

INSTITUTIONAL INVESTORS AND STOCK PRICE VOLATILITY: A LITERATURE REVIEW

Ewa Blaszkę

Wrocław University of Economics and Business, Wrocław, Poland
e-mail: ewa.blaszke@ue.wroc.pl

ORCID:0000-0002-0194-034X

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Abstract: The purpose of this article is to provide an overview of some important literature on institutional investors. After several decades of study, no consensus has yet merged on whether institutional trading contributes to stock price volatility. There is also no clear answer to the question of whether the increase in volatility, if any, is due to herding behaviour among institutions. Despite the common perception that institutional managers follow each other into and out of the same securities and the strong theoretical foundations of herding, the results of empirical research on this matter are mixed. The article reviews the theoretical premises regarding the impact of institutions on stock prices and the most influential classic publications. The author also took into account the results of more recent studies, which focused not so much on herding behaviour but on the characteristics of institutional investors that could be considered important contributors to stock price volatility.

Keywords: institutional investors, herding behaviour, stock price volatility.

1. Introduction

The literature on institutional ownership has produced a large body of theoretical and empirical research. The growing institutional presence has resulted in a large number of studies that document the relation between changes in institutional ownership and returns (Cai, Kaul, & Zheng, 2000; Dasgupta, Prat, & Verardo, 2011; Grinblatt & Titman 1989, 1993; Jones, Lee, & Weis, 1999; Sias, Starks, & Titman, 2001; Wermers 1999, 2000). However, these publications did not provide a definitive answer to the question of whether institutional herding influences stock prices and leads to excess volatility and market fragility. Some most influential classic studies developed and empirically tested various models to explain that certain trading

styles often implemented by institutions could potentially exacerbate stock price volatility. Others argue that managers who herd new information about the prospects of companies help to speed up the incorporation of this new information into prices. Recent studies focus not only on the direct relation between trading by institutions and stock price volatility but also on other characteristics of institutional investors that may influence asset prices. This article presents the results of some of the most relevant studies on the impact of institutional investors on stock price volatility.

2. Theoretical considerations on the impact of institutional investors on stock prices

Lakonishok, Shleifer, and Vishny (1992) presented two radically different views of the effect of institutional investors on stock prices. According to the first of them, institutions destabilise stock prices, which usually means that they deviate prices from their fundamental values, thus enhancing long-run price volatility. This view originates from two assumptions – first, changes in institutional demand will probably translate into much greater price movements than swings in the demand of individual investors. Moreover, the destabilising impact of institutions may be compounded by engaging in herding behaviour (which consists in buying/selling the same stocks that other managers are buying/selling at the same time). When institutions receive the same information, they herd and hit the market in the same direction and thus destabilise stock prices. Hirshleifer, Subrahmanyam, & Titman (1994) pointed out that in existing models of information acquisition, all informed investors receive their information at the same time. For this reason, they developed a model that describes trading behaviour and information acquisition when some investors receive private information before others. This model implies that, under some conditions, investors will focus only on a subset of securities while neglecting other securities with identical exogenous characteristics. Thus herding behaviour will also occur if only some investors have access to the information. Lakonishok, Shleifer, and Vishny suggested that herding by itself does not necessarily result in increasing the stock price volatility. When institutions make correlated decisions in response to the same fundamental information, their actions increase market efficiency by accelerating the adjustment of prices to new fundamentals. The second premise supporting the thesis that institutional investors may have a destabilising effect on asset prices concerns the trading strategies they implement. According to Lakonishok, Shleifer, and Vishny, trading strategies based on fundamentals, such as contrarian investment strategies consisting in buying cheap high-dividend yield or high-book-to-market stock, usually do not bring immediate profits but take a rather long time to pay off. Meanwhile, fund managers may be dismissed after only a few quarters of poor financial performance, making them more likely to follow some type of feedback trading strategy. One of the most common examples of short-term

strategies that potentially may have a destabilising effect on stock prices is positive feedback trading (buying winners and selling losers).

