Industrial Major Firms Investments in a Financialized Context

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INDUSTRIAL MAJOR FIRMS' INVESTMENTS IN A FINANCIALIZED CONTEXT

TESTS ON FRENCH SBF 250 PRICE INDEX PANEL DATA

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Abstract

The evolution of firms' investment behavior is interpreted by heterodox theories as the resultant of the financialization of the accumulation regime. The French School of Regulation thus introduces the notion of patrimonial capitalism. The strategies of productive and financial investments, and the financing mode of these activities, respond to increased shareholder requirements on the return of invested funds. In order to check these assumptions, we have made tests on panel data, starting from a sample on big French groups, quoted in the SBF 250 Price Index.

Keywords: Financialization; Investment; Corporate Governance; Growth Regime; Panel data
JEL Classification: E12, E22, G34, C33.

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Introduction

The modification of firms' investment behaviors in the past two decades and within financialized capitalism has been the subject of a lot of recent works, both theoretical, notably in Stockhammer (2005-6), Aglietta and Breton (2001) or Boyer (2000), and empirical, as in Stockhammer (2004) and Van Treeck (2008). However, the assumptions made on the impact of financial constraints on firms' behaviors are often tested with national accounts data, whereas these are the major firms which are supposed to be constrained first by shareholder requirements and by the evolution of financial markets. The main objective is thus to test here the hypothesis on the financialization of strategies, which aims at maximizing the shareholder return, i.e. the behavior of big firms in the patrimonial regime. For this purpose, we have constructed a panel of consolidated accounts data of the French major quoted groups and have proposed some investment and financing equations with the use of GMM estimator in first difference. This work follows previous empirical works with VECM modeling, carried out primarily on the basis of a post-Keynesian assumption (Lavoie and Godley, 2001-2002), taken from national accounting data (Clévenot et al., 2009, 2010).

The main lessons are the following ones. First of all, we have highlighted a negative link between firms' investment and their financial profitability, as clarified by du Tertre and Guy (2009) starting from descriptive statistics relating to the same data. Financial investment including Merger and Acquisition mainly rests on leverage effect objectives and on objectives of increase in financial profitability. Firms' debt is also explained in particular by the pursuit of the financial leverage effect. Lastly, financing external growth seems to justify shares issuance (Toporowski, 2000a), and during financial crises, firms reduce these issuances in order to support profitability for their shareholders. We have finally tried to

show how these results support the thesis of investment cycles generated by the evolution of the financial sphere.

1 Financialization of firms' strategies: the financial constraints on investments and financing

The evolution of the financial market and the evaluation of the resultant risk lead to endogenous fluctuations in investment. Minsky's model of investment shows the sequences which generate this mechanism. In addition, today the shareholder value principle leads firms to resort to various strategies to maximize shareholders' profitability. This principle implies that an external growth boom is added to the productive investment boom, and that the risks that productive investment drops increase during financial crises.

A return on Minsky's works

The works of Minsky (1986) describe investment behavior as largely dependent on the evolution of the financial sphere. Indeed the inflation of financial markets recurrently implies a surge in firms' productive investment, considering the ensuing evolution of the capital cost. At the height of the boom, the endogenous and systematic reversal of financial markets then reveals an insolvency risk for a certain number of firms and therefore causes a generalized fall in investment.

According to Minsky, productive investment is fixed on the basis of capital supply and demand on financial markets. The supply price is based on the supply price of capital goods on the goods market, and it takes into account the interest burden if firms finance their

activities with debt. The demand price of capital on financial markets corresponds to the price which managers are ready to pay to acquire a capital asset, considering the profits expected for the corresponding investment project. This price must not only cover the price of the capital asset and the financial burden on debt, but must also ensure the return expected by the owners of the companies' capital. Beyond a self-financed amount, investment requires debt-financing. The supply and demand prices of capital, fixed with no external financing, respectively move upward and downward when debt becomes necessary.

This is explained by the principle of the increasing risk of Kalecki (1937). According to him, since it is getting riskier and riskier to finance a project beyond a certain amount, lenders tend to compensate the risk with a rise in interest rates. As long as debt leverage allows to obtain a higher return on investment projects, capital accumulation increases. Nevertheless, when the supply price is equal to the demand price, the investment is fixed since a new increase in investment implies a rise in the interest burdens so that firms cannot ensure the return expected by the owners of common stock. However, Minsky shows that for a fixed project of investment, if the profits observed at the end of the period are just equal to the expected profits (which allow to determine the demand price of capital at the beginning of the period) and a surge in investment takes place. In this case, indeed, the risk evaluated by lenders and investors immediately subsides. One thus observes a rise in the supply price of capital and a drop in the demand price, which generates an increase in investment. However, according to Kalecki's law of profits (Kalecki, 1943), total profits over the period depend on demand, therefore in particular on productive investment.

When expectations on financial asset prices rise, the perception of risk subsides. Investment increases and consequently profits do so at the end of the period, implying another fall in the perception of risk. Thus a boom in investment can take its source in the

development of a financial bubble, implying a period of endogenous fragility in firms' balance sheets ('Financial Instability Hypothesis'). Indeed, the increase of the debt financing of investment during the boom leads firms to subject to the expectations on financial markets. When an event reveals to investors that certain firms are dependent on the evolution of profits to ensure their debt refinancing (in the case of speculative and Ponzi firms), the risk is immediately upgraded, and capital cost rises. Hence debt refinancing becomes extremely expensive, and companies must reduce their investment to be able to refund their debt on the basis of self-financing.

