sustainability

MDPI

Article

The Impact of Capital Structure on the Performance of Serbian Manufacturing Companies: Application of Agency Cost Theory

Aleksandra Stoiljković [1], Slavica Tomić [1,*], Bojan Leković [1], Ozren Uzelac [1] and Nikola V. Ćurčić [2]

[1] Department of Management, Faculty of Economics in Subotica, University of Novi Sad, 24000 Subotica, Serbia; aleksandra.stoiljkovic@ef.uns.ac.rs (A.S.); bojan.lekovic@ef.uns.ac.rs (B.L.); ozren.uzelac@ef.uns.ac.rs (O.U.)
[2] Tamiš Research and Development Institute, 26000 Pančevo, Serbia; curcic@institut-tamis.rs
* Correspondence: slavica.tomic@ef.uns.ac.rs; Tel.: +381-24-628-039

Abstract: This paper examines the impact of debt in the capital structure on agency costs and therefore on the performance of a company. The efficiency of companies was estimated using two parametric techniques: Ordinary Least Squares (OLS) methods and a Stochastic Frontier Analysis (SFA). The estimated efficiency represents a measure of (inverse) agency costs. Agency costs cause a lower level of efficiency compared to companies that have minimized these costs, and companies that reach the efficiency frontier, in the observed context of this research, are viewed as those that have minimized agency costs. A panel regression model was applied in order to determine the direction and intensity of the influence of leverage and control variables on the initially estimated efficiency of the company. The results of this research on Serbian manufacturing companies show the expected positive effect of capital structure (leverage) on the efficiency of the company, which is in accordance with the predictions of the agency cost theory. The contribution of this research is reflected in the application of efficiency as a performance indicator in the observed context of examining the theory of agency costs, bearing in mind that the measure of efficiency is closer to the theoretical view of these costs.

Keywords: efficiency; agency cost; performance; capital structure; leverage; conflict of interest

Citation: Stoiljković, A.; Tomić, S.; Leković, B.; Uzelac, O.; Ćurčić, N.V. The Impact of Capital Structure on the Performance of Serbian Manufacturing Companies: Application of Agency Cost Theory. *Sustainability* **2024**, *16*, 869. https://doi.org/10.3390/su16020869

Academic Editor: Vasilii Erokhin

Received: 4 November 2023
Revised: 25 December 2023
Accepted: 15 January 2024
Published: 19 January 2024

1. Introduction

The economic activity of companies presupposes the availability of appropriate resources. Resources include all assets, capabilities, organizational processes, company attributes, information, knowledge, etc., which are controlled by a company and which enable it to design and implement strategies that improve its efficiency and effectiveness [1]. In order for a company to operate successfully in market conditions, it is necessary to dispose of appropriate resources and to successfully use resources in achieving tasks and goals [2] (p. 31). Krtstić and Sekulić [3] emphasize the importance of managing the use of resources in order to achieve the economic and non-economic goals of a company. Organizational goals represent an organization's reason for existence and the outcomes it seeks to achieve [4] (p. 74). Komazec, Tomić and Jakovčević [2] (p. 32) define goals as the desired state toward which the entire activity of a company is directed.

One of the assumptions on which the traditional theory is based is that the goal of a company is to maximize profits, which implies that the "company" somehow has a mind of its own capable of arriving at independent, rational decisions. In reality, of course, companies do not make decisions; it is entrepreneurs, managers and employees (i.e., individuals) who make business decisions, while a "company" is nothing more than an abstract concept that includes owners, managers and employees [5] (p. 194). Jensen and Meckling [6] (p. 311) view each company as "a legal fiction which serves as a focus for a complex process in which the conflicting objectives of individuals are brought into equilibrium within a framework of contractual relations." The aforementioned conflict is particularly significant for re-examining the traditional goal of a company's operations.

In the case in which a wholly owned company is managed by its owner, the traditional assumption of profit maximization is acceptable. However, since each person has their own interests and consciously enters organizational systems in order to realize their personal interests more fully and comprehensively through them, due to the diversity of people and their interests, during their realization, there is a conflict of the interests of individuals and organizational systems. Also, any conscious association of people into certain types, forms and modalities of organizational systems limits the freedom of behavior, thereby limiting the possibilities for the desired realization of personal interests. Likewise, any aspiration and effort to satisfy personal interests more fully at the expense of other people in the structure of an organizational system disrupts organization and thus the efficiency and effectiveness of the functioning of the organizational system and the achievement of its goals [7] (p. 220).

Over time, the relationship between ownership and control in companies has changed substantially, from the earliest forms when companies were owned and managed by the same people to the development of large corporations in which a separation of ownership from control emerged. Ownership is in the hands of shareholders, while control is largely in the hands of the senior managers and executive directors of the company. This situation is described as managerial capitalism and has led to "managerial theories" to explain the behavior of companies [5] (p. 194). Managerial theories view each company as a "coalition" of managers, workers and owners, and each group has its own objectives [8] (p. 25).

Different groups within a company (owners, managers, creditors, and the community) have very different interests and incentives, which can result in a conflict of interest between them. The costs caused by these conflicts are called agency costs [9] (pp. 15–16). A governance system in which ownership and management are separated can create potential costs due to conflicts of interest [10] (p. 574). Costs due to conflicts of interest arise when managers or other interest groups undertake activities that conflict with the interests of the company's owners. In joint-stock companies in the private sector, shareholders (the owners or "principals" of the firm) appoint directors as their "agents" to manage the firm efficiently; that is, a principal–agent relationship arises which raises the whole question of the objectives of companies and management and the subject of corporate governance. Profit maximization and therefore the drive for a more efficient use of resources, though presumably desired by shareholders, may not always be the primary goal of managers [5] (p. 90). The assumption of profit maximization can be replaced by alternative goals which management aims to achieve, such as sales revenue maximization, managerial utility maximization and corporate growth maximization [5] (p. 200).

The agency conflict between a manager (agent) and outside shareholders (principal) arises due to the manager's tendency to appropriate perquisites out of the firm's resources for his own consumption but also due to the reduction of his efforts in finding and realizing profitable ventures, which can lead to the company's value being significantly lower compared to the case in which the company is fully owned by the manager, so he is encouraged to be more personally involved in the aforementioned activities [6]. Although in theory managers, as agents of shareholders (principals), should manage the assets in the interests of the principals, in practice, this cannot be guaranteed. In practice, agents may lack incentives or motivation to pursue their principals' goals, and the principal–agent relationship may involve costs in terms of lower efficiency. At the root of the problem lies the fact that the principal faces costs, not least in terms of time and effort involved, in monitoring the work of their agents [5] (p. 197).

Jensen and Meckling [6], in the theory they developed, explain why the manager of a company whose capital structure contains both debt and outside equity undertakes activities so that the total value of the company is less than it would be if the manager were its sole owner and why their failure to maximize the value of the company is perfectly consistent with efficiency. If both parties seek to maximize utility, there is good reason to believe that the manager (agent) will not always act in the best interest of the owner (principal). On the other hand, the principal can limit divergence from their own interests

with the appropriate incentives for the agent and by incurring monitoring costs designed to limit the agent's aberrant activities. In addition, in some situations, the principal will pay the agent to expend resources (bonding costs) to guarantee that the agent will not take certain actions which would harm the principal or to ensure that the principal will be compensated if the agent does take such actions. In most agency relationships, the principal and the agent will incur positive monitoring and bonding costs (non-pecuniary as well as pecuniary) and, in addition, there will be some divergence between the agent's decisions and those decisions which would maximize the welfare of the principal. The monetary reduction in welfare experienced by the principal due to this divergence is also a cost of the agency relationship and is called a "residual loss" [6] (p. 308).

Since agency costs are as real as any other costs, the objective is to minimize them. The objective is not the minimization of the residual loss but the sum of all agency costs, which include monitoring and bonding costs; therefore, the levels of these activities should satisfy the conditions of efficiency. The above will not result in the company being run in a manner so as to maximize its value since agency costs inevitably arise as a result of an agency relationship and the value of a company in which there is a separation of ownership and control will, as a rule, always be lower than that of a company which is wholly owned by its manager. The reduced value of the company caused by the manager's consumption of perquisites is "non-optimal" or inefficient only in comparison to a world in which we could achieve compliance of the agent with the principal's wishes at zero cost or in comparison to a hypothetical world in which the agency costs were lower [6]. Therefore, comparing the real world with an ideal but nonexistent world in which agency costs do not exist and concluding that the real world is (relatively) inefficient would be a typical example of what Demsetz [11] calls the Nirvana fallacy, since agency costs (monitoring and bonding costs and "residual loss") are an unavoidable result of an agency relationship [6].

An increase in the company's leverage can reduce the agency costs of outside equity, but the opposite effect can occur with the agency cost of debt, which arises as a result of a conflict of interest between shareholders and debt holders [12] who have different requirements for the cash flows generated by the company. Agency costs arising from conflicts between debt holders and equity holders or from different principal–agent objectives will give rise to resource misallocation and the sacrifice of potential output [13], which will cause a lower level of efficiency compared to companies that have minimized these costs.

The nature of the relationship between the level of debt in a firm's capital structure and economic performance represents one of the most important issues in corporate governance [14]. This paper examines the role of debt as an internal mechanism of corporate governance in mitigating conflicts between the owners and manager of a company and its effect on company performance. The aim of this research is to analyze the impact of capital structure on efficiency as a measure of company performance. The contribution of this research is reflected in the application of efficiency as a performance indicator in the observed context of examining the theory of agency costs, bearing in mind that the measure of efficiency is closely related to the theoretical definition of these costs. The importance of the application of the mentioned concept is reflected in the fact that in addition to evaluating the efficiency of a company's use of resources, it also represents a relative measure of performance in relation to other companies. Therefore, unlike simple financial indicators, the analysis of company efficiency identifies potential deviations between the actual and optimal (maximum potential) performance of companies. Bearing in mind that agency costs lead to resource misallocation and the sacrifice of potential output [13], the estimated efficiency of a company is closer to the theoretical view of these costs. Agency costs cause a lower level of efficiency compared to companies that have minimized these costs, and companies that reach the efficiency frontier, in the observed context of this research, are viewed as those that have minimized agency costs. Therefore, the estimated efficiency represents a measure of (inverse) agency costs.

The remainder of the paper is organized as follows. Section 2 reviews corporate governance mechanisms to mitigate the agency problem with special emphasis on debt as

one of the internal mechanisms of corporate governance and describes research hypothesis development based on a literature review. Section 3 describes the research methodology of this study, such as the selection of the research sample, data collection, variable selection, model specification and data processing methods. Section 4 presents the empirical findings and discusses the theoretical and practical implications of this research. Finally, Section 5 concludes this article, states the limitations of this research and provides scope for further research.

