Section 4.1 will provide a detailed description of the multiplicative

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[7] The differences in observation periods in the entry and growth models exist because of data limitations. The idea behind the choice of the specific time periods for each model was to include the most years available in the databases and at the same time to create datasets whose results would be easily comparable. In this sense, the time periods chosen were most of the times the same in the models examined in this research, while in some cases a few extra years were included. More specifically, in all the models, the time period 2008-2014 is included. The additions in the UK entry models cover the years 2005-2007 and 2015, while the French entry models cover the additional period 2006-2007. Regarding the growth models, the additions in the UK cases corresponds to the time period 2015-2016, while in the French cases to the time periods 2007 and 2015-2016. Thus, the information extracted from each model is comparable to each other, while at the same time, the explanatory power of each model is the highest possible considering the limitations that arise from the data.

interaction model. Sections 4.1.1 - 4.1.2 and 4.1.3 – 4.1.4 will present the specification of the entry and growth models used for the examination of the performance of the different cooperative forms in the UK and France, and for the investigation of the complementarities in the UK and French cooperative sectors. Finally, Section 4.2 will provide the datasets analysis, including the summary statistics of the variables used and tables incorporating the correlation matrices.

4.1 Multiplicative Interaction Model

Before presenting the entry and growth models, it is important to explain the econometric methodology followed in order to examine the existence of the complementarities in the UK and French cooperative sectors.

Within the literature, the method that has been used for estimating the separate effects of interaction terms is the multiplicative interaction model (Ernst 2004; Brambor et al. 2006; Gagliardi 2009). The choice of the multiplicative model as the analytical model of this research is based on the fact that the focus of this research is on identifying whether there exist specific institutional complementarities. The multiplicative interaction model is structured on the basis of explaining the performance of each type of cooperative firm through the inclusion of interaction terms which capture the links arising between different types of cooperatives, and specific internal and external financial arrangements. In this sense, focus is given on the intercorrelations between the explanatory variables and the different types of cooperative firms. By using the multiplicative interaction model, the effect of an independent variable on a dependent variable is broken down into two sub-effects. The first sub-effect is the effect of the variable when there is no distinction in the characteristics of the observations. The second effect is the effect of the variable when

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considering some differentiations in the characteristics of the observations. In this work this distinction is illustrated by the use of a dummy variable which takes on the value 0 for all the non-worker cooperatives and the value 1 when worker cooperatives are examined.

More specifically, in this research, the independent variable corresponds to the performance of each cooperative firm. The first sub-effect corresponds to the effect that institutional arrangements have on the performance of each cooperative firm, disregarding the distinction between successful and struggling cooperative firms. The second sub-effect, which arises only in the case of worker cooperatives, corresponds to the additional effect that institutional arrangements have on the performance of each cooperative firm because of its distinctive "struggling" character. Finally, the sum of the first and second sub-effects will correspond to the effect of the institutional arrangements on the performance of worker cooperatives. A parametrical depiction of this model is:

$$Y = \beta 0 + \beta 1 X + \beta 2 D + \beta 3 X D + \beta 4 Z + \varepsilon, \quad (1)$$

where Y is the dependent variable, defined as cooperative firms' entry in the entry regressions and cooperative firms' growth in the growth regressions, X stands for the explanatory variables which refer to external and internal financial arrangements, D is the dummy variable STRUGGLE which corresponds to the companies that in each model are considered to be struggling, Z is the vector of control variables, ε is the error term, $\beta 0$ is the constant, $\beta 1$ the first effect of the variable when D equals 0, $\beta 2$ is the effect of the dummy variable, $\beta 3$ is the separate effect of X on Y when D is equal to 1, and $\beta 4$ is the coefficient that represents the effects of the vector of control variables. The total effect of variable X on Y is extracted by the calculation of the marginal effect of X on Y when D is equal to 1,

and the coefficient is equal to the sum of $\beta 1 + \beta 3$. When looking at the results, $\beta 1 + \beta 3$ portrays the total effect of the explanatory variables on the growth and entry of worker cooperatives and SCOPs, respectively, for the UK and France.

An alternative to the multiplicative interaction model would have been the construction of multivariate regression model for each cooperative type. In this case, separate regressions models would have been run for each type of cooperative firm and then a comparative analysis would have been possible by looking at the differentiations in the effects of the institutional arrangements on the performance of different types of cooperative firms. This method is followed in the case of the French entry models since no complementarity was found through the multiplicative interaction models. The methodology employed in the French entry models allowed for a basic comparative analysis, but with weaknesses in identifying complementarities.

The first weakness is related to the fact that multivariate regression model, which do not incorporate interaction terms, are structured for explaining the performance of each dependent variable through the simple effects of each independent variable. In the finalized version of each regression model, different variables may be included. More specifically, in each regression model different variables may prevail statistically significant, and, as a result, different variables may be included in the final presentation of each regression model, when the general-to-simple method[8] is applied. When comparing simple effects that are presented in different regression models, if there are differentiations in the other variables included in each model, then the explanatory strength of the comparison is reduced. This is

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[8] When applying the general-to-simple method, the final version of an econometric regression model occurs after the exclusion of all the statistically insignificant variables. More specifically, the calculations of the model start with the inclusion of all the relevant variables. Then, the most statistically insignificant variable is excluded each time, until there are included only statistically significant variables in the regression model.

because the magnitude of the effect of the variable of interest may change as some other variables are included or excluded.

The second problematic that prevails when trying to identify complementarities by comparing effects of a set of multivariate regression models is that the comparisons between statistically insignificant effects or statistically significant effects of the same sign becomes difficult. In the multiplicative interaction model, where the effects of the explanatory variables are broken down to main and interaction effects, complementarities can be identified by looking at the interaction term only.

4.1.1 Entry Models

After explaining the econometric modelling technique used for the investigation of institutional complementarities, this section presents the entry models for the UK and French cases. These models aim to identify potential complementarities between the effects of specific external institutional arrangements on the entry of worker cooperatives when compared to other types of cooperative firms. The cases which are discussed in this section for the entry models have corresponding models with those discussed in section 4.1.3 for the growth models, since the complementarities that arise in the entry models are compared to the complementarities observed in the growth models as well. Internal financial arrangements are not included in the entry models because of the inability of finding a suitable variable to account for their effect when firms are created.

The entry models for the UK case examine four cases. The first one refers to the comparison between the sum of consumer retail cooperatives, employee trusts, and enterprise agricultural cooperatives entries, on the one hand, and the entries of worker cooperatives on the other hand. The remaining three cases refer to the separate study of the

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entry of each individual successful cooperative form against the struggling form of worker cooperatives.

As far as the French case is concerned, a preliminary analysis of the French entry models through the use of multiplicative interaction models does not reveal any institutional complementarities. For this reason, the econometric strategy is to estimate separate models for agricultural cooperatives and SCOPs in France. After obtaining the results from the French entry models, the corresponding UK entry models are extracted for comparison purposes.

The dependent variable for the entry models is the counts of companies created every year (BIRTH). The explanatory variables referring to the external financial arrangements are building societies' loans (BSC), local financial development (LOCAL), cooperative banks' loans (BANKS), and credit unions' loans (UNION). The dummy variable STRUGGLE considers worker cooperatives against each of the other types of cooperative firms specified above. The set of control variables included in the model consists of: the regional density of cooperative firms (DENSITY), the count of incumbent cooperative firms (INCUMBENT), the national Gini coefficients (INEQ), the national interest rate (INTEREST), the regional income (REG_INC), the regional risk (RISK), and the regional unemployment (UNEMPLO). Furthermore, categorical variables controlling for regional (REGION), and yearly (YEAR) effects have been used.

4.1.2 Entry Models Specification

As mentioned above, the regressors included in the entry models are made up of external financial arrangements variables and control variables. The first external financial arrangement that will be discussed in this section, local financial development, refers to the

number of bank branches operating in each region. Local financial development has been characterized as an important factor for the growth of small and medium-sized enterprises (SMEs) and cooperative firms (Degryse and Ongena 2005; Gagliardi 2009). By analysing the density of bank branches in each region, the importance of the closeness of intermediate financial institutions for different types of cooperative firms will be examined. Within the literature, there exists the position that the closer a bank branch is to a firm, the better the evaluation of a borrower, and the lower the transaction costs of a bank in providing loans (Degryse and Ongena 2005; Petersen and Rajan 2002). In addition, it has been found that the greater the physical distance between a bank and the firm requesting a loan, the higher the interest rates will be (Degryse and Ongena 2005). These higher interest rates express the transaction costs created because of the difficulty of the bank to closely observe the financial progress of the borrower. Additionally, as a result of a greater physical distance between creditors and borrowers, the soft information—which is important for SMEs and smaller-sized cooperative firms—cannot reach the loan providers easily, and thus cooperatives lose the opportunity to attract financing that could be critical to their growth. This situation is especially harmful for worker cooperatives, which are particularly dependent on the financial help of intermediate institutions (Roelants 2000).

The other three external financial arrangements (BSC, UNION, and BANKS), for different reasons, could potentially allow cooperative firms to gain easier access to capital. Building societies are considered financial institutions that primarily give loans to SMEs, which support sustainable jobs and long-term low risk business plans. Furthermore, focus is placed on other functions of the firm, such as the environmental policy of the firm. These investment decision criteria are considered effective potential promoters of the growth of cooperative firms, since cooperative firms propel local and community welfare (Pérotin 2013). Credit unions place a special focus on financing cooperatives since, in some cases,

these credit unions are even formed by cooperative firms. In contrast to building societies, credit unions do not just require that the characteristics of cooperative firms fit with certain criteria for their investment decisions, but they openly regard the financing of cooperatives as one of their goals. Finally, cooperative banks are themselves a part of the cooperative sector and, as a result, there could possibly exist a special lending relationship with cooperative firms.

When examining the potential complementarities between the entry of worker cooperatives and the external financial arrangements, the expected sign of the complementarities may not be clear-cut at first sight. On the one hand, the effects of external financial arrangements on the entry of cooperative firms may show positive complementarities with worker cooperatives if worker cooperatives are treated the same by these financial arrangements before and after they are created. However, if the levels of uncertainty for worker cooperatives are much higher before they are created, then the complementarities between the effects of external financial arrangements on the entry of worker cooperatives would be expected to be negative.

The French legislative framework around cooperative firms is far more developed than that of the UK (Cracogna et al. 2013), as previously discussed, and this could be the reason that there exist higher levels of uncertainty for UK cooperative firms than for French cooperative firms. This uncertainty, in turn, raises barriers between cooperative firms and their potential lenders. Thus, the effects of receiving funding from external financial arrangements on the performance of cooperative firms would be expected to be stronger for cooperative firms in the UK than in France, and the complementarities would be expected to be stronger in the UK compared to France.

Regarding the control variables included in the entry models, it is stated in the literature that in regions where more cooperative firms exist, it is easier for new cooperative firms to

join the market (Ben-Ner and Jun 1996, Elster 1989). However, this advantage is limited by the power of the market to support a set number of firms. Thus, an inverted-U curve may be the result of this peculiarity (Pérotin 2006; Carroll and Hannan 1989). Inequality seems to play an important role in the creation of cooperative firms by defining the relative economic power of the agents who compete to organize the production process. Ellerman (1992) supports that there is a struggle in society between labour, which tries to hire capital, and capital, which tries to hire labour. As the wealth of a country is accumulated by fewer and fewer people, capital holders gain advantage over labour. Interest rates control for the trade-off between investments and savings in every period (Pérotin 2006). The importance of regional income is related to the economic performance of a region and its demand, for which we want to control (Pérotin 2006). Pérotin (2006) considers this variable at a national

Table 4.1: UK Entry Model - Description of Variables

BIRTH[2]	Annual entry of firms per region
BSC[4]	Annual amount of loans provided by Building Societies and Cooperative Banks in thousands
DENSITY[2]	Annual number of firms per region squared
INCUMBENT[2]	Annual number of firms per region
INEQ[3]	Annual national Gini coefficient
INTEREST[6]	Annual national real interest rate
LOCAL[6]	Number of bank branches per UK region normalized by population, scaled by 10,000
REG_INC[6]	Regional Gross disposable income of households per capita
REGIONAL[2]	Dummy variable counting for the effect of different regions
RISK[1]	Variance of regional profits after considering the last 5 years of firms' operation[9]
STRUGGLE[2]	Dummy variable controlling for the effect of the worker cooperatives ownership classification compared to the other cooperative firms
UNEMPLO[6]	Annual regional unemployment rate
UNION[5]	Annual amount of loans provided by Credit Unions per region in thousands

Sources of the variables: [1] FAME, [2] CUK, [3] WORLD BANK, [4] BSA, [5] BANK OF ENGLAND, [6] ONS

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[9] RISK was created by extracting the numbers for regional profits from ONS, and then, calculating out of them, their 5-year variance.

level, while this research considers it at a regional level. Furthermore, a regional risk variable encompasses the fears of members regarding their limited wealth, their alternative options, and the diversification of their investment. Podivinsky and Steward (2007) are using this variable at an industry level, while this research considers it at a regional level. The importance of regional unemployment comes from the fact that in the conventional literature around cooperative firms, it is supported that the creation of this type of firm follows an anti-cyclical trend (Ben-Ner 1984; Arando et al. 2009). Finally, the categorical variables REGION, STRUGGLE, and YEAR, are used in order to capture the trends that are related with the characteristics of each of these variables.

Table 4.2: French Entry Model - Description of Variables

BIRTH[2]	Annual entry of firms per region
BANKS[3]	Annual amount of loans provided by cooperative banks in thousands
DENSITY[2]	Annual number of firms per region squared
INCUMBENT[2]	Annual number of firms per region
INEQ[2]	Annual national Gini coefficient
INTEREST[2]	Annual national real interest rate
LOCAL[2]	Number of bank branches per region of France normalized by population, scaled by 10,000
REG_INC[2]	Annual growth rate of regional Gross Value Added
REGIONAL[2]	Dummy variable counting for the effect of different regions
RISK[1]	Variance of regional profits after considering the last 5 years of firms' operation[10]
STRUGGLE[1]	Dummy variable controlling for the effect of the worker cooperatives ownership classification compared to the other cooperative firms
UNEMPLO[2]	Annual regional unemployment rate

Sources of the variables: [1]DIANE; [2]INSEE; [3]EACB

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[10] Regarding RISK for France, the same methodology followed in the UK entry models was followed in this case as well. However, since the regional profits were not found in INSEE, the calculation of the regional profits was made by averaging the profits of all companies available in DIANE. Afterward, the variance of the profits in each region was calculated for the last 5 years of operation. All the companies available in DIANE were examined and their profits were used to calculate the regional risk.

Tables 4.1 and 4.2 give a detailed presentation of the variables used in the UK and French entry models respectively.

4.1.3 Growth Models

The main question that this research is trying to answer is how the interaction between specific financial and organizational arrangements affect differently the performance of different cooperative forms. Having discussed the entry model in the previous section, this section goes a step further and looks more precisely at the growth models for UK and French cooperative firms. The methodology used in the growth models is the same as the one used in the entry models. More specifically, for the identification of institutional complementarities in the UK case, multiplicative interaction models are employed for four different cases. The first case compares retail consumer cooperatives, enterprise agricultural cooperatives and employee trusts to worker cooperatives. The second, third, and fourth cases consider each of the three successful cooperative cases separately against worker cooperatives.

Having the UK growth analysis as a starting point, another level of analysis is added by examining the French case. The focus remains on the complementarities between worker cooperatives (SCOPs for the French case) and specific financial arrangements that could potentially explain the lower performance of SCOPs compared to agricultural and retailers cooperatives. These results are then incorporated into a comparative analysis of the performance of the French and UK cooperative sectors. For the examination of the French case, multiplicative interaction models are used in the same way in which they are used in the UK case. For France, three different cases are examined: i) SCOPs' performance is compared to the combined performance of agricultural and retailers cooperatives; ii) the

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performance of SCOPs is compared to the performance of agricultural cooperatives; iii) SCOPs' performance is compared to retailers cooperatives' performance.

The dependent variable in the growth models is the annual growth of the firm (GROWTH), measured as the turnover growth of firm i in year t. Regarding the independent variables, a dummy variable (STRUGGLE), which takes the value 1 when considering worker cooperatives, is used to capture the potential effect of institutional complementarities. In all the other cases (consumer cooperatives, enterprise cooperatives, and employee trusts – agricultural cooperatives, retailer cooperatives) the dummy variable STRUGGLE takes on the value 0. The other explanatory variables of these models are separated into internal and external financial arrangements. The group of internal financial arrangements for the UK and France consists of the growth of shareholders' funds (SHARE_G). The external financial arrangements correspond to building societies' loans (BSC), local financial development (LOCAL), and credit unions' loans (UNION) for the UK. In the model for the French case, BSC and UNION correspond to the variable BANKS, which is proxied by cooperative banks' loans, while LOCAL also measures local financial development. The control variables considered in all cases are: age (AGE), total assets (ASSETS), leverage (LEV), liquidity (LIQ), population (POP), profit rates (PROFIT), regional income (REG_INC), and shareholders' funds (SHARE_F). Finally, categorical variables controlling for the effects of region (REGION), legal form (LEGAL), industry (INDUSTRY), and year (YEAR) are considered.

4.1.4 Growth Models Specification

Within the literature, the three main proxies which have been considered as valid for measuring the growth of a firm are total assets, profits, and turnover. Considering the data

availability provided by the databases used in this research, and the fact that, in most of the existing literature on firm growth, turnover is considered to be the most appropriate proxy of firm growth, this research chose to measure firm growth as the annual growth of the turnover of each firm (Delmar et al. 2003; Gagliardi 2009; Sutton 1997).

Turning now to the explanatory variables included in the growth models, and more specifically the internal financial arrangements considered, this research examines if there is a relationship between the growth of shareholders' funds and the growth of UK and French cooperative firms. Within the literature, it is supported that the amount of shareholders' funds plays a significant role in the performance of cooperative firms, either by defining their size (Benham and Keefer 1991) or their equity (Mamouni Limnios et. al 2016). However, this research does not only look at the absolute shareholders' funds but instead it looks at the growth of shareholders' funds, in order to identify the ability of different types of cooperatives to efficiently facilitate an increase in their shareholders' funds. The decision that shareholders make to join a firm or invest additional money in a firm in which they already have acquired shares, is partly based on the security and diversification of their investment. Since non-worker cooperative firms are shown to have a more secure position in the market, the pool of their members is much larger than the pool of members in worker cooperatives (Sodano and Hingley 2009). Moreover, worker cooperatives are lacking in members' investment diversification compared to other cooperative firms (Berman and Berman 1989). After considering these differentiations, a negative complementarity between the effect of the growth of shareholders' funds on the growth of cooperative firms and worker cooperatives would be expected.

The property rights structure of cooperative firms creates a barrier concerning the available financial options for this type of firm. In the case of the UK, the absence of a specific legal framework until 2014 increased the problems related to the uncertainty that

governs this type of firms. However, this situation also gives cooperative firms the freedom to create more flexible hybrid forms that move away from the strict definition of cooperative firms (e.g. one member - one vote) (Chaddad and Cook 2004; Chaddad 2012). This flexibility may allow cooperative firms to attract shareholders easier, since the cooperative rules about acquiring non-member shareholders would be more relaxed. After considering the fact that within the literature it is supported that this hybridization has been observed more frequently in cooperative firms others than worker cooperatives, the complementarities between internal financial arrangements and worker cooperatives would be expected to rise more frequently in the UK, than in the French growth models.

In regard to external financial arrangements considered in the growth models, although the reason for considering external financial arrangements important for the growth of cooperative firms is roughly the same as in the entry models, when looking at the a-priori expectations for institutional complementarities in the growth models, the picture is clearer. The fact that generally worker cooperatives are smaller and younger than the other cooperative forms examined in this research, may differentiate their capital sources. Worker cooperatives may be in a higher need of specialized financial institutions that focus on the peculiarities of their property rights structures, while non-worker cooperative firms, because of their strong position in the market may need less of these specialized financial institutions and may be able to acquire capital easier through centralized and mainstream capital sources. After considering the latter point, in addition to all the information discussed in the previous section regarding the peculiarities of the external financial arrangements examined here, then it could be hypothesised that a positive complementarity could arise between the effect of these external financial arrangements on the growth of cooperative firms and worker cooperatives.

Regarding the description of the control variables included in the growth models, age of the firm (Evans 1987; Becchetti and Trovato 2002) is considered a potential determinant of firm's growth, since within the literature there is a consensus that younger firms exhibit higher growth rates compared to their older counterparts. The variable counting for the total assets of the firms is one of the two proxies for size in this research (shareholders' funds is the other). The idea behind the inclusion of the size variable in the models is that within the literature it has been shown that bigger companies are exceeding lower growth rates compared to other smaller companies (Evans 1987; Beck et al 2005). Regarding LEV, firms with lower levels of leverage should display higher growth rates (Brav 2009). The other variable related to the financial performance of a firm is liquidity. LIQ accounts for the liquidity constraints of the firms which create a difficult financial environment for firms to grow (Oliveira and Fortunato 2006). Population is simply controlling for the effect of the population in a region. Looking at the profit rates of a firm, and according to the literature, profit is expected to affect the growth of the firm in both negative and positive ways. The final effect of profits on the growth of firms is supposed to depend on two conditions. First, if a company depends heavily on retained profits for its operation, then growth rates would be expected to present a positive relationship with profits rates, while a negative relationship would be expected if the company depends on external finance (Glancey 1998). The next determinant of the effect of profit rate concerns the long-term or short-term growth targets of the firms. If short-term profitability and growth are the target, then a positive relationship would be expected between the growth rates and profit rates, while a negative relationship would emerge in case long-term growth is targeted (Demirgüç-Kunt and Maksimovic 1998). The regional income counts for the effect of the development of the regional economy. Finally, the categorical variables INDUSTRY, LEGAL, REGION, STRUGGLE, and YEAR, capture the trends that are related with the characteristics of each of these variables.

Table 4.3: UK Growth Model - Description of Variables

AGE[1]	Date of incorporation minus the year of interest if the last year available is greater than the year of interest. Otherwise, date of incorporation minus the last year that the firm has available accounts in Fame.
ASSETS[1]	Annual total assets of each firm in thousands.
BSC[4]	Annual amount of loans provided by building societies and cooperative banks in thousands.
GROWTH[1]	The growth rate of turnover of each firm multiplied by 100.
INDUSTRY[3]	Dummy variable controlling for the effect of the cooperative sector according to CUK[11].
LEGAL[1]	Dummy variable counting for the effect of different legal forms.
LEV[1]	Annual gearing ratio.
LIQ[1]	Annual liquidity ratio.
LOCAL[2]	Number of bank branches per region of UK normalized by population, scaled by 10,000.
POP[2]	Log of the population of each region.
PROFIT[1]	Annual profit margin.
REG_INC[2]	Annual regional income in thousands.
REGION[3]	Dummy variable controlling for the effect of the region in which every firm operates.
SHARE_F[1]	Shareholders' funds divided by the total assets of each firm multiplied by 100.
SHARE_G[1]	The growth rate of shareholders' funds of each firm multiplied by 100.
STRUGGLE[3]	Dummy variable controlling for the effect of the worker cooperatives ownership classification.
UNION[5]	Annual amount of loans provided by Credit Unions per region in thousands.[12]
YEAR[3]	Dummy variable counting for the effect of different years.

Sources: [1]**FAME;** [2]**ONS;** [3]**CUK;** [4]**Building Societies Association;** [5]**Bank of England.**

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[11] The CUK industry classification was preferred over the FAME industry classification as there are some inconsistencies regarding the industrial dispersion of cooperative firms in the case of the latter.

[12] Regarding UNION, there is no information available for 2016. For 2008-2012, there is no information for Northern Ireland. The complete regional dispersion for the UK is available only for 2012. For the rest of the years, the regional dispersion available was limited to England, Scotland, Wales, and Northern Ireland. This research deals with this limitation by extracting sample weights out of the regional dispersions of 2012 and applying these weights to all the other years. The application of this technique allowed for the approximation of the loans provided from credit unions to their members in English NUTS for the periods 2008-2011 and 2013-2015.

Table 4.4: French Growth Model - Description of Variables

AGE[1]	Date of incorporation minus the year of interest if the last year available is greater than the year of interest. Otherwise, date of incorporation minus the last year that the firm has available accounts in Diane.
ASSETS[1]	Annual total assets in thousands.
BANKS[3]	Amount of loans provided per year by cooperative banks in thousands.
GROWTH[1]	The growth rate of turnover of each firm multiplied by 100.
INDUSTRY[1]	Dummy variable controlling for the effect of the industry in which every firm operates.
LEV[1]	Annual gearing ratio.
LIQ[1]	Annual liquidity ratio.
LOCAL[2]	Establishments belonging to the 6419Z NEF.2 classification per region divided by the population of that region and multiplied by 10000.
POP[2]	Log of the population of each region.
PROFIT[1]	Annual EBITDA margin.
REG_INC[2]	Gross disposable income of households per capita.
REGION[1]	Dummy variable controlling for the effect of the region in which every firm operates.
SHARE_F[1]	Shareholders' funds divided by the total assets of each firm multiplied by 100.
SHARE_G[1]	The growth rate of shareholders' funds of each firm multiplied by 100.
STRUGGLE[2]	Dummy variable controlling for the effect of the SCOP ownership classification.
YEAR[1]	Dummy variable counting for the effect of different years.

Source of the variables: [1]DIANE; [2]INSEE; [3]EACB

More information regarding the variables used in the UK and French growth models is provided in Tables 4.3 and 4.4. Table 4.3 presents the description of the variables for the UK model, while Table 4.4 presents the description of the variables used in the French case.

4.2 Dataset Characteristics

Following the presentation of the models and the variables considered in this research, this section will look at the datasets used. Apart from the methodologies and steps followed for the creation of each dataset, in the sections that discuss the entry and growth models, a presentation of the composition of the datasets is also provided. Regarding the entry models, the discussion will be focused on the data sources, since the data on firm creation is limited to count data (i.e. number of firms created in region x, in year t). Finally, section 4.2.3 will present the statistical characteristics of the models used in the empirical work.

4.2.1 Entry Data

The steps followed for the construction of the entry datasets will now be presented, starting with the UK. In order to construct this dataset, information was gathered from several sources, as can be seen in Table 4.1. The most important step for the creation of the entry dataset for the UK was to identify a source for obtaining a proxy for BIRTH, since there is no specific information in ONS (Office for National Statistics) about cooperative firms' birth. As a result, for the creation of BIRTH, this research looked at the dataset of Cooperatives UK (CUK). From that database, the companies whose incorporation date was after 2005 were considered as the number of cooperatives created in every region. Obviously, there is a limitation to this proxy since the formation of these variables is based

on the data extracted from CUK, which includes a large subset of cooperative firms but not all of them. However, these numbers can be considered to have validity as the CUK is considered an officially recognized representative by the International Co-operative Alliance. A similar methodology was followed for the creation of the variables INCUMBENT and DENSITY, where the companies that had an incorporation date before the date of interest and a dissolution date after the date of interest were counted. Furthermore, no outlier was found in this model following the 10-standard-deviation method. Finally, the region Jersey is not presented in the entry models—even though it is presented in the growth models—since in the entry models the composition of the observations referred to Jersey did not present any result in the tables because of insufficient data for this region. The period considered in the entry dataset of the UK is 2005-2015.

Regarding the steps followed to create the French entry dataset, information was much more easily obtained through INSEE (National Institute of Statistics and Economic Studies), which has specific databases regarding the counts of enterprises in the French economy. Within these databases, the information needed for the construction of BIRTH was included. It was preferred to focus on the counts of enterprises instead of focusing on the counts of establishments, for consistency with the approach taken in the case of UK coops' entry. Data on DENSITY and INCUMBENT were also extracted from the INSEE database. The 10-standard-deviation method for identifying outliers was used here, however no observation was excluded. The period considered in the entry dataset of the France is 2005-2015.