The patrimonial regime and the financial fragility

It should nevertheless be stressed that the risks weighing on the level of debt subscribed by firms are accentuated in the financialized growth regime in comparison with Minsky's model. The return constraints imposed by the owners of common stock lead managers to financialize their strategies, implying an amplification of the potential fall in the economic activity during the periods of financial crisis. Within the framework of the patrimonial or financialized regime (Aglietta, 2006; Boyer, 2000), firms widely resort to financial leverage, but not only to finance their productive investment with an objective of strengthening long-term growth. In fact, the managers of big companies pay special attention to the question of the maximization of shareholder return. For two decades, the principle of shareholder value has imposed itself on managers (Plihon, 2002; Stockhammer, 2005-6). In other words, according to Aglietta and Rebérioux (2004), the community of investors on financial markets imposes a strong constraint on companies, which corresponds to the maximization of the actualized sum of future dividends.

The principle of the shareholder value is based on the possibility of divergent interests

between managers and shareholders, highlighted by the Agency Theory (Jensen and Meckling, 1976). The management of companies in the interest of shareholders leads to a modification in profit distribution between firms' stakeholders. A norm of very high financial profitability then gradually imposes itself, since it ensures that a substantial part of the net profit is allocated to shareowners. This is what ultimately leads firms to maximize the financial leverage effect. The constraint of financial markets thus encourages managers to adopt particular strategies intended to respect these conventional norms of return. They thus seek some strategies complementary to the principle of productive investment financed by debt leverage as described in Minsky's model. Financial profitability is increased thanks to financial strategies, and makes the structure of firms' balance sheets increasingly dependent on the evolution of expectations on financial markets, i.e. the evolution of the risk perception. The principle of shareholder value will thus amplify the phenomenon of endogenous fragility in balance sheets.

On the industrial side, one of the main methods of shareholder value maximization depends on the firms strategy of external growth carried out through merger-and-acquisition activities. Firms make a choice between external growth, minority acquisitions, financial investment and internal growth (productive investment), thus becoming stakeholders in the running of stock markets. Merger-acquisition activities make it possible to benefit from synergies between consolidated firms, or economies of scale (Plihon, 2002). Lastly, companies also resort to operations that contribute to reducing the capital engaged, in particular debt-financed stock buyouts.

As described in the Minskyan model, a financial boom can take place on the basis of an undervaluation of the underlying risk of the projects in a fast-growing sector. Since the risk premium recedes and since the principle of shareholder value dominates entrepreneurs'

decision-process, it is consequently rational for them to take the opportunity to resort to financial leverage at the utmost. The boom in growth projects does not only relate to productive investment anymore, but to financial investment additionally. It concerns in particular Merger and Acquisitions operations (M&A). Thus, when a period of financial euphoria begins, the increase in productive investment is from then on limited by the shareholder value principle. This is explained by the change in profits destinations towards external growth, but more generally because of the requirements on profitability, which make companies more selective concerning the return output of investments and thus lead shareholders to require a maximization of cash-flow payouts (Batsch, 2006).

When a financial crisis occurs, the evaluation of lender risk is revised upward, just like the risk premium expected by shareholders. Financial fragility is then revealed, and debt refinancing becomes, here again, increasingly expensive. Consequently, for a great number of firms, debt reduction becomes essential. As in the Minskyan scheme, investment collapses in order to have some leeway in disposable self-financing so as to proceed to debt reducing. The fall in investment for financially troubled companies generates a fall in total profits and consequently a decrease in total investment. However, the constraint of the shareholder value principle then generates additional difficulties because of its maintenance in a downward period of the cycle, while at the same time capital gains on financial markets disappear. Theoretically as profits are plummeting, what is left must essentially be used to refinance the debt. However the remaining sums are also both used to buy-back shares intended to support financial profitability, and to uphold a high level of dividends payouts, so as to compensate for the fall in the price index. The hypothesis of the scheme presented here thus clearly involves firms in a financial cycle of investment, which implies particular behaviors regarding investment and its financing mode. The behavior of the big quoted groups in the last years is consequently described through the equations which will be

tested.

Theoretical equations about investment and financing in a financialized context

Theoretical equations including the particular behaviors of firms within the financialized regime of growth can be constructed from post-Keynesian models and equations inferred from them. The traditional post-Keynesian function of investment is Kalecki's, which establishes a positive link between productive investment and the increase in profit[1] (Kalecki, 1937, 1954). The principle of this profit accelerator is the following one: when profits increase on the one hand, some previously non-profitable investment plans become profitable because it indicates an increase in outlets and on the other hand, the possibility to self-finance investment grows. More recent theoretical models (Taylor, 1985) introduce the rate of capacity utilization, in order to test both profits and sales expectations (thus close to a demand accelerator). As in Minsky's model, when profits increase, productive investment rises even more so because of the fall in risk perception, and an investment boom takes place. These theoretical links can thereby be summarized as:

$$\frac{I}{K_{-1}} = f(\Delta P, U) \qquad (1)$$

With $\frac{I}{K_{-1}}$ = Rate of accumulation, I = Productive investment, K = Stock of productive capital, P = Gross profit and U = Rate of capacity utilization.

The impact of finance on productive investment is sometimes tested through Tobin's Q ratio, and some post-Keynesian authors resort to it in their models (Davidson, 1972; Lavoie and Godley, 2001-2002). However, empirical verifications are not very conclusive (Ashworth and Davis, 2001; Medlen, 2003). The assumption of an opposition between financial and productive investment actually poses a problem. As a matter of fact, the main

determinant of these two behaviors is the same, i.e. the rate of profit. When profits rise, productive and financial investment both increase even more so. In order to study the links between finance and investment, we then resort to the hypothesis presented above. First of all, according to Kalecki's principle of increasing risk (Kalecki, 1937), a firm takes more and more risks as it is involved in debt. In addition, a negative link between the debt ratio and productive investment is expected. So, we have a theoretical equation such as:

$$\frac{I}{K_{-1}} = f(\Delta P, \frac{L}{K}) \quad (2)$$

With $\frac{L}{K}$ = debt ratio, L = total debt.

