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THE CAPITAL STRUCTURE OF FRENCH FARMS

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Abstract

This article focuses on the capital structure of French farms, in order to understand how they finance their investments. The financial literature usually considers three theoretical frameworks, the trade-off theory, the pecking order theory and the agency theory. Using data from the Farm Accountancy Data Network (FADN 2000-2014) for the whole population of farms, we perform a statistical analysis and econometric modeling with simultaneous equations (3SLS). Our results validate certain parts of the theoretical framework, while showing that farmers prefer to finance investments with debt, and more precisely short-term debt. Implications in terms of public policy are then suggested.

Keywords: Agricultural finance, Capital structure, France

1. INTRODUCTION

For decades, a large number of choices have been made available for firms to finance their investments. Among them, farms can be seen as a special case in terms of financing. While many industrial and commercial firms have generally a direct access to capital markets and exhibit a complicated capital structure, accessible financial sources are relatively limited for most farms whose resources mainly depend on internal funds, or (short- and long-term) financial debt. Each of these financing sources has its advantages and drawbacks.

Historically, farmers have preferred internal funds because of their apparent lower cost and risk, but in that case, they would often fail to meet their own financial needs. In contrast, debt is associated with lower tax payments but it comes at the expense of higher cost and risk, which implies several restrictive requirements. In case of combination of these two sources of financing, farms enjoy or suffer from different benefits and drawbacks depending on how funding sources are combined.

Empirically, farmers must decide which financial strategy to select given their situation. The evaluation of capital structure of a firm and its determinants play a central role in the financial management of a business. After the seminal work of Modigliani and Miller (1958), which stated that, in perfect markets, either capital structure choices nor dividend policy decisions matter, many authors have advocated that the choice of financial channels may differently affect firm value, giving birth to different theories on optimal capital structure. Given the significant relationship between capital structure and firm competitiveness (Myers, 1984), an in-depth look at how financial decisions are made is meaningful and important for farms.

The objective of this paper is to identify the main determinants of the capital structure of French farms and to quantify their effect, including the interconnection of the results with the conclusions of conditional theories of capital structure and empirical studies.

To our knowledge, our study is the first to investigate the capital structure of French farms and their financial choices. More precisely, we aim to answer the following research questions: First, what is the capital structure of French farms and how it has evolved over time? Second, which financial theories of capital structure apply to French farms? Third, what are the implications in terms of public policies?

Our work relies on the database of the Farm Accountancy Data Network (FADN) for the period 2000-2014. By construction, FADN data are representative of French professional farms of commercial size, especially in terms of productive orientation. Because of the numerous accounting and financial elements included in this database (products and charges, balance sheets and income statement), it appears to be the most complete and the most appropriate to capture the financial structure of farms.

Our article is organized as follows. The first section is devoted to the theoretical determinants of capital structure and the formulation of research hypotheses. The second section is focused on the empirical framework including a description of the database and econometric modelling. The third section displays the results of the econometric model and discusses them. The fourth section concludes.

2. THEORETICAL FRAMEWORK: THE DETERMINANTS OF CAPITAL STRUCTURE

Several theories have been proposed to explain choices of capital structure, including the trade-off theory (Miller, 1977), the pecking order theory (Myers, 1984), and the agency theory (Jensen and Meckling, 1976).

2.1 The trade-off theory of capital structure

In the trade-off theory, the managers (or owners) seek to optimize the leverage ratio of the firm in order to maximize its value. This maximization is obtained considering the trade-off between the costs and benefits of borrowing (Myers, 1984): interest tax shields are balanced against the costs of financial distress (legal and administrative bankruptcy costs, moral hazard, monitoring and contracting costs). The optimization of the leverage ratio implies several testable hypotheses, depending on the level of tax rate, the likelihood of bankruptcy, and the bankruptcy costs of the farm business.

First of all, firms may be interested in lowering their taxes by borrowing. This strategy can be useful only if they have measurable benefits in terms of tax decrease. On the one hand, firms with a high tax rate will have more incentives to finance their projects with debt (DeAngelo and Masulis, 1980; Fama and French, 2002; López-Gracia and Sogorb-Mira, 2008). On the other hand, even if the effective tax rate is high, non-debt tax shields (depreciations and investment tax credit) can replace the role of tax savings permitted by debt (DeAngelo and Masulis, 1980). Consequently, there should be a negative relationship between other non-debt tax shields and debt. As stated above, the trade-off theory considers the benefits and the risk of borrowing at the same time. Variables for likelihood of bankruptcy and related bankruptcy costs should then be included in the analysis.

