
Article:
Rabinovich, J orcid.org/0000-0002-9175-0848 (2020) Financialisation and the 'supply-side' face of the investment-profit puzzle. Journal of Post Keynesian Economics. ISSN 0160-3477

https://doi.org/10.1080/01603477.2020.1734463

Financialisation and the 'supply-side' face of the investment-profit puzzle

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Acknowledgements: Earlier versions of this paper have been presented at the YSI Europe Convening in Trento (June, 2018) and the EAEPE conference in Nice (September, 2018). The paper has benefited from discussions there and from comments by Marc Lavoie, Engelbert Stockhammer, Federico Bassi, Ceciliia Rikap, Reeves Johnson and Niall Reddy. All errors and omissions remain the sole responsibility of the author.

Abstract: The high level of profits along with low levels of gross physical investment has been characterized as a puzzle in heterodox economics. One of the most extended answers at the firm level is that changes in corporate governance have altered the objectives of the firm towards profits, rather than growth. However, once it is acknowledged that investment becomes the basis upon which companies supply commodities as well as compete with other firms, an ever decreasing rate of investment should not be compatible with permanent high levels of profits. This is what we call the 'supply-side' face of the investment-profit puzzle. The article builds on the post-Keynesian theory of the firm and its investment decision and explores different answers already linked to the financialisation literature such as changes brought about by production outsourcing, increased market power, the attack on labor conditions and financial accumulation. Once these solutions are critically assessed, an extension to the theory is proposed in order to show that firm's profitability has been detaching from its physical investment decisions.

Keywords: Profit, Investment, Financialisation, Globalisation, Monopolisation.

1. Introduction

One of the salient features associated with the finance-dominated accumulation regime in developed economies has been the coexistence of high levels of aggregate profits with low levels of gross fixed investment (simply investment in the rest of the article); a 'profits without accumulation' situation which has been experienced by the economy in general (Cordonnier, 2006) and the nonfinancial sector in particular (Durand & Gueuder, 2018, p. 127). According to Milberg and Winkler (2013, p. 218), this phenomenon "is well documented but not well theorized", and has been defined as a puzzle by different scholars as it runs counter to economic intuition (Epstein, 2015; Orhangazi, 2018; Stockhammer, 2005, 2008).

Besides the conceptual framework or theory, investment is, at the same time, a source of effective demand as well as an addition to current and future capacity which allows the firm to produce and compete with others. Therefore, in relation to profits, investment represents a realization of present profits and is a basis upon which future profits will be made. Moreover, the quest for profitability is a fundamental determinant of investment, while different theories in mainstream and non-mainstream economics indicate that profits also serve as a preferred source to finance investment, compared to external ones.

Figure 1 illustrates these various relations in a very abstract way, i.e., setting aside whether they operate at the micro or macro level as well as the possible inconsistencies among them (for this, see Seccareccia, 2010). For instance, the theory of loanable funds would posit the second arrow as the causality at the macro level. For the post-Keynesian theory, on the contrary, "it is clear that capitalists may decide to consume and to invest more in a given period than in the preceding one, but they cannot decide to earn more. It is, therefore, their investment and consumption decisions which determine profits, and not vice versa" as famously put by Kalecki (1954/2010, p. 46). Therefore, in the post-Keynesian framework, arrow 3 is the relevant one at the macro level while the rest operate at the micro level.

[FIGURE 1]

The four channels indicate that profits and investment have a double sided relation which should be positive. This is why a weakening link between them since the 1980s represents a very puzzling situation. By looking at Figure 1 we can also realize that, rather than being *a* puzzle, the current weakening relation in fact involves *various* puzzles simultaneously that correspond to each arrow. These questions are: a) why are firms not investing in spite of high profitability?, b) what are they doing with those funds?, c) which alternative sources of effective demand compensate the reduction of investment at the aggregate level? and d) how can they remain profitable with their capacity to supply goods and one of their main weapons in competition diminished?

At the aggregate level (answering question c), different post-Keynesian studies have analyzed the sources of effective demand that compensate the reduction of investment in the macroeconomic level, following Kalecki's profit equation (Kalecki, 1954/2010 ch. 3). Examples of this are the increase in capitalists' consumption (Cordonnier, 2006), expenditures cascades (Behringer & Van Treeck, 2013; Frank et al., 2014) or government deficits and external surpluses (Van Treeck, 2009).

At the firm level, the post-Keynesian literature has analyzed the puzzle largely as an outcome of the introduction of the maximization of shareholder value as guiding principle of corporate behavior. According to this narrative, the hostile take-over movement and changes in payment structure in the 1980s aligned managers' interests with those of shareholders, shifting firms' goals of retaining and reinvesting towards downsizing and distributing (Lazonick & O'Sullivan, 2000). These changes are usually referred to as the financialisation of the firm (Van der Zwan, 2014) -the definition followed in this paper- and have spurred several empirical studies which showed its negative consequences on real investment (Barradas, 2017; Clévenot et al., 2010; Hecht, 2014; Orhangazi, 2008; Stockhammer, 2004; Tori & Onaran, 2018b).

However, within a firm-level analysis, in this paper we will show that the theoretical problem of the financialisation explanation is that while it can answer questions a) and b), it provides no solution and actually goes against question d). The narrative needs to account not only for the distribution of funds to shareholders *instead of*, but also *in spite of* not investing them; and hence needs to be necessarily linked to other explanations at the firm-level. Moreover, the macro-oriented solutions are insufficient as they explain the sustained demand for goods and services but not how firms are still able to adequately deliver them in the first place. Overlooking the question concerning firms´ ability to remain profitable with a reduced capacity to supply goods and one of their main weapons in competition diminished is what we call the *supply-side* face of the investment-profit puzzle.

We will base our analysis on the post-Keynesian theory of the firm and its investment decision, presented by Wood (1975) and continued by Lavoie (1992) and others, to illustrate that in order to maintain high levels of profit with low levels of investment, the *supply-side* face of the investment-profit puzzle has to be properly addressed. That means coupling financialisation with other sources of productive capacity and competitive skills achieved by the firm that allow it to increase production and/or prices and/or reduce costs per unit of investment.

In this paper we discuss a (non-exhaustive) list of answers which have already been associated, to different degrees, with the financialisation of the firm. The redistribution against labour and

the shift towards financial accumulation are the main explanations found in the literature. The former is a salient feature associated with financialisation as a regime of accumulation (Hein, 2010; Hein & Vogel, 2008; Onaran et al., 2011; Stockhammer, 2008; Stockhammer et al., 2009), while the latter is sometimes used even as a synonym for the financialisation of the firm (see Rabinovich, 2019). We also discuss the links between financialisation and outsourcing (Auvray & Rabinovich, 2019; Durand & Gueuder, 2018; Milberg, 2008; Milberg & Winkler, 2009, 2013), increasing market power (Durand & Gueuder, 2018; Durand & Milberg, 2019; Orhangazi, 2018) and, finally, the possibility that the puzzle is an accounting artifact. With these insights we propose an extension to the Post-Keynesian model of the firm that captures the increasing decoupling of firm's profitability from its gross fixed investment decisions.

The paper is organized as follows. Section 2 revises the post-Keynesian theory of the firm and its investment decision under financialisation together with the empirical literature that supports it. Section 3 presents the supply-side face of the investment-profit puzzle, while Section 4 discusses possible answers. Section 5 integrates them into the model and reformulates it. We finally provide some concluding remarks.

