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Analysis of Sustainable Growth Rate in Manufacturing and Construction Firms: Evidence from Selected Western Balkan Countries

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Abstract

This research's primary goal is to examine the factors influencing organizations' sustainable growth rates (SGR) between 2013 and 2022. A panel regression analysis was done to extensively assess the variables linked with SGR. The study included data from 92 manufacturing and construction companies in selected Western Balkan countries, resulting in a dataset of 1,012 observations. According to the study, asset efficiency and sales growth have a positive and significant impact, while leverage negatively impacts the SGR. These results are important to companies because they provide useful insights that can help them achieve their planned SGR. Management can make informed decisions to improve business performance by better understanding the impact of factors such as asset efficiency, leverage ratio, and sales growth on SGR. This informed decision-making not only ensures a healthy growth path but also helps avoid major financial problems. The study underlines that the findings serve as a significant tool for business management in long-term planning and strategy formulation. By providing insight into the company's growth goals and prospects, this congruence also benefits numerous internal and external stakeholders. Additionally, it makes it possible to examine the company's overall business situation more precisely and helps forecast its long-term performance.

Keywords: Manufacturing firms, Construction firms, Fixed effect model, Sustainable growth rate, Western Balkans

JEL: F43; N60

1. Introduction

Within the fields of economics and finance, the concept of the sustainable growth rate is significant. It refers to the best rate at which a company's sales or earnings can increase while remaining independent of sources of external finance like loans. A company is more likely to encounter stagnation, lose its competitive edge, and

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possibly even face the terrible consequences of bankruptcy if its growth rate falls below the sustainable level. If a company's rate of growth exceeds its capability for long-term growth, it may suffer financial difficulties, a lack of liquidity, and insolvency. The rapid expansion of a corporation can be funded by a variety of internal and external sources. While external options may have to deal with increasing debt or recapitalization through the sale of new shares, internal alternatives may concentrate on enhancing production effectiveness, total asset turnover ratios, and all of its components.

An SGR is essential to fine-tune growth rates without increasing the company's debt burden or issuing additional shares that are believed to significantly impact the company's overall well-being. Businesses utilize SGR to assess their profitability. According to Higgins (1977) , sustainable growth is the most important platform or standard required for a corporation to raise its earnings while using less money. Factors include earnings retention rate and return on equity. When evaluating the financial performance of a manufacturing, and construction company, profit margin and firm efficiency can be combined with financial ratios such as capital structure and retention rate, resulting in a comprehensive assessment. Industry-specific performance indicators should be used to assess the SGR.

It is possible to identify the factors affecting a company's SGR to define these indicators and promote informed stakeholder decision-making. Previous researches (Radasanu, 2015; Hartono et al., 2016) have identified four main elements that affect SGR: Profitability Ratio, Asset Turnover Rate, Financial Policy, and Dividend Policy. Accurate performance metrics can be established to help consumers, management, and stakeholders make optimal decisions for the company by identifying the components that influence a company's SGR.

Some key data indicators allow us to study the manufacturing and construction sectors' sustainable growth rates. According to the Kosovo Statistics Agency, the production and construction industry is the country's economic engine for sustainable growth, contributing to the country's development. According to 2021 figures from the Statistical Business Center, the manufacturing and construction sectors account for 21.27% of all companies, 27.95% of all workers, and 23.10% of the total turnover structure of economic sectors. These numbers demonstrate that, although receiving little attention, the manufacturing and construction industries are critical to a country's economy, and that working capital management and company profitability are especially crucial in these areas. According to the Institute of Statistics of Albania, manufacturing and construction enterprises will account for 12.24% of all active companies in Albania in 2021, with a total employee count of 29.76%. The State Statistical Office of North Macedonia's data on the region's businesses shows that manufacturing and construction companies make up 20.10% of all firms in the area (stat.gov.mk),. Additionally, these industries account for 26.71% of the overall workforce, which is employment.