However, some premise indicate that actions taken by institutional investors may contribute to stabilising share prices. Institutions are often perceived as cool-headed and rational entities who counteract swings in the sentiment of individual investors. Thanks to unlimited access to financial analyses and news reports they are well-informed market participants, which allows them to better estimate the fundamental value of stocks. The authors note that, even if the belief that institutions are rational and best-informed investors is true, they may still engage in herding behaviour. They would herd if they received the same information and interpreted it similarly, or if they reacted to the same changes in the sentiment of institutional investors. However, no institution would follow the institutional crowd if it received uncorrelated information or interpreted the given information differently. The authors predict that rational institutional investors are likely to introduce negative-feedback strategies consisting in “buying stocks that have fallen too far and selling stocks that have risen too far”.

The authors also distinguish a third approach, according to which institutional investors have a neutral impact on stock prices. In this view, institutions are heterogeneous which means that they pursue a variety of different portfolio strategies that offset each other. For this reason, entities applying positive-feedback strategies do not destabilise stock prices because there are enough negative-feedback traders to offset them.

3. Pioneering research

Theoretical considerations on the impact of institutional investors did not provide a sufficient answer to the question of whether institutions destabilise stock prices or reduce volatility. Consequently, a vast number of empirical studies were carried out to investigate the nature of this relation. Lakonishok, Shleifer, and Vishny examined the trading patterns of 769 all-equity pension funds during the period from 1985 to 1989. They attempted to answer two questions: do pension fund managers engage in herding behaviour and whether they pursue the positive-feedback strategy. The results proved that there is no evidence of institutions herding in their trades in large stocks (which is their preferred habitat since 95% of institutional trade is concentrated there). What is more, it turned out that neither the stabilising nor the destabilising image of institutional investors is accurate. Regarding common trading styles, it seems that institutions do follow either positive or negative-feedback strategies. Admittedly, the authors found some evidence of positive-feedback trading in the smaller stock. However, this effect was not observed among large stocks. The results also showed that the correlation between institutional investors’ excess demand for a stock and its price change is extremely weak.

Grinblatt, Titman, and Wermers (1995) are the authors of another influential paper on the tendency of institutional investors to exhibit herding behaviour, however, they focused on another subset of institutions. The main purpose of their research was to examine the extent to which herding and trading strategies affect stock price volatility. The analysis of trading data from 155 mutual funds over the 1975-1984 period proved that they display a tendency of purchasing stocks based on their past returns. It turned out that 77% of the mutual funds were momentum investors buying stocks that were past winners, yet most of them did not systematically sell past losers. The authors did not find strong evidence of herding among mutual funds – the average level of following the institutional crowd was statistically significant, but not high. Similar results were obtained when examining the statistical significance of momentum strategy. Nonetheless, a clear dispersion among funds in their tendency of herding or purchasing past winners was observed, prompting the authors to investigate the relation between these trends and the performance of mutual funds. The results showed that entities that pursue momentum strategy outperform other funds. As for the impact of the tendency to go with the herd, the relation between the fund's performance and herding behaviour turned out to be less convincing.

Wermers (1999) also investigated the tendency of mutual funds to follow the institutional crowd and the impact of herding on stock prices using data of the mutual fund industry from 1975 to 1994. They also found little evidence of herding behaviour in the trading activity of funds, but it should be noted that mutual funds show a slightly greater tendency to herd than pension funds. However, they proved that the level of herding differs depending on the subgroups of funds and the subgroups of stocks – a much higher level of herding was found among growth-oriented mutual funds than among income funds. This finding confirms, according to the authors, that growth funds have less precise information about the future earnings of their stockholdings than income funds. These inequalities in access to information result in growth funds having greater incentives to herd. Looking at the subgroups of stocks, the authors found a much higher level of herding behaviour in small stocks, especially on the sell-side. Wermers et al. also analysed the effect of mutual fund trading on long-term stock returns. The results show that stocks that funds buy in herds have significantly higher abnormal returns in the following quarters than stocks sold by herds. When it comes to stocks most often bought and sold by mutual funds, the difference in their abnormal returns in the next quarter exceeded 2%. This effect was visible mainly among small stocks which exhibit a return difference greater than 4%, but there was also a slight return difference for large stocks (approximately 1%). Moreover, these differences appear to be permanent, which confirms the validity of the theory that managers speed up the incorporation of new information into stock prices while they herd on receiving this new information.