When firms use debt as a financing tool, they should be able to repay the principal and interests. It implies that the more profitable firms have a greater capacity for indebtedness, because recurrent cash flows contribute to a less likelihood of bankruptcy. As they are less risky, they are encouraged to take the maximum advantage of debt tax shields (Fama and French 2002). Profitability of the firm should then be positively related to debt. On the contrary, firms with innovative industrial projects and high expectations of growth opportunities suffer from greater bankruptcy costs because they are seen as very risky by creditors. Myers (1984) shows that these firms are reluctant to use high amounts of debt so as not to increase their likelihood of bankruptcy. As a result, firms with high growth opportunities may not use debt as the first financing option and prefer to issue securities. Firms with greater growth opportunities have a lower leverage ratio. In case of farm bankruptcy, tangible assets can be used as collaterals (Michaela, Chittenden and Poutziouris, 1999). Therefore, we can forecast a positive relationship between asset tangibility and firms' level of debt. This hypothesis could be very relevant in the case of farm businesses as assets are almost all tangible.

As demonstrated by Titman and Wessels (1988) and Smith and Stulz (1985), size also plays an important role. Larger firms, with greater diversification of activities and also less volatile profits, have a lower likelihood of bankruptcy. This implies a positive relationship between size and debt. In the same spirit, we can also argue that age can might be an important determinant of capital structure decisions, given that the well-established firms have more advantageous terms in obtaining debt than younger firms. The older is the firm (and its reputation), the lower is the cost of debt.

In the trade-off theory, there is an optimal leverage ratio, where tax benefits are equal to the bankruptcy and agency costs associated with debt. When firms deviate from their target debt ratio,

the existence of adjustment costs prevents firms from making a total adjustment to that ratio, and so firms make a partial adjustment of debt towards the optimal debt ratio (López-Gracia and Sogorb-Mira, 2008). In the financial literature, the factors of financial distress can be summarized by four variables: profitability, asset tangibility, size and age of the firm. The threat of these costs pushes firms toward lower leverage targets.

2.2 The pecking order theory

The pecking order theory asserts that firms show a distinct preference for using internal finance (such as retained earnings or excess liquid assets) over external finance due to the information asymmetry between managers/owners and investors. If internal funds cannot finance investment opportunities, firms may acquire external financing, and if they do, they will choose among the different external finance sources in such a way as to minimize additional costs of asymmetric information.

In Myers and Majluf (1984), owing to the information asymmetries between the firm and potential investors, the firm will prefer retained earnings to debt, short-term debt over long-term debt and debt over equity. Issuing equity becomes more expensive as asymmetric information insiders and outsiders increase. Managers and inside investors have more information (like the true distribution of firm future returns) than outsiders. As the risk of the firm's return is unknown to potential investors, they are forced to rely on noisy signals such as the firm's level of capital structure to determine the risk of their investment and firm's value may be underpriced by the market (Myers and Majluf, 1984).

For these reasons, managers avoid equity whenever possible. In the absence of investment opportunities, firms retain profits and build up financial slack to avoid having to raise external

finance in the future. According to the pecking order theory, the more profitable is the firm, the greater is its capacity to accumulate retained profits, and so there is less need to turn to external finance. A negative relationship is therefore expected between profitability and debt, as identified in various empirical studies (Fama and French, 2002; González and González, 2012).

Firms with high growth opportunities must undertake major investment projects, which generate greater needs for finance and if a firm entirely relies on internal funds, then the growth may be restricted (managers may forgo some profitable projects). Empirical tests of the effect of growth opportunities on capital structure sometimes lead to opposite results. On the one hand, Myers (1977) argues that firms with growth potential will have less debt because growth opportunities generate moral hazard effects and push firms to take more risk. In order to mitigate this problem, investments should be financed with equity instead of debt (Smith and Watts, 1992). On the other hand, firms with high growth will look for external funds. Growth is likely to put a strain on retained earnings and push the firm into borrowing. Firms would then look at short-term, less long-term for their financing needs. In addition, during the last years, many farms suffered from volatile market conditions and their income is often perceived as risky (Hill and Bradley, 2015). In that case, short term financing is generally preferred to long-term liabilities.

Asset structure is also an important determinant of the capital decision. Tangible assets tend to have a greater liquidation value (Harris and Raviv, 1991). So, the more tangible assets are, the more collateral would be. Several studies show that the capital structure is positively with the firm's assets structure, consisting with pecking order theory (Allen, 1995; Michaelas et al., 1999).

According to Modigliani and Miller (1963), companies should aim towards entire debt financing due to tax deductions associated with interest payments on debt. This effect encourages the use of debt by firms as more debt increases the after-tax earnings to the owner. MacKie-Mason (1990)

studied the tax impact on the choice between debt and equity and concluded that changes in the marginal tax rate for any firm should affect financing decisions. Several authors use the average tax rate, arguing that it includes the impact of tax loss carry forwards and the use of the corporation as a channel for income inflows. The average tax rate should affect financing decision.