This article aims to assess the sustainable growth levels within the manufacturing and construction sectors across selected Western Balkan countries. Alongside insights garnered from various global authors, the article elucidates the approach to calculating the sustainable growth rate from a theoretical perspective pertinent to the research subject. The structure of the paper unfolds as follows: Beginning with an introduction

to the research matter in the initial section, the subsequent section delves into the influence of financial performance on the sustainable growth rate of small and medium enterprises (SMEs) in chosen Western Balkan countries. This section also encompasses a literature review that underscores pivotal research. The third section expounds on the data collection techniques and analytical methods employed in the study. The impact of financial performance on the sustainable growth rate of SMEs operating in these three nations is thoroughly investigated in the fourth section of the article, which focuses on empirical data. The fifth section goes into greater detail on the conclusions and their economic importance, as well as how the initial ideas were evaluated. The sixth section, Conclusion, summarizes the study's goals, goes into further detail about its findings and contributions to the field of science, offers applications, and makes suggestions.

2. Literature Review

The concept of SGR has its reference to Babcock (1970), who provided a simple explanation of the behavior of various elements of SGR. This concept was later developed by Higgins (1977), who emphasized the increase in unfavorable financial circumstances if there was unlimited growth in a firm. According to him, a company's SGR represents the maximum rate at which it can increase its revenue without depleting its financial resources in a given business environment. Given that it integrates the operating (profit margin and asset efficiency) and financial (capital structure and retention ratio) aspects of a company into one indicator, it is viewed as being valuable. Higgins' study of sustainable growth was further elaborated by Johnson (1981) by classifying the behavior of assets and liabilities in an inflationary environment. Platt et al. (1995) extended Higgins' study of the sustainable growth rate for firms in financial distress and developed a formula that describes how much growth can be achieved if firms do not borrow from the market to maintain a target capital structure. Under these circumstances, they propose to estimate the sustainable growth rate simply as the product of profit margin and return on assets. Ashta (2008) modified the SGR model of Higgins somewhat but still supported it. According to the study, SGR must be evaluated using the same leverage ratio. Dividing total assets (opening) by equity is the only way to calculate SGR (opening). Contrarily, concentrating on the mathematical component of the model, an adjustment must be made in the above alteration specifically by modifying the ratio of total asset turnover as sales divided by total asset opening, not by total assets ending as was anticipated by Higgins (1977). The sale of an asset becomes more natural as it is devoured by the opening of a current asset, and a new inducement of an asset yields profit in the form of future gains, it was also discovered. The growth rate will stabilize with the utilization of sales, regardless of the ratio of financial leverage and asset openness in asset turnover (Rosenberg, 2004; Ryabova and Samodelkina, 2018; Steblyanskaya et al., 2019; Ponce et al., 2021).

The study examined how six different variables—profitability, liquidity, asset efficiency, leverage, company size, and sales growth—as well as a control variable—financial distress—affect the sustained growth rate of businesses operating in selected Western Balkan countries. With a focus on factors including, profitability, liquidity, asset efficiency, leverage, size, and

sales growth indicators, the development of this sustainable growth rate model aimed to improve the performance of these Western Balkan countries' companies.

The effect of profitability on SGR has been examined by several authors. Lim and Rokhim (2021) found that profitability measured by return on assets, return on equity, and earnings per share are strongly and favorably correlated with SGR, except for profits per share. As a result, businesses with greater success would have higher SGR. Multiple research studies have highlighted a notable and positive correlation between the elements of SGR and ROE. This correlation has been substantiated by various authors such as Hafid (2016); Rahim (2017); Mukherjee and Sen (2018). Additionally, several other investigations, including those by Memon et al. (2011); Mamila (2019); and Mumu et al. (2019) have undertaken an examination of the influence of liquidity on SGR. These works collectively indicate that a higher liquidity ratio contributes to elevated sustainable growth rates. Importantly, the connection between liquidity and SGR holds statistical significance, as affirmed by the outcomes derived from these researchers.

