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The Impact of Short Selling on Firms: An Empirical Literature Review

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Abstract: This review surveys the existing empirical literature on the real effects of short selling on firms, addressing them through three main perspectives: corporate governance, financial decisions, and performance. The results of the (too) few empirical studies under scrutiny converge to a common rationale: a positive impact as a disciplinary mechanism on corporate governance and corporate investment policy and a positive impact on operating and corporate social responsibility (CSR) performance, even if some results are still puzzling. It appears that further investigations are necessary and should test the consequences of short selling on firms from a broader and more systematic perspective, with different theoretical and methodological approaches.

Keywords: short selling; real effects; corporate governance; investment; performance

JEL Classification: G14; G30; G34; G41

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1. Introduction

Short sellers are currently attracting considerable media attention as they target numerous well-known listed companies in various countries (e.g., Tesla in the USA, Casino in France). Dechow et al. (2001) describe a short sell as "a sale of a stock that one does not already own, but has borrowed from a brokerage house, a large institutional investor, or another broker-dealer. The short-seller establishes the position by selling the borrowed stock, and closes the position by buying the stock back at a later time, using the purchased shares to extinguish the initial loan of the stock." The goal of short sellers is to achieve a capital gain as a result of the decline of the target's stock price net of the borrowing costs.

Short sellers have been extensively identified as well-informed and sophisticated investors who contribute to market informational efficiency (e.g., Diamond and Verrechia, 1987). Short sellers also enhance market liquidity.

However, short selling has also been seen as endangering the stability of financial markets, causing downward price distortion (Hirshleifer et al., 2011), and increasing market volatility. It was even banned in many countries during the recent financial crisis (Massa et al., 2015b). As Massa et al. (2015a) put it, "the common wisdom in the literature is that short-term investors impose short-term goals; in other words, short-term shareholders doom companies to short-term investment and a lack of focus for the future." However, as informed investors, short-term investors can also reduce information asymmetry and convey better information about firms' long-term projects to the market. In fact, the (mainly negative) arguments about the impact of short selling on firms are based on beliefs rather than on factual evidence.

Based on the results of previous investigations, this literature review intends to assess whether and how short sellers can have a positive or negative effect on firm-level outcomes. A huge flow of empirical research has tried to identify the determinants of short selling in terms of size, growth, uncertainty of firm environment, firm complexity, ease of stock borrowing, market liquidity, overvaluation, earnings management, accruals management, CSR attributes, entrenchment—the list is not exhaustive. However, surprisingly few empirical papers[1] have actually focused on the real effects of short selling on firms, although the number has recently been growing. Here, we classify the results of the empirical research we have identified in terms of three main areas in which short selling impacts organizations: corporate governance, financial decisions, and ultimately firm performance.

2. The Impact of Short Selling on Corporate Governance

The studies that have investigated the impact of short selling on corporate governance also focus on two main aspects: firm misconduct and internal corporate governance.

2.1. The Impact on Firm Misconduct

This first stream of research relies theoretically on the traditional agency problem between managers and shareholders and specifically on firm managers' misconduct when they pursue their own interests and divert value at the expense of shareholders by manipulating corporate disclosure and earnings. The main question addressed by these studies is whether or not short sales constrain such malicious behavior. Massa et al. (2015b) have proposed two opposing assumptions based on agency theory. The disciplining hypothesis states that because short sellers increase price informativeness and potentially expose firm misconduct, their presence reduces managers' incentives to manipulate earnings by increasing the probability and speed with which the market uncovers earnings management. Conversely, the price pressure hypothesis stresses that the threat of potential bear raids can drive managers to manipulate earnings to avoid the attention of short sellers and the confounding impact associated with the downward price pressure of their trades.

Only one study supports the price pressure hypothesis. Li and Zhang (2015) show that in the U.S.[2], short-selling pressure and consequent stock price behavior have a causal effect on managers' voluntary disclosure choices. Specifically, they found that managers respond to a positive exogenous shock from short-selling pressure and price sensitivity to bad news by reducing the precision of bad news forecasts. In particular, they found that, in response to increased short-selling pressure, managers also reduce the readability (or increase the fuzziness) of bad news annual reports. They also observed that the effect of short-selling pressure on bad news forecast precision is more pronounced for smaller firms, firms with higher CFO compensation portfolio sensitivity to stock prices, and firms with lower analyst following.

[1] As far as we have been able to identify them.