According to pecking order theory, the relationship between size and debt can be positive or negative. On the one hand, some studies show a negative relationship between size and debt (López-Gracia and Sogorb-Mira 2008). On the other hand, greater firm size reduces the problems of information asymmetry between managers/owners and creditors, allowing firms to obtain debt on more favorable terms (Myers (1984)). Then a positive relationship between size and debt may be expected (Psillaki and Daskalakis 2009).

2.3 The agency theory

The agency theory claims that the interests of the firm's management, stockholders and debtholders cannot be perfectly aligned. Since Jensen and Meckling (1976), it is well known that there are unavoidable agency costs in corporate management. These costs mainly arise from two types of managerial conflicts: a conflict between the firm's management and its shareholders and a conflict between shareholders and debtholders. Jensen and Meckling (1976) have developed their theory in the context of ownership structure and its relation to finance. In the context of the French farming sector, firms are mainly single-owner corporations (managers are also the owners): these agency costs problems should then not be determinants of the capital structure.

However, the agency conflict between equity holders and debt holders may be a problem for French farms. If a large amount of cash is available, farmers might spend it by increasing the size of the business with negative net present value projects, or by increasing private expenses. Debt creation

will increase interest and principal payments, and then reduce the so called "free cash flows" (Jensen, 1986). Debt issuance effectively commits farmers to pay out future cash flows. If the firm fails to make interest and principal payments, debt holders have a right to take the firm into a bankruptcy procedure. This threat acts as a motivating force to increase the efficiency of the firm.

The agency theory can be viewed as overlapping with both the trade-off theory and the pecking order theory. The trade-off theory can also include the agency costs as a part of costs of financial distress. Conflicts of interest between equity and debt holders may be relevant in the explanation why firms do not fully utilize tax advantages of debt. Myers (2003) argues that some versions of the agency theory infer a financing hierarchy as in the pecking order theory. For example, agency costs of equity might result in the pecking order.

2.4 Research hypotheses

Many studies (Myers, 1984; Barry and Ellinger, 2012) demonstrated that these theories do not contradict each other and can work together with different time horizons: the trade-off theory is more addressed to the long-term equilibrium between different financial sources whereas the pecking order theory rather concerns short term financial decisions. The joint consideration of these three theories implies to test three research hypotheses.

H1. French farms have long- and short-term debt targets and they partially adjust debt levels towards them each year.

H2. French farms rank their financing sources in the following way: cash flows, short-term loans and long-term loans.

H3. French farms owners have to signal their performance to lenders in order to reduce agency costs. These signals are composed of cash flows, short- and long-term debt levels, and profitability (Return On Assets, ROA).

These three hypotheses will be jointly tested using the following empirical framework.

3. EMPIRICAL FRAMEWORK

This section presents the empirical framework of our study. We start by presenting the database, with a highlight on the main variables used. Then, we detail our empirical model.

3.1 Database

In order to examine the capital structure of French farms, we use data from the French Farm Accountancy Data Network (FADN) for the period 2000-2014. These data are both the most precise available at the individual level and the most complete and recent that we have. It is worth noticing that the FADN sample includes only commercial farms which, by definition, reach a minimum economic size (standard output of at least 25,000 euros). Furthermore, the sample is based on a defined stratification (geographic location, economic and technical orientation and physical size), and extrapolation factors are computed. Our study is then representative of French professional farms.

Table 1 below specifies the variables used to test the hypotheses defined above.

Table 1. List of variables used in the analysis

3.2 Econometric model

According to the literature (Vogt, 1994; Barry, Bierlen and Sotomayor, 2000; Zhao, Barry and Katchova, 2008; Tian, 2013), the most adequate model to test our research hypotheses consists in three simultaneous equations which take into account the variation of long-term debt, short-term debt and investments. As a consequence of the sample rotation, the panel is unbalanced and we take into account annual effects.

$$vltd_{it} = \alpha_1 + \alpha_2 vstd_{it} + \alpha_3 vinv_{it} + \alpha_4 CF_{it} + \alpha_5 vltd_{it-1} + \alpha_6 FE_{1i} + \alpha_7 YE_{1t} + \varepsilon_{it} \quad (1)$$

$$vstd_{it} = \beta_1 + \beta_2 vltd_{it} + \beta_3 vinv_{it} + \beta_4 CF_{it} + \beta_5 vstd_{it-1} + \beta_6 FE_{2i} + \beta_7 YE_{2t} + \mu_{it} \quad (2)$$

$$vinv_{it} = \gamma_1 + \gamma_2 vltd_{it} + \gamma_3 vstd_{it} + \gamma_4 CF_{it} + \gamma_5 ltd_{it-1} + \gamma_6 std_{it-1} + \gamma_7 ROA_{it-1}$$
$$+\gamma_8 vltd_{it-1} + \gamma_8 vstd_{it-1} + \gamma_9 CF_{it-1} + \gamma_{10} FE_{3i} + \gamma_{11} YE_{3t} + \nu_{it} \quad (3)$$