The following hypothesis was put forward in light of all the offered empirical research:

Hypothesis 1 (H_1). The profitability has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.

A basic idea necessary for the existence, steady growth, and further development of a company is optimal liquidity. It shows how successful management has been in preventing a failure of immediate corporate responsibility. The current liquidity ratio measures how quickly current assets can be used to pay short-term obligations (Vukoviç et al., 2018). The relationship between improved liquidity and higher sustainable growth rates has been statistically demonstrated in studies by Memon et al. (2011); Mamila (2019); and Mumu et al. (2019). Regarding the positive or negative relationship of liquidity in SGR, different authors have come to different conclusions. Thus, Mukherjee and Sen (2018), in their analysis, found a positive relationship between liquidity and SGR, while Amouzech et al. (2011) in examining the sustainable growth rate and results of 162 companies registered on the Tehran Stock Exchange from 2006 to 2009, and Madbouly (2022) by examining the firm value and sustainable growth rate of 43 Egyptian listed companies between 2015 and 2019, found the opposite. Similar conclusions were drawn in another study that examined the financial data of 69 manufacturing companies listed on the Borsa Istanbul to determine the essential elements of the sustainable growth rate. No statistically significant relationship was found between the deviation of the actual growth rate from the sustainable growth rate and the current ratio in this study (Sahin and Ergun, 2018).

Considering all the previous theoretical and empirical research, we posed the following research hypotheses:

Hypothesis 2 (H_2). Liquidity has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.

The owners of the company expect that the company is capable of ensuring sustainable development and increasing the asset volume in the process of business running (Vukoviç et al., 2018). In order to achieve strategic goals and successfully manage funding

sources to support continued growth, good asset management is essential. An important component in evaluating a company's ability to sustain growth is operational capacity, which assesses how well a company uses its resources. The flow of resources is accelerated by improving fund use efficiency, ensuring the availability of crucial financial resources to support the company's capacity for sustained growth. Asset efficiency and SGR relations are studied by Rahim (2017); Subbaredy and Reddy (2017); and Mukherjee and Sen (2018). The authors concluded that the most efficient asset management has a positive effect on SGR. Apart from this, by analyzing the SGR of privately held retail enterprises based on the growth cycle stages, Phillips et al. (2010) discover evidence of a high association between sales growth and SGR. The relationship between trade credit finance and sustainable growth at the business level is examined by Huang et al. (2019). They discovered that trade credit financing had a considerable and positive impact on a firm's total capacity for sustainable growth, particularly for those with stronger internal control systems.

After taking into account all of the research that has been presented, the following hypotheses were set:

Hypothesis 3 (H_3). The asset efficiency of manufacturing and construction firms has a statistically significant positive effect on their sustainable growth rate.

Regarding leverage ratio and SGR association, some studies have discovered that debt leverage significantly increases the firm's SGR (Rahim, 2017; Pratama 2019; Mumu et al., 2019). The debt leverage has a favorable impact on the growth of the firm since it causes the SGR of the company to climb when financial leverage rises and to fall as it falls (Almaqtari et al., 2019). The company's financial leverage rises as the debt ratio does as well. As a result, more resources will be made available, which in turn will boost the company's pace of sustainable growth. According to other studies, financial leverage has little effect on SGR (Raza and Farooq 2017; Warrad and Nassar 2017). Vintila and Duca (2012), on the other hand, concentrated on the effect of financial leverage on ROE and concluded that an increase in financial leverage increased a firm's profitability as measured by ROE. Additionally, Mukherjee and Sen (2018) attested that the faster the company's sustainable growth rate, the bigger the leverage. Vukoviç et al. (2018) came to similar conclusions in their study, which found a statistically significant positive relationship between leverage and sustainable growth. Only if companies can achieve a higher return on their total capital than the cost of accessing these external sources of capital can leverage, i.e. raising additional funds from external sources, contribute to long-term profitability. We have developed the following study hypothesis, which takes into account the entirety of previous theoretical research and actual investigations.