2. Literature Review and Hypothesis Development

2.1. Conflicts of Interest and Mechanisms to Mitigate the Agency Problem

The relationship of agency represents one of the oldest and most common codified modes of social interaction [15] (p. 134). Still, in his capital work The Wealth of Nations in 1776, Adam Smith pointed out that "the directors of such joint-stock, however, being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own" [16] (p. 700). Berle and Means state that the separation of ownership from control produces a condition in which the interests of owners and of the ultimate manager may, and often do, diverge [17] (p. 7). Apart from the fact that it dates back to the 18th century, it is also important to point out the generality of the agency problem. Essentially all contractual arrangements, such as those between an employer and an employee or between the state and the governed, contain important elements of agency [15] (p. 134). The relationship between stockholders and the manager of a corporation fits the definition of a pure agency relationship [6] (p. 309). Corporate managers are the agents of shareholders, a relationship fraught with conflicting interests [18] (p. 323). Companies (corporations) are legal entities, and their representation in legal transactions takes place through the phenomenon of representation agency [19] (p. 7). The agency problem is defined as the problem of how person A can motivate person B to work for the benefit of person A and not to pursue person B's own interest. This type of problem basically does not occur in owner-managed companies, where there is no separation of professional management from the owner, but only exists in the legal environment of ownership (property) separated from management [19] (p. 6). Therefore, from the company owner's point of view, agency costs can be understood as the opportunity costs of hiring managers [20] (p. 421). On the other hand, professional managers may be more qualified to run a business because of their technical expertise, experience and personality traits, which is certainly one of the reasons for hiring them [21].

Fulfilling the goals and interests of different interest groups in a company can often be mutually opposed actions [22]. There are many misunderstandings and conflicting interests between shareholders and management due to the division of roles within an organization [23] (pp. 1–2). Although managers, as agents of owners, should work for the benefit of owners, incentives for managers to act for their own benefit are always present. The separation of ownership and control in a professionally managed firm may result in managers exerting insufficient work effort, indulging in perquisites, choosing inputs or outputs that suit their own preferences or otherwise failing to maximize firm value [12] (p. 1066). The problem of ensuring that professional managers work in the interests of the owners and not in their own interests is particularly pronounced in companies with disparate ownership [24]. In a corporation with many small owners, it may not pay any of them to monitor the performance of management [25] (p. 461).

Principals will develop mechanisms to monitor their agents in order to mitigate opportunistic behavior and better align the parties' interests [26] (p. 5). Principals can discourage this behavior of managers using various mechanisms of monitoring and control, including supervision by independent directors, the threat of takeover and the threat of bankruptcy [27,28], but each of these mechanisms also causes certain costs, so perfect monitoring is out of the question [27].

Although the agency relationship between the owners and managers of a company is fraught with conflicts of interest and incentives for managers to act in their own interests rather than in the interests of owners, there are forces and constraints that align the interests of owners and managers [10] (p. 574) and a range of corporate governance tools to reduce agency costs [29] (p. 2).

Fama [30] points out the importance that the managerial labor market, both external and internal, can have in solving potential incentive problems associated with the separation of ownership and control in companies; that is, he explains how the pressure of the managerial labor market can aid in disciplining managers. The success or failure of a company represents a significant signal to the managerial labor market regarding the talent of the manager and their ability to ensure the survival of the company on the market and about the value of the human capital of the company manager. The performance of the company may not be directly reflected in the current salary of the manager, but it will have an impact on the future salary of the manager, given that the managerial labor market will use the performance of the company in evaluating the human capital of the company manager, that is, in determining the possible external earnings of the manager. Therefore, the value of the manager's human capital on the managerial labor market will depend on the success or failure of the company. In addition to the discipline created by the competitive external managerial labor market, an internal managerial labor market can be an effective mechanism for monitoring managers. Regarding a company's top managers who comprise the board of directors, the existence of competition among the top managers themselves is perhaps the best mechanism for controlling the work of this body, while lower levels of management are usually supervised by higher levels of management. Also, Fama [30] states that an efficient capital market can indirectly assist the managerial labor market in evaluating a company's management. That is, the value of the company's shares can represent a significant signal to the managerial labor market that will indirectly affect the manager's valuation.

Grossman and Hart [28] (p. 107) state that in corporations that are owned by many small shareholders (dispersive ownership), the "incentive problem" is especially present, that is, the managers have their own goals, such as the enjoyment of perquisites or the maximization of their own income, which are in conflict with shareholders' goals related to profit or market value maximization. Jensen and Meckling [6] state that increases in management ownership contribute to a reduction in the divergence of interests, that is, the cost of deviation from value maximization declines as management ownership increases. The authors explain the above using the fact that with increases in management ownership, the managers also bear a greater part of the costs of their on-the-job consumption, and they are less likely to waste corporate wealth. Therefore, increasing management ownership contributes to improving corporate performance.

However, Morck, Shleifer and Vishny [31] state that theoretical arguments alone cannot unambiguously predict the relationship between management ownership and corporate performance. Thus, under the "convergence of interests" hypothesis, the authors find that as management ownership increases, agency costs decline and corporate performance improves, as previously suggested by Jensen and Meckling [6]. However, with the "entrenchment" hypothesis, Morck, Shleifer and Vishny [31] prove that with a sufficiently high management stake, there is a decline in company performance because in this, situation managers pursue their own goals instead of the goal of maximizing the company's value. The reason for this is that when a manager owns only a small stake, the discipline created by the market may still force them to maximize the value of the company, which was previously explained through the pressure that the managerial labor market can have in disciplining managers [30]. Therefore, when management's ownership increases beyond the point at which market-imposed discipline is still effective, the entrenchment effect causes the company's performance to decline. Demsetz [32] also highlights the entrenchment effect of managers and states that significant management ownership can potentially cause managers to focus more on their own interests rather than the interests of outside

shareholders, thus contributing to a reduction in company value. In addition to managerial ownership, Shleifer and Vishny [33] show how the concentration of ownership, in various forms including large shareholders, takeovers and large creditors, contributes to mitigating the agency problem.

Grossman and Hart [28] (p. 107) state that salary incentive schemes, such as profit-sharing arrangements or stock options, can contribute to aligning the interests of managers with the interests of shareholders. Myers [27] (p. 96) also states that the interests of managers and investors can be aligned through the design of a compensation package, but he points out that this mechanism is not perfect and has its shortcomings.

Grossman and Hart [28] also state the incentive effect that the threat of taking over a company creates for managers to achieve higher profits, while they especially emphasize the importance of the threat of the possible bankruptcy of the company in improving the quality of management, i.e., in turning managers toward the interests of the owners and maximizing profits. If managers do not seek high profits, the probability that the company will go bankrupt increases, and in that case, the managers will lose all the benefits they receive from the company in the event of bankruptcy. Therefore, managers will seek to maximize the company's profits rather than risk losing their perquisites. Grossman and Hart [28] (p. 108) point out that the efficacy of bankruptcy as a source of discipline for management will depend on the company's financial structure—in particular, its debt-equity ratio. The reason for the above is that companies that do not have debt are protected from bankruptcy, and therefore managers have less reason to maximize profit. The manager's potential loss of his benefits under the threat of bankruptcy is one of many possible incentive schemes that can induce good managerial performance [28] (p. 131).

Jensen [18] also states the importance and benefits of using debt in motivating managers and companies to be more efficient. The conflict of interests between shareholders and managers regarding payout policy is particularly serious when the company generates substantial amounts of free cash flow. Free cash flow is cash flow in excess of what is required to fund all projects that have positive net present values when discounted at the relevant cost of capital. The problem is how to motivate managers to disgorge the cash rather than investing it at below the cost of capital or wasting it on organization inefficiencies [18] (p. 323). Jensen [18] states that debt service obligations reduce the free cash flow that managers may use for discretionary spending, so debt is very useful in reducing the agency costs of free cash flow. The threat caused by the failure to make debt service payments serves as an effective motivating force to make such organizations more efficient [18] (p. 324). Debt also restricts the agent's capacity to diminish value via a lack of effort or perquisite spending [34] (p. 2).

However, increased leverage also comes with costs. As leverage increases, the agency costs of debt, which are mainly related to bankruptcy costs, rise. Therefore, the optimal debt/equity ratio is the point at which the value of the company is maximized, the point at which the marginal costs of debt just offset the marginal benefits [18] (p. 324). However, Jensen [18] warns that issuing debt will not always have a positive control effect and points out that the stated effect will not be as important for rapidly growing organizations with large and highly profitable investment projects but no free cash flow and that the control function of debt is more important in organizations that generate large cash flows but have low growth prospects [18] (p. 324). Myers [27] (p. 98) explains the above using the fact that growth companies have more to lose, unlike a company lacking valuable investment opportunities for which the debt-overhang problem is no problem. Therefore, these agency costs, caused by the conflict of interest between debt and equity holders, help explain why growth companies tend to rely on equity. Although debt can mitigate the problem of "overinvestment", on the other hand, it can cause what Myers [35] calls "underinvestment" or "debt overhang" problem and in that case the debt will have a negative effect on the value of the company.

Financing decisions are now still controversial, particularly in relationship with firm efficiency. Some theoretical and empirical studies have shown that there is a positive

impact of debt financing choices on firm performance, whereas others have proved that the impact is negative [36] (p. 24). Vijayakumaran [37], in addition to other internal governance mechanisms, investigates the impact of debt financing on agency costs using a large panel of Chinese listed firms. Research results suggest that debt financing functions as effective corporate governance mechanisms for Chinese listed firms to mitigate agency conflicts and resulting agency costs. A study by Rashid Khan et al. [38] supports the literature, finding that agency cost and firm performance are negatively related to the Chinese listed firms. Kontuš [39] finds that equity to capital and long-term debt to capital variables positively and significantly influence the agency costs of listed companies in the Republic of Croatia. The study also indicates that the long-term debt to capital variable has a negative and significant impact on the agency costs of listed companies in Slovenia and the Czech Republic. Brendea et al. [40] examine the relationship between capital structure and company performance in a sample of non-financial companies from eight Central and Eastern European countries in the period of 2008–2017. The results indicate a negative relationship between debt and company performance and therefore do not support the agency cost hypothesis. Harvey et al. [41] find that debt mitigates the reduction in firm value that accompanies a separation between a management group's control rights and its proportional cash flow ownership. The results indicate that the incremental benefit of debt is concentrated in firms with high expected managerial agency costs that are also the most likely to have overinvestment problems resulting from high levels of assets in place or limited future growth opportunities.

Singh and Davidson [42] find in large firms that leverage is negatively related to one of the measures of agency cost. Ankamah-Yeboah et al. [43] confirm that the agency cost hypothesis holds in the Mediterranean aquaculture sector such that leverage has an inverted U-shaped relationship with performance. This implies that efficiency increases with leverage, but efficiency begins to decrease at sufficiently high levels of leverage. Fernandes, Vaz and Monte [44] determined a positive and statistically significant effect of short-term leverage on the efficiency of companies in Portugal. Margaritis and Psillaki [13] found a positive and significant effect of leverage on the efficiency of companies in France. The cited authors show that debt is more significant for companies operating in industries with fewer growth opportunities since the effect of debt on efficiency is greater for companies in traditional industries. Margaritis and Psillaki [45] confirm the positive and significant effect of leverage on efficiency in New Zealand companies as well. The results of Margaritis and Psillaki [45] show a positive and significant effect of leverage on efficiency even in the case of quadratic leverage, which shows that the determined effect remains positive in the entire relevant range of leverage values. Berger and Di Patti [12] find in the U.S. banking industry a positive and significant effect of leverage on estimated efficiency. The established positive effect remained present even at a very high level of leverage. Le and Phan [46] found a non-linear relationship between short-term leverage and company performance in Vietnam, i.e., that at a high level of leverage, the relationship between leverage and company performance changes from positive to negative. The results of Nguyen and Tran [36] illustrate that there is a non-linear relationship between leverage and firm performance. These findings are consistent with the agency cost hypothesis.