4.2.2 Growth Data

The first growth model that this research analyses is the one of the UK. Before moving on to the presentation of the composition of this dataset, it is useful to explain the steps followed

for its construction. The main idea of the construction process was to identify the cooperative firms of interest using the CUK database, and then extract as much information available from the accounts of these firms in FAME. Following this logic, 8,456 cooperative firms were initially available in the CUK dataset. Out of these firms only 8,208 had an ID number which was needed in order to identify the firms in FAME. In FAME, 6,863 cooperatives firms were matched, however, only 1,111 had available accounts for at least one of the last ten years (2008-2018). This set of 1,111 firms was composed of 864 active firms and 247 dissolved within the last 5 years. The final dataset consists of 388 cooperative firms of the UK, after considering the forms of cooperative firms this research examines. More analytically, 46 (11.9%) of the cooperative firms included in the sample are consumer cooperatives operating in retail, 34 (8.8%) are enterprise cooperatives operating in agriculture, 23 (5.9%) are employee trusts operating in several industries, and finally, 285 (73.4%) are worker cooperatives operating in several industries. The selection of the firms was based on their availability on FAME and on their compatibility with the successful/struggling dipole examined in this research. Consumer cooperatives in retail, enterprise cooperatives in agriculture, and employee trusts represent the successful sample of cooperative firms, while worker cooperatives in several industries represent the struggling cooperatives in the UK cooperative sector, because of characteristics discussed in previous sections. The period for which the performance of these firms is examined is 2008-2016. The selection of this period and the selection of the number of firms is a result of data limitation. The key characteristics of the selected firms which are included in the sample are presented in Table 4.5. In Table 4.5, two different industrial categories are presented. The first category regards the industry in which the company operates, while the second category considers the industry in which the patrons of the firms operate. In the UK growth model, the second category is used for constructing the dummy variable

INDUSTRY. The raw dataset was then examined with a view to 'clean' the data. The first step was to delete the Turnover and Total Assets observations that had values of 0. This was an indication that companies had either not started their production yet, or companies were in the process of being dissolved. The second step was to delete all observations of other variables corresponding to a value of 0 for Turnover and Total Assets to avoid analysing observations depicting abnormal performance for firms. The third step was to normalize all the variables over assets. For these variables, the observations presented as #VALUE! were excluded. Regarding the growth rates of all the variables, the 2008 observations were not available, observations presented as #VALUE! were deleted, and the #DIV/0! observations were deleted as well. Finally, a few outliers (46) were identified by using the 10-standard-deviations method.

Table 4.5.1: UK Growth Model Dataset Characteristics

Firms	388
Year	2008-2016
Regional Level[1]	NUTS 1
Date of incorporation[1]	1861-2016
Ownership[1]	Consumers *(46 – 11.86%)*
	Employee Trusts *(23 – 5.93%)*
	Enterprises *(34 – 8.76%)*
	Workers *(285 – 73.45%)*
Region[1]	East Midlands *(33 – 8.51%)*
	East of England *(29 – 7.47%)*
	Jersey *(1 – 0.26%)*
	London *(46 – 11.86%)*
	North East *(27 – 6.96%)*
	North West *(37 – 9.54%)*
	Northern Ireland *(6 – 1.55%)*
	Scotland *(43 – 11.08%)*
	South East *(33 – 8.51%)*
	South West *(56 – 14.43%)*
	Wales *(21 –5.41%)*
	West Midlands *(22 – 5.67%)*
	Yorkshire and The Humber *(34 – 8.76%)*

[1] **CUK**

Table 4.5.2: UK Growth Model Dataset Characteristics

Legal Form[2]	Charitable organization *(4 – 1.03%)*
	Guarantee *(233 – 60.05%)*
	Industrial/Provident *(18 – 4.64%)*
	Limited Liability Partnership *(22 – 5.67%)*
	Private Limited *(109 – 28.09%)*
	Public Not Quoted *(1 – 0.26%)*
	Unlimited *(1 – 0.26%)*
Industry[1]	Accommodation and Food Services *(7 – 1.80%)*
	Administrative and Support Services *(18 – 4.64%)*
	Agriculture, Forestry and Fishing *(45 – 11.60%)*
	Arts, Entertainment and Recreation *(19 – 4.90%)*
	Construction *(2 – 0.52%)*
	Education *(38 – 9.79%)*
	Electricity, Gas, Steam and Air Con *(1 – 0.26%)*
	Financial and Insurance *(2 – 0.52%)*
	Human Health and Social Work *(22 – 5.67%)*
	Information and Communication *(33 – 8.51%)*
	Manufacturing *(36 – 9.28%)*
	Mining and Quarrying *(2 – 0.52%)*
	Other Service Activities *(16 – 4.12%)*
	Professional, Scientific and Technical *(61 – 15.72%)*
	Real Estate *(1 – 0.26%)*
	Transportation and Storage *(4 – 1.03%)*
	Water Supply; Sewerage and Waste *(4 – 1.03%)*
	Wholesale and Retail; Vehicle Repair *(76 – 19.59%)*
Industrial CUK Classification[1]	Agriculture *(45 – 11.60%)*
	Arts and Culture *(12 – 3.09%)*
	Digital, Media and Communication *(38 – 9.79%)*
	Education *(45 – 11.60%)*
	Energy and Environment *(5 – 1.29%)*
	Finance *(2 – 0.52%)*
	Food service, Accommodation and Pubs *(7 – 1.80%)*
	Health and Social Care *(22 – 5.67%)*
	Housing *(6 – 1.55%)*
	Manufacturing *(36 – 9.28%)*
	Membership associations, social clubs and trade unions *(6 – 1.55%)*
	Other *(18 – 4.64%)*
	Professional and Legal services *(56 – 14.43%)*
	Retail *(75 – 19.33%)*
	Sports and Recreation *(7 – 1.80%)*
	Transport *(4 – 1.03%)*

[1] CUK; [2] FAME

The French growth dataset on cooperative firms were extracted from Diane. Identifying all the French cooperatives was not possible for the French case, since there were no data publicly available that would correspond to all the cooperative firms of interest, and, for this reason, only the companies available in Diane were used in the sample. The first step for the creation of the working dataset for France was to identify the companies of interest included in Diane. The companies of interest were under three cooperative forms that correspond to the dipole 'successful-struggling' cooperative firms. For this reason, and after considering data limitations, the companies identified as successful are retailers and agricultural cooperatives, and the companies identified as struggling are SCOPs. The main variable that allowed this research to obtain the cooperative firms of interest was "legal category". The legal categories chosen were: "Caisse de Crédit Agricole Mutuel", "Coopérative d'utilisation de matériel agricole en commun (CUMA)", "SA coopérative de commerçants-détaillants à conseil d'administration", "SA coopérative de commerçants-détaillants à directoire", "SA coopérative ouvrière de production (SCOP) à conseil d'administration", "SA coopérative ouvrière de production (SCOP) à directoire", "SARL coopérative ouvrière de production (SCOP)", "Société coopérative Agricole", "Union de sociétés coopératives agricoles". Once the search results were gathered, only those with their last available accounts in 2016 and 2017 were included in order for active companies only to be included. Since this exclusion reduced the number of "Caisse de crédit agricole mutual" (10 observations), "SA coopérative de commerçants-détaillants à directoire" (30 observations), and "SA coopérative ouvrière de production (SCOP) à directoire" (16 observations) to very low levels, these categories were excluded as well. Furthermore, the years in which the companies did not yet exist were excluded, as well as years for which companies had 0 or negative turnover. The latter was also done for the UK dataset so that problematic years of

Table 4.6: French Growth Dataset Characteristics

Firms	2033
Years	2007-2016
Regional Level	NUTS 1
Date of incorporation	1893-2016
Region[1]	Auvergne-Rhône-Alpes *(275 – 13.53%)* Bourgogne-Franche-Comté *(204 – 10.03%)* Bretagne *(105 – 5.16%)* Centre-Val de Loire *(65 – 3.20%)* Corse *(9 – 0.44%)* Grand Est *(206 – 10.13%)* Hauts-de-France *(101 – 4.97%)* Normandie *(137 – 6.74%)* Nouvelle-Aquitaine *(39 – 1.92%)* Occitanie *(241 – 11.85%)* Pays de la Loire *(338 – 16.63%)* Provence-Alpes-Côte d'Azur *(98 – 4.82%)* Île-de-France *(215 – 10.58%)*
Ownership[2]	CUMA *(23 – 1.13%)* SA Coopérative De Commerçants-Détaillants À Conseil D'administration *(49 – 2.41%)* SA Coopérative Ouvrière De Production (SCOP) à Conseil D'administration *(157 – 7.72%)* SARL Coopérative Ouvrière De Production (SCOP) *(590 – 39.02%)* Société Coopérative Agricole *(1074 – 52.82%)* Union De Sociétés Coopératives Agricoles *(140 – 6.88%)*
Industry[1]	Accommodation and Food Service Activities *(18 - 0.89%)* Administrative and Support Service Activities *(76 - 3.74%)* Agriculture, Forestry and Fishing *(127 - 6.25%)* Arts, Entertainment and Recreation *(32 - 1.57%)* Construction *(191 - 9.39%)* Education *(40 - 1.97%)* Financial and Insurance Activities *(3 - 0.15%)* Human Health and Social Work Activities *(22 - 1.08%)* Information and Communication *(52 - 2.56%)* Manufacturing *(746 - 36.69%)* Other Service Activities *(14 - 0.69%)* Professional, Scientific and Technical Activities *(154 - 7.58%)* Real Estate Activities *(2 - 0.10%)* Transportation and Storage *(41 - 2.02%)* Water Supply, Sewerage, Waste Management and Remediation Activities *(4 - 0.20%)* Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles *(511 - 25.14%)*

[1] DIANE; [2] INSEE

companies would not affect the results. Observations presented as #VALUE! and #DIV/0!

were deleted throughout the dataset as well. Finally, the dataset was examined for outliers

and, using the 10-standard-deviation method, it was cleaned appropriately. All these adjustments resulted in a dataset of 2,033 companies (49 retailers cooperatives – 747 SCOPs – 1,237 agricultural cooperatives), whose composition is analytically presented in Table 4.2. The period for which the performance of these firms is examined is 2007-2016.

4.2.3 Summary Statistics

Starting with the entry models, Tables 4.7-4.12 present the variables used in these entry models in more detail. Table 4.7 presents the summary statistics of the variables discussed earlier in this chapter for the UK entry interaction models, while Tables 4.8 and 4.9 refer to the summary statistics of the separate entry models created for comparison purposes between the French and UK entry performance of cooperative firms. Tables 4.10, 4.11, and 4.12 show the correlation matrices for the interaction models of the UK and the non-interaction models of the UK and France. More information regarding the variables used in the UK and French growth models are provided in Tables 4.13-4.16. Table 4.13 provides information regarding the summary statistics of the UK models, while Table 4.14 presents the summary statistics of the French case. Finally, the correlation matrices for each country are presented in Tables 4.15 and 4.16.

Table 4.7: UK Entry Interaction Model - Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
BIRTH1	660	0.9863636	1.837428	0	13
BSC	600	26,447.81	5,236.644	18,073.2	37,376.7
DENSITY	660	2,046.544	4,761.187	0	31,329
INCUMBENT1	660	29.88333	33.98942	0	177
INEQ	660	33.35455	0.8300472	32.3	34.7
INTEREST	600	0.1354944	1.615469	-1.481635	2.886834
LOCAL	660	2.512167	0.6233175	1.661123	4.784549
REG_INC	660	119,409.6	79,791.8	29207	398,128
REGION	660	6.5	3.454671	1	12
RISK	660	5,927,749	1.41e+07	55,959.04	8.02e+07
OWN	660	5.6	1.85613	1.85613	8
UNEMPLO	660	6.622727	1.704746	3.6	10.8
UNION	625	40,908.17	59,405.49	3,543.002	290,550.7

For the description of the variables and their way of measurement see Table 4.1

Table 4.8: UK Entry Model - Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
BIRTH	264	1.401515	2.077802	2.077802	13
BSC	240	26,447.81	5,243.213	18,073.2	37,376.7
DENSITY	264	1,456.716	2,133.969	1	10,816
INCUMBENT	264	31.57197	21.48663	1	104
INEQ	264	33.35455	.8309935	32.3	34.7
INTEREST	240	0.1354944	1.617495	-1.481635	2.886834
LOCAL	264	2.512167	.6240281	1.661123	4.784549
REG_INC	264	119,409.6	79,882.76	29,207	398,128
REGION	264	6.5	3.458609	1	12
RISK	264	5,927,749	1.42e+07	55,959.04	8.02e+07
UNEMPLO	264	6.622727	1.70669	3.6	10.8
UNION	250	40,908.17	59,477.02	3,543.002	290,550.7

For the description of the variables and their way of measurement see Table 4.1

Table 4.9: French Entry Model - Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
BIRTH	234	2.465812	3.696783	3.696783	20
BANKS	234	1,358,114	305,089.9	873,600	1,851,300
DENSITY	234	1,016,843	1,896,984	0	7,650,756
INCUMBENT	234	611.8504	803.2682	803.2682	2766
INEQ	234	0.2945556	0.0060887	0.289	0.306
INTEREST	234	1.824974	1.629746	0.2099333	4.634233
LOCAL	234	5.374156	0.6664207	3.603996	6.615064
REG_INC	208	19,243.25	1,537.728	16,076	24,200
REGION	234	7	3.749678	1	13
RISK	234	7.246713	0.8536256	5.586831	9.417326
UNEMPLO	234	8.807692	1.501939	5.9	12.8

For the description of the variables and their way of measurement see Table 4.1

Table 4.10: UK Entry Interaction Model – Correlation Matrix

	BIRTH	BSC	DENSITY	INCUMBENT	INEQ	INTEREST	LOCAL	REG_INC	RISK	UNEMPLO	UNION
BIRTH	1.0000										
BSC	0.0506	1.0000									
DENSITY	0.3688	0.0242	1.0000								
INCUMBENT	0.4760	0.0266	0.9339	1.0000							
INEQ	0.0371	-0.1844	-0.0363	-0.0406	1.0000						
INTEREST	0.0290	-0.1792	-0.0408	-0.0447	0.8487	1.0000					
LOCAL	0.1500	-0.0451	0.1390	0.1194	0.5659	0.5414	1.0000				
REG_INC	0.1045	0.0267	0.0240	0.0373	-0.0553	-0.0430	0.3465	1.0000			
RISK	-0.0319	-0.0899	-0.0803	-0.1057	0.1906	0.1814	0.5666	0.7180	1.0000		
UNEMPLO	-0.1438	0.2014	-0.2464	-0.2835	-0.4844	-0.6110	-0.2677	0.0017	0.0880	1.0000	
UNION	-0.0100	0.0175	0.0639	0.0726	-0.1806	-0.1570	-0.0280	-0.0891	-0.0743	0.0685	1.0000

For the description of the variables and their way of measurement see Table 4.1

Table 4.11: UK Entry Model – Correlation Matrix

	BIRTH	BSC	DENSITY	INCUMBENT	INEQ	INTEREST	LOCAL	REG_INC	RISK	UNEMPLO	UNION
BIRTH	1.0000										
BSC	0.0597	1.0000									
DENSITY	0.2558	0.0326	1.0000								
INCUMBENT	0.3850	0.0419	0.9471	1.0000							
INEQ	-0.1367	-0.1844	-0.0724	-0.0939	1.0000						
INTEREST	-0.1991	-0.1792	-0.0799	-0.1012	0.8487	1.0000					
LOCAL	0.0224	-0.0451	0.1889	0.1414	0.5659	0.5414	1.0000				
REG_INC	0.1904	0.0267	0.0759	0.0788	-0.0553	-0.0430	0.3465	1.0000			
RISK	-0.0177	-0.0899	-0.0404	-0.0908	0.1906	0.1814	0.5666	0.7180	1.0000		
UNEMPLO	0.0415	0.2014	-0.1461	-0.2171	-0.4844	-0.6110	-0.2677	0.0017	0.0880	1.0000	
UNION	0.0380	0.0175	0.3442	0.2779	-0.1806	-0.1570	-0.0280	-0.0891	-0.0743	0.0685	1.0000

For the description of the variables and their way of measurement see Table 4.1

Table 4.12: French Entry Model – Correlation Matrix

	BIRTH	BSC	DENSITY	INCUMBENT	INEQ	INTEREST	LOCAL	REG_INC	RISK	UNEMPLO
BIRTH	1.0000									
BANKS	-0.0667	1.0000								
DENSITY	0.5816	0.1197	1.0000							
INCUMBENT	0.6566	0.1018	0.9461	1.0000						
INEQ	0.0207	0.8257	0.0686	0.0580	1.0000					
INTEREST	0.0720	-0.6251	-0.0927	-0.0806	-0.4814	1.0000				
LOCAL	0.1215	0.0214	0.1882	0.2407	0.0129	-0.0148	1.0000			
REG_INC	-0.1074	0.3484	-0.0152	-0.0458	0.2111	-0.2733	0.1199	1.0000		
RISK	-0.1527	0.4537	-0.0449	-0.1175	0.2846	-0.4144	-0.4303	0.6898	1.0000	
UNEMPLO	-0.0284	0.3220	0.0231	0.0015	0.2165	-0.5883	-0.4035	-0.2133	0.2863	1.0000

For the description of the variables and their way of measurement see Table 4.2

Table 4.13: UK Growth Model - Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
AGE	3070	19.62573	25.14522	1	156
ASSETS	2724	33895.8	390260.8	1	8213000
BSC	3492	26882.54	5338.523	18110.5	37376.7
GROWTH	611	11.60317	83.95856	-95.09203	1760
INDUSTRY	3456	8.510417	4.96359	1	16
LEGAL	3492	3.015464	1.373644	1	7
LEV	1005	87.17619	163.2488	0.01	973.92
LIQ	2533	3.347201	6.660242	0	79.71
LOCAL	3483	2.351836	0.5662717	1.587491	4.15378
POP	3483	6.736602	0.1534537	6.250213	6.95551
PROFIT	796	3.761269	19.38353	-99.95	96.11
REG_INC	3483	143377.9	90056.19	30899	419563
REGION	3492	7.255155	3.679577	1	13
SHARE_F	2670	0.138049	1.871126	-31	1
SHARE_G	2172	18.19721	225.041	-3600	2600
STRUGGLE	3492	0.7345361	0.4416432	0	1
UNION	3072	41518.03	52303.01	4460.737	290550.7
YEAR	3492	2012	2.582359	2008	2016

For the description of the variables and their way of measurement see Table 4.3

Table 4.14: French Growth Model - Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
AGE	18,915	27.88126	24.51003	1	124
ASSETS	16,259	13,681.71	54,907.27	1.213	984,792.2
BANKS	14,869	1,426,508	264,901.6	1,024,400	1,851,300
GROWTH	13,874	18.71786	382.1226	-99.89556	28,303.75
INDUSTRY	18,915	10.29421	4.344816	1	16
LEV	15,681	53.99176	94.63432	0	991.452
LIQ	16,063	2.025695	2.714875	0.007	41.369
LOCAL	14,869	5.48537	0.4041396	3.67636	6.615064
POP	16,891	6.708003	0.1842148	5.475975	7.082379
PROFIT	16,176	5.355729	9.308148	-84.991	100
REG_INC	14,869	19,443.95	1,328.011	16752	24,200
REGION	18,915	7.143484	4.020189	1	13
SHARE_F	16,279	41.74197	23.24784	-232.8794	159.5398
SHARE_G	13,595	31.6412	1,083.811	-67903.03	65,106.45
STRUGGLE	18,915	0.3392017	0.4734509	0	1
YEAR	18,915	2011.655	2.863369	2007	2016

For the description of the variables and their way of measurement see Table 4.4

Table 4.15: UK Growth Model – Correlation Matrix

	AGE	ASSETS	BSC	GROWTH	LEV	LIQ	LOCAL	POP	PROFIT	REG_INC	SHARE_F	SHARE_G	UNION
AGE	1.0000												
ASSETS	0.2965	1.0000											
BSC	-0.0233	-0.0696	1.0000										
GROWTH	-0.0902	-0.0174	0.1046	1.0000									
LEV	-0.1521	0.0367	0.0605	0.1806	1.0000								
LIQ	-0.1567	-0.1156	0.0132	0.2739	0.0200	1.0000							
LOCAL	-0.1915	0.0973	0.2836	0.1758	0.1562	0.1473	1.0000						
POP	0.1359	0.2057	-0.0649	0.1120	-0.0832	0.1173	0.2124	1.0000					
PROFIT	-0.0731	-0.0334	-0.0457	0.0184	-0.1146	0.1371	-0.0048	-0.0324	1.0000				
REG_INC	0.0773	0.2992	-0.1330	0.1512	-0.0099	0.1837	0.3095	0.7805	-0.0172	1.0000			
SHARE_F	0.2860	-0.1098	-0.0517	-0.1460	-0.6388	0.2602	-0.1268	0.2275	0.0444	0.1828	1.0000		
SHARE_G	-0.1585	-0.0706	0.0511	0.0560	0.0164	0.0042	-0.0649	-0.0707	0.2564	-0.0558	-0.0404	1.0000	
UNION	-0.1169	0.0001	-0.0259	-0.0146	0.0823	-0.1648	0.0977	-0.0950	-0.0387	-0.0789	-0.1049	-0.0278	1.0000

For the description of the variables and their way of measurement see Table 4.3

Table 4.16: French Growth Model - Correlation Matrix

	AGE	ASSETS	BANKS	GROWTH	LEV	LIQ	LOCAL	POP	PROFIT	REG_INC	SHARE_F	SHARE_G
AGE	1.000											
ASSETS	0.0384	1.000										
BANKS	0.0208	0.0005	1.000									
GROWTH	-0.0293	-0.0004	0.0077	1.000								
LEV	-0.0567	0.0189	-0.0065	0.0027	1.000							
LIQ	0.0416	-0.0574	0.0183	-0.0066	-0.0137	1.000						
LOCAL	0.0422	-0.0257	-0.0295	-0.0122	0.0466	-0.0150	1.000					
POP	-0.1164	-0.0139	-0.0030	0.0185	-0.0178	-0.0000	-0.2331	1.000				
PROFIT	-0.0367	-0.0394	-0.0280	-0.0049	-0.0219	0.0497	0.0117	-0.0021	1.000			
REG_INC	-0.0078	-0.0597	0.1594	0.0326	-0.0066	-0.0008	0.0034	0.4246	-0.0101	1.000		
SHARE_F	0.0991	0.0296	0.0091	-0.0083	-0.4481	0.3693	-0.0185	-0.0246	0.1598	-0.0862	1.000	
SHARE_G	-0.0153	-0.0031	0.0058	0.0057	-0.0560	-0.0005	-0.0055	0.0136	0.0404	0.0342	-0.0071	1.000

For the description of the variables and their way of measurement see Table 4.4

5 Results

This chapter presents the results of the entry and growth models for the UK and France. Section 5.1 reports the results of the entry specifications, while those for the growth specifications are discussed in Section 5.2. Section 5.3 provides a synthesis of the results presented in sections 5.1 and 5.2 in order to provide an overall conclusion regarding the hypotheses developed in Chapter 3.

Before starting the presentation of the tables that summarize the statistical characteristics of the variables included in the models and before examining each of the entry and growth cases, it is important to provide some basic information that affects the presentations in both cases. In all the results tables, the first column of each table presents the estimations for the econometric specifications discussed in Chapter 4. However, because of the statistically insignificant coefficients of some variables, the general-to-simple method is applied following a number of iterations, the results of which are presented in the last three columns of each table. The methodology used here is to exclude statistically insignificant variables one at a time and starting with the least significant one up to the point where no statistically significant variables are left, while at the same time the efficiency of the models is verified by the F-test, and the marginal effects are estimable. In some cases, the excluded variables were statistically significant in the initial specification, however, they lost their statistical significance after the exclusion of some other statistically insignificant variables.

5.1 Entry Model Results

Starting with the analysis of cooperative firms' entry, the econometric specifications are estimated using Ordinary Least Squares (OLS), Poisson, and Negative Binomial. Poisson and Negative Binomial models are preferred due to an issue that arises with modelling firms' entry, namely that entry levels cannot take negative values and the model has to allow for the dependent variable to take zero counts. As a result, OLS is not the most suitable method. The common log transformation also does not meet the standards of the model since the dependent variable cannot take zero values. One method that has been used to correct for these issues is the Poisson Regression Model (Cameron and Trivedi 2013). However, two more problems arise: heteroskedasticity and overdispersion/underdispersion (i.e. the value of the conditional variances is greater/lower than the value of the conditional mean). Podivinsky and Steward (2007) use a Negative Binomial Regression Model to correct for these issues, whereas Pérotin (2006) uses a sample correction technique. All the tables included in the remainder of this section report the results for both the Poisson and Negative Binomial estimations, as well as for the OLS estimations, so as to provide a more robust presentation of the results. Thus, in each table, four specifications are presented: the general OLS including all the variables, and the three simplified specifications (OLS-Poisson-Negative Binomial), which include only the statistically significant variables. All the independent variables have been lagged by one year in order to avoid potential simultaneity bias.

5.1.1 UK

The results of the entry models for the UK, as reflected in Tables 5.1.1-5.1.2, 5.2.1-5.2.2, 5.3.1-5.3.2, and 5.4.1-5.4.2, take into consideration the interaction effects between different types of cooperatives and specific external financial arrangements. Tables 5.1.1-5.1.2 compare the entry performance of consumer cooperatives in retail, employee trusts, and enterprise cooperatives in agriculture against the entry performance of worker cooperatives (case 1). In case 2 (Tables 5.2.1-5.2.2), the entry of consumer cooperatives in retail against the entry of worker cooperatives is specifically examined. In case 3 (Tables 5.3.1-5.3.2), the entry of employee trusts compared to the entry of worker cooperatives is examined; and finally, in case 4 (Tables 5.4.1-5.4.2) the entry of enterprise cooperatives in agriculture compared to the entry of worker cooperatives is examined.