Although Lakonishok, Shleifer, and Vishny (1992), Grinblatt, Titman, and Wermers (1995), as well as Wermers (1999), found little evidence of systematic

institutional herding, the results obtained by Chakravarty (2000), Dennis and Weston (2000), Sias, Starks, and Titman (2001), are consistent with the hypothesis that institutional investors trading in the same direction impact on stock prices. Sias (2004) also presented convincing evidence of institutional herding, and concluded that institutions' demand for security in a given quarter is positively correlated with their demand for this security from the previous quarter. He attributed these results to institutional investors following each other into and out of the same securities (herding), and their tendency to follow their lag trades. Furthermore, institutional herding declines over time (in large stocks) and differs across capitalisations and investor types. Chang, Cheng, and Khorana (2000) examined the tendency to exhibit herding behaviour among market participants within different international markets (the US, Hong Kong, Japan, South Korea, and Taiwan). No evidence of herding was found in the US and Hong Kong and only partial evidence in Japan. However, for two emerging markets included in the sample (South Korea and Taiwan), the authors documented significant evidence of herding behaviour. Chiang and Zheng (2010) also investigated herding in global markets. They observed institutional investors following the institutional crowd in advanced stock markets (except the US) and in Asian markets, but they found no evidence of herding in Latin American markets. Furthermore, the authors concluded that a crisis triggers herding activity in the crisis country of origin, and then produces a contagion effect, which spreads the crisis to neighbouring countries. During crisis periods, institutions begin to herd in the US and Latin American markets. Herding behaviour was also observed among Portuguese mutual funds – the level of herding was four to five times stronger than that found for institutional investors in mature markets (Lobao & Serra, 2007).

Nofsinger and Sias (1999) also offered somewhat stronger evidence that institutional investors engage in positive feedback trading. They noted that previous studies focused on specific types of institutions instead of all kinds of institutional investors. Most of them investigated the tendency of herding or trading styles among mutual funds (apart from research carried out by Lakonishok, Shleifer, and Vishny). It should be noted, however, that in the 1990s mutual funds made up a relatively small proportion of total institutional ownership – according to the authors at the end of 1990 they accounted for less than 16% of total institutional ownership. Moreover, Nofsinger and Sias evaluated the returns of securities that experience large changes in institutions' holdings instead of focusing on returns realized by institutional investors. They observed a strong positive correlation between annual changes in institutional ownership and assets' returns – on average, the decile of stocks experiencing the largest increase in institutional ownership outperforms the decile that experienced a large decrease by over 31% per year. The authors explain the occurrence of this trend as follows: either institutions engage in intra-year positive feedback trading to a greater extent than individual investors or institutions' herding impacts on stock prices to a greater extent than individual investors' herding.

4. Recent research

Pioneering research on the impact of institutional investors on stock prices focused primarily on the institutions' propensity to engage in herding behaviour or on the trading strategies they use. However, papers published more recently assume that the relation between institutional investors' investment decisions and stock price volatility is somewhat more complex. For instance, Rubin and Smith (2009) argued that signs of the correlation between institutional ownership and volatility depends on the company's dividend policy: institutional ownership is negatively (positively) related to volatility among non-dividend (dividend) paying stocks. Che (2018) investigated how different types of investors affect stock return volatility. The results show that foreign investors increase stock return volatility because they are momentum traders, trade the most and have the shortest investment horizon. On the other hand, individual investors reduce stock return volatility as they trade the least, are contrarian traders, and have the longest investment horizon. Domestic institutional investors fall in between these extremes. Greenwood and Thesmar (2011) created a new indicator that helps to explain how liquidity shocks affecting institutions impact on stock prices whilst Ben-David, Franzoni, Moussawi, and Sedunow (2016) believe that the largest institutional investors are responsible for increasing stock price volatility.