In order to take into account the assumed negative impact of shareholder requirements because of the financialization of firms' strategies and the increase of selectivity in internal growth projects, financial profitability must then be introduced in the determination of productive investment, as with Boyer (2000). Contrary to Stockhammer (2004), Van Treeck (2008) or Hein (2010), we do not use ratios relating to financial expenses, because the dividends in particular do not seem to be at the origin of the fluctuations of investment in the French case (du Tertre and Guy, 2009). Moreover, these studies do not take into account financial profitability, which seems the key variable on which investors focus, to make sure that firms are managed in a way that is consistent with their interests (Boyer, 2000; Aglietta and Breton, 2001). The rate of interest finally plays a role, it represents the cost of borrowed capital including borrowers' risk. To finish, a theoretical function of investment including the financial constraint of the shareholder value principle can thus be the following one:

$$\frac{I}{K_{-1}} = f(\Delta P, \frac{L}{K}, Rf, i) \quad (3)$$

With Rf = Financial profitability (Net income divided by common stock) and i = Rate of interest on debt.

Concerning financial investment, as explained above, the financial constraints of maximization of shareholder value imply more and more M&A operations, especially based on debt leverage. The behavior of financial investment will be studied through the supposed positive role of the financial profitability requirements, as well as through the positive role of the debt ratio directly expressing the recourse to debt leverage. The rate of interest is also introduced and can express two phenomena: a traditional negative effect on the financing cost of investment, or a second negative effect of arbitrage between various financial investments. Financial investment can be summarized as:

$$FA = f(\Delta P, \frac{L}{K}, Rf, i) \quad (4)$$

With FA = Financial accumulation.

Considering theoretical assumptions relating to investment behaviors, the analysis of indebtedness has initially been carried out through a first approach, in terms of indebtedness norm. According to this analysis (Aglietta and Breton, 2001), companies choose between a high debt necessary to fulfill shareholder requirements through the leverage effect, and a weak debt desired by banks, in order to limit the risks of insolvency. Furthermore, the rate of interest will play a negative role and financial profitability a positive one as an indicator of the convention of return established on financial markets. The theoretical equation is also close to the Stock-Flow Consistent (SFC) models, which includes a behavioral equation of the loan demand, as in Taylor (2004), since credit demand negatively depends on the rate of interest and positively so on the demand for investment, because of firms' budget constraint (on this last point, see Charles (2008)). Finally, the loan demand is defined through a debt ratio, as in Taylor (2004), and depends on these last parameters:

$$\Delta \frac{L}{K} = f(\frac{I}{K_{-1}}, Rf, i) \quad (5)$$

Lastly, several kinds of equations are proposed on the issues of shares among SFC models: a simple proportional link between productive investment and share issuance (Lavoie and Godley, 2001-2002; Taylor, 2004); a constant ratio between the volume of issued equities and the stock of fixed assets (Dos Santos and Zezza, 2004) corresponding to the neo-Keynesian principle of equity rationing, according to the authors. We propose here an alternative specification. According to Toporowski (2000a,b), the aim of equity issuing is mainly to refinance the debt and to finance M&A operations. The assumption that these projects are often financed by the quoted groups on the basis of share issuance will be tested, given the firms' need to conform to shareholders' requirements through financializing their strategies as explained above.

More precisely, firms undergo a financial constraint which can be described as "good practices of management": to reach the norms of the financial return expected by the markets, they become particularly demanding on the level of return on their investments, and ensure a maximum redistribution of cash-flow to their shareholders, in particular by a rigorous control of the invested capital (Batsch, 2006; Toporowski, 2000b). Thus, in a thriving period, firms will be incited to arbitrate between maximizing the financial leverage effect as explained above, and the issuance of equities. Consequently, equities are issued to obtain sufficient funds to throw into investment projects and in particular into Merger and Acquisition operations (Share Exchange Offer for example), but these issuance must be less important than indebtedness. In a period of indebtedness reduction, companies will conversely tend to limit their equity issuance or even to buy-back equities, so that the cash-flow remaining after the repayment of part of the debt will be focused on a few shareholders. To summarize, an increase in the debt ratio will tend to have a positive impact on equity

issuing and conversely. So as in the SFC model of Lavoie and Godley (2001-2002), equity issuing can be studied on the basis of the flow of issued equities:

$$\Delta E = f(MA, \frac{L}{K}) \quad (6)$$

With E = Total stock of issued equities and MA = Financial investment in operations of Mergers and Acquisitions.

2 Methodology and Tested Equations

Panel tests on firms' productive investment often rely on neo-Keynesian assumptions of asymmetrical information and agency costs (Fazzari et al., 1988; Mairesse et al., 1999; Carpenter and Guariglia, 2008). These tests essentially try to determine the link between firms' cash-flow and their accumulation of fixed assets, with the hypothesis that more cash is a sign of the firms' financial healthiness which can then benefit from less expensive funds and prevent capital rationing. The aim of the following tests is to bring a global scheme of firms' behaviors in productive investment, financial investment and their financing mode, in order to show how major firms can be influenced by the financial sphere, and can then be caught up in financial cycles. These decisions from large firms within the framework of financialized capitalism have been tested resorting to consolidated account data of the French major quoted and non financial groups over the 1989-2008 period (SBF 250 - Worldscope Base).