2.2. Hypothesis Development

Viewing the company as a "black box" within which inputs are transformed into predetermined outputs assumes that each company minimizes its costs and excludes the possibility of misusing resources or making decisions that are not optimal; therefore, the actual output is always equal to the potential output [47,48]. However, Leibenstein [49] states that given inputs cannot be transformed into predetermined outputs. As reasons for the discrepancy between the maximum possible output and realized output, which causes what he calls X-inefficiency, he cites different interests between principals and agents, inadequate motivation, and incomplete contracts that allow employees a certain degree of discretion regarding the level of effort they invest in their work [50]. Therefore, in contrast

to the neoclassical approach to the firm, Leibenstein suggests an approach to the theory of the firm that does not depend on the assumption of cost minimization by all firms but that the level of unit cost depends to some measure on the degree of X-efficiency which, in turn, depends on the degree of competitive pressure, as well as other motivational factors.

Stigler [51] (p. 213) states that there are important and pervasive problems in all contracts between people in seeking the fulfillment of reciprocal contractual promises. Alchian and Demsetz [52] state that substantial resources are required to enforce contractual accomplishment. Also, since it is practically technologically infeasible to formulate a complete contract that would specify what the manager does in every situation, since most future contingencies are hard to describe and foresee, the manager has some discretion to allocate the owner's funds at their discretion [33], which may lead to managers using discretionary spending to achieve their own goals rather than the owner's interests [53] (p. 4).

Although in theory, corporate managers, as agents of owners, should, in all situations, act in accordance with the interests of owners and not in accordance with their own interests [6], in practice, agents may lack the incentive or motivation to follow the goals of their principals, and the principal–agent relationship may entail costs in terms of lower efficiency [5] since it is impossible to achieve a complete alignment of the interests of the agent (manager) and the principal (owner) with zero costs.

Although spending resources on various monitoring activities cannot completely eliminate the opportunistic behavior of managers, these activities can significantly limit divergence from the interests of the principal [6]. Therefore, bearing in mind that agency costs (monitoring and bonding costs and "residual loss") are an inevitable result of an agency relationship, the goal is to minimize them.

Jensen and Meckling [6] state that the choice of capital structure can contribute to mitigating agency costs and that a higher leverage level reduces the agency costs of outside equity and increases the value of the company, limiting or encouraging managers to act more in the interests of shareholders. A higher level of leverage can be used as a disciplinary mechanism to reduce the opportunistic behavior of managers through pressure imposed by the obligation to service the debt [6], but also due to the threat of the possible bankruptcy of the company [28], which increases with an increase in the debt/equity ratio, which certainly causes personal losses for managers in the form of loss of earnings, reputation, perquisites, etc. [54].

Jensen [18] also states that debt can be significant in motivating managers and companies to be more efficient. Since the obligation to service the debt reduces the free cash flow over which managers have the discretionary right to spend, the danger of not being able to properly service the debt is very motivating for improving organizational efficiency. Jensen [18] points out that debt is particularly useful for companies with significant free cash flows in mature industries with limited growth opportunities.

Therefore, based on the aforementioned theoretical framework, the following research hypothesis was formulated:

H_1. *There is a positive relationship between capital structure (leverage) and company efficiency.*

However, although the existence of debt in the capital structure can motivate managers to act in accordance with the interests of the owners, i.e., leverage acts as a disciplining mechanism in mitigating the agency costs of outside equity, the opposite effect can occur with the agency cost of debt, which arises as a consequence of a conflict of interests between stockholders and debt holders who have different requirements for cash flows generated by the company. Debt holders are only interested in debt payment specified in the contract, while stockholders, in order to achieve a return over and above the amount required to repay debt, are interested in pursuing riskier business activities [55]. An organization's capital structure is the foundation for any sound investment policy [56] (p. 1). A high level of debt can affect a company's investment decisions. Default risk can cause the problem of "underinvestment" [35]. Also, if the risk of default is significant, the manager can have a strong incentive to implement very risky activities (investments) that will "transfer" wealth

from creditors to the company's stockholders. Also, the inclusion of various covenants in the indenture provisions to limit managerial behavior occasionally limits management's ability to take optimal actions on certain issues that may reduce the profitability of the company [6].

Based on the above, the following research hypothesis was formulated:

H_2. *There is a non-linear relationship between the capital structure and efficiency of companies—at lower levels of leverage, a positive impact on efficiency is expected, while at high levels of leverage, the relationship changes from positive to negative.*

3. Research Methodology

3.1. Sample and Data Collection

The target population consisted of joint stock companies operating in the Republic of Serbia. The choice of the mentioned legal form stems from the theoretical framework of the research, bearing in mind that the relationship between stockholders and corporate managers fits into the definition of a pure agency relationship [6] (p. 309). The total number of companies in the form of a joint stock company in the Republic of Serbia in 2020, based on the annual financial report bulletin of the Business Registers Agency [57], was 1113.

Since an efficiency analysis was used to evaluate the company's performance, it is necessary that the sample consists of companies that apply mostly similar production technologies; accordingly, traditional, mature areas within the manufacturing industry in the Republic of Serbia were selected: the production of food products, the production of beverages, the production of tobacco products, the production of textiles, the production of clothing, the production of leather and leather goods, and the production of chemicals and chemical products. According to the regulation on the classification of activities [58] in the Republic of Serbia, the manufacturing industry belongs to sector C. The economic and financial data of the companies were obtained from the website of the Business Registers Agency [57] and the company website, scoring.rs [59]. The period of the research was 2006–2020. Companies for which financial reports were not available for all years of the analyzed period were excluded from the initially defined sample based on the criteria of legal form, selected areas of the manufacturing industry and period of analysis to avoid using average values for missing data and thereby creating artificial variability. Also, due to inadequate input/output data, it was not possible to assess the efficiency of certain companies, which is why those companies were excluded from the initial sample and, after the exclusions, the total number of observations was 855. Although the agency costs of separation of ownership and management are more pronounced in large, organizationally complex companies, bearing in mind that the time period of the analysis is very long and that during the observed period in the Republic of Serbia, the legal criteria for determining the size of the company [60] changed, and also that in the case of individual companies, the values of the defined size criteria and thus the category to which they belong changed, the sample was not restricted in terms of company size, but the size of the companies was used as one of the control variables in the models.

3.2. Variable Selection and Model Specification

Empirical research includes two related phases. In the first phase, this research aimed to evaluate the technical efficiency of companies in the areas of the manufacturing industry. The efficiency of the companies was estimated using two parametric techniques: Ordinary Least Squares (OLS) methods and a Stochastic Frontier Analysis (SFA). According to Berger and Di Patti [12], Margaritis and Psillaki [45], Margaritis and Psillaki [13] and Fernandes, Vaz and Monte [44], the estimated efficiency of a company is a measure of its (inverse) agency costs, and the companies that achieve efficiency frontiers were viewed as those that minimize agency costs.

The second phase of this research involved the application of panel regression models in order to determine the direction and intensity of the influence of leverage and con-

trol variables on the initially estimated efficiency of companies. The literature identified numerous factors that are significant determinants of the efficiency of companies, such as size, age, ownership concentration, tangibility of assets and profitability; therefore, in addition to determining the direction and intensity of the influence of leverage, it is very important to examine the impact of these control variables on the estimated efficiency of companies. The inputs in the efficiency model are represented by the number of employees and fixed tangible assets, whereas the output is represented by net result of the company; capital structure is measured by the leverage level, which is calculated as the ratio of total liabilities to total assets; company size is represented by a natural logarithm of the total assets; company age is represented by the number of years of operation (observed year minus year of the establishment of the company); ownership concentration is represented by the share of the largest shareholder (the given data refer to the year 2020, since data on ownership shares for previous years were not available to the authors.); risk is represented by the standard deviation of the ROA; the tangibility of assets is calculated as (fixed assets–intangible assets)/total assets; and profitability is represented by return on total assets (ROA).

Hypothesis H_1 was tested with a model in which efficiency is estimated using the COLS method (1) and a model in which efficiency is assessed using the SFA method (2):

$$EffCOLS_{it} = \beta_0 + \beta_1 LEV_{it} + Z\beta + e_{it} \quad (1)$$

$$EffSFA_{it} = \beta_0 + \beta_1 LEV_{it} + Z\beta + e_{it} \quad (2)$$

where LEV represents the leverage ratio; Z represents a limited design matrix that includes a set of control variables, company size, company age, ownership concentration, risk, tangibility of assets and profitability; and e_{it} represents the error term composed of the firm-specific (η_i) and time-specific effects (λ_i) followed by the time-varying error term (ϵ_i). In functional form, the dominant influence of leverage on efficiency is expected, but it is necessary to consider the mentioned control variables. So,

$$Efficiency = f(Leverage, Z) \quad (3)$$

In general, a positive effect of company size on efficiency is expected. Large companies can be more efficient in production because they use more specialized inputs, coordinate their resources better, enjoy the benefits of economies of scale, etc. [61]. Large companies generally have lower costs than small companies due to economies of large scale. However, it should be noted that the superiority of large-scale operations usually depends on the full or nearly full use of capacity [62]. In addition to economies of scale, large companies have other advantages that make them more efficient than small companies. A large company has a better chance of recruiting good and experienced executives internally, thus avoiding the additional costs of finding an adequate workforce externally. Also, size, and the reputation and strength which go with it, are an assurance to investors, enabling large companies to borrow more easily and inexpensively than small ones. Financial strength enables a firm to take risks, e.g., in the research and pilot development of new products, which is especially important in industries where research is expensive, innovations are frequent and obsolescence is high. Also, large companies have more scope for diversifying their products, markets and sources of supply without losing much of the economy of large-scale production, and diversification is a useful way of reducing overall risk [62]. A negative effect of size can arise in situations in which there is a loss of control due to ineffective hierarchical structures in the management of a company [63]. Smaller companies could be more efficient because they are more flexible, have non-hierarchical structures and do not suffer from the agency problem precisely because of their smaller size [61]. On the other hand, in addition to the inability to take advantage of scale economies, small companies face difficulties in obtaining credit for investment, a lack of resources in terms of qualified human capital and the informality of contracts with clients and suppliers, which are factors that can explain their lower efficiency compared to large companies [64].

The positive effect of company age on efficiency is explained as a learning effect [61]. Older companies will be the most experienced in terms of their production and commercial processes [65] since they have had more time to learn and become more experienced in their operations and thus become more efficient [66] (p. 51). The negative effect of company age on efficiency is explained by the fact that older companies generally use older and less productive technologies rather than advanced technologies [61]. The high replacement cost of capital results in older firms using equipment which does not embody more recent technological advances, while younger firms are able to adopt the most efficient technologies available at the time of their conception [66] (p. 51).