2. The post-Keynesian theory of the firm and its investment decision under different regimes of accumulation

2.1. Theoretical insights

The representative firm analyzed in post-Keynesian economics is what Eichner (1976) defined as the 'megacorp', an organization characterized by a) a separation of management from ownership, b) carrying its production within multiple plants, and c) operating in an oligopoly market and setting prices, rather than taking them as given. In fact, price competition tries to be avoided in oligopolistic markets given its harmful effects on profits. As Baran and Sweezy (1966, p. 63) put it, "price competition is normally taboo in oligopolistic situations" so competition is shifted to other tools such as advertising, sales campaigns and innovation (Kalecki, 1954/2010).

While neoclassical models based on Tobin's q (Brainard & Tobin, 1968) are derived from a standard model of a perfectly competitive firm that maximizes shareholders' net wealth over multiple periods of time and faces adjustment costs in changing its capital stock (Hayashi, 1982), the post-Keynesian theory has a different perspective. Rather than maximizing profits under technological constraints as in neoclassical economics, firms maximize growth under financing constraints (Melmiès, 2016, p. 159).[1] Investment therefore allows firms to fulfill its main objective of growth. Besides the role given to unexpected changes and institutional factors that could originate swings in investment -the so-called "animal spirits"-, the post-Keynesian literature recognizes that investment is largely determined by the fact that it provides the capacity to produce the goods needed to fulfill the expected growth in demand (Eichner, 1976; Wood, 1975).

[1] The idea of maximization is contested. In a context of fundamental uncertainty, the firm may seek overall satisfactory performances, rather than maximizing ones (Koutsoyiannis, 1975; Lavoie, 2014).

Another determinant of investment decisions is the possibility to finance it, as we said. Internal funds have a more relevant role for post-Keynesian theory *vis-à-vis* neoclassical. Contrary to the Modigliani-Miller (1958) principle of capital structure irrelevance for which investment decisions are independent of financial factors, Kalecki (1954/2010) early identified the importance of financing constrains and, specially, the role of internal funds or firm's gross savings for investment decisions, what he called the entrepreneurial capital. In the works of Eichner (1976) and Wood (1975) the profit margin is set, for instance, according to the necessity to finance investment.[2] These internal funds additionally determine the amount a firm is able to borrow following a principle of 'increasing risk': higher leverage gives more volatility and uncertainty to future earnings, whilst it also increases the risk of capital loss in the event of bankruptcy (Wood, 1975, p. 30).

These various constraints and determinants surrounding investment decisions were put together by Wood (1975), Eichner (1976), Harcourt and Kenyon (1976) and later synthetized by Lavoie (1992) based on Wood's formulation and other post-Keynesians and Institutionalists (Penrose, 1959; Sylos-Labini, 1971). The general framework regarding the theory of the firm's investment decision is therefore presented in a two-curve graphical analysis that picks on the two main determinants we have briefly discussed: the financing of investment –represented as a finance frontier (FF)– and the growth possibilities –represented as an expansion frontier (EF)– following Lavoie's terminology. Additionally, the model is thought for the long run, at least in its original formulation by Wood, defined as three-to-five year moving average (Wood, 1975, p. 2) and at normal capacity use (Wood, 1975, p. 61).

Before going to the presentation and discussion of both curves, it is important to clarify one distinction between early post-Keynesian's formulations (Eichner, 1976; Galbraith, 1968; Harcourt & Kenyon, 1976; Wood, 1975) and those coming later (Dallery, 2009; Dallery & Van Treeck, 2011; Hein & Van Treeck, 2010; Lavoie, 1992, 2014; Stockhammer, 2004, 2005). Early post-Keynesians stated that the objective of the firm is to grow in terms of sales -gross or net- (Eichner, 1976, p. 23; Galbraith, 1968, p. 200; Wood, 1975, p. 62). In Wood's model, for instance, this variable is endogenous (see for example Wood, 1975, p. 83). Investment is defined by an 'investment coefficient' that indicates the amount of investment needed to obtain the growth in sales defined by the model. In later post-Keynesians analysis, growth is defined as capital accumulation. The difference may seem trivial but its relevance will become clear once we develop our critique in Sections 3 and 4. In the rest of this section we will follow Lavoie (2014) and specially Dallery's (2009) notation in order to discuss the current state of the theory.

The FF represents the finance constrain of the firm and shows the maximum level of investment that can be achieved with a certain amount of profits or, similarly, the minimum amount of profit needed to carry out an investment project. It is derived, basically, from a relation between sources and uses of funds:

$$s_f(\Pi - iD) + x_s I + x_d I = I + x_f I \qquad (1)$$

[2] And this is why both of them belong to what has been termed the 'investment financing' theory of profits which is a different theory of profit margins from that of other early post-Keynesians such as Kalecki and Robinson (for a detailed analysis see Melmiès, 2016).

The left side of equation (1) represents the sources of funds where s_f is the retention ratio, Π firm's profits, i the interest rate, D issued debt, I net physical investment and x_s and x_d are, respectively, net new equity and net new debt, expressed as a ratio of net physical investment.

The right side of equation (1) represents the uses of funds where, apart from net physical investment, x_f represents net financial investment as a ratio of net physical investment. Equation (2) is obtained by dividing everything by the stock of capital and rearranging terms, which gives the equation of the FF:

$$r = g\left(\frac{1 + x_f - x_s - x_d}{s_f}\right) + id \qquad (2)$$

Where $r = \Pi/K$, $g = I/K$ and $d = D/K$. Equation (2) indicates a positive relation between investment and profits since, as the latter grows, the firm is able to finance an increasing amount of investment. A higher retention ratio (s_f), net equity (x_s) or debt (x_d) issued will allow the firm to achieve higher levels of investment with a certain amount of profits while growing financial investment (x_f) or interest payments (id) will go in the opposite direction. These parameters should therefore be interpreted as targeted values that will allow the firm to grow at a pace g.

The other constituent of firm's investment decision is the EF which gives the maximum rate of profit that can be expected at a certain level of accumulation. The literature usually portrays it with a concave shape and a positive slope segment in order to indicate that, up to a certain point, there is a positive relation between expected profits and investment due to dynamic economies of scale and scope that allow firms to obtain higher profit rates with increasing accumulation.[3] However, beyond that point a negative relation arises because of two reasons. First, due to the limitations of management to handle the speed of expansion (the Penrose effect). Second, because the firm would expect reduced profit rates if it wants to grow at higher rates and compete for market share with other firms. It is usually assumed that the firm decides in the segment of the curve where the trade-off exists since, before that point, it can achieve higher rates of growth and profit at the same time.

Figure 2 illustrates both curves and the broad different equilibriums that might appear under two regimes of accumulation: M (for Managerial Capitalism) and F (for Financialisation). This distinction recognizes the changes brought about by financialisation in the relations among different groups within the firm which motivated further developments in the post-Keynesian theory of the firm (Dallery, 2009; Dallery & Van Treeck, 2011; Hein & Van Treeck, 2010; Stockhammer, 2004, 2005).

[FIGURE 2]

Ending in M or F depends on the power struggle between shareholders and managers according to Stockhammer (2004). He assumes that while the former focus on profit, the latter prefer growth. The equilibrium M associated with r^* and g^* belongs to the so-called managerial capitalism, where managers have a higher degree of freedom from shareholders in order to pursue growth strategies. Consequently, they may choose (g^*, r^*) that maximizes the rate of

[3] In Wood's original formulation, the EF (or opportunity frontier as he defined it), was concave but did not have a positive slope segment.

growth of the firm given the finance constrain. On the contrary, when shareholders become more powerful, that is, when the firm financialises, they can force managers to follow a lower growth strategy, g^{**} associated with a higher rate of profit, r^{**}.