[2] Most of the studies mentioned in this paper have measured short selling indirectly through the threat of short selling. Numerous countries used to ban or constrain short selling to eliminate stock price manipulation but have subsequently removed restrictions on short sales on randomly selected pilot firms for which short sales were authorized without any constraints (e.g., the SEC's 2004 approval of regulation SHO in the U.S.). This allows researchers to assess the effect of short selling by comparing the pilot firms that were more likely to be threatened by short sellers to the others.

All the other studies offer evidence supporting the disciplining hypothesis and suggest that short selling functions as an external governance mechanism to discipline managers and has a beneficial, rather than detrimental, effect on the corporate market. Clinch et al. (2018) found in the U.S. a significant increase in the likelihood of voluntary bad news management forecasts, and that firms provide these forecasts in a more timely manner. They also found that firms accelerate the release of quarterly bad earnings news. Each of these effects is stronger for subsamples of moderate (compared to extreme) bad news, firms facing high (compared to low) litigation risks, and firms that had a high likelihood of forecasting in the pre-Regulation SHO period (i.e., before January 2005).

Hirshleifer et al. (2011), Karpoff and Lou (2010), and Park (2017) have shown that short sellers attack firms that manipulate earnings or exhibit misconduct. Massa et al. (2015b) documented a significantly negative relationship between the threat of short selling and earnings management in 33 countries. Fang et al. (2016) revealed that in the U.S., an increase in the prospect of short selling increases the detection of financial misconduct (i.e., earnings management). They indicated that "the most plausible interpretation of our results is that the pilot program reduced the cost of short selling sufficiently among the pilot firms to increase potential short sellers' monitoring activities, and that the increased monitoring induced a decrease in these firms' earnings management". Deng et al. (2017a) in China tested the proposition that short selling has an attenuating effect on the politically motivated suppression of bad news. They examined the stock price behavior of Chinese public firms around visible Chinese political events and found that political bad news hoarding has been reduced since short selling became available. They also found this reduction in bad news hoarding to be more pronounced in firms with stronger political connections (higher state ownership and larger size) and higher accounting opacity, which further confirmed their findings.

One study (Chen et al., 2018) addresses another agency problem, the costs not of managers but of controlling shareholders at the expense of minority shareholders. This topic is of premium importance for the vast majority of countries (Continental Europe and Asia in particular) where ownership concentration is high compared to the U.S. or the U.K. (e.g., La Porta et al., 1999; Faccio and Lang, 2002). The founding intuition of Chen et al. (2018) is that short sales can also serve as a governance mechanism against controlling shareholders and prevent them from engaging in tunneling activities ex ante. "When controlling shareholders engage in the extraction of private benefits, short sellers can trade against the controlling shareholders' misconduct, leading to a stock price decline and damage to large shareholders' wealth" (Chen et al., 2018). Using the introduction of short sales in China, they showed that short sales curb expropriation by the controlling large shareholder: the removal of short sale constraints leads to a reduction of 7.35% in total related party transactions, 19% in industry-adjusted related party transactions, and 20% in exploitative related party transactions. The disciplinary effect is more pronounced for firms with higher ownership concentration and bankruptcy risk, and comparatively muted when alternative governance mechanisms are in place.

Finally, based on the results of the papers surveyed, it appears that short sales are an effective external corporate governance mechanism to discipline managers and controlling shareholders.

2.2. The Impact on Internal Corporate Governance

Massa et al. (2013) hypothesized that short selling increases, rather than reduces, shareholders' incentives to monitor managers ("governance through threat"). As short sellers threaten the payoff on exit, they incentivize shareholders to monitor internal governance and reduce the likelihood of bad actions in the first place. Their investigation, based on 23 developed countries, confirmed that the threat of short selling significantly enhances the quality of internal governance measured by a corporate governance index (RiskMetrics/ISS). This effect is stronger for financially constrained firms (i.e., those more dependent on equity markets for financing) and more pronounced in countries with weak institutional environments (i.e., weak governance regulations).

On the specific governance topic of the design of managers' incentive contracts, De Angelis et al. (2017) developed two competitive hypotheses. On the one hand, the "stock price informativeness" hypothesis states "since stock prices are more informative about agents' actions (in the presence of short selling), standard principal-agent models predict that firms should rely more on stock prices in the compensation contract by increasing the provision of performance incentives" (De Angelis et al., 2017). Massa et al. (2013) support this hypothesis, observing that the threat of short selling incentivizes investors to pay more equity-based compensation to align managerial incentives better.

On the other hand, the "bear raids threat hypothesis" stresses that "firms can increase the convexity of the compensation pay to mitigate the adverse effect of bear raids and decrease incentives that are linked to stock performance" (De Angelis et al., 2017). In the U.S., De Angelis et al. (2017) found that an exogenous removal of short-selling constraints causes firms to convexify compensation payoffs by granting relatively more stock options to their managers while simultaneously reducing the use of restricted stocks. They also observed that the firms increase their "entrenchment index," a measure of managerial entrenchment based on antitakeover provisions, and that threatened firms adopt new antitakeover provisions.