Where: *ltd* is the stock long-term debt, *vltd* is the variation of long-term debt, *std* is the stock short-term debt, *vstd* is the variation of short-term debt, *vinv* is the variation of investments, *CF* is the value of annual cash-flows, *ROA* is the return on assets, FE are fixed effects, YE are year effects, ε, μ and ν are the error terms, assumed to be *iid*. *i* and *t* respectively index farms and the time period. Given we consider all farms of commercial size included in FADN data, variables are scaled by the closing valuation of total assets for each period *t* considered. By construction, *ROA* and *YE* are already normalized.

The estimation of simultaneous equations can be performed using several techniques (OLS, 2SLS or 3SLS). We choose to adopt a Three-Stage-Least Squares (3SLS) which takes into account potential correlation between cross-equation error terms. This method appears to be the most appropriate with correctly identified equation systems (Biørn, 2016). For the purpose of the analysis, we consider a model with fixed effects in order to account for the unobserved farm effects

as non-random variables and eliminate them by subtracting the within-firm mean of each variable (Tian, 2013).

4. RESULTS

In this section, we start by presenting some descriptive statistics. We then develop the results of the econometric modelling.

4.1 Descriptive statistics

As shown in Table 2, French farms had on average 351 k€ of owned assets over the period 2000-2014, which consisted of 89 k€ of long-term debt and 48 k€ of short-term debt. Net investments increased by 24.8 k€ on average. At first look, it seems that these new investments were financed by indebtedness which slightly progressed each year of more than 1.8 k€ on average, and above all from self-financing given the observed cash-flow and profit levels. One should note that the values of the standard deviation, minimum and maximum for all these indicators denotes the heterogeneity of the sampled farms.

Table 2. Summary statistics of French farms

Capital structure of French farms is mainly based on equity, which covers 59% of total assets value on average (Table 3). While debt is less preferred, farmers combine long-term (25%) and short-term liabilities (19%) with similar shares. The relative importance of short-term debt raises the issue of financial stability given that (1) associated interest rates usually more expensive and (2) it has to be paid back within one year. Despite the existence of some extreme situation (e.g. negative value of

equity, which denote highly distressed farms unable to payback their debt), standard deviations remain at low levels.

Table 3. Summary statistics of the capital structure of French farms

Figure 1 complements the analysis. Distributions for the stock long- and short-term debts are skewed to the left, many farms exhibiting no or little indebtedness. Conversely, the figure shows that French farms intensively rely on equity to finance their activities.

Figure 1. Frequency of stock long-term debt, stock short-term debt and equity to total assets

Figure 2 exhibits the evolution of the capital structure of French farms over the period 2000-2014 with the same variables as above. Despite a small increase in the stock of (short-term) debt, the relative proportion between debt and equity remains almost unchanged.

Figure 2. Evolution of stock long-term debt, stock short-term debt and equity to total assets

Financials flows are examined in Table 4. Annual variations appear to be very small, although some disparities exist among farms. The trend observed above is confirmed, *i.e.* an increase in short-term debt while short-term debt, cash-flows and investments are decreasing. The ROA is also slightly decreasing. All these figures describe the deterioration of the financial structure of French farms.

Table 4. Summary statistics of financial flows of French farms

Figure 3 complements the analysis. Distributions mainly emphasize the decrease of long-term debt in the capital structure of French farms. The distribution of cash-flows is also skewed to the left.

Fluctuations in short-term debt and investment are much pronounced than for long-term debt and cash-flows.

Figure 3. Frequency of financial flows of French farms

Figure 4 exhibits the contrasted evolution of the main financial flows related to the capital structure of French farms. Volatility of cash-flows and ROA seems to increase over time, which translates the consequences of the deregulation of agricultural markets. The strong correlation between these indicators is not surprising because the value of ROA is closely linked to cash flows. The increase of short-term debt appears to be quite regular and so is the decrease of investments on the farm. Short-term debt fluctuations are less volatile.

Figure 4. Evolution of financial flows of French farms

4.2 Econometric models

The results of the econometric models (3SLS simultaneous equations) are presented in Table 5.

Table 5. Econometric models

Our results show that we can validate the first hypothesis H_1 related to the trade-off theory. Indeed, we found statistically significant negative coefficients on the lagged stock long-term debt (-0.058 ***) and short-term debt (-0.038***). This result demonstrates that French Farms have both short-term and long-term debt targets and partially adjust to them. Surprisingly, the adjustment factor is higher for long-term debt than for short-term debt, which may denote the sensitivity of lenders to the farmers' long-term commitments.