In Table 5.1.1, the results of the first case are presented. The explanatory variable BSC, which measures the effect of building societies' loans, is not present in the three specifications because of the statistical insignificance of the coefficients of BSC, BSC#STRUGGLE, and BSC_ME. LOCAL, which measures the effect local financial development, is presented as positive and statistically significant in all the specifications. On the other hand, LOCAL#STRUGGLE, which accounts for the interaction effect between local financial development and worker cooperatives, is observed as being negative and statistically significant throughout the three specifications. This last observation reveals a negative complementarity between the effect of local financial development and the creation of worker cooperatives. These results are showing that local financial development is observed to have a positive effect on the entry of UK non-worker cooperatives. However, when looking at the complementarity between the effect of local financial development on the entry of UK cooperatives and worker cooperatives, there is a consistent negative

Table 5.1.1: UK Entry Interaction Model – Case 1

BIRTH	Initial OLS Coef.	P>t	OLS Coef.	P>t	Poisson Coef.	P>t	Negative Binomial Coef.	P>t
(EXPLANATORY)								
BSC	0.0003777	*0.242*	-	-	-	-	-	-
BSC#STRUGGLE	-0.0000254	*0.563*	-	-	-	-	-	-
LOCAL	1.448689	*0.017*	1.344677	*0.019*	0.4846711	*0.021*	0.4959452	*0.022*
LOCAL#STRUGGLE	-1.889264	*0.000*	-1.801143	*0.000*	-1.048651	*0.000*	-1.040291	*0.000*
UNION	0.0000152	*0.478*	0.0000186	*0.272*	9.94e-06	*0.226*	0.0000107	*0.187*
UNION#STRUGGLE	0.0000115	*0.003*	8.63e-06	*0.013*	3.74e-06	*0.064*	3.81e-06	*0.057*
STRUGGLE	6.617091	*0.000*	5.733523	*0.000*	3.558568	*0.000*	3.530051	*0.000*
(CONTROL)								
DENSITY	-0.0003608	*0.002*	-0.0003695	*0.001*	-0.0001323	*0.000*	-0.0001369	*0.000*
INCUMBENT	0.0836194	*0.000*	0.08348	*0.000*	0.0348668	*0.000*	0.0356746	*0.000*
INEQ	0.6731501	*0.511*	0.6267654	*0.026*	0.5251181	*0.002*	0.5235739	*0.002*
INTEREST	0.4765499	*0.718*	-	-	-	-	-	-
REG_INC	-0.0000189	*0.476*	0.000026	*0.038*	0.000011	*0.048*	0.0000107	*0.055*
RISK	-6.81e-08	*0.013*	-	-	-	-	-	-
UNEMPLO	-0.1940352	*0.629*	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- **East Midlands**	-	-	-	-	-	-	-	-
- **East of England**	1.232778	*0.235*	-.3016549	*0.640*	0.116537	*0.772*	0.1283364	*0.748*
- **London**	8.17381	*0.299*	-5.925784	*0.082*	-2.145242	*0.162*	-2.122687	*0.168*
- **North East**	0.8829816	*0.428*	2.220538	*0.002*	0.5620639	*0.176*	0.5586147	*0.179*
- **North West**	1.784222	*0.436*	-1.427443	*0.378*	-0.6770365	*0.349*	-0.7069769	*0.326*
- **Northern Ireland**	-5.207829	*0.368*	-3.239209	*0.463*	-1.727834	*0.372*	-1.951656	*0.308*
- **Scotland**	-2.124852	*0.532*	-3.743465	*0.188*	-1.514899	*0.216*	-1.619452	*0.185*
- **South East**	4.328819	*0.189*	-1.895639	*0.295*	-0.5432618	*0.490*	-0.5333678	*0.503*
- **South West**	2.807577	*0.023*	1.969085	*0.070*	0.7252171	*0.035*	0.7121154	*0.044*
- **Wales**	-0.4603732	*0.623*	1.087196	*0.062*	0.4667027	*0.239*	0.4482094	*0.258*
- **West Midlands**	1.123167	*0.308*	-0.0365995	*0.955*	0.2129465	*0.576*	0.2054059	*0.592*
- **Yorkshire and The Humber**	1.478549	*0.126*	0.6462571	*0.304*	0.4887909	*0.134*	0.4801818	*0.146*
CONSTANT	-34.45059	*0.298*	-29.41379	*0.003*	-21.99182	*0.000*	-21.9567	*0.000*
Lnalpha	-		-		-		-3.12705	
Alpha	-		-		-		0.043847	
F Test	0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.5283		0.5044		0.3113		-	
Observations	204		228		228		228	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

behaviour observed in the analysed specifications, which disagrees with the hypothesised positive complementarity between external financial arrangements and the entry of worker cooperatives. The UNION variable, which measures the effect of credit unions' loans, is positive and statistically insignificant in all the specifications. In this case, the effect of credit unions' loans is positive and suggests that credit unions are supportive of non-worker cooperative firms during their entry process. The interaction term between UNION and worker cooperatives (UNION#STRUGGLE) is positive and statistically significant in all the specifications in Table 5.1.1. This effect suggests a positive complementarity between the effect of credit union loans and the entry of worker cooperatives, showing that credit unions' loans are presented more supportive during the entry of worker cooperatives compared to the entry of non-worker cooperatives. This positive complementarity between the effect of the credit unions' loans on the entry of cooperative firms and worker cooperatives in Table 5.1.1 supports the hypothesis of positive complementarities between external financial arrangements and the entry of worker cooperatives. Finally, the effect of STRUGGLE is positive and statistically significant in all three specifications. This result proposes that worker cooperatives have significantly higher birth counts compared to non-worker cooperatives. The positive effect of the dummy variable of the struggling worker cooperatives is an expected behaviour, since this research has already discussed the tendency of worker cooperatives to rise and fall at a higher rate, compared to the other cooperative forms because of their small size.

Moving on to the control variables, the effect of DENSITY is observed as being negative and statistically significant, while the effect of INCUMBENT positive and statistically significant in all the specifications. The negative effect of the density of the already existing cooperative firms in the region and the positive effect of the number of already existing cooperative firms in the region is a behaviour that follows the theoretical

predictions of Pérotin (2007) who proposes an inverse-U relationship between the number of cooperative firms that operate in a region and the entry of new cooperative firms. The effect of INEQ is positive and statistically significant in the OLS, Poisson, and Negative Binomial specifications supporting in this way the theoretical idea that cooperative firms exhibit an anticyclical trend when it comes to their entry process, adding to the existing literature (Ben-Ner 1984; Arando et al. 2009). REG_INC is positive and statistically significant in all three specifications, decreasing, in this way, the support for the anticyclical entry of cooperative firms. Finally, the estimation results reveal that a higher number of cooperative firms are created in the "North East", "South West", and "Wales" regions, while the opposite holds for the "London" region.

Table 5.1.2: UK Entry Model Marginal Effects – Case 1

	dy/dx	Std. Err.	P>z
Poisson LOCAL (1) (LOCAL_ME)	-1.842887	0.8178737	*0.024*
Negative Binomial LOCAL (1) (LOCAL_ME)	-1.777208	0.8414347	*0.035*
Poisson UNION (1) (UNION_ME)	0.0000447	0.0000238	*0.061*
Negative Binomial UNION (1) (UNION_ME)	0.0000473	0.0000236	*0.045*

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

When looking at the marginal effects for case 1 (see Table 5.1.2), LOCAL and UNION are keeping the signs of their interaction terms and are statistically significant in the second and third specifications. These results can be observed by the statistically significant LOCAL_ME and UNION_ME in Table 5.1.2 and suggest that the overall effect of LOCAL on the entry of worker cooperatives is negative, and that the overall effect of UNION on the entry of worker cooperatives is positive. Moreover, the negative complementarity between the effect of LOCAL on the entry of cooperative firms and worker cooperatives is shown to be strong enough to cause a negative LOCAL_ME. In other words, not only successful cooperatives access local financial development easier than worker cooperatives when considering their entry process, but in addition, the entry of worker cooperatives negatively

depends on local financial development, supporting that local financial development affects the entry of successful and struggling cooperative firms in opposite ways.

Table 5.2.1 presents the second case where consumer cooperatives in retail are examined for their entry trends in comparison to the entry behaviour of worker cooperatives. The effects of BSC, BSC#STRUGGLE, and BSC_ME are statistically insignificant also in this case and for this reason are excluded. The results for LOCAL and LOCAL#STRUGGLE are similar as those for Case 1, namely, the effect of LOCAL is positive and statistically significant in the second and third specifications, while LOCAL#STRUGGLE is found to be negative and statistically significant throughout all the specifications. While LOCAL and LOCAL#STRUGGLE sustain their significance levels, UNION and UNION#STRUGGLE are presented only in the OLS specification because of the positive and statistically significant coefficient of UNION#STRUGGLE. In the other two specifications, neither UNION nor UNION#STRUGGLE are statistically significant and consequently they are not presented. STRUGGLE sustains its positive and statistically significant effect in all three specifications.

Regarding the control variables, DENSITY is negative and statistically significant, while INCUMBENT and INEQ are positive and statistically significant in all three specifications, agreeing with the observations of the first entry UK case. Finally, all the regions for which a statistically significant coefficient is estimated ("London", "North West", "Scotland", "South East", "South West", "West Midlands", "Yorkshire and The Humber") are positively related to cooperative firms' entry.

Table 5.2.1: UK Entry Interaction Model – Case 2

BIRTH	Initial OLS		OLS		Poisson		Negative Binomial	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0003298	0.309	-	-	-	-	-	-
BSC#STRUGGLE	-0.0000159	0.708	-	-	-	-	-	-
LOCAL	0.6306508	0.305	0.1950165	0.724	0.4792172	0.088	0.4730526	0.098
LOCAL#STRUGGLE	-1.485918	0.000	-1.371985	0.000	-1.165027	0.000	-1.146432	0.000
UNION	6.95e-06	0.747	8.39e-06	0.608	-	-	-	-
UNION#STRUGGLE	6.13e-06	0.046	4.60e-06	0.093	-	-	-	-
STRUGGLE	4.445059	0.012	3.778018	0.000	3.71042	0.000	3.627979	0.000
(CONTROL)								
DENSITY	-0.0007381	0.005	-0.0007272	0.003	-0.0003435	0.000	-0.0003563	0.000
INCUMBENT	0.1121964	0.000	0.1096653	0.000	0.0641158	0.000	0.0654436	0.000
INEQ	0.5036921	0.632	0.5461097	0.046	0.3391323	0.023	0.3381752	0.026
INTEREST	0.4779442	0.725	-	-	-	-	-	-
REG_INC	-0.0000274	0.304	-	-	-	-	-	-
RISK	-6.69e-08	0.021	-	-	-	-	-	-
UNEMPLO	-0.2806173	0.480	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	0.9419516	0.375	0.141893	0.766	0.469794	0.237	0.4474372	0.261
- London	10.65978	0.178	1.275774	0.190	0.9211475	0.022	0.8701677	0.037
- North East	0.3368924	0.762	0.735877	0.148	0.3093964	0.441	0.2943215	0.468
- North West	2.563775	0.254	0.56923	0.679	0.6560668	0.040	0.6347619	0.053
- Northern Ireland	-2.127961	0.716	-0.8754157	0.838	0.6263315	0.343	0.6148717	0.348
- Scotland	0.0377396	0.991	-0.7092939	0.781	0.8718136	0.017	0.8581883	0.022
- South East	5.018573	0.124	1.353729	0.120	0.8754346	0.008	0.8190653	0.016
- South West	2.690742	0.063	2.566621	0.033	0.6983218	0.075	0.6831034	0.092
- Wales	-0.5106604	0.591	0.5180953	0.274	0.6446014	0.116	0.6215552	0.134
- West Midlands	1.412023	0.190	0.557397	0.328	0.9897187	0.006	0.9823394	0.007
- Yorkshire and The Humber	1.399521	0.137	0.8591095	0.125	0.80515	0.007	0.7962997	0.010
CONSTANT	-23.49078	0.485	-20.76424	0.018	-15.18127	0.001	-15.10684	0.001
Lnalpha	-		-		-		-2.722601	
Alpha	-		-		-		.0657036	
F Test	0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.5115		0.4869		0.3628		-	
Observations	204		228		240		240	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

In Table 5.2.2, LOCAL_ME is found to be negative and statistically significant in both the Poisson and Negative Binomial specifications, as it was observed in the first UK entry case. In this case, the effect created by the interaction of worker cooperatives with LOCAL is strong enough to make the marginal effect of this variable negative. This result indicates that while the effect of local financial development on the entry of cooperative firms in general is positive, worker cooperatives present a negative complementarity strong enough to make them negatively dependent on local financial development in this case.

Table 5.2.2: UK Entry Model Marginal Effects – Case 2

	dy/dx	Std. Err.	P>z
Poisson LOCAL (1) (LOCAL_ME)	-1.512933	0.6433465	*0.019*
Negative Binomial LOCAL (1) (LOCAL_ME)	-1.465394	0.6424669	*0.023*

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

The third case of the UK entry models is the one that compares the employee trusts' entry behaviour against the behaviour of the entry of worker cooperatives. This case is special because the birth for most of the observations of employee trusts is zero. This fact may decrease the importance of the results presented in Table 5.3.1. However, despite this flaw, the presentation of this case is useful for consistency of comparison between the growth and entry complementarities in the UK cooperative sector. Moreover, it can provide some general information regarding the entry processes of cooperative firms. Starting with the effect of BSC, a positive and statistically significant coefficient for this variable can be observed in the second and third specifications, while BSC#STRUGGLE is statistically insignificant. This is a weak indication for the supportive role of building societies loans on the entry of cooperative firms. The coefficient of LOCAL is positive and statistically significant in the Poisson and Negative Binomial specification, while the coefficient of LOCAL#STRUGGLE is negative and statistically significant in all three specifications.

Table 5.3.1: UK Entry Interaction Model – Case 3

BIRTH	Initial OLS		OLS		Poisson		Negative Binomial	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0004018	*0.149*	-	-	0.0002324	*0.070*	0.0002324	*0.070*
BSC#STRUGGLE	-5.01e-06	*0.885*	-	-	-0.0000809	*0.375*	-0.0000809	*0.375*
LOCAL	0.1068554	*0.823*	-0.1462932	*0.711*	1.436142	*0.003*	1.436142	*0.003*
LOCAL#STRUGGLE	-0.8908174	*0.006*	-0.6733044	*0.017*	-1.666717	*0.000*	-1.666717	*0.000*
UNION	-0.0000179	*0.348*	-8.60e-06	*0.549*	-2.69e-06	*0.831*	-2.69e-06	*0.831*
UNION#STRUGGLE	5.82e-06	*0.056*	4.81e-06	*0.051*	-0.0000102	*0.016*	-0.0000102	*0.016*
STRUGGLE	1.729329	*0.331*	0.7960791	*0.287*	9.912012	*0.004*	9.912013	*0.004*
(CONTROL)								
DENSITY	0.0002962	*0.715*	-	-	-0.0008375	*0.013*	-0.0008375	*0.013*
INCUMBENT	0.0791071	*0.179*	0.0983283	*0.000*	0.125483	*0.001*	0.125483	*0.001*
INEQ	0-.0427584	*0.954*	-	-	-	-	-	-
INTEREST	0.9677187	*0.386*	-	-	0.5836095	*0.093*	0.5836095	*0.093*
REG_INC	-0.0000149	*0.515*	-	-	-	-	-	-
RISK	-3.17e-08	*0.171*	-	-	-1.94e-08	*0.009*	-1.94e-08	*0.009*
UNEMPLO	-0.3353806	*0.229*	-0.3921548	*0.076*	-	-	-	-
(CATEGORICAL)								
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	0.8512323	*0.331*	0.281562	*0.493*	0.8452325	*0.106*	0.8452325	*0.106*
- London	6.35193	*0.340*	1.63804	*0.043*	1.263715	*0.015*	1.263715	*0.015*
- North East	0.8000609	*0.400*	1.504916	*0.015*	1.118064	*0.023*	1.118064	*0.023*
- North West	3.186549	*0.112*	1.781629	*0.117*	1.446184	*0.058*	1.446184	*0.058*
- Northern Ireland	4.728821	*0.352*	3.475353	*0.360*	6.463441	*0.037*	6.463441	*0.037*
- Scotland	3.222789	*0.291*	1.700195	*0.442*	2.674062	*0.113*	2.674062	*0.113*
- South East	3.376011	*0.237*	1.185707	*0.034*	1.191925	*0.001*	1.191925	*0.001*
- South West	0.2945361	*0.709*	0.1071142	*0.868*	0.3457974	*0.553*	0.3457974	*0.553*
- Wales	0.367086	*0.663*	1.069879	*0.010*	1.246674	*0.039*	1.246674	*0.039*
- West Midlands	2.04046	*0.019*	1.729488	*0.002*	1.679206	*0.003*	1.679206	*0.003*
- Yorkshire and The Humber	1.873106	*0.016*	1.656104	*0.002*	1.111319	*0.004*	1.111319	*0.004*
CONSTANT	-5.264029	*0.823*	1.718028	*0.253*	-15.79177	*0.000*	-15.79177	*0.000*
Lnalpha	-		-		-		-20.37716	
Alpha	-		-		-		1.41e-09	
F Test	0.0000		0.0000		0.0000		0.0000	
(Pseudo) R2	0.6880		0.6784		0.5903		-	
Observations	204		228		204		204	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

This is a behaviour similar to the one observed previously. However, when looking at UNION and UNION#STRUGGLE, the former is observed as being statistically insignificant, while UNION#STRUGGLE is positive and statistically significant in the OLS specification, and negative and statistically significant in the Poisson and Negative Binomial specifications. In this latter case, a positive complementarity is observed between the effect of credit unions' loans on the entry of worker cooperatives in the OLS specification, while a negative complementarity can be seen between the effect of credit unions' loans on the entry of cooperative firms and worker cooperatives, in the Poisson and Negative Binomial specifications. The positive complementarity aligns with what was found in the first case, while the negative complementarity is contradictory. Therefore, in this case, a clear result cannot be established. STRUGGLE remains positive and statistically significant in the second and third specification.

When looking at the control variables, DENSITY and RISK are negative and statistically significant in the second and third specification, INCUMBENT is positive and statistically significant in OLS, Poisson, and Negative Binomial specifications, and INTEREST is positive only in the last two specifications. Another variable that is also found to have a negative and statistically significant effect on the creation of cooperatives is UNEMPLO in the OLS specification. DENSITY and INCUMBENT are behaving them same as in the previous cases. INTEREST, RISK, and UNEMPLO are presented statistically significant for the first time. The positive effect of the interest rate and the negative effect of the unemployment rate on the entry of cooperative firms is against the consensus of the countercyclical behaviour of the cooperative firm. The negative effect of risk on the entry of cooperative firms can be explained by the tendency of cooperative firms to avoid high risks in their operations and, as a result, avoid entering a region where profits are shown to be quite variable. This is a result that is in line with the corresponding avoidance of industrial

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risk for worker cooperatives in the research of Podivinsky and Stewart (2007) as well as Belloc (2017). Again, all the regions that are statistically significant in this case are shown to have a positive effect on the creation of cooperative firms. The regions which are not statistically significant are "East of England", "Scotland", and "South West".

Table 5.3.2: UK Entry Model Marginal Effects – Case 3

	dy/dx	Std. Err.	P>z
Poisson BSC (1) (BSC_ME)	0.0002163	0.0001271	*0.089*
Negative Binomial BSC (1) (BSC_ME)	0.0002163	0.0001271	*0.089*
Poisson LOCAL (1) (LOCAL_ME)	-0.3293034	0.393613	*0.403*
Negative Binomial LOCAL (1) (LOCAL_ME)	-0.3293034	0.393613	*0.403*
Poisson UNION (1) (UNION_ME)	-0.0000185	0.0000155	*0.233*
Negative Binomial UNION (1) (UNION_ME)	-0.0000185	0.0000155	*0.233*

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

Finally, the only marginal effect that is statistically significant is BSC_ME. In this case, the statistically significant and positive main BSC effect overcomes the negative and statistically insignificant interaction effect and provides BSC_ME with a positive coefficient, meaning that the creation of worker cooperatives is positively correlated with the loans provided by building societies.

The last case for the UK entry models is the one shown in Table 5.4.1. In this Table, BSC has been excluded since BSC, BSC#STRUGGLE, and BSC_ME are statistically insignificant in all three specifications. LOCAL is positive and statistically significant in the second and third specifications, while LOCAL#STRUGGLE is negative and statistically significant throughout all the specifications. In this case, the negative complementarity of the effect of LOCAL is present in all the estimations and is the strongest among those observed across all the UK entry models. This negative complementarity, which is present in the tables of all four cases, shows a tendency for worker cooperatives to struggle to raise funds from local financial institutions for their establishment, when compared to other cooperative forms. UNION#STRUGGLE has a positive and statistically significant effect

Table 5.4.1: UK Entry Interaction Model – Case 4

BIRTH	Initial OLS Coef.	Initial OLS P>t	OLS Coef.	OLS P>t	Poisson Coef.	Poisson P>t	Negative Binomial Coef.	Negative Binomial P>t
(EXPLANATORY)								
BSC	0.0004672	0.108	-	-	-	-	-	-
BSC#STRUGGLE	5.66e-06	0.889	-	-	-	-	-	-
LOCAL	0.7521764	0.165	0.6934752	0.142	0.8798836	0.000	0.8846669	0.000
LOCAL#STRUGGLE	-0.8657179	0.011	-0.7959824	0.011	-0.7656662	0.000	-0.7651816	0.000
UNION	-9.50e-06	0.637	-4.17e-06	0.785	-	-	-	-
UNION#STRUGGLE	0.0000128	0.002	9.54e-06	0.013	-	-	-	-
STRUGGLE	3.396695	0.024	3.377242	0.000	3.602308	0.000	3.601121	0.000
(CONTROL)								
DENSITY	-0.0002484	0.270	-0.0003597	0.090	-0.0002734	0.040	-0.0002731	0.039
INCUMBENT	0.0690637	0.002	0.0783283	0.000	0.0397687	0.008	0.0396701	0.008
INEQ	0.2581167	0.793	-	-	-42.47784	0.058	-42.23612	0.062
INTEREST	0.9111804	0.455	-	-	32.14276	0.059	31.95578	0.063
REG_INC	2.01e-06	0.934	0.0000294	0.009	-	-	-	-
RISK	-3.42e-08	0.159	-	-	-2.64e-08	0.001	-2.65e-08	0.001
UNEMPLO	-0.2587363	0.467	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	0.3732389	0.692	-0.4174819	0.470	0.5100839	0.196	0.5093915	0.196
- London	2.428982	0.731	-6.041925	0.043	1.177469	0.003	1.172003	0.003
- North East	1.580344	0.132	2.152464	0.002	0.3328475	0.401	0.3314515	0.404
- North West	2.184995	0.314	0.0043662	0.998	1.010442	0.003	1.013813	0.003
- Northern Ireland	1.501523	0.777	2.237533	0.572	-0.0534293	0.923	-0.0587881	0.915
- Scotland	-0.3080816	0.923	-1.401065	0.582	0.459523	0.247	0.4576188	0.247
- South East	0.874306	0.771	-2.676826	0.087	1.035312	0.002	1.027774	0.002
- South West	0.5022793	0.611	0.1830518	0.828	0.8149237	0.023	0.811761	0.023
- Wales	0.5560037	0.526	1.520434	0.006	-0.2839541	0.551	-0.2899695	0.545
- West Midlands	1.054857	0.291	0.1839453	0.725	0.3446646	0.338	0.340356	0.348
- Yorkshire and The Humber	1.623019	0.068	0.9668341	0.072	0.7555708	0.016	0.7547791	0.016
CONSTANT	-21.39672	0.494	-6.031331	0.002	1416.489	0.059	1408.397	0.062
Lnalpha	-		-		-		-5.033105	
Alpha	-		-		-		.0065185	
F Test	0.0000		0.0000		0.0000		. (0.0000)	
Pseudo R2	0.5646		0.5627		0.4160		-	
Observations	204		228		216		216	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

only in the OLS specification, in line with the results of Tables 5.1.1, 5.2.1, and 5.3.1. STRUGGLE continues to be positive and statistically significant.

Most of the control variables that are statistically significant in this case act in the same way that they did in the previous cases, while only INEQ is differentiated. The coefficient of DENSITY is negative and statistically significant in all three specifications, while INEQ and RISK are negative and statistically significant only in the second and third specifications. The effect of INCUMBENT is positive and statistically significant in all three specifications, while the effect of REG_INC is positive only in the first specification, and INTEREST is positive and statistically significant in the second and third specifications. In Table 5.4 there is a negative relationship between the effect of inequality and the entry of cooperative firms, a result that agrees with the proposition developed by Ellerman (1990), that higher levels of inequality provide an advantage for capital to hire labour against the case of labour hiring capital. This result disagrees with what was previously found and presents the relationship between inequality and the creation of the UK cooperative firms slightly vague. Finally, "North East", "North West", "South West", and "Yorkshire and The Humber" are found to display positive and statistically significant coefficients, while those of "London" and "South East" are statistically significant but have contradicting positive and negative results throughout the different specifications.

Regarding the marginal effects of the fourth case (Table 5.4.2), no marginal effect seems to be statistically significant.

Table 5.4.2: UK Entry Model Marginal Effects – Case 4

	dy/dx	Std. Err.	P>z
Poisson LOCAL (1) (LOCAL_ME)	0.2600222	0.5428268	*0.632*
Negative Binomial LOCAL (1) (LOCAL_ME)	0.2720547	0.543351	*0.617*

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

5.1.2 France

This section analyses the results of the French entry models, and the corresponding UK entry models which are used for comparison. As it has already been mentioned, the French entry interaction models did not show any signs of complementarities and, for this reason, some weaker indications of complementarities will be discussed using two separate models for the French agricultural and worker cooperatives. Table 5.5 presents the case of French agricultural cooperatives; Table 5.6 presents the case of French SCOPs; Table 5.7 presents the case of UK enterprise agricultural cooperatives; and Table 5.8 presents the results for UK worker cooperatives.

Starting with the results in Table 5.5, it can be observed that the two variables which are statistically significant for the entry of French agricultural cooperatives are local financial development (LOCAL) and interest rate (INTEREST_RATE). LOCAL is observed to have a negative and statistically significant relationship with the entry of agricultural cooperatives, disagreeing with the results of Table 5.4.1, and proposing that local financial development is negatively related to the entry of agricultural cooperatives. INTEREST RATE displays a positive and statistically significant effect on the entry of agricultural cooperatives that agrees with what was observed in the cases of the UK entry models. In Table 5.5, the coefficients of all regions are negative and statistically significant apart from those of "Bretagne" and "Nouvelle-Aquitaine" which are statistically insignificant.