The effect of concentration of ownership on company efficiency can be explained by the fact that concentrated ownership is a significant mechanism of management discipline and contributes to mitigating the agency problem. Large shareholders solve the agency problem in such a way that on the one hand, they generally have an interest in maximizing profits, while on the other hand, they also have significant control over the company's assets, which allows them to have their interests respected. Thus, as ownership increases, due to incentives to reduce agency costs, performance improves. However, concentrated ownership has its costs. A high concentration of ownership leads to an entrenchment effect. Large owners who have almost full control over a company can use the company to generate private benefits from this control which are not shared by minority shareholders [33].

The effect of risk on the company's efficiency is expected to be negative. Business risk disrupts forecasting and planning activities, making it difficult to create an organizational strategy and plan future actions. It is usually defined as greater variability in organizational returns and increased chances of business failure [67]. Riskier companies tend to be those that are poorly organized [13]. Also, higher levels of business risk not only make it more difficult for the principal to determine what actions the agent takes but also make it more difficult for the principal to determine what actions the agent should take [67]. On the other hand, if we look for the argument in the classic risk–return trade-off, it is expected that companies with greater variability in operating income will have higher returns [68], and riskier companies can be evaluated as more efficient. However, companies that are poor at operations might also be poor at risk management, yielding a negative relationship between efficiency and risk [12].

Tangible assets are easily monitored and provide good collateral and therefore tend to mitigate agency conflict [13]. The existence of asymmetric information and agency costs may lead creditors to require collateralized guarantees. If a company has significant investments in land, equipment and other tangible assets, it will usually face lower financing costs compared to a company that is based mostly on intangible assets [44].

A positive effect of profitability on efficiency is expected. More profitable companies are generally better managed and are therefore expected to be more efficient [13].

Although a positive effect of leverage on the efficiency of companies is assumed, there is a possibility that at sufficiently high levels of leverage, this effect may be negative. The quadratic specification allows the relationship between leverage and efficiency to change from positive to negative at a substantial increase in leverage. Therefore, hypothesis H_2 was tested using non-linear models. Non-linear specification was tested by a model in which the efficiency was estimated using the COLS method (4) and by a model in which the efficiency was estimated using the SFA method (5).

$$EffCOLS_{it} = \beta_0 + \beta_1 Leverage_{it} + \beta_2 Leverage_{it}^2 + Z\beta + e_{it} \quad (4)$$

$$EffSFA_{it} = \beta_0 + \beta_1 Leverage_{it} + \beta_2 Leverage_{it}^2 + Z\beta + e_{it} \quad (5)$$

3.3. Data Processing Methods

Bearing in mind the stochastic nature of efficiency dynamics, companies' efficiency was estimated using two parametric techniques: (1) Ordinary Least Squares (OLS) methods and a (2) Stochastic Frontier Analysis (SFA). The choice regarding the use of parametric methods resulted from obvious methodological advantages, primarily regarding problems arising

from measurement error and the predominant influence of random events. Therefore, this research was based on information collected about the inputs (Input1: the number of employees; Input2: fixed tangible assets) and outputs (Output1: net result) of each company (x^k, y^k) in order to estimate the beta parameters, specify the production function, and evaluate the performance of each company. The estimation of the production function was based on the principle of maximum likelihood, so the estimated beta parameters $\hat{\beta}$ were chosen to make the current observations as reliable as possible. The assessment of (in)efficiency is based on the assumed process of generating observations, so within the OLS approach, any deviation is considered a stochastic factor. Also, the SFA approach assumes that any deviation from the estimated production function is due to inefficiencies and stochastic factors.

Starting from the technology set T, the production function can be represented as an optimal combination of inputs to maximize output. More formally, $f(x) = max\{y \vee (x, y) \in T\}$, implying that the inputs and outputs belong to the technological set T. According to the parametric approach, the production function has an a priori assumed functional form, but its dynamics are functions of unknown beta (β) parameters. Thus, the assumed production function includes a vector of inputs and a vector of unknown beta parameters: $f(x) = f(x, \beta)$. In accordance with practice in comparable research, the Cobb–Douglas production function was used in this research in order to reliably describe the production processes of the companies that make up the research sample.

The application of Ordinary Least Squares (OLS) methods is a standard initial stage in evaluating the efficiency of companies. More precisely, the empirical analysis in this case will be based on the estimation of the parameters of the production function specified as follows: $y^k = f(x^k, \beta) + v^k,\ k \in \{1, K\}$, assuming deviations that are symmetric about zero. This implies that the random parameter defined in this way follows a normal distribution: $v^k N\left(0, \sigma^2\right)$. It should be noted that the standard stochastic OLS approach generates individual observations that are greater than the production possibilities defined by the production function. Therefore, this research was based on the correction of the Ordinary Least Squares (COLS) estimation in order for the empirical research to be in accordance with the postulates of economic theory.

After the COLS assessment, this research focused on evaluating the efficiency of the companies using a Stochastic Frontier Analysis (SFA). Basically, the SFA is a respecified parametric technique which, in addition to the stochastic parameter v (error term), also includes an (in)efficiency parameter u. In this research, the log-linear SFA model $y^k = f(x^k, \beta) + v^k + u^k,\ k \in \{1, K\}$ was applied, assuming that the stochastic parameter v (error term) follows a normal distribution, while the (in)efficiency parameter follows a normal distribution within the positive scale of values (a half-normal distribution). The standard assumption that the stochastic parameter and the (in)efficiency parameter are mutually independent, $u = 0$, implies that the company is 100% efficient, while $u > 0$ implies a certain degree of inefficiency.

After evaluating the efficiency, the second phase of empirical research involved the application of panel regression models, more precisely, grouped OLS models, fixed effects models and random effects models. STATA and R programs were used for data processing.

4. Data Analysis, Results and Discussions

Table 1 presents descriptive statistics. The efficiency of the companies was estimated using two parametric techniques. The average efficiency of companies in the observed period, estimated using the COLS method, is 0.38. The efficiency estimated using the SFA method shows that the average efficiency of the analyzed companies is 0.72. The average efficiency usually differs between the two studied methods [69–71]. COLS and SFA are completely different methodologies that take completely different approaches when estimating the efficiency frontier, and it is quite expected that the average scores are different. The average total leverage of the analyzed companies is 0.56, varying widely from 0.03 to 4.63. The average value of total leverage is comparable to the leverage values obtained in

other studies conducted in developing countries, where it is significant to point out that high values of total leverage are due to very high levels of short-term leverage, while on the other hand, these companies have a very low level of long-term leverage [53,72]. Since the sample consisted of companies that were in operation for all years of the observed period, the above also influenced the average age of the analyzed companies to be relatively high. What is particularly worrying based on the descriptive statistics presented is that extremely low average profitability characterizes the analyzed companies.

Table 1. Descriptive statistics for the period 2006–2020.

Variable		Mean	Std. Dev.	Min	Max	Observations	
Efficiency (COLS)	overall	0.380933	0.2014898	6.60×10^{-8}	1.05659	N =	855
	between		0.1374826	0.1554902	0.8949224	n =	57
	within		0.148346	−0.2047232	1.225443	T =	15
Efficiency (SFA)	overall	0.7212987	0.228507	7.00×10^{-8}	0.999702	N =	855
	between		0.1038875	0.1656397	0.9456949	n =	57
	within		0.2039602	0.1365755	1.495958	T =	15
Leverage	overall	0.5616149	0.5421162	0.030457	4.62922	N =	855
	between		0.3960727	0.0617331	1.942447	n =	57
	within		0.3736149	−0.6269617	3.703435	T =	15
Leverage square	overall	0.6089575	1.831457	0.0009276	21.42968	N =	855
	between		1.076277	0.003894	5.291108	n =	57
	within		1.488238	−3.92068	16.74753	T =	15
Size	overall	6.041712	0.7391403	4.40081	7.76653	N =	855
	between		0.729737	4.643073	7.407187	n =	57
	within		0.1451375	5.401032	6.534056	T =	15
Age	overall	17.17544	14.69693	3	59	N =	855
	between		14.72864	3	59	n =	57
	within		1.619553	10.17544	24.17544	T =	15
Ownership Concentration	overall	0.6742105	0.2414312	0.2	1	N =	855
	between		0.2434349	0.2	1	n =	57
	within		1.63×10^{-16}	0.6742105	0.6742105	T =	15
Risk	overall	0.0985965	0.0877798	0.01	0.49	N =	855
	between		0.0885082	0.01	0.49	n =	57
	within		3.59×10^{-17}	0.985965	0.0985965	T =	15
Tangibility	overall	0.5001261	0.1895378	0.077254	0.996655	N =	855
	between		0.1478652	0.2198017	0.7892477	n =	57
	within		0.1200786	−0.0197057	0.96589	T =	15
Profitability	overall	0.0007999	0.1403611	−0.8442	1.6148	N =	855
	between		0.0793234	−0.27396	0.1898933	n =	57
	within		0.1162419	−0.7745268	1.702053	T =	15

Source: authors.

This section will present the results of testing hypothesis H_1 using Equations (1) and (2), and then hypothesis H_2 using Equations (4) and (5) in order to test the effect of leverage on the efficiency of the companies. Estimates using two models will be presented. In the first model, the efficiency of the company was assessed using the COLS method, while in the second model, the efficiency of the company was assessed using the SFA method.

To test Hypothesis H_1, which assumes that there is a positive relationship between leverage and company efficiency, a linear specification of leverage was used, while since hypothesis H_2 assumes that at a high level of leverage, the relationship between leverage and company efficiency changes from positive to negative, the quadratic specification of leverage was used to test H_2.

A multiple regression analysis of panel data was conducted using common panel data estimation techniques. A Pooled Ordinary Least Squares (OLS) regression model, a Fixed

Effects (FE) model and a Random Effects (RE) model were used. To select the appropriate model between the Pooled OLS and RE models, the Breusch–Pagan LM test was used. The Breusch–Pagan LM test tests the null hypothesis that there are no significant differences between observation units (i.e., no panel effect), or formally:

Null Hypothesis. *The variance between observation units is zero*.

The results of the chi-square statistic show that the RE model is more credible than the Pooled OLS model. Since $p < 0.05$ ($p = 0.000$), null hypothesis is rejected. This test proves that there is a panel effect and that the Random Effects model is better (a model that is credible) for estimation than the OLS model. Since it has panel effects, an FE model and an RE model were estimated.

The evaluation results of the RE model are presented in Table 2, and the FE model is presented in Table 3. The results of both models show a positive and statistically significant relationship between leverage and efficiency.

Table 2. The effect of capital structure on COLS efficiency (RE model).