The estimation results partially support our second hypothesis H_2 related to the pecking-order theory. As anticipated, we found statistically significant negative coefficients between long-term debt and short-term debt in the two first equations. However, while the coefficients associated with cash-flows are negative, they are not significant at all. It implies that this source of investment does not predetermine variation in indebtedness. The huge annual volatility of cash-flows (Figure 4) may be an explanation of this situation. We also observe at the same time a positive relationship between long-term debt (1.030***), short-term debt (1.384***) and investment as well as a negative relationship between cash-flows (-0.335***) and investment in the third equation. These results suggest that an increase in indebtedness is directly associated with new investments. Moreover, the coefficient of short term debt is higher than those of long term debt, which implies that farmers prefer short-term financing sources, as predicted by the pecking order theory.

Finally, the model provides some support to the third hypothesis H_3. Lagged cash-flows (0.306***) have a positive and significant influence on the level of investments. However, lagged short-term debt (-0.046***) and long-term debt (-0.142***) negatively impact investments. Profitability measured through the ROA has no impact. Cash-flows are therefore the most relevant positive signal sent to potential lenders, thus acting as a collateral. Conversely, past borrowings convey a negative signal because additional investments may result in increased debt and risk.

5. CONCLUSION

In this article, we have proposed a study of the capital structure of French farms. This work relies on the financial literature - trade-off theory, pecking order theory and agency theory - that has been developed over several decades, although with limited interest in the agricultural sector. Using the FADN database 2000-2014, we provide information about capital structure of French farms and the way they finance their investments. The econometric model takes into account 3 simultaneous equations (3SLS) with short-term debt, long-term debt and investments as dependent variables.

The results showed that farms prefer to finance investments using first internal funds, second short-term debt and third short-term debt. Over the years, capital structure of French farms remains quite stable, although it has progressively integrated more short-term debt. The reason may probably lie in the conjunction of lower interest rates and increasing risks in farm revenue. Indeed, cash-flows appeared to be very volatile among years while they remain a strong signal addressed to lenders. Consequently, farms have adapted their capital structure, while refereeing to a target of indebtedness as indicated by the econometric model.

This summarized portrait of the capital structure of French farms would deserve to be deepen by considering more precisely some economic and technical productive orientation, some of them (e.g. cattle breeding and wine-growing) being more capital-intensive. Special emphasis should also be paid to short-term financing which appears to be volatile and may weaken farm sustainability.

Moreover, improved knowledge on capital structure of French farms could help to provide some insights about their value on the market. This analysis could promote precise implications in terms of public policies in a context during which farm structure and activities evolve quickly.