If internal and external corporate governance mechanisms are not monitoring firms' top management successfully, corporate boards can fire CEOs. Bennett and Wang (2018) and Kunzmann and Meier (2018) addressed the impact of short selling on CEO turnover in the U.S. and both found that the short-selling threat increases the probability of forced turnover. According to Bennett and Wang (2018), there are two channels through which this can happen: "Short selling reveals negative information and leads to forced CEO turnover, which we call the *revelation channel*; short sellers manipulate stock price and make CEOs more likely to be fired, which we call the *manipulation channel* [our italics]."

Bennett and Wang (2018) offer evidence that these two mechanisms coexist. Consistent with revelation, they found stronger effects when firms have more earnings management and fewer competitive product markets. Consistent with manipulation, they found stronger effects when firms have more growth opportunities and fewer blockholders. Evidence on long-run stock performance suggests that the manipulation mechanism dominates. Kunzmann and Meier's (2018) results support the revelation channel; they observed that CEO turnover does not seem to have lasting negative effects, since both stock and operating performance recover in the years that follow. In addition, Kunzmann and Meier (2018) found that the relationship between short interest and forced turnovers is stronger in the presence of shareholder activism, while it does not vary with different board characteristics, suggesting that shareholder activists are one channel for the effect.

Finally, it appears that short selling could be a complementary discipline mechanism to improve internal corporate governance and the monitoring of top managers but that conclusions about the impact on the design of incentivizing contracts are mixed.

3. The Impact of Short Selling on Financial Decisions

Financial decisions have been investigated by previous studies to assess whether or not short selling has real effects on the firm, specifically on corporate investment and more broadly on other financial decisions.

3.1. The Impact of Short Selling on Firm Investments

Massa et al. (2015a) proposed two alternative ways to consider the impact of short selling on investment decisions. On the one hand, short-term investors may reduce managerial short-termism as they know more and better than the market and so are able to lower the information asymmetry between the manger and the market. On the other hand, executives may adopt a short-term orientation because investors' horizons are short and they impose short-term goals. "These considerations suggest the existence of a positive relation between the presence of informed short-term investors in the market and the incentives of the firm to engage in value-creating long-term projects, which we can refer to as the 'watch-dog hypothesis,' as opposed to the alternative 'myopic (short-term) investor hypothesis' reflecting the traditional wisdom" (Massa et al., 2015a).

Grullon et al. (2015) in the U.S. support the myopic investor hypothesis. They found that investment declines for firms that experience an increase in short selling, especially small firms. Wong and Zhao (2017) similarly documented that short-selling firms in the U.S. reduce investing, financing, and payout activities significantly. Ni and Yin (2018) in China observed that the staggered removal of short-sale bans induces firms to adopt more conservative investment policies and significantly cut capital investment and R&D expenditures. Their results also suggested that as the magnitude of private benefits is constrained by governance mechanisms, controlling shareholders are less likely to adopt conservative investment policies at the expense of other investors.

However, these results can also been interpreted as a positive impact, as they put pressure on companies to reduce overinvestment (managerial myopia). Chang et al. (2015) in the U.S. have found that short selling has a disciplinary effect on overinvestment. They tested whether lending supply in the short selling market captures the amount of ammunition short sellers can use to profit from spotting managerial value-destroying overinvestment, with positive results. The higher the lending supply, the more severe the potential punishment (short-selling-induced price drops) managers might face. They also found that the disciplinary effect is more prominent for firms with high sensitivity to managers' wealth performance. They found that the lending supply will discipline overinvestment more effectively for firms in an industry in which a hostile takeover has occurred. This result shows that the effectiveness of the disciplinary force of short selling depends on the extent to which managers are worried about their job security, which reinforces the disciplinary interpretation. Based on similar data, Chang et al. (2019) focused their investigation on the governance effect of the threat of short selling on mergers and acquisitions, an important corporate real investment decision. They confirmed that acquirers with higher lending supply have higher announcement returns. This effect is stronger when acquirers are more likely to be targets of subsequent hostile takeovers and when their managers' wealth is more closely linked to stock prices. Deng et al. (2017b) revealed that in 14 countries where short selling is allowed and feasible, corporate investment dropped and investment allocation efficiency improved. Unexpectedly, Nezafat et al. (2017) in the U.S. showed that short selling leads to overinvestment and that the overinvestment problem is more severe for managers with strong short-term incentives and firms that lack quality investment opportunities. They found that short interest is strongly and positively associated with subsequent corporate investment, and the effects of short-selling activities on investment are greater when a firm's investment prospect is poor or when the sensitivity of CEO compensation to stock price performance is high.