Hypothesis 4 (H_4). The leverage has a statistically significant negative impact on the sustainable growth rate of manufacturing and construction companies.

To maximize their profitability, businesses should aim to grow to the right size beyond which additional expansion would be counterproductive. Company size has a big impact on things like presence in the market, adaptability to changes in the market, and investor appeal. Larger businesses often enjoy better access to financial markets,

higher rates of return on capital invested, and greater access to economies of scale, all of which improve the prospects for long-term success. Considering how company size affects SGR from a broad perspective, researchers Rahim (2017); Xu and Wang (2018); Wang et al. (2019) discovered a strong and positive association between the SGR and the size of the company, but Mamila (2019); Huang et al. (2019); and Madbouly (2022) reported opposite results regarding the effect of companies' size on SGR. They discovered that firm size is highly detrimental and hypothesized that the larger the value, the less likely it is for a corporation to experience sustained growth. Conversely, an alternate perspective is presented by (Pouraghajan et al., 2012), who identified a substantial and direct correlation between a firm's growth potential and factors such as return on equity, the proportion of tangible assets to equity, company size, and total assets turnover.

After reviewing all prior studies, we established the following research hypotheses:

Hypothesis 5 (H_5). The sustainable growth rate of manufacturing and construction companies is significantly and positively affected by the size of the company.

The idea of SGR focuses on whether a company's strategic goal can be supported by its current resources. Managers and investors can learn a lot by comparing SGR to sales growth, which helps them understand the likelihood of future cash flow issues. Investors and managers should carefully analyze the impact of internal resources (sales growth) in creating a safe base for sustainable growth by rigorously examining performance by examining the SGR when they consider investing in a certain sector of the economy. The significance of sales growth has been examined in numerous earlier research. In this function, there are studies that support the hypothesis that sales growth has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies (Kijewska. 2016), which says that if sales growth exceeds the necessary financial resources to maintain its SGR, the company does not need to seek additional financing either through retained earnings or through the issuance of new shares or borrowing. On the other hand, this result is contrary to the results of Mumu et al. (2019); Pratama (2019) and Rahim (2017), who found in their works a negative relationship between SGR and sales growth.

The following hypothesis has been developed by us based on the knowledge gained from the aforementioned research:

Hypothesis 6 (H_6). Sales growth has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.

We included financial distress as a control variable because our research was limited to manufacturing and construction companies in certain Western Balkan countries, where financial difficulties are more frequent than in other European countries. This control factor is incorporated into the model to improve its replicability and the validity of the study.

3. Research Methodology and Model Specification

The definitions of dependent and independent variables are given in Section 3. The study includes a sizeable dataset, which consists of 92 manufacturing and construction companies, with a total of 1,012 observations ranging from 2013 to 2022. The sample size calculation algorithm created by Yamane

(1967) was used to establish the sample size for this study. This sample includes large, medium, and small businesses, as well as a variety of active private manufacturing and construction companies.

Table 1. Overview of the number of companies per country

Country	Companies
Kosovo	42
Albania	24
North Macedonia	26
Total	92

Source: author's illustration.

The audited financial statements are employed as secondary data sources for the study. Since the sample consists of data from several companies, repeating in different periods, panel regression analysis was implemented.

SGR is an important measure that organizations use in evaluating long-term performance and planning for sustainable growth without relying on external financing. SGR can be determined in two ways: The Higgins technique, which is based on the assumptions of cash flow and smooth growth, and the Van Horn approach, which takes into account operational reasons, borrowing, and dividend payments. Given the level of development of the companies in our sample, we have based the Higgins strategy which assumes that the business will no longer issue its capital and will instead spend part of the retained earnings and loans on assets. The company's profit ultimately increases from these assets, which also helps increase sales. The discrete change framework is the only one for which the Higgins (1977) model may be employed. The Higgins model was used to determine the effect of independent factors on SGR. Using multiple regression analysis and SPSS, we gathered and examined the variables.