Variable	Coef.	Std. Err.	z	$p > \|t\|$
Leverage	0.0298	0.0127	2.34	0.020
Size	0.1543	0.0194	7.95	0.000
Age	−0.0013	0.0008	−1.67	0.095
Ownership Concentration	0.0692	0.0491	1.41	0.159
Risk	−0.0045	0.0126	−0.36	0.719
Tangibility	0.0587	0.0389	1.51	0.132
Profitability	0.0731	0.0247	2.96	0.003
_cons	−0.4847	0.0947	−5.12	0.000
Observations	855	Wald chi2(5)	132.83	0.0000
R-sq:		within	between	overall
		0.0674	0.3536	0.2765

Source: authors.

Table 3. The effect of capital structure on COLS efficiency (FE model).

Variable	Coef.	Std. Err.	t	$p > \|t\|$
Leverage	0.0445	0.0135	3.31	0.001
Size	0.2101	0.0411	5.11	0.000
Age	−0.0058	0.0031	−1.9	0.057
Ownership Concentration	0.0729	0.0503	1.45	0.147
Risk	−0.0068	0.0030	−2.32	0.021
Tangibility	0.0542	0.0224	2.42	0.016
Profitability	0.0984	0.0259	3,8	0.000
_cons	−0.5877	0.2306	−2.55	0.011
Observations	855	F (5.812)	10.62	0.0000
R-sq:		within	between	overall
		0.0733	0.3867	0.2075

Source: authors.

In order to choose which of these two models is better, i.e., consistent in assessment, the Hausman test was applied. With it, we tested the null hypothesis that the differences in coefficients between the FE model and the RE model are not systematic, that is, that there is no significant difference between the models, i.e., both models are consistent.

Null Hypothesis. *Differences in coefficients are not systematic.*

Based on the Hausman test statistic value of 25.02 with a probability of 0.0003, at a significance level of 5%, Null hypothesis was rejected.

The results confirm the positive relationship between the capital structure and the efficiency of companies. There is a positive and significant marginal effect of leverage on efficiency and the model predicts that a unit change in total leverage could affect the change in efficiency by 0.0445.

As for other variables that can have an impact on efficiency, the evaluated model shows that with a percentage change in size, an increase in efficiency by 0.0021 is expected. A unit change in asset tangibility and profitability can be expected to have a positive marginal effect on efficiency, while a unit change in risk assumes a decrease in efficiency by 0.0068. The age variable is not significant at the 5% significance level, but it is significant at the 10% significance level and has a negative effect on the efficiency of companies. The ownership concentration variable has no significant effect on efficiency.

In the following section, the results of the model in which efficiency was assessed using the SFA method will be presented. Since the Breusch–Pagan LM test showed that there are significant differences between the observed companies (test statistic value of 52.28, with a probability of 0.0000), the RE model is more credible for estimation than the OLS model. Table 4 shows the results of the RE model for SFA efficiency.

Table 4. The effect of capital structure on SFA efficiency (RE model).

Variable	Coef.	Std. Err.	z	$p > \|t\|$
Leverage	0.0136	0.0040	3.42	0.001
Size	0.8006	0.2044	3.92	0.000
Age	−0.0013	0.0007	−1.74	0.082
Ownership Concentration	0.0761	0.0468	1.63	0.104
Risk	−0.0204	0.0042	−4.85	0.000
Tangibility	0.0468	0.0080	5.84	0.000
Profitability	0.0241	0.0321	0.75	0.451
_cons	1.3298	0.0950	14.01	0.000
Observations	855	Wald chi2(5)	84.52	0.0000
R-sq:		within	between	overall
		0.0747	0.2839	0.1092

Source: authors.

By applying the Hausman test, based on the test statistic value of 35.08 (p = 0.0000) at a significance level of 5%, it was proven that the FE model is consistent in the estimation, and the interpretation of the results of this model follows.

The results of the FE model for SFA efficiency are presented in Table 5.

Table 5. The effect of capital structure on SFA efficiency (FE model).

Variable	Coef.	Std. Err.	t	$p > \|t\|$
Leverage	0.0106	0.0040	2.66	0.008
Size	0.2042	0.0421	4.85	0.000
Age	−0.0164	0.0042	−3.95	0.000
Ownership Concentration	0.0354	0.0494	0.72	0.473
Risk	−0.0158	0.0041	−3.91	0.000
Tangibility	0.0661	0.0101	6.53	0.000
Profitability	0.0649	0.0352	1.85	0.065
_cons	1.5243	0.3130	4.87	0.000
Observations	855	F (5.812)	14.01	0.0000
R-sq:		within	between	overall
		0.0945	0.1052	0.0422

Source: authors.

As in the previous model in which the dependent variable was the efficiency assessed using the COLS method, in the model of efficiency assessment using the SFA method, there is a positive and significant marginal effect of leverage on efficiency. If the leverage increases by 1, it is expected that the efficiency increases by 0.0106.

Regarding other variables, there is a positive and statistically significant relationship between company size, age, risk and efficiency. The ownership concentration variable, as in the previous model, is not significant for this model specification, nor is the profitability variable. The relationship between risk and efficiency is negative, and the model predicts that a unit change in the risk measure would affect the reduction in efficiency by 0.0158.

Both models show a positive effect of capital structure on the efficiency of the company. However, since the agency costs of debt can reverse this relationship at very high leverage levels, hypothesis H_2 was tested using a non-linear specification of leverage.

In order to test hypothesis H_2, which predicts the existence of a non-linear relationship between the capital structure and the efficiency of the companies, a non-linear model specification was used which allowed the relationship between the capital structure and the efficiency of the companies to be non-monotonic, i.e., it was able to change from positive to negative at a high leverage level.

A Breusch–Pagan LM test statistic value of 174.5 (p = 0.0000) proved that the RE model is more credible for estimation than the OLS model. The results of the RE model are presented in Table 6.

Table 6. Non-linear relationship between capital structure and COLS efficiency (RE model).

Variable	Coef.	Std. Err.	z	$p > \|t\|$
Leverage	0.0002	0.013479	0.01	0.991
Lev^2	−0.0026	0.000455	−5.68	0.000
Size	0.1519	0.0184	8.23	0.000
Age	−0.0012	0.0007	−1.62	0.106
Ownership Concentration	0.0718	0.0459	1.56	0.118
Risk	−0.0039	0.0118	−0.33	0.741
Tangibility	0.0471	0.0380	1.24	0.215
Profitability	0.2753	0.0434	6.34	0.000
_cons	−0.4293	0.0899	−4.78	0.000
Observations	855	Wald chi2(5)	178.11	0.0000
R-sq:		within	between	overall
		0.0859	0.413	0.1236

Source: authors.

The Hausman test statistic value of 25.02 with a probability of 0.0008 and a significance level of 5% proved that the FE model is consistent in the estimation. Table 7 presents the results of the non-linear relationship between capital structure and COLS efficiency using the FE model.

Table 7. Non-linear relationship between capital structure and COLS efficiency (FE model).

Variable	Coef.	Std. Err.	t	$p > \|t\|$
Leverage	0.0165	0.01488	1.11	0.267
Lev^2	−0.0020	0.000486	−4.22	0.000
Size	0.1897	0.0410	4.63	0.000
Age	−0.0050	0.0030	−1.64	0.102
Ownership Concentration	0.0741	0.0471	1.57	0.115
Risk	−0.0690	0.0149	−4.62	0.000
Tangibility	0.0533	0.0221	2.41	0.016
Profitability	0.2509	0.0443	5.66	0.000
_cons	−0.4522	0.2305	−1.96	0.050
Observations	855	F (8.812)	11.83	0.0000
R-sq:		within	between	overall
		0.0933	0.3393	0.1446

Source: authors.

The results in Table 7 show the existence of a non-linear relationship between leverage and efficiency. The coefficient of quadratic leverage is negatively and stati-

stically significantly related to efficiency, indicating that leverage at a high level is negatively related to efficiency. A marginal effect of leverage on COLS efficiency, b2 × Lev^2 = −0.0020466 × Lev^2 = 2 × (−0.0020) × Lev, i.e., with a marginal change in leverage, is expected to decrease efficiency by 2 × (−0.0020) × Lev.

Regarding other variables, company size, the tangibility of assets and profitability have predicted positive and significant effects on efficiency, while the expected effect of risk on efficiency is negative. The variables leverage, company age and ownership concentration are not significant in this model specification.

The non-linear relationship between capital structure and efficiency was also tested in the model in which the dependent variable was estimated using the SFA method. Applying the Breusch–Pagan LM test based on the test statistic value of 20.33 (p = 0.0000) proved that the RE is consistent in its estimation compared to the OLS model.

Table 8 presents the results of the non-linear relationship between capital structure and SFA efficiency using the RE model.

Table 8. Non-linear relationship between capital structure and SFA efficiency (RE model).

Variable	Coef.	Std. Err.	z	$p > \|t\|$
Leverage	−0.0416	0.016605	−2.5	0.012
Lev^2	0.0041	0.0005798	7.01	0.000
Size	0.7815	0.5539	1.41	0.159
Age	−0.0011	0.0006	−1.69	0.091
Ownership Concentration	0.1046	0.0439	2.38	0.017
Risk	−0.0059	0.0106	−0.55	0.580
Tangibility	0.0365	0.0065	5.63	0.000
Profitability	0.0439	0.0174	2,53	0.012
_cons	1.3871	0.0852	16.27	0.000
Observations	855	Wald chi2(5)	143.26	0.0000
R-sq:		within	between	overall
		0.0859	0.413	0.1236

Source: authors.

To select the appropriate model between the FE and RE, the Hausman test was applied. A Hausman test statistic value of 40.36 with a probability of 0.0000 at a significance level of 5% shows that the Fixed Effects model is consistent in its estimation. The results of the model using the FE method are shown in Table 9.

Table 9. Non-linear relationship between capital structure and SFA efficiency (FE model).

Variable	Coef.	Std. Err.	t	$p > \|t\|$
Leverage	0.0216	0.020122	1.07	0.283
Lev^2	−0.0032	0.000657	−4.9	0.000
Size	0.7641	0.1847	4.14	0.000
Age	−0.0151	0.0041	−3.67	0.000
Ownership Concentration	0.0773	0.0412	1.88	0.061
Risk	−0.0061	0.0114	−0.54	0.590
Tangibility	0.0562	0.0086	6.57	0.000
Profitability	0.0310	0.0178	1.74	0.081
_cons	1.7371	0.3117	5.57	0.000
Observations	855	F(8.812)	15.78	0.0000
R-sq:		within	between	overall
		0.1207	0.1672	0.068

Source: authors.

The results of the FE model confirm that the relationship between capital structure and efficiency is non-linear. A significant increase in leverage is expected to reduce efficiency.

There is a statistically significant positive relationship between the size of a company and efficiency. Also, a statistically significant positive relationship exists between the

tangibility of assets and the efficiency of a company, and with a marginal change in the aforementioned independent variables, the estimated value of efficiency is expected to increase. The relationship between company age and efficiency is negative. The variables ownership concentration, risk and profitability are not statistically significant.

Based on the presented results of empirical research on the impact of capital structure on the efficiency of companies in the Republic of Serbia, it can be concluded that research hypotheses H_1 and H_2 have been confirmed.

