VOLUNTARY DISCLOSURE OF A COMPANY
PERFORMANCE AND THE MARKET REACTION

INTRODUCTION
Interactions between managers and investors conducted through less regulated communication channels raise a significant economic problem: the asymmetry of information between the managers of a company and its investors. This asymmetry occurs primarily due to differences in interests held by the two types of agents. An investor strives to maximize the company’s profits, leading to high dividends for shareholders and a high probability of debt repayment for borrowers. A company manager aims to maximize their value, expressed through a high wage, a stable position, a considerable degree of effort, etc. As a result, managers’ level of information disclosure after weighing the pros and cons is not set at an equal level necessary for the successful functioning of a company in the financial market.

Regulators in various countries have repeatedly drawn attention to this economic problem, introducing certain standards to determine the minimum level of corporate information disclosure. That provides investors with the information they need for effective decision-making. Managers may not be willing to provide such important information without legislative requirements. The greatest number of disclosure requirements amalgamates the US GAAP-SEC (GAAP-SEC Disclosure Requirements: URL: https://www.fasb.org/brrp/brrp3.shtml). In addition to the financial statements required of American companies, both the US-GAAP and the SEC are ordered to annually provide detailed disclosures of taxes, information about the largest client or client group, the total value of transactions, and the litigation processes in which the company is involved. The company must also specify its address and contacts at the judicial headquarters. Besides, they require the disclosure of all risks that may arise in one way or another for users of the company’s financial instruments, information about participation in research and development projects, each type of project, related expenditures, etc.

It is necessary to note that the measures first appeared in the United States more than 50 years ago when the US Securities and Exchange Commission began demanding more from enterprises than just the disclosure of income and expenses (GAAP-SEC Disclosure Requirements: URL: https://www.fasb.org/brrp/brrp3.shtml). Since then, the burden on enterprises, and subsequently on management, has only increased. Nevertheless, these measures are primarily aimed at increasing market efficiency through positive changes in the interaction of agents, specifically managers, and investors. A study by Gotsias & Tompkins found that introducing the measures improved the interactions between managers and investors (GOTSIAS; TOMPKINS, 2013). Regulators in other countries also have set the task of increasing efficiency. Studies by MacAulay, Dutta, Oxner and Hynes examine the impact of the measures introduced on the behavior of firms in Canada. Rosser researched the impact in Indonesia; Hermes, Postma, and Zivkov examined the measures in Eastern Europe (MACAULAY, DUTTA, OXNER, HYNES, 2009; ROSSER, 2003; HERMES, POSTMA, ZIVKOV, 2007).

Companies, especially public ones, are currently held to mandatory disclosures. However, enterprises often disclose even beyond the norm. This phenomenon is called the “voluntary disclosure of information”. It is especially typical of conference calls and press releases since these channels involve only the interactions of company management and its investors. Nevertheless, a study by Bagnoli & Watts showed that many firms voluntarily disclose information in their financial statements (BaGNOLI, WATTS, 2007; SENATOROVA, 2018;
Research on voluntary disclosures is becoming increasingly relevant, as investors often rely less on mandatory disclosures in financial statements when making decisions. Indeed, financial reports provide information about events that have already taken place and do not say anything about its strategy and plans for the future. Financial reports are a formality used for researching past periods. A voluntary disclosure can signal investors about the need to feed new capital into the company at the right time (SARAA et al., 2020).

This paper aims to study voluntary disclosures of companies' activities and the subsequent reactions of financial markets. This paper first examines the phenomenon of information disclosure, both mandatory and voluntary, and the development of regulated standards for mandatory disclosures. Without this stage, it is extremely difficult to understand what information is voluntarily disclosed and what goals are being pursued by the company managers, as demonstrated by the disclosure. Further, the types of voluntary disclosures and the motivations of the company management in each case are considered. The results of the empirical research of changes in share prices after the appearance of positive and negative disclosures are also considered. The factors that identify companies making voluntary disclosures are highlighted. Finally, examples of companies voluntarily disclosing information and the subsequent market responses following the disclosure will be empirically examined. Conclusions will be drawn and recommendations provided to management on the voluntary disclosure of information.

LITERATURE REVIEW: VOLUNTARY DISCLOSURES PHENOMENON

To study voluntary disclosures, becoming familiar with what firms must disclose is necessary. It is well known that in the United States, regulatory control over firms is the strongest. Before starting the research, I studied the resource base of the Council of the Financial Accounting Standards Committee in the USA (Financial Accounting Standards Board URL: https://www.fasb.org/). Since this paper was to deal with the financial market analysis, I also studied another American regulator, the Securities and Exchange Commission (U. S. Securities and Exchange Commission URL: https://www.sec.gov/).

A study by Gotsias and Tompkins uses the example of the United States to empirically check for the positive impact of disclosure obligations and an increase in the efficiency of interaction between management and investors (GOTSIAS & TOMPKINS, 2013). In addition, similar positive results on samples from other countries are to be observed in the works of MacAulay, Dutta, Oxner, and Hynes (2009); Rosser (2003); and Hermes, Postma, and Zivkov (2007). The results from these studies show that mandatory disclosures positively impact market efficiency, but the effect of voluntary disclosures could be different. Therefore, a further search was conducted to search for papers studying voluntary disclosures.

One type of such disclosure is the forecast published by firms about the results of their activities. The work of Jung discusses the incentives of a firm's management to make such forecasts and shows that the decision to publish forecasts allows firms to reduce costs (JUNG, 2010). The work of Guo and Zhao proves a positive reaction of investors to forecast publishing, which increases trust (GUO & ZHAO, 2009). Gigler studies the reverse effect of the influence of interested investors on the growth of the forecasts of the companies they invest in (GIGLER, 1994). Baginski and Hassell (1997) show the relationship between fundamental financial indicators and management forecasts. Works examining such incentives of forecast publications as evading legal costs were also necessary for the present research (FRANCIS, PHILBRICK, & SCHIPPER, 1994; BROWN, CHRISTENSEN & ELLIOTT, 2012; ROGERS, BUSKIK & ZECHMAN, 2011; EVANS & SRIDHAR, 2002).

Before conducting our research, it was also necessary to find out if the other researchers were working in a similar vein: the work of Skinner had been studied, in which the difference in voluntary disclosures between quarterly and annual reports is checked econometrically (SKINNER, 1994). In addition, this paper examines the difference in the significance of negative and positive voluntary disclosures, and the market reaction towards each of them, comparing the changes in yields after each type of disclosure. Another important research is that of Meek, Roberts & Gray, about the influence of some indicators on the index of
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voluntary disclosures, analyzing the proportion of committed voluntary disclosures to the maximum possible disclosures (MEEK, ROBERTS, GRAY, 1995). Voluntary disclosures are divided into strategic, financial, and non-financial, and the impact of such regressors as the size of the enterprise, its country of origin, international activity, etc., is studied for each disclosure type.

Despite the possible decrease in the relevance of their results over time, the last two works are fundamental in terms of research phases, selection of regressors, and their econometric base - all these remained unchanged, which made the research methodology of these works the basis for our research. However, contrary to predicting indexes of voluntary disclosures, we want to examine whether such disclosures can impact the stock price and whether this effect is statistically significant. As mentioned in these papers, we divide the disclosures into positive and negative ones.