- We applied descriptive statistics to describe the variables, including measurements such as the minimum, maximum, mean, and standard deviation values of the independent and dependent variables.
- The strength of the correlations between the dependent and independent variables was assessed using the Pearson correlation test. This test is useful for evaluating the degree of linear association between two variables.
- The variance inflation factor (VIF) was used to test for multicollinearity among the independent variables. The VIF checks whether there is a high correlation between independent variables, which can impair the reliability of regression results. A linear regression analysis was performed to analyze the important components that contribute the most to evaluating sustainable growth rate analysis. This analysis aids in determining the relative significance of each independent variable in explaining variance in the dependent variable.
- We employed a robust fixed effect model to account for potential biases and alter the model's standard errors. The observed variability is incorporated into the model residuals, which are the discrepancies between the actual results and the outcomes predicted by the statistical model.

The study examined the effects of six independent variables — profitability, liquidity, asset efficiency, leverage, firm size, and sales growth, and a controlling factor — financial distress - on the sustainable growth rate in

Table 2. Overview of the different types, names, and formulations of variables

Variables	Symbols	Measurement
Sustainable growth rate	SGR	Return on equity subtracting the rate of earnings retention
Profitability	ROA	Net Profit / Total Assets
Liquidity	LIQ	Current Assets / Current Liabilities
Asset Efficiency	STA	Sales / Total Assets
Leverage	LEV	Total Debt / Total Assets
Firm Size	SZ	Natural logarithm of Total Assets
Sales growth	SGr	(Sales $_t$ – Sales $_{t-1}$) / Sales $_{t-1}$
Financial Distress	FD	Altman Z Score[1]

manufacturing and construction companies in selected Western Balkan countries.

The model may be expressed using the following equation based on the variables mentioned above.

$$SGR_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 LIQ_{it} + \beta_3 STA_{it} + \beta_4 LEV_{it} + \beta_5 SZ_{it} + \beta_6 SGr_{it} + \beta_7 FD_{it} + \varepsilon_{it} \quad (1)$$

Table 4 mainly relies on the studies of Alayemi and Akintoye (2015); Hartono and Utami (2016); Rahim et al. (2017); Mamilla et al. (2019); Mumu et al. (2019), to show the above variables in detail.

4. Empirical results

4.1. Descriptive statistics

Table 3 provides descriptive statistics and a normal assessment of the characteristics of manufacturing and construction firms in selected Western Balkan countries from 2013 to 2022. The mean, standard deviation, minimum, and maximum values for variables such as the Higgins sustainable growth rate, Profitability, Liquidity, Asset efficiency, Leverage, Firm size, Sales growth, and Financial distress are presented. Based on descriptive statistics, the businesses had an average SGR of -0.102, showing that enterprises in the sample are impoverished on average and do not successfully manage growth and advancement policies. The sample contains severe conditions, as indicated by the minimum value of -8.735 and the maximum value of 0.250. These two variables show that some companies are far from attaining sustainable growth rates through retained earnings. Regarding profitability (ROA) and liquidity (LIQ) the mean is 0.092, and 1.280 respectively. Considering asset efficiency (STA) and Leverage (LEV), average values are 1.001 and 0.486, respectively, and minimum and maximum values are 0.570 and 5.330, and 0.018 and 0.993 respectively. The standard deviations for SZ and SGr were 1.159 and 0.394, respectively. The last variable, FD has an average value of 1.351. Depending on several variables, including industry benchmarks, corporate objectives, and particular settings, one can judge whether the figures in Table 3 are good or

[1] Altman Z-Score is calculated by; Z = 0.012 X1a + 0.014 X2a + 0.033 X3a + 0.006 X4a + 0.999 X5a; where, X1a= Working Capital/ Total Assets, X2a = Retained earnings/ Total Assets, X3a= Earnings Before Interest and Tax/ Total Assets, X4a = Market Value of Equity/ Book Value of Total Debts, X5a = Sales/ Total Assets, Z = Overall Index