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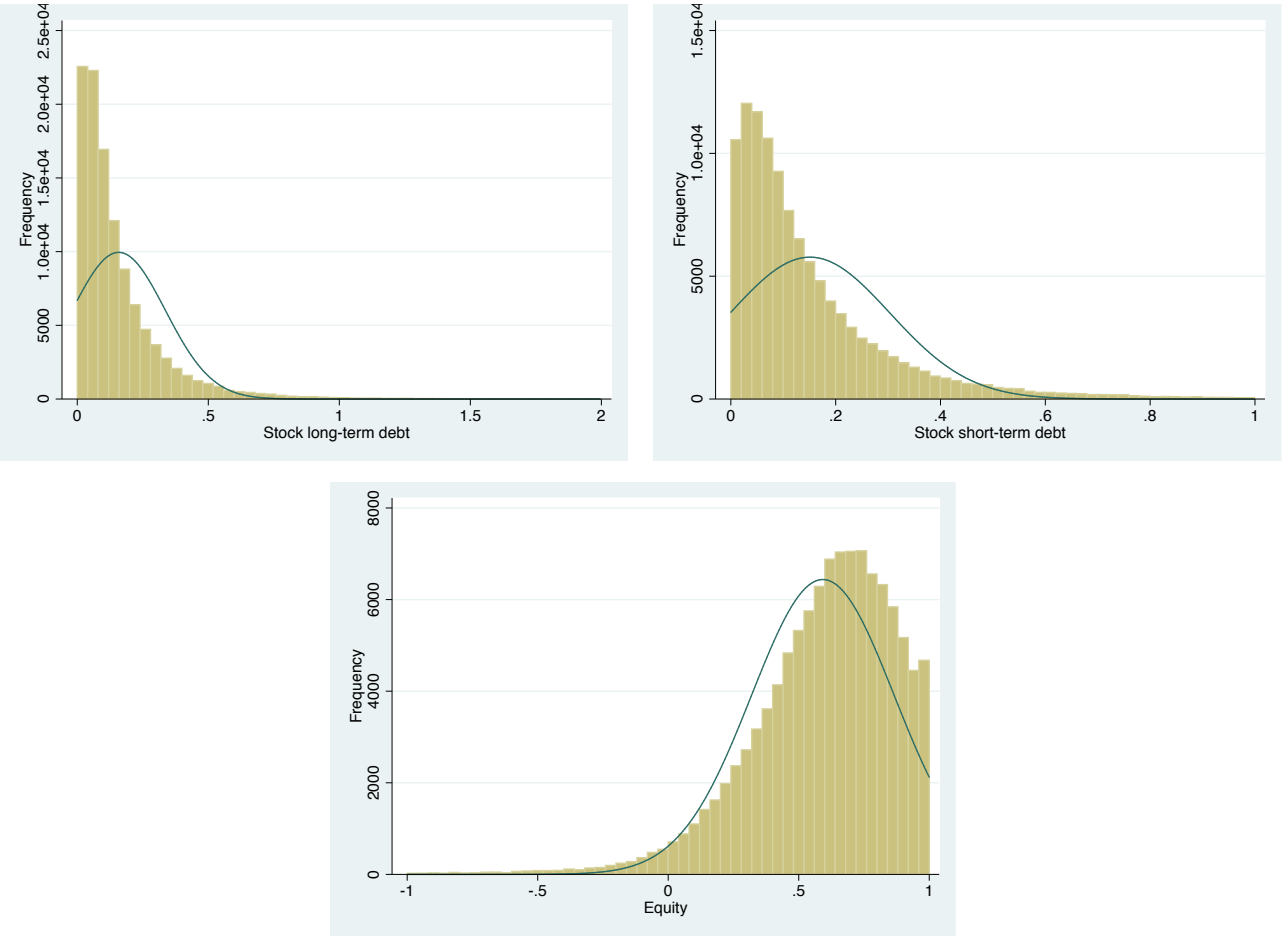
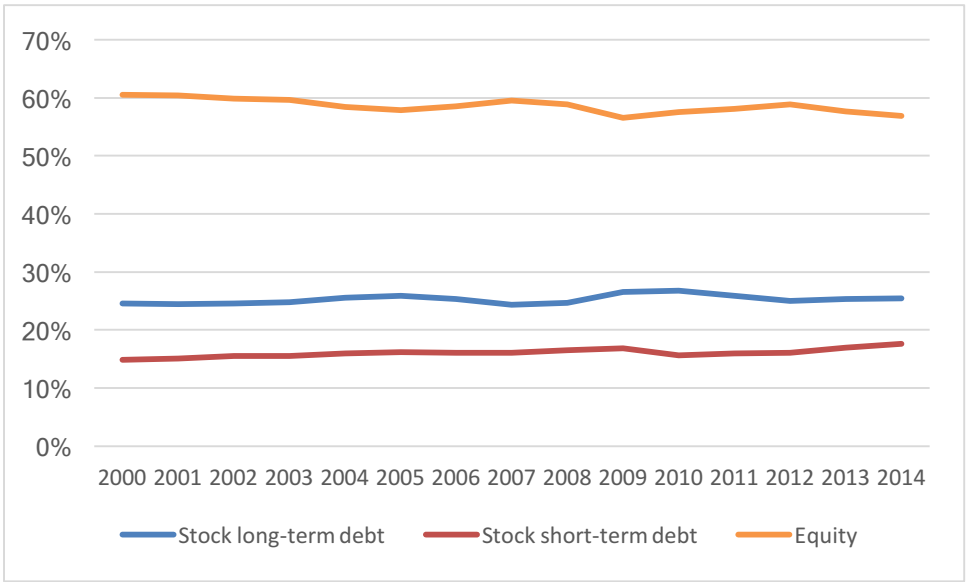
Figure 1. Frequency of stock long-term debt, stock short-term debt and equity to total assets



