



Asymmetric Information and Agency Cost of Financial Leverage and Corporate Investments: Evidence from Emerging South-East European Countries

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Abstract

In this paper, we investigated the impact of financial leverage on investment decisions on a sample of 811 firms from ten emerging South-Eastern European countries (Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia and Turkey). We apply a panel regression model involving investment ratio as a dependent variable, leverage as independent variable, and control for several firm characteristics that closely determines the corporate investments. The results of the analysis show that leverage is negatively related to investment in the companies in SEE. But only long term debt has a stronger negative impact on investment for firms with low growth opportunities than for firms with high growth opportunities. These findings show supportive evidence of agency theories of corporate leverage, especially with the debt overhang theory, but did not give strong validation that leverage has a disciplining role for firms with low growth opportunities in SEE emerging markets. In addition to leverage, we found that corporate investments in the SEE countries decrease significantly with tangibility and the company size. Corporate investments in the SEE countries increase significantly with cash flow, sales, non-debt tax shield and profitability. Overall, the results slightly defer with those from the research on the case of developed markets.

Keywords: leverage; investments; emerging markets; asymmetric information; agency problem.

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1. INTRODUCTION

One of the most crucial decision-making domains in corporate finance is the selection of the funding vehicles necessary to provide capital for the company activities. The financing decision determines the capital structure of the company. Under conditions of a perfect capital market, as assumed by Modigliani and Miler, with no taxes and transaction costs, the total cash flows from the firm projects are not affected by the method of financing. Under these conditions, the capital structure is irrelevant, and the financial decision does not affect the investment decision because it does not affect the cost of capital, and thus the NPV of the projects, the value of the company and the share price.

The real economic world of decision making is far from the assumptions of the perfect Modigliani - Miler world, so the company's capital structure is influenced by incomplete and imperfect capital markets, in which taxes, transaction costs, costs of financial distress, agency costs, and asymmetric information have an important impact. The financing decision consequently has a major impact on the investment decision in conditions of imperfect markets with asymmetric information and agency costs. It is the agency costs that arise from the conflict of interest between key stakeholders that have a key impact on investment decision-making, outside of the rational economic decision-making that the neoclassical economic paradigm assumes. The excessive amount of debt in the company reduces managers' and shareholders' incentives to undertake investment projects with a positive NPV if most of the benefits are in favor of debt holders, which leads to the problem of underinvestment. On the other hand, in a company with large amount of cash and no growth opportunities (i.e., excess cash flow), managers have an incentive to undertake wasteful investment projects for personal gain, i.e., the phenomenon of overinvestment. Here the leverage will impose constraints on managers for wasteful investments, known as disciplining role of debt. In both situations, underinvestment and overinvestment, leverage has a negative impact on the company's investments.

This paper considers the study of the impact of leverage on investment with the intention of finding support for the agency theory of leverage. It adds great value to the existing literature and research that has been done so far. Papers with the greatest impact in this area, such as that of [Lang, Ofek, and Stulz \(1996\)](#) and [Aivazian, Ge, and Qiu \(2005\)](#), were an inspiration for many authors as well as for this research, but also a challenge to upgrade. Our study contributes to previous research in two crucial aspects. The first is that the research is done at the level of emerging markets, unlike most of the research that is done in the case of developed countries. Emerging markets have their own specific characteristic that differs from the developed markets. In the research, we considered a large group of ten emerging South-East European countries (Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey), since most of them started their transition towards market economy in the 1990s after the fall of socialism. Since then, companies in SEE countries have found themselves in a new business environment based on market forces, rather central planning economic system, and corporate finance managers tend to follow the practices of companies from mature market economies. But emerging markets from SEE at this stage of development have completely different characteristics, opportunities and circumstances than developed markets. The analyzed SEE economies have underdeveloped capital markets with a dominant role of banks. They are clearly bank-centered with banking sector assets participation in the total assets of the financial sector ranges

between 75% and 92,4% (Arsov & Naumoski, 2016), shallow capital markets, the IPOs are very rare, as well as the use of corporate bonds for financing. So, the predominant source of external financing of corporate investments seems to be the bank loans, in a correlation with the retained earnings as a main internal source of financing.

The emergence and development of today's dominant theories in corporate finance is based on empirical research in the case of developed capital markets, especially the USA. However, it becomes obvious that this wisdom does not exactly match the reality even in the developed countries of continental Europe, not to mention the post-transition economies of Central and Eastern Europe (Filatotchev, Wright, Uhlenbruck, Tihanyid, & Hoskisson, 2003; Mramor & Valentinčič, 2001; Peev, 2001; Yeoh, 2007). Most of the SEE countries are small and open economies, interdependent with strong trade, capital and other economic relations. Empirical research on corporate financial practices in the case of individual SEE countries is not attractive and has no basis for making relevant conclusions. Primarily because each of them has a relatively small number of listed companies (except Turkey), insufficiently large volume of data and short research series. By extending our field of research to all SEE countries, we expect to obtain a sufficiently large basis for drawing relevant conclusions. We conducted a panel regression analysis using a sample of 811 publicly listed companies and data from their financial statements for a period of eleven years (2005 – 2015) assembled from the Thomson Reuters Eikon and Datastream database. The goal of the paper is to check if the conclusions about the impact of financial leverage on investment decisions in the analyzed group of countries differ significantly from those of developed countries. There are other similar studies that address emerging markets, but they generally involve country-specific surveys. The second aspect is that, in addition to the standard exogenous variables found in Aivazian et al. (2005) and applied in almost all other research, this study includes a wide range of intercompany control variables that are strong determinants of corporate investment.

The rest of the paper is systematized as follows. Section 2 provides an overview of the current literature on the impact of leverage on investment through the prism of agency theory of leverage and the problem of underinvestment and overinvestment, and the empirical evidence from other authors that underlies our research. Section 3 provides an overview of the broader set of intercompany variables that affect the investments we will use as control variables. Section 4 provides a more detailed description of how these variables will be measured. A narrower specification of the model is given in Section 5, where the results of the empirical analysis are presented. Section 6 concludes the paper.

2. LITERATURE REVIEW

2.1 Agency cost of leverage – the underinvestment and overinvestment phenomenon

Under conditions of a perfect capital market where all investors have all the information available in a timely manner, as assumed by Modigliani and Miller (1958), the capital structure is irrelevant and the investment, financing, and dividend decisions are independent. Here, investment decision-making is based on the assumptions of the neoclassical paradigm, where the relevant determinants of undertaking or rejecting the investment are economic fundamentals such as future value added for the company, profitability, expected cash flows, future demand, interest rate, etc. Subsequent theories, developed on the basis of empirical

evidence for the incompleteness and imperfection of capital markets, have shown that there is a great interdependence of investment and financial decision-making. Finance tends to affect capital investment decisions when there are missing or incomplete markets due to transaction costs and asymmetric information – that is, outside a Miller–Modigliani world (Aivazian et al., 2005). Informational asymmetries bring potential conflicts of interest between the company's key stakeholders (managers, shareholders, and debtholders) leading to overinvestment or underinvestment processes in the company. It can simply be a situation in which the company rejects good investment projects with a positive NPV or undertakes projects with a negative NPV. Underinvestment occurs due to conflict between shareholders and debtholders leading to the occurrence of *asset substitution* (Jensen & Meckling, 1976), *moral hazard* (Myers, 1977), and *adverse selection* (Stiglitz & Weiss, 1981). Overinvestment occurs due to conflict between shareholders and managers, which was developed by Jensen (1986) in his *free cash flow hypothesis*.