Table 3. Descriptive Statistics

Variable	Obs.	Minimum	Maximum	Mean	Std. Deviation
SGR	1,012	-8.735	0.250	-0.102	0.810
ROA	1,012	-0.437	1.672	0.092	0.176
LIQ	1,012	0.092	14.619	1.280	1.391
STA	1,012	0.570	5.331	1.001	0.765
LEV	1,012	0.018	0.993	0.486	0.254
SZ	1,012	6.928	12.241	9.766	1.159
SGr	1,012	-0.727	6.312	0.112	0.394
FD	1,012	0.147	28.254	1.351	1.536

Source: Author calculations

poor. Labeling the data as good or negative is challenging without additional context and comparison to pertinent criteria. Based on these numbers, it would be necessary to do more analysis and comparison to assess the performance of manufacturing and construction firms operating in selected Western Balkan countries.

4.2. Pearson's Correlation analysis

The absence of multicollinearity is confirmed in Table 4 on the variation impact factors (VIF). In theory, multicollinearity refers to a scenario in which two or more explanatory variables are highly linearly correlated in a multiple regression model. Perfect multicollinearity exists when, as in the equation above, the correlation between two independent variables is equal to 1 or 1. As expected, all correlations between the independent variables are less than 1.00. As a result, there appear to be suspicious instances of multicollinearity influencing the research variables. A VIF score greater than 1.5 suggests multicollinearity. Even if we (Assfaw, 2020; Vukoviç et al. 2022) accept a VIF greater than 5, the predictor variable's variance inflation factor (VIF) should not be bigger than 5. In our case, the reciprocal of the VIF is greater than 0.20. These graphs demonstrated a lack of multicollinearity.

Table 4. Results of variation impact factors (VIF) for the variables

Variable	VIF	1/VIF
Profitability	2.073	0.482
Liquidity	1.170	0.855
Asset efficiency	1.698	0.589
Leverage	1.163	0.859
Size	1.135	0.881
Sales growth	1.904	0.840
Financial distress	1.450	0.690

The Pearson's correlation results in Table 5 reveal that the SGR connection with all variables and all p-value correlations are reasonably low. Pearson correlation is used to assess the strength of a two-variable linear connection. In other words, Table 5 displays the findings of the correlation analysis, which is based on the relationship between the dependent and independent variables. At the 1% level, the correlation coefficients show a negative and statistically significant relationship between the sustainable growth rate (SGR) and some of the model's drivers such as ROA (-0.137), LEV (-0.339), and FD

Table 5. Correlation analysis of SGR with all variables

Variable	SGR	ROA	LIQ	STA	LEV	SZ	SGr	FD
SGR	1							
ROA	-0.137**	1						
LIQ	0.031	-0.126**	1					
STA	0.021	0.202**	-0.151**	1				
LEV	-0.339**	0.021	-.288**	0.073	1			
SZ	0.024	-0.135**	-0.009	-0.189**	-0.021	1		
SGr	-0.013	0.617**	-0.056	-0.073	-0.026	-0.083	1	
FD	-0.161**	0.295**	-0.000	0.473**	-0.042	-0.157**	-0.036	1

Notes: **p < 0.01; *p < 0.05;

Source: Own compilation

(-0.161). Profitability (ROA) has a negative relationship with LIQ (-0.126), and SZ (-0.135), but a positive relationship with STA (0.202), SGr (0.617), and FD (0.295). At the 1% level, liquidity (LIQ) exhibits a negative relationship with STA (-0.151) and LEV (-0.288). At the 1% level, Asset Efficiency (STA) has a negative relationship with SZ (-0.189), but a positive relationship with FD (0.473). Leverage (LEV) does not have any association with other variables, such as sales growth (SGr). Firm size (SZ) has a negative correlation with FD (-0.157) at the 1% level.