Table 5.6, which presents the case of the French SCOPs, shows that in the second and third specifications, BANKS, INTEREST, and UNEMPLO have a positive and statistically

Table 5.5: French Entry Model Agriculture Cooperatives

BIRTH	Initial OLS		OLS		Poisson		Negative Binomial	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BANKS	0.0000224	*0.234*	-	-	-	-	-	-
LOCAL	-2.397	*0.329*	-	-	-1.415949	*0.023*	-1.476322	*0.019*
(CONTROL)								
DENSITY					-	-	-	-
INCUMBENT	0.0048046	*0.080*	-	-	-	-	-	-
INEQ	-862.2024	*0.207*	-	-	-	-	-	-
INTEREST	1.408603	*0.590*	0.6727436	*0.088*	0.1411738	*0.037*	0.1332546	*0.057*
REG_INC	-0.001779	*0.319*	-	-	-	-	-	-
RISK	-4.157064	*0.203*	-	-	-	-	-	-
UNEMPLO	-1.220295	*0.471*	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- Auvergne-Rhône-Alpes	-	-	-	-	-	-	-	-
- Bourgogne-Franche-Comté	-7.713206	*0.029*	-6.125	*0.001*	-1.176584	*0.000*	-1.179813	*0.000*
- Bretagne	-4.596514	*0.170*	-3	*0.105*	-0.2086855	*0.313*	-0.1887843	*0.355*
- Centre-Val de Loire	-7.265524	*0.017*	-8.5	*0.000*	-2.665413	*0.000*	-2.665943	*0.000*
- Corse	-4.31551	*0.614*	-8.5	*0.000*	-5.334004	*0.000*	-5.449875	*0.000*
- Grand Est	-6.73515	*0.111*	-4.625	*0.017*	-1.07453	*0.000*	-1.085362	*0.000*
- Hauts-de-France	-6.213313	*0.522*	-5.75	*0.003*	-2.818179	*0.001*	-2.883423	*0.001*
- Normandie	-7.163825	*0.137*	-7.75	*0.000*	-1.952218	*0.000*	-1.945366	*0.000*
- Nouvelle-Aquitaine	.2676411	*0.919*	1.25	*0.543*	-0.1467733	*0.527*	-0.1369245	*0.551*
- Occitanie	-2.544965	*0.648*	-3.25	*0.188*	-1.011919	*0.018*	-1.051563	*0.011*
- Pays de la Loire	-7.316764	*0.039*	-6.5	*0.001*	-0.0702903	*0.901*	-0.0071773	*0.990*
- Provence-Alpes-Côte d'Azur	4.579394	*0.515*	-3.5	*0.053*	-0.7991082	*0.001*	-0.8058953	*0.001*
- Île-de-France	9.597481	*0.450*	-8.75	*0.000*	-3.903208	*0.000*	-3.940164	*0.000*
CONSTANT	313.2568	*0.138*	8.313086	*0.000*	10.05231	*0.005*	10.40033	*0.004*
Lnalpha	-		-		-		-3.307485	
Alpha	-		-		-		0.0366081	
F Test	0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.6463		0.6306		0.4046		-	
Observations	104		104		104		104	

For description of the variables see Table 4.2; For explanations of the Table see introduction of Chapter 5

Table 5.6: French Entry Model SCOPs

BIRTH	Initial OLS Coef.	P>t	OLS Coef.	P>t	Poisson Coef.	P>t	Negative Binomial Coef.	P>t
(EXPLANATORY)								
BANKS	0.0000134	*0.101*	-	-	0.0000238	*0.001*	0.0000238	*0.001*
LOCAL	-0.1820568	*0.836*	-	-	-	-	-	-
(CONTROL)								
DENSITY	0.0003964	*0.085*	-	-	-	-	-	-
INCUMBENT	-0.0877217	*0.373*	-	-	-	-	-	-
INEQ	-406.1972	*0.124*	-	-	-637.7107	*0.004*	-637.6809	*0.004*
INTEREST	1.286833	*0.111*	-	-	1.769795	*0.036*	1.769897	*0.036*
REG_INC	-0.0008504	*0.353*	-	-	-	-	-	-
RISK	-2.572287	*0.071*	-1.577535	*0.088*	-8.740897	*0.002*	-8.74032	*0.002*
UNEMPLO	0.950379	*0.155*	-	-	2.500583	*0.007*	2.500563	*0.007*
(CATEGORICAL)								
REGION								
- Auvergne-Rhône-Alpes	-	-	-	-	-	-	-	-
- Bourgogne-Franche-Comté	-5.1182	*0.097*	-1.936782	*0.008*	-22.97258	*0.000*	-21.93183	*0.000*
- Bretagne	-5.411711	*0.135*	-1.93676	*0.007*	-21.32353	*0.000*	-20.10835	*0.000*
- Centre-Val de Loire	-4.918893	*0.208*	-1.517881	*0.007*	-20.24039	*0.000*	-19.11973	*0.000*
- Corse	-4.088143	*0.445*	0.6120995	*0.551*	-11.29286	*0.000*	-9.901023	*0.000*
- Grand Est	-8.2736	*0.367*	-0.7789064	*0.249*	-5.106237	*0.001*	-5.106098	*0.001*
- Hauts-de-France	-9.545544	*0.114*	-1.369527	*0.008*	-27.96962	*0.000*	-26.7856	*0.000*
- Normandie	-6.612111	*0.111*	-1.71744	*0.012*	-8.512081	*0.000*	-8.511823	*0.000*
- Nouvelle-Aquitaine	-4.183447	*0.137*	-1.275701	*0.011*	-20.04291	*0.000*	-18.9885	*0.000*
- Occitanie	-3.043828	*0.298*	1.279629	*0.075*	-3.054461	*0.119*	-3.054558	*0.119*
- Pays de la Loire	-4.859137	*0.136*	-1.600112	*0.012*	-4.125109	*0.000*	-4.124938	*0.000*
- Provence-Alpes-Côte d'Azur	-1.678214	*0.464*	1.049778	*0.233*	1.930585	*0.401*	1.929925	*0.401*
- Île-de-France	8.502489	*0.159*	2.644179	*0.188*	16.83676	*0.004*	16.83548	*0.004*
CONSTANT	132.0689	*0.133*	10.85625	*0.064*	193.3933	*0.004*	193.382	*0.004*
Lnalpha	-		-		-		-16.99802	
Alpha	-		-		-		4.15e-08	
F Test	0.0001		0.0008		0.0000		0.0000	
Pseudo R2	0.4969		0.4294		0.5144		-	
Observations	104		104		104		104	

For description of the variables see Table 4.2; For explanations of the Table see introduction of Chapter 5

significant effect on the entry of SCOPs. The coefficients of INEQ and RISK, on the other hand, are negative and statistically significant in the Poisson and Negative Binomial specifications. BANKS's positive coefficient shows a positive relationship between the creation of SCOPs and the amount of loans provided by cooperative banks in France. As in the model for agricultural cooperatives, INTEREST seems to have a positive and statistical effect also on the creation of SCOPs. When comparing the positive relationship between the entry of French worker cooperatives and the unemployment rate, to the statistically insignificant relationship between the entry of agricultural cooperatives and the unemployment rate, it can be shown that French worker cooperatives are closer, at least when looking at this variable, to following the anticyclical theoretical predictions discussed earlier in the chapter and generally in the literature about cooperative firms. The negative relationship between inequality and the creation of French worker cooperatives supports the struggle theorisation mentioned earlier in the research (Ellerman 1990). Interestingly, the entry of worker cooperatives is shown to be negatively affected by risk while the entry of agricultural cooperatives is not affected by risk. This last observation could be explained by the size of the agricultural cooperatives sector which is bigger and more stable compared to that of worker cooperatives, and as a result, the entrants are not facing the uncertainty discussed earlier in the UK entry cases (Podivinsky and Stewart 2007). Finally, all regions have negative and statistically significant coefficients apart from Provence-Alpes-Côte d'Azur which is statistically insignificant.

Looking at the specific case of agricultural enterprise cooperatives in the UK, reported in Table 5.7, the effects of LOCAL, INCUMBENT, and INTEREST are positive and statistically significant, while DENSITY and RISK are negative and statistically significant coefficients. Most of these results are in agreement with what has already been observed in previous UK and French cases. However, it can be observed that LOCAL, in this case, has

Table 5.7: UK Entry Model Agriculture Cooperatives

BIRTH	Initial OLS Coef.	P>t	OLS Coef.	P>t	Poisson Coef.	P>t	Negative Binomial Coef.	P>t
(EXPLANATORY)								
BSC	0.0000727	0.554	-	-	-	-	-	-
LOCAL	1.363545	0.001	1.319669	0.000	1.718818	0.005	1.718962	0.005
UNION	0.0000122	0.457	-	-	-	-	-	-
(CONTROL)								
DENSITY	-0.0016067	0.198	-.0020065	0.032	-0.0034754	0.077	-0.0034755	0.077
INCUMBENT	0.2733667	0.028	.2666775	0.006	0.4794491	0.038	0.4794355	0.038
INEQ	0.2439295	0.581	-.2344935	0.085	-	-	-	-
INTEREST	0.0593219	0.908	-	-	6.007212	0.000	6.052454	0.000
REG_INC	0.0000219	0.046	0.0000149	0.002	-	-	-	-
RISK	-2.15e-09	0.888	-	-	-4.39e-07	0.010	-4.39e-07	0.010
UNEMPLO	0.1876175	0.305	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	0.4827289	0.329	0.3554863	0.354	2.182261	0.001	2.182184	0.001
- London	-1.265816	0.773	0.3584101	0.892	17.09219	0.008	17.09138	0.008
- North East	4.605732	0.009	4.214838	0.003	-10.47131	0.002	-10.73255	0.001
- North West	0.1982658	0.909	1.107197	0.226	5.016295	0.009	5.016118	0.009
- Northern Ireland	-3.671386	0.371	-0.5512558	0.334	-19.46687	0.000	-19.77083	0.000
- Scotland	-7.209549	0.327	-1.128214	0.816	-1.086812	0.909	-1.085659	0.909
- South East	-3.770996	0.011	-3.007577	0.000	-0.2922657	0.806	-0.2921526	0.806
- South West	-3.004592	0.023	-2.536564	0.023	-3.71564	0.083	-3.715386	0.083
- Wales	2.205061	0.044	1.791484	0.029	-14.55619	0.000	-14.78058	0.000
- West Midlands	0.6540361	0.533	0.9848756	0.164	1.820449	0.415	1.820456	0.415
- Yorkshire and The Humber	2.153503	0.128	2.28955	0.029	5.027363	0.037	5.027118	0.037
CONSTANT	-22.34791	0.147	-2.223297	0.641	-25.49845	0.000	-25.57309	0.000
Lnalpha	-		-		-		-133.1345	
Alpha	-		-		-		1.51e-58	
F Test	0.0001		0.0000		. (0.0000)		. (0.0000)	
Pseudo R2	0.4975		0.4655		0.4175		-	
Observations	102		120		108		108	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

Table 5.8: UK Entry Model Worker Cooperatives

BIRTH	Initial OLS		OLS		Poisson		Negative Binomial	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0007965	*0.116*	0.0006396	*0.097*	0.0001696	*0.039*	0.0001695	*0.039*
LOCAL	-0.2973156	*0.742*	-	-	-	-	-	-
UNION	-0.0000304	*0.437*	-	-	-	-	-	-
(CONTROL)								
DENSITY	-0.0014426	*0.377*	-	-	-0.0010243	*0.006*	-0.0010243	*0.006*
INCUMBENT	0.3652248	*0.027*	0.2224837	*0.000*	.1480891	*0.000*	0.1480837	*0.000*
INEQ	-0.2862642	*0.834*	-	-	-	-	-	-
INTEREST	2.334084	*0.246*	2.234183	*0.066*	0.6430003	*0.026*	0.6429408	*0.026*
REG_INC	-0.0000501	*0.225*	-	-	-	-	-	-
RISK	-7.11e-08	*0.090*	-	-	-1.79e-08	*0.011*	-1.79e-08	*0.011*
UNEMPLO	-0.7952425	*0.158*	-	-	-	-	-	-
(CATEGORICAL)								
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	4.225317	*0.022*	2.718984	*0.007*	1.053595	*0.058*	1.053544	*0.058*
- London	16.21074	*0.181*	-1.077561	*0.315*	0.6633108	*0.178*	0.6633061	*0.178*
- North East	3.67192	*0.087*	3.448106	*0.001*	1.387696	*0.009*	1.387629	*0.009*
- North West	5.604523	*0.136*	.1319089	*0.914*	0.4741998	*0.309*	0.4741942	*0.309*
- Northern Ireland	15.24038	*0.167*	7.083053	*0.001*	3.050008	*0.009*	3.049853	*0.009*
- Scotland	7.238049	*0.246*	1.333595	*0.121*	0.68842	*0.113*	0.6883998	*0.113*
- South East	9.374545	*0.071*	3.209993	*0.001*	1.145481	*0.002*	1.145422	*0.002*
- South West	-2.626075	*0.271*	-2.995616	*0.106*	0.17837	*0.773*	0.1784202	*0.773*
- Wales	4.126527	*0.062*	4.054671	*0.002*	1.42348	*0.038*	1.42339	*0.038*
- West Midlands	7.596702	*0.002*	4.004446	*0.001*	1.61176	*0.005*	1.611682	*0.005*
- Yorkshire and The Humber	4.359477	*0.008*	2.074684	*0.003*	0.8518933	*0.020*	0.8518719	*0.020*
CONSTANT	-8.2951	*0.848*	-21.26493	*0.028*	-7.512411	*0.001*	-7.511847	*0.001*
Lnalpha	-		-		-		-15.41285	
Alpha	-		-		-		2.02e-07	
F Test	0.0000		0.0000		0.0000		0.0000	
Pseudo R2	0.6356		0.6227		0.3177		-	
Observations	102		108		108		108	

For description of the variables see Table 4.1; For explanations of the Table see introduction of Chapter 5

a positive relationship with the creation of agricultural cooperatives for the UK, while in the French entry model there is a negative relationship between LOCAL and the creation of agricultural cooperatives. The regional categorical variable is positive and statistically significant for "East of England", "London", "North West", and "Yorkshire and The Humber", negative and statistically significant for "Northern Ireland", and "South East", while "North East" and "Wales" present contradicting results between the OLS and the other two specifications.

Regarding the entry model for UK worker cooperatives, the results are very similar to those of Table 5.7, with the only exception being that in Table 5.7, LOCAL is positive and statistically significant. By contrast, in Table 5.8, BSC has a positive and statistically significant effect on the creation of worker cooperatives INCUMBENT, and INTEREST are also found to have a positive and statistically significant effect on the entry of UK worker cooperatives, while DENSITY and RISK have a negative and statistically significant impact on the entry of UK worker cooperatives. In Table 5.8, a positive and statistically significant regional impact on the creation of worker cooperatives is found for "East of England", "North East", "Northern Ireland", "South East", "Wales", "West Midlands", and "Yorkshire and The Humber".

5.2 Growth Model Results

In both the UK and French growth models, the three specifications presented in the results tables included in this section refer to the robust standard error specification (column Robust POLS), the specification which clusters for ownership classification (Cluster Own POLS), and the specification clustering for industry classification (Cluster Industry RE). The choice to cluster for ownership and industrial classification and not for region, was made after

considering the analysis in previous chapters which indicated that the levels of interest in the analysis of the UK cooperative sector are those of ownership and industry classification. In both the UK and French growth models, panel data analysis including pooled OLS and random effects estimations are used, and LM[13] tests are used for the choice of the most appropriate econometric technique. When looking for endogeneity in the models, no endogeneity was identified in any of the UK or French models. In the estimations where pooled OLS is presented as the most appropriate econometric model, the Durbin and Wu-Hausman tests were used. In order to test for endogeneity in random effect models, Sargan-Hansen statistics are considered and by extension the categorical variables existing in the models (including interaction terms) had to be excluded.

As a result, the Sargan-Hansen statistics for the variables of interest are acquired, but only for models that do not contain the categorical variables. Moreover, all the variables except AGE are lagged by one year in order to avoid simultaneity bias. The variables used as instruments for the tests are all the one-year-lagged variables that are statistically significant in at least one specification, while the two-years-lagged variables are used as instruments for the already one-year-lagged statistically significant variables that are included in each specification of interest.

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[13] Lagrange Multiplier (LM) tests are used in panel data analysis for choosing the most appropriate econometric model to fit the data in. In this case, the test was done in order to choose the most appropriate model between random effects and pooled OLS, since there are specific categorical variables of interests that would be excluded in fixed effects analysis.

5.2.1 UK

Starting with the case of the UK growth model presented in Table 5.9.1, all of the selected non-worker cooperatives are compared to worker cooperatives, meaning that the 0 value of the dummy variable STRUGGLE corresponds to consumer retail cooperatives, employee trusts, and enterprise agricultural cooperatives together. In Tables 5.10.1, 5.11.1, and 5.12.1 the performance of each of these cooperative forms is compared separately to the performance of worker cooperatives. Table 5.10.1 considers the performance of consumer retail cooperatives against the performance of worker cooperatives; Table 5.11.1 considers the performance of employee trusts against the performance of worker cooperatives; and Table 5.12.1 considers the performance of enterprise agricultural cooperatives against the performance of worker cooperatives. Tables 5.9.2, 5.10.2, 5.11.2, and 5.12.2 present the marginal effects of the explanatory variables for all four cases, hence illustrating the cumulative effect of these variables on the growth of worker cooperatives.

The variables excluded in all the models are ASSETS, LIQ, and LEV after applying the general-to-simple method mentioned earlier. In Table 5.9.1, it can be observed that only SHARE_G and LOCAL are the explanatory variables present in the finalized specifications. This is because of the statistically insignificant coefficients of BSC and UNION, the interaction effects of BSC and UNION with STRUGGLE, and the marginal effects of BSC and UNION. The two specifications in columns Robust POLS and Cluster Own POLS are estimated with pooled OLS since the LM test is presented as statistically insignificant, while the specification in column Cluster Industry RE is estimated using a random effects model because of the statistically significant LM test.

In all the specifications reported in Table 5.9.1, it can be observed a positive effect of shareholders funds' growth on the growth of cooperative firms and a negative

complementarity between the effect of shareholders funds' growth on cooperative firms and worker cooperatives. The main effect of SHARE_G is positive and statistically significant in all three specifications. The main effect of shareholders funds' growth on the growth of cooperative firms seems to suggest that as more money is invested in the firm by their shareholders, the growth of the firm increases. The support for the existence of the negative complementarity between worker cooperatives and the effect of the growth of shareholders' funds on the growth of cooperative firms can be observed by the negative and statistically significant coefficient of SHARE_G#STRUGGLE. This negative complementarity agrees with the hypothesis of this research that proposes negative complementarities between internal financial arrangements and the growth of worker cooperatives. This result could be interpreted as evidence of the inability of worker cooperatives to exploit their shareholders funds' growth, relative to the other types of cooperative firms, in order to promote their growth.

Moving on to the second explanatory variable presented, which has to do with external financial arrangements, the main effect of LOCAL on the growth of cooperative firms is negative and statistically significant in the first and third specification suggesting that as the local financial development increases, the levels of the growth of non-worker cooperatives decline. Worker cooperatives are observed as taking more advantage of local financial development compared to their cooperative counterparts, something that suggests a positive complementarity. This can be seen in Table 5.9.1 when looking at the coefficient of LOCAL#STRUGGLE which is positive and statistically significant. The only specification in which the effect of LOCAL on the growth of cooperative firms is not observed to have a complementarity with worker cooperatives, is the specification which clusters for industry classification. This positive complementarity is in line with the hypothesis of this research,

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Table 5.9.1.1: UK Growth Interaction Model – Case 1

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry RE	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0241586	0.586	-	-	-	-	-	-
BSC#STRUGGLE	0.0022955	0.172	-	-	-	-	-	-
LOCAL	-41.19426	0.021	-39.06001	0.001	-37.99413	0.138	-28.72772	0.012
LOCAL#STRUGGLE	2.838805	0.806	12.66181	0.054	11.6701	0.095	10.53552	0.286
SHARE_G	0.1284405	0.021	0.0838855	0.010	0.0919503	0.035	0.0542048	0.023
SHARE_G#STRUGGLE	-0.1269714	0.031	-0.0833532	0.013	-0.0904852	0.032	-0.0543707	0.013
UNION	-0.0002676	0.693	-	-	-	-	-	-
UNION#STRUGGLE	-0.0000736	0.427	-	-	-	-	-	-
STRUGGLE	-56.15798	0.291	-29.69967	0.102	-29.2039	0.109	-22.60334	0.338
(CONTROL)								
AGE	-0.0420941	0.581	-0.1262594	0.009	-	-	-0.1392952	0.038
ASSETS	3.84e-07	0.912	-	-	-	-	-	-
LEV	-0.0645061	0.070	-	-	-	-	-	-
LIQ	1.081485	0.586	-	-	-	-	-	-
POP	1307.133	0.501	-	-	79.04465	0.914	-	-
PROFIT	0.0715178	0.728	-0.3008706	0.087	-0.2896922	0.049	-	-
REG_INC	-0.0008508	0.164	-0.0006931	0.009	-0.0007055	0.092	-0.000577	0.023
SHARE_F	-32.51932	0.097	-	-	-	-	-	-
(CATEGORICAL)								
INDUSTRY								
- Agriculture	-	-	-	-	-	-	-	-
- Arts and Culture	-40.20314	0.000	-15.08712	0.215	-19.36651	0.047	-18.15485	0.046
- Digital, Media and Communication	-6.637635	0.679	1.709917	0.884	-3.300589	0.583	0.8901106	0.918
- Education	18.77857	0.234	10.28571	0.238	8.824482	0.184	3.112643	0.555
- Energy and Environment	-4.571578	0.740	18.4441	0.284	16.82488	0.100	13.20591	0.249
- Finance	-	-	-	-	-	-	-	-
- Food Service, Accommodation, and Pubs	-	-	14.96069	0.200	10.92549	0.185	15.00742	0.034
- Health and Social Care	-35.00552	0.119	38.05662	0.077	35.57497	0.039	27.17589	0.000
- Housing	-	-	59.56253	0.218	55.49064	0.003	52.27703	0.000
- Manufacturing	4.024262	0.624	4.983449	0.446	1.682522	0.711	7.621688	0.090
- Membership associations, social clubs, etc.	-	-	-23.71314	0.087	-24.63578	0.010	-25.6796	0.000
- Other	-41.65994	0.006	-4.809028	0.642	-6.956325	0.185	-3.899269	0.492
- Professional and Legal services	0.7800942	0.964	6.731853	0.415	4.746417	0.051	2.043722	0.700
- Retail	10.10978	0.351	12.11285	0.041	8.388822	0.011	8.013226	0.020
- Sport and Recreation	-12.54241	0.457	34.13942	0.054	31.31201	0.006	26.36757	0.027
- Transport	-54.83459	0.198	-37.72626	0.004	-39.53377	0.001	-33.22812	0.000

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

Table 5.9.1.2: UK Growth Interaction Model – Case 1

	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry RE	
GROWTH	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**
LEGAL FORM								
- **Charitable organization**	-	-	-	-	-	-	-	-
- **Guarantee**	-19.35478	*0.170*	-15.86869	*0.225*	-14.29284	*0.033*	-11.98124	*0.377*
- **Industrial/Provident**	-23.394	*0.119*	-11.67594	*0.427*	-22.98519	*0.001*	-7.74423	*0.519*
- **Limited Liability Partnership**	-46.00907	*0.071*	1.935523	*0.914*	4.816531	*0.612*	-8.318409	*0.512*
- **Private Limited**	-20.54529	*0.168*	-8.870106	*0.508*	-12.05802	*0.020*	-8.552347	*0.471*
- **Public, Not Quoted**	-17.09559	*0.436*	-2.582342	*0.874*	-10.01196	*0.158*	-1.44809	*0.911*
- **Unlimited**	-	-	-	-	-	-	-	-
REGION								
- **East Midlands**	-	-	-	-	-	-	-	-
- **East of England**	-104.2423	*0.593*	27.68244	*0.010*	20.2854	*0.797*	21.0878	*0.112*
- **Jersey**	-	-	-	-	-	-	-	-
- **London**	-70.72381	*0.862*	213.914	*0.007*	196.9551	*0.407*	174.7812	*0.025*
- **North East**	287.8063	*0.533*	-41.61029	*0.021*	-21.41876	*0.912*	-39.83063	*0.087*
- **North West**	-169.0664	*0.650*	42.85102	*0.029*	31.41755	*0.825*	30.54783	*0.092*
- **Northern Ireland**	561.6843	*0.398*	-28.08613	*0.083*	12.46724	*0.966*	-27.56319	*0.114*
- **Scotland**	4.443526	*0.981*	36.82591	*0.011*	36.03045	*0.519*	23.48636	*0.080*
- **South East**	-241.6117	*0.614*	93.86389	*0.013*	76.85729	*0.713*	83.12116	*0.024*
- **South West**	-41.40574	*0.722*	43.13971	*0.001*	38.36866	*0.517*	30.65123	*0.016*
- **Wales**	191.9207	*0.549*	-21.18922	*0.080*	-5.898157	*0.961*	-25.25661	*0.003*
- **West Midlands**	-82.78803	*0.637*	21.05264	*0.011*	18.35118	*0.776*	17.05258	*0.171*
- **Yorkshire and The Humber**	-54.9898	*0.665*	22.79418	*0.146*	20.81083	*0.661*	16.03188	*0.308*
CONSTANT	-9049.46	*0.513*	157.3819	*0.000*	-370.496	*0.989*	123.3642	*0.001*
LM Test	1.0000		1.000		1.000		0.0057	
R-Squared	0.2345		0.1567		0.1513		0.1220	
F Test (Test_Parm)	. (0.0000)		. (0.0000)		. (0.0000)		. (0.0000)	
Endogeneity Tests - Durbin	1.0000		1.0000		1.0000		-	
Endogeneity Tests - Wu-Hausman	1.0000		1.0000		1.0000		-	
Sargan-Hansen statistic	-		-		-		0.2337	
Observations	257		464		464		475	

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

which supports the existence of positive complementarities between external financial arrangements and worker cooperatives, and the results of Gagliardi (2009). In this sense, worker cooperatives are shown to take more advantage of the local financial development compared to their non-worker cooperatives counterparts, in order to boost their growth. In regard to the dummy variable STUGGLE, which counts for the effect of the worker cooperative type on the growth of the firm, its coefficient is negative and statistically insignificant in all three specifications in Table 5.9.1.

Regarding the control variables, the negative and statistically significant coefficient of AGE in the first and third specification supports the findings of scholars who show that younger companies tend to have higher growth rates compared to their older counterparts (Evans 1987; Becchetti and Trovato 2002). Interestingly, the effect of age on cooperative firms is seen in this case to be the same as that of their non-cooperative counterparts presented in the literature. The coefficient of PROFIT is negative and statistically significant in the first two specifications, while the coefficient of REG_INC is negative and statistically significant in all three specifications. The negative effect of the profits of each cooperative on the growth of the firms is in accordance with the predictions in the literature that propose a negative relationship between profits and the growth of the firm (Demirgüç-Kunt and Maksimovic 1998). The idea that profits have a negative relationship with the growth of cooperative firms could make the idea of long-term planning for sustainable development more attractive, which is considered to be a characteristic of cooperative firms when looking at the empirical literature (Craig and Pencavel 1992; Pencavel and Craig 1994; Burdin and Dean 2009). The negative effect of regional income on the growth of cooperative firms shows a tendency for the growth of cooperative firms to not follow the regional income development, showing in this way a persistence in their growth rates during the last economic recession and the years after, and agreeing with the literature that proposes

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cooperative firms as an organization that is able to absorb efficiently negative economic shocks (Stiglitz 2009). Regarding the categorical variables, INDUSTRY shows statistically significant coefficients in all the specifications. More specifically, "Arts and Culture", "Membership associations, social clubs, etc.", and "Transport" are negative and statistically significant, while "Food service, Accommodation, and Pubs", "Health and Social Care", "Housing", "Manufacturing", "Professional and Legal services", "Retail", and "Sports and Recreation" are positive and statistically significant in at least one specification each. When looking at the categorical variable of LEGAL, "Guarantee", "Industrial/Provident", and "Private Limited" are negative and statistically significant when clustering for ownership classification. Moreover, REGION is shown to be statistically significant in the robust and cluster industry specifications, since no region is statistically significant when clustering for ownership classification. In particular, the coefficients of "London", "North West", "South East", and "South West" are positive and statistically significant in both first and third specifications; "East of England", "Scotland', and "West Midlands" are positive only in the first specification; "North East" and "Wales" are negative and statistically significant in both first and third specifications; and "Northern Ireland" is negative and statistically significant only in the first specification.

Table 5.9.2: UK Growth Model Marginal Effects – Case 1

	dy/dx	Std. Err.	P>z
Robust SHARE_G (1) (SHARE_G_ME)	0.0005323	0.0070416	*0.940*
Robust LOCAL (1) (LOCAL_ME)	-26.3982	12.13971	*0.030*
Cluster Own SHARE_G (1) (SHARE_G_ME)	0.001465	0.0037938	*0.699*
Cluster Own LOCAL (1) (LOCAL_ME)	-26.32403	17.04461	*0.122*
Cluster Industry SHARE_G (1) (SHARE_G_ME)	-0.0001659	0.0097745	*0.986*
Cluster Industry LOCAL (1) (LOCAL_ME)	-18.1922	15.38149	*0.237*

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

When looking at Table 5.9.2, the only marginal effect which is statistically significant is the one of LOCAL in the 'robust standard errors' specification. The fact that the coefficient of SHARE_G is positive and statistically significant, while the coefficient of

SHARE_G#STRUGGLE is negative and statistically significant, results in the neutralization of SHARE_G_ME. The idea that a statistically significant complementarity does not add up to a statistically significant marginal effect can be supported by extending the position of Brambor et al. (2006) who propose that statistically insignificant parameters can sum up to statistically significant joint marginal effects. This peculiarity arises because of the negative covariance of SHARE_G and SHARE_G#STRUGGLE. As a result, in the case of this model, the complementarity exists, but in such a way that it neutralizes the marginal effect of shareholders' growth funds on turnover growth for worker cooperatives. From the statistically significant LOCAL_ME it can be observed that the positive and statistically significant coefficient of LOCAL#STRUGGLE reduces the negative and statistically significant effect of LOCAL, however it is not strong enough to alter the sign of LOCAL_ME, which remains negative and statistically significant. As a result, a positive complementarity exists in this case, and reduces the negative effect of LOCAL on turnover growth for worker cooperatives, but its magnitude cannot create a positive relationship between LOCAL_ME and turnover growth for worker cooperatives. Thus, worker cooperatives are presented to be negatively related with local financial development.