The basic equations which will be tested are the following ones. First of all, concerning productive investment, the main specification is:

$$\frac{I_{it}}{K_{i(t-1)}} = a_0 + a_1 \Delta Log\ P_{it} + a_2 \frac{L_{i(t-1)}}{OF_{i(t-1)}} + a_3 \Delta ROE_{it} + a_4 Log\ r_{it} \quad (7)$$

With $a_1 > 0$, $a_2 < 0$, $a_3 < 0$, $a_4 < 0$, i = firms, t = time (and t = 1989-2008), $\frac{I}{K_{-1}}$ rate of capital accumulation, I = Productive investment in cash-flow statements, K = Total fixed assets, P = gross profit; $\frac{L}{OF}$ = debt ratio (L net financial debt), r = apparent nominal interest rate and ROE = Rate of return on Equity = Financial profitability.

It is thus a profit-accelerator type of investment equation à la Kalecki (1954), augmented with the financial constraints presented above. An alternative to the profit accelerator has also been analyzed with a demand-accelerator and the introduction of gross value added Y instead of gross profit. Then, we test the following equation for financial investment:

$$\Delta Log\ FA_{it} = b_0 + b_1 \Delta Log\ P_{it} + b_2 r_{it} + b_3 Log\ ROE_{i(t-1)} + b_4 \Delta \frac{L_{it}}{OF_{it}} \quad (8)$$

With $b_1 > 0$, $b_2 < 0$, $b_3 > 0$ and $b_4 > 0$.

FA = Financial assets acquisitions in cash-flow statements.

Equation (8) permits to test the role which the apparent rate of interest plays on financial investment through an arbitrage between financial assets, or as representing the financing cost of investment. The debt ratio and financial profitability have been introduced to check the hypothesis on the financial leverage effect. The coefficients are expected positive. The debt ratio in equation (9) highlights the same phenomenon.

The indebtedness equation has the following form:

$$\Delta \frac{L_{it}}{OF_{it}} = c_0 + c_1 \Delta Log\ K_{it} + c_2 \Delta r_{i(t-1)} + c_3 Log\ ROE_{i(t-1)} \quad (9)$$

With $c_1 > 0$, $c_2 < 0$ and $c_3 > 0$.

$\frac{L}{OF}$ = Debt leverage in the strictest sense. It aims at showing more specifically the link between the trend of financial profitability and indebtedness. In order to support the

assumption the search for higher financial profitability leads firms to increase their debt, here again in order to activate the financial leverage effect.

Lastly, the issues of shares will be estimated starting from this specification:

$$\Delta Log\ E_{it} = d_0 + d_1 \Delta Log\ Ki_{it} + d_2 \frac{L_{i(t-1)}}{OF_{i(t-1)}} \quad (10)$$

With $d_1 > 0$ and $d_2 > 0$.

E = Total equities capital held by external stakeholder of firms and Ki = Intangible capital.

Here we have assumed that share issuance mainly aims at financing Mergers and Acquisitions. To highlight this phenomenon, as explained in the next section, the significance of the link between intangible capital and equity issuing is tested.

The various equations presented above can then be rewritten in the more general shape of panel equations. This gives as follows:

$$y_{ij} = \alpha X_{it} + v_i + v_t + e_{it} \quad (11)$$

With i the corresponding individual or firm, T the period, y the explained variable for each equation (7) to (10), X all the explanatory variables, v_i the individual fixed effect, v_t a temporal effect and e_{it} the error term. We can then resort to a Generalized Method of Moments (GMM) estimator in first difference. This allows to eliminate the fixed individual effects. The next global equation in first difference is then obtained:

$$\Delta y_{ij} = \alpha \Delta X_{it} + \Delta v_t + \Delta e_{it} \quad (12)$$

The explanatory variables in equation (12) can be instrumented by their level values lagged one period or more (Arellano and Bond, 1991; Kpodar, 2007). The variables chosen here, supposed slightly exogenous, are instrumented by their values lagged once or more. To then ensure models validity, two tests have been used. They correspond to the second-order serial correlation of Arellano and Bond (m_2 test) and of Hansen test for the validity of

the lagged variables used as instruments (*J*-test).

For all specifications, sectoral dummies have been introduced in order to test the possible presence of sectoral effects and the robustness of the estimations. The tested sectors correspond to the SIC classification[2] (Standard Industrial Classification) available in Worldscope Database, except of course for the financial sector because of the composition of the sample. The chosen reference sector is the Capital Goods Industry (SIC 3).

3 Main Characteristics of the Data and Descriptive Statistics

The data used here result from the Worldscope database (Thomson Financial). These are data of group accounts, which are major non-financial groups quoted in the French SBF 250 Index at the end of 2008. We have however excluded France Telecom and Vivendi groups from the sample after a descriptive analysis of the data. Indeed, the evolution of the debt of these two groups tends to distort the global analysis which arises from the remainder of the sample. It finally consists in 215 firms, relates to the 1989-2008 period, and is not balanced. The tests have been carried out starting from Stata 10.0 software, which can manage unbalanced panels[3]. In order to exclude uncommon shocks, which are very occasional and specific to few firms, we have eliminated some data considered as not very significant in our sample, on a case-by-case basis. Indeed, two main issues can arise. First equity capital can plummet over one year, because of an exceptionally negative net income. One particular consequence may be an abnormally high financial profitability ratio or debt ratio. Secondly, firms' debt is a net financial debt, i.e. reduced by the amount of short-term investments, according to the admitted definition of the total debt in functional balance-sheet (Vernimmen et al., 2005). In some cases this implies a debt close to 0, and consequently a

disproportionate apparent rate of interest. The descriptive statistics of the final database used here are presented in Table 1.