4.3. Regression analysis

Before deciding which model is best for calculating the influence of independent variables on the dependent variable, two models are presented: FE, and RE, both of which can be found in most similar research. The results of different model specification tests, such as the Hausman and Breusch-Pagan tests, determine which model has the best estimate capability. Table 6 summarizes the findings of the three techniques.

The Hausman test was used in the panel regression analysis to determine whether the fixed effects model or the random effects model was acceptable. The result shows that the Prob (Chi^2) of the test is greater than 0.05 (0.525), indicating that random effect is a more suitable method for evaluating the study model. The Breusch-Pagan test yields the same results (the value of Prob (Chi2) is 0.897, which is larger than 5%. In the next step of the analysis, the F test for random specification was used to determine the presence of individual and time effects. The test model includes a random specification, including the presence of time and the individual effect, according to the p-value = 0.000. So, considering these results and based on the findings of Arora et al. (2018) and Listiani and Supramono (2020 the random effects model is the most appropriate model for the analysis of our results.

An alternate model specification with consistent standard errors is used to examine the effect of independent variables on SGR. The changed model is shown in the following table.

The regression model with HAC random effects is shown in Table 7. It produces an R Square within a score of 0.531, indicating that the model's independent variables explained 53.10% of the variation in the dependent

Table 6. Summary results of econometric models - Dependent Variable: SGR

Variable	Model 1 (FE)			Model 2 (RE)		
	β (Std)	T	Sig.	β (Std)	t	Sig.
(Constant)	0.425	1.154	0.249	0.466	1.300	0.193
ROA	-0.680	-2.318	0.020**	-0.693	-2.401	0.016**
LIQ	-0.026	-0.936	0.349	-0.030	-1.111	0.266
STA	0.195	3.463	0.000***	0.192	3.461	0.001***
LEV	-1.179	-7.745	0.000***	-1.185	-7.944	0.000***
SZ	0.008	0.254	0.799	0.005	0.169	0.865
SGr	0.152	1.265	0.206	0.152	1.268	0.204
FD	-0.113	-4.031	0.000***	-0.112	-4.041	0.000***
R^2			0.182			0.189
Adjusted R			0.170			0.179
F-Test (8, 429) (Time effect)			13.819 (0.000)			13.403 (0.000)
F-Test (2, 430) (Individual effect)			11.767 0.000			
Durbin - Watson			1.453			1.466
Breusch-Pagan test			-			0.016 0.897
Hausman Test			-			1.287 0.525

Notes: ***p < 0.01; **p < 0.05;

Source: Own compilation

Table 7. Robust (HAC) Random Effects Model Results

Variable	Coefficient	Std. error	t	Sig.
(Constant)	0.466	0.811	0.575	0.565
ROA	-0.693	0.791	-0.875	0.381
LIQ	-0.030	0.039	-0.780	0.434
STA	0.192	0.042	4.505	0.000***
LEV	-1.185	0.201	-5.870	0.000***
SIZE	0.005	0.098	0.055	0.955
SGr	0.152	0.028	5.309	0.000***
FD	-0.112	0.024	-4.588	0.000***
F (7,2) = 12.220 Prob>F = 0.000 R^2 within = 0.531; overall = 0.418				

Source: author's calculation.

variable. The study's independent factors explain 46.9% of the variation in the dependent variable. Table 7 further demonstrates that SGR and independent factors have an influence, as evidenced by an F-value of 12.220 and a result with a significant value of 0.000 at 1%. This highlights how SGR can help boost the company's capacity to create corporate profits in manufacturing and construction enterprises in selected Western Balkan countries.