However, as noted by Dallery (2009), financialisation has further implications for the firm, in particular for parameters in equation (2) (Figure 3). Shareholders do not necessarily consider the profit rate, or the whole amount of profits earned by the firm, as their main objective but, rather, the part of those profits that can be claimed by them, the free cash flows (FCF). Graphically, the maximization of FCF (g_{FCF}, r_{FCF}) implies maximizing the gap between the FF and the EF, determining the retention ratio (s_f) as a residual. Without reaching that extreme point, shareholders might push for higher dividends (lower s_f), lower issuance of net new equity (lower x_s) or greater indebtedness (higher d). All in all, these different alternatives will shift the FF upwards with the associated (g_1, r_1).

Finally, shareholders might also be interested in maximizing the firm's value on the market. In this case, since firm's value has a positive relation with its growth, shareholders also have to take into account capital accumulation. Considering that the maximization of firm's value implies calculations over an infinite span of time and the absence of relevant knowledge in order to do so, firms follow rules of thumb such as the well-know 15% return on equity (Dallery, 2009, p. 511). The result of this strategy of maximizing shareholder's wealth might imply a combination similar to (g_1, r_1). Whether the final location is (g_{FCF}, r_{FCF}) or (g_1, r_1) will depend on the objectives of shareholders: the more short-termed, the closer to (g_{FCF}, r_{FCF}).

[FIGURE 3]

After presenting the post-Keynesian theory of the firm and its investment decisions under financialisation, the next section will revise the empirical literature that deals with the effect of financialisation on investment.

2.2. Empirical findings

As it is presented in Equation (1), the literature recognizes two broad channels by which investment is affected. The first, what Fiebiger (2016) calls the drain side of financialisation, has implied a heightened transfer of earnings from non-financial corporations to financial markets through stock buybacks, interest and dividend payments. The definition we are following of financialisation -the negative consequences of the maximization of shareholder value- is basically represented by this channel. The second channel, what Fiebiger (2016) calls the pull side of financialisation, and Rabinovich (2019) partly refers as the *financial turn of accumulation* hypothesis, has implied an enlarged acquisition of financial assets from which NFCs derive a growing proportion of financial income. This channel is reminiscent as well of Krippner's definition of financialisation where "profit-making occurs increasingly through financial channels rather than trade and commodity production" (2005, p. 181).

Whether the drain side or the pull side, the idea is that both channels have a negative impact since financial payouts, including interest expenses, represent a drain of resources that could be used for investment purposes while financial income is obtained from financial investment which crowds out real investment. Following these hypothesis, a prolific empirical literature, both econometric and non-econometric, appeared since the early 2000s with the aim of

estimating those channels. Most studies have been restricted to advanced economies and, among them, especially the USA. For this country, studies using aggregate data find negative effects for both channels on capital accumulation which are not always significant nevertheless (Onaran et al., 2011; Stockhammer, 2004; Tomaskovic-Devey et al., 2015; Van Treeck, 2008). Similar findings are reported on studies using firm level data (Auvray & Rabinovich, 2019; Davis, 2017; Hecht, 2014; Orhangazi, 2008; Schoder, 2014), while additionally showing differentiated effects according to the size of the firm. For bigger firms, Orhangazi (2008) finds that financial payouts and financial income present a negative and significant effect on capital expenditures which is 50% higher than for small firms. Davis (2017) also finds a negative and significant effect of financial payouts for larger firms. From a mainstream perspective, Gutiérrez and Phillipon (2017) show that investment is weak relative to Tobin's *q* since the early 2000s and find tighter governance to be significant both at the industry and firm level. This tighter governance is related to those changes in corporate governance that promote buybacks as in the financialisation literature.

Without relying on econometric studies, Krippner (2005, p. 185) documents an increase in the proportion of financial income which, according to her measure, has gone from less than 10% in 1950 to 40% in 2001. In their highly-cited paper Lazonick and O'Sullivan (2000) indicate how, during the 1980s and especially in the 1990s, the principle of retain and reinvest shifted towards downsize and distribute. Consequently, an increased proportion of funds started to be transferred to shareholders through dividends and, especially for the USA, share buybacks expanded in detriment of investment in physical capital and human resources.

Findings for other advanced and even emerging countries go in similar direction. For the latter, Demir (2009) documents negative effects of the financial income channel for a panel of Argentinian, Mexican and Turkish firms. Stockhammer (2004) showed, using national accounts data, that increased financial income in the UK and France has been associated with lower rates of capital formation. The same finding, as well as for financial payouts, was derived from firm-level data in the UK and European countries by Tori and Onaran (2018a, 2018b). Barradas (2017), also with European firm-level data, finds positive effects of financial income and negative of payouts for capital accumulation. Similar differential effects in terms of positive financial income and negative financial payouts were found by Seo, Kim and Kim (2016) for a panel of Korean firms. Hecht (2014) used firm level data from China, France, Germany, Great Britain, India and Japan and found negative effects of financial profit in China, France, Germany, India and the USA. For France, Clévenot, Guy and Mazier (2010) measure financialisation by firms' financial asset accumulation and find it not to be negatively related to investment.

Besides the fact that all papers find at least one channel negatively affecting investment, the effect of the financial payout channel tends to be more robust through the literature, while the financial income channel is found to be positive in some papers (Auvray & Rabinovich, 2019; Barradas, 2017; Hecht, 2014; Orhangazi, 2008; Seo et al., 2016). However, even when focusing mainly on financial payouts, the vast majority of the *changes taken into account in the investment-profit relation seem to be limited to the FF,* as it is clear both from the theoretical and empirical review.[4] Still, it should also be taken into account whether or not these changes

[4] Dallery (2009) and Dallery and Van Treeck (2009) are notable exceptions which will be discussed in Section 4.

in the FF are sustainable from the point of view of the EF. This is at the core of what we defined as the supply-side face of the investment-profit puzzle and next section deals with it.

3. Still a (supply-side face of the) puzzle

In spite of the various empirical findings that confirm the trade-off between payouts and investment previously exposed, other theoretical problems arise and have been surprisingly under-studied.

As Dallery (2009, pp. 500–501) correctly puts it: "it seems that the trade-off is not between profits and investment, or between profit rate and accumulation rate. The trade-off under study may be between today's profitability and tomorrow's profitability. Considering this trade-off raises the puzzling question of shareholders preferences in terms of accumulation, because tomorrow's profitability depends on today's accumulation". Similarly, Lavoie (2014, p. 136) also states that "[p]rofitability and expansion are thus tightly related. Firms can grow because they make profits that allow them to finance their expansion. But, reciprocally, the growth of firms allows them to be profitable."

As we indicated in Figure 1, investment not only provides the possibility to expand capacity but serves as well as a competitive weapon in the struggle against other firms. Wood (1975, p. 68), for example, clearly highlights this aspect: "Investment expenditures thus play a double role, a fact of which companies are well aware. On the one hand it provides the extra capacity needed to supply any given increase in demand. On the other, it is a way of improving the firm's efficiency or 'trade position' – a weapon in the competitive struggle to attract demand at the expense of other firms." Moreover, according to Eichner (1976, p. 88), investment is not just another weapon in competition but it actually replaces price competition under oligopolistic conditions.

The work done by Crotty (1993, 2017), Crotty and Goldstein (1992) and Goldstein (2009) picks on this aspect of investment. Their *growth-safety* model identifies the different dimensions related to investment decisions we have discussed so far: the need to grow and to finance that growth along with the risks that finance implies. Management seeks growth and safety, being positively and negatively associated with investment respectively. The negative relation with safety is because investment has to be financed and, eventually, management's autonomy and/or the survival of the firm can be threatened by shareholders or creditors. However, if the intensity of competition reaches a point in which the results are not minimally acceptable, a managerial firm does not decrease investment given that it has an imperative to survive. Therefore, it will engage in "a coercive invest-or-die model" (Crotty, 1993, p. 16) as many US firms did in the 1970s and part of the 1980s according to this narrative.