The existence of debt in the capital structure, on one hand, reduces the agency costs of equity and thereby contributes to increasing the efficiency of companies, while on the other hand, with very high leverage, the agency costs of debt can exceed the agency costs of equity, which increases the total agency costs and consequently reduces the efficiency of companies. Hypothesis H_1 assumes that higher leverage motivates managers to act more in line with the interests of shareholders, i.e., a higher level of leverage is expected to reduce the agency costs of equity and thereby increase the efficiency of companies. Bearing in mind that the stated hypothesis was confirmed in all models, it can be concluded that the existence of debt in the capital structure represents a useful mechanism for controlling the opportunistic behavior of managers and acts as an incentive for managers to act more in accordance with the interests of the owners. However, when leverage becomes very high, the disciplining effect of debt can disappear. By confirming research hypothesis H_2, which assumes a non-linear relationship between leverage and the efficiency of companies, the negative effect of very high leverage on the efficiency of companies in the Republic of Serbia was identified. Very high leverage can limit a company's flexibility and affect the company's investment activities in such a way that it significantly limits or directs it to very risky projects, which increases the expected costs of bankruptcy and causes the loss of the disciplinary effect of debt. The research results are in accordance with the predictions of the agency cost theory that the existence of debt in the capital structure reduces the agency costs of equity in a way that encourages or limits managers to behave more in accordance with the interests of owners. Agency costs caused by conflicts of interest between owners and managers or owners and creditors will give rise to resource misallocation and potential output will be sacrificed [13], which will cause a lower level of efficiency compared to companies that have minimized these costs.

The research results are partly in agreement with other empirical research studies. Fernandes, Vaz and Monte [44] determined a positive and statistically significant effect of leverage on the efficiency of companies in Portugal, with the fact that in the mentioned research, short-term leverage was used to express the capital structure of companies. However, bearing in mind that companies in the Republic of Serbia also predominantly rely on short-term rather than long-term debt [53], the results are not entirely incomparable. Margaritis and Psillaki [13] found a positive and significant effect of leverage on the efficiency of companies in France. The cited authors show that debt is more significant for companies operating in industries with fewer growth opportunities since the effect of debt on efficiency is greater for companies in traditional industries (chemical and textile). Margaritis and Psillaki [45] confirm the positive and significant effect of leverage on efficiency in New Zealand companies as well. The results of Margaritis and Psillaki [45] show a positive and significant effect of leverage on efficiency even in the case of quadratic leverage, which shows that the determined effect remains positive in the entire relevant range of leverage values. Ankamah-Yeboah et al. [43] confirm that the agency cost hypothesis holds in the Mediterranean aquaculture sector such that leverage has an inverted U-shaped relationship with performance. This implies that increasing leverage increases efficiency, but efficiency begins to decrease at sufficiently high levels of leverage. The determined effect on efficiency is confirmed with short-term, long-term and total leverage. Berger and Di Patti [12] also identified a positive and significant effect of leverage on estimated efficiency. The established positive effect remained present even at a very high level of leverage, but it should be kept in mind that the research sample in this research consisted of banks, and that the results of the research are not entirely comparable since banks have a different capital

structure compared to companies operating in other industrial sectors and because their operations are highly regulated. Also, unlike Fernandes, Vaz and Monte [44], Margaritis and Psillaki [45] and Margaritis and Psillaki [13], who used technical efficiency, Berger and Di Patti [12], in their research, used profit efficiency as a measure of (inverse) agency costs. Le and Phan [46] found a non-linear relationship between short-term leverage and company performance in Vietnam, i.e., that at a high level of leverage, the relationship between leverage and company performance changes from positive to negative, with the authors using ROE to express company performance. Nguyen and Tran [36], using a sample of Vietnamese listed firms, found that there is a non-linear relationship between leverage and firm performance (ROE). These findings are consistent with the agency cost hypothesis.

Regarding other variables, the expected positive and significant impact on efficiency in all models was identified for firm size and asset tangibility. The identified positive impact of size on company efficiency confirms the theoretical views that large companies take advantage of the economy of large scale [62] and better coordinate their resources [61]. Contrary to the stated theoretical view, Fernandes, Vaz and Monte [44] and Margaritis and Psillaki [45] identified a negative and statistically significant effect of size on the efficiency of companies, while Margaritis and Psillaki [13] found that the effect of company size on efficiency is not monotonic, i.e., the expected effect on efficiency is positive for smaller companies but negative for large companies. Also, regarding asset tangibility, Margaritis and Psillaki [13] shows a non-monotonic effect—negative at a low level, while at a high level of asset tangibility, the effect is positive. Fernandes, Vaz and Monte [44] identified a negative and statistically significant effect of asset tangibility on efficiency. Most of the presented models show the expected negative effect of risk on the efficiency of companies, while in comparable studies, this variable did not prove to be significant.

The agency cost hypothesis (H_1) was confirmed by all models, so it can be concluded that in the context of the analyzed companies, debt financing can act as an internal governance mechanism in constraining managers' misuse of resources, thus reducing agency costs and contributing to improvement in the company's performance.

Agency costs might be significantly higher in countries with weak legal systems and poor investor protection; therefore, corporate governance matters more in these countries [73,74]. Emerging markets are prone to managerial discretion to a greater extent compared to Anglo-American countries. The managers in these economies tend to manage funds inefficiently, and this directly effects firm performance [38] (p. 2). The opportunistic behavior of managers can be curtailed through a good set of internal and external corporate governance principles. Leverage is considered an agency-mitigating mechanism as outsiders monitor the actions of managers with respect to efficient contracting [38] (p. 4). An increase in leverage provides greater incentive for lenders to monitor managers' actions and decisions more closely, reducing agency costs [37] (p. 140). Emerging markets provide an excellent laboratory to test the governance potential of debt, given that the shareholders of emerging market firms typically suffer from misaligned managerial incentives, ineffective legal protection [75] and underdeveloped markets for corporate control. Debt should create value for firms with high expected agency costs if the use of debt directly reduces overinvestment or allows firms to signal that they do not or will not overinvest [41] (p. 4).

However, although the application of the Hausman test proved that the FE model is consistent in the estimation of both efficiency models (using the COLS and SFA methods) and H_2 was proved by the FE model, the obtained results should be taken with some caution. One of the limitations of this research refers to the use of total leverage as a proxy for capital structure. Companies in developing countries have a very high degree of participation of short-term financing sources in the capital structure [53,72]. Not all forms of debt are equally likely to curtail overinvestment. For instance, with short-term debt, managers must frequently face the scrutiny of capital markets to refinance principal [41] (p. 6). Therefore, it would be very important in future research to separately analyze the impacts of short-term leverage and long-term leverage on companies' performance, as well

as whether the established effects change at extremely high values of these indicators since this could potentially shed a different light on the research results and their implications.

5. Conclusions

A company's operations are affected from an internal perspective by the relationship between participants in the governance system, shareholders, creditors and employees, and the external aspect of corporate governance is focused on the relationship between the company and external stakeholders, namely the governments of countries, state authorities and the local community in which the company operates. The role of all the abovementioned participants in their interaction varies significantly between countries, but there is a general agreement that modern economic societies cannot effectively perform their activities while simultaneously ignoring the interests of interest groups [76] (p. 2). As the main engine of national economic development, industrial enterprises generate high GDP growth while causing numerous negative impacts for the ecological environment [77]. Corporate social responsibility is seen as necessary to enable businesses to satisfy the demands of changing times and achieve sustainable growth [78] (p. 243). In this competitive world, every nation tries to acquire sustainable economic solvency. For this, rapid economic growth via the elevation of the production level is a prerequisite [79] (p. 166). Financial development encourages the transformation of savings into investment, which leads to the inflow of capital to new types of industries, eliminates backward industries and promotes industrial upgrading [80] (p. 4710). In the process of economic development, traditional innovation activities focus on improvements in production efficiency and reductions in costs, and the input and output of innovation focus on the technical level and obey the mainstream economic analysis paradigm [80] (pp. 4697–4698).

At the heart of corporate governance literature is the effect of capital structure impact on firm performance. This relationship is described by what is called the agency cost theory [43] (p. 372). The idea of agency relationships emphasizes that managers, stockholders, bondholders and other parties act in their own self-interest and that costly conflicts may arise due to these self-interests [39] (p. 74). From the agency theory perspective, strong corporate governance plays an important role in protecting shareholders in general and should therefore result in lower agency costs [81]. To solve the agency problem, various governance mechanisms have been devised such as providing equity ownership and compensation to managers, monitoring using boards of directors/large shareholders, the use of debt financing, discipline via capital markets and the managerial labor market, the market for corporate control and so on [37] (p. 135). With effective corporate governance mechanisms, the agency cost can be curtailed while greater firm performance is simultaneously achieved [38] (p. 6).

The choice of how to supply capital to a firm is an important decision [43] (p. 368). Hence, this research focused on the impact of capital structure on a company's performance; more precisely, the effect of the leverage on the estimated efficiency of companies was examined in order to verify the predictions of the theory of agency costs. According to the theory of agency costs, debt can represent an important mechanism of controlling the opportunistic behavior of managers, which encourages and/or constrains managers to act in accordance with owners' interests rather than their own. According to the premise of agency costs, a higher level of leverage reduces the agency costs of equity caused by the conflict of interest between owners and managers and contributes to increasing the efficiency of companies. Since agency costs of equity inevitably arise as a consequence of the separation of ownership and management (control), the goal is to minimize these costs. Bearing in mind that agency costs are real like all other costs, a significant level of these costs leads to resource misallocation and the loss of potential output, which leads to a lower level of efficiency compared to companies that have minimized these costs.

The results of this research confirmed that a higher level of leverage represents a significant mechanism for improving the efficiency of companies. The existence of debt in a company's capital structure motivates company managers to efficiently use the company's

resources since debt creates an obligation to return, and failure to fulfill these obligations can result in bankruptcy, which also causes managers to lose their position, power and employment. However, bearing in mind that very high levels of debt in a company's capital structure generate another type of agency costs, i.e., agency costs of debt, which arise due to conflicts of interest between a company's owners and creditors, the expected effect of a very high level of leverage on the efficiency of companies was examined. The research results showed that the effect of leverage on a company's efficiency is non-linear, that is, it is expected that a sufficiently high level of leverage will negatively affect the company's efficiency. The research results indicate that the use of debt is important for improving the efficiency of companies in mature industries but that its application requires caution since at high levels of leverage the disciplining effect of debt is not sustainable. High levels of leverage lead to the risk of default and increase the probability of bankruptcy and thus the growth of expected bankruptcy costs; on the other hand, it significantly affects the limitation of the investment activities of the company, which negatively affects the growth and competitiveness of the company. Regarding o other variables, the expected positive and significant impact on efficiency in all models was identified for firm size and asset tangibility. The identified positive impact of size on company efficiency confirms the theoretical views that large companies take advantage of the economy of large scale [63] and better coordinate their resources [61]. Tangible assets are easily monitored and provide good collateral and therefore tend to mitigate agency conflict [13].