INFORMATION DISCLOSURE AND INVESTORS’ BEHAVIOR

Disclosure requirements in various standards

There is still no scientific consensus on whether to oblige enterprises to disclose information and, if so, what information and at what level of detail.

Despite many years of attempts to solve information asymmetry between managers and investors, the regulation for disclosure of obligations still varies significantly across countries. With a large amount of information that is required to be published, it can be assumed that the market works efficiently, and the trust in firms should be at a high level, which is good both for removing the risks of investors and for the firms since the low risk allows them to borrow capital at low interest. Consequently, it should be profitable for the firms themselves to disclose information, and the state does not need to spend resources on the regulator’s functioning. Proponents of such an approach Fishman & Hagerty argue that investors can perceive insufficient disclosure of information as a negative signal from the firm. The equilibrium will not be achieved until the firm decides to disclose (FISHMAN, HAGERTY, 2003). Thus, from this point of view, there is no need for a regulator to achieve equilibrium.

In reality, firms often disclose only the mandatory part of the information required by the regulator. It can be explained by the fact that disclosing the information is a cost for the firm: it is necessary to aggregate all the necessary information and then post it on some (online) resources. In addition, legislation often requires firms to organize verification of information by independent auditors, which is also a cost for companies. A reluctance to disclose information can also stem from a fear of exposing corporate data to competitors, resulting in a loss of comparative advantage or bargaining power.

Nevertheless, in the work of Tjio using the example of the Singapore market, it was proved that even taking into account the disclosure costs for the company, equilibrium is achieved only in the event of disclosure: if certain information can change the behavior of investors, and its absence reduces their incentives to invest their capital into such an enterprise, then the optimal solution for both, the company and the society, will be to disclose information without the need for a regulator (TJIO, 2009).

How does it turn out that firms prefer to keep silent about some information for investors and tell them only what they are required to tell? It appears that the management-weighted costs of disclosing information, combined with side losses that disclosures can cause, outweigh the difference with the equilibrium. The side losses here can be considered losses of capital caused by the reaction of some investors to information that could be disclosed. Therefore, it makes sense to develop a regulatory system.

Let us consider the development of one of the most progressive financial market regulators, the SEC. This US Government agency requires senior management of companies to disclose all corporate privileges used for personal ends. Moreover, the IRS (Internal Revenue Service) considers all such privileges to be the personal income of management and therefore imposes income tax on them (U.S. Internal Revenue Service URL: https://www.sec.gov/). From the late 1990s to the present, science has extensively investigated the impact of a high level of control over mandatory disclosures. An empirical study by Hung, Gong & Burke proved that such requirements lead to improved efficiency of the firm and management, profitable
strategic decisions, and positively affect the relationship between management and investors (HUNG, GONG, BURKE, 2015). In conditions of mandatory disclosure, management can take a more serious approach to the company’s problems and think about actions over more carefully since in conditions of information disclosure by the owners, the problem of “weak” management can be identified. The improvement in the information environment in this situation is explained by the emergence of data on several companies due to their mandatory disclosure, which can change the investors’ decision about investing in a particular company.

Thus, the expansion of regulatory disclosures has facilitated the disclosure of relevant information to markets and investors, enabling the latter to make better decisions. However, one cannot speak of the flawlessness of the disclosure regulation system at the moment. There are many cases when enterprises find workarounds and may not demonstrate important features of their activities to investors despite adhering to existing standards. Given this situation, investors are increasingly paying attention not to mandatory information disclosures but to what firms publish over it - to voluntary disclosures. Further in this paper, we will focus on the latter.

VOLUNTARY DISCLOSURE

As noted earlier, voluntary disclosure of the information is attracting more attention from both investors and science. With increased voluntary disclosure of information, there is a decrease in the borrowed capital rate (BERTOMEU, BEYER, DYE, 2011), growth in the valuation of shares by analysts (KUMAR, LANGBERG, SIVARAMAKRISHNAN, 2012). Investors are interested in the essence of the information being disclosed: for example, forecasts for future performance from the management itself. Often, the management is interested in publishing its forecasts when a company is doing well, and there is an incentive to report them to investors. In addition, forecasts also serve as a source of market expectations about the firm’s performance. For example, Jung shows that when investors’ expectations are excessively high or low, a firm has an incentive to publish a forecast to reach equilibrium (JUNG, 2010). If investors’ expectations are low, the company’s assets may fall in value and, if the company is doing well, it is beneficial for it to restore investor attitudes by publishing the forecast.

In the case of overstated investors’ expectations, the company understands that publishing performance results without issuing preliminary forecasts may collapse its assets too strongly due to investors’ negative reactions. Due to this fact, the company has incentives to disclose the information even in this situation. The firm can also publish forecasts to reduce potential litigation risks. There are cases when investors are dissatisfied with the size of their earnings and litigate to obtain more. Even if the firm wins the case and does not pay the investors above the normative profit, it incurs legal costs. Suppose management weighs the costs of generating and publishing a forecast against legal costs, and the latter exceeds the former. In that case, the firm also has an incentive to publish the forecast.

In addition, in the work of Guo & Zhao, it is proved that the publication of management forecasts increases investor confidence in the management, and such actions can be interpreted as the competence of the latter, which signals investors about the reliability of the equity capital (GUO, ZHAO, 2009). In the work of Gigler, the following feedback is also established. With interested investors, management forecasts are published more often and are more reliable since investors themselves are interested in them and try to use their influence on the actions of managers (GIGLER, 1994).

Let us consider the motivation of managers. Unlike shareholders, they may not own shares in a company but may only hold a certain position and receive a fixed income. In addition, managers can change jobs at any time. Consequently, their target function does not include the maximization of the company’s profit. This problem of conflict of interests between managers interested in their earnings and shareholders striving for profit is well-reviewed in corporate finance theory. Often, shareholders need to use part of their capital to provide managers with bonuses to motivate the latter. Let's consider its impact on the disclosure of information by the firm. So, it is likely that managers need to increase a firm’s profits to receive bonuses or raise wages. Cheng, Luo & Yue empirically show that many managers
strive to maximize the growth of the firm’s profits for several periods in a row (CHENG, LUO, YUE, 2013). Managers, bound by the limitations of their contracts, are often focused on the short term and try to utilize all possible resources to maximize profitability during this time. Sometimes such actions can lead to the fact that the opportunities for increasing profitability end since all resources have been used at a certain point.

However, even in such a situation, the financial instruments of an enterprise can give high returns on the market, since such behavior of the management represents a positive signal for investors, who can subsequently invest their capital into a company, due to which it will again have resources for effective operation. In addition, voluntary disclosures may be more accurate and relevant than in a general sample in such firms. Managers are interested in providing partial information to investors to form the best expectations in the market. With a sharp drop in the value of financial instruments in the market, managers will be responsible for the downturn. However, voluntary disclosure of a large amount of unnecessary information, as already noted, requires resources. Therefore managers are forced to determine the optimal amount of information to be disclosed, ensuring the formation of stable and trust-based expectations among investors. As the matter stands, in some cases, firms can be mistrusted in the marketplace, which requires managers to use additional resources to restore trust and disclose a large amount of information.