However, this explanation does not seem to be valid nowadays since it stresses the determinants of high investment with low profits while the current situation is the opposite. As put by Baragar and Chernosmas (2012, p. 35), "[w]ith high profits, low interest rates, and large quantities of retained corporate earnings, firms are clearly not financially constrained from undertaking additional investment projects. Substantial positive net savings by these corporations also suggest internally determined investment restraint... In short, Crotty's dual classification appears inapplicable to the recent conjuncture".

Besides being considered in some analysis, the little attention received by the 'supply-side' face of the puzzle is probably related to the fact that post-Keynesian economics focuses rather on the 'demand-side' of investment. This may explain why studies on the mechanisms that allow profits to remain high despite low levels of investment have relied on the alternative sources of effective demand that compensate the reduction of investment at the macroeconomic level. These other sources of effective demand can be traced down to Kalecki's profit equation (1954/2010 ch. 3) and Erdös & Molnár (1980) distinction between paper and material profits, i.e., profits generated by trade surplus and budget deficit vs. investment and consumption respectively. Consequently, theoretical and empirical work has been done on the increase in consumption, fuelled either by capitalist expenditures and/or debt (Behringer & Van Treeck, 2013; Cordonnier, 2006; Cordonnier & Van de Velde, 2014; Cynamon & Fazzari, 2008; Dallery & Van Treeck, 2011; Frank et al., 2014) as well as government deficits and external surpluses (Cordonnier, 2006; Stockhammer, 2008; Van Treeck, 2009).[5]

Although these are necessary conditions at the macroeconomic level, from a 'supply-side' point of view, the maintenance of high profits with low investment is still puzzling. The insufficiency of the demand-side explanations relies on the fact that, while they account for the maintenance of a demand for the goods and service produced by firms, they cannot explain how firms are still able to adequately supply them. Figure 4 takes the example of US firms to illustrate this point. All rates with the exception of gross average accumulation show a declining trend since the 1980s, with even negative rates for the median net accumulation since the early 2000s. Taking the case of the median as an example of a representative firm, a permanent reduction in its own productive facilities should eventually endanger its capacity to produce those commodities from which profits are obtained as well as weaken its competitive position against other firms.[6]

[FIGURE 4]

This outcome can be represented in terms of the model in Figure 5. The fact that not only accumulation has continued decreasing since the formulations of the model under financialisation by Stockhammer (2004) and Dallery (2009)[7] -graphically, g^{**} moving to g^{***}- but also that some of the sharpest decreases happened after the Great Recession (Figure 4) puts forward the puzzling question of how firms avoided a downward shift in their EF. That means, how decreasing capacity to supply goods and compete with other firms brought about by feeble accumulation did not eventually endanger their profitability. Far from this outcome, in a paper dedicated exclusively to discuss trends, measurement and drivers of the rate of profit in the USA (to continue with the example we took), Basu and Vasudevan (2012) show that, except in one measure, there was a break in the declining trend in profitability in the early 1980s followed either by an increasing or trendless period. Figure A1 in the Appendix shows similar trends.

[FIGURE 5]

[5] The kind of macroeconomic analysis we make reference to should not be confused with that which studies different types of macroeconomic regimes under financialisation (such as Boyer, 2000; Hein & Van Treeck, 2010).

[6] Unless all firms are doing the same. However, this has not been the case worldwide.

[7] It could be argued that, by the time Stockhammer (2004) and Dallery (2009) wrote their papers, the rate of accumulation was not g** but a higher one and, since that moment, it has been decreasing towards g**. But then the question should be why they didn't chose g** in the first place.

In the next section we will review the different answers found in the literature.

4. Solutions to the puzzle

Sticking strictly to the model we discussed so far as well as the two properties of investment at the firm level from a supply-side point of view (capacity + competitive weapon), the answer for sustained high levels of profitability (and also payouts) with permanent low or even negative levels of net accumulation should be found in a combination of three elements. Firms ought to obtain increases in production and/or prices and/or decreases in costs per unit of investment, basically an increase in profits per unit of investment. Graphically, this implies an upward shift of the EF.

At this point, the distinction between growth in sales and growth in investment mentioned in Section 2 becomes more relevant. This is because the solution to the supply-side face of the investment-profit puzzle partly involves being able to sustain growth in revenue with a lower amount of investment. Whereas in the mid-1970s it could be argued "that the maximization of the rate of growth of sales or assets is a close approximation to the maximization of the growth of the corporate levy, and all three maximands can in most cases be used interchangeably." (Eichner, 1976, p. 24), this does not seem to be the case anymore. While Figure 4 indicated a decreasing rate of net (and sometimes gross) accumulation for US firms, Figure 6 shows that this did not happen hand in hand with a similar trend in the growth of sales. For a sample of firms with positive growth (65.9% of the total), the rate of growth in real sales in fact increased. For the whole sample of firms, growth remained roughly constant, when computed for the median, and only decreased for a weighted average. Alternative measures such as sales growth relative to investment (Figure A2) and sales per unit of investment (Figure A3) portray a similar picture. It should also be stressed that once the distinction between growth in sales and growth in capital stock is acknowledged, it is doubtful that managers had abandoned their growth (in sales) preferences.

[FIGURE 6]

Having shown that a lower or even negative growth in net accumulation has not been matched by a similar trend in growth in sales -at least in the US setting-, we will next review some potential explanations for this phenomenon as well as the other possible answers we mentioned: increases in price and/or decreases in costs per unit of investment. All of them have already been associated, to different degrees, with the financialisation literature in general and that of the firm in particular -although not explicitly acknowledging them as a solution to the type of question raised in this article.

a. Worsening labor conditions and financial accumulation

We put together these answers not because they are necessarily related to each other, but due to the fact that they are the two main explanations provided by the financialisation literature to the supply-side face of the puzzle. Dallery (2009) claims that the EF can be shifted upwards by worsening labor conditions. The attack on wages and labor conditions with the distributive changes it brought about are one of the salient features associated with financialisation (Hein, 2010; Hein & Vogel, 2008; Onaran et al., 2011; Stockhammer, 2008; Stockhammer et al., 2009).

This answer is relevant for cost management but nevertheless seems unable to explain a firm's capacity to sustain permanent or increasing growth in sales. One way around this problem is by linking increased wage pressure and labour flexibility to a higher utilisation rate and a more intensive use of productive capacities, as done by Dallery (2009).

Another widespread alternative provided by the financialisation literature is a higher proportion of financial profits generated by NFCs due to their investment in financial assets (Davis, 2016; Krippner, 2005), what Rabinovich (2019) calls the *financial turn of accumulation* hypothesis. Stockhammer (2004, p. 727), for example, puts together the increased profitability and distribution of funds to shareholders along with a turn to financial accumulation: "[i]f our story were true, one would expect that managers and consequently non-financial businesses to identify increasingly as rentiers and hence also to behave as such. We should expect higher dividend payout, lower growth and more financial investment by nonfinancial businesses." Translating this hypothesis into the model, the idea would be that financial accumulation does not only affect the FF *but also the EF* by providing alternative sources of profits.