(Table 1)

The data used come either from the consolidated balance sheets, the cash-flow statements or the income statements from companies. Productive and financial investments have been tested through the corresponding flows in cash-flow statements. This last kind of account only includes the operations actually giving place to a flow of funds. For example, any Merger or Acquisition financed by equity issuance will be eliminated. When such an operation occurs, a variation in the perimeter of consolidation is reported in balance sheets data. However, in this case, the physical and financial assets of the acquired firm are reported in the balance sheets assets, proportionally to the acquired share of the corresponding total common stock. It is thus impossible to distinguish external and internal growth within it. Consequently, I and FA investment flows are here studied through cash-flow statements data because, even if part of these projects is suppressed, nevertheless these data seem most relevant for a periodic study. On the other hand, the financing mode of firms' growth (i.e. issued equities E and loans L) has been studied starting from balance sheets data. Indeed, a sizeable amount of capital demanded by firms would be eliminated with the use of data from these kinds of accounts, because of the rules according to which cash-flow statements are developed, and as confirmed by the example presented above. Consequently, the studied data cannot be stock-flow consistent, however the econometric analysis through these data seems the most pertinent one to study companies' effective behaviors.

A last precision must be brought concerning dependent variables, about the total equities capital held by external stakeholder of firms E. These variables include on the one hand, the

common stock, i.e. the total number of issued equities multiplied by the issuance price of the first equity issuance of the firm, and on the other hand the capital surplus, that-is-to-say the difference between the amount raised on financial markets through the new issuing of equities and this same issuance evaluated at the price of the first equity issuance of the firm. The variation of *E* thus corresponds to the total amount raised by non-financial groups each year through equity issuing, but does not include any reevaluation of past issued equity (historical cost accounting data), as is for example the case in French national accounts (Accounting data evaluated at market value).

(Table 2)

Finally, a distinction has been made between tangible fixed and intangible assets, in order to consider one of the main characteristics of the group accounts. Indeed, as seen above, when Merger and Acquisition operations occur, the new entity acquired by the group is integrated (overall or not) in its perimeter. In particular, by doing so, a goodwill is recorded on the asset side. This element corresponds to the difference between on the one hand, the cost of acquisition of the titles, and on the other hand the difference between the estimated fair value of assets and liabilities, except for common stock, balanced by the quota of the company acquired by the parent company (Bachy and Sion, 2005). To a large extent the goodwill therefore represents the sum invested in external growth, even if it can be undervalued because of the possible overvaluation of the target's assets when the acquisition takes place. This item is reported in the intangible assets. This last element thus takes a very different meaning from the notion of intangible assets in the sense of French national accounting (Depoutot, 2002). The intangible capital *Ki* is then used as a proxy for external growth activities in equation 10, supposed to be mainly financed by the issue of shares. The correspondence between all variables used in this work and the Worldscope database are

presented in Table 2.

4 Tests Results

The tests with GMM estimator in first difference are presented from Table 3 to Table 6. The results clearly support the hypothesis presented above on the transformation of firms' behaviors in financialized capitalism.

4.1 Productive Investment

Table 3 presents the results of the estimates of the investment equations, based on equation (7). Equations (a) and (b) are directly derived from the latter. The assumption of a profit accelerator seems confirmed since the coefficient connecting the rate of growth of gross profit and capital accumulation is significant. According to equation (b), a 1 point increase in the rate of growth of gross profit[4] implies an 0.94 point increase in the rate of accumulation. It is worth noting that the variation of firms' financial profitability negatively influences investment, which thus tends to confirm the thesis stating that the impact of finance on firms' activities acts through the shareholder requirements in financial profitability.

(Table 3)

By seeking an increase in financial profitability for shareholders, the pursuit for a strong and positive financial leverage effect to satisfy the shareholder requirements on "good practices of management" also leads firms to increase their debt, which generates another

financial constraint on investment. Indeed, this especially leads companies to an increasing risk (Kalecki's principle of increasing risk) because this rise in the debt ratio might induce financial fragility. The negative link between the debt ratio $\frac{L}{OF}$ and investment can then be explained. Lastly, the variations in the rate of interest have a negative impact on investment too, because of the ensuing variation in capital cost. According to equation (a), a shift of the apparent interest rate from 4% to 3% implies a 1.47 point increase[5] in the accumulation of fixed assets. Thus, when a financial boom takes place, productive investment rises and then profits increase too. The fall in the evaluated risk implies a decrease in the cost of capital which positively impacts productive investment, in spite of the increasing risk underscored by the negative role played by the debt ratio.

However, the shareholder value principle leads managers to take advantage of all the possibilities that allow a quick increase in financial profitability, as external growth for example. Likely firms become more selective about productive investment. Therefore, this explains the negative impact of the trend in *ROE* on internal growth projects. When a financial crisis occurs, in our theoretical framework, the risk estimated by investors soars, and financing becomes very costly. The rate of interest may increase, and the refinancing of firms' debt by equity issuing is from then on very difficult, since it is reinforced by the fall in profits described in Kalecki's law. Share buy-backs support financial profitability, and this financial constraint complicates the crisis ending. Equation (c) is an alternative formulation of the investment equation with a demand-accelerator close to Samuelson's. The *J* and m_2 statistics respectively point out that the instruments are valid and that the serial correlation of the residuals is excluded. These GMM models thus seem acceptable.

4.2 Financial Investments

Table 4 specifically shows the role of the return of various financial assets in firms' financial investments and especially for Merger and Acquisition. These investments correspond to financial assets acquisitions both in terms of minority interests and in terms of external growth, but as explained above, only for financial assets paid in cash. One notes the importance of the increasing pressure on this kind of investment through financial profitability. Indeed, the positive link between the past trend of the *ROE* and financial investment supports this hypothesis. According to equation (d), a surge in *ROE* from 10% to 13%, in proportion to the fluctuations observed at the beginning of the last two investment cycles ("technological", 1996-2003, and "subprime", 2004 until now) implies a 24.85 points increase in the growth rate of financial investments (equation (e)). Thus, the upward trend in financial profitability since the beginning of the 1990's seems to have important consequences on the participation of firms on financial markets. More specifically, financial investment strongly speeds up during an ascendant phase in a financial cycle, with the decrease of perceived risk and the role of the shareholder value principle.