Accordingly, firms with ever-increasing profitability are better positioned to build trust with the market and can do without additional disclosure costs. In addition, Bottazzi, Rin & Hellmann discuss market confidence in new firms (BOTTAZZI, RIN, HELLMANN, 2016). In such firms, with the usual high volatility of profits, have high indebtedness and unsettled channels of communication with investors, managers cannot do without disclosing a small part of information and are forced to bear the costs of building trust in the market. In microeconomic theory, the problem of “effort” is discussed: agents may not necessarily make an effort to work. In this case, this effort's indicator is equal to 0; similarly, it is equal to 1 at maximum efficiency. Consider this factor in managers’ work environment: with a fixed salary, managers may not expect bonuses and thus may not be sufficiently motivated to make a strong effort. In this case, the company’s management may not be effective, and the company’s profitability suffers as a result.

In the work of Baginski & Hassell (1997), it is shown that enterprises with efficient top management achieve higher results in fundamental financial indicators, and they give more accurate forecasts of performance. With the maximum return, a manager can find the best options for the stable growth of these financial indicators, and this stability allows the making of more accurate forecasts.

Situations with erroneous predictions also arise: in cases of voluntary disclosures, management weighs the potential pros and cons, including forecasting accuracy. The pros include stability of the contract and its shareholder profit when owning shares of the company; the cons may include loss of reputation and possible legal costs. To make a prudent decision regarding the accuracy of the forecast, managers consider the ratio of efforts and costs for these pluses and minuses. One of the consequences of an erroneous forecast may be increased interest from the market, analysts, and the press in the activities of the firm's management. That could lead to the investigation of the reasons for the growth in profitability of instruments, if such growth did occur, and potentially result in the loss of the firm's reputation. The additional costs of rebuilding a reputation can be quite high for management and are an important factor in making decisions about forecast accuracy.

In addition to managers’ forecasts, investors also rely on independent analysts. The latter is not interested in the profitability of a third party, and the stability of their salaries is determined only by the accuracy of predictions. If a company regularly shows high profitability and the forecasts of its managers are accurate, then the analysts take this into account as one of the factors in their forecast. Beyer & Guttman show that firms, overly optimistic in their performance forecasts, often manipulate the earnings data to achieve the projected figures (BEYER, GUTTMAN, 2012). If independent analysts expect such behavior, they will consider it, resulting in an unreasonably high forecasted profit. Thus, management’s attitude to voluntary forecasts also affects non-corporate forecasts.
However, it is obvious that the manipulation of forecasts and results, although leading to an increase in profitability in the short term, may come to the point when the management has nothing to manipulate, or their contracts end. In this case, the market can react extremely negatively to the company's behavior, which will result in a sharp plunge in the value of its shares. How, then, can manipulation in voluntary management disclosures be revealed beforehand?

Langberg & Sivaramakrishnan compare the market's response in the event of an overly positive forecast from management and a positive forecast from independent sources (LANGBERG, SIVARAMAKRISHNAN, 2010). In the first case, the market reacts much weaker to such forecasts since a significant proportion of investors see no justification for the given results and can suspect manipulation. In the case of a positive forecast of analysts, the market reacts more strongly, which is associated with investor confidence in independent assessments. After the market reacts to the initial forecast from analysts and the release of the forecast from the management, analysts often release a second forecast, already based on the results of the previous one. Thus, investors need to follow the sequence of forecasts and take into account voluntary disclosures in the form of forecasts from management and the opinions of independent experts.

MANAGEMENT MOTIVATION FOR NEGATIVE VOLUNTARY DISCLOSURES

Managers' performance forecast is the most common type of voluntary disclosure. It is often used by firms as a positive signal and is designed to generate capital. Let us look at other types of voluntary disclosures. Some firms tend to publish quantitative reports for quarterly earnings in advance. This type of disclosure can be explained by the negative results of a firm's operation. While publishing its expenditure items, management tries to explain investors' reasons for the negative results and, thereby, reduce the negative consequences from the market.

Nevertheless, it is a known fact that investors tend to treat negative news much sharper than positive ones, which is why the reaction of share prices in the first case is also stronger. Here again, it is necessary to dwell on the motivation of management to disclose information about negative profits. First, investors have the opportunity to file claims against management due to a sharp drop in the value of shares that occurs due to unexpected negative performance in the case when investors are not warned about this in advance. The managers themselves are directly responsible for the consequences, which motivate them to inform investors about low or negative quarterly earnings in advance.

Another reason is the potential costs of losing confidence: if a firm does not disclose "bad" information in advance, it loses investors and independent analysts' confidence. Suppose an investor holds shares in the company and realizes that its management does not report negative results in advance, and on the day of publication, the share price may fall sharply. In that case, the investor may prefer not to hold shares of such a company.

Legal aspects also significantly influence the motivation of management's negative performance without a preliminary announcement, leading to a significant drop in the company's share price and, therefore, potential costs for lawsuits from investors. To prevent this effect, managers prefer to notify investors about the negative results in advance and thus reduce the number of investors filing lawsuits. A common argument of an investor when filing a lawsuit is far too late announcements of management about events that lead to a decrease in profits or the occurrence of losses. Therefore, the time difference between negative events and the transfer of information to investors is reduced. Moreover, shortening of this time difference can decrease their size. In addition to lawsuits, management also faces indirect costs.

Lang & Lundholm show that professional analysts and rating agencies leave negative reviews for a company when its management does not make initial voluntary disclosures about poor performance (LANG, LUNDHOLM, 1996). Moreover, all firms with voluntary disclosures enjoy more forecasts from independent analysts, and those forecasts are more accurate than the average for the general sample. Reviews of influential bodies also impact the financial market, and therefore the profitability depends on them – many of the lawsuits filed by US
investors with the SEC (U. S. Securities and Exchange Commission URL: https://www.sec.gov/) are based on prohibiting all individuals from making any false statements about significant facts. These lawsuits also deal with a failure to provide facts necessary to make statements that are not misleading, considering the circumstances in which they are made. Regulatory disclosure legislation prohibits managers not to disclose material information in several situations: firstly, it obliges the insiders of the company to disclose information they know or otherwise not to participate in trading on the financial markets, and secondly, if the information was disclosed even voluntarily, it must meet the characteristics of completeness and accuracy.

Consequently, a firm must promptly correct and update published information when circumstances arise that affect its operating results, even if it has been included involuntary rather than mandatory disclosures. Investors can use failure to comply with these obligations in lawsuits: they can refer to missing data, incorrect wording, and deliberate absence of significant facts that affect their decisions. In reality, the situation looks simpler: with a sharp decline in the value of shares after the report's release, investors file lawsuits, citing the absence or inaccuracy of previously published voluntary disclosures. In addition, some studies confirm that such claims are often resolved between managers and investors before trial. Brown, Christensen & Elliott empirically show that most conflicts between the two parties do not result in a court verdict (BROWN, CHRISTENSEN, ELLIOTT, 2012). Rogers, Buskirk & Zechman demonstrate a similar result (ROGERS, BUSKIRK, ZECHMAN, 2011). Evans & Sridhar illustrate the reasons for conflict resolution: often such claims are directed specifically at top management, characterized by risk aversion, which is why the management prefers to publish even negative disclosures to avoid potential litigation (EVANS, SRIDHAR, 2002).