However, Fiebiger (2016) asserts that, for the USA, FDI is classified as a financial asset in the national accounts, thus used as evidence for financial accumulation when its increase would rather support the thesis of an internationalization of the NFC (as it will be shown in the next section). In a similar fashion, Rabinovich (2019) shows, also for the USA, that the empirical evidence to sustain the idea of a financial accumulation is misguided as it mistakenly considers some assets to be financial (intangibles, goodwill, FDI), also inaccurately assumes some types of income to be financial (dividends from domestic and international subsidiaries) and overestimates the weight of that income in total income (3.5% at most, not 40%). Nevertheless, this overestimation at the macroeconomic level does not deny that certain NFCs do pursue a business model oriented towards financial accumulation (Froud et al., 2006).

b. Production outsourcing

The pioneering works of Milberg (2008) and Milberg and Winkler (2009, 2013) addressed the relation between outsourcing of production and financialisation: by outsourcing production, firms decrease their need to invest, being therefore able to distribute those funds to shareholders. Further work in this direction has been done by Fiebiger (2016, pp. 360–361) who indicated that "the claim of the shareholder value literature that managers of US NFCs abandoned their growth preference cannot be asserted without considering the sector's entire operations." Auvray and Rabinovich (2019) show that the negative correlation between payouts and investment is stronger for those US firms belonging to high offshoring sectors.

Studies on financialisation have traditionally focused on the relation between the 'real' and the financial sector and its effects on investment, paying comparatively less attention to other phenomena that might affect investment and profits such as the globalization of production. For example, Dallery (2009, p. 494) states that contrary to "Crotty (1993) who addresses globalization through increased competition, I approach here globalization through its second dimension: the increasing power of finance." Krippner (2005) considers the claim that financialisation might reflect spatial relocation of production but dismisses it because results from domestic economy dominate the trend for the global measure. Also Duménil and Lévy (2011, p. 301), when discussing the conditions for an alternative postcrisis US and international

scenario, make reference to investment and globalization of production. Yet, while the decrease in investment is associated with financialisation, globalization of production is associated with trade deficits in the US and global imbalances.

However, explicitly taking into account the global nature of contemporary capitalism is a way to solve the 'supply-side' face of the investment-profit puzzle by allowing higher production (when it is done by other firms) and lower costs per unit of investment. The reconfiguration of global production has allowed big NFCs to focus on some activities considered as core or strategic (development and design, trans-divisional research, technology and business intelligence) while dropping the non-core ones, usually with low value creation (Gereffi et al., 2005; Lee & Gereffi, 2015; Schwörer, 2013; Serfati, 2008). The latter are carried, most of the time, through arm-length relations with various suppliers all over the world, over whom the leading firm establishes a monopsonic relation (Milberg & Winkler, 2013). As put by Dzarasov (2016, p. 148), "financialized corporations have largely shifted the burden of production to others." These suppliers not only compete among each other but also face leader's terms of payments, its standards of just-in-time production and absorb risks associated to the volatility of sales (Baud & Durand, 2012; Melmiès & Dallery, 2014). For the big NFC, outsourcing could therefore be thought of as a decision that has the benefits of investment (increased production) but without its costs (sinking funds). Through outsourcing, big NFCs smooth the dependence on their own internal productive capacity and hence their link between investment and profits.

c. Increasing market power

Big NFCs that outsource part of their production not only establish an asymmetric market structure with their various suppliers, but also manage to exercise increasing oligopoly power as sellers (Milberg & Winkler, 2013). In fact, since the 1990s, some trends have been pointing towards an increasing oligopolization of the economy. First, economic globalization, technological innovation and deregulation triggered a merger wave in the 90s with the European and Asian takeover market becoming more important and cross-border transactions growing substantially (Martynova & Renneboog, 2008), consequently increasing concentration levels and declining competition (Diez et al., 2019; Grullon et al., 2019; Kahle & Stulz, 2017). Second, there has also been an increase in the common ownership of competitor firms by a group of big institutional investors, therefore reducing their incentive to compete (Azar et al., 2018). Third, also since the mid-90s, there has been a growth in a historically-specific type of monopoly, related to the privatization of knowledge and its transformation into firms' assets: intellectual monopolies (Pagano, 2014).

In fact, different scholars have linked a rent-seeking strategy with intangible investment. Orhangazi (2018) identifies four distinct functions of intangible assets. First, intangible assets such as patents can generate absolute monopolies for certain products. Second, in industries such as high-technology and telecommunications they can act as barriers to entry. Third, assets like brand names and trademarks enhance pricing power. Finally, assets like copyrights for software can generate artificial scarcity for products that have a cost of reproduction that tends to zero. Schwartz (2016) and Durand and Milberg (2019) highlight the role of intangibles as enablers in the coordination of and value extraction from global value chains. While global competition pushes downward the share of value captured in the production segments, stricter international IP norms put upward pressure on both sides of the chain (R&D, design in the first

part; marketing and after-sales in the last one) generating the so-called smile curve. Similarly, Rikap (2018) argues that leaders in global value chains appropriate the intellectual rents of the innovation networks they organize taking Apple as a case study. Both the rising role of intangible assets and mergers and acquisitions has been documented by Rabinovich (2019) for the US setting and offer another prospective way to solve the puzzle.

d. Illusory puzzle

Finally, it could be argued that part of the puzzle is rather related to different measurement issues. First, if calculated using national accounts, the puzzle could be exaggerated since investment done under FDI would be missing (Fiebiger, 2016). This is because, in the case of in-house offshoring, investment carried out by international subsidiaries is still made by the firm but in a different country. Although this is an issue when using national accounts, it is not the case when working with consolidated financial statements for the parent company along with its national and international subsidiaries (as we did in Figures 4, 6 and the Appendix).

Second, the decrease in the investment-profit ratio might be the side effect of the declining prices of investment goods relative to other prices in the economy (see for example Lian et al., 2019). However, the highest decrease in relative prices is verified for machinery and equipment (excluding transportation) and, within this category, communications and computing equipment (Bachman, 2015; Lian et al., 2019, p. 81). As a consequence, it is only machinery and equipment (excluding transportation) where a decrease in the nominal investment-to-GDP ratio comes with a rise in the real measure. Moreover, this increase does not compensate for the real shrinkage in structures[8] in advanced economies (Lian et al., 2019 see Annex 3.2).

5. The model redefined

The solutions to the supply-side face of the investment-profit puzzle discussed in the previous section lead us to the conclusion that firms have experienced non-negligible modifications in the EF. To recall, the upward-sloping part of the EF was related to the dynamic economies of scale and scope that allow a higher rate of profit with increasing accumulation. However, it will eventually reach a point where those economies of scale and scope end and the profit rate is maximized. Beyond that point, higher rates of accumulation imply entering in the downward-slope of the EF where managerial inefficiencies show up (due to the size of the firm) as well as the need to reduce prices when fighting for market share.

To the best of our knowledge, even though the different papers assume a concave shape, no one has provided a functional form for it. We propose one simple possibility, already dividing by the stock of capital, with the purpose of introducing the different variables that capture the dynamics we have been discussing so far. This is:

$$r = -\omega.(g-\mu)^2 + A \qquad (3)$$

Equation (3) follows the definition of the expansion frontier: the maximum level of profit that can be expected by the firm at a given rate of investment. It is also flexible enough to represent

[8] Authors do not distinguish between residential and nonresidential.

the different shapes of the EF, either with an increasing segment or not, by introducing only three variables affecting the relation between the rate of profit and accumulation.

The first, μ, represents the point where the economies of scale and scope related to increasing accumulation stop and the profit rate is maximized. If we go back to the distinction between managerial capitalism and financialisation, it could be argued that a rate of accumulation close to μ would be preferred by shareholders.

The second new variable, ω, captures the sensitivity of the profit rate to the current rate of accumulation: higher values of ω will make the profit rate more reactive to changes in the rate of accumulation. For simplicity we put only one variable even though it implies (rather unrealistically) symmetric upward and downward slopes.