Consequently, as for productive investment, the growth rate of profit positively impacts financial investment, and when profits drop during the falling phase of the financial cycle, due to the decline in productive investment, financial investment is clearly revised downwards. According to equation (e), a 5% decrease of the growth rate of gross profit generates a 5.62% decrease in the growth of financial assets acquisitions. As expected, the coefficient of apparent rate of interest is negative (cf. equation (d)). The firms wishing to get into debt so as to increase the common equity return via the return on bought equities, do even more so as the debt cost is weak. Consequently, the rise in the debt ratio is positively connected to financial accumulation, as a financing source for this kind of activities, as

shown by equation (e). Thus, a 5% rise in the debt ratio $\frac{L}{OF}$ induces a 4.07 points increase in the growth rate of financial investment. There again, the J and m_2 statistics result in validating the GMM models.

(Table 4)

4.3 Indebtedness Function

The tests on debt demand from firms are reported in Table 5. Both equations (f) and (g) show a negative link between the variation of apparent rates of interest and companies' debt. In addition, they also demonstrate the positive role played by the trend in financial profitability. Thus, with financialized capitalism, the considerable level of financial profitability required by shareholders generates a clear tendency for firms to exploit the financial leverage effect via an increase in debt leverage in the strictest sense, namely $\frac{L}{OF}$. According to equation (g), a 3% increase in the *ROE* induces firms to carry on resorting to debt leverage in the strictest sense through a 5 points increase in this last ratio, so as to satisfy shareholders. This result thus supports the idea that a strong tendency to financial endogenous fragility appears when debt cost decreases and financial euphoria grows. This situation then generates a period of debt reduction which reveals a certain weakness due to the reversal of financial assets prices.

(Table 5)

Lastly, companies' debt finances all fixed assets K (tangible and intangible), and a positive relation is thus obtained between the stock of fixed assets and the debt ratio tested. The J

and m_2 statistics fail to reject the null assumptions of the variables overidentifying and of the autocorrelation of the residuals, the models can consequently be accepted.

4.4 Equity issuing

To finish, the equations of share issuance presented in Table 6 follow the two assumptions of equation (10). First of all, a debt growing period is compatible with an increase in equity financing in spite of the objectives of high *ROE*, because of the huge needs for funds during the ascendant phases of a financial cycle, especially for M&A operations. These two objectives can be compatible if equity issuing remains lower than the debt increase. Equation (i) clearly shows a positive link between the debt ratio $\frac{L}{OF}$ and the rate of growth of issued equities. In addition, the bearish period in a financial cycle goes with debt reduction for firms and profits losses, consequently financial profitability plummets. Given the shareholder value principle, the major groups buy-back shares to maintain the ROE. As a consequence, our result supports the idea that in the patrimonial regime, firms find it difficult to limit the decrease in their investment (and thus in employment) during a financial crisis, because the destinations of cash-flow are strongly constrained by shareholders requirements.

Secondly, the issue of shares certainly meets the financing need of capital accumulation, but we have highlighted here the financing of intangible capital in particular. As seen above, in their model and starting from Kaldor's equation (Kaldor, 1966), Lavoie and Godley (2001-2002) postulate that these issuances are proportional to the accumulation of fixed assets during the period. Nevertheless they have specified that this formulation seems to them far too simplifying. Following Toporowski (2000a), we have worked on the assumption that

these are Mergers and Acquisitions, i.e. operations of external growth, which are mainly financed by the issue of shares. Through the consolidated balance-sheets, one of the ways to test such a link is to retain the accumulation of goodwill which is reported in intangible assets item, as a substitute variable (i.e. as a proxy). The coefficient obtained is positive and very significant (equations (h) and (i)). Hence we can assert that a 5% increase in the stock of intangible capital implies a 0.94 point increase in the growth rate of the stock of issued equity. The J and m_2 statistics lead us to validate the models.

(Table 6)

Conclusion

Financial power coming back thus has very clear consequences on the financialization of companies' strategies, whether it concerns their investment plans or their financing decisions. Firms, and in particular the big quoted groups, must fulfill the requirements of financial return established by convention on financial markets. We wished to check these assertions, based on post-Keynesian and Regulationists assumptions, starting from the consolidated accounts of groups which are members of the SBF 250 French Index. These accounts and the resulting tests bring new lessons as well as confirmations, compared to the studies on French firms usually carried out from the national accounts of INSEE. They both confirm that the norms of financial profitability have a negative impact on productive investment for these groups, and show the very positive impact of these norms through financial leverage on financial investment and debt. This proves the reality of an endogenous financial fragility in a period of strong expansion. Lastly, these tests have demonstrated that the issues of shares respond to two particular constraints: financing the external growth

considered as necessary to a fast increase in financial profitability, and limiting indebtedness when its growth generates a risk of insolvency.

Notes

1. Kalecki declared: "Another factor which influences the rate of investment decisions is the increase of profit per unit of time. A rise in profits from the beginning to the end of the period considered renders attractive certain projects which were previously considered unprofitable and thus permits an extension of the boundaries of investment plans in the course of the period.", Kalecki (1954), p. 97.

2. Sectors' names and corresponding labels are given in the Appendix.

3. The function used for the tests is the xtabond2 command developed by Roodman (2003).

4. Namely $\Delta P/P_{-1} \approx \Delta Log\, P = 1\%$.

5. Since $I/K = -0.051\ Log\, r$ according to equation (a) with sectoral dummies; for a shift of r from 4% to 3%, $\Delta I/K = -0.051 \times Log\,(0.03) - (-0.051 \times Log\,(0.04)) \approx 1.47$ point.