Thus, in the event of negative performance results, the company loses its capitalization due to a decrease in the value of shares and may incur legal costs resulting from investors' claims. It suggests that firms with such results should make more voluntary preliminary disclosures than firms with positive results. It does not mean that with such voluntary disclosures, the firm will stop receiving claims from investors: the latter is aimed at obtaining compensation in any case if the value of the company's shares falls sharply. Francis, Philbrick & Schipper even demonstrate cases where voluntary disclosures themselves cause investor lawsuits (FRANCIS, PHILBRICK, SCHIPPER, 1994). However, managers should strive to minimize potential losses, which are reduced by voluntary disclosures.

Roychowdhury & Sletten show that the management voluntarily discloses only those negative aspects of its activities that overcome a certain threshold of materiality; therefore, even with voluntary disclosures, investors are exposed to the risk of the existence of other information that is unknown to them (ROYCHOWDHURY, SLETten, 2012). Jansen shows that the reason for some voluntary disclosures is not to inform investors but to prevent new companies from entering the market (JANSEN, 2010). It is assumed that if an influential firm shows negative results in the market, then startup leaders should think before developing another firm in the same market - that is how the management tries to solve the issue of competition. Consequently, the optimal management solution may provide positive results to investors and negative to competitors since the former are interested in increasing their profitability. The latter studies of market participants are to assess their possible results when entering it. In such a situation, management may agree to provide false predictions to the public and potential competitors while notifying their investors about the falsity of these predictions and notifying them of actual positive performance results.

Skinner tests several hypotheses: H1 - Voluntary disclosures in the form of quarterly reports have a higher proportion of negative results than annual reports (Skinner DJ, 1994). In the examined sample of 126 companies, 72 of them, in 109 out of 140 quarterly reports, give negative results, while 72 out of 103 annual reports already have positive news. Empirical support for this hypothesis suggests that firms do try to notify investors of negative results more often. In addition, it is shown that firms present different forms of disclosure depending on whether their performance results are positive or negative. In 52% of cases, positive results are presented as point or interval estimates versus 26% in negative results.

Meanwhile, qualitative disclosure with a relatively low number of calculations is more often used to disclose negative results - 39% versus 16% (for disclosing positive results). It is
probably because management tries to explain the factors that influenced them with negative results, while with positive results, there is no such need. Another hypothesis argues that the market reaction to bad news in voluntary disclosures is larger in absolute terms than the reaction to positive news. That is, with negative results, stocks dive deeper than they grow with positive ones. The results of testing the hypothesis can be presented in the form of table 1 below:

**Table 1: Changes in the value of shares of companies that made voluntary disclosures**

| Observations                  | Positive news | Negative news | Significance of testing statistics |
|-------------------------------|---------------|---------------|-----------------------------------|
| All disclosures               | 313           | 2.46%         | -6.06%                            | -3.10 |
| Annual disclosures            | 79            | -0.28%        | -8.88%                            | -2.84 |
| Quarterly disclosures         | 152           | 4.62%         | -5.59%                            | -0.53 |
| Precise estimates             | 61            | 1.86%         | -5.92%                            | -2.23 |
| Interval estimates            | 34            | 2.33%         | -7.10%                            | -1.65 |
| One-sided evaluation interval | 67            | 3.14%         | -7.61%                            | -1.21 |
| Quality disclosures with a small number of calculations or their absence | 66 | 1.36% | -4.50% | -1.19 |

Source: Based on a sample of 313 disclosures by 93 firms

On average, other things being equal, when negative news is disclosed, two days later, the shares of the companies are worth 6.06% less than before the disclosure; however, when positive news is disclosed, shares grow in two days by only 2.46%. Thus, the market does react more strongly to negative news than to positive ones. The test statistic -3.10 on the significance of the difference in market reactions is significant even at the significance level of 1%, suggesting that the hypothesis of a different magnitude of reactions is not rejected at any reasonable level of significance.

**DETERMINANTS OF COMPANIES WITH VOLUNTARY DISCLOSURES**

One of the main factors that potentially affect the likelihood of voluntary disclosures is the size of an enterprise. Large-cap companies have a large number of shareholders, or, if there are not so many shareholders, these few have large stakes with huge funds. In either case, the potential need for disclosures grows. One incentive to disclose information is to minimize lawsuits. This risk arises both in the case of an enterprise with many shareholders and in the case of investors with large shareholdings. A positive relationship between company size and voluntary disclosures is shown in the empirical study of Swiss businesses by Hail (HAIL, 2003). He argues that it is financially easier for large enterprises to disclose information since they have a large turnover. In addition, large companies have higher salary costs for the senior management, who have a stronger incentive to maintain its stability.

Another factor is the country of origin; the laws of some countries, for example, the USA or the UK, are extremely strict regarding the requirements for enterprises, which increases the likelihood of an investor’s rightness in litigation. Then we can assume that the management of companies from these countries will be more prudent about their results and more inclined to disclose information beforehand. The relationship between voluntary disclosures and the stringency of legislation is confirmed in a study by Francis, Khurana & Pereira (FRANCIS, KHURANA, PEREIRA, 2005). In addition, many firms operate in several markets at once. This expansion leads to an influx of foreign investors, which can also influence the degree of voluntary disclosures.

The use of voluntary disclosures differs across industries. Industries with high R&D costs need to be careful with their disclosures; for example, when developing chemical products, information must be kept confidential. The same is true for many other high-tech industries. Cooke shows Inter-industrial differences in voluntary disclosures on a sample of Japanese and Swedish companies. Another determining factor can be leverage, calculated as the ratio of debt to equity (COOKE, 1991). With its decrease, more and more of the company’s capital is owned by investors, whose profitability depends, among other things, on the market. At the same time, the creditors’ income is fixed and more stable. Thus, as leverage decreases, the influence of investors grows, which means that they need to make voluntary disclosures grows as well.
The profitability of a company can also determine voluntary disclosures - a firm can use its positive results as an advantage over competitors and borrow capital at a lower interest rate. To raise debt and guarantee its obligations, a firm can go for a special voluntary disclosure to potential creditors. This mechanism is described in detail and empirically proven in the work of Hail (HAIL, 2003). Each of these factors is theoretically capable of positively affecting the availability of voluntary disclosures, and each has been discussed in detail in various works. In addition, a study by Meek, Roberts & Gray uses the international listing status (MEEK, ROBERTS, GRAY, 1995). All these factors are taken as regressors (table 2).

At the same time, a dependent variable is the index of voluntary disclosures, obtained through the ratio of all disclosed information for the period to the maximum possible amount of information on disclosures, which, in their turn, are divided into three groups according to the principle of relevance for investors: strategic, financial, and non-financial. While the first two types of disclosures are often material in decision-making, non-financial disclosures are usually associated with social responsibility, such as environmental disclosures. The regressors are presented in the following form: the size of enterprises is presented in terms of the ratio of sales turnover, the country indicator is presented in the form of a company’s belonging to one of the dummy variables, which are taken as the USA, Great Britain, and Continental Europe. If a company belongs to one of these categories, the value of one of the dummy variables equals 1; otherwise, it equals 0. Industry specificity is presented similarly, i.e., companies are divided by industry: metallurgy and construction, consumer sector, mining.