Greenwood and Thesmar (2011) examined the relation between a company's ownership structure and the level of idiosyncratic risk. For this purpose, they created a new indicator called the *fragility* of financial assets. They believe an asset is fragile if it is susceptible to changes in demand due to non-fundamental factors. Fragility results from the high concentration of ownership or may be caused by the fact that equity holders suffer from sudden and correlated liquidity shocks. In their analysis, the authors focused solely on stocks of companies listed on the NYSE, with at least one mutual fund among their shareholders, and proved that their proposed indicator is a very effective predictor of share price volatility. The assumption that there could be a significant link between the stock fragility (which reflects the possible liquidity shocks affecting shareholders) and the level of firm's risk resulted from the following reasoning: in the case of a company with several owners, where each of those owners has large stockholdings, the occurrence of liquidity shock affecting one of the equity holders will force this investor to sell their shares, which will likely entail a significant increase in stock price volatility. However, if among these few large shareholders there are low liquidity needs (none of them has to buy or sell shares due to non-fundamental factors), it can be assumed that the share price will not be exposed to high volatility. Yet, in the case of a company with a highly dispersed shareholding structure, owners may still individually experience liquidity shocks which could result in the need to sell their stocks, but the impact of these transactions on the stock price will be negligible. Nevertheless, the dispersed ownership structure does not provide full protection if liquidity shocks affecting

shareholders are strongly correlated - their occurrence is likely to increase stock price volatility. In general, asset fragility depends on ownership concentration and the correlation between transactions resulting from the owners' liquidity needs. A stock is fragile when the company's ownership structure is highly concentrated or when the equity holders receive variable and correlated cash flows. It can therefore be assumed that highly fragile stocks are likely to have a high level of risk.

While the intuitive assumptions underlying the fragility-to-volatility hypothesis are fairly straightforward, the actual measurement of fragility presents some difficulties. Although it is not difficult to examine the ownership structure of a given company, it is a challenge to estimate the correlation between the transactions resulting from the liquidity needs of shareholders. However, based on the published data of investment funds, one can infer transactions driven by changes in the level of a company's liquidity based on inflows and outflows of participants of these funds. Yet it should be noted that stock fragility can also be influenced by the actions of other investors, including individual investors, whose cash flows may also be correlated or highly volatile. Therefore, limiting the analysis to only one type of investor may lead to errors in estimating the strength of the impact of stock fragility on the volatility of stock prices. Meanwhile, in the period covered by the research (from December 1989 to December 2007), the authors observed a clear upward trend in the stockholdings of mutual funds in companies listed on the NYSE (at the end of 1989, mutual funds owned 5% of all stocks listed on the NYSE, while at the end of the analysed period, the total share of the funds exceeded 20%). The number of equity-holding funds also increased (at the beginning of the research period, there were fewer than fifty, while at the end of 2007, the number of equity-holding funds had more than tripled). These trends clearly illustrate the growing importance of mutual funds as market participants. Interestingly, the authors also noticed a decrease in ownership concentration among the surveyed companies and a significant increase in the average level of fragility (in December 1989, fragility practically did not differ from zero, while at the end of the analysed period it ranged between 0.008% and 0.010%). The simultaneous decrease in ownership concentration and the increase in stock fragility suggest that new smaller funds have emerged among shareholders with capital flows that are sufficiently correlated and volatile to compensate for the effect of the dispersion of ownership.

Regarding the direct relation between stock fragility and price volatility, the authors showed that there is a clear positive correlation, but this relation becomes more and more statistically significant with the increase of the level of fragility. Moreover, the authors demonstrated that the daily volatility of the stock price is positively correlated with the size of block holdings owned by mutual funds - a 10% increase in funds' ownership causes an increase in daily price volatility by 0.2%, which confirms the results of research conducted by Sias (1996) and Bushee and Noe (2000). However, the relation between the number of mutual funds acting as shareholders and volatility turned out to be negative, suggesting that the dispersion

of ownership is accompanied by a decrease in idiosyncratic risk. It can therefore be concluded that not only the number of shares held by the funds but also the concentration of ownership affects the volatility of stock prices. In the authors' opinion, the stock fragility is a better predictor of stock price volatility than the size of mutual funds' shareholdings, as it reflects the actual dispersion of the shareholding structure. This is because it differentiates between a company with one large shareholder and 199 small investors from an entity with 200 equal owners. As shown by the regression analysis, an increase in the level of this indicator by 0.008 leads to an increase in the daily stock price volatility by 0.5% (which means an increase in volatility by a quarter of its average level). What is more, stock fragility remains an important predictor of volatility also when the analysis takes into account two other variables representing the ownership concentration, namely the Herfindahl index and the size of the shares held by mutual funds. The introduction of these additional explanatory variables in no way diminishes the ability of stock fragility to explain a company's level of idiosyncratic risk, which confirms the assumption that it is an indicator containing additional information (the variability and correlation of cash flows of shareholder mutual funds). Therefore, the obtained results seem to confirm the authors' assumptions that the direct impact of the ownership of mutual funds on the volatility of stock prices is due to the stock fragility – it is not the size of the shares held by the funds that count, but the volatility and correlation of capital inflows and outflows.