Excessive risk taking and asset substitution. In a leveraged company, there is a conflict of interest between the shareholders and debtholders, if the investment decision has different effects on equity value and debt value. This conflict is much more likely to occur in the case of a higher level of indebtedness of the company when there is a large risk of financial distress. Here, the managers who are appointed agents who should protect the interests of their principals - shareholders, are likely to make a decision to take action that will benefit shareholders to the detriment of creditors, but also reduce the overall value of the company. In fact, due to limited liability, shareholders may be encouraged to undertake riskier investment projects that are different from those for which a lending agreement has been entered into. If these projects are successful, they would potentially bring very large returns that would benefit the shareholders. But if they fail, the damage would fall on the creditors (Jensen & Meckling, 1976). Thus, lenders, in order to protect themselves from this risk of asset substitution, impose various preventive restrictive measures such as an increased risk premium and thus a higher interest rate, credit rationing, restrictive financing conditions, and way of investing. This leads to many investment projects becoming unacceptable or investors facing inability to invest. Therefore, this problem of substitution between shareholders and debtholders subsequently leads to underinvestment.

In cases where the company faces a risk of financial distress, the shareholders are the ones who will benefit from an investment decision that significantly increases the risk of the company, even when these investment projects have a negative NPV. Replacing low-risk assets with other much riskier assets is called asset substitution (Jensen & Meckling, 1976), as a way out of the crisis of a high levered company and salvation from bankruptcy. In some cases, it may be a decision to undertake high risk projects with a negative NPV that would benefit only the shareholders, which represents a case of overinvestment.

By undertaking projects with negative NPVs, the risk of the whole company increases and thus the value of the whole company decreases. However, if lenders anticipate this behavior in advance, then they will initially pay less for the debt when it is issued, reducing the amount the company can distribute to shareholders. This leads to a reduction in the initial share price which corresponds to the negative NPV of the decision. Therefore, this is an agency cost that is ultimately borne by the shareholders.

Moral hazard and debt overhang. The shareholders are subordinated to the debt holders in case of bankruptcy of the company, which creates a new conflict of interest between them, which then gives rise to a problem of underinvestment by moral hazard. When a company

faces a high risk of financial distress, it may decide not to undertake new investment projects because most or all of the return will be to the benefit of the debtors, but not to the benefit of the shareholders. Because debt holders get most or all of the benefits from a new project, this project is considered a negative-NPV investment opportunity for shareholders, although it is essentially a project that offers positive NPV to the company and adds value to the company as a whole. Therefore, shareholders will have an incentive to not undertake or to abandon positive NPV projects whenever the NPV is lower than the amount of debt issued (Myers, 1977). In this case when a high leverage company prefers not to undertake new investment projects with a positive NPV, it is called *debt overhang*, or problem of *underinvestment*. This agency cost of debt was formalized by Myers (1977). The unrealized returns from this investment are, in fact, an opportunity costs for debt holders, but also for the overall value of the company. The costs are higher for a company that has great growth opportunities in the future and needs new investments.

As the most extreme form of underinvestment that results from debt overhang is the problem of *cashing out*. Namely, in the case of an over-indebted company facing financial distress, the shareholders not only refrain from undertaking investment projects and exit from the crisis, but they also have the incentive to extract as much cash as possible from the company. Moreover, they can ask the managers to sell significant assets of the company at a price lower than their real value and to be paid a dividend. This is a *disinvestment* situation that drastically reduces the value of the company.

But what level of indebtedness should the company have before the debt overhang problem arises. Berk and DeMarzo (2017) give the following useful approximation: $\frac{NPV}{I} > \frac{\beta_D D}{\beta_E E}$, where I is the investment amount, D and E are the market values of the debt and equity, a β_D and β_E are their respective betas. The threshold for accepting projects is exactly the leverage of the company D/E multiplied by the relative risk of the debt (β_D/β_E). All projects, whose profitability index (NPV/I), although positive but below the threshold, will be rejected by shareholders.

The management of the company, which timely realizes ex-ante good opportunities for the growth of the company in the future, can take corrective action and reduce the debt accordingly to weaken the potential underinvestment incentives arising from the debt overhang. Therefore, a negative empirical relation between leverage and growth may arise even in regressions that control for growth opportunities because managers reduce leverage in anticipation of future investment opportunities (Aivazian et al., 2005).

Adverse selection. Another conflict of interest that arises between shareholders and debt holders is the unfavorable selection that leads to underinvestment. Debtors want to choose a borrower who is a good credit risk, while the credit risk premium depends on the size of the assessed credit risk. This problem arises from the higher premium required by bondholders, since they do not have enough information to distinguish the quality of the different investment projects of the firm (Stiglitz & Weiss, 1981). This leads to number of projects with a positive NPV becoming unprofitable and all future returns benefiting debt holders. This encourages shareholders to invest only up to the amount of internally generated funds and avoid extra borrowings to invest.

Maturity of debt and agency cost. According to Johnson (2003), short-term debt causes lower agency costs. The short-term debt should be repaid in a short time, and if the company is unable to pay it then it should either negotiate an extension of the terms or refinance it,

otherwise it defaults. In the case of short-term debt, the time is short for shareholders to act and take excessive risk and assets substitution, cash out, or to abandon project. Short-term debt can lead to increased risk for financial distress. With long-term debt, shareholders have more time and thus more opportunities to make profit for themselves, at the expense of debt holders, until the debt matures.

Debt covenants. Restrictive clauses imposed by debtors on companies in contracts are intended to reduce the moral hazard of agency costs and to maintain the company's liquidity and solvency and thus its ability to repay debt. But they sometimes put different provisions that limit the positive investment opportunities and lead to underinvestment due to leverage.

Overinvestment. Separation of ownership and control within the corporation leads to a conflict of interest between management and shareholders. Managers can make decisions that bring a variety of personal pecuniary and non-pecuniary benefits at the expense of investors. In literature and practice, one can find a huge number of examples when managers spend on personal perks and luxuries. Managers may use the free cash flow to undertake negative NPV projects in their own best interest (Jensen, 1986). Some economists explain this with the propensity of managers to build *empire* by undertaking productive and unproductive projects that increase company size rather than profit. This leads to the satisfaction of their personal preferences as managers of large corporations for higher salaries, prestige and publicity. Other authors explain the effect of overinvestment with the *overconfidence* of managers (Heaton, 2002; Malmendier & Tate, 2005; Roll, 1986). Managers, even when they work entirely in the interests of shareholders, can make mistakes, be overly optimistic about the company's development, and even because of reduced risk aversion and overestimation of the low probability of investment success called the effect of *long shot bias* (Golec & Tamarkin, 1998; Griffith, 1949; Quandt, 1986; Thaler & Ziemba, 1988). The possibility of overinvestment of managers depends on the size of the free cash flow, which can be limited by issuing debt. Debt creates obligations to service equity and interest and thus prevents managers from making wasteful investments; some call it *disciplinary role of the debt*. Therefore, leverage is a mechanism for overcoming the overinvestment problem suggesting a negative relationship between debt and investment for firms with weak growth opportunities (Aivazian et al., 2005).

According to the agency theories of corporate leverage leading to under- and over-investment, *leverage has a significant negative effect on investment* suggesting that capital structure plays an important role in the firms' investment policies.