The research results add to the empirical literature on agency cost theory by providing useful insights into how debt, as one of the internal mechanisms of corporate governance, can help mitigate agency costs and thereby contribute to improving company performance. Agency costs might be significantly higher in countries with weak legal systems and poor investor protection [73]. Emerging markets are prone to managerial discretion to a greater extent compared to Anglo-American countries [38] (p. 2). Leverage is considered an agency-mitigating mechanism as outsiders monitor the actions of managers with respect to efficient contracting [38] (p. 4). Increase in leverage provides greater incentive for lenders to monitor managers' actions and decisions more closely, reducing agency costs [37] (p. 140). Given that shareholders of emerging market firms typically suffer from misaligned managerial incentives and ineffective legal protection, emerging markets provide an excellent laboratory for testing the potential of debt management [75]. Confirmation of the agency costs hypothesis shows that the choice of capital structure for a firm is an important decision that can have practical implications for composing the capital structure in emerging markets. It can be concluded that in the context of the companies analyzed, debt financing can act as an internal governance mechanism in constraining managers' misuse of resources, thereby reducing agency costs and contributing to the improvement of company performance. The aforementioned conclusions can be very significant guidelines for the composition of the capital structure of companies operating in mature industries and contribute to improving the efficiency of a company by making adequate decisions about its capital structure.

In most studies on the relationship between capital structure and company performance, accounting indicators calculated based on financial statements (ROA, ROE), followed by market performance measures (EPSs) and Tobin's Q indicator, which combines accounting and market values, were applied. Only a few empirical studies used efficiency as a performance indicator [12,13,43–45]. Therefore, bearing in mind the advantage of an efficiency analysis as a performance indicator compared to traditional financial indicators, the results of this research can be considered significant.

One of the limitations of this conducted empirical research relates to data on the ownership structure of joint stock companies in the Republic of Serbia. Since the data on the ownership share of the largest shareholder, which was used for the ownership concentration variable, were only available for the last year of the research period (2020), it potentially limited the achievement of significant research results regarding the effect of ownership concentration on the efficiency of companies since the mentioned variable did not prove to be significant in any model. However, similar limitations were identified in

other research studies [12], and the reason why the mentioned variable, with a significant limitation, was retained in this research is that the ownership structures of companies in developing countries mostly show stability over time. Another limitation of this research is related to the research sample. The research sample was defined based on the theoretical framework of the research, and in order to represent an adequate laboratory for testing the developed research hypotheses, it was necessary to fulfill various requirements that arose from the defined research context. It was necessary for the companies to be in the form of joint-stock companies since the relationship between the stockholders and the manager of a corporation fit the definition of a pure agency relationship [6] (p. 309). Also, bearing in mind that the period of analysis was very long (2006–2020), during the observed period, the values of the size criterion changed significantly for some companies, i.e., companies moved into different categories according to this criterion, but during this period in the Republic of Serbia, the legally defined criteria for determining the size of companies, as well as their reference values [60], also changed. Therefore, although the agency costs of the separation of ownership and management are more pronounced in large, organizationally complex companies, and bearing in mind that some authors point out that agency problems can also occur in small- and medium-sized companies that employ professional managers [82,83], the sample was not limited by the size of the companies, but size was used as one of the control variables in the model. On the other hand, bearing in mind that an efficiency analysis was used to assess the performance of companies, it was necessary that the sample comprise companies operating in the same conditions and applying predominantly similar production technologies. Therefore, the empirical research focused on traditional, mature areas of the manufacturing industry. It would be significant to conduct similar research on companies operating in other growing areas of the industry since such companies, due to greater opportunities for growth, have different capital requirements than firms in mature industries. Therefore, it would be important to test whether the disciplining effect of debt, which was confirmed for companies operating in mature areas of the manufacturing industry, was also significant for companies operating in growing areas, such as the areas of computer, electronic and optical product production.

In addition to the research sample which, due to the observed context of the research, was limited to a specific sample of companies that met all the defined criteria, one of the limitations of this research also refers to the applied indicator that expresses the capital structure of the analyzed companies. This research used total leverage as a proxy for capital structure. Bearing in mind that companies in developing countries have very low long-term leverage, in contrast to short-term leverage, which is quite high [53,73], in addition to testing the disciplinary effect of debt and the impact on the performance of companies in other areas, it would be very important in future research to separately examine the impacts of short-term leverage and long-term leverage on company performance. Using long-term leverage and short-term leverage as a proxy for capital structure could potentially provide different results and conclusions about the impact of capital structure on company performance, which would certainly cause different theoretical and practical implications; therefore, it would be very important to investigate the proposed relationships in future research.

Author Contributions: Conceptualization, A.S. and S.T.; methodology, A.S. and B.L.; software, A.S. and B.L.; validation, S.T. and N.V.Ć.; formal analysis, A.S. and O.U.; investigation, A.S. and S.T.; resources, A.S. and O.U.; data curation, S.T., B.L. and N.V.Ć.; writing—original draft preparation, A.S.; writing—review and editing, A.S., S.T., B.L. and O.U.; visualization, N.V.Ć.; supervision, S.T. and O.U.; project administration, B.L.; funding acquisition, A.S., S.T., B.L., O.U. and N.V.Ć. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data are available upon request from the corresponding author.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Daft, R.L. *Organization Theory and Design*; West: New York, NY, USA, 1983.
2. Komazec, L.; Tomić, S.; Jakovčević, K. *Ekonomika Preduzeća [Business Economics]*; Faculty of Economics: Subotica, Serbia, 2018; ISBN 978-86-7233-377-0.
3. Krstić, B.; Sekulić, V. *Upravljanje Performansama Preduzeća [Enterprise Performance Management]*; Faculty of Economics: Niš, Serbia, 2013; ISBN 978-86-6139-066-1.
4. Daft, R.L. *Organization Theory and Design*, 10th ed.; South-Western Cengage Learning: Mason, OH, USA, 2013.
5. Nellis, J.; Parker, D. *Principles of Business Economics*; Financial Times, Prentice Hall: Hoboken, NJ, USA, 2002.
6. Jensen, M.C.; Meckling, W.H. Theory of the firm: Managerial behavior, agency costs and ownership structure. *J. Financ. Econ.* **1976**, *3*, 305–360. [CrossRef]
7. Vučenović, V.; Leković, B. *Menadžment: Filozofija i Tehnologija [Management: Philosophy and Technology]*; Želnid: Belgrade, Serbia, 1998; ISBN 86-7307-051-1.
8. Jakovčević, K. *Upravljanje Troškovima [Cost Management]*; University of Novi Sad, Faculty of Economics: Subotica, Serbia, 2008; ISBN 86-7233-202-5.
9. Damodaran, A. *Korporativne Finansije: Teorija i Praksa [Corporate Finance: Theory and Practice]*, 2nd ed.; Popović, S., Ed.; Modus: Podgorica, Montenegro, 2007; ISBN 978-9940-9095-0-5.
10. Brealey, R.A.; Myers, S.C.; Marcus, A.J. *Osnove Korporativnih Financija [Fundamentals of Corporate Finance]*; Mate: Zagreb, Croatia, 2007; ISBN 953-246-039-1.
11. Demsetz, H. Information and efficiency: Another viewpoint. *J. Law Econ.* **1969**, *12*, 1–22. [CrossRef]
12. Berger, A.N.; Di Patti, E.B. Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *J. Bank. Financ.* **2006**, *30*, 1065–1102. [CrossRef]
13. Margaritis, D.; Psillaki, M. Capital structure, equity ownership and firm performance. *J. Bank. Financ.* **2010**, *34*, 621–632. [CrossRef]
14. Williamson, O.E. Corporate finance and corporate governance. *J. Financ.* **1988**, *43*, 567–591. [CrossRef]
15. Ross, S.A. The economic theory of agency: The principal's problem. *Am. Econ. Rev.* **1973**, *63*, 134–139.
16. Smith, A. *The Wealth of Nations*; Modern Library: New York, NY, USA, 1937.
17. Berle, A.; Means, G. *The Modern Corporation and Private Property*; Macmillan Publishing Co.: New York, NY, USA, 1932.
18. Jensen, M.C. Agency costs of free cash flow, corporate finance, and takeovers. *Am. Econ. Rev.* **1986**, *76*, 323–329.
19. Vasiljević, M. Korporativno upravljanje i agencijski problem (I deo) [Corporate governance and the agency problem (Part I)]. *Anal. Pravnog Fak. U Beogr. [Ann. Fac. Law Belgrade]* **2009**, *57*, 5–24.
20. Cerović, L.; Zaninović, V.; Dukić, N. Utjecaj vlasničke i kapitalne strukture na kretanje agencijskih troškova: Studija slučaja vlasnički nisko koncentriranih poduzeća Republike Hrvatske [The impact of ownership and capital structure on the movement of agency costs: Case study of low concentrated ownership companies of the Republic of Croatia]. *Ekon. Misao I Praksa* **2011**, *20*, 419–442.
21. Sdiq, S.R.; Abdullah, H.A. Examining the effect of agency cost on capital structure-financial performance nexus: Empirical evidence for emerging market. *Cogent Econ. Financ.* **2023**, *10*, 2148364. [CrossRef]
22. Stoiljković, A.; Komazec, L. Tradicionalni i savremeni pokazatelji efikasnosti poslovanja na primeru odabranih kompanija u Republici Srbiji [Traditional and modern indicators of business efficiency on the example of selected companies in the Republic of Serbia]. In Proceedings of the XXI International Scientific Conference Strategic Management and Decision Support Systems in Strategic Management, Palić, Serbia, 19 May 2016; Faculty of Economics in Subotica: Subotica, Serbia, 2016; pp. 1058–1068.
23. Bai, K.; Ullah, F.; Arif, M.; Erfanian, S.; Urooge, S. Stakeholder-Centered Corporate Governance and Corporate Sustainable Development: Evidence from CSR Practices in the Top Companies by Market Capitalization at Shanghai Stock Exchange of China. *Sustainability* **2023**, *15*, 2990. [CrossRef]
24. Vunjak, N.; Tomić, S. Monografija: Korporativno upravljanje [Monograph: Corporate governance]. In *Korporativna Strategija u Funkciji Razvoja Banke u Periodu Tranzicije [Corporate Strategy in the Function of Bank Development in the Period of Transition]*; Leković., B., Miler Emelianovič, A., Eds.; Faculty of Economics in Subotica: Subotica, Serbia; Omsk State University F. M. Dostoevsky: Omsk, Russia, 2014; pp. 30–51, ISBN 978-86-7233-337-4.
25. Shleifer, A.; Vishny, R.W. Large shareholders and corporate control. *J. Political Econ.* **1986**, *94*, 461–488. [CrossRef]
26. Espinosa-Méndez, C.; Maquieira, C.P.; Arias, J.T. The Impact of ESG Performance on the Value of Family Firms: The Moderating Role of Financial Constraints and Agency Problems. *Sustainability* **2023**, *15*, 6176. [CrossRef]
27. Myers, S.C. Capital structure. *J. Econ. Perspect.* **2001**, *15*, 81–102. [CrossRef]
28. Grossman, S.J.; Hart, O.D. Corporate financial structure and managerial incentives. In *The Economics of Information and Uncertainty*; University of Chicago Press: Chicago, IL, USA, 1982; pp. 107–140.
29. Nie, J.; Ye, S. Ownership Structure, Corporate Governance, and Performance of Listed Companies—An Empirical Application of a Semi-Parametric Quantile Regression Model. *Sustainability* **2022**, *14*, 16590. [CrossRef]
30. Fama, E.F. Agency problems and the theory of the firm. *J. Political Econ.* **1980**, *88*, 288–307. [CrossRef]