Ben-David, Franzoni, Moussawi, and Sedunow (2016) identified large institutional investors as separate and more important contributors to stock price volatility. In their opinion, the destabilisation of stock prices should not be blamed on the smaller institutions, because this effect is often caused by a few large players. Since 1980, the ten largest institutions have quadrupled their shares in US-listed companies, and their total equity market share in December 2016 was 26.5%. The high degree of ownership concentration by some of the leading institutional investors and the growing importance of their trading activities, raise concerns that their actions may seriously destabilise stock prices. According to the research hypothesis adopted by the authors, the largest institutional investors cause increased price pressure, which in turn translates into an increase in the volatility of stock prices. In other words, large institutions have a greater influence on the volatility of stock prices than a group of smaller, independent entities managing assets of the same size. Regression analysis showed a statistically significant relation between the size of shares held by the top ten institutional investors (distinguished based on the average size of assets managed by those institutions) and the volatility of stock prices. The authors also observed that the strength of this relation increases over time, which coincides with the growing importance of large institutions in the financial market. At the end of the analysed period, the link between the shares held by institutions and price volatility was particularly evident: an increase in the ownership of the ten largest institutions by one standard deviation was associated

with an increase in volatility by 16% of the standard deviation. Trades by smaller institutional investors were associated with a lower increase in volatility - after extending the number of the largest institutions considered in the study to the thirty largest investors, the authors again observed a positive link between institutional ownership and stock price volatility, and although this relation remained statistically significant, its strength was decreasing among entities ranked from 21st to 30th. No statistically significant correlation of a similar nature was observed for investors ranked from 31st to 50th. Moreover, the correlation between the size of shares held by institutional investors with the lowest positions in the ranking and the volatility of stock prices was negative. According to the authors, the fact that it is the activity of the largest institutional investors that increases stock price volatility results from the granular nature of the largest institutions.

The concept of granularity of institutional investors was introduced by Gabaix (2011): “many economic fluctuations are not due to small, diffuse shocks that directly affect every firm. Instead, many economic fluctuations are attributable to the incompressible “grains” of economic activity, the large firms... call this view the “granular” hypothesis. In the granular view, idiosyncratic shocks to large firms have the potential to generate nontrivial aggregate shocks that affect GDP, and via general equilibrium, all firms.” Jinjark and Zheng (2014) also addressed the effect of the granular nature of institutional investors focusing on the propagation of global investment risk across the markets. Based on the data of international mutual funds between 2003 and 2011, they showed that idiosyncratic shocks to large institutions explain both aggregate market risk and cross-market risk interdependence – idiosyncratic shocks to the top 10% of the largest funds investing in the US explain about 40% of the risk fluctuations in other non-US markets.

Ben-David, Franzoni, Moussawi, and Sedunow believed that large institutional investors are primarily responsible for the destabilisation of stock prices, as they are usually entities with high granularity. Their granular nature is because they are organisations consisting of many subunits whose behaviour shows a much higher correlation than actions taken by independent institutions. The results obtained by Brown and Wu (2016) seem to confirm the validity of the assumption that there exists a relation between an institution’s granularity and stock price volatility. The aforementioned authors studied the impact of the performance of an entire family of mutual funds on the skills of a single fund being a family member. In their opinion, shared skills and centralised functions performed for all units operating within the same organisation (e.g. market research, marketing, risk management) result in correlated behaviour among various departments in this organisation, which in turn translates into similar investment decisions. Therefore, it can be assumed that the actions taken by those subunits will have a significant impact on the stock prices, as they do not offset each other, but rather hit the market in the same direction. The degree of granularity also reflects an institution’s ability to internally neutralise idiosyncratic shocks faced by large organisations. If an institutional investor is characterised by