2.2 Subsequent research

The agency theories of corporate leverage (Jensen, 1986; Jensen & Meckling, 1976; Myers, 1977; Stiglitz & Weiss, 1981) inspired many scholars to investigate the impact of financial leverage on corporate capital expenditures. These theories were originally developed in the case of the developed (mostly in USA) economy with developed financial markets. Almost all subsequent research is predominantly done on samples of companies from developed countries, and little research has been done in the case of emerging countries where this study belongs. The results of subsequent research provide the only clear confirmation of the negative effect of financial leverage on the capital investments of companies, while the differences are in terms of the effect of leverage on investments in companies with different growth opportunities. In some studies, the negative effect of leverage is stronger in companies with low growth opportunities, by that providing support to agency theories of corporate

leverage, and especially the theory that leverage has a disciplining role for firms with low growth opportunities. But in some studies, the negative effect is stronger in companies with high growth opportunities; somewhere it was found that growth opportunities are not significant, etc., up to the point of a very rare extreme situation where leverage has no or positive effect on investment. These differences are immanent for developing countries and are mostly result of the economic conditions in the country, the institutional set-up, corporate governance mechanisms, ownership, and other factors, such as: bank relationship with the company, the role of the capital market in financing, which have very different set-up in some countries. It is the divergence of the conditions under which companies operate in individual countries that lead to differences in research results. A brief overview of the most influential studies is presented in the rest of this section.

Morgado and Pindado (2003) investigating the case of Spanish companies, found that the optimal level of company investments can be exceeded thus leading to overinvestment process, created by the divergence of interests between shareholders and managers and fostered by the existence of asymmetric information. Similarly, the conflict between shareholders and bondholders and the conflict between current and prospective shareholders, lead companies to not reach the optimal level creating underinvestment process. Denis and Denis (1993), in the US study on a sample of 39 leveraged recapitalization cases, found that the increase of firms leverage leads to reduction of capital investments. Later, they extend their analysis to explore constrains of leverage on investments in diversified firms, those operating in multiple lines of business having different marginal growth opportunities (Ahn, Denis, & Denis, 2006). Their findings suggest that higher leverage appears to impose a greater constraint on investment in the high growth segments of diversified firms than in the low growth segments. In other words, the disciplinary benefits of debt are partially offset by the additional managerial discretion in allocating debt service that is provided by the diversified organizational structure, since managers can allocate a disproportionate share of their debt service burden to their higher growth and non-core segments.

Lang et al. (1996), on a sample of 640 US firms, for the 1970-1989 period, prove the negative relationship between the financial leverage of the company and subsequent investment, which is relevant only to companies having low growth opportunities. Their conclusion supports the claim that leverage reduces managers' incentive to invest in bad projects. Similarly, Aivazian et al. (2005), on a sample of Canadian publicly traded companies for the 1982-1999 period, show that leverage is negatively related to investment and that this negative effect is significantly stronger for firms with low growth opportunities than those with high growth opportunities. Their results give support to agency theories of corporate leverage, and especially to the theory that leverage has a disciplining role for firms with low growth opportunities. These findings are consistent with those of McConnell and Servaes (1995) that leverage has negative relationship with corporate value of high-growth firms, and positively with low-growth firms. This gives validation of previous claims that leverage encourages underinvestment and reduces the value of the firm and weakens overinvestment and increases the value of the firm.

In some countries, there are specific factors due to which the impact of leverage on investment is different. Dutch firms operate in an environment where corporate governance mechanisms are weak, there is a limited shareholder influence in controlling management, ownership is characterized by the presence of large block holders, while share ownership by insiders is relatively small, financial sector maintains close bank-firm relations, through

financing with debt and equity and by sharing board members (Degryse & De Jong, 2006). In the case of Netherlands, they show that financial leverage, and particularly bank debt, is a key disciplinary mechanism, which reduces the managerial discretion problem and attenuates overinvestment. Hoshi, Kashyap, and Scharfstein (1991) state that Japanese firms operate in an environment that appears to mitigate information problems in the capital market, because of the close bank relationship with the company where they are both creditors and shareholders of group firms (*keiretsu*). They find no evidence to support the overinvestment hypothesis. Firth, Lin, and Wong (2008), researching in the case of China's listed firms, confirm the negative relation between leverage and investment, but contrary to Lang et al. (1996) and Aivazian et al. (2005), it is stronger in the case of companies with high growth opportunities and good operating performance. They argue that this is because state-owned banks in China impose fewer restrictions on the capital expenditures of low growth and poorly performing firms and also on firms with greater state ownership. Further research in the case of China shows that leverage has a significant and adverse impact on non-state-owned enterprises' investment behavior (Khan, Qina, & Jebran, 2019). Interestingly, a study of a sample of Iranian firms for the 2000-2010 period conducted by Eghbalnia, Fadayinejad, and Noferehti (2013), found results that are opposite to all others. Namely, they found no significant relationship between total leverage and investment, and positive impact of long term leverage on firm investment. It appears that the capital structure does not play an important role in Iranian firms' investment policies. They explain this with the environment of the country's economy as a heavily bank-based financial system with arbitrary interest rates and the insignificant role of the capital market in financing. The firms can go over-indebted regardless of growth opportunities, leading to inappropriate allocation of the resources.

Other studies of a sample of emerging markets confirm the negative impact of financial leverage on corporate investments. In the case of Turkish firms, Umutlu (2010) states that there is a negative impact of leverage on investment only for firms with low growth opportunities. Danso, Lartey, Fosu, Owusu-Agyei, and Uddin (2019), in research of sample of Indian firms during the 1995–2014 period, confirm the negative relationship of financial leverage with firm investment, which is stronger and significant for the firms with low growth opportunities, but no for firms with high growth opportunities. The same conclusion was reached for the African firms (Vengesai & Kwenda, 2018). K. Ahmad, Zulfiqar, Shah, Bilal, and Ahmad (2013), in the case of Pakistan for the 2000-2008 period, also find negative relationship between the firm leverage and investments, but the growth opportunities of the firm have no significance. Another recent study about Pakistan confirmed that the presence of asymmetric information increases the adverse effect of leverage on the investment of firms (M. M. Ahmad, Hunjra, & Taskin, 2021). In Mauritius, Odit and Chittoo (2008) confirm the negative relationship between leverage and investment for firms with low growth opportunities, and reveal an insignificant relationship between the two variables for high growth firms. Contrary, Vo (2018), in the case of Vietnam, shows that leverage has a stronger negative impact on corporate investment for firms with high growth opportunities than for firms with low growth opportunities.

3. OTHER INTERCOMPANY DETERMINANTS ON LEVERAGE AND INVESTMENTS

Firm size. Gala and Julio (2016) found empirical evidence that small firms have significantly higher investment rates than large firms have, while the negative relationship between firm size and investment is driven by heterogeneity in firms' investment opportunities and financial status. The negative relationship was further confirmed after including control variable Tobin's Q as a proxy for firm's investment opportunity and cash flow as proxy for a firm's financial status (M. S. Fazzari, Hubbard, Petersen, Blinder, & Poterba, 1988); and Hubbard (1998).

On the other hand, large companies are considered to have better access to debt financing than small companies do. First, the costs of raising external funds are larger for the small firms making those funds to be more expensive to the small firms than to the large ones. The cost for raising external funds is fixed and does not depend on the size of those funds. The fees of borrowing are uncorrelated with the size of the loan (Peterson & Rajan, 2002); also, there are large fixed costs in public issuance (Barclay & Smith, 1995). Furthermore, large firms have less information asymmetry than small firms do (Brennan & Hughes, 1991; Collins, Rozeff, & Dhaliwal, 1981), which makes external funds costlier, and the borrowing is more constrained for small firms (S. M. Fazzari & Petersen, 1993; Kim, Mauer, & Sherman, 1998; Whited, 1992). Secondly, larger firms are more diversified, so they can sell assets to provide financing sources (Bates, Kahle, & Stulz, 2009). Consequently, large and diversified firms are less likely to experience a financial distress (Rajan & Zingales, 1995; Titman & Wessels, 1988), while small firms are more likely to go bankrupt when facing financial distress (Ozkan, 1996). Hence, large firms have greater leverage than small firms do, while high leverage causes potential conflicts of interest between shareholders and debt holders when the company has a leverage that leads to an underinvestment process. This is another reason why the size of the company is expected to have a negative relationship with investment.