After examining the relative growth performance of the group of cooperatives which can be regarded as successful in the UK (consumer retail cooperatives, employee trusts, and enterprise agricultural cooperatives) against worker cooperatives (i.e. the cooperative form which for the reasons explained in earlier Chapters is considered to be experiencing difficulties in the UK), it is time to look at the three success cases in further detail. To this end, Table 5.10.1 presents the results of the case where only consumer retail cooperatives and worker cooperatives are considered. In this model, all three specifications are estimated with random effects, since all the LM tests had statistically significant results. Again, the coefficients of BSC and UNION, the interaction effects of BSC and UNION with

STRUGGLE, and the marginal effects of BSC and UNION are not statistically significant.

Regarding the results of the explanatory variables, the complementarities that can be seen in the previous case arise as in this case. The coefficient of SHARE_G#STRUGGLE is negative and statistically significant in all the specifications, while the coefficient of LOCAL#STRUGGLE is positive and statistically significant in each specification. Similarly, the main effect of SHARE_G is positive and statistically significant across all the specifications, while the coefficient of LOCAL is negative and statistically significant when looking at the second specification. These explanatory variables seem to behave mostly in the same way as in the first case. However, in this case, the effect of STRUGGLE is negative and statistically significant, meaning that when looking at this specific comparison between consumer cooperatives in retail and worker cooperatives, the latter cooperative form is observed to have a significantly negative effect on the growth of the cooperative firm. This result supports the idea that worker cooperatives are struggling to grow when compared to their non-worker cooperative counterparts. Thus, worker cooperatives are not only smaller in size and in turnover compared to their successful cooperative counterparts but, in addition, they seem to have lower growth rates. This is a strong indication for considering them as struggling cooperative forms in the UK.

The coefficients of REG_INC and AGE are negative and statistically significant in the first and third specification. These results are analogous with those in the previous case, something that was observed for most of the explanatory variables as well. Although POP is a variable that was included in the previous case for the sake of efficiency of the model, in this case it is negative and statistically significant. The coefficient of SHARE_F is negative and statistically significant only in the second specification, that is when clustering

Table 5.10.1.1: UK Growth Interaction Model – Case 2

GROWTH	Initial POLS Coef.	Initial POLS P>t	Robust RE Coef.	Robust RE P>t	Cluster Own RE Coef.	Cluster Own RE P>t	Cluster Industry RE Coef.	Cluster Industry RE P>t
(EXPLANATORY)								
BSC	0.0852	*0.209*	-	-	-	-	-	-
BSC#STRUGGLE	0.0043456	*0.072*	-	-	-	-	-	-
LOCAL	-84.87721	*0.018*	-39.41337	*0.102*	-31.76025	*0.019*	-39.41337	*0.126*
LOCAL#STRUGGLE	19.07936	*0.257*	15.59027	*0.083*	14.0902	*0.000*	15.59027	*0.015*
SHARE_G	0.1379912	*0.030*	0.0547624	*0.046*	0.0579173	*0.000*	0.0547624	*0.000*
SHARE_G#STRUGGLE	-0.1770584	*0.020*	-0.0505465	*0.082*	-0.0522418	*0.000*	-0.0505465	*0.003*
UNION	0.0006763	*0.438*	-	-	-	-	-	-
UNION#STRUGGLE	-0.000124	*0.510*	-	-	-	-	-	-
STRUGGLE	-158.0808	*0.053*	-42.59061	*0.085*	-45.57731	*0.000*	-42.59061	*0.005*
(CONTROL)								
AGE	0.1020521	*0.437*	-0.1494514	*0.009*	-	-	-0.1494514	*0.009*
ASSETS	-5.05e-06	*0.251*	-	-	-	-	-	-
LEV	-0.0831894	*0.039*	-	-	-	-	-	-
LIQ	1.147433	*0.600*	-	-	-	-	-	-
POP	2626.047	*0.434*	-	-	-1907.009	*0.000*	-	-
PROFIT	-0.0154964	*0.947*	-	-	-	-	-	-
REG_INC	-0.0011687	*0.201*	-0.0007625	*0.055*	-	-	-0.0007625	*0.055*
SHARE_F	-46.47038	*0.018*	-	-	-0.5810667	*0.000*	-	-
(CATEGORICAL)								
INDUSTRY								
- **Agriculture**	-	-	-	-	-	-	-	-
- **Arts and Culture**	-38.70957	*0.113*	-11.61505	*0.382*	-16.06153	*0.000*	-11.61505	*0.238*
- **Digital, Media, and Communication**	-18.83659	*0.529*	4.0103	*0.695*	1.527069	*0.264*	4.0103	*0.579*
- **Education**	41.57239	*0.148*	5.401502	*0.277*	5.52713	*0.000*	5.401502	*0.211*
- **Energy and Environment**	-5.45206	*0.860*	22.05855	*0.161*	22.6297	*0.000*	22.05855	*0.089*
- **Finance**	-	-	-	-	-	-	-	-
- **Food Service, Accommodation, and Pubs**	-	-	17.35061	*0.156*	5.561494	*0.536*	17.35061	*0.060*
- **Health and Social Care**	-133.2086	*0.206*	37.93979	*0.055*	35.73391	*0.000*	37.93979	*0.000*
- **Housing**	-	-	54.67719	*0.110*	54.16642	*0.000*	54.67719	*0.000*
- **Manufacturing**	14.27704	*0.587*	7.319376	*0.571*	8.194962	*0.398*	7.319376	*0.360*
- **Membership Associations, Social Clubs etc.**	-	-	-23.20534	*0.000*	-25.37424	*0.000*	-23.20534	*0.000*
- **Other**	-31.97839	*0.238*	-0.9380277	*0.887*	-3.016325	*0.000*	-0.9380277	*0.779*
- **Professional and Legal Services**	-8.760487	*0.805*	2.527719	*0.731*	0.6934326	*0.791*	2.527719	*0.645*
- **Retail**	13.12399	*0.633*	4.822141	*0.520*	-0.1601194	*0.973*	4.822141	*0.396*
- **Sport and Recreation**	-23.22048	*0.522*	30.38631	*0.010*	29.64887	*0.000*	30.38631	*0.008*
- **Transport**	-	-	-	-	-	-	-	-

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

Table 5.10.1.2: UK Growth Interaction Model – Case 2

	Initial POLS		Robust RE		Cluster Own RE		Cluster Industry RE	
GROWTH	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
LEGAL FORM								
- Charitable organization	-	-	-	-	-	-	-	-
- Guarantee	-36.18113	0.066	-11.26977	0.489	-9.420909	0.205	-11.26977	0.510
- Industrial/Provident	-66.74231	0.024	-5.60581	0.742	-22.51617	0.000	-5.60581	0.740
- Limited Liability Partnership	-24.86592	0.425	-4.901235	0.772	-1.458853	0.876	-4.901235	0.758
- Private Limited	-66.80897	0.037	-6.431744	-0.669	-8.726309	0.000	-6.431744	0.678
- Public, Not Quoted	-	-	-	-	-	-	-	-
- Unlimited	-	-	-	-	-	-	-	-
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	-246.3791	0.470	18.02966	0.269	202.2477	0.000	18.02966	0.217
- Jersey	-	-	-	-	-	-	-	-
- London	-310.5429	0.663	228.3758	0.053	516.3473	0.000	228.3758	0.059
- North East	690.9431	0.372	-77.24533	0.021	-511.4946	0.000	-77.24533	0.021
- North West	-446.9631	0.485	39.24054	0.159	354.4472	0.000	39.24054	0.107
- Northern Ireland	-	-	-	-	-	-	-	-
- Scotland	-173.317	0.560	30.86063	0.181	128.5499	0.000	30.86063	0.170
- South East	-549.3083	0.513	100.8827	0.071	529.3885	0.000	100.8827	0.061
- South West	-104.0468	0.613	34.57216	0.105	140.6927	0.000	34.57216	0.095
- Wales	461.7474	0.398	-26.79918	0.055	-331.7857	0.000	-26.79918	0.015
- West Midlands	-213.3812	0.482	13.20242	0.328	175.595	0.000	13.20242	0.332
- Yorkshire and The Humber	-143.8477	0.514	14.23982	0.392	128.288	0.000	14.23982	0.404
CONSTANT	-19061.57	0.422	169.1586	0.049	12781.39	0.000	169.1586	0.041
LM Test	1.0000		0.0016		0.0018		0.0016	
R-Squared	0.3296		0.1278		0.1188		0.1278	
F Test (Test_Parm)	. (0.0000)		. (0.0000)		. (0.0000)		. (0.0000)	
Endogeneity Tests – Durbin	1.0000		-		-		-	
Endogeneity Tests - Wu-Hausman	1.0000		-		-		-	
Sargan-Hansen statistic	-		0.5030		0.3883		0.5030	
Observations	155		348		348		348	

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

for ownership classification. The coefficient of SHARE_F could be considered as a substitute to the ASSETS variable in some cases given that shareholders' funds account is one of the main components of total assets in a company. The effect of shareholders' funds on the growth of the firm, which is presented as negative, could be related to the idea that bigger firms have lower growth rates compared to their smaller counterparts. This explanation may be even stronger in the case of cooperative firms, where the level of shareholders' funds plays a significant role in the determination of their size.

When looking at the categorical variables INDUSTRY and LEGAL, these are observed to increase their statistical significance when clustering for ownership classification, while REGION is observed to increase its significance levels when clustering for industry classification. More analytically, "Arts and Culture", "Membership associations, social clubs, etc.", and "Other" are negative and statistically significant, while "Education", "Energy and Environment", "Food Service, Accommodation and Pubs", "Health and Social Care", "Housing", and "Sport and Recreation" are positive and statistically significant. LEGAL is statistically significant and negative only in the second specification and only for "Industrial/Provident" and "Private Limited". Finally, all regions are statistically significant in at least one of the three specifications, with the coefficients of "East of England", "London", "North West", "Scotland", "South East", "South West", "West Midlands", and "Yorkshire and The Humber" being positive, and the coefficients of "North East" and "Wales" being negative.

Table 5.10.2: UK Growth Model Marginal Effects – Case 2

	dy/dx	Std. Err.	P>z
Robust SHARE_G (1) (SHARE_G_ME)	0.0042159	0.0109065	*0.102*
Robust LOCAL (1) (LOCAL_ME)	-23.8231	20.68764	*0.250*
Cluster Own SHARE_G (1) (SHARE_G_ME)	0.0579173	0.001117	*0.000*
Cluster Own LOCAL (1) (LOCAL_ME)	-17.67005	12.3693	*0.153*
Cluster Industry SHARE_G (1) (SHARE_G_ME)	0.0042159	0.0096883	*0.663*
Cluster Industry LOCAL (1) (LOCAL_ME)	-23.8231	24.60542	*0.333*

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

In regard to the marginal effects, a similar story to case 1 is presented in case 2. In case 2, however, SHARE_G_ME is the statistically significant marginal effect and it is observed in the cluster ownership specification. Here, the effect that remains sufficiently strong to overcome the negative complementarity arising from worker cooperatives is the one of SHARE_G. On the other hand, LOCAL_ME does not achieve statistically significant effects in this case.

Table 5.11.1, reports results for the case that looks at employee trusts and worker cooperatives. All the specifications here are estimated with pooled OLS, since LM tests were presented statistically insignificant in all these specifications. The absence of SHARE_G and UNION is due to the statistical insignificance of SHARE_G, UNION, SHARE_G#STRUGGLE, UNION#STRUGGLE, and the marginal effects of SHARE_G and UNION. The effects of LOCAL (negative and statistically significant) and LOCAL#STRUGGLE (positive and statistically significant when clustering for ownership and industry classification) remain the same as they were in the two previous cases, thus strengthening the positive complementary feature of the effect of LOCAL on the growth of cooperative firms and worker cooperatives. Building societies' loans do not seem to have a significant effect on the growth of cooperative firms when not counting for the distinct effect arising from worker cooperative form. However, when looking at the interaction term between building societies' loans and worker cooperatives there is prevailing a positive complementarity. The BSC estimated coefficient, which was not included in the previous cases, is reported in Table 5.11.1 since BSC#STRUGGLE is positive and statistically significant in the second specification. This effect indicates a positive complementarity between building societies' loans and the growth of cooperative firms, and in particular worker cooperatives. The positive sign of this complementarity comes as an addition

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Table 5.11.1.1: UK Growth Interaction Model – Case 3

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0788408	0.280	-	-	0.0010053	0.219	-	-
BSC#STRUGGLE	0.0018891	0.444	-	-	0.0025466	0.083	-	-
LOCAL	-76.86511	0.029	-73.68193	0.013	-58.02988	0.097	-73.68193	0.008
LOCAL#STRUGGLE	-0.8090783	0.960	29.63788	0.103	10.33691	0.028	29.63788	0.001
SHARE_G	0.1478558	0.310	-	-	-	-	-	-
SHARE_G#STRUGGLE	-0.2091124	0.210	-	-	-	-	-	-
UNION	-0.0001119	0.910	-	-	-	-	-	-
UNION#STRUGGLE	-0.0002575	0.178	-	-	-	-	-	-
STRUGGLE	8.24136	0.901	-83.90497	0.185	-103.9468	0.070	-83.90497	0.001
(CONTROL)								
AGE	-0.1691651	0.237	-0.3979854	0.077	-	-	-0.3979854	0.001
ASSETS	-3.92e-06	0.765	-	-	-	-	-	-
LEV	-0.0833816	0.077	-	-	-	-	-	-
LIQ	2.207043	0.489	-	-	-	-	-	-
POP	1285.562	0.732	-	-	-	-	-	-
PROFIT	-0.0975692	0.762	-0.7260122	0.063	-0.7404074	0.152	-0.7260122	0.097
REG_INC	-0.0010643	0.341	-0.0006798	0.099	-0.0007341	0.215	-0.0006798	0.047
SHARE_F	-31.39249	0.378	-	-	-1.233403	0.085	-	-
(CATEGORICAL)								
INDUSTRY								
- Agriculture	-	-	-	-	-	-	-	-
- Arts and Culture	-40.08613	0.290	-30.70568	0.495	-35.56021	0.000	-30.70568	0.124
- Digital, Media, and Communication	51.10679	0.275	-25.55336	0.527	-32.35335	0.016	-25.55336	0.281
- Education	43.69749	0.191	9.95605	0.723	8.806563	0.190	9.95605	0.266
- Energy and Environment	50.40104	0.233	-4.57044	0.903	-9.049629	0.011	-4.57044	0.798
- Finance	-	-	-	-	-	-	-	-
- Food service, Accommodation, and Pubs	-	-	-24.04471	0.645	-50.8772	0.009	-24.04471	0.250
- Health and Social Care	-176.4655	0.178	17.49533	0.684	16.9529	0.089	17.49533	0.173
- Housing	-	-	21.7666	0.675	18.42937	0.090	21.7666	0.064
- Manufacturing	27.78679	0.372	-11.45563	0.767	-12.28995	0.005	-11.45563	0.299
- Membership associations, Social Clubs, etc.	-	-	-66.22412	0.189	-67.81552	0.023	-66.22412	0.014
- Other	7.844913	0.825	-37.45823	0.249	-38.67386	0.072	-37.45823	0.014
- Professional and Legal Services	35.94502	0.370	-4.147806	0.900	-9.957098	0.281	-4.147806	0.763
- Retail	18.2875	0.592	31.18524	0.365	21.5285	0.052	31.18524	0.007
- Sport and Recreation	-12.06646	0.794	39.13602	0.302	37.40712	0.008	39.13602	0.025
- Transport	-2.629016	0.970	-60.44824	0.166	-52.10739	0.123	-60.44824	0.001

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

Table 5.11.1.2: UK Growth Interaction Model – Case 3

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
LEGAL FORM								
- **Charitable organization**	-	-	-	-	-	-	-	-
- **Guarantee**	-92.63188	*0.297*	-52.79663	*0.128*	-50.43837	*0.013*	-52.79663	*0.014*
- **Industrial/Provident**	-	-	-	-	-	-	-	-
- **Limited Liability Partnership**	-108.5117	*0.331*	72.45653	*0.187*	83.97682	*0.041*	72.45653	*0.153*
- **Private Limited**	-66.5161	*0.366*	-46.85737	*0.157*	-53.98126	*0.046*	-46.85737	*0.013*
- **Public, Not Quoted**	-	-	-37.14516	*0.475*	-62.67201	*0.036*	-37.14516	*0.022*
- **Unlimited**	-	-	-	-	-	-	-	-
REGION								
- **East Midlands**	-	-	-	-	-	-	-	-
- **East of England**	-152.5227	*0.666*	9.585065	*0.715*	15.23817	*0.421*	9.585065	*0.581*
- **Jersey**	-	-	-	-	-	-	-	-
- **London**	2.993132	*0.997*	218.2362	*0.077*	235.0328	*0.196*	218.2362	*0.067*
- **North East**	404.825	*0.629*	-43.2889	*0.230*	-44.67672	*0.153*	-43.2889	*0.136*
- **North West**	-201.3859	*0.776*	67.92881	*0.107*	75.07237	*0.146*	67.92881	*0.004*
- **Northern Ireland**	-	-	-	-	-	-	-	-
- **Scotland**	0.9291415	*0.998*	50.81128	*0.035*	55.44007	*0.185*	50.81128	*0.020*
- **South East**	-294.0448	*0.748*	80.77238	*0.166*	91.25556	*0.241*	80.77238	*0.154*
- **South West**	-8.693097	*0.968*	55.2591	*0.026*	58.07654	*0.144*	55.2591	*0.009*
- **Wales**	143.1123	*0.814*	-21.48997	*0.215*	-18.39867	*0.301*	-21.48997	*0.277*
- **West Midlands**	-112.6766	*0.774*	-11.48236	*0.682*	-6.823088	*0.341*	-11.48236	*0.540*
- **Yorkshire and The Humber**	-107.0211	*0.654*	36.91954	*0.094*	41.80764	*0.103*	36.91954	*0.078*
CONSTANT	-10020.93	*0.703*	320.0668	*0.023*	215.4011	*0.160*	320.0668	*0.001*
LM Test	1.0000		1.0000		1.0000		1.0000	
R-Squared	0.3564		0.1639		0.1617		0.1639	
F Test (Test_Parm)	. (0.0000)		0.0043 (0.0043)		. (0.0000)		. (0.0000)	
Endogeneity Tests – Durbin	0.9785		1.0000		0.6581		1.0000	
Endogeneity Tests - Wu-Hausman	0.9985		1.0000		0.7442		1.0000	
Observations	135		377		371		377	

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

to the complementarity observed earlier in the discussion of the effect of local financial development, strengthening in this way the hypothesis of this research that proposes that the growth of struggling cooperatives depends more on external financial arrangements compared to the growth of successful cooperatives. Finally, the coefficient of STRUGGLE is negative and statistically significant in the second and third specifications, supporting the negative effect that the worker cooperative form has on the growth of the cooperative firm observed in the previous case.

The coefficients of REG_INC, PROFIT, and AGE are negative and statistically significant in the first and third specifications, in line with what was observed in the previous cases. The test for the fitness of the parameters when clustering required the inclusion of some variables whose coefficients are statistically insignificant. When clustering for ownership classification, REG_INC and PROFIT are included even though they are not statistically significant in order for the model to be fitted properly and meet the F-test criteria. The coefficient of SHARE_F is negative and statistically significant when clustering for ownership classification, again in line with the behaviour of this variable in the second specification of the second case. REGION has higher statistical significance levels in the first and second specifications, while LEGAL and INDUSTRY have higher statistical significance levels in the second specification. In Table 5.11.1, the industries that are negative and statistically significant are: "Arts and Culture", "Digital, Media, and Communication", "Energy and Environment", "Food service, Accommodation, and Pubs", "Manufacturing", "Membership Associations, Social Clubs etc.", and "Other". Positive and statistically significant are instead the effects of "Health and Social Care", "Housing", "Retail", and "Sport and Recreation". Regarding LEGAL, the effects of all the categories considered are negative and statistically significant, apart from the effect of "Limited Liability Partnership" which is positive and statistically significant. The regional categorical

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variable shows the effects of "London", "North West", "Scotland', "South West", and "Yorkshire and The Humber" to be positive and statistically significant.

Table 5.11.2: UK Growth Marginal Effects Model – Case 3

	dy/dx	Std. Err.	P>z
Robust LOCAL (1) (LOCAL_ME)	-44.04406	22.67015	*0.052*
Cluster Own LOCAL (1) (LOCAL_ME)	-47.69297	9.361795	*0.000*
Cluster Own BSC (1) (BSC_ME)	0.0035519	0.0000254	*0.000*
Cluster Industry LOCAL (1) (LOCAL_ME)	-44.04406	24.20047	*0.069*

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

When looking at the marginal effects of this case in Table 5.11.2, what can be observed is that for all the variables presenting a complementarity in Table 5.11.1, statistically significant marginal effects are achieved. In the case of LOCAL_ME, the marginal effects are negative and statistically significant in all the specifications, following the behaviour of the main effect of LOCAL when STRUGGLE takes the value 0. Interestingly, in the case of BSC_ME, a positive and statistically significant marginal effect is observed when clustering for ownership classification, which proposes a sustaining and additionally positive tendency of worker cooperatives to depend on building societies' loans for their growth. In this case, the statistically insignificant main BSC effect is overpassed by the interaction effect of worker cooperatives and provides in this way a statistically significant positive relationship in the end. This results presents building societies' loans as a significantly positive contribution to the growth of worker cooperatives.

The fourth and final case that this research looks at regarding the UK growth models, is the one which compares the performance of agricultural enterprise cooperatives against worker cooperatives and where for all three specifications, the LM test was statistically insignificant, revealing pooled OLS as the most appropriate model for the data of this case. In this case, SHARE_G is not reported because of the statistical insignificance of the

Table 5.12.1.1: UK Growth Interaction Model – Case 4

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BSC	0.0973487	0.102	-	-	0.0001066	0.785	-	-
BSC#STRUGGLE	0.0021386	0.302	-	-	-0.0004556	0.245	-	-
LOCAL	-43.5453	0.120	-50.78824	0.022	-30.37593	0.088	-44.40864	0.169
LOCAL#STRUGGLE	-12.34179	0.450	23.43709	0.149	16.50914	0.034	27.49453	0.074
SHARE_G	-0.1091508	0.835	-	-	-	-	-	-
SHARE_G#STRUGGLE	0.1036021	0.842	-	-	-	-	-	-
UNION	-0.0000311	0.967	-	-	-0.0018958	0.054	-	-
UNION#STRUGGLE	0.0001726	0.389	-	-	-0.0001375	0.065	-	-
STRUGGLE	-32.55513	0.662	-66.69339	0.183	-31.91904	0.040	-71.09977	0.055
(CONTROL)								
AGE	-0.4082735	0.246	-	-	-	-	-0.3685959	0.048
ASSETS	0.0000145	0.935	-	-	-	-	-	-
LEV	-0.1037767	0.021	-	-	-	-	-	-
LIQ	2.114791	0.563	-	-	-	-	-	-
POP	4431.397	0.118	3053.277	0.087	-	-	-	-
PROFIT	-0.1908764	0.464	-0.7892712	0.057	-0.7677915	0.051	-0.7923658	0.034
REG_INC	-0.0013836	0.128	-0.0015437	0.012	-	-	-	-
SHARE_F	-46.90845	0.073	-	-	-1.705703	0.065	-	-
(CATEGORICAL)								
INDUSTRY								
- Agriculture	-	-	-	-	-	-	-	-
- Arts and Culture	-13.69935	0.624	-40.68005	0.307	-43.4466	0.027	-34.10522	0.016
- Digital, Media, and Communication	2.723198	0.954	-34.26971	0.374	-37.82995	0.040	-27.74742	0.165
- Education	32.43688	0.322	12.47277	0.642	8.152774	0.058	11.75289	0.182
- Energy and Environment	13.78334	0.753	-2.382698	0.946	-4.571328	0.561	1.932724	0.868
- Finance	-	-	-	-	-	-	-	-
- Food service, Accommodation, and Pubs	-	-	-27.06715	0.584	-55.23684	0.039	-27.09989	0.103
- Health and Social Care	-37.99447	0.308	23.05791	0.485	17.2479	0.128	16.69737	0.069
- Housing			18.44474	0.717	14.92819	0.122	23.08146	0.013
- Manufacturing	-0.5782664	0.985	-3.940685	0.906	-7.062971	0.077	-11.26034	0.206
- Membership Associations, Social Clubs etc.	-	-	-64.08365	0.191	-68.7686	0.041	-66.17949	0.013
- Other	-30.86667	0.304	-38.01635	0.198	-34.37547	0.065	-37.77862	0.001
- Professional and Legal services	-0.2883737	0.994	-4.339258	0.887	-15.17041	0.066	-5.251868	0.722
- Retail	24.24182	0.487	27.34881	0.419	25.10246	0.013	31.76774	0.005
- Sport and Recreation	-0.1197348	0.997	41.47133	0.219	38.32313	0.022	43.05824	0.005
- Transport	-	-	-	-	-	-	-	-

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

Table 5.12.1.2: UK Growth Interaction Model – Case 4

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
LEGAL FORM								
- Charitable organization	-	-	-	-	-	-	-	-
- Guarantee	-1.054563	*0.960*	-34.24989	*0.206*	-29.44796	*0.005*	-35.43703	*0.043*
- Industrial/Provident	2.873352	*0.969*	-79.37331	*0.085*	-95.35057	*0.035*	-67.93958	*0.012*
- Limited Liability Partnership	-23.80761	*0.616*	98.60736	*0.094*	108.4406	*0.020*	88.8182	*0.089*
- Private Limited	0.1260572	*0.996*	-44.51662	*0.163*	-37.50731	*0.015*	-35.99122	*0.033*
- Public Not Quoted	-	-	-	-	-	-	-	-
- Unlimited	-	-	-	-	-	-	-	-
REGION								
- East Midlands	-	-	-	-	-	-	-	-
- East of England	-418.2644	*0.139*	-284.7973	*0.131*	-17.98804	*0.385*	-1.69598	*0.867*
- Jersey	-	-	-	-	-	-	-	-
- London	-709.6012	*0.217*	-363.1943	*0.336*	50.64092	*0.027*	19.11291	*0.514*
- North East	1046.5	*0.119*	673.8707	*0.110*	-17.51087	*0.338*	-5.72883	*0.344*
- North West	-754.8035	*0.163*	-459.4023	*0.120*	165.4182	*0.024*	30.87722	*0.120*
- Northern Ireland	1727.27	*0.073*	1170.883	*0.093*	534.6137	*0.046*	26.45864	*0.063*
- Scotland	-221.2767	*0.388*	-117.3352	*0.245*	319.9102	*0.043*	31.28437	*0.182*
- South East	-1043.977	*0.136*	-639.8888	*0.149*	0.8845175	*0.955*	3.752695	*0.812*
- South West	-211.5361	*0.222*	-135.1429	*0.232*	11.06771	*0.202*	29.98978	*0.141*
- Wales	745.5289	*0.102*	482.0804	*0.100*	4.160613	*0.520*	8.064948	*0.643*
- West Midlands	-351.7652	*0.166*	-239.9562	*0.121*	45.73179	*0.062*	2.223477	*0.859*
- Yorkshire and The Humber	-256.5019	*0.178*	-143.2226	*0.167*	70.61177	*0.036*	31.4585	*0.145*
CONSTANT	-31471.35	*0.115*	-19998.61	*0.090*	129.649	*0.115*	160.4221	*0.088*
LM Test	1.0000		1.0000		1.0000		1.0000	
R-Squared	0.3518		0.1612		0.1684		0.1571	
F Test (Test_Parm)	. (0.0000)		0.0377		. (0.0456)		. (0.0000)	
Endogeneity Tests – Durbin	0.9923		0.5805		0.0605		0.2132	
Endogeneity Tests - Wu-Hausman	0.9995		0.6558		0.1055		0.2642	
Observations	145		415		405		415	

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

coefficients of SHARE_G, SHARE_G#STRUGGLE, and SHARE_ G_ME in all three specifications. The variable BSC is included even though it is statistically insignificant because it is required for the model to meet the fitness criteria of the F-test.