Finally, we include variable A which captures other exogenous effects that shift the EF upwards or downwards. Higher values of A mean firms are able to attain higher profitability at every single rate of accumulation. All the different solutions we found to the supply-side face of the investment-profit puzzle are mainly (but not only) represented by this variable.

As previously noted, Dallery (2009) indicated that the EF can be shifted upwards due to wage contraction and higher capacity utilization. By providing an explicit functional form for the EF we are able to incorporate the broader spectrum of previously discussed options. While outsourcing increases production and decreases costs per unit of investment, intangible accumulation is associated with market power that increases prices per unit of investment. This is also the case of mergers and acquisitions. In terms of financial accumulation, firms lending to their clients are able to achieve higher sales. As a result, in these cases, the EF is shifted upwards ($A_1 > A_0$).

[FIGURE 7]

However, it is also the case that the more a firm relies on external suppliers and the more it shifts to intangible or financial accumulation, the less responsive its current profit rate is to its tangible accumulation. In our model this implies a lower value of ω ($\omega_1 < \omega_0$) which flattens the EF. Greater M&A activity will also affect the shape of EF in the case the firm is able to exploit economies of scale and scope. Figure 7 illustrates the new EF comparing it both with the original one and with that of Figure 5 (i.e., the result of a permanent decrease in investment without the solutions discussed so far).

Likewise, the FF will also be affected. Besides the decision to offshore part of the production in arm-length basis which does not compromise internal funds, the choice to carry an intangible investment or acquire another company do represent additional uses of funds. Equation (4) illustrates this:

$$s_f(\Pi - iD) + x_s I + x_d I = I + x_f I + x_i I + x_{aq} I \qquad (4)$$

This is the same equation as (1) but with those other uses indicated on the right side: x_i and x_{aq} are, respectively, intangible investment and acquisitions expressed as a ratio of net physical investment. We could also explicitly divide total profits (Π) into financial (Π_f) and nonfinancial (Π_{nf}) as the former represent an additional source of funds which helps lowering the financial

constraint of the firm. For simplicity and in order to keep only one variable in the vertical axis we continue using total profits so the equation of the new FF will be:

$$r = g\left(\frac{1 + x_f + x_i + x_{aq} - x_s - x_d}{s_f}\right) + id \qquad (5)$$

Positive values of either term will imply a higher slope of the FF, i.e., the level of physical investment that can be achieved with a certain amount of profits will be lower. It is worth highlighting that while the shift to intangible investment and the organization of global value chains represent novel phenomena and therefore were not considered by Wood's original formulation, the cases of mergers and acquisition were discussed by the author but left aside as they were eventually considered irrelevant (Wood, 1975, pp. 20–24). However, the increasing role that mergers and acquisitions have nowadays requires us to explicitly take them into account.

[FIGURE 8]

Figure 8 shows the FF and the redefined EF redefined along with the case in which a firm increases payouts to shareholders and reduces investment. Starting from a specific accumulation and distribution rate (g_a, r_a) the firm decides to permanently use a higher proportion of funds for distribution and less for investment, going therefore to (g_b, r_b). Given the current way in which global production is organized, the firm is able to carry out this decision without threatening its rate of profit and, therefore, $r_a \approx r_b$.

6. Conclusion

Financialisation as a current stage of capitalism is characterized, among other things, by the concomitance of low levels of investment with constant or increasing profit rates in developed economies. Taking into account the expected positive relation among them, the current situation has been defined as the 'investment-profit puzzle'. Once the different relations between profit and investment are taken into account, it can be seen that, at the firm level, the puzzle involves various puzzles or simultaneous questions: 1) why are not firms investing in spite of high profitability?, 2) what are they doing with those funds?, 3) how can they remain profitable with their capacity to supply goods and one of their main weapons in competition diminished?

This article has not been the first to address these questions, not even to propose answers to them. The main contribution of this article has been, on the contrary, to show theoretically the need to provide comprehensive answers which are able to tackle, simultaneously, all the questions listed before.

One common answer has emphasized the role played by the maximization of shareholder value as guiding principle for corporate governance, by downsizing and distributing -the definition of financialisation we have followed. The theoretical problem of this explanation is its inability to answer question 3), and thus the need to be linked with other reasons for firm's maintained capacity to supply demanded goods and to compete with other firms, i.e., the two roles of investment from a supply point of view.

This side of the puzzle can be solved by recognizing that nowadays big NFCs' supply capacity and competitive abilities are becoming partly detached from gross fixed investment and depending more on other variables. The main answers provided by the financialisation literature are worsening wages and labor conditions, and financial accumulation. The former undoubtedly plays a relevant role in terms of cost management but the general validity of the second has been lately put into question. Other response discussed in this paper is the delocalization of production through global value chains which allows firms to be less dependent from their own production facilities and decrease costs. Increasing market power through mergers and acquisitions and intangible accumulation also allow firms to attain higher mark-ups, therefore being part of the explanation.

Overall, this paper reinforces the need to keep on developing the multiple dimensions involved in the theory of the firm and leaves open questions for the future as well. The first is to what extent the changes described in this paper are a permanent feature of the 'new megacorp' or could be reverted when facing a context of increasing demand rather than the current stagnation. Second, the paper points towards the need to broaden the scope of what is considered to be productive investment, as Eichner (1976, pp. 88–89) had already done. Third, the paper also points towards the need to keep on reflecting on the changes brought about by the financialisation of the firm. Wood (1975, pp. 8–9), for instance, distinguished financial from non-financial firms based on whether they tried to maximize the present value of future earnings or their size, respectively. While neoclassical theory attributed the former to all firms, he saw this objective as belonging only to financial firms. Fourth, the empirical evidence presented in this paper is mainly explorative, future research should study more carefully the links between investment and current NFC´s capacity to deliver final goods and compete with other firms, tracking more carefully the evolution of those links over time as well as their sectoral specificities.

This last point is of major relevance. In most macro heterodox papers, investment is usually modeled as depending on some measure of profits, expected growth in sales and capacity utilization. While this paper does not deny these links, it claims that they have been weakened and therefore the conclusions of those models might be flawed.