Cash flow. The relationship between cash flow and investment is too controversial, while numerous empirical studies have come to different conclusions. The relationship between cash flow and investment may be positive, negative and even certain authors show completely different relations. The "free cash flow" theory (Jensen, 1986) shows that cash flow in excess will lead to an increase in investment wasteful spending, leading then to overinvestment. The financial frictions theory (M. S. Fazzari et al., 1988) indicates the large impact of cash flow on investments in companies facing financial constraints in the presence of an imperfect capital market and information asymmetries. Also, Hoshi et al. (1991), Gertler and Gilchrist (1994) and Lamont (1997), provide evidence to show that there is a positive relationship between internal cash flow and investment, and that the relationship is significant particularly for firms experiencing significant barriers to external funds. Whited (1992) shows that investment is more sensitive to cash flow in firms with high leverage than in firms with low leverage. According to Bond and Meghir (1994), current investment is positively related to lagged cash flow. Pawlina and Renneboog (2005) notice that investment is influenced by cash flow, and the agency costs and the level of free cash flow determine this effect. Melander, Sandstrom, and Von Schedvin (2017) show that cash flow has a positive impact on investment for all companies, but this effect is enhanced for financially constrained firms. According to Aidogan (2003), sensitivity of investment to cash flow is lower for higher dividend payout ratios, while it increases for growing firms. Mulier, Schoors, and Merlevede (2016), and Lopez-Gracia and

Sogorb-Mira (2014), show high sensitivity of investment on the cash flow for the financially constrained firms. Flor and Hirth (2013) show that the investment-cash flow sensitivity can be negative, and it is determined by the liquidity of firm's assets. Morck, Schleifer, and Vishny (1988) show that the relationship between investment, cash flow, and insider ownership is S-shaped. Kadapakkam, Kumar, and Riddick (1998) find that cash flow - investment sensitivity is generally highest in the large firm size group and smallest in the small firm size group. Malmendier and Tate (2005) provide a behavioral explanation for sub-optimal firm's investment decision pointing that the personal characteristics of chief executive officers (i.e., their overconfidence) influence the sensitivity of investment to cash flow. We want to determine whether the sensitivity of investment to cash flow in companies in SEE is also positive and significant and confirm the claims of agency theories of corporate leverage.

Tangibility of assets. The influence of tangibility of assets on investments is not direct, but rather indirect. Almeida and Campello (2007) state that asset tangibility increases investment-cash flow sensitivity for financially constrained firms, but no such effects are observed for unconstrained firms. Moreover, tangibility influences a firm's credit status according to theoretical expectations: firms with more tangible assets are less likely to be financially constrained. Tangible assets support more borrowing, which allows for further investment in tangible assets. With tangible assets, the financial distress costs of leverage are likely to be low, as the assets can be liquidated for close to their full value. Given that tangible asset provide an opportunity for greater leverage of the company, they would have an amplifying effect on the leverage, which has a negative relationship with investment. Therefore, we expect a negative relationship between tangibility and investments.

Profitability. Cantor (1990) shows that investment is more sensitive to earnings for highly leveraged firms. More profitable companies need less additional funding according to the pecking order theory (Avarmaa, Hazak, & Männasoo, 2011; Bauer, 2004; Kedzior, 2012); accordingly, more profitable companies will have larger own internally generated sources of funding leading to larger investments, and we expect a positive relation of the profitability with investments.

Growth opportunities. Numerous studies have shown empirically that the negative effect of leverage on investment is significantly stronger for firms with low growth opportunities than those with high growth opportunities (Aivazian et al., 2005; Segara & Yang, 2020), or that leverage has a negative effect on investment only for firms with low growth opportunities (Danso et al., 2019; Lang et al., 1996; Umutlu, 2010). Common to all these studies is that they are based on the case of developed countries with efficient capital markets where, as proxy for growth opportunity, they take Tobin's Q. Our study refers to the SEE countries having emerging stock markets (except Greece) that appeared after the collapse of the socialist-communist regime and the transition to a market economy in the early and during the 1990s. In the period we analyze, their markets went through a huge volatility, a huge bubble that was created before the great financial crisis of 2008 and burst, and after that the liquidity completely evaporated which lasted until recently (Naumoski, Arsov, Gaber, & Gaber-Naumoska, 2017). For the SEE emerging capital markets that are inefficient, less liquid, where share valuations are doubtful and the companies' R&D investments are negligible, a more appropriate proxy could be the change in the log of assets (Titman & Wessels, 1988). McConnell and Servaes (1995), in their research based on USA, have a particular concern whether the P/E ratio comprises a reasonable proxy for the firm's future investment growth opportunities, and they use firm's five-year historical growth rate in sales as a proxy for future

growth opportunities. Furthermore, [Danbolt, Hirst, and Jones \(2011\)](#), in an efficient market research, have proven that Tobin's Q is very poor measure of growth opportunities. They suggest seven other alternative better measures, but all use the stock price as input in the calculation, and none of them is suitable for low performing inefficient emerging SEE markets. [Arsov and Naumoski \(2016\)](#) also use another measure for growth opportunities instead Tobin's Q.

Non-debt tax shields. Among the benefits of using debt to finance a company are the tax savings that are generated as a result of the interest deduction, which is why interest is called debt tax shield. Depreciation and amortization, as well as others called non-debt tax shields, have the same effect as interest. Depreciation and amortization are a value expression of the consumption of fixed assets, and they reduce the tax base by making companies pay less tax, in the same way that debt interest causes this effect. But on the other hand, depreciation and amortization are cash inflows that serve the company to rebuild obsolete, and invest in new fixed assets, as opposed to interest, which is cash outflow. Because of this, depreciation is a non-debt tax shield that is a substitute for interest and causes squeezing out of debt ([Clemente-Almendros & Sogorb-Mira, 2018](#)). One of the first papers to point to the relevance of non-debt tax substitutes within corporate capital structures is that of [De Angelo and Masulis \(1980\)](#). Although the economic logic of squeezing out of debt from non-debt tax substitutes such as depreciation, surprisingly, there are many papers like that of [Bradley, Jarrell, and Kim \(1984\)](#) who found that debt is positively related to non-debt tax shields proxied by depreciation and investment tax credits. If we connect this in the context of investment, [Minton and Wruck \(2001\)](#) found evidence that non-debt tax shields might have a positive relationship with debt conservatism as the latter is related to companies that invest more. In addition, [Graham \(2013\)](#) states a positive relation between debt and non-debt tax shields (as measured by depreciation and investment tax credits) may appear if a firm invests heavily and borrows to invest. Given this evidence of amortization as non-debt tax shields, we assume that it amplifies the positive effect on the debt of the investing company. Moreover, depreciation is a cash flow that the company uses to invest, then we expect a strong positive relationship between depreciation as a non-debt tax shield and the company's investments.

4. DATA AND DESCRIPTION OF VARIABLES

To investigate the impact of financial leverage on the company's investment decisions, we use a sample of publicly traded firms from the SEE countries for the eleven-year period, from 2005 to 2015, obtained from Thomson Reuters Eikon and Datastream database. The sample includes the companies from the following ten SEE countries: Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey. These data include survivors and non-survivors that appeared on Datastream at any time in the sample period. When designing the sample, we made the following adjustments: *i*) we omit utilities and financial firms from the sample, focusing only to industrial companies; *ii*) we exclude the firms with negative sales, capital and/or assets; *iii*) in each variable we excluded the 1st and 99th percentiles of their distributions to reduce the influence of outliers, which are common in accounting ratios. In addition, we start and provide a balanced panel, after trimming for the outliers; finally, our sample encompasses an unbalanced panel of 811 firms and 7.994 firm-year observation.