Conversely, Gong (2016) in the U.S. found that the removal of short-selling constraints positively affects the firm's investment efficiency, that is, reduces corporate under-investment, increases investment sensitivity to investment opportunities, and reduces investment sensitivity to cash flow. Massa et al. (2015a) are also supportive of the watchdog hypothesis. In a study of the impact in 33 countries, they observed that the threat of short selling increases long-term (i.e., R&D) investment, reduces underinvestment rather than inducing overinvestment, and enhances the firm's future growth, performance, and innovation output by encouraging long-term investment. They found that short-selling potential affects R&D investment through both channels, more specifically, for firms with poor internal governance, firms from countries with weaker investor protection, younger firms, and for firms with less news coverage and more analyst forecasting errors. They also provided evidence of a positive feedback effect: the presence of short sellers in the market increases investors' sensitivity to the firm's stock price. Along the same lines, He and Tian (2016) in the U.S. showed that the threat of short selling has a positive impact on innovation (measured by patenting activities), "suggesting that short sellers mitigate managerial myopia and that the type of myopia that short sellers help to curb is related more to the underinvestment in resources contributing to the quality and value of long-term projects than to the underinvestment in resources increasing the quantity of such output."

All these studies mainly converge toward short selling having a disciplinary effect on managers who see investment decisions in terms of reducing overinvestment and/or underinvestment and supporting long-term value creation.

3.2. The Impact of Short Selling on Other Financial Decisions

Grullon et al. (2015) found in the U.S. that equity issues declined for firms that experienced an increase in short selling, especially small firms. Deng et al. (2017b) in a study of 14 countries similarly found that short selling reduces net debt and equity issues. In addition, Gong (2016) in the U.S. found that the removal of short-selling constraints increases equity issuance sensitivity to investment opportunities and reduces equity issuance sensitivity to cash flow. Finally, Ni and Yin (2018) in China observed that the threat of short selling induces firms to adopt more conservative financial policies. Firms significantly reduce equity financing and the leverage ratio, suggesting a reduction in not only the level but also the riskiness of external financing.

Wang (2018) studied the effect of stock short selling on corporate cash holdings in the U.S. and found that short sellers increase the cost of external financing and exacerbate financial constraints. Short selling functions as a catalyst for firms' financial distress and makes them more likely to suffer financial constraints, thus strengthening the precautionary motive for cash holdings (firms hold on to more cash as a hedge against periods when liquidity is urgently needed). This impact is stronger for firms that are more vulnerable to short selling, such as financially constrained firms and firms with more liquid stock, more short-term investors, and more product market competition.

4. The Impact of Short Selling on Performance

Three dimensions of firm performance have been investigated so far: growth, operating performance, and corporate social responsibility (CSR).

4.1. The Impact of Short Selling on Firm Growth

Broadly speaking, most of the studies surveyed in this paper are in the finance area, and their assumptions and hypotheses are based on the same theoretical premises with a positive a priori toward short selling. Conversely, the research of Shi et al. (2018) refers to a totally different theoretical framework—threat rigidity theory—a strategic theory with a negative a priori toward short selling. Threat rigidity theory explains two key managerial reactions to external threats. The first is a narrowing of their cognitive process that constrains their willingness and ability to process information and induces problem-solving rigidity. The second is the tendency to concentrate power and influence. This can lead to "more conservative investments, reductions in accepted risk, and the diminishing of long-term strategic commitments to fulfill short-term efficiencies" (Sirmon et al., 2008).

Building on threat rigidity theory assumptions, Shi et al. (2018) investigated the impact of the short-selling threat on firm growth. They found that firms undertake fewer and less diverse growth actions as their short-term interest increases. The negative relationship between short interest and the number as well as the diversity of growth actions is weaker when firms have high board centrality (board members' connections) and maintain sufficient financial slack (Kaplan–Zingales Index). In addition, the negative relationship between short interest and the number of growth actions is attenuated when firms have high absorptive capacity (R&D intensity measured by expenditure against annual sales revenue) and are well regarded in the media (news sentiment).

Conversely, Massa et al. (2015b) found that the threat of short selling increases the positive relationship between R&D and growth.