Leverage is represented through the ratio of long-term debt to equity. Belonging to several markets (from now on referred to as the degree of international activity) is implemented through the ratio of the sales volume outside the home country to total sales. Profitability is presented in terms of the ratio of profit after taxes to revenue. The dummy variable is taken as the index of voluntary disclosures, which, in their turn, are divided into three groups according to the principle of relevance for investors: strategic, financial, and non-financial. While the first two types of disclosures are often material in decision-making, non-financial disclosures are usually associated with social responsibility, such as environmental disclosures. The regressors are presented in the following form: the size of enterprises is presented in terms of the ratio of sales turnover, the country indicator is presented in the form of a company’s belonging to one of the dummy variables, which are taken as the USA, Great Britain, and Continental Europe. If a company belongs to one of these categories, the value of one of the dummy variables equals 1; otherwise, it equals 0. Industry specificity is presented similarly, i.e., companies are divided by industry: metallurgy and construction, consumer sector, mining.

\[
\text{Leverage} = \frac{\text{long-term debt}}{\text{equity}}
\]

\[
\text{Profitability} = \frac{\text{profit after taxes}}{\text{revenue}}
\]

\[
\text{Leverage} = \frac{\text{sales volume outside home country}}{\text{total sales}}
\]

\[
\text{Industry specificity} \quad \text{if metallurgy and construction} = 1; \quad \text{if consumer sector} = 1; \quad \text{if mining} = 1.
\]

\[
\text{Countries: USA, Great Britain, Continental Europe.}
\]

\[
\text{Coefficient values:}
\]

\[
\text{Table 2: Regression according to the types of voluntary disclosures}
\]

| Variable | Strategic disclosures | Non-financial disclosures | Financial disclosures | All disclosures |
|----------|----------------------|--------------------------|----------------------|----------------|
| Corrected R² | 0.33 | 0.46 | 0.14 | 0.35 |
| Test statistics | 12.00 | 19.98 | 4.69 | 12.71 |
| P-value | 0.000 | 0.000 | 0.000 | 0.000 |
| Constant | 30.83 (0.00) | 12.52 (0.00) | 14.98 (0.00) | 17.35 (0.00) |
| Size | -9.838*10⁻⁴ (0.01) | 3.14*10⁻⁴ (0.01) | 1.75*10⁻¹ (0.01) | -1.48*10⁻⁴ (0.00) |
| Country: = 1, if Great Britain | 1.12 (0.63) | 16.34 (0.00) | 3.16 (0.03) | 4.27 (0.00) |
| Country: = 1, if Continental Europe | 24.19 (0.00) | 11.36 (0.00) | 1.37 (0.42) | 9.80 (0.00) |
| Industry: = 1, if metallurgy and construction | -3.58 (0.18) | -0.15 (0.93) | 4.94 (0.00) | 1.21 (0.34) |
| Industry: = 1, if consumer sector | -2.35 (0.34) | -1.89 (0.21) | 2.49 (0.11) | -4.45*10⁻¹ (0.99) |
| Industry: = 1, if mining | -0.98 (0.68) | 3.75 (0.01) | 3.38 (0.02) | 2.37 (0.03) |
| Leverage | -0.28 (0.13) | -0.15 (0.18) | 0.20 (0.09) | -0.19 (0.03) |
| International Activity | -3.89 (0.42) | 3.07 (0.09) | 5.27 (0.08) | -0.53 (0.81) |
| Profitability | -7.71 (0.38) | 3.50 (0.51) | 8.11 (0.14) | 2.86 (0.48) |
| International listing | 4.78 (0.01) | 0.95 (0.42) | 2.41 (0.05) | 2.40 (0.01) |

Source: Search data.

According to the results of the study, the following indirect conclusions are made. The UK-based internationally listed companies have the highest leverage, while domestic UK companies have the lowest. Companies from Continental Europe have, on average, a higher degree of international activity than British companies, and British ones - higher than American ones. The regression results are statistically significant at any significance level for each type of disclosure and all observations. The adjusted R² varies from 0.14 for financial disclosures to 0.46 for non-financial disclosures. It means that the model explains a different
proportion of variance for different types of disclosures, has explained 35% of the variation across all observations. The size variable turns out to be significant for all disclosures.

Except for strategic ones, and it is also significant for the regression for all observations - the significant coefficients are positive, which indicates a positive relationship between the size of an enterprise and a disclosure index. The country score is also most significant, with a positive coefficient for UK and Continental European dummies. The industry indicator turns out to be insignificant, along with the indicators of international activity and profitability. Leverage is, as expected, significant and negative, and international listing status is significant, with a positive coefficient. Thus, the size, the country score, the leverage, and the international listing status do impact the extent of voluntary disclosures in businesses.

EMPIRICAL STUDY OF THE MARKET RESPONSE TO VOLUNTARY DISCLOSURES

Choice of a dependent variable, regressors, and a study period

The market reaction can be determined by the change in the value of financial instruments. Since a company's management in making decisions is guided by the actions of investors, stock prices of a sample of companies were taken as an instrument. Next, we need to decide on the frequency: investors, unlike speculators, are primarily focused on long-term profitability, and therefore it makes no sense to consider the profitability of stocks per day or even per quarter.

We take as a dependent variable the annual return on shares in % (gain) is taken and then expressed through the ratio of a share value at the year-end to the value of the same share at the beginning of the year.

Voluntary disclosures are primarily of interest as regressors for this exercise since they are qualitative variables, not quantitative. They can be determined in a binary way: either a voluntary disclosure has been made or not. Then the voluntary disclosures can be represented as a dummy variable equal to 1 in the case of material voluntary disclosures during the year and 0 in their absence. However, with introducing one dummy variable, the interpretation of its coefficient on stock returns would be very difficult. Therefore, voluntary disclosures are divided into positive (positive_discl), denoting optimistic forecasts or news from management, and negative (negative_discl). Each variable equals 1 in the event of such disclosure and 0 in the opposite case. Bloomberg and Reuters (Bloomberg: URL: https://www.bloomberg.com/; Reuters: URL: https://www.reuters.com/) publications are used as sources of information on voluntary disclosures since these agencies regularly publish news reports on a variety of companies, including their voluntary disclosures in the form of performance forecasts. Companies submit their forecasts several times; however, the study uses the final forecasts published commencing late October to mid-November since such forecasts take into account the largest amount of information for the reporting period and, accordingly, turn out to be closer to real values.

The outlook is determined as positive if it predicts higher values of the company’s profit growth than earlier forecasts or, in case of losses, they turn out to be lower than previously assumed. In this case, the variable ‘positive_discl’ assumes a value equal to 1. The forecast is considered negative if the predicted profit growth value turns out to be lower than that of the earlier forecasts or if losses turn out to be higher than previously assumed. In this case, the ‘negative_discl’ variable takes a value equal to 1. If the company's final forecast does not deviate from the earlier variables, both variables are assigned zero values. The choice of changing the final forecast relative to the early ones is explained by the fact that if the company demonstrates certain growth rates or, conversely, falls throughout the year, this is reflected in the early forecasts, and the shareholders are aware of what happens. Therefore, even if the final forecast assumes high growth or fall rates, but at the same time the values are predicted from the beginning of the year, then such a forecast will not cause a sharply negative or positive reaction from informed investors and, therefore, will not have such a strong effect on the change in profitability.