4.1 Measure of leverage

In this research, we simultaneously use three leverage measures that are applied as the most relevant indicators of the level of indebtedness of the company. The leverage indicator for all three is obtained when book value of liabilities and debt is divided by the book value of total assets. The difference is in terms of debt maturity: *i)* Total Liabilities includes short term and long term liabilities together; *ii)* Long Term Debt together with the current portion of LTD; and *iii)* only Long Term Debt. The first is the broadest measure of the company's total indebtedness. Obviously, the total leverage has a decisive influence on the investment decision, but as a composite measure of indebtedness, it does not differentiate between short-term debt and long-term debt. Companies often create short-term debt to finance working capital. Given the long-term nature of investments, it is important to look separately at the impact of only long-term debt on investments, without short term liabilities. Therefore, along with the first measure, the other two are used, which give a different perspective on the debt. In fact, this approach to using different leverage measures according to debt maturity is found in several authors who have previously researched on this topic (Aivazian et al., 2005; Lang et al., 1996).

4.2 Exogenous variables

Explanatory variables in research on the impact of financial leverage on the company investment decisions are derived from the postulates of the corporate finance theories of capital structure, that are trade-off, pecking order, free cash flow, and agency theories of corporate leverage. The variables used here are as follows:

(1) *Investment to Capital Ratio*. Investment is defined as capital expenditures in fixed assets. The capital stock is the amount of the fixed assets. We calculate this ratio by dividing the current year investment with the lagged net fixed assets.

(2) *Cash Flow Ratio*. Cash flow is measured as the sum of earnings before extraordinary items and depreciation. We divide the current year cash flow with the lagged fixed assets.

(3) *Sales ratio* is defined as net sales divided by fixed assets.

(4) *Tangibility* is the ratio of tangible fixed assets to total assets.

(5) *Non-debt tax shield*. We use depreciation and amortization as a proxy for the non-debt tax shield. Since the investment are defined more narrowly as capital expenditures in fixed assets, and also because depreciation is a monetary value expression of consumption of fixed assets, it makes a lot of sense to use a narrow definition for non-debt tax shield ratio as the amount of depreciation and amortization over the fixed assets. In fact, this is depreciation to fixed assets ratio as a measure of how well a company replaces its long term, or fixed assets. The increase of this ratio means that the company invests more in fixed assets, suggesting positive relationship with the investments.

(6) *Profitability* is expressed through the return on equity ratio, calculated as Net Income After Taxes over the Total Equity, since we want to express the firm's own internally generated sources available for funding the investments. Using other measures as ROA, or the operating income ratios, seems appropriate in this research focusing on capital investments in fixed assets.

(7) *Firm size*. There are many proxies used in the literature as a measure for the firm size, such as the size of total revenue, total assets, etc., depending on the context of the

research. Since we focus on the investments in fixed assets, it seems very normal for the firm size to be expressed as the natural logarithm of the beginning-of-year capital stock of fixed assets, in the same way as [Gala and Julio \(2016\)](#) did.

(8) *Growth opportunities*. Almost all papers use the Tobin's Q as a proxy for the growth opportunities. As explained above, neither this nor any other market measure is appropriate for emerging markets in the SEE. Therefore, in this analysis, we use the change in the log of assets as a proxy.

5. EMPIRICAL RESULTS OF THE IMPACT OF LEVERAGE ON FIRM INVESTMENT

5.1 Model specification

In order to investigate the impact of financial leverage on firm investment, we designed a model similar to [Aivazian et al. \(2005\)](#) but much extended one. The [Aivazian et al. \(2005\)](#) model is the most used one in the same specification by many other authors who have replicated this research on another sample. But this model is a reduced form investment equation, as the author himself points out, controlling only three variables (cash flow, sales, and growth opportunities). Capital structure and the related investment decision are determined by a great number of factors, so we also control these three variables, while introducing another five. Our study, to our knowledge so far, is the first one to attempt to create such a broad model. Specifically, we estimate the following equation:

$$I_{i,t} / K_{i,t-1} = \alpha + \beta_1 LEVERAGE_{i,t-1} + \beta_2 (CF_{i,t} / K_{i,t-1}) + \beta_3 (SALE_{i,t-1} / K_{i,t-1}) + \beta_4 (TANG_{i,t-1} / TA_{i,t-1}) + \beta_5 (NDTS_{i,t-1} / K_{i,t-1}) + \beta_6 ROE_{i,t-1} + \beta_7 SIZE_{i,t-1} + \beta_8 GROWTH_{i,t-1} \quad (1)$$

where:

- $I_{i,t}$ is the net investment of firm i at time t ;
- $K_{i,t-1}$ is lagged fixed assets of firm i ;
- $LEVERAGE_{i,t-1}$ is lagged leverage of firm i ;
- $CF_{i,t}$ is cash flow of firm i at time t ;
- $SALE_{i,t-1}$ is lagged net sales of firm i ;
- $TANG_{i,t-1}$ is lagged tangible fixed assets of firm i ;
- $TA_{i,t-1}$ is lagged total assets of firm i ;
- $NDTS_{i,t}$ is lagged depreciation and amortization of firm i ;
- $ROE_{i,t-1}$ is lagged return on equity of firm i ;
- $SIZE$ is natural logarithm of the lagged fixed assets of firm i ($\ln(K_{i,t-1})$);
- $GROWTH_{i,t}$ is the change in the log of total assets.

The summary statistics of the variables is presented in [Table no. 1](#). The mean ratio of the investments to fixed assets is 0.12, with a standard deviation of 0.25. The leverage of the SEE firms shows the extent to which they rely on debt as a source of financing. The widest leverage ratio measured as total liabilities divided by total assets amounts 49% meaning that SEE firms on average, 51% of the financing is provided by equity and 49% from liabilities and borrowing. This ratio is very similar with other findings in the case of SEE countries which amounts to 45% for the period 2008 - 2013 ([Arsov & Naumoski, 2016](#)) and 42% for the period 2010-2014

(Vukovic & Jaksic, 2019). The long-term debt is only 10%, which means that short-term debts amount to 39% in the capital structure, suggesting a very significant reliance of the SEE companies on short-term debt finance. Total debt amounts 23% of total assets which is almost identical with that of 23.8% determined by Botoc and Anton (2017) in the case of the broad set of companies from Central, Eastern, and South-Eastern Europe during the same time span 2006–2015. Previously, Hernadi and Ormos (2012) determined the total debt ratio of 24.5% for Central and Eastern European companies between 2002 to 2007.

Tangible fixed assets amount to 48% of the total assets, which almost equals to the share of equity capital employed (51%), meaning that SEE companies rely on much aggressive strategy of financing. They finance the fixed assets and much of their permanent working capital by long term sources (51% equity and 10% long term debt), while the occasional working capital is financed by short term debt (39%). This figure is the outcome of the great amount of the short-term liabilities, since SEE companies suffer from illiquidity because receivables collection period and accounts payable payment period are very large.

The profitability of the SEE companies is very low with average ROE of just 1% for ten years period, with a standard deviation of even 0.41. This is due to poor revenue generation amounting to 2.54 units per unit of fixed capital. By comparison, companies in the USA generated almost twice as much 4.5 units per unit of fixed capital employed (Aivazian et al., 2005). This eventually leads to low cash flow of 0.14 per one unit of fixed capital employed.

The depreciation to fixed assets ratio, which we use as a non-debt tax shield, is only 0.08, meaning that the SEE companies replace their long term, or fixed assets moderately. This is largely shown by the insignificant growth of total assets. Overall, SEE companies show moderate investment intensity and high level of indebtedness, which is mostly the result of short-term liabilities and debts. The low investment intensity can be the result of the high leverage which needs to be confirmed through regression analysis.