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Table 1: Descriptive statistics

	Means	**Standard deviations**	**Number of observations**
FA	123.735	678.734	3191
P	525.037	1687.426	3191
Y	1456.842	3179.29	2747
K	2802.146	9015.941	3192
Ki	999.896	3116.601	3189
E	790.008	2785.173	3191
ROE	0.186	0.426	3091
r	0.050	0.256	3091
I/K_{-1}	0.220	0.610	2938
L/OF	0.555	2.060	3184

Notes: The first column reports sample means. Standard deviations are in second column. The studied period is 1990-2008.

Table 2: Determination of the variables and correspondences in Worldscope database

Variable	Corresponding Worldscope Data
I	04601 Capital Expenditures + 04351 Disposal Of Fixed Assets + 04651 Additions To Other Assets + 04450 Other Uses
FA	04355 Net Assets From Acquisitions + 04760 Increase In Investment - 04440 Sale Of Investment - 04796 Other Investment Sources + 04795 Other Investment Uses
P	07240 Net Sales or Revenues + 01051 Cost Of Goods Sold - 01101 Selling, General and Administrative Expenses - 01020 Other Operating Expenses
Y	P + 01084 Staff Costs
K	02501 Property plant and equipment - Net + 02652 Total Other assets - 02648 Other assets
Ki	02652 Total Other assets - 02648 Other assets
L	- 02001 Cash and Short term Investment + 03051 Short term Debt and Current portion of long term debt + 03251 Total Long Term Debt + 18183 Deferred Taxes Credit + 03273 Other Liabilities
E	03480 Common Stock + 03481 Capital Surplus
OF	E + 03493 Other Appropriated Reserves + 03497 Unrealized Foreign Exchange Gain/Loss + 03495 Retained Earnings + 03499 Treasury Stock + 03401 Non Equity Reserves + 03061 Dividends Payable + 03260 Provision for risk and charge + 03426 Minority Interest + 03451 Preferred Stock
r	(01251 Interest Expense On Debt - 01016 Interest Income – 01255 Interest Capitalized) / L
ROE	(P - 01151 Depreciation, Depletion and Amortization Expenses - 01149 Amortization Of Intangible - 01701 Preferred Dividend Requirements + 01253 Extraordinary Credit Pretax + 01262 Other Income/Expenses Net - 01254 Extraordinary Charge Pretax - 01301 Reserves Increase/Decrease + 01505 Discontinued Operations + 01503 Equity In Earnings + 01267 Pretax Equity In Earnings + 01601 Extraordinary Items & Gain/Loss Sale Of Assets + 01504 After Taxes Other Incomes Or Expenses) / OF

Notes: In right column are presented the corresponding Worldscope items and the database's associated number.

Table 3: Alternative specifications of productive investment's determinants

1989-2008

Dependant variable : I/K_{-1}	**(a)**	**(a) with sectoral dummies**	**(b)**	**(b) with sectoral dummies**	**(c)**	**(c) with sectoral dummies**
$\Delta Log\ P$	0.125** (0.052)	0.116** (0.051)	0.111* (0.038)	0.094* (0.035)	-	-
$\Delta Log\ \Upsilon$	-	-	-	-	0.249*** (0.15)	0.218*** (0.125)
$(L/OF)_{-1}$	-	-	-0.008*** (0.004)	-0.011** (0.006)	-	-
$\Delta\ ROE$	-0.045** (0.018)	-0.044** (0.018)	-	-	-0.050* (0.018)	-0.050* (0.018)
$Log\ r$	-0.065*** (0.034)	-0.051** (0.025)	-	-	-	-
sic0	-	0.012 (0.017)	-	0.050 (0.040)	-	0.028 (0.029)
sic1	-	-0.023 (0.021)	-	-0.017 (0.018)	-	-0.013*** (0.007)
sic2	-	-0.008 (0.005)	-	-0.004 (0.003)	-	0.001 (0.006)
sic4	-	-0.020*** (0.011)	-	-0.006 (0.007)	-	-0.009 (0.008)
sic5	-	-0.011*** (0.005)	-	-0.002 (0.008)	-	-0.035 (0.023)
sic7	-	-0.020 (0.017)	-	-0.030 (0.023)	-	-0.009 (0.012)
sic8	-	-0.063 (0.049)	-	-0.109 (0.066)	-	-0.073 (0.046)
sic9	-	-0.022 (0.016)	-	0.006 (0.008)	-	-0.007 (0.007)
Number of firms	205	205	210	210	209	209
Sample size	1918	1918	2525	2525	2135	2135
m_2	1.13	1.20	0.98	0.96	1.22	1.20
(critical prob.)	(0.257)	(0.231)	(0.329)	(0.336)	(0.222)	(0.229)
J (p-value)	148.85	152.10	124.42	131.53	101.51	94.72
(critical prob.)	(0.352)	(0.286)	(0.422)	(0.262)	(0.256)	(0.431)

Notes: The figures reported in parentheses are asymptotic standard errors. m_2 statistic corresponds to the Arellano & Bond test for second-order serial correlation under the null hypothesis of no serial correlation. The *J*-statistic corresponds to the Hansen test of the overidentifying restrictions, under the null hypothesis of instrument validity. Concerning equation (a), $\Delta Log\ P$ is lagged from one to three times, ΔROE is lagged twice, and $Log\ r$ from one to four times. In (b), $\Delta Log\ P$ and $(L/OF)_{-1}$ are both lagged from one to four times. In (c), $\Delta Log\ \Upsilon$ is lagged from one to four times and ΔROE from one to two times. For each specification, a second equation is proposed, with sectoral dummies. The sic_j variables correspond to the sectors considered by the SIC classification (*sic3* is the reference sector and *sic6* is not introduced because it corresponds to the financial sector). *Indicates significance at the 1% level. **Indicates significance at the 5% level.***Indicates significance at the 10% level.