Stock returns can hardly be explained only by dummy variables on the occurrence of two types of disclosures - the dependent variable is probably explained by fundamental financial
indicators, i.e., return on assets (ROA), return on equity (ROE), earnings per share (EPS), the ratio of the company's capitalization to its book value (price-to-book) and the measure of market risk $\beta$ (beta). The choice of these indicators is due to the focus on them of investors when making decisions and their special significance in the assessments of various analysts.

The period of 2010 - 2018 is taken as the study period. This time range is large enough and does not include the financial crisis of 2008 to avoid bias in the regression estimate due to the presence of outliers that are not explained by exogenous parameters. 2019 is not included in the sample due to the lack of financial indicators for some firms. The study is conducted on a sample of 15 companies in the automotive sector from the US and European countries, which are selected based on the principle of being the most ”perfect” in terms of immediate market response and independence from government agencies. The resources of Yahoo Finance, Investing.com, and Finbox are used as sources for obtaining financial indicators (Yahoo Finance URL: https://finance.yahoo.com/; Investing.com URL: https://www.investing.com/; Finbox URL: https://finbox.com/watchlist).

**RESEARCH METHODOLOGY**

Since the sample contains data grouped by 15 companies and 9 years, we consider the panel data type when constructing regressions. We evaluated models in which only financial indicators are regressors: a simple linear model, a model with random effects, and fixed effects. The results (including all other assessed model specifications) are presented in Appendix A. Haussmann’s test does not reject the main hypothesis about the non-systematicity of the difference in the coefficients in the model with random effects. Therefore, this specification is similar to the model with fixed effects. The Brousch-Pagan test shows that the significance of a simple linear model is not inferior to the significance of a model with random effects. Thus, we can conclude that there are no random and fixed effects in the observations, and simple linear regression was more effective. Further on, a simple linear model is compared with the averaged model based on the generalized estimating equation, and the latter turned out to be better in terms of coefficients and predictive power.

Similar actions were also performed with the model, which includes dummy variables for voluntary disclosures: the results for all tests do not change. At the same time, in the averaged model, the regressors’ EPS, ROE, and beta-turn out to be insignificant at the 5% significance level: their $p$-values are equal to 0.488, 0.894, and 0.701, respectively. Therefore, they are excluded from the model. The resulting model’s specification with standard errors in White’s form was chosen as the final model to obtain more accurate estimates and avoid heteroscedasticity.

**The model evaluation results**

The final model results are presented below:

| Source: Search data. |
|----------------------|

**Table 3. Final model results**

| Source: Search data. |
|----------------------|

| Coef. | Std. Err. | z | P>|z| | [95% Conf. Interval] |
|-------|-----------|---|------|-------------------|
| ROA   | -0.0051731| 0.0014926| -3.47| 0.001 | -0.0080986 | -0.0022477 |
| price to book | 0.0033941 | 0.0006478 | 5.24 | 0.000 | 0.0021245 | 0.0046338 |
| positive_discl | 0.5856455 | 0.0856961 | 6.83 | 0.000 | 0.4176841 | 0.7536068 |
| negative_discl | -0.4038345 | 0.0354741 | -11.38 | 0.000 | -0.4733624 | -0.3343065 |
| _cons | 0.068771 | 0.0194237 | 3.54 | 0.000 | 0.0307011 | 0.1068408 |

White’s test statistic is 702.06, and P-value = 0; that is, the hypothesis of the simultaneous equality of all coefficients to zero is rejected at any reasonable level of significance, and the model is adequate. In addition, according to the test statistics and P-value coefficients, it can be concluded that each of them is significant for predicting the annual return of a stock at any level of significance. For this sample, the variable ROA negatively affects the annual profitability, while the ratio of the firm’s capitalization to its book value - positively.

Both dummies for voluntary disclosures turn out to be significant, i.e., they affect profitability. While the variable for positive voluntary disclosures has a coefficient of 0.58, all other things being equal, firms that make such voluntary disclosures during the year on average bring investors 0.58% more profitability than firms without such disclosures. The variable for
negative voluntary disclosures has a coefficient of -0.4, i.e., all other things being equal, enterprises that make this type of disclosure during the year on average have a yield lower by 0.4% than enterprises without negative disclosures. Despite the intuitiveness of the positive coefficient of the dummy variable with positive voluntary disclosures and intuitiveness of the negativeness of a similar coefficient for negative disclosures, the importance of the result lies in the significance of the effect of voluntary disclosures on the annual stock return, since for both variables the test statistics are significant at any level of significance, which indicates the reliability of such estimates.

**CONCLUSION**

Between the management of enterprises and their investors, there is a problem of asymmetry of information and a conflict of investors, which, as a result, can lead to negative results of enterprises’ activities and a shock reaction of the financial market to the financial instruments of such firms. The work examines the motivation of management, which goes for voluntary disclosures, the main type of which is forecasts of their results, which can mitigate the market’s negative reaction directly during the publication of publicly available information. In addition, it is shown that in some cases, the target audience of voluntary disclosures is not investors but competing firms, and such a step (as disclosures) can be taken by management to prevent competition in the market in the form of an attempt to “intimidate” entrepreneurs who are ready to enter the market. In addition, it has been shown that such voluntary disclosures can positively affect investor and analyst confidence in a firm.

We also reviewed the works highlighting the factors influencing management decisions to make voluntary disclosures, including, for example, unwillingness to deal with investors’ claims and, consequently, legal costs. Another important observation was identifying variables that influence the degree of voluntary disclosures, e.g., an enterprise size, a country of origin, international activity, an industry, etc. This result allows a different explanation of the managers’ motivation for voluntary disclosures.

The most important part of the work is our research. The effect of making positive and negative voluntary disclosures on the annual return on shares of these companies is studied based on a sample of companies in the automotive industry from the United States and Europe. It turns out that this effect is significant, while it equally increases the annual yield of the shares with positive disclosures and decreases - with negative ones.

Despite the significane of the results obtained, there is still much space for further study of the topic. For example, we can expand the model to several sectors or consider the cross-country effect. In addition, within the framework of the study, we are limited in obtaining data on some regressors: the measure of the market risk in Internet sources is set as a constant for each company. It does not differ over the years, despite its variability. Another difficult stage is collecting news about positive and negative voluntary disclosures - such information in the media is not fully presented. Some of it is intended only for investors, which may lead to inaccuracies in assessing dummy variables for voluntary disclosures, therefore, biased estimated regression coefficients.

However, obtaining significant regression coefficients is an important result. The next stage of the research can be contacting companies and obtaining information on voluntary disclosures, which can lead to a more accurate assessment of their impact on the financial market. The relevance of the research results is primarily due to the increased attention of investors to voluntary disclosures rather than mandatory ones. Despite the strictness of the regulators, many firms have adapted to the emerging requirements. They can function ineffectively even in such conditions, making disclosures beyond the mandatory ones an important signal for management to be ready for mutually beneficial cooperation with investors.