Table no. 1 – Summary statistics

	Mean	25 th percentile	Median	75 th percentile	Standard deviation
Investments _t / Fixed assets _{t-1}	0.12	0.01	0.05	0.14	0.25
(Total liabilities / Total assets) _{t-1}	0.49	0.28	0.47	0.66	0.27
(Total debt / Total assets) _{t-1}	0.23	0.04	0.18	0.36	0.21
(Long term debt / Total assets) _{t-1}	0.10	0.00	0.04	0.16	0.14
Cash flow _t / Fixed assets _{t-1}	0.14	0.01	0.09	0.24	0.40
(Net sales / Fixed assets) _{t-1}	2.54	0.62	1.33	2.63	7.40
(Tangible fixed assets / Total assets) _{t-1}	0.48	0.30	0.46	0.63	0.23
(Deprec. & Amort./ Fixed assets) _{t-1}	0.08	0.04	0.07	0.10	0.06
ROE _{t-1}	0.01	-0.02	0.03	0.11	0.41
SIZE = $\ln(\text{Fixed assets}_{t-1})$	18.24	19.05	18.23	20.71	2.11
GROWTH = $\ln(\text{Total assets}_t) / \ln(\text{Total assets}_{t-1})$	1.00	1.00	1.00	1.01	0.01

Source: authors' own calculations

Another problem could be the high correlation among the variables as it may affect the efficiency of the estimated coefficients in the regression. Multicollinearity exists in the model when the explanatory variables are strongly related to each other. The correlations among the independent variables are reported in Table no. 2. Almost all are very low and are near 0, with

a few exceptions that are generally less than 0.30, suggesting that collinearity is not a serious problem.

Table no. 2 – Correlation among independent variables

	(Total liabilities / Total assets) $_{t-1}$	(Total debt / Total assets) $_{t-1}$	(Long term debt / Total assets) $_{t-1}$	Cash flow $_t$ / Fixed assets $_{t-1}$	(Net sales / Fixed assets) $_{t-1}$	(Tangible fixed assets / Total assets) $_{t-1}$	(Deprec. & Amort. / Fixed assets) $_{t-1}$	ROE $_{t-1}$	SIZE = $\ln(\text{Fixed assets }_{t-1})$	GROWTH = $\ln(\text{Total assets }_t) / \ln(\text{Total assets }_{t-1})$
(Total liabilities / Total assets) $_{t-1}$	1									
(Total debt / Total assets) $_{t-1}$	0.73	1								
(Long term debt / Total assets) $_{t-1}$	0.47	0.70	1							
Cash flow $_t$ / Fixed assets $_{t-1}$	-0.17	-0.21	-0.14	1						
(Net sales / Fixed assets) $_{t-1}$	0.10	-0.04	-0.08	0.32	1					
(Tangible fixed assets / Total assets) $_{t-1}$	-0.16	-0.01	0.15	-0.21	-0.30	1				
(Deprec. & Amort. / Fixed assets) $_{t-1}$	0.06	-0.05	-0.11	0.25	0.28	-0.39	1			
ROE $_{t-1}$	-0.06	-0.08	-0.05	0.19	0.05	-0.09	0.07	1		
Size = $\ln(\text{Fixed assets }_{t-1})$	0.04	0.09	0.17	-0.02	-0.14	0.29	-0.19	0.05	1	
Growth = $\ln(\text{Total assets }_t) / \ln(\text{Total assets }_{t-1})$	-0.09	-0.12	-0.05	0.29	0.06	-0.02	0.02	0.12	0.00	1

Source: authors' own calculations

5.2 Regression analysis

The impact of financial leverage on fixed capital investments is investigated using a panel regression of investment to fixed assets ratio on the exogenous variables described above. Since the leverage can be measured differently, we use three alternative measures for the leverage, so three different regressions are performed. They all differ only in the leverage measure variable, while the dependent variable is the same and all other independent variables remain the same.

The analysis of an unbalanced panel of data is done, using the sample that encompasses 811 firms and 7.994 firm-year observation. At the very least, using the Hausman test, we examined which regression model was most appropriate. The results showed that the fixed effects model is best for the given data sample. According to [Deloof \(2003\)](#), fixed effects estimation assumes firm specific intercepts, which capture the effects of those variables that are particular for each firm and that are constant over time. A disadvantage of fixed effects estimation is that it eliminates anything that is time-invariant from the model.

The results of the three regressions are presented in [Table no. 3](#). All explanatory variables have statistically very significant effects on the investment to capital ratio in the first regression, except the non-debt tax shield represented by Depreciation and Amortization which is not significant in the other two regressions. In addition, the signs of the coefficients are all according to our expectation and prescriptions in the different theories. Overall, the explanatory power of the model is quite satisfactory, given that as exogenous variables are only inter-company variables, while we ignore the external variables that have a significant impact on the investment decision, such as interest rate, state of the economy, future demand, government intervention, technical-technological factors, etc.

Table no. 3 – Estimation results of the regression analysis

Leverage =	<i>Dependent variable = Investments_t / Fixed assets_{t-1}</i>		
	<i>(Total liabilities / Total assets)_{t-1}</i>	<i>(Total debt / Total assets)_{t-1}</i>	<i>(Long term debt / Total assets)_{t-1}</i>
Intercept	-4.859*** (0.274)	-4.806*** (0.273)	-4.941*** (0.273)
Leverage	-0.035** (0.017)	-0.099*** (0.021)	-0.078*** (0.026)
Cash flow _t / Fixed assets _{t-1}	0.017** (0.008)	0.016** (0.008)	0.018*** (0.008)
(Net sales / Fixed assets) _{t-1}	0.009*** (0.001)	0.009*** (0.001)	0.009*** (0.001)
(Tangible fixed assets / Total assets) _{t-1}	-0.280*** (0.027)	-0.279*** (0.027)	-0.280*** (0.0268)
(Deprec. & Amort. / Fixed assets) _{t-1}	0.100* (0.063)	0.091 (0.063)	0.089 (0.063)
ROE _{t-1}	0.014** (0.006)	0.013** (0.006)	0.013** (0.006)
SIZE = ln(Fixed assets _{t-1})	-0.029*** (0.006)	-0.027*** (0.006)	-0.027*** (0.007)
GROWTH = ln(Total assets _t) / ln(Total assets _{t-1})	5.612*** (0.220)	5.533*** (0.220)	5.648*** (0.219)
R ²	0.459	0.461	0.460
Adjusted R ²	0.398	0.399	0.399
F-statistic	7.463	7.506	7.475
Prob(F-statistic)	0.000	0.000	0.000

Note: The results were obtained by applying the fixed effect OLS model for estimation. Standard errors in parentheses. Method: Panel Least Squares. Period 2005 – 2015. Cross-sections included: 811. Total Panel (Balanced) Observations: 7.994

* Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

Source: Authors' own calculations.

The three different regression models have shown that financial leverage has a significant negative effect on investment, suggesting that capital structure plays an important role in the firms' investment policies and in determining corporate investment decisions. This means that the investment decision is highly dependent on financing decision. The estimated coefficients are -0.035, -0.078 to -0.099 for the three regressions, suggesting that the investment to capital ratio decreases by about 0.035, 0.078 to 0.099 monetary units for 0.01 unit increase in leverage, or 1% increase in leverage leads to decrease in investment by 3.5%, 7.8% to 9.9%. As discussed earlier, this is consistent with the underinvestment theory where leverage could have a negative effect on investment because of an agency problem between shareholders and bondholders (Myers, 1977). Myers (1977) demonstrates that "too much" debt induces managers acting in shareholders' interests to forego positive net present value projects, due to debt overhang. The biggest effect of the decrease in investments is caused by the long-term debt and the total debt (long-term debt together with the current unpaid part of the long-term debt), where each increase by 1% leads to a decrease in investments by 7.8% and 9.9% respectively. The descriptive statistics has shown that the companies in SEE have low investment intensity and rather high indebtedness where short-term debt dominates; long-term debt amount only to 10%, and short-term debt is present as much as 39% in the capital

structure. These results strongly support the thesis of the relationship between maturity of debt and agency cost of leverage on investments, evidenced by [Johnson \(2003\)](#) that short-term debt causes lower agency costs. With short-term debt, there is a short period of time where shareholders can act and undertake excessive risk and assets substitution, unlike long-term debt where shareholders have more time and thus more opportunities to make a profit for themselves.