low granularity, they can fully diversify idiosyncratic shocks internally and these shocks do not lead to net demand for the stock from this institution. The structure of such investors resembles a set of many independent companies that are exposed to demand shocks that offset each other and do not enhance the net demand for the stock, whereas in the case of highly granular entities, idiosyncratic shocks scale up proportionally with their size, which increases demand for the stock. Large institutions may make efforts to smooth shocks internally by taking action within the organisation, for example by exchanging assets in off-market transactions between funds within a family of funds. However, it should be remembered that the largest institutional investors often experience correlated cash flows and implement similar investment strategies, which means that funds operating within the same family may be exposed to the occurrence of correlated shocks. In such cases there can be no possibility of neutralising idiosyncratic shocks through actions taken within the organisation. If stock ownership is more concentrated, the shocks affecting individual shareholders are a bigger fraction of the stock demand and are less easily diversified. For this reason, idiosyncratic shocks generate stronger price pressures and increase share price volatility. Institutions that manage to diversify internally, even if they are very large, do not have a large impact on prices and therefore do not significantly affect volatility.

Interesting research on herding behaviour was also carried out by Jiang and Verardo (2018), who proved the existence of a negative relation between herding behaviour and skill in the mutual fund industry. Antiherding funds outperform their herding peers by over 2% per year. This performance gap results from the fact antiherding funds can make superior investment decisions even on securities not heavily traded by institutions and can anticipate the trades of the crowd. A similar study was also carried out by Prendergast and Stole (1996), Avery and Chevalier (1999), Cremers and Petajisto (2009), Cohen, Polk, and Silli (2008), as well as Pástor, Stambaugh, and Taylor (2017).

5. Conclusion

In the literature on institutional investors, two completely different theoretical views are often cited regarding the impact of institutions on stock prices. The first one states that institutional trades increase stock price volatility, which is mainly caused by herding behaviour. Proponents of this view believe that when institutions herd, they destabilise asset prices, because they move them away from fundamental values, thereby increasing their long-term volatility. An opposing view argues that institutions are the best-informed investors with a better position to evaluate the fundamental value of stock and their trades often make the market more efficient. Despite many empirical studies and strong theoretical foundations, so far it has not been possible to fully confirm herding behaviour among institutions. Some studies found little evidence that institutional investors herd (e.g. Grinblatt, Titman, and

Wermers, 1995; Lakonishok, Shleifer, and Vishny, 1992), others documented herding for example among certain kinds of stocks or note that it differs across types of investors (Sias, 2004). Some more recent papers do not focus on herding behaviour but identify the characteristics of institutional investors, the presence of which translates into an increase in volatility, e.g. Greenwood and Thesmar (2011), and Ben-David, Franzoni, Moussawi, and Sedunow (2016).

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INWESTORZY INSTYTUCJONALNI A ZMIENNOŚĆ CEN AKCJI – PRZEGLĄD LITERATURY

Streszczenie: Celem artykułu jest dokonanie przeglądu najważniejszych publikacji na temat inwestorów instytucjonalnych. Po kilkudziesięciu latach badań wciąż nie udało się ustalić, czy transakcje przeprowadzane przez tę kategorię inwestorów zwiększają zmienność cen akcji. Nie udzielono też jednoznacznej odpowiedzi na pytanie, czy wzrost zmienności, o ile w ogóle występuje, jest konsekwencją zachowań stadnych wśród instytucji. Pomimo bardzo rozpowszechnionego przekonania, że ich menedżerowie obserwują swoje poczynania i naśladują siebie nawzajem oraz teoretycznych przesłanek potwierdzających występowanie zachowań stadnych, wyniki badań empirycznych nie rozstrzygają tej kwestii. W artykule przeanalizowano najistotniejsze przesłanki teoretyczne dotyczące wpływu instytucji na ceny walorów oraz dokonano przeglądu najśłynniejszych klasycznych publikacji. Wzięto również pod uwagę wyniki najnowszych badań, które skupiały się nie tyle na występowaniu naśladownictwa wśród inwestorów instytucjonalnych, ale na ich cechach charakterystycznych, które można uznać za istotne czynniki wpływające na zmienność cen.

Słowa kluczowe: inwestorzy instytucjonalni, zachowania stadne, zmienność cen.