4.2. The Impact of Short Selling on Operating Performance

Even if the purpose of these investigations was not to assess the impact of short sales on operating performance (concentrating instead on other firm attributes such as earnings management or corporate governance), they nevertheless addressed this impact as a side effect. Massa et al. (2013) in 23 developed countries, Massa et al. (2015b) in 33 countries, Chang et al. (2015) in the U.S., and Kunzmann and Meier (2018) in the U.S. observed that short selling eventually leads to an improvement in firms' operating performance (return on assets). However, in an emerging market, China, Ni and Yin (2018) found a decrease in return on assets. They also found that the negative effect of short selling on firm risk-taking and performance is weaker among firms with less divergence between voting rights and cash-flow rights, a higher ratio of independent directors on the board, and higher liquidity, which facilitates the potential exit of external blockholders.

4.3. The Impact of Short Selling on Corporate Social Responsibility

Two alternative assumptions could be made about a firm's CSR behavior in the presence of increasing short-selling pressure. On the one hand, "managers [may] have incentives to create a positive firm image by enhancing CSR performance ... If a firm's engagement in CSR indicates less unethical behavior that may cause a future drop in share price, and/or it suggests lower future impact of bad news on its stock price, short sellers may be deterred from taking positions against the firm, since there will be less profit when the short selling position is closed" (Lu et al., 2016). On the other hand, "it is possible that, rather than enhancing CSR performance, managers may cut firms' efforts in CSR when facing increasing short selling pressure, for two reasons. First, CSR is a long-term investment with uncertain returns to firm values [...] and as a consequence, managers who care about short-term stock prices or operating performance may cut CSR spending and focus more effort on routine tasks that offer faster and more stable returns. Second, it is possible that managers invest in CSR for their own self-interests." (Lu et al., 2016).

Lu et al. (2016) and Rusinova et al. (2017), both in the U.S., detected a positive impact on CSR performance (measured by CSR scores constructed from the MSCI STATS database and KLD, respectively). Lu et al. (2016) found that the improved CSR performance by firms in their study is driven mainly by (1) stakeholder CSR, rather than third-party CSR; and (2) improvements in CSR strength, rather than reduction in CSR concerns. Lu et al. (2016) also observed that "the positive impact of short selling pressure on firm's CSR performance is more pronounced in an environment where the firm's CSR activities are emphasized by its stakeholders." Rusinova et al. (2017) found additional supporting evidence that short-term oriented firms reduce their CSR performance while long-term oriented firms increase their performance. They also found that the effect is moderated by firms' access to financing, with constrained firms reducing and unconstrained firms increasing their CSR performance.

From a narrower perspective in the CSR field, Brockman et al. (2017) investigated the impact of short selling on corporate employee relations in the U.S. "Since employees are a group of important stakeholders who can shape a firm's financial leverage, cash holding, and dividend policies, firm managers are likely to improve their employee-relation policies to avoid being targeted by short sellers" (Brockman et al., 2017). They found that firms respond to increased threats of short selling by significantly improving their employee relations, enhancing employee security to reduce the likelihood of negative announcements that might attract short-selling interest. They also showed that the largest employee-relation improvements occur among firms that operate in the high tech industry and have above-average levels of R&D intensity, product and labor market competition, financial leverage, and employment-specific litigation risk.

Lin et al. (2018) examined how short sellers affect workplace safety in the firm. They found that short-selling pressure causes an increase in employee injuries. This effect is more pronounced in firms with greater incentives to meet/beat predetermined targets, firms with higher analyst coverage, firms with more short-term institutional ownership, or remote establishments. Further analyses revealed that protection from a labor union can help to mitigate the negative effect of short-selling pressure on workplace safety. Overall, their findings indicated that short sellers emphasize pecuniary benefits but overlook nonpecuniary losses. The resultant cost is borne by the frontline employees.

The results of the (too) few empirical studies examined here converge to a common rationale—the positive impact of short selling as a disciplinary mechanism on corporate governance and corporate investment policy and a positive impact on operating and CSR performance—even if some results are still puzzling. As short-selling activity is increasing, further research on its impact is of tremendous importance to assess its economic relevance; it cannot simply be justified by its positive impact on market informational efficiency. Investigation of its real effects has largely been too narrow.

Most empirical data are from the U.S., a few from China, and very few from other countries. Moreover, most U.S. studies are based on the Security and Exchange Commission's (SEC) 2004 approval of regulation SHO between 2005 and 2007 and measure short selling indirectly through the threat of short selling. Most of the studies are also based on the traditional assumptions of financial theory. Further investigation should test the consequences of short selling on firms from a broader and more systematic perspective, with different theoretical and methodological approaches. Specifically, the impact of short selling on firm growth, operating performance, investment, and employment should be prioritized.

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