The negative effect of leverage on corporate investments was determined by many other studies. [Table no. 4](#) shows a synthesized overview of selected results obtained from research conducted in other countries.

Table no. 4 – Findings of the impact of financial leverage on firm investments in other studies

Country and time span	Definition of leverage		Author
	Leverage= (Total liabilities/Total Assets)	Leverage= (Long term debt/Total assets)	
	Regression coefficient	Regression coefficient	
Canada, 1982 - 1999	-0.034	-0.441	Aivazian et al. (2005)
China, 2011-2017	-0.052		Changa, Dingc, Loud, Lid, and Yang (2021)
Developed countries, 1998 - 2017	-0.210	-0.245	Segara and Yang (2020)
Developing countries, 1998 - 2017	-0.309	-0.362	Segara and Yang (2020)
India, 1995–2014	-0.049	-0.039	Danso et al. (2019)
Netherlands, 2008 – 2017	-0.068	-0.089	Ince (2018)
Peripheral euro area, 2005-2014	-0.233		Gebauer, Setzer, and Westphal (2018)
South Africa, 2008 to 2014	-1.616		Mondosha and Majoni (2018)
Teheran, 2000-2009	-0.108		K. Ahmad et al. (2013)
Teheran, 2000–2018	-0.133		M. M. Ahmad et al. (2021)
Teheran, 2009 to 2013		-2.593	Sajid, Mahmood, and Sabir (2016)
Turkey, 1993 to 2002	-0.870		Umutlu (2010)
USA, 1970-1989	-0.105		Lang et al. (1996)
USA, 1982–1997	-0.043		Ahn et al. (2006)
Vietnam, 2006-2015	-1.340		Vo (2018)

Source: authors' own presentation based on other studies

The positive impact of leverage on firm investment was randomly found in the case of Iranian companies, where 1% increase in long term debt leads to increase in investment by 46.5%, and 1% increase in total liabilities leads to increase in investment by 9,4% ([Eghbalnia et al., 2013](#)). Still, this is not statistically significant.

Investments have a positive and statistically significant relationship with cash flow. As we explained above, numerous studies show a positive relationship between cash flow and investment, and that investment is more sensitive to cash flow in firms with high leverage than in firms with low leverage. This positive relationship between investment and cash flow is consistent with the pecking order theory because investment is related to the availability of internal funds ([Hoshi et al., 1991](#)).

The regression shows a positive relation between sales and investment, like many other authors as [Aivazian et al. \(2005\)](#). This is in line with economic logic of the neoclassical theory, that is, sales growth should be supported by additional investment, and additional investment should lead to additional sales growth that is an incentive to invest. [Opler and Titman \(1994\)](#) show that leverage has a positive effect on sales growth for large, highly leveraged firms that are not in distressed industries, as are the SEE companies. As sales growth may provide an incentive for firms to increase their level of investment and so expand their market share ([Serrasqueiro, Mendes, Nunes, & Armada, 2012](#)).

Firms that are more profitable can generate more internal sources of retained earnings and to finance their investments, consistent with the pecking order theory. Our finding of the very significant and positive relations of the profitability and investments is consistent with this.

Similarly, because depreciation and amortization are internally generated sources of financing, the positive relationship between non-debt tax shield and investment is consistent with pecking order theory.

Firms with higher tangibility of assets are more reliable to the banks for lending using the fixed assets as a collateral according to the agency theory of leverage. SEE companies apply more aggressive financing strategies, and most of the debt is short-term used to finance the working capital. Increased leverage does not generate investment and that is why there is a negative statistically significant relationship between tangibility and the investments in fixed assets.

The negative relationship between the size of the company and the investment was confirmed by this regression. As we discussed above, this is consistent with trade-off theory and agency theory of leverage.

5.3 Regression test with growth opportunities

The negative impact of leverage on investment stemming from the debt overhang phenomenon was confirmed by the above regression. On the other hand, the agency conflict of interest that arises between managers and shareholders means that companies with large amounts of internally generated funds, but lacking growth opportunities, push managers to undertake investment projects with negative NPV, which are in their personal interest, to the detriment of shareholders. Proponents of this agency theory of corporate leverage are [Jensen \(1986\)](#), [Grossman and Hart \(1982\)](#), and [Stulz \(1990\)](#). In this context, managers have both the incentive and the opportunity (i.e., excess cash flow) to undertake wasteful investment projects, that is, the phenomenon of overinvestment problem. Potentially this would lead to negative implications for management especially if the company with a lot of cash and no growth opportunities is subject to acquisition. It gives managers an incentive to borrow heavily, and use future expected excess cash flows to service debt leading to limitation of overinvestment. In other words, for firms with more internally generated funds than investment opportunities, debt financing has a positive effect on the value of the firm ([McConnell & Servaes, 1995](#)). These theories suggest a negative relationship between leverage and investment, but only for firms with no or little growth opportunities ([Aivazian et al., 2005](#)).

In order to investigate the agency cost of leverage on investments in companies with different investment opportunities, we design a new specification of the model, in which we insert another variable:

$$I_{i,t}/K_{i,t-1} = \alpha + \beta_1 LEVERAGE_{i,t-1} + \beta_2 (D_{i,t-1} \times LEVERAGE_{i,t-1}) + \beta_3 (CF_{i,t}/K_{i,t-1}) + \beta_4 (SALE_{i,t-1}/K_{i,t-1}) + \beta_5 (TANG_{i,t-1}/TA_{i,t-1}) + \beta_6 (NDTS_{i,t-1}/K_{i,t-1}) + \beta_7 ROE_{i,t-1} + \beta_8 SIZE_{i,t-1} + \beta_9 GROWTH_{i,t-1} \quad (2)$$

where D is a dummy variable that is equal to 1 if Growth_{i,t} ratio defined above as the change in the log of total assets Q>1, and 0 otherwise.

The evidence from the analysis presented in Table no. 5 shows that there is no satisfactory support for the theory that leverage has a disciplining role in preventing overinvestment. The coefficient before the dummy variable is statistically insignificant in the first two regressions. Only in the third regression, it is positive and significant at the level of 10%. These results imply that only long-term debt has a stronger negative impact on investment for firms with low growth opportunities than for firms with high growth opportunities.