Table 4: Alternative specifications of financial investment's determinants

1989-2008

Dependant variable : $\Delta Log\ FA$	**(d)**	**(d) with sectoral dummies**	**(e)**	**(e) with sectoral dummies**
$\Delta Log\ P$	1.414*	1.247*	1.167*	1.124**
	(0.433)	(0.464)	(0.437)	(0.477)
$Log\ ROE_{-1}$	1.163*	0.902**	1.002*	0.947*
	(0.444)	(0.364)	(0.374)	(0.359)
$\Delta\ (L/OF)$	-	-	0.766*	0.814*
			(0.180)	(0.181)
r	-0.791**	-0.709***	-	-
	(0.385)	(0.363)		
sic0	-	-1.687*	-	-1.968*
		(0.159)		(0.148)
sic1	-	-0.123	-	-0.037
		(0.102)		(0.097)
sic2	-	0.157	-	0.137
		(0.145)		(0.136)
sic4	-	-0.140	-	-0.103
		(0.160)		(0.154)
sic5	-	0.322	-	0.331
		(0.334)		(0.330)
sic7	-	-0.109	-	-0.059
		(0.182)		(0.178)
sic8	-	-0.476**	-	-0.709*
		(0.237)		(0.230)
sic9	-	-	-	-
Number of firms	172	172	172	172
Sample size	910	910	921	921
m_2	0.25	0.23	0.12	0.11
(critical prob.)	(0.804)	(0.815)	(0.901)	(0.916)
J (p-value)	104.41	104.05	117.03	113.94
(critical prob.)	(0.262)	(0.270)	(0.218)	(0.282)

Notes: In equation (d), $\Delta Log\ P$ is lagged once, $Log\ ROE_{-1}$ is lagged form one to three times, and r is lagged twice. In (e), $\Delta Log\ P$ and $\Delta(L/OF)$ are both lagged once and $Log\ ROE_{-1}$ is lagged from one to five times. The *sic9* sector is automatically dropped in the equations with sectoral dummies because of collinearity.

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

Table 5: Alternative specifications of indebtedness equations

1989-2008

Dependant variable : $\Delta L/OF$	**(f)**	**(f) with sectoral dummies**	**(g)**	**(g) with sectoral dummies**
$\Delta Log\ K$	0.710*	0.640*	-	-
	(0.264)	(0.236)		
$Log\ r_{-1}$	-0.444***	-0.346***	-0.514***	-0.380***
	(0.254)	(0.208)	(0.282)	(0.220)
ROE_{-1}	1.688**	1.669**	1.710**	1.681**
	(0.790)	(0.797)	(0.798)	(0.802)
sic0	-	-0.202	-	-0.199
		(0.158)		(0.166)
sic1	-	-0.090	-	-0.118***
		(0.058)		(0.070)
sic2	-	0.067	-	0.052
		(0.041)		(0.039)
sic4	-	-0.026	-	-0.045
		(0.067)		(0.069)
sic5	-	0.022	-	0.023
		(0.031)		(0.031)
sic7	-	-0.247***	-	-0.249***
		(0.142)		(0.142)
sic8	-	0.034	-	0.058
		(0.067)		(0.062)
sic9	-	0.189	-	0.299***
		(0.152)		(0.162)
Number of firms	207	207	207	207
Sample size	2017	2017	2017	2017
m_2	1.07	1.07	1.05	1.06
(critical prob.)	(0.285)	(0.283)	(0.295)	(0.290)
J (p-value)	173.08	177.50	166.14	168.59
(critical prob.)	(0.298)	(0.223)	(0.146)	(0.118)

Notes: In equation (f), $\Delta Log\ K$ is lagged once, $Log\ r_{-1}$ and ROE_{-1} are both lagged from one to five times. In (g), $Log\ r_{-1}$ and ROE_{-1} are both lagged from one to five times.

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

Table 6 - Alternative specifications of equity issuing

1989-2008

Dependant variable : $\Delta Log\ E$	**(h)**	**(h) with sectoral dummies**	**(i)**	**(i) with sectoral dummies**
$\Delta Log\ Ki$	0.181*	0.180*	0.191*	0.188*
	(0.061)	(0.062)	(0.066)	(0.066)
$(L/OF)_{-1}$	-	-	0.013**	0.012**
			(0.006)	(0.006)
sic0	-	0.145***	-	0.083*
		(0.076)		(0.031)
sic1	-	0.010	-	0.007
		(0.014)		(0.015)
sic2	-	-0.001	-	-0.001
		(0.010)		(0.010)
sic4	-	0.005	-	0.006
		(0.016)		(0.016)
sic5	-	-0.032*	-	-0.032*
		(0.011)		(0.010)
sic7	-	0.006	-	-0.001
		(0.015)		(0.015)
sic8	-	-0.043***	-	-0.045**
		(0.023)		(0.022)
sic9	-	-0.035	-	0.030
		(0.052)		(0.045)
Number of firms	213	213	213	213
Sample size	2694	2694	2686	2686
m_2	1.04	1.04	1.00	0.99
(critical prob.)	(0.297)	(0.300)	(0.317)	(0.322)
J (p-value)	55.59	54.73	53.32	53.15
(critical prob.)	(0.183)	(0.205)	(0.277)	(0.283)

Notes: In equation (h), *Log Ki* is lagged from one to three times. In (i), *Log Ki* is lagged once and $(L/OF)_{-1}$ is lagged from one to two times. *Indicates significance at the 1% level. **Indicates significance at the 5% level. ***Indicates significance at the 10% level.