In Table 5.12.1, the complementarities observed are related to the effects of LOCAL and UNION. The effect of LOCAL is negative and statistically significant for the first and second specification, while the effect of UNION is negative and statistically significant only in the second specification. This negative effect shows that there is a negative relationship between credit unions' loans and the growth of non-worker cooperatives. The effect of LOCAL on the growth of cooperative firms presents a positive complementarity with worker cooperatives when clustering for ownership classification and industry, while the effect of UNION on the growth of cooperative firms presents a negative complementarity with worker cooperatives when clustering for ownership classification and industry. These two effects can be seen from the negative and statistically significant coefficient of LOCAL#STRUGGLE and the positive and statistically significant coefficient of UNION#STRUGGLE. The positive significance of LOCAL#STRUGGLE supports the idea of the positive complementarity developed in the previous cases and strengthens its validity, since this positive complementarity is observed in all the UK cases that this research examines. The negative complementarity of UNION goes against the a priori expectations of this research, which considers credit unions an external financial arrangement and, as a result, a positive complementarity would have been expected. The coefficient of STRUGGLE is negative and statistically significant in the second and third specifications; a result supporting the idea observed in the previous cases that worker cooperatives fall short in growth compared to the other cooperative firms.

The coefficient of PROFIT is negative and statistically significant for all the specifications, while the coefficient of SHARE_F is negative and statistically significant

only in the second specification. The coefficient of REG_INC is negative and statistically significant only in the first specification, while the coefficient of AGE is negative and statistically significant only in the third specification. All estimates for the control variables in Table 5.12.1 are aligned with what was observed in the previous cases, providing in this way robust evidence on the behaviour of these variables and the results of these models. All the categorical variables have stronger statistical significance when clustering for ownership classification. Table 5.12.1 shows that INDUSTRY is negative and statistically significant for "Arts and Culture", "Digital, Media, and Communication", "Food Service, Accommodation, and Pubs", "Manufacturing", "Membership associations, Social Clubs, etc.", "Other", and "Professional and Legal Services", while it is positive and statistically significant for "Education", "Housing", "Retail", and "Sport and Recreation". When looking at LEGAL, the same effects observed in Table 5.11.1. Except for the effect of "Limited Liability Partnership" which is positive and statistically significant the rest of the effects are presented negative and statistically significant. Finally, for REGION, "London", "North West", "Northern Ireland", "Scotland', "West Midlands", and "Yorkshire and The Humber" are positive and statistically significant.

Table 5.12.2: UK Growth Model Marginal Effects – Case 4

	dy/dx	Std. Err.	P>z
Robust LOCAL (1) (LOCAL_ME)	-27.35115	17.11339	*0.110*
Cluster Own LOCAL (1) (LOCAL_ME)	-13.86679	3.33508	*0.000*
Cluster Own BSC (1) (BSC_ME)	-0.000349	0.0004876	*0.474*
Cluster Own UNION (1) (UNION_ME)	-0.0020334	0.000174	*0.000*
Cluster Industry LOCAL (1) (LOCAL_ME)	-16.91411	22.11802	*0.444*

For description of the variables see Table 4.3; For explanations of the Table see introduction of Chapter 5

Finally, in Table 5.12.2, LOCAL_ME and UNION_ME are negative and statistically significant when clustering for ownership classification. In the case of LOCAL_ME the main effect of LOCAL is observed once again as sufficiently strong to maintain its negative sign. In the case of UNION_ME, both the main and interaction effects are negative, and

they result in a negative UNION_ME. Thus, a negative relationship between credit unions' loans and the growth of worker cooperatives is observed.

5.2.2 France

In this section, the results for the three French cases are presented. The first case presented in Tables 5.13.1 and 5.13.2 compares the performance of non-SCOPs and SCOPs cooperatives. The dummy variable STRUGGLE is given the value 1 for SCOPs and 0 for non-SCOPs observations. In Tables 5.14.1-5.14.2 and 5.15.1-5.15.2 the results of the separate cases of agricultural and retailer cooperatives are compared to SCOPs respectively. Again, the dummy variable STRUGGLE is given the value 1 for SCOPs and the value 0 for agricultural and retailer cooperatives, depending on the case under analysis. The only variable that is missing from all three specifications is POP, since it did not present any statistically significant result in any specification. For all the specifications in the French growth models, pooled OLS was used because the LM tests were presented in every case as statistically insignificant.

Table 5.13.1 presents the results of the case where SCOPs performance is compared to the performance of all the other cooperatives included in the French sample. SHARE_G and BANKS as well as their interaction terms with STRUGGLE and their marginal effects have statistically insignificant effects and for this reason are excluded and not presented in this table. The only complementarity observed in this case is between the effect of local financial development on the growth of cooperative firms and SCOPs and only when clustering for industry classification. The sign of this complementarity is positive and can be seen by the positive and statistically significant coefficient of LOCAL#STRUGGLE, while LOCAL is statistically insignificant. These results are in agreement with the hypothesis for positive

complementarities between external financial arrangements and the growth of worker cooperatives. Moreover, this positive complementarity is aligned to what has previously been discussed in the UK growth cases and what has already been suggested in the literature by Gagliardi (2009), indicating a strong case for the existence of these complementarities across several countries. The explanatory variable counting for the cooperative form of worker cooperatives is found to negatively affect the growth of cooperative firms. This result seems to suggest that worker cooperatives lag in economic growth when compared to all the non-worker cooperatives studied and when compared to agricultural cooperatives. Again, the this a result that is observed in the UK growth models as well.

Regarding the control variables, the coefficient of AGE is negative and statistically significant in the robust standard errors specification only, while the coefficient of ASSETS is negative and statistically significant for the first and third specifications. This result supports once again the theoretical literature predictions about younger firms having higher growth rates compared to their older counterparts. The variable proxied by the total assets of the firm, which counts for the effect of the size of the firm on firm's growth, is also found to have a negative effect on firm's growth. This result is aligned to the theoretical expectations that smaller firms tend to display higher growth rates compared to bigger firms (Evans 1987; Beck et al 2005). These results support the theoretical predictions discussed in the literature and presented in the UK growth cases. Finally, the coefficient of LEV is negative and statistically significant for all the three specifications. In this way, Brav's (2009) predictions about non-cooperative firms are supported. The theoretical predictions for the negative effect of the leverage level on firm growth, which were developed in chapter 4, are confirmed. Regarding the categorical variables, INDUSTRY displays the expected

Table 5.13.1.1: French Growth Interaction Model – Case 1

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BANKS	0.0000663	*0.003*	-	-	-	-	-	-
BANKS#STRUGGLE	-3.83e-06	*0.592*	-	-	-	-	-	-
LOCAL	-10.76914	*0.363*	-	-	-	-	-10.69168	*0.641*
LOCAL#STRUGGLE	1.656149	*0.457*	-	-	-	-	13.91532	*0.027*
SHARE_G	-0.0001006	*0.906*	-	-	-	-	-	-
SHARE_G#STRUGGLE	0.0000581	*0.948*	-	-	-	-	-	-
STRUGGLE	-7.310664	*0.670*	-12.89314	*0.017*	-7.693847	*0.040*	-85.83474	*0.016*
(CONTROL)								
AGE	-0.0544951	*0.141*	-0.4296094	*0.001*	-	-	-0.0000625	*0.003*
ASSETS	-0.0000209	*0.032*	-0.0000658	*0.023*	-	-	-	-
LEV	-0.0159718	*0.184*	-0.0649251	*0.006*	-0.0585869	*0.082*	-0.059852	*0.050*
LIQ	-0.0573808	*0.883*	-	-	-	-	-	-
POP	-76.40318	*0.724*	-	-	-	-	-	-
PROFIT	-0.2818874	*0.051*	-	-	-	-	-	-
REG_INC	-0.013962	*0.053*	-	-	-	-	-	-
SHARE_F	0.0315522	*0.695*	-	-	-	-	-	-
(CATEGORICAL)								
INDUSTRY								
- **Accommodation and Food Service Activities**	-	-	-	-	-	-	-	-
- **Administrative and Support Service Activities**	-7.784973	*0.143*	14.54599	*0.452*	16.59386	*0.430*	24.81552	*0.055*
- **Agriculture, Forestry, and Fishing**	-5.382736	*0.469*	20.25276	*0.340*	23.47227	*0.302*	32.02363	*0.047*
- **Arts, Entertainment, and Recreation**	67.24731	*0.282*	75.30757	*0.128*	73.39514	*0.020*	88.81508	*0.000*
- **Construction**	-8.854345	*0.130*	3.909944	*0.712*	0.9376805	*0.927*	5.720869	*0.651*
- **Education**	-9.969292	*0.035*	0.1699321	*0.986*	1.800947	*0.893*	6.113242	*0.596*
- **Financial and Insurance Activities**	-15.62603	*0.159*	-35.75403	*0.010*	-26.40412	*0.015*	-33.87819	*0.002*
- **Human Health and Social Work Activities**	4.628816	*0.666*	291.3999	*0.317*	295.3152	*0.030*	358.2814	*0.000*
- **Information and Communication**	-6.535346	*0.136*	-0.999212	*0.903*	1.933148	*0.780*	4.940705	*0.596*
- **Manufacturing**	-8.134437	*0.072*	2.524379	*0.845*	-0.1576473	*0.989*	2.933855	*0.856*
- **Other Service Activities**	-12.19441	*0.070*	4.988258	*0.684*	5.645005	*0.703*	11.04735	*0.495*
- **Professional, Scientific, and Technical Activities**	-0.0012411	*1.000*	20.26906	*0.081*	22.40023	*0.066*	28.85467	*0.002*
- **Real Estate Activities**	34.01627	*0.267*	33.0698	*0.169*	29.71177	*0.133*	38.2871	*0.023*
- **Transportation and Storage**	-6.351638	*0.223*	-2.311537	*0.854*	-3.778701	*0.810*	-0.0209386	*0.999*
- **Water Supply, Sewerage, Waste Management and Remediation Activities**	-4.777479	*0.394*	0.8038257	*0.953*	3.759306	*0.726*	13.74136	*0.393*
- **Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles**	-3.547792	*0.513*	16.05876	*0.232*	13.80637	*0.323*	16.52389	*0.301*

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

Table 5.13.1.2: French Growth Interaction Model – Case 1

	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
GROWTH	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**
REGION								
- Auvergne-Rhône-Alpes	-	-	-	-	-	-	-	-
- Bourgogne-Franche-Comté	-39.59869	*0.681*	11.03057	*0.025*	5.088266	*0.294*	7.17062	*0.035*
- Bretagne	-22.31966	*0.824*	9.011447	*0.532*	8.628908	*0.472*	10.72737	*0.557*
- Centre-Val de Loire	-39.17663	*0.711*	-6.248854	*0.320*	-7.687047	*0.097*	-6.713547	*0.513*
- Corse	-150.0034	*0.625*	-11.82655	*0.057*	-6.859707	*0.059*	-21.43428	*0.619*
- Grand Est	-33.66955	*0.378*	6.844551	*0.405*	8.261588	*0.045*	10.79162	*0.081*
- Hauts-de-France	-61.22826	*0.162*	21.22878	*0.446*	21.98363	*0.486*	21.28631	*0.564*
- Normandie	-22.34341	*0.790*	69.63157	*0.240*	67.44606	*0.352*	81.08449	*0.287*
- Nouvelle-Aquitaine	-12.67408	*0.701*	5.205081	*0.340*	6.519663	*0.490*	8.68474	*0.227*
- Occitanie	-30.76105	*0.417*	13.17843	*0.092*	11.66712	*0.148*	13.48493	*0.309*
- Pays de la Loire	-32.0686	*0.676*	18.54661	*0.307*	15.60605	*0.111*	2.958298	*0.842*
- Provence-Alpes-Côte d'Azur	-17.62531	*0.690*	5.136478	*0.416*	5.998459	*0.554*	6.567795	*0.414*
- Île-de-France	59.68774	*0.325*	33.67803	*0.189*	30.74205	*0.194*	35.12766	*0.409*
CONSTANT	790.9089	*0.612*	17.7665	*0.172*	5.472789	*0.692*	59.66897	*0.663*
LM Test	0.2238		0.2451		0.2417		0.1781	
R-Squared	0.0077		0.0071		0.0064		0.0080	
F Test (Test_Parm)	0.0000		0.0376		. (0.0002)		. (0.0000)	
Endogeneity Tests – Durbin	1.0000		0.8193		0.8294		0.8290	
Endogeneity Tests - Wu-Hausman	1.0000		0.8200		0.8297		0.8300	
Observations	9447		13328		13350		11646	

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

increase in its significance levels when clustering for industry, while REGION has a few significant levels scattered in the three specifications. More analytically, "Administrative and Support Service Activities", "Agriculture, Forestry, and Fishing", "Arts, Entertainment, and Recreation", "Human Health and Social Work Activities", "Professional, Scientific, and Technical Activities", "Real Estate Activities", and "Transportation and Storage" are shown positive and statistically significant, while "Financial and Insurance Activities" is negative and statistically insignificant. When looking at the REGION variable, "Bourgogne-Franche-Comté", "Grand Est", and "Occitanie" are positive and statistically significant and "Centre-Val de Loire", and "Corse" are negative and statistically significant.

In Table 5.13.2, the marginal effect of LOCAL when STRUGGLE equals 1 shows no statistical significance, meaning that the final effect of LOCAL on the growth of SCOPs is statistically insignificant.

Table 5.13.2: French Growth Model Marginal Effects – Case 1

	dy/dx	Std. Err.	P>z
Cluster Industry LOCAL (1) (LOCAL_ME)	3.223645	19.87118	0.871

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

In the second case, where the performance of SCOPs is compared to the performance of agricultural cooperatives, almost the same trends are observed as those observed in the first case. The variables SHARE_G, BANKS, the interaction terms SHARE_G#STRUGGLE, BANKS#STRUGGLE, and the marginal effects SHARE_G_ME, BANKS_ME are not reported because of statistical insignificance of their coefficients. LOCAL and LOCAL#STRUGGLE behave in the same way as in case one, meaning that the effect of LOCAL is negative but statistically insignificant in the third specification, while LOCAL#STRUGGLE is positive and statistically significant when clustering for industry classification. This last result supports the existence of a positive

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Table 5.14.1.1: French Growth Interaction Model – Case 2

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BANKS	0.0000651	0.004	-	-	-	-	-	-
BANKS#STRUGGLE	-2.34e-06	0.746	-	-	-	-	-	-
LOCAL	-10.90501	0.366	-	-	-	-	-10.20903	0.663
LOCAL#STRUGGLE	2.681529	0.207	-	-	-	-	18.20517	0.005
SHARE_G	-0.0001919	0.825	-	-	-	-	-	-
SHARE_G#STRUGGLE	0.0001514	0.868	-	-	-	-	-	-
STRUGGLE	-15.38227	0.374	-14.06985	0.025	-9.141821	0.018	-111.1424	0.003
(CONTROL)								
AGE	-0.051307	0.177	-0.414575	0.001	-	-		
ASSETS	-0.0000189	0.070	-0.0000627	0.044	-	-	-0.0000644	0.008
LEV	-0.0149417	0.260	-	-	-		-0.0628967	0.057
LIQ	-0.0532333	0.893	-	-	-0.0608172	0.094	-	-
POP	-80.19885	0.719	-	-	-	-	-	-
PROFIT	-0.2958259	0.053	-	-	-	-	-	-
REG_INC	-0.0135132	0.057	0.0645932	0.095	-	-	-	-
SHARE_F	0.0365873	0.664	-	-	-	-	-	-
(CATEGORICAL)								
INDUSTRY								
- Accommodation and Food Service Activities	-	-	-	-	-	-	-	-
- Administrative and Support Service Activities	-6.48121	0.268	31.94645	0.212	20.53358	0.391	30.37886	0.044
- Agriculture, Forestry and Fishing	-4.943396	0.513	35.07367	0.193	23.8575	0.315	33.18636	0.059
- Arts, Entertainment and Recreation	67.62171	0.279	89.11202	0.081	74.17719	0.032	90.06492	0.000
- Construction	-8.218026	0.180	16.15773	0.326	2.281968	0.835	7.804326	0.580
- Education	-9.486372	0.054	12.51622	0.401	3.126004	0.825	8.255924	0.523
- Financial and Insurance Activities	-14.20286	0.183	-10.31372	0.613	-12.5482	0.382	-14.30089	0.478
- Human Health and Social Work Activities	4.927467	0.647	315.9056	0.301	295.3414	0.042	358.6659	0.000
- Information and Communication	-6.030116	0.188	8.021443	0.519	2.722368	0.707	6.432055	0.539
- Manufacturing	-7.61653	0.108	12.7643	0.502	0.601007	0.962	4.302488	0.809
- Other Service Activities	-11.75796	0.093	20.98696	0.301	6.976458	0.659	12.99446	0.464
- Professional, Scientific and Technical Activities	0.6652121	0.890	32.96279	0.033	23.62346	0.076	30.91791	0.004
- Real Estate Activities	34.41805	0.262	50.36297	0.109	30.65081	0.148	39.80971	0.032
- Transportation and Storage	-5.565271	0.308	8.794771	0.625	-2.846357	0.865	1.496811	0.928
- Water Supply, Sewerage, Waste Management and Remediation Activities	-4.153006	0.471	21.45084	0.215	5.265453	0.651	15.98621	0.352
- Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	-2.950663	0.617	24.7253	0.199	15.52921	0.341	18.6804	0.294

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

Table 5.14.1.2: French Growth Interaction Model – Case 2

	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
GROWTH	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**	**Coef.**	**P>t**
REGION								
- **Auvergne-Rhône-Alpes**	-	-	-	-	-	-	-	-
- **Bourgogne-Franche-Comté**	-41.12416	*0.679*	54.94405	*0.051*	4.325241	*0.360*	6.739074	*0.043*
- **Bretagne**	-23.03438	*0.823*	74.02031	*0.074*	8.704863	*0.504*	10.29543	*0.581*
- **Centre-Val de Loire**	-40.99866	*0.707*	10.78581	*0.241*	-8.836546	*0.082*	-7.601422	*0.474*
- **Corse**	-154.7649	*0.624*	86.51361	*0.125*	-7.928879	*0.063*	-19.79542	*0.658*
- **Grand Est**	-33.77868	*0.388*	97.53233	*0.071*	7.443075	*0.060*	10.56073	*0.094*
- **Hauts-de-France**	-60.50691	*0.169*	201.8783	*0.110*	21.41201	*0.516*	23.3064	*0.549*
- **Normandie**	-29.57734	*0.731*	141.9904	*0.084*	68.25128	*0.411*	81.61555	*0.326*
- **Nouvelle-Aquitaine**	-12.58372	*0.711*	55.63289	*0.070*	5.193488	*0.581*	7.649632	*0.265*
- **Occitanie**	-30.65761	*0.430*	108.7303	*0.059*	11.31963	*0.195*	13.77412	*0.311*
- **Pays de la Loire**	-33.71192	*0.671*	74.14542	*0.111*	16.01538	*0.119*	-0.9292621	*0.955*
- **Provence-Alpes-Côte d'Azur**	-18.32297	*0.687*	32.34043	*0.051*	5.554473	*0.608*	6.55172	*0.437*
- **Île-de-France**	60.39326	*0.332*	-193.8357	*0.109*	34.47752	*0.182*	42.70281	*0.373*
CONSTANT	809.9206	*0.613*	-1247.085	*0.100*	5.253579	*0.720*	55.90127	*0.690*
LM Test	0.2691		0.1639		0.2480		0.1841	
R-Squared	0.0076		0.0079		0.0065		0.0081	
F Test (Test_Parm)	0.0000		0.0288		. (0.0015)		. (0.0000)	
Endogeneity Tests - Durbin	1.0000		0.7840		0.8948		0.8562	
Endogeneity Tests - Wu-Hausman	1.0000		0.7848		0.8950		0.8570	
Observations	9216		11726		13024		11365	

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

complementarity between the effect of local financial development on the growth of cooperative firms and SCOPs. The effect of STRUGGLE is observed, again, to be negative and statistically significant again for all three specifications.

Concerning the control variables in Table 5.14.1, the coefficient of AGE is negative and statistically significant in the first specification only. The coefficients of ASSETS are negative and statistically significant in the first and third specification, while the coefficient of REG_INC is positive and statistically significant in the first specification only. The coefficient of LEV follows the results found in case one and presents a negative and statistically significant effect on the growth of cooperative firms when clustering for ownership and industry classification, while LIQ is negative and statistically significant in the second specification. The new significant effects presented in this case are the positive effect of the regional income on the growth of cooperative firms and the negative effect of the liquidity on the growth of cooperative firms. The former result differs from what was found in the UK growth models, where the effect of regional income was negative, showing that cooperative firms are possibly following the theoretical predictions for non-cooperative firms in France. The negative effect of liquidity is in accordance with the theoretical predictions proposed by Oliveira and Fortunato (2006). Again, INDUSTRY is observed to have increased significance levels when clustering for industry whereas REGION, in this case, shows higher significance levels in the first specification. The positive and statistically significant industrial categories are almost the same as those in the first French case, with the only differences being that "Transportation and Storage" and "Financial and Insurance Activities" are statistically insignificant here. REGION is statistically significant here as well as in the first French case and the coefficients for "Bretagne", "Normandie", "Nouvelle-Aquitaine", and "Provence-Alpes-Côte d'Azur" are also positive and statistically significant.

The marginal effect of LOCAL when STRUGGLE takes the value 1 is statistically

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significant and LOCAL for SCOPs' growth becomes statistical insignificant.

Table 5.14.2: French Growth Marginal Effects Model – Case 2

	dy/dx	Std. Err.	P>z
Cluster Industry LOCAL (1) (LOCAL_ME)	7.996147	22.7483	0.725

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

Turning now to the case where the performance of SCOPs is compared to retailer cooperatives, complementarities arise from each of the explanatory variables for at least one specification. Starting with the effects of the internal financial arrangements, which are expressed through shareholders funds' growth, there can be observed a positive relationship between this variable and the growth of non-worker cooperatives, and a negative complementarity between the effect of shareholders funds' growth on the growth of cooperative firms and French worker cooperatives. SHARE_G is observed to have a positive and statistically significant effect when clustering for ownership and industry classification. Moreover, in these two specifications, the coefficient of SHARE_STRUGGLE is negative and statistically significant, suggesting the existence of a negative complementarity between the effect of shareholders' funds growth on the growth of cooperative firms and the SCOPs. This complementarity is in line with the hypothesized, in this research, negative complementarity between internal financial arrangements and the growth of worker cooperatives. This behaviour was identified in the case of the UK as well. Thus, the internal financial arrangements seem to have a negative impact on the growth of worker cooperatives compared to non-worker cooperative firms in both the UK and France.

The second most statistically significant explanatory variable in this case is BANKS. A peculiar result is observed also when looking at cooperatives banks' loans in Table 5.15. This variable presents a positive effect on the growth of non-worker cooperatives, while the complementarity between the effect of cooperatives banks' loans on the growth of the firm

and worker cooperatives is negative. BANKS effect is positive and statistically significant in the first and second specifications, while BANKS#STRUGGLE is negative and statistically significant in all three specifications. This negative complementarity does not agree with the hypothesis of positive complementarities between external financial arrangements and the growth of worker cooperatives. Although this apparent contradiction would decrease the strength of the argument that supports positive complementarities between external financial arrangements and the growth of worker cooperatives in France, the empirical evidence is not clear-cut hence one cannot rule out the above complementarity hypothesis. Looking at LOCAL, its effect is positive and statistically significant only in the third specification. This is the first time that LOCAL is found to be statistically significant in the French growth models, and moreover positive. Although LOCAL was shown to display a positive complementarity in the first and second case, in this case, it is observed as having a negative complementarity. This can be observed by the negative and statistically significant coefficient of LOCAL#STRUGGLE. The explanatory variable counting for worker cooperatives is found to positively impact on cooperatives' growth in Table 5.15, contradicting in this way what has already been observed in the case of the UK, since in the UK all the successful cooperatives were found to have higher growth rates than worker cooperatives.