Table no. 5 – Estimation results of the regression analysis of growth opportunities and leverage on investments

	<i>Dependent variable = Investments_t / Fixed assets_{t-1}</i>		
	Leverage = (Total liabilities / Total assets)_{t-1}	(Total debt / Total assets)_{t-1}	(Long term debt / Total assets)_{t-1}
Intercept	-4.924*** (0.303)	-4.683*** (0.293)	-4.808*** 0.284
Leverage	-0.032** (0.017)	-0.106*** (0.022)	-0.099*** 0.028
$D_{i,t-1} \cdot Leverage_{i,t-1}$	-0.005 (0.011)	0.021 (0.018)	0.049* 0.030
Cash flow _t / Fixed assets _{t-1}	0.017** (0.008)	0.015** (0.008)	0.018** 0.008
(Net sales / Fixed assets) _{t-1}	0.009*** (0.001)	0.008*** (0.001)	0.009*** 0.001
(Tangible fixed assets / Total assets) _{t-1}	-0.281*** (0.027)	-0.279*** (0.027)	-0.279*** 0.027
(Deprec. & Amort. / Fixed assets) _{t-1}	0.101* (0.063)	0.089 (0.063)	0.090 0.063
ROE _{t-1}	0.014** (0.006)	0.013** (0.006)	0.013** 0.006
SIZE = $\ln(\text{Fixed assets}_{t-1})$	-0.029*** (0.006)	-0.028*** (0.006)	-0.027*** 0.006
GROWTH = $\ln(\text{Total assets}_t) / \ln(\text{Total assets}_{t-1})$	5.674*** (0.253)	5.422*** (0.240)	5.526*** 0.231
R ²	0.459	0.461	0.460315
Adjusted R ²	0.398	0.399	0.398704
F-statistic	7.454	7.498	7.471246
Prob(F-statistic)	0.000	0.000	0.000000

Note: The results were obtained by applying the fixed effect OLS model for estimation. Standard errors in parentheses. Method: Panel Least Squares. Period 2005 – 2015. Cross-sections included: 811. Total Panel (Balanced) Observations: 7.994

* Significant at the 10% level. ** Significant at the 5% level. *** Significant at the 1% level.

Source: authors' own calculations

6. CONCLUSION

Neoclassical economic paradigm presumes that the investment decision of the company depends on the key economic factors such as the interest rate, future demand, the general situation in the economy, technological factors and so on. However, the reality is much more complex, and it involves number of intercompany factors. Among them, the size of the leverage plays a key role, which is the source of asymmetric information that gives rise to a conflict of interest between key stakeholders (shareholders, managers, and debt holders). In the ideal Miller – Modigliani world the company's capital structure is irrelevant, but in the real world where there are missing or incomplete markets due to transaction costs, while asymmetric information finance tends to affect real investment decisions. On one side, [Myers \(1977\)](#) demonstrates that “too much” debt induces managers acting in shareholders’ interests to forego positive net present value projects. The debt overhang causes phenomenon of “underinvestment” problem of debt financing. On the other side, [Jensen \(1986\)](#) argues that, when firms have more internally generated funds than positive net present value investment opportunities, managers have incentive to use this excess cash flow to undertake even wasteful investment projects with negative NPV for their personal benefit, to the detriment of shareholders. This phenomenon has been labeled the “overinvestment problem”. In this case, the borrowing of the company will discipline the managers by forcing them to use the excess cash flow to repay the loan and thus will reduce and/or prevent it. Both problems impose a negative relationship between investment and leverage.

This study adds knowledge to the existing literature and research on the impact of leverage on investment. Most of the research of this issue so far has been conducted in the case of developed countries. There are also researches of individual countries with emerging markets. This study provides two new achievements. The first novelty of this research is that the research is done at the level of a large group of ten emerging markets from South-East European countries (Bosnia and Herzegovina, Bulgaria, Montenegro, Croatia, Greece, Romania, North Macedonia, Slovenia, Serbia, and Turkey). To our knowledge, this is the first paper that explores this issue at the level of these countries as a whole. We use a similar research methodology and approach as previous research did. Research was conducted on a sample of 811 companies that are publicly listed on their domestic stock exchanges, for a period of eleven years, from 2005 – 2015. Data are provided from Thomson Reuters Eikon and Datastream database. The second achievement is that this study, in addition to the standard exogenous variables that are found in [Aivazian et al. \(2005\)](#) and apply to almost all other studies, includes a wide range of intercompany control variables that are strong determinants of corporate investment.

The results we have obtained differ slightly from the results obtained in the studies involving developed countries. Leverage is negatively related to investment in the companies in SEE. But, only long term debt has a stronger negative impact on investment for firms with low growth opportunities compared to firms with high growth opportunities. In addition, other intercompany determinants that have negative impact on the investments are tangibility and the company size, while they are significantly impacted by cash flow, sales, non-debt tax shield and profitability. Our evidence supports the agency theories of corporate leverage, especially with the debt overhang theory, but did not show strong validation that leverage has a disciplining role for firms with low growth opportunities in SEE emerging markets.

Our study contains some limitations that need to be considered. Although the explanatory power of the model is satisfactory, there are other independent and control variables that could be added to enhance it. Thus, our analysis did not include a control variable for the financial crisis. Given that the period of our analysis covers the period of the global financial crisis, it seems very reasonable the need to include an additional variable that would enhance the explanatory power of the model. For that purpose, we made an attempt to include a *financial crisis dummy* that was supposed to control for the impact of the global financial crisis on investments, taking value 1 for the years of the crisis and 0 for the remaining years. The results of the model remain robust even after its inclusion. However, we found that the results were not in line with our expectations. This variable did not contribute at all on improving the explanatory power of the model. A bigger problem is that this variable delivers results that are contrary to expectations and are opposite to the reality. Namely, the regression coefficient of this variable is positive in all the exercises we performed, which means that investments grew in conditions of financial crisis i.e., that the financial crisis has a positive impact on the investments of companies in SEE. The real developments in the case of SEE companies show a slowdown in growth of investments in 2008 and a sharp decline of investments of 19% in 2009. The negative impact of the financial crisis on companies' investments is clear. For the illogical results obtained by the dummy variable included in the model, the reason seems to lie in the way the dependent variable is defined. Namely, the dependent variable is investments to fix asset ratio, where we divide the investments of the company from year t by the volume of fixed assets from the previous year $t-1$. The global financial crisis is thought to took place between mid 2007 and early 2009, so since we work with annual data, we did three exercises on how to determine the period to align it with the independent variable in an attempt to capture the economic reality (for 2007-2008, for 2007-2009, and 2008 only). The results from the regressions show that this variable in all exercises has a positive sign of the regression coefficient, and additionally, if the crisis period is considered to be 2008-2009, it is not statistically significant. A second approach to control for the financial crisis is to take the stock market index and its movements as a variable that will be a proxy for the financial crisis. But the limitations of the application of this variable in the case of SEE countries are explained in more detail above in this paper. The third approach is to divide the period into two parts, the period before and the period after the great financial crisis, which is beyond the scope of the methodology of this paper. The analysis of the impact of the financial crisis on the transfer mechanism of leverage on corporate investments is an opportunity for future research in another paper, with a different definition of variables and eventually with a different methodology.

We should also emphasize that in creating the model we considered only the exogenous explanatory variables. For this purpose, we performed testing for endogeneity in advance. Some of the variables were initially exogenous, and some became exogenous after calibration. Several initial variables that were found to be endogenous initially and subsequently could not be calibrated were discarded. Thus, we limited the model to a smaller number of control variables. The use of the OLS model provides limitations in this regard, so further research can be performed with multiple variables using other models that can provide additional assessment of the relationship between leverage and corporate investment.

The dominant theories in corporate finance were initially developed based on empirical research in the case of developed capital markets, primarily in the case of the USA. Research on agency costs of leverage was established on a scientific basis in the 1970s, when SEE

economies were socialist. After their reorientation towards the market economy in the early 1990s, there was a need to research the relevance of the existing corporate finance theories in the case of these emerging markets. Most previous research on the relationship between leverage and corporate investment has been based on the case of developed market economies. This paper aims to contribute to the existing literature on research on the impact of leverage on corporate investment, especially in the case of SEE emerging markets which to our knowledge are lacking. SEE countries are small and open economies that have large interrelationships, and individual research at the level of individual countries may not be sufficiently relevant. In addition to several SEE country-level research, this paper is among the first more complex papers to use a wide range of control variables to explain the impact of financial leverage on corporate investment through the prism of asymmetric information and the agency cost of leveraging on a large sample of companies from all SEE countries in one place. In that direction it brings a lot of useful knowledge and implications for scientific research and modern financial managers from these countries.

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