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Voluntary disclosure of a company performance and the market reaction

Divulgação voluntária do desempenho da empresa e da reação do mercado

Divulgación voluntaria del rendimiento de una empresa y la reacción del mercado

Resumo
No mundo de hoje, a divulgação de informações por uma empresa afeta sua posição nos mercados financeiros. As empresas entram em contato com investidores utilizando relatórios sobre determinados eventos. Para isso, tanto relatórios financeiros oficiais quanto canais de comunicação menos regulamentados, como o site da empresa na Internet, reuniões pessoais ou redes sociais, podem ser utilizados. A relevância deste resultado da pesquisa deve-se principalmente ao aumento da atenção dos investidores às divulgações voluntárias e não às obrigatórias. Ao estudar uma amostra de empresas da indústria automotiva dos Estados Unidos e da Europa, descobrimos que fazer divulgações voluntárias positivas e negativas sobre o retorno anual das ações dessas empresas. O artigo relata que esse efeito é significativo: ao mesmo tempo em que aumenta o rendimento anual das ações com divulgações positivas e diminui com as negativas.

Abstract
In today’s world, the disclosure of information by a firm affects its position in the financial markets. Enterprises contact investors utilizing reporting about certain events. For this purpose, both official financial reports and less regulated communication channels, such as the company’s website on the Internet, personal meetings, or social networks, can be used. The relevance of this research result is primarily due to the increased attention of investors to voluntary disclosures rather than mandatory ones. By studying a sample of companies in the automotive industry from the United States and Europe, we found out that making positive and negative voluntary disclosures on the annual return on shares of these companies. The paper reports that this effect is significant: while it increases the shares’ annual yield with positive disclosures and decreases with negative ones.

Resumen
En el mundo de hoy, la divulgación de información por parte de una empresa afecta su posición en los mercados financieros. Las empresas se comunican con los inversores utilizando informes sobre ciertos eventos. Para ello se pueden utilizar tanto informes financieros oficiales como canales de comunicación menos regulados, como la web de la compañía en Internet, reuniones personales, o redes sociales. La relevancia de este resultado de la investigación se debe principalmente a la mayor atención de los inversores a las divulgaciones voluntarias en lugar de las obligatorias. Al estudiar una muestra de empresas de la industria automotriz de los Estados Unidos y Europa, descubrimos que hacer divulgaciones voluntarias positivas y negativas sobre el rendimiento anual de las acciones de estas compañías. El documento informa que este efecto es significativo: mientras que aumenta el rendimiento anual de las acciones con divulgaciones positivas y disminuye con las negativas.
Here we present Results for various model specifications where only financial indicators are used as regressors:

1. **Simple linear regression**

|       | Coef.  | Std. Err. | z    | P>|z|  | [95% Conf. Interval] |
|-------|--------|-----------|------|------|---------------------|
| EPS   | 0.0022726 | 0.0045361  | 0.50 | 0.616 | -0.006618 to 0.011632 |
| ROE   | -0.0000644 | 0.0001439  | -0.45 | 0.654 | -0.0030465 to 0.002176 |
| ROA   | -0.0062235 | 0.0054415  | -1.14 | 0.253 | -0.0168866 to 0.0044416 |
| beta  | -0.0249804 | 0.0750067  | -0.33 | 0.739 | -0.1719908 to 0.12203 |
| pricetobook | 0.0053632 | 0.003313   | 1.62 | 0.105 | -0.0011302 to 0.0118565 |
| _cons | 0.1525637 | 0.1218725  | 1.25 | 0.211 | -0.086302 to 0.3914294 |

2. **Model with random effects**

|       | Coef. Std. Err. | z    | P>|z|  | [95% Conf. Interval] |
|-------|-----------------|------|------|---------------------|
| EPS   | 0.0022726       | 0.0045361   | 0.50 | 0.616 | -0.006618 to 0.011632 |
| ROE   | -0.0000644      | 0.0001439    | -0.45 | 0.654 | -0.0030465 to 0.002176 |
| ROA   | -0.0062235      | 0.0054415    | -1.14 | 0.253 | -0.0168866 to 0.0044416 |
| beta  | -0.0249804      | 0.0750067    | -0.33 | 0.739 | -0.1719908 to 0.12203 |
| pricetobook | 0.0053632 | 0.003313   | 1.62 | 0.105 | -0.0011302 to 0.0118565 |
| _cons | 0.1525637       | 0.1218725   | 1.25 | 0.211 | -0.086302 to 0.3914294 |

3. **Model with fixed effects**

|       | Coef. Std. Err. | t    | P>|t|  | [95% Conf. Interval] |
|-------|-----------------|------|------|---------------------|
| EPS   | 0.0022726       | 0.0045361   | 0.50 | 0.581 | -0.0096495 to 0.0171203 |
| ROE   | -0.0000644      | 0.0001439    | -0.45 | 0.654 | -0.0030465 to 0.002176 |
| ROA   | -0.0062235      | 0.0054415    | -1.14 | 0.253 | -0.0168866 to 0.0044416 |
| beta  | 0               | (omitted)    | 0.75 | 0.458 | -0.0092953 to 0.0205141 |
| pricetobook | 0.0053632 | 0.003313   | 1.62 | 0.105 | -0.0011302 to 0.0118565 |
| _cons | 0.1525637       | 0.1218725   | 1.25 | 0.211 | -0.086302 to 0.3914294 |

Brousch-Pagan test for choosing between a simple linear model and a model with random effects:

|       | Coef.  | Std. Err. |
|-------|--------|-----------|
| gain  | 0.2373554 | 0.4871913 |
| e     | 0.2468765 | 0.4968666 |
| u     | 0       | 0         |

Test: Var(u) = 0
Chi-square = 0.00
Prob > chi-square = 1.00

Haussmann test for choosing between fixed effects model and random effects model:

|       | fixed | random | (fixed-random) difference | sqrt(diag (V_fixed-V_random)) |
|-------|-------|--------|---------------------------|------------------------------|
| EPS   | 0.0037354 | 0.0022726 | 0.0014629 | 0.0050093 |
| ROE   | -1.67e-06 | -0.0000644 | 0.0000628 | 0.0000622 |
| ROA   | 0.0056094  | -0.0062235 | 0.0018329 | 0.0051981 |
| pricetobook | 0.0031567 | 0.0053632 | -0.0022065 | 0.0010811 |

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4. Averaged model:

|        | Coef.    | Std. Err. | z     | P>|z| | [95% Conf. Interval] |
|--------|----------|-----------|-------|-----|----------------------|
| EPS    | 0.0025109| 0.0025118 | 1.00  | 0.317| -0.0024121          | 0.007434 |
| ROE    | -0.0000692| 0.0001219 | 0.57  | 0.570| -0.0003082          | 0.0001698 |
| ROA    | -0.0158367| 0.0031776 | -4.98 | 0.000| -0.0220652          | 0.0096082 |
| beta   | 0.0034469| 0.033188  | 0.10  | 0.917| -0.0616005          | 0.0684942 |
| pricetobook | 0.0076747| 0.0033006 | 2.33  | 0.020| 0.0012057           | 0.0141438 |
| cons   | 0.1174288| 0.0553862 | 2.12  | 0.034| 0.0088739           | 0.2259837 |

Results for various specifications of the model, where both financial indicators and dummy variables for voluntary disclosures are used as regressors:

5. Simple linear model:

|        | Coef.    | Std.Err | z     | P>|z| | [95% Conf. Interval] |
|--------|----------|---------|-------|-----|----------------------|
| EPS    | 0.0007267| 0.0034084| 0.21  | 0.831| -0.0002344          | 0.0001883 |
| ROE    | -0.000023 | 0.0001078| -0.21 | 0.831| -0.0002344          | 0.0001883 |
| ROA    | -0.0034383| 0.0040737| -0.84 | 0.399| -0.0114225          | 0.0045459 |
| beta   | 0.0055749| 0.0562821| 0.10  | 0.921| -0.1047360          | 0.1158858 |
| pricetobook | 0.0031487| 0.0024852| 1.27  | 0.205| -0.0017241          | 0.0080215 |
| positive_disc | 0.550221 | 0.0784667| 7.01  | 0.000| 0.3963898           | 0.740522  |
| negative_disc | -0.4407331| 0.0841508| -5.24 | 0.000| -0.6056657          | -0.2758005 |
| cons   | 0.0713307| 0.0937252| 0.76  | 0.447| -0.1123973          | 0.2549987 |

6. Model with random effects:

|        | Coef.    | Std.Err | z     | P>|z| | [95% Conf. Interval] |
|--------|----------|---------|-------|-----|----------------------|
| EPS    | 0.0007267| 0.0034084| 0.21  | 0.831| -0.00059536         | 0.0074069 |
| ROE    | -0.000023 | 0.0001078| -0.21 | 0.831| -0.0002344          | 0.0001883 |
| ROA    | -0.0034383| 0.0040737| -0.84 | 0.399| -0.0114225          | 0.0045459 |
| beta   | 0.0055749| 0.0562821| 0.10  | 0.921| -0.1047360          | 0.1158858 |
| pricetobook | 0.0031487| 0.0024852| 1.27  | 0.205| -0.0017241          | 0.0080215 |
| positive_disc | 0.550221 | 0.0784667| 7.01  | 0.000| 0.3963898           | 0.740522  |
| negative_disc | -0.4407331| 0.0841508| -5.24 | 0.000| -0.6056657          | -0.2758005 |
| cons   | 0.0713307| 0.0937252| 0.76  | 0.447| -0.1123973          | 0.2549987 |

7. Model with fixed effects:

|        | Coef.    | Std.Err  | z     | P>|z| | [95% Conf. Interval] |
|--------|----------|----------|-------|-----|----------------------|
| EPS    | 0.0000969| 0.0051863| 0.02  | 0.985| -0.0010177          | 0.0010371 |
| ROE    | -8.68e-06| 0.0001195| -0.07 | 0.942| -0.0002453          | 0.0002228 |
| ROA    | 0.0012236| 0.0057972| 0.21  | 0.833| -0.0012806          | 0.0012707 |
| beta   | 0 (omitted) | 0 (omitted) | 0 (omitted) | 0 (omitted) | 0 (omitted) | 0 (omitted) |
| pricetobook | 0.0024052| 0.0026508| 0.91  | 0.366| -0.002846          | 0.0076565 |
| positive_disc | 0.5148799| 0.0857421| 6.00  | 0.000| 0.3450254           | 0.6847344 |
| negative_disc | -0.4562743| 0.0889844| -5.13 | 0.000| -0.6325517          | -0.279997 |
| cons   | 0.0890181| 0.0516749| 1.72  | 0.088| -0.0133495          | 0.1913857 |

Brousch-Pagan test for choosing between a simple linear model and a model with random effects:

|        | Coef.    | Std. Err.  |
|--------|----------|------------|
| gain   | 0.2373554| 0.4871913  |
| e      | 0.1426308| 0.377665   |
| u      | 0         | 0          |

Test: Var(u) = 0  
Chi-square = 0.00  
Prob > chi-square = 1.00
Haussmann test for choosing between fixed effects model and random effects model:

|                | fixed     | random    | (fixed-random) difference | sqrt(diag(V_fixed-V_random)) |
|----------------|-----------|-----------|---------------------------|-----------------------------|
| EPS            | 0.0000969 | 0.0007267 | -0.0006298                | 0.0039091                   |
| ROE            | -8.68e-06 | -0.000023 | 0.0000143                 | 0.0000514                   |
| ROA            | 0.0012236 | -0.0034383 | 0.0046619                | 0.0041246                   |
| pricetobook    | 0.0024052 | 0.0031487 | -0.0007435                | 0.0009197                   |
| positive_d-l   | 0.5148799 | 0.550221  | -0.0353411                | 0.0345188                   |
| negative_d-l   | -0.4562743 | -0.4407331 | -0.0155412                | 0.0289285                   |

8. Averaged model:

|                | Coef.     | Std. Err. | z      | P>|z | [95% Conf. Interval] |
|----------------|-----------|-----------|--------|-----|---------------------|
| EPS            | 0.0014541 | 0.0020981 | 0.69   | 0.488 | -0.002658 to 0.0055663 |
| ROE            | -0.0000126 | 0.0000943 | -0.13  | 0.894 | -0.0001974 to 0.0001723 |
| ROA            | -0.0063455 | 0.0027372 | -2.32  | 0.020 | -0.0117704 to -0.0009806 |
| beta           | 0.011045  | 0.0287765 | 0.38   | 0.701 | -0.045356 to 0.067446 |
| pricetobook    | 0.0036461 | 0.0024593 | 1.48   | 0.138 | -0.0011741 to 0.0084664 |
| positive_diszcl| 0.5846926 | 0.0737825 | 7.92   | 0.000 | 0.4400815 to 0.7293036 |
| negative_diszcl| -0.4015193 | 0.086891 | -4.98  | 0.000 | -0.559667 to -0.2433716 |
| _cons          | 0.0463355 | 0.0502251 | 0.92   | 0.356 | -0.052104 to 0.1447749 |

9. Averaged model excluding some financial indicators:

|                | Coef.     | Std. Err. | z      | P>|z | [95% Conf. Interval] |
|----------------|-----------|-----------|--------|-----|---------------------|
| ROA            | -0.0051731 | 0.0023928 | -2.16  | 0.031 | -0.0096629 to -0.0004833 |
| pricetobook    | 0.0033941  | 0.0024335 | 1.39   | 0.163 | -0.0013755 to 0.0081637 |
| positive_diszcl| 0.5856455 | 0.0732364 | 8.00   | 0.000 | 0.4421048 to 0.7291862 |
| negative_diszcl| -0.4038345 | 0.0786484 | -5.13  | 0.000 | -0.5579825 to -0.2496865 |
| _cons          | 0.068771  | 0.0297451 | 2.31   | 0.021 | 0.0104716 to 0.1270703 |

10. Final model as an averaged model excluding some financial indicators and using standard errors in White's form:

|                | Coef.     | Std. Err. | z      | P>|z | [95% Conf. Interval] |
|----------------|-----------|-----------|--------|-----|---------------------|
| ROA            | -0.0051731 | 0.0014926 | -3.47  | 0.001 | -0.0080986 to -0.0022477 |
| pricetobook    | 0.0033941  | 0.0006478 | 5.24   | 0.000 | 0.0021245 to 0.0046638 |
| positive_diszcl| 0.5856455 | 0.0858691 | 6.83   | 0.000 | 0.4176841 to 0.7536068 |
| negative_diszcl| -0.4038345 | 0.0354741 | -11.38 | 0.000 | -0.4733624 to -0.3343065 |
| _cons          | 0.068771  | 0.0194237 | 3.54   | 0.000 | 0.0307011 to 0.1068408 |