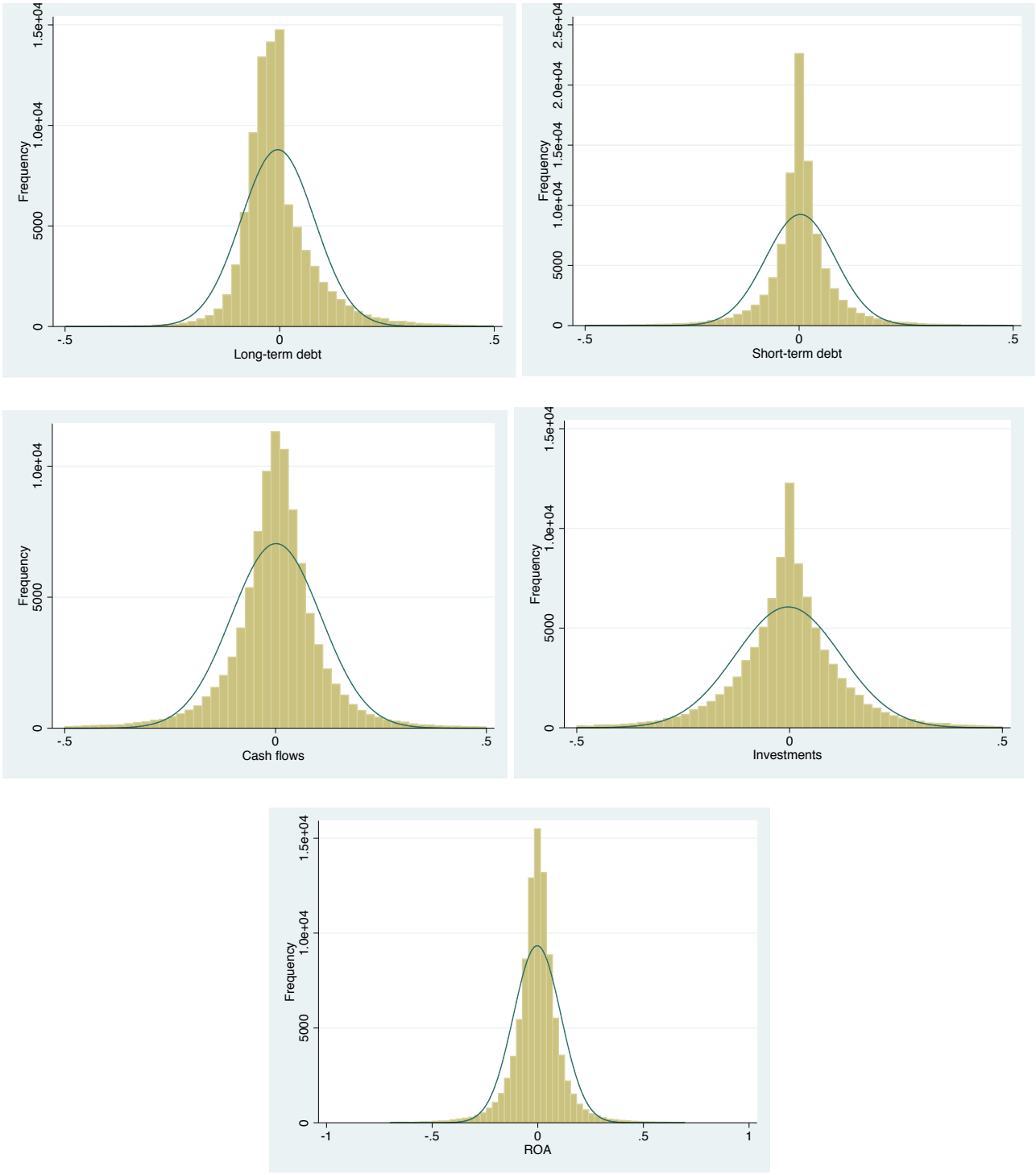
Key: Original values with normal adjustment.
Source: Own calculations based on the FADN database 2000-2014.

Figure 2. Evolution of stock long-term debt, stock short-term debt and equity to total assets



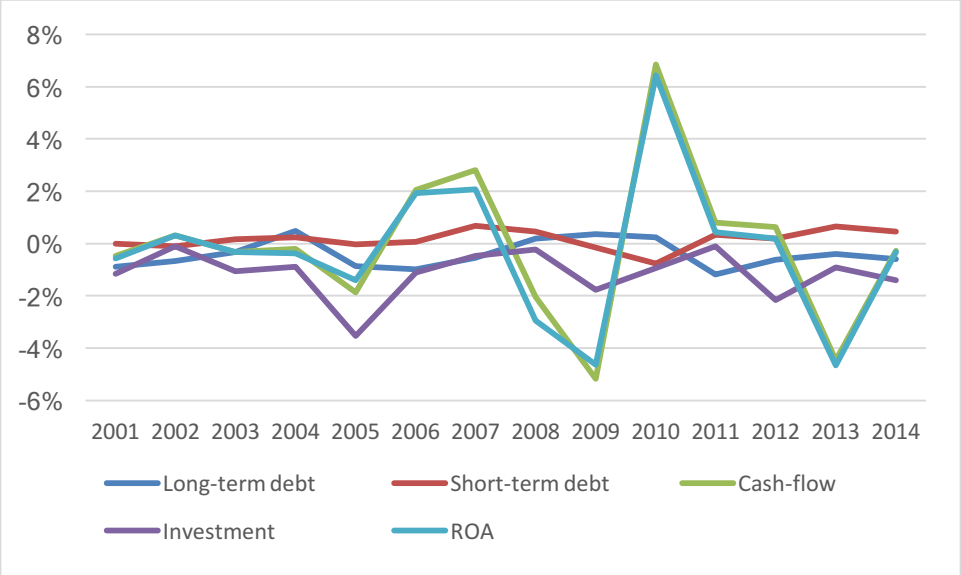
Source: Own calculations based on the FADN database 2000-2014.