Regarding the control variables of the third case, the coefficient of ASSETS is negative and statistically significant in all the three specifications. LEV has a negative and statistically significant effect when clustering for ownership classification only; a behaviour that is consistent with the other two cases. LIQ is presenting a negative and statistically significant coefficient only when clustering for ownership classification, adding a statistically significant negative effect in the third case. The coefficient of PROFIT is

Table 5.15.1.1: French Growth Interaction Model – Case 3

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
(EXPLANATORY)								
BANKS	0.0001515	0.002	0.0001158	0.085	0.0000457	0.000	0.000118	0.125
BANKS#STRUGGLE	-0.0000457	0.076	-0.0000422	0.068	-0.0000453	0.000	-0.0000415	0.002
LOCAL	4.481544	0.778	-	-	-	-	3.650197	0.789
LOCAL#STRUGGLE	-12.5226	0.061	-	-	-	-	-11.7774	0.002
SHARE_G	0.1317823	0.284	0.1288304	0.298	0.1259257	0.000	0.1260243	0.000
SHARE_G#STRUGGLE	-0.1320143	0.283	-0.1287117	0.299	-0.1260108	0.000	-0.1260923	0.000
STRUGGLE	135.2835	0.047	64.10485	0.057	67.36789	0.001	125.4078	0.001
(CONTROL)								
AGE	-0.2427921	0.121	-	-	-	-	-	-
ASSETS	-0.0000359	0.166	-0.0000406	0.071	-0.0000407	0.054	-0.0000587	0.000
LEV	-0.0277982	0.184	-	-	-0.0290304	0.029	-	-
LIQ	-3.701146	0.101	-	-	-2.470442	0.060	-2.773011	0.001
POP	-112.1505	0.779	-	-	-	-	-	-
PROFIT	-0.289189	0.218	-0.478518	0.037	-0.2865322	0.029	-	-
REG_INC	-0.0061132	0.733	-	-	-	-	-	-
SHARE_F	0.1233853	0.366	-	-	-	-	-	-
(CATEGORICAL)								
INDUSTRY								
- Accommodation and Food Service Activities	-	-	-	-	-	-	-	-
- Administrative and Support Service Activities	-12.93566	0.054	-7.274014	0.123	-10.57536	0.007	-6.313515	0.107
- Agriculture, Forestry and Fishing	-7.344154	0.518	-6.61574	0.509	-6.323684	0.047	-4.162368	0.571
- Arts, Entertainment and Recreation	65.20808	0.293	58.35828	0.289	63.05065	0.068	59.94689	0.000
- Construction	-13.35882	0.119	-10.57448	0.084	-12.99458	0.006	-8.285012	0.146
- Education	-15.17231	0.013	-7.864473	0.154	-12.32723	0.009	-4.487747	0.336
- Financial and Insurance Activities	6.649393	0.695	-6.229917	0.715	2.205668	0.742	13.57279	0.024
- Human Health and Social Work Activities	-5.449138	0.639	-0.3643092	0.972	-0.0350601	0.961	1.152062	0.820
- Information and Communication	-12.42899	0.046	-4.933451	0.269	-8.118934	0.011	-3.160622	0.238
- Manufacturing	-12.37442	0.070	-7.580333	0.104	-10.86238	0.081	-6.10731	0.069
- Other Service Activities	-17.42667	0.048	-13.49015	0.057	-15.14961	0.233	-9.348858	0.139
- Professional, Scientific and Technical Activities	-4.876815	0.374	0.0969892	0.984	-2.178065	0.257	1.494372	0.517
- Real Estate Activities	42.03224	0.289	48.41253	0.215	41.19761	0.002	44.75408	0.000
- Transportation and Storage	-10.7283	0.120	-7.346502	0.130	-10.94755	0.144	-7.835558	0.001
- Water Supply, Sewerage, Waste Management and Remediation Activities	-12.07477	0.062	-8.286903	0.116	-10.32998	0.011	-5.960988	0.094
- Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles	-10.62516	0.180	-6.41964	0.292	-8.656158	0.036	-5.116105	0.377

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

Table 5.15.1.2: French Growth Interaction Model – Case 3

GROWTH	Initial POLS		Robust POLS		Cluster Own POLS		Cluster Industry POLS	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
REGION								
- Auvergne-Rhône-Alpes	-	-	-	-	-	-	-	-
- Bourgogne-Franche-Comté	-55.78057	*0.758*	-0.9832187	*0.825*	-1.826208	*0.812*	-1.586124	*0.595*
- Bretagne	-12.47044	*0.947*	33.39861	*0.255*	33.99707	*0.149*	33.69131	*0.319*
- Centre-Val de Loire	-47.01183	*0.810*	7.566938	*0.203*	6.471228	*0.196*	6.913001	*0.177*
- Corse	-184.8799	*0.754*	-6.006137	*0.627*	-7.656557	*0.104*	-18.98258	*0.541*
- Grand Est	-22.30979	*0.778*	7.124126	*0.140*	3.659468	*0.288*	4.20816	*0.592*
- Hauts-de-France	-34.46014	*0.728*	3.42168	*0.480*	2.991984	*0.340*	-6.185163	*0.790*
- Normandie	-4.601716	*0.977*	38.84417	*0.066*	40.8314	*0.058*	40.36151	*0.057*
- Nouvelle-Aquitaine	-8.188078	*0.898*	10.34971	*0.117*	11.28444	*0.203*	8.984303	*0.247*
- Occitanie	-22.4074	*0.782*	6.057646	*0.146*	4.814256	*0.057*	2.429773	*0.756*
- Pays de la Loire	-30.57973	*0.830*	6.320136	*0.059*	7.249147	*0.197*	13.51205	*0.242*
- Provence-Alpes-Côte d'Azur	-21.96307	*0.797*	3.839843	*0.341*	3.471523	*0.046*	2.548577	*0.700*
- Île-de-France	42.67963	*0.740*	3.160868	*0.312*	2.5648	*0.446*	-0.7509131	*0.937*
CONSTANT	685.6051	*0.822*	-152.3706	*0.073*	-51.83593	*0.002*	-171.4518	*0.295*
LM Test	0.2554		1.0000		0.4892		1.0000	
R-Squared	0.0163		0.0143		0.0140		0.0141	
F Test (Test_Parm)	. (0.0000)		0.0003		. (0.0434)		. (0.0000)	
Endogeneity Tests - Durbin	1.0000		1.0000		1.0000		1.0000	
Endogeneity Tests - Wu-Hausman	1.0000		1.0000		1.0000		1.0000	
Observations	3463		3634		3463		3620	

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

negative and statistically significant in all the specifications. The behaviour of PROFIT follows that observed in the UK growth case. Finally, REGION has a few significant coefficients spread throughout the specifications, while INDUSTRY shows increased significance levels when clustering for ownership and industry classification. Most of the industries here ("Administrative and Support Service Activities", "Agriculture, Forestry, and Fishing", "Construction", "Education", "Information and Communication", "Manufacturing", "Other Service Activities", "Transportation and Storage", "Water Supply, Sewerage, Waste Management and Remediation Activities", "Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles") have negative and statistically significant coefficients, while only "Arts, Entertainment and Recreation", "Financial and Insurance Activities", and "Real Estate Activities" are positive and statistically significant. In the case of REGION, the opposite trend can be observed, where all the statistically significant regions ("Normandie", "Occitanie", "Pays de la Loire", "Provence-Alpes-Côte d'Azur") have positive estimated coefficients.

Table 5.15.2: French Growth Model Marginal Effects – Case 3

	dy/dx	Std. Err.	P>z
Robust BANKS (1) (BANKS_ME)	0.0000736	0.0000631	0.244
Robust SHARE_G (1) (SHARE_G_ME)	0.0001187	0.0003506	0.735
Cluster Own SHARE_G (1) (SHARE_G_ME)	-0.0000851	0.0002138	0.691
Cluster Own BANKS (1) (BANKS_ME)	3.45e-07	1.67e-06	0.836
Cluster Industry SHARE_G (1) (SHARE_G_ME)	-0.0000679	0.0004058	0.867
Cluster Industry LOCAL (1) (LOCAL_ME)	-8.127206	14.2811	0.569
Cluster Industry BANKS (1) (BANKS_ME)	0.0000765	0.0000723	0.290

For description of the variables see Table 4.4; For explanations of the Table see introduction of Chapter 5

When looking at Table 5.15.2, the marginal effects of the explanatory variables presented in the Tables are observed to be statistically insignificant in all cases where STRUGGLE is equal to 1. This result simply means that although complementarities exist (negative and positive), they do not cause the cumulative effect of the variables to be

significant for SCOPs. As a result, these results sum up to statistically insignificant coefficients for BANKS, LOCAL, and SHARE_G for SCOPs' growth.

5.3 Results & Hypotheses Synthesis

Having presented the results which were extracted through the analysis of the entry and growth models, this section moves towards the incorporation of these results into a discussion that will juxtapose the outcomes of the econometric analysis of this research with the hypotheses of this research. Table 5.16 summarises the key findings regarding the explanatory variables of entry models reported in the previous sections. In a similar fashion Table 5.17 summarises the empirical evidence emerging from the growth models estimated for the UK and France giving focus to the core explanatory variables.

Table 5.16: Entry Models Effects[14]

Variables/Tables	5.1 UK Case 1	5.2 UK Case 2	5.3 UK Case 3	5.4 UK Case 4	5.5 France Case 1	5.6 France Case 2	5.7 UK-for-France Case 1	5.8 UK-for-France Case 2
(EXPLANATORY)								
BSC/BANKS	-	-	Positive	-	-	Positive	-	Positive
BSC#STRUGGLE	-	-	-	-	-	-	-	-
BSC_ME	-	-	Positive	-	-	-	-	-
LOCAL	Positive	Positive	Negative /Positive	Positive	Negative	-	Positive	-
LOCAL#STRUGGLE	Negative	Negative	Negative	Negative	-	-	-	-
LOCAL_ME	Negative	Negative	Negative	Negative	-	-	-	-
UNION	Positive	-	-	-	-	-	-	-
UNION#STRUGGLE	Positive	Positive	Positive/ Negative	Positive	-	-	-	-
UNION_ME	Positive	-	-	-	-	-	-	-
STRUGGLE	Positive	Positive	Positive	Positive	-	-	-	-

For description of the variables see Table 4.1 and 4.2; For explanations of the Table see introduction of Chapter 5

[14] Case 1 UK: Non-worker cooperatives entry compared to worker cooperatives entry.
 Case 2 UK: Consumer retail cooperatives entry compared to worker cooperatives entry.
 Case 3 UK: Employee trusts entry compared to worker cooperatives entry.
 Case 4 UK: Enterprise agriculture cooperatives entry compared to worker cooperatives entry.
 Case 1 France: Enterprise agriculture cooperatives entry.
 Case 2 France: SCOPs entry
 Case 1 UK-for-France: Enterprise agriculture cooperatives entry.
 Case 2 UK-for-France: Worker cooperatives entry.

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Table 5.17: Growth Models Effects[15]

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Variables/Tables	5.9 UK Case 1	5.10 UK Case 2	5.11 UK Case 3	5.12 UK Case 4	5.13 France Case 1	5.14 France Case 2	5.15 France Case 3
(EXPLANATORY)							
BSC/BANKS	-	-	Positive	-	-	-	Positive
BSC/BANKS#STRUGGLE	-	-	Positive	-	-	-	Negative
BSC/BANKS_ME	-	-	Positive	-	-	-	-
LOCAL	Negative	Negative	Negative	Negative	Negative	Negative	Positive
LOCAL#STRUGGLE	Positive	Positive	Positive	Positive	Positive	Positive	Negative
LOCAL_ME	Negative	-	Negative	Negative	-	-	-
SHARE_G	Positive	Positive	-	-	-	-	Positive
SHARE_G#STRUGGLE	Negative	Negative	-	-	-	-	Negative
SHARE_G_ME	-	Positive	-	-	-	-	-
UNION	-	-	-	Negative	-	-	-
UNION#STRUGGLE	-	-	-	Negative	-	-	-
UNION_ME	-	-	-	Negative	-	-	-
STRUGGLE	Negative	Negative	Negative	Negative	Negative	Negative	Positive

<div align="center">

For description of the variables see Table 4.3 and 4.4; For explanations of the Table see introduction of Chapter 5

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Starting with the complementarities observed in the entry models, external financial arrangements were observed to exhibit mixed complementarities with the entry of worker cooperatives in the UK and none with the entry of worker cooperatives in France. More specifically, credit unions' loans presented positive complementarities with the entry of worker cooperatives in the UK, supporting the hypothesis of positive complementarities between external financial arrangements and the entry of struggling cooperative firms. In this way, the entry of worker cooperatives seems to be more dependent on the debt capital of credit unions compared to successful cooperatives. Local financial development presented negative complementarities with the entry of worker cooperatives in the UK, contradicting the latter hypothesis, and suggesting that worker cooperatives, during their entry process, are less dependent on debt capital provided by local banking compared to successful cooperatives.

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[15] Case 1 UK: Non-worker cooperatives growth compared to worker cooperatives growth.
Case 2 UK: Consumer retail cooperatives growth compared to worker cooperatives growth.
Case 3 UK: Employee trusts growth compared to worker cooperatives growth.
Case 4 UK: Enterprise agriculture cooperatives growth compared to worker cooperatives growth.
Case 1 France: Non-worker cooperatives growth compared to SCOPs growth.
Case 2 France: Enterprise agriculture cooperatives growth compared to SCOPs growth.
Case 3 France: Retailer cooperatives growth compared to SCOPs growth.

Regarding the complementarities between internal financial arrangements and the growth of worker cooperatives, shareholders' funds growth was observed to exhibit negative complementarities with the growth of both UK and French worker cooperatives, confirming the hypothesis of negative complementarities between internal financial arrangements and the growth of struggling cooperative firms. This complementarity seems to indicate that the growth of worker cooperatives is less dependent on equity capital compared to the growth of successful cooperatives.

The behaviour of external financial arrangements shows several differentiations compared to internal financial arrangements when it comes to their effects on the growth of UK cooperative firms. External financial arrangements presented mixed results regarding their complementarities with the growth of worker cooperatives in the UK and France. However, the majority of these results were in agreement with the hypothesis made in this research that external financial arrangements exhibit positive complementarities with the growth of struggling cooperative firms, meaning that the growth of worker cooperatives is more dependent on debt capital provided by specific external financial arrangements compared to the growth of successful cooperative firms. More specifically, building societies' loans presented positive complementarities with the growth of UK worker cooperatives. Positive complementarities were observed, as well, between local financial development and the growth of worker cooperatives in all the case of the UK and France, except from the case of the comparison between retailer cooperatives and SCOPs in France, in which negative complementarities were identified between local financial development and the growth of SCOPs. In the case where the growth of retailer cooperatives in France was compared to the growth of SCOPs, a negative complementarity prevailed between cooperative banks' loans and the growth of SCOPs. Finally, credit unions' loans presented a negative complementarity with the growth of UK worker cooperatives only in the case

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where the agricultural cooperatives were compared to worker cooperatives. Despite the limited strength of the results related to both internal and external financial arrangements in the French case, it can be observed that the complementarities in the French and UK growth models tend to be similar in two out of the three models.

Considering the discussion of both the effects of internal and external financial arrangements on the growth models in the UK, the main complementarities observed between internal financial arrangements and the growth of worker cooperatives are negative while in the cases of external financial arrangements, mostly positive complementarities arise. These opposite complementarities are in line with the hypotheses made earlier in this research which suggest that external financial arrangements favour worker cooperatives when it comes to raising capital, as opposed to internal financial arrangements. Thus, worker cooperatives as a cooperative form struggles when it comes to raising internal funds (equity capital), and, as a result, it is more dependent on external supportive financial arrangements (debt capital) in both France and the UK, as hypothesized by this research.

6 Discussion

Having extracted and presented the results of this research, Chapter 6 brings together pieces of the previous chapters in order to present and explain the contributions to knowledge of this thesis and propose new research pathways. First, the problematics that arise in the literature regarding cooperative firms are summarized and, in addition, the "successful-struggling" categorization for cooperative firms is used to connect the existing debate in the literature with the working hypotheses advanced in this research. Second, the findings emerging from the present study are explained and connected to the existent debate about the access of cooperative firms to capital sources. Finally, all this information is brought together in order to move towards a synthesis of the aforementioned analysis. In this way, new ways for understanding the existent debate are suggested. The structure of the rest of the chapter is as follows: Section 6.1 presents the novelties of this research narrative, as well as, the steps followed in order for this narrative to end up formulating the hypotheses of this research; Section 6.2 explains the finding of this research, relates these findings to the hypotheses and the existent literature, and presents a comparative institutional analysis; finally, Section 6.3 moves towards a synthesis between the findings of this research and the existent literature in order to advance some tentative explanations for the relationship between the performance of cooperative firms and financial institutional arrangements, while at the same time providing new directions for the existent debates.

6.1 The Puzzle

As it was thoroughly discussed in Chapter 2, the main problem identified in the literature regarding the performance of cooperative firms is the underinvestment problem. The first contribution to knowledge of this research is the analytical and extensive presentation of the existent literature relative to the underinvestment problem of cooperative firms. More specifically, issues that cause underinvestment in cooperative firms, according to the theoretical literature, are related to their property rights structure, which tightly connects memberships and shares in the firm. The issues identified by this research are the free-rider problem, the horizon problem, the common property problem, the non-transferability problem, the principal-agent problem, members' risk aversion, and market costs. Although studies show that cooperative firms have managed to become competitive as an organizational form compared to capitalist firms (Putterman 1984; Ben-Ner and Jones 1995; Dow 2003), their underinvestment problem has not been overcome. This is because the aforementioned studies focus on the characteristics that have allowed cooperative firms to disregard their financial issues, rather than deal with the property rights issues that cause the underinvestment problem. The present research incorporated recent theories, such as hybridization and institutional complementarity theoretical frameworks, in order to analyse the ways that cooperative firms have found to face the issues that arise from their inflexible property rights structure, which cause the underinvestment problem.

The second contribution of this research is the categorization of cooperative forms into successful and struggling cooperatives. These groups were created based on observations regarding the turnover, size, and levels of survival. Interestingly, this research identified successful cooperative firms as having developed some specific organizational characteristics that differentiate them from struggling cooperative forms. These

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characteristics include increased diversification in the investments of members, increased levels of hierarchy, homogeneity between members, a relatively big pool of potential members, and relatively tradable residual claims. On the other hand, struggling cooperative forms were observed to have low diversification in investments, rare hierarchies, weak homogeneity between members, a limited member pool, and difficultly tradable residual claims. The differentiations in the characteristics of successful and struggling cooperative firms suggest that the former have developed their property right structures in a way that imitates some characteristics of capitalist firms, while the latter have remained closer to the traditional cooperative model. Thus, in general, high hybridization levels were observed in successful cooperatives and low hybridization levels were observed in struggling cooperatives. Having identified the issues that cause the underinvestment problem for cooperative firms in the literature, and having suggested specific differentiations between different cooperative forms, the next step was to connect these pieces in order to present the way in which this research hypothesized whether and how the above differentiations define the access to debt and equity for successful and struggling cooperative firms. In this sense, the focus was on the identification of the differentiations in the choices of capital resources between different cooperative forms.

The underinvestment problem mainly arises due to the difficulty of cooperative firms to raise equity capital. As a result, cooperative firms are increasingly dependent on dept capital to finance their operations. In general, firms that are compelled to finance their operations using debt capital instead of equity capital face specific difficulties that create inefficiencies in their operations. In the case of cooperative firms, the cost of raising debt capital is even higher because of their peculiar property rights structure. This research hypothesized that successful cooperative firms depend on equity capital more than struggling cooperatives in the UK and France. Since struggling cooperatives face difficulties

in raising equity capital and debt capital through mainstream banking, they would be expected to depend more on specialized intermediate financial institutional arrangements for financing their operations. As a result, struggling cooperative firms were hypothesized to depend on specialized debt capital more than successful cooperatives in the UK and France.

6.2 Integrating the Results

In this section, the results of this research are incorporated into a discussion about their relevance in terms of what the existing literature suggests. In other words, this section is focused on presenting the contribution to knowledge, which arise from the results of this research, about the relationship between the performance of different cooperative forms and their different ways of accessing equity and debt capital. Sections 6.2.1 and 6.2.2 will examine how the main findings of this research explain the different ways of accessing capital for successful and struggling cooperative firms. Moreover, a cross-country comparative analysis will take place between the behaviour of successful and struggling cooperative firms in the UK and France. Section 6.2.3 offers a twofold comparative analysis of the results discussed in sections 6.2.1 and 6.2.2. This comparative analysis first compares the institutional complementarities observed in the entry and growth models of each country (section 6.2.3.1). It then compares the institutional complementarities observed in the UK entry and growth models with the corresponding French complementarities (section 6.2.3.2).

6.2.1 Entry Level Complementarities

Starting with local financial development, this external financial arrangement presents a negative complementarity with the entry of worker cooperatives in the UK. This complementarity proposes that for worker cooperatives accessing local financial development finance during their entry process tends to more difficult than for successful cooperative firms. The tendency of worker cooperatives to struggle to raise funds from local bank financing for their establishment, when compared to other cooperative forms, may be due to the low wealth endowments that new members can invest in a worker cooperative and which can be used as collateral in loan applications. This proposition agrees with the findings of Bowles and Gintis (1993) who argue that low levels of initial wealth endowments are one of the difficulties that worker cooperatives face. Further reasoning for this negative complementarity may be connected the higher levels of uncertainty that already govern these struggling cooperative firms compared to the other successful cooperatives. Local financial development may become more important for worker cooperatives after they have been created and have established their position in the market since worker cooperatives are less likely to default on loan repayments at that point of their life cycle. This latter issue is considered by Hansmann (2013) and Conte (1986) as one of the main difficulties that worker cooperatives face, both from an institutional and monetary perspective. Finally, the fact that worker cooperatives tend to have higher levels of creation and dissolution compared to other cooperative forms of interest, combined with the decreasing trend of local financial development in the years of interest, may create this negative complementarity by increasing the distrust in worker cooperatives.

Moving on to the second complementarity that is observed in the UK entry models, credit unions' loans are found to be positively complementary to the entry of worker

cooperatives in most of the cases examined for the UK. The positive complementarity between credit unions' loans and the entry of worker cooperatives may be related to the negative complementarity discussed in the previous paragraph, between local financial development and the creation of worker cooperatives. More specifically, the fact that the mainstream banking system may not appear supportive of financing worker cooperatives, pushes these types of cooperative firms to raise initial external capital through other specifically supportive financial institutions, as has been observed theoretically and empirically in the case of Mondragon (Ben-Ner 1984; Defourney et al. 1985). Another explanation for this complementarity is related to the nature of the data used for these estimations. The fact that the birth counts of worker cooperatives are higher compared to the births of non-worker cooperatives, combined with the continuously increasing credit unions' loans, may be one of the reasons for the presence of this positive complementarity.

Generally, when looking at the effects of external financial arrangements on the entry of worker cooperative firms in the UK, credit unions—which differ from local bank financing in the way they approach cooperative firms—are the most helpful to new worker cooperatives. Local bank financing is recognised as an institutional arrangement whose loan characteristics reduce costs for cooperative firms, while credit unions consider supporting cooperative firms as one of their goals. In the case of an entrant worker cooperative, what ends up being the most helpful tool is the financial support, which is based on the adherence to the legal form itself rather than the financial credibility for a firm of this type. In other words, during the entry process of the firm, financial support for UK worker cooperatives is more a political rather than a financial decision. This is a proposition that can add to the discussion of Maroudas and Rizopoulos (2014), in which worker cooperatives are presented as a cooperative organisational form that acts more as a political missionary organisation rather than as an organisation focused on monetary goals.

In the French entry models, no complementarities were identified when multiplicative models were used. For this reason, a set of regression models were estimated for each type of cooperative firm considered in the analysis in order to study the entry process of French cooperative firms. A positive relationship was found between worker cooperatives and cooperative banks' loans, while a negative relationship emerged between local financial development and agricultural cooperatives. Cooperative banks' loans and local financial development were observed as statistically insignificant for agricultural and worker cooperatives respectively. The positive relationship between cooperative banks' loans and the entry of worker cooperatives can show a tendency for worker cooperatives to be more dependent on cooperative banks, compared to agricultural cooperatives, which probably access finance through regular banks, due to their size. The negative relationship between local financial development and the entry of agricultural cooperatives could be explained by the fact that agricultural cooperatives have mainly reduced or sustained entry levels, while local financial development, even though it could have decreased or remained unchanged for some years has generally increased.

6.2.2 Growth Level Complementarities

Moving on to the complementarities identified for the growth models, the growth of UK worker cooperatives was observed to be less dependent on shareholders' funds growth and credit unions' loans compared to the growth of successful cooperative forms. Furthermore, the growth of UK worker cooperatives was found to be more dependent on local financial development and building societies' loans compared to the growth of successful cooperative forms in the UK. In France, the growth of SCOPs was less dependent on shareholders' funds growth compared to the growth of French successful cooperative forms while, in most cases,

the growth of SCOPs was more dependent on local financial development compared to the growth of French successful cooperative forms.

The negative complementarity between shareholders' funds growth and the growth of UK worker cooperatives could be related to the internal organisation of worker cooperatives, as can be seen in Figure 3.1 (Chapter 3) and, more specifically, in the problematics that are presented in the literature regarding the property rights issues that worker cooperatives face because of the needed homogeneity between old and new members (Hansmann 2013). The negative complementarity between internal financial arrangements and the growth of worker cooperatives in France is in line with what is found for the UK cases. These observations propose a lower dependency of worker cooperatives on equity capital for their growth, compared to successful cooperatives. In order to grow their shareholders' funds, worker cooperatives need to increase the number of their workers as well, while in the case of the other cooperative firms, the increase in members refers to consumers, producers, or employees of firms who do not own the company. Apart from the bigger membership pool that exists in the case of consumers and producers, compared to worker cooperatives, another important factor that defines the difficulty of worker cooperatives to effectively increase their shareholders' funds is the inability of workers to have investment diversification, as discussed extensively in the literature from several points of view (Meade 1972; Jensen and Meckling 1979; Berman and Berman 1989; Dow and Putterman 2000). This is an indication that the issues which have been discussed in the literature as investment obstacles for worker cooperatives remain. Finally, this complementarity may be due to the organisational specificities of worker cooperatives, which do not allow for the utilisation of shareholders funds' growth as efficiently as other cooperative structures do. This is a case that has been discussed in detail in this research since most of the literature on hybridised cooperative forms is focused on non-worker

cooperatives (Cook and Chaddad 2004; Chaddad and Cook 2004). Since worker cooperatives are closer to the traditional cooperative model, they remain inflexible in changing some of their organizational characteristics   and, as a result, they face difficulties in raising equity capital. This inflexibility is much lower in successful cooperative forms and thus makes them keener to raise equity capital.

Regarding the positive complementarities between building societies' loans and local financial development, and the growth of worker cooperatives, this is an observation that proposes an increased dependence of worker cooperatives on specialised debt finance during their growth process, compared to successful cooperatives. Building societies' loans are presented as positively complementary to worker cooperatives' growth only in the UK growth models, while local financial development is presented as positively complementary to the growth of both UK and French worker cooperatives. The theorization about positive complementarities between external financial arrangements and the growth of worker cooperatives is based on the idea that worker cooperatives, because of their specific property rights structure, struggle to raise internal capital compared to other types of cooperative firms. Once again, this can be taken as indirect support for the view that property rights issues affect the investment levels of worker cooperatives. This difficulty in raising internal capital makes worker cooperatives more dependent on external financial arrangements for accessing capital sources. Although building societies do not like to be labelled as financial supporters of cooperative firms, the fact that the majority of their loans are given to SMEs, with preference for long-term sustainable investments, may indicate that these financial intermediaries are a more reliable financial choice for worker cooperatives compared to mainstream banks. Because of their smaller size, worker cooperatives tend to be served through local branches more often, while bigger cooperative firms tend to be served through more centralised capital sources. Moreover, as it has already been discussed, the tendency

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of worker cooperatives to take more advantage of external financial arrangements for meeting their capital needs, compared to other bigger and more successful cooperative firms, is, according to this research, based on the fact that in most cases the addition of equity in worker cooperatives is connected to the addition of a workforce, while in the case of enterprise cooperatives, the equity increase in the company is connected with immediate product increase. Finally, when looking at the declining performance of local financial development in the last few years, the positive complementarity between the effect of this variable on the growth of cooperative firms and worker cooperatives could be interpreted as a tendency of worker cooperatives to have lower growth rates compared to other types of cooperative firms when local financial development is declining. Thus, it appears that worker cooperatives increasingly depend on local financial development.

Against the hypothesis made in this research and in contrast to the other two external financial arrangements, credit unions' loans present a negative complementarity with the growth of worker cooperatives. Although the negative complementarity between credit unions' loans and the growth of worker cooperatives is present only in one specification and in one model, and although the construction of the variable had to be modified for several years[16] resulting in a limitation in the results' validity, there may be an explanation for this result hidden in the concept of long-term lending relationships. In other words, the reason underpinning this behaviour may be the special relationships between credit unions and cooperative firms. Credit unions are the only external financial arrangement analysed in this

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[16] The modification of UNION occurred because of data limitation for the 2016 and 2008-2012 periods. More specifically, for 2016 there is no information available. For 2008-2012, there are observations missing for Northern Ireland. The only year for which a complete UK regional dispersion is available is 2012. The technique used by this research to bypass the aforementioned limitation, was to extract sample weights out of the regional dispersions of 2012 and apply these weights to all the other years.

research that is admittedly devoted to providing financial support to cooperative firms. This long-term and fixed relationship may cause older cooperative firms to have an advantage in accessing credit union's financial sources more easily, since they have created a special relationship with these financial intermediaries over the years (Bodenhom 2003).

The unexpected behaviour of the complementarities of credit unions' loans in the UK is followed by a few unexpected complementarities in one French case. Cooperative banks' loans and local financial development present a negative complementarity to the growth of French worker cooperatives when the performance of worker cooperatives is compared to the performance of retailer cooperatives. Considering the peculiarities observed in the third French case—regarding both the effects of the external financial arrangements and of the dummy variable considered for worker cooperatives—it seems that future research should focus on the investigation of this specific case in order to understand these peculiarities. However, there may be some explanations for these observations. A possible explanation for this behaviour of external financial arrangements may be a potentially continuous financial relationship developed through the years between external financial arrangements and the aforementioned successful cooperative firms. The fact that retailer cooperatives are more established than worker cooperatives, allows them to create long-term relationships with cooperative banks, a relationship that decreases the costs of lending and, as a result, makes it easier for them to access these loans (Bodenhom 2003). These relationships could allow retailer cooperatives to access capital more easily than worker cooperatives. This is an idea that was previously put forward in this research, when looking at the case of credit unions in the UK. The common ground of these two cases is that cooperative banks and credit unions have special relationships with cooperative firms. The second speculation is based on the idea that the focus of cooperative banks does not generally tend to favour cooperative firms in France and cooperative banks act just like any other bank. In this case,

bigger and older companies could potentially have easier access to loans because of their more stable financial performance. In this case, the negative complementarity between the effect of local financial development on the growth of cooperative firms and the worker cooperatives could be explained as well. Although worker cooperatives are more comfortable with appropriating local financial development to promote their growth, the negative prepossession of the mainstream banking system that considers the problematics that arise from their property rights structure, or their limited capital endowments may not allow them to fully exploit the benefits of this external financial arrangement.