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Appendix

Figures

Figure 1. Main relations between profits and investment

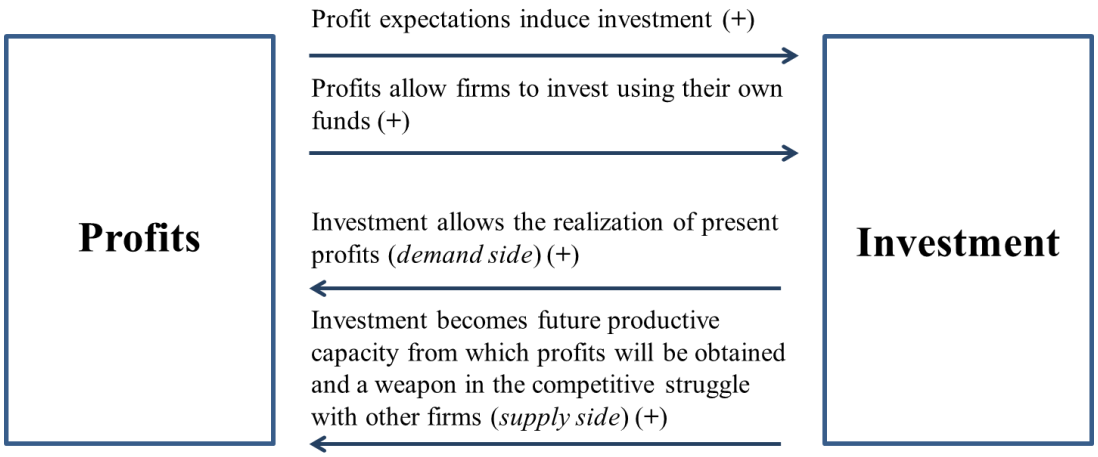


Figure 2. Post-Keynesian Firm under Managerial Capitalism and Financialisation

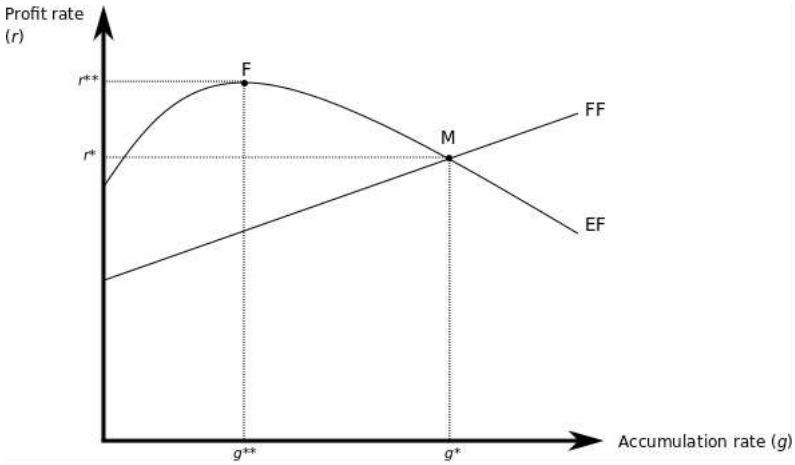


Figure 3. Post-Keynesian Firm under different scenarios in Financialisation

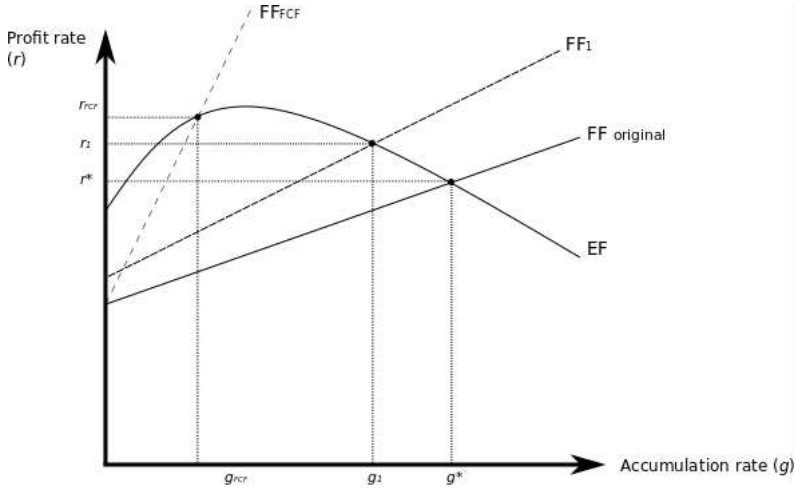
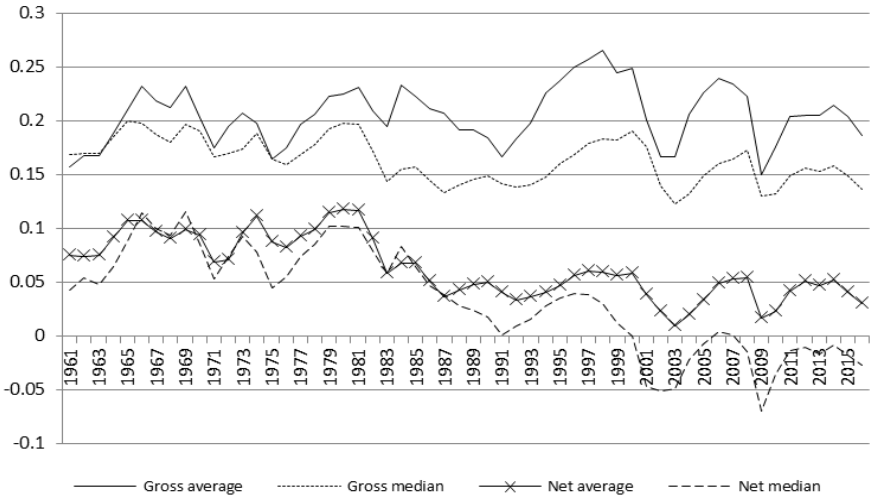


Figure 4. Rate of physical accumulation



Note. Median and average of gross physical accumulation calculated as capital expenditures (Compustat Data Item 128) over net property, plant and equipment (Compustat Data Item 8). For the net measure, depreciation (Compustat Data Item 14) is subtracted from capital expenditures. US nonfinancial listed firms, duplicates removed. Weighted average is calculated according to the net stock of property, plant and equipment.
Source. Compustat North America.

Figure 5. Post-Keynesian firm under permanent reduction in the rate of accumulation

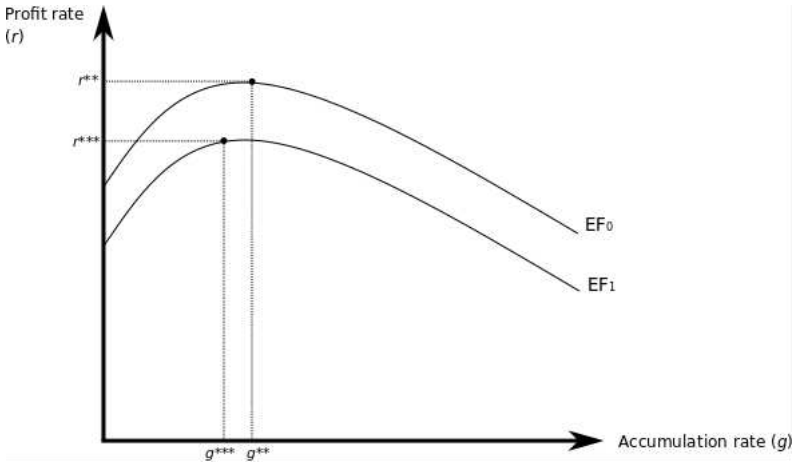
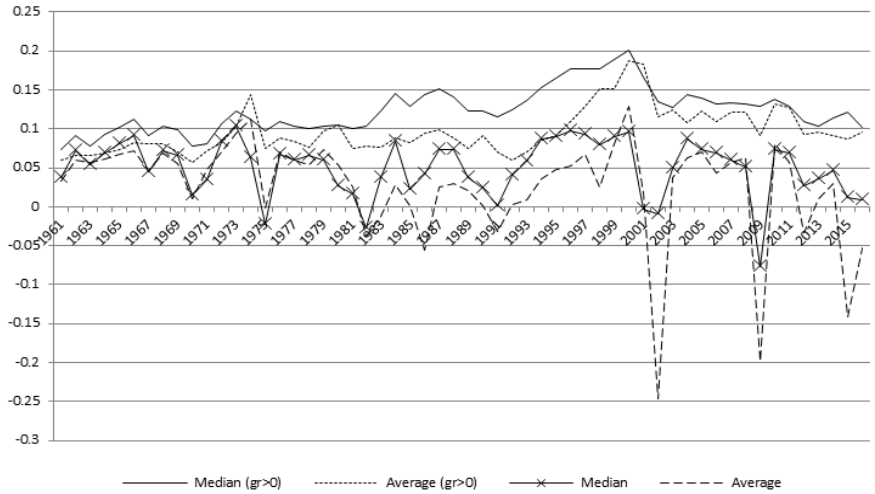


Figure 6. Sales growth



Note. Sales growth calculated as the difference in real yearly revenues (Compustat Data Item 12) over sales. Variables deflated using GDP Implicit Price Deflator (Federal Reserve Bank of St. Louis). US nonfinancial listed firms, duplicates removed. Weighted average is calculated according to the net stock of property, plant and equipment (Compustat Data Item 8).
Source. Compustat North America.