31. Morck, R.; Shleifer, A.; Vishny, R.W. *Management Ownership and Corporate Performance: An Empirical Analysis*; Working Paper No. 2055; NBER: Cambridge, MA, USA, 1986.
32. Demsetz, H. The structure of ownership and the theory of the firm. *J. Law Econ.* **1983**, *26*, 375–390. [CrossRef]
33. Shleifer, A.; Vishny, R.W. A survey of corporate governance. *J. Financ.* **1997**, *52*, 737–783. [CrossRef]
34. Ahmed, A.M.; Nugraha, D.P.; Hágen, I. The Relationship between Capital Structure and Firm Performance: The Moderating Role of Agency Cost. *Risks* **2023**, *11*, 102. [CrossRef]
35. Myers, S.C. Determinants of corporate borrowing. *J. Financ. Econ.* **1977**, *5*, 147–175. [CrossRef]
36. Nguyen, T.A.; Tran, T.P.T. The impact of capital structure on firm performance of Vietnamese non-financial listed companies based on agency cost theory. *Vnu J. Econ. Bus.* **2019**, *35*, 24–33. [CrossRef]
37. Vijayakumaran, R. Agency Costs, Ownership, and Internal Governance Mechanisms: Evidence from Chinese Listed Companies. *Asian Econ. Financ. Rev.* **2019**, *9*, 133–154. [CrossRef]
38. Rashid Khan, H.U.; Khidmat, W.B.; Hares, O.A.; Muhammad, N.; Saleem, K. Corporate Governance Quality, Ownership Structure, Agency Costs and Firm Performance. Evidence from an Emerging Economy. *J. Risk Financ. Manag.* **2020**, *13*, 154. [CrossRef]
39. Kontuš, E. Agency costs, capital structure and corporate performance: A survey of Croatian, Slovenian and Czech listed companies. *Ekon. Vjesn./Econviews: Rev. Contemp. Bus. Entrep. Econ. Issues* **2021**, *34*, 73–85. [CrossRef]
40. Brendea, G.; Pop, F.; Mihalca, L. Capital structure and firm performance: The case of Central and Eastern European economies. *Ekon. Cas.* **2022**, *70*, 430–449. [CrossRef]
41. Harvey, C.R.; Lins, K.V.; Roper, A.H. The effect of capital structure when expected agency costs are extreme. *J. Financ. Econ.* **2004**, *74*, 3–30. [CrossRef]
42. Singh, M.; Davidson, W.N., III. Agency costs, ownership structure and corporate governance mechanisms. *J. Bank. Financ.* **2003**, *27*, 793–816. [CrossRef]
43. Ankamah-Yeboah, I.; Nielsen, R.; Llorente, I. Capital structure and firm performance: Agency theory application to Mediterranean aquaculture firms. *Aquac. Econ. Manag.* **2021**, *25*, 367–387. [CrossRef]
44. Fernandes, A.; Vaz, C.B.; Monte, A.P. Efficiency and Capital Structure in Portuguese SMEs. In *Operational Research*; Vaz, A.I.F., Almeida, J.P., Oliveira, J.F., Pinto, A.A., Eds.; Springer: Cham, Switzerland, 2018; pp. 101–119. [CrossRef]
45. Margaritis, D.; Psillaki, M. Capital structure and firm efficiency. *J. Bus. Financ. Account.* **2007**, *34*, 1447–1469. [CrossRef]
46. Le, T.P.V.; Phan, T.B.N. Capital structure and firm performance: Empirical evidence from a small transition country. *Res. Int. Bus.* **2017**, *42*, 710–726. [CrossRef]
47. Acs, Z.J.; Gertowsky, D.A. *Managerial Economics and Organization*; Prentice Hall: Hoboken, NJ, USA, 1996.
48. Fidalgo, E.G.; Garcia, A.C. *A Resource-Based Interpretation of Technical Efficiency Indexes*; Documentos de Trabajo; Universidad de Oviedo, Facultad de Ciencias Económicas: Oviedo, Spain, 2001; pp. 1–17.
49. Leibenstein, H. Allocative efficiency vs. "X-efficiency". *Am. Econ. Rev.* **1966**, *56*, 392–415.
50. Leibenstein, H. X-inefficiency Xists: Reply to an Xorcist. *Am. Econ. Rev.* **1978**, *68*, 203–211.
51. Stigler, G.J. The Xistence of X-efficiency. *Am. Econ. Rev.* **1976**, *66*, 213–216.
52. Alchian, A.A.; Demsetz, H. Production, information costs, and economic organization. *Am. Econ. Rev.* **1972**, *62*, 777–795.
53. Stoiljković, A.; Tomić, S.; Leković, B.; Matić, M. Determinants of Capital Structure: Empirical Evidence of Manufacturing Companies in the Republic of Serbia. *Sustainability* **2023**, *15*, 778. [CrossRef]
54. Williams, J. Perquisites, risk, and capital structure. *J. Financ.* **1987**, *42*, 29–48. [CrossRef]
55. Simerly, R.L.; Li, M. Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. *Strateg. Manag. J.* **2000**, *21*, 31–49. [CrossRef]
56. Amin, H.I.M.; Cek, K. The Effect of Golden Ratio-Based Capital Structure on Firm's Financial Performance. *Sustainability* **2023**, *15*, 7424. [CrossRef]
57. Available online: www.apr.rs (accessed on 20 January 2022).
58. Official Gazette of Republic of Serbia. Regulation on Classification of Activities. No. 54/2010. Available online: https://www.paragraf.rs/propisi/uredba_o_klasifikaciji_delatnosti.html (accessed on 15 January 2022).
59. Available online: www.scoring.rs (accessed on 22 February 2022).
60. Official Gazette of Republic of Serbia. Law on Accounting. No. 62/2013. Available online: https://www.mfin.gov.rs//upload/media/SQs4X1_601bb4d0027ae.pdf (accessed on 20 January 2022).
61. Yang, C.H.; Chen, K.H. Are small firms less efficient? *Small Bus. Econ.* **2009**, *32*, 375–395. [CrossRef]
62. Speight, H. *Economics and Industrial Efficiency*, 2nd ed.; St Martin's Press: New York, NY, USA, 1967.
63. Williamson, O.E. Hierarchical control and optimum firm size. *J. Political Econ.* **1967**, *75*, 123–138. [CrossRef]
64. Alvarez, R.; Crespi, G. Determinants of technical efficiency in small firms. *Small Bus. Econ.* **2003**, *20*, 233–244. [CrossRef]
65. Hill, H.; Kalirajan, K.P. Small enterprise and firm-level technical efficiency in the Indonesian garment industry. *Appl. Econ.* **1993**, *25*, 1137–1144. [CrossRef]
66. Pitt, M.M.; Lee, L.F. The measurement and sources of technical inefficiency in the Indonesian weaving industry. *J. Dev. Econ.* **1981**, *9*, 43–64. [CrossRef]
67. Bloom, M.; Milkovich, G.T. Relationships among risk, incentive pay, and organizational performance. *Acad. Manag. J.* **1998**, *41*, 283–297. [CrossRef]

68. Zeitun, R.; Tian, G.G. Does ownership affect a firm's performance and default risk in Jordan? *Corp. Gov. Int. J. Bus. Soc.* **2007**, *7*, 66–82. [CrossRef]
69. De-Graft Acquah, H. Sensitivity of technical efficiency estimates to estimation methods: An empirical comparison of parametric and non-parametric approaches. *APSTRACT Appl. Stud. Agribus. Commer.* **2014**, *8*, 67–72. [CrossRef]
70. Jaforullah, M.; Premachandra, E. Sensitivity of technical efficiency estimates to estimation approaches: An investigation using New Zealand dairy industry data. In *Economics Discussion Papers Series No. 306*; University of Otago: Dunedin, New Zealand, 2003. Available online: http://hdl.handle.net/10523/896 (accessed on 23 December 2023).
71. Bogetoft, P.; Otto, L. *Benchmarking with DEA, SFA and R*; Springer: New York, NY, USA, 2011.
72. Stoiljković, A.; Tomić, S.; Uzelac, O. Does capital structure affect the differences in the financial performance of small enterprises? *Strateg. Manag.* **2021**, *26*, 72–80. [CrossRef]
73. Gugler, K.; Mueller, D.C.; Burcin Yurtoglu, B. The impact of corporate governance on investment returns in developed and developing countries. *Econ. J.* **2003**, *113*, F511–F539. [CrossRef]
74. Klapper, L.F.; Love, I. Corporate governance, investor protection, and performance in emerging markets. *J. Corp. Financ.* **2004**, *10*, 703–728. [CrossRef]
75. Porta, R.L.; Lopez-de-Silanes, F.; Shleifer, A.; Vishny, R.W. Law and finance. *J. Political Econ.* **1998**, *106*, 1113–1155. [CrossRef]
76. Rajnović, L. Društveno odgovorno poslovanje u funkciji poboljšanja privrednog ambijenta u Republici Srbiji. *Ekon. Vidici* **2016**, *21*, 1–13.
77. Li, Z.; Huang, Z.; Su, Y. New media environment, environmental regulation and corporate green technology innovation: Evidence from China. *Energy Econ.* **2023**, *119*, 106545. [CrossRef]
78. Jing, Z.; Hossain, G.M.S.; Rahman, M.S.; Hasan, N. Does corporate reputation play a mediating role in the association between manufacturing companies' corporate social responsibility (CSR) and financial performance? *Green Financ.* **2023**, *5*, 240–264. [CrossRef]
79. Idowu, A.; Ohikhuare, O.M.; Chowdhury, M.A. Does industrialization trigger carbon emissions through energy consumption? Evidence from OPEC countries and high industrialised countries. *Quant. Financ. Econ.* **2023**, *7*, 165–186. [CrossRef]
80. Li, Z.; Zhu, J.; He, J. The effects of digital financial inclusion on innovation and entrepreneurship: A network perspective. *Electron. Res. Arch.* **2022**, *30*, 4697–4715. [CrossRef]
81. Owusu, A.; Weir, C. Agency costs, ownership structure and corporate governance mechanisms in Ghana. *Int. J. Account. Audit. Perform. Eval.* **2018**, *14*, 63–84. [CrossRef]
82. Hiebl, M.R. Finance managers in family firms: An upper-echelons view. *J. Fam. Bus. Manag.* **2017**, *7*, 207–220. [CrossRef]
83. Tabor, W.; Chrisman, J.J.; Madison, K.; Vardaman, J.M. Nonfamily members in family firms: A review and future research agenda. *Fam. Bus. Rev.* **2018**, *31*, 54–79. [CrossRef]