6.2.3 Comparative Analysis

Although the hypotheses of this research focus on the interactions between cooperative firms and specific financial arrangements, this research has highlighted the importance of the institutional environments in which cooperative firms operate and interact with other institutional arrangements. The upcoming sections focus on comparisons of the performance of cooperatives within and across the two countries of interest in order for light to be shed on the importance of the institutional environments' characteristics on the differentiations of the entry and growth processes of cooperative firms. Thus, the discussion in the following sub-sections focuses on comparisons of the impacts that the characteristics of the institutional environments of the UK and France have on the complementarities observed in the entry and growth models of these two countries.

6.2.3.1 Within-Country Comparisons

The complementarities observed in the UK entry models between the effects of external financial arrangements on the growth of cooperative firms and worker cooperatives differ from the complementarities observed in the UK growth models. This discrepancy could be explained by the fact that worker cooperatives seem to struggle to raise external capital even more before their creation compared to when they are already operating. A possible cause of this behaviour could be the fact that worker cooperatives, apart from the uncertainty that governs them, have no proof of their trustworthy financial operation. This behaviour is relative to the importance of regional density of other cooperative firms (Arando, Gago, Podivinsky, and Stewart 2012; Kalmi 2013; Arando, Peña, and Verheul 2009), which was observed to positively affect the entry of cooperative firms by decreasing the uncertainty around this type of firm in the region where the cooperatives plan to enter. Worker cooperatives tend to enter regions where cooperative firms are already concentrated because they can exploit the already existing positive externalities of agglomeration. Geographical scarcity of worker cooperatives is considered to increase the costs for their creation through increased costs of accessibility of information about these types of firms, inadequate legislative frameworks, incomplete internal rules of worker cooperatives, and higher capital costs for access to credit (Ben-Ner 1988a).

In the case of France, even though complementarities are weaker—especially in the entry models—there are indications of lower differentiations between worker cooperatives' entry and growth, meaning that worker cooperatives are not treated differently before and after their creation, as in the UK. The more developed legislative framework that exists in France around cooperatives, when compared to that of the UK, could be one of the factors, arising from the institutional environments' characteristics that explains the more stabilised

interactions between external financial arrangements and cooperatives before and after their creation.

6.2.3.2 Cross-Country Comparisons

When considering the cross-country comparisons, a first and general distinction observed shows that the institutional complementarities observed in the UK are more consistent and stronger compared to the complementarities observed in France. This result could be explained by the selection criteria of these two cooperative sectors. As it has already been stated, France is a civil law country with a much stricter and developed legislative framework[17] in regard to cooperative firms in general while in the UK, the legislative framework is much weaker and relatively underdeveloped. The existence of a more developed legislative framework may contribute to a lower level of uncertainty for French worker cooperatives, and in this way provide them easier access to potential outside investors, as well as easier access to finance from the mainstream banking sector (Cracogna et al. 2013). If higher levels of certainty around worker cooperatives increase the ease with which these types of firms access finance, then they would be less dependent on alternative forms of supportive financial arrangements, since they would be keener on utilizing internal financial arrangements. Thus, the positive complementarities between supportive external

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[17] The development of the French legislative framework in regard to cooperative firms refers to the development of legislation specialized for this type of firm. More specifically, in France, there is extended legislation regarding several legal forms of cooperative firms. In addition to the legislation around the specialties of each cooperative legal form, there has been developed legislation that is focused on helping cooperative firms to deal with their underinvestment problem. The greatest examples of this type of legislation is the legislation of the investor-member membership in the SCOPs.

financial arrangements and the performance of worker cooperatives will be expected to diminish, as well as the negative complementarities between internal financial arrangements and the performance of worker cooperatives.

More specifically, when comparing the complementarities between the effects of external financial arrangements on the entry of cooperative firms and worker cooperatives in the UK and France, there are indications that complementarities are more prevalent in the UK. The fact that the complementarities in the UK are presented as negative only, and not at all in the case of France, indicates that French worker cooperatives face the same difficulties as their non-worker counterparts, while in the case of the UK, worker cooperatives struggle more than their non-worker counterparts. However, since there are no complementarities observed in the interaction entry models for France, the comparisons between the complementarities of the entry of French and UK worker cooperatives lack explanatory strength. This lack of explanatory strength holds for the comparison between complementarities of the French worker cooperatives' entry and growth as well.

The comparisons that may have more explanatory strength are those between the non-interaction tables for the French and UK entries (Tables 5.5-5.8). When comparing UK worker cooperatives with French worker cooperatives, it can be observed that the results are relatively similar. The main differences are in the effect of the unemployment rate, which is presented as positive only in the French entry of worker cooperatives, supporting more intensively the anticyclical idea in the case of French worker cooperatives, and the effect of inequality, which is presented as negative in the French entry model of worker cooperatives, supporting a more intense effect of a power struggle in the case of France.

Growth models provide more information for a cross-country comparison. First, when looking at institutional complementarities with regard to the internal financial arrangements in both countries, these are negative. However, in the case of France, this complementarity

is prevalent only in one case. This relationship appears to be relatively stronger in the case of the UK since complementarities are found in two cases in the UK growth models, while only once in the French growth models. This difference may arise from the fact that in France, specific legislation was passed in 1992 that enables investor-members to join worker cooperatives. Through such legislation, worker cooperatives in France can raise equity more easily compared to worker cooperatives of a country where this legislation does not exist. Moreover, shareholders may be more sceptical of joining worker cooperatives in the UK and workers may face more difficulties when deciding to cooperate since legislation is not clear around this legal form. In general, however, the complementarities between internal financial arrangements and worker cooperatives emerging for both countries seem to provide strong support to the argument contending that worker cooperatives have difficulties in accessing internal financial arrangements.

Regarding the complementarities observed between external financial arrangements and worker cooperatives, the findings for the two countries are, broadly speaking, aligned, but they are not as robust as in the case of internal financial arrangements. The weaker complementarities, when looking at the growth models for France, could be based on the reduced levels of uncertainty that may be reflected in easier access to capital through bank loans, or to keener workers' cooperation under the legal form of worker cooperatives. On the other hand, in the UK, workers may be thirstier for external financial arrangements to support them because it is harder for them to access capital, hence the stronger institutional complementarities emerging from the empirical analysis of the UK case.

Altogether, the discussion of the cross-country comparisons speculates that the importance of a developed legislative framework for worker cooperatives in countries where such a framework is relatively weak should not be underestimated. Although the gap between worker cooperative and non-worker cooperative firms is still present in the UK and

France, the more developed French legislative framework relative to cooperative firms could be considered one of the indicators that may have already reduced this gap. More specifically, successful forms of cooperative firms seem to have already proved their viability to potential capital providers through their economic activity, while less successful cooperative forms, which struggle to sustain stable growth, are in need of gaining easier access to external financial arrangements. This has been observed in the analysis of the worker cooperatives of the two countries in Chapter 3, where SCOPs were found to achieve more than ten times the turnover of UK worker cooperatives. Moreover, the fact that worker cooperative firms are closer to the traditional cooperative firm combined with the fact that the French financial environment is suggested to be more supportive to firms with the characteristics of traditional cooperatives, could allow French worker cooperatives to reduce the gap between their performance and the performance of successful cooperative firms.

6.3 Reformulating the Debate

Having discussed the issues presented in the literature regarding the underinvestment problem and the findings and contributions of this research that arise from the Results chapter, this section puts together all of these pieces in order to place the existent discussion around cooperative firms, and the underinvestment problem they face, at a new level of analysis.

The most significant contribution of this research is the empirical identification of the differentiations in the ways that different cooperative forms access equity and debt capital. It is not only the distinction itself between successful and struggling cooperative forms, which was discussed in Section 6.1, that is of great importance but, furthermore, the different finance pathways that these cooperative forms follow. These pathways depend on

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the organizational characteristics of each cooperative form and define their accessibility to different financial arrangements.

Starting with the problem itself, the issues which were raised in the literature regarding the underinvestment problem in cooperative firms are not false and are still present in several cooperative forms. However, this issue does not seem to affect all the types of cooperative forms at the same level. The cooperative forms which present stronger indications of facing underinvestment issues are those whose characteristics are close to those of the traditional cooperative firm. These cooperative forms struggle and are indeed in need of supportive external financial arrangements that will focus on the specific character of the cooperative firm instead on just monetary criteria for their finance. Their persistence on keeping a tight relationship between membership and shares does not allow them to easily raise equity capital. The difficulty in raising equity does not allow these cooperative forms to be financially flexible and, as a result, reduces their efficiency and competitiveness. On the other hand, successful cooperative firms seem to not struggle or face the issues raised in the theoretical literature to a high degree. This is because through hybridization processes, they have adopted characteristics that exist in capitalist firms and allow them to overcome underinvestment issues up to a significant point. This is a proposition of the organizational economics literature which was discussed earlier in this research. By allowing internal organizational changes, cooperative firms allow for the development of internal financial arrangements that are focused on raising equity capital and giving these firms higher financial degrees of freedom.

Cooperative forms which have chosen to follow the efficient way of allowing organizational changes so that they are able to raise equity seem to achieve significant positive results in their performance. Cooperative forms which have chosen to sustain their organizational characteristics closer to their prototype characteristics, do survive because of

the existence of institutional complementarities between them and supportive external financial arrangements, but they struggle in achieving sustainable high performance. This means that both successful and struggling cooperative forms have managed to deal with underinvestment problems, and this is done with them being an institutional complement to internal and external financial arrangements respectively, but the most efficient way has been chosen by successful cooperative forms. In other words, both organizational forms have become a sustainable equilibrium through the years, understanding how multiple equilibria have arisen. However, struggling cooperative forms are achieving lower outcomes through their equilibrium, because they are inflexible in making organizational changes and their available option is the most expensive which is translated into external financial arrangements.

Regarding the importance of the characteristics of the institutional environment in the interactions between cooperative firms and financial arrangements, a more developed legislative framework for cooperatives firms, and more specifically around the organizational form of worker cooperatives, could firstly be one potential steppingstone for struggling cooperative firms to develop internal financial arrangements. The 1992 French legislation that allowed investors to join cooperative firms with special membership rights is a great example of a legislation that allows the development of internal financial arrangements. Secondly, a more developed legislative framework for worker cooperatives could potentially guarantee, up to a point, their financial validity against their capital providers and counteract other transaction costs created because of the peculiar property rights structure of this type of firm.

Considering all the aforementioned findings, the analysis of cooperative firms should not be limited at an aggregate level by considering all the cooperative forms as firms with the same characteristics, but instead focus needs to be placed on each specific cooperative

form separately and to the institutional environments in which they operate. This separation

may correspond to different industrial levels, and patron levels.

7 Conclusion

This thesis started by looking at the literature around cooperative firms in order to identify the issues that have been identified by scholars in relation to the diffusion and performance of these types of firms. Several issues were observed which were mainly related to the property rights structure of cooperative firms and could all be considered as different aspects of underinvestment problem. Although many of these issues persist, several forms of cooperative firms have been successful in making internal organizational rearrangements that allow them to solve their underinvestment issues and succeed in the sectors in which they operate. Such organizational arrangements are related to changes that allow equity to be raised in a more efficient way and are mainly observed in enterprise and consumer cooperatives. However, since these internal rearrangements are not observed in all types of cooperative firms, more focus was placed by this research, on the reasons why some cooperative firms were not eligible for these arrangements and the ways in which they dealt with this issue (Chaddad and Cook 2004; Bijman and Iliopoulos 2014). This systematic review of the theoretical and empirical literature about cooperative firms, which ends up identifying the gaps of the literature, is itself the first contribution to knowledge that the present study has made.

Given this background, this research conducted an in-depth analysis of the UK and French cooperative sectors in order to identify the types of cooperatives that have succeeded in their operation and have established their position in the economic activity of each of those countries, as well as those that have struggled to achieve significant and consistent economic results, facing difficulties in terms of having a stable presence in the UK and

French economies. When looking at the UK cooperative sector, enterprise agricultural cooperatives, consumer retail cooperatives, and employee trusts have been found to represent the successful examples of cooperative firms, while when looking at France, enterprise agricultural cooperatives and enterprise retail cooperatives are the two successful cases. This study also showed that in both these countries, it is the worker cooperatives that struggle the most.

Having identified the successful and struggling cooperative firms, the next analytical step of this research work was to take a closer look at the internal organizational characteristics that distinguish different cooperative forms. In line with the literature, the main differentiations that identified in this study are related to investment diversification, hierarchy structures, members' interests, homogeneity, members' pool, sectorial complementarities, and the tradability of residual claims. More specifically, as the hybridization literature has shown, successful cooperatives are observed to be able to achieve diversified investments, high levels of hierarchies, homogeneity between their members' interests, a sufficiently large members' pool, sectorial complementarities, and tradable residual claims. On the contrary, struggling cooperatives are observed to achieve low or no levels of investment diversifications, hierarchical structures only when they become big, homogeneity in their members' interests only if they sustained a low number of members, a small members' pool, sectorial complementarities only in services, and residual claims that are difficult to trade. The categorization of cooperative firms according to their performance in the UK and France, as well as, the identification of the common organizational characteristics that distinct successful and struggling cooperatives, is the further contribution made by this research. Understanding cooperative firms as a whole does not seem the most appropriate way to analyse their performance. The organizational changes that have or have not occurred in each type of cooperative firms need to be considered when

trying to understand the reasons behind the success or struggle of each cooperative form.

When considering these characteristics, this research hypothesised that there would be differentiations between the interactions of specific financial arrangements and different cooperative forms. Analytically, the hypotheses of this research were: the entry of worker cooperatives exhibits positive complementarities with the external financial arrangements of interest in the UK and France; the growth of worker cooperatives exhibits negative complementarities with the internal financial arrangements of interest in the UK and France; and, the growth of worker cooperatives exhibits positive complementarities with the external financial arrangements of interest in the UK and France. In other words, successful cooperative firms would be keener to utilise equity capital for dealing with the underinvestment problem compared to struggling cooperative firms. On the other hand, struggling cooperative firms would be more reliant on debt capital compared to successful cooperative firms. These hypotheses were tested in both the UK and France and in relation to both the entry and growth of cooperative firms for the 2005-2015 (entry) and 2007-2016 (growth) periods for the UK, and for the 2006-2014 (entry) and 2008-2018 (growth) periods for France. The theoretical framework that underpins the study centres around the concept of institutional complementarities which considers the importance of the context within which cooperative firms perform, by paying attention to the interdependences among the performance of cooperative firms, other institutional arrangements and the characteristics of the institutional environments in which these cooperative firms operate. The approach of institutional complementarities that was used in this research was Aoki's (2001) approach. The fact that Aoki's approach allows for equilibria outcomes to be Pareto-non-optimal and Pareto-non-rankable, allowed this research to study both the positive and negative aspects of the aforementioned interdependencies.

The core findings of the econometric work showed that there are negative

complementarities between the effects of local financial development on the entry of UK cooperative firms and worker cooperatives, supporting that the entry of UK struggling cooperative firms depends less on debt capital provided by this external financial arrangement compared to the entry of UK successful cooperative firms. This complementarity does not support the hypothesised positive complementarities between external financial arrangements and worker cooperatives advanced in this study. Positive and negative marginal effects were identified, respectively, for building societies' loans and local financial development on the entry of UK worker cooperatives, showing that the entry of UK worker cooperatives depends positively on debt capital expressed through building societies' loans and negatively on debt capital expressed through local financial development. Mostly positive, and in accordance with the hypotheses of this research, were observed the complementarities between the effects of credit unions' loans on the entry of UK cooperative firms and worker cooperatives, showing that the entry of struggling cooperative firms depend more on debt capital provided by credit unions compared to the entry of successful cooperative firms. The marginal effects of credit unions' loans on the entry of UK worker cooperatives were mostly insignificant, except from one positive marginal effect in the first case. The dummy variable corresponding to the struggling cooperative firms was always positive in the UK entry models, showing that worker cooperative firms enter the market more frequently than successful cooperative firms. In France, the entry interaction models showed no indication of complementarities. When looking at the weaker analysis of the separable entry models for French cooperatives, it was evident that local financial development is negatively affecting the entry of agricultural cooperatives only, and cooperative banks' loans are positively affecting the entry of worker cooperatives only.

Moving on to the key results for growth models, negative complementarities, which support the hypotheses of this research, emerged between the effect of shareholders' funds growth on the growth of cooperative firms and worker cooperatives in both the UK and France, showing that the growth of struggling cooperative firms depends less on equity capital provided by internal financial arrangements compared to the growth of successful cooperative firms. The marginal effect of shareholders' funds growth was positive only in the second case of the UK growth models in which case, the growth of worker cooperatives prevails to be positively affected by the growth of their shareholders' funds. Regarding the results of the external financial arrangements in the growth models, there were positive complementarities between the effects of building societies' loans and local financial development on the growth of cooperative firms in the UK, proposing that the growth of struggling cooperatives depends more on debt capital provided by these two financial arrangements compared to the growth of successful cooperative firms. Moreover, positive complementarities were seen between local financial development and the growth of worker cooperatives in France for the first and second French cases, while negative complementarities were observed between cooperative banks' loans and local financial development, and the growth of worker cooperatives in the third case of France. These mixed complementarities on the one hand cannot give a clear-cut interpretation for the way that external financial arrangements interdepend with worker cooperatives in France. However, when considering that the negative complementarities prevail only in one out of the three cases presented in this research, the analysis seems to lean towards supporting the hypothesis for positive complementarities between external financial arrangements and the growth of worker cooperatives in France. Furthermore, there were positive marginal effects of building societies' loans on the growth of worker cooperatives and negative marginal effects of local financial development on the growth of worker cooperatives in the UK,

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while no marginal effects were statistically significant in French growth models, showing that only the growth of worker cooperatives in the UK depends positively on building societies' loans and negatively on local financial development. Finally, there were negative complementarities between the effect of credit union loans on the growth of cooperative firms and worker cooperatives in the UK only in the fourth specification, showing that the growth of struggling cooperative firms depends less on debt capital provided by credit unions' loans compared to the growth of successful cooperative firms. The marginal effect of credit unions' loans on the growth of worker cooperatives was negative in this case only, presenting the growth of worker cooperatives to negatively depend on credit unions' loans. The dummy variable corresponding to the struggling cooperative firms was mainly negative throughout the growth models of the UK and France, with only one exception in the third French case. This last observation shows that in most cases struggling cooperative firms exhibit lower growth rates compared to successful cooperative firms.

The main findings that arise from the above results are that worker cooperatives struggle to utilise the benefits of internal financial arrangements when compared to the types of cooperative firms which are considered to be successful in this research. This is a robust result that can be observed in both the UK and France. This result proposes that because of the property rights issues that were presented in the new institutional economics literature, worker cooperatives face difficulties in raising equity capital for supporting their growth, when compared to other successful cooperative forms. This difficulty in accessing equity capital decreases investment levels even further according to the corporate governance literature. As a result, the property rights issues faced by worker cooperatives, are transferred on to the financial environment of these types of firms through their difficulties in accessing equity capital and end up affecting negatively their performance.

When looking at the interactions between worker cooperatives and external financial

arrangements, in the entry process of the UK worker cooperatives, the results in terms of the hypotheses explored are mixed. On the one hand, worker cooperatives seem less able to take advantage of local financial development compared to their successful cooperative counterparts, upon entering the markets. This is perhaps due to the fact that local financial development does not exactly favour cooperative firms, but instead show stronger support for SMEs that have common characteristics with some of these types of cooperatives. As a result, if looking at worker cooperatives, which have high dissolution rates, local banks may be sceptical of supporting new worker cooperatives. On the other hand, there is a greater tendency for worker cooperatives to depend on credit unions' loans for entering the market than successful cooperative firms do. The fact that credit unions have as one of their goals to support worker cooperatives makes it easier for these types of cooperative firms to access loans through this financial channel. In the case of France, the weakness of the results does not allow for strong conclusions to be drawn, however, something that could be mentioned here is the fact that worker cooperatives are shown to be either less negatively or more positively dependent on external financial arrangements during their entry process compared to agricultural cooperatives. The discussion above supports the part of the literature that understands the creation of worker cooperatives as an entrepreneurial decision which is based more on political rather than monetary criteria at its core (Maroudas and Rizopoulos 2014).

In the growth models, worker cooperatives have been found to be more dependent on external financial arrangements compared to successful cooperative firms. More specifically, worker cooperatives seem to use building societies' loans and local financial development better than non-worker cooperatives in most of the cases for both the UK and France. The only exception arises in in one of the models estimated for the French case where worker cooperatives were found to be at a disadvantage in utilising cooperative bank

loans and local financial development compared to retailer cooperatives. Moreover, in the case where enterprise agricultural cooperatives were compared with worker cooperatives, credit unions seemed to be relatively more useful to the former rather than the latter cooperative firms. Again, the results concerning the relationship between external financial arrangements and worker cooperatives are mixed.

The core novelty that arises from the results discussed in this research is related with the conceptualization of the complementarities that exist between different property rights structures that are observed within different cooperative forms, and the financial channels that each of these cooperative forms chose. This selection prevails crucial in defining their performance potentials. The overall underperformance of worker cooperatives, and the respective success of other cooperative forms, are rooted in the formation of their property rights structures. Property rights structures are complementing the less efficient financing (debt capital) in the case of worker cooperatives, while in the case of successful cooperative firms, their property rights structures are complements with more efficient financing options (equity capital). Thus, overall, the underinvestment problem that has been identified in the literature, is still persistent, and it is mainly observed in cooperative firms which are close to the traditional cooperative. The cooperative firms whose organizational characteristics are closer to the traditional cooperatives are worker cooperatives. Interestingly, most of the theoretical literature of new institutional economics considers worker cooperatives in their analysis as the representative cooperative example. In this sense, cooperative firms should not be understood as altogether as a group of firms with the same characteristics. Instead, future research about the performance of cooperative firms should focus on deeper analytical levels that would distinct these types of firms according to their organizational characteristics.

Another finding that corresponds to the cross-country comparative analysis of the models examined by this research is that the complementarities in the case of the UK were stronger compared to the complementarities in France in both entry and growth models. The explanation of this finding may be the fact that a more developed legislative framework around cooperative firms—such as in France—may work as a bridge for decreasing, if not eliminating, the difference in the creation and subsequent performance of successful and struggling cooperative forms. As it has already been discussed in the comparative law literature, the development of the legislative framework around specific types of firms can incentivise shareholders to increase their equity provision in these firms. This can be achieved either by decreasing shareholders' investment risk, or by increasing their future returns. Shareholders' investment risk can be decreased through higher levels of voice in the firms and increased levels of priority claims, whereas the future returns can be increased by better tax allowances. However, this is only one of the characteristics of the institutional environment, meaning that a one-dimensional change in the legislative framework of a country may not provide the desired results.

The limitations of this research are mainly focused on the construction of the datasets used for this empirical analysis. In both the UK and France, the availability of the data was limited most of the times for the growth datasets on the available companies in FAME and DIANE respectively. Furthermore, there was unavailability for the entries of enterprise retailer cooperatives in the publicly available data, and it was not possible to proxy this variable from the data available in DIANE. This peculiarity did not allow for comparisons between the entry of enterprise retailer cooperatives and the entry of worker cooperatives in France, adding in this way even more blur to the case of French enterprise retailer cooperatives. Although the contradictions in the results concerning the relationship between external financial arrangements and worker cooperatives are presented in the models as an

exception rather than the rule, further focus needs to be given to these cases and especially in the case of retailer cooperatives that presents some results that differ from the results of the other successful cooperative forms. A broader and more complete selection of data regarding the cooperative sectors of both the UK and France will allow for a deeper and more detailed analysis. In this way, through more complete data of the cooperatives of interest, future research would be able to explore even further the types and levels of asset specificity of cooperative firms. This limitation which discussed above focuses on the firm-level observations that were used in the datasets. Regarding the construction of the explanatory variables, as already has been mentioned, the construction of the credit unions' loans proxies was made at a regional level through weighted samples. This modification may not allow the proxy to present the holistic picture of the effects of credit unions on cooperative firms. Moreover, limitations regarding the construction of explanatory variables were observed in the entry models and more specifically in the case of internal financial arrangements. The entry models do not contain explanatory variables that represent internal financial arrangements, since shareholders' effects were not able to be proxied at their entry level from the identified datasets. This limitation did not allow this research to extract any information regarding the importance of equity finance during the entry process of cooperative firms. Finally, limitations are observed in the inclusion of internal financial arrangements, other than shareholders' funds. Within the organizational economics literature, shareholders' funds is not the only internal financial arrangement that provides solutions to the underinvestment problem of cooperative firms, but other internal financial arrangements are discussed as well. More specifically, subsidiaries and strategic alliances are presented as some of the available institutional arrangements that prevail in cooperative firms. Considering the limitations around the construction of the explanatory variables, future research should focus on constructing more complete datasets that would be able to

present even better proxies for the institutional arrangements discussed above. Lastly, the implementation of more internal and external financial arrangements in future research will add even further to our understanding about the complementarities between organizational characteristics and financial choices of different cooperative forms.

Regarding the cross-country comparative institutional analysis that is presented in this research, data from other countries, can contribute to a broader understanding regarding the importance of legal frameworks and the hybridization processes that cooperative firms follow within these institutional environments. The analysis of other countries with significantly strong cooperative sectors will provide more evidence and will allow for stronger observations regarding the case examined in this research as well as a broader variation of opinions. As it has been discussed in the literature of comparative law and Varieties of Capitalism, the characteristics of the national legislative frameworks affect the economic performance of firms. For this reason, the legal origins comparative analysis that has occurred in this research should be developed even further and include more information that will arise from different legislative frameworks. Furthermore, as it has already been discussed in the literature of Varieties of Capitalism, the institutional environments of cooperative firms are defined by several institutional arrangements that are related to non-financial spheres as well. Other types of complementarities between the performance of cooperative firms and labor market characteristics, corporate governance practices, dispute resolution mechanisms would be needed to be examined for a more complete understanding of the impact of the context in which cooperative firms operate on their performance. Within the above arrangements, legislations that affect, either directly or indirectly, the performance of cooperative firms may be included as well.

Lastly, three are the main policy implications that arise from this comparative analysis. First, focus needs to be given to the development of specialised external financial

arrangements that will be supportive to worker cooperative firms. Worker cooperatives are observed in this research to be in high need for institutional arrangements that consider the special property rights structure of this type of firms. These external financial arrangements would need to consider more the holistic and social character of worker cooperatives rather than purely looking at monetary financial criteria when deciding their lending criteria. This allows them to keep their cooperative character and at the same time deal with their underinvestment problems. The second policy implication is related to the development of legal framework around cooperative firms. A more developed legal framework around worker cooperatives was observed by this research to allow French worker cooperatives to achieve better performances compared to the UK worker cooperatives which operate within a country with a much less developed legal framework regarding them. The gaps between successful and struggling cooperative forms were observed to be smaller in the case of France where the development of legislation around cooperative firms has allowed for the participation of shareholders in the equity capital of worker cooperatives to be easier. Third, cooperative firms should embrace internal property rights changes that would allow them through hybridization to unlock their potentials. This hybridization process will allow them to access equity capital more easily and, by extension, it will provide them a cheaper financial alternative to debt capital. Generally, countries that would like to promote the development of cooperative firms should focus on creating an institutional environment that would provide these type of firms with opportunities for them to deal with their underinvestment issues, either by supporting the creation of financial arrangements that would focus on the peculiar characteristics of cooperative firms as in the case of worker cooperatives, or by developing a legislation framework around cooperative firms in a way that would allow them through internal organizational changes, and decrease in the uncertainty related to their property rights structures, to attract capital more easily.

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