Figure 3. Frequency of financial flows of French farms



Source: Own calculations based on the FADN database 2000-2014.

Figure 4. Evolution of financial flows of French farms



Source: Own calculations based on the FADN database 2000-2014.

Table 1. List of variables used in the analysis

Variable	Unit	Definition
Year	-	Year of the observation
Stock long-term debt	€	Closing valuation of loans whose maturity is higher than 1 year
Long-term debt	€	Annual variation in long-term debt
Stock short-term debt	€	Closing valuation of loans whose maturity is lower than 1 year, short-term loans and creditors
Short-term debt	€	Annual variation in short-term debt
Investment	€	Value of purchased minus sold fixed assets
Cash-flows	€	Total cash income minus cash expenses for operating activities
Profit	€	Net annual profit (or loss)
Total assets	€	Sum of fixed and current assets
ROA	-	Earnings before interests and taxes / Total assets

Table 2. Summary statistics of French farms

Variable	Mean	Std. Dev.	Min	Max
Cash-flow (1.000 €)	60.34	64.08	-520.65	3547.93
Long-term debt (1.000 €)	1.33	43.81	-1010.62	3573.75
Short-term debt (1.000 €)	1.52	36.52	-2055.11	1850.12
Investment (1.000 €)	24.85	60.60	-1365.27	5266.06
Stock value of long-term debt (1.000 €)	89.76	126.89	0.00	5569.96
Stock value of short-term debt (1.000 €)	48.82	90.92	0.00	6485.39
Profit (1.000 €)	40.82	55.26	-737.23	3421.98
Total assets (1.000 €)	351.02	351.39	1.36	16445.97

Key: Euro amounts are current euros.

Source: Own calculations based on the FADN database 2000-2014.

Table 3. Summary statistics of the capital structure of French farms

Variable	Mean	Std. Dev.	Min	Max
Total debt	0.41	0.30	0.00	15.39
Stock long-term debt	0.25	0.20	0.00	13.86
Stock short-term debt	0.16	0.19	0.00	7.57
Equity	0.59	0.30	-14.39	1.00

Key: Variables are measured in ratios to total assets.

Source: Own calculations based on the FADN database 2000-2014.

Table 4. Summary statistics of financial flows of French farms

Variable	Mean	Std. Dev.	Min	Max
Long-term debt	-0.00	0.09	-4.63	2.77
Short-term debt	0.00	0.10	-7.65	2.02
Cash-flow	-0.00	0.14	-21.14	3.27
Investment	-0.01	0.46	-153.76	6.41
ROA	-0.00	0.12	-1.88	1.38

Key: Variables are measured in ratios to total assets.

Source: Own calculations based on the FADN database 2000-2014.

Table 5. Econometric models

	3sls		
Variables	**Long-term debt**	**Short-term debt**	**Investment**
Endogenous variables			
Long-term debt		-0.728***	1.030***
Short-term debt	-0.733***		1.384***
Investment	0.383***	0.373***	
Exogenous variables			
Cash-flow	-0.003	-0.003	-0.335***
Lagged stock long-term debt	-0.058***		
Lagged stock short-term debt		-0.038***	
Lagged ROA			-0.001
Lagged short-term debt			-0.046**
Lagged long-term debt			-0.142***
Lagged cash-flow			0.306***
Time dummies			
Y=2002	0.000	0.000	0.000
Y=2003	0.006*	0.006	-0.009
Y=2004	0.017***	0.014***	-0.023*
Y=2005	0.003	0.003	-0.011
Y=2006	0.003	0.003	-0.002
Y=2007	0.010**	0.011**	-0.011
Y=2008	0.012***	0.011**	-0.020
Y=2009	0.012***	0.009*	-0.028*
Y=2010	0.009**	0.003	0.013
Y=2011	0.001	0.002	-0.003
Y=2012	0.012***	0.012**	-0.026*
Y=2013	0.009**	0.010**	-0.027*
Y=2014	0.007*	0.007*	-0.012
Constant	-0.019***	-0.024***	0.080***
Farm observations	77,002	77,002	77,002
χ2 for H0 (all slope parameters=0)	0.000	0.000	0.000

Key: *, ** and *** respectively denote significance at the 10%, 5% and 1% levels respectively.

Source: Own calculations based on the FADN database 2000-2014.