Figure 7. The Expansion frontier reformulated

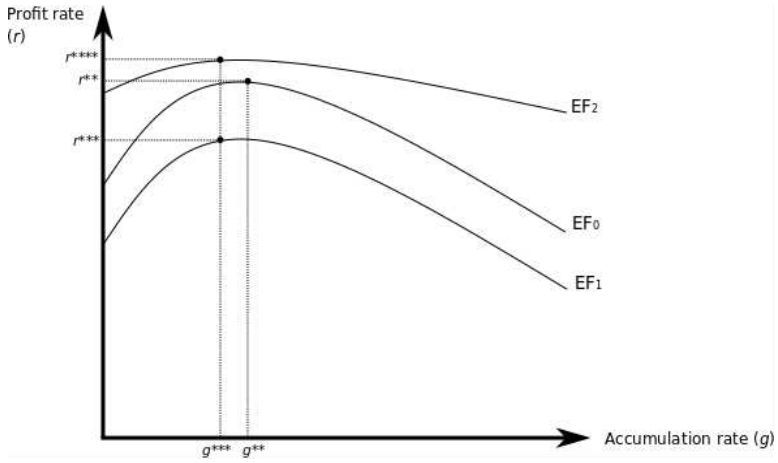


Figure 8. The model redefined

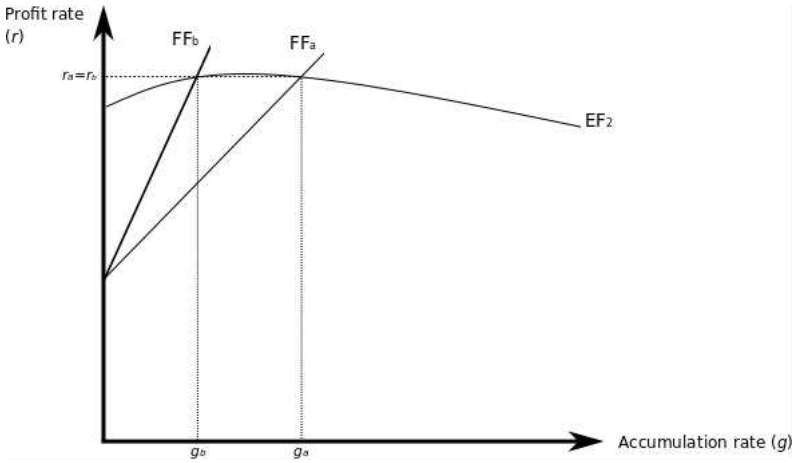
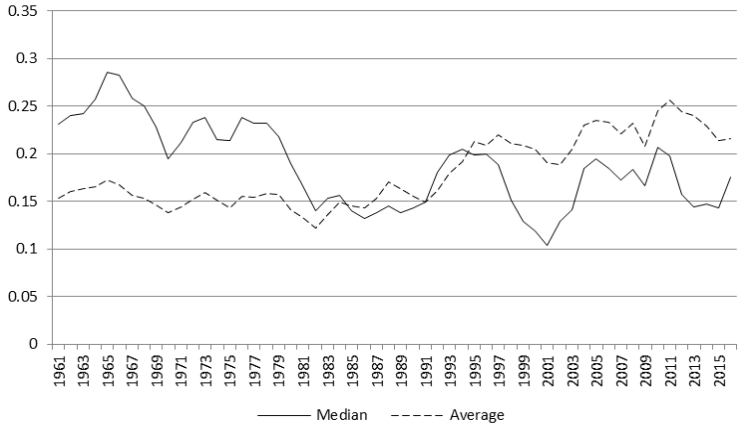
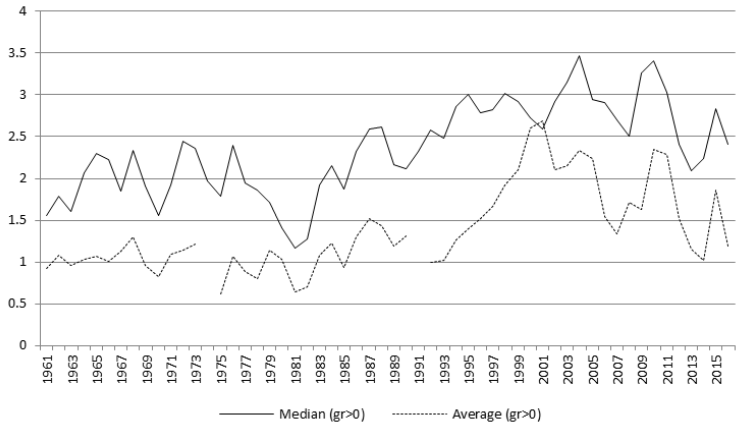


Figure A1. Profit Rate



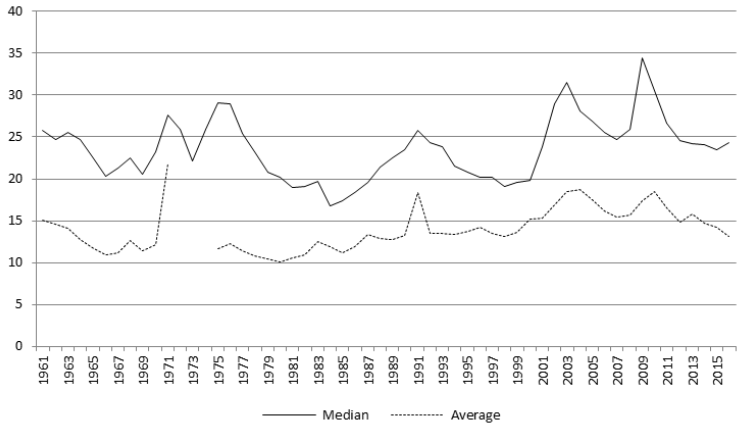
Note. Median and average of profit rate calculated as operating income before depreciation (Compustat Data Item 13) – income taxes (Compustat Data Item 16) – interest expense (Compustat Data Item 15) over net property, plant and equipment (Compustat Data Item 8). US nonfinancial listed firms, duplicates removed. Weighted average is calculated according to the net stock of property, plant and equipment.
Source. Compustat North America

Figure A2. Sales growth



Note. Sales growth calculated as the difference in real yearly revenues (Compustat Data Item 12) over capital expenditures (Compustat Data Item 128). Variables deflated using GDP Implicit Price Deflator (Federal Reserve Bank of St. Louis). US nonfinancial listed firms with positive growth in sales, duplicates removed. Weighted average is calculated according to the net stock of property, plant and equipment (Compustat Data Item 8). Averages for years 1974 and 1991 are not included due to their extremely high values arising from low investment (in the figure, the values for these years would be 27.97 and 7.59 respectively).
Source. Compustat North America

Figure A3. Sales per unit of investment



Note. Sales revenues (Compustat Data Item 12) calculated over capital expenditures (Compustat Data Item 128). US nonfinancial listed firms, duplicates removed. Weighted average is calculated according to the net stock of property, plant and equipment (Compustat Data Item 8). Averages for years 1972 and 1974 are not included due to their extremely high values arising from low investment (in the figure, the values for these years would be 35.61 and 61.12 respectively).
Source. Compustat North America