5. Discussions

Looking at the individual variables, the variable Profitability (ROA) has a statistically negative impact on the SGR. The regression coefficient of -0.680 indicates that a one-unit increase in ROA leads to a decrease of 0.680 units in the SGR. This relationship is not significant at any level of significance as indicated by the p-value (0.488), and the t-ratio of - 0.841 reinforces the importance of this relationship. Therefore, based on the findings provided by the model, there is no support to prove the hypothesis (H_1) that ROA has a statistically significant positive impact on SGR for manufacturing and construction companies. This is supported by research conducted by Susanto and Josua (2013), and Nugroho (2020) , which concluded that profitability reports have a negative effect on sustainable growth rate. This implies that highly profitable corporations may face reduced long-term growth rates, possibly as a result of variables such as cautious financial practices or restricted investment prospects in the industry. On the other hand, it is found according to Amouzesh (2011), and Hartono and Utami (2016), that profitability has a positive regression coefficient and the results do not significantly influence the sustainable growth rate.

Regarding the impact of liquidity (LIQ) on the SGR, the study shows that LIQ has a negative impact on SGR, but this relationship is not statistically significant. The regression coefficient of -0.026 suggests that a one-unit decrease in liquidity leads to a 0.026-unit increase in SGR. However, the p-value of 0.581 and the t-ratio of -0.651 indicate that this relationship may be the result of chance. Based on these findings, there is insufficient support to prove the hypothesis (H_2) that liquidity has a statistically significant positive impact on SGR for manufacturing and construction companies. This finding aligns with the studies conducted by Amouzesh et al. (2011), which propose that current liquidity does not have an impact on the SGR. However, it contradicts the findings of (Hartono and Utami, 2016; Rahim, 2017; Pratama, 2022). Such a finding goes beyond the general economic rule according to which the higher the liquidity, the greater the possibilities for sustainable growth. The reason may lie in the purchase and sale with a payment term, which according to the accrual principle of accounting, is recognized as a current asset as well as a current liability, but that, on the other hand, businesses may have limited ability to pay due to the non-collection of accounts receivable, which may affect the level of creating sustainable growth for manufacturing and construction businesses. Also, a negative association between liquidity and SGR may be discovered by a firm that is overly concerned with maintaining high levels of liquidity and may miss out on investment opportunities, resulting in a lower SGR. Allocating a large number of current assets to short-term investments may limit the company's ability to utilize these resources for growth-generating operations.

The variable STA, which represents asset efficiency, exhibits a statistically significant influence on the SGR at the 5% significance level. With a regression coefficient of 0.195, the result indicates that a rise of one unit in asset efficiency corresponds to a 0.195-unit increase in the SGR. Also, the p-value of 0.027 and the t-ratio of 5.944 indicate that this relationship is significant. In terms of asset management efficiency, the findings reveal that asset efficiency has a positive and statistically negligible impact on the sustainable growth rate, requiring hypothesis H3 to be approved. Companies that maximize asset usage can improve financial performance, market value growth, and long-term development. Our result supports the research by Nuswandari (2009), Rahim (2017), and Platt et al. (1995) but does not support the research by Wirajaya (2013), Vukoviç (2022), Alayemi and Akintoye (2015).

The study reveals that the LEV variable, which represents the leverage factor, has a statistically significant negative impact on SGR. The regression coefficient of -1.179 suggests that a one-unit increase in the equity ratio leads to a 1.179-unit decrease in SGR. The association is significant at the 5% level, as indicated by the low p-value of 0.023 and the t-ratio of -6.376. Based on the information provided, the analysis supports the hypothesis (H4) that leverage has a statistically significant negative impact on the sustainable growth rate of manufacturing and construction companies. This result supports the research by Efendi and Wibowo (2017), but it does not support the research by Mardiyati et al. (2012); Haryanto (2014); Utami et al. (2018); Arzu (2018) saying that LEV has no significant effect on the SGR.

The effect of firm size, as measured by the natural logarithm of total assets, has a positive but not statistically significant (coefficient 0.008) impact on the rate of sustainable growth (p-value of 0.943). As a result, Hypothesis H5 is refuted. The fact that the size of the firm does not have any significant impact on sustainable growth shows that the manufacturing and construction companies operating in selected Western Balkan countries have not yet reached the level that creates opportunities to gain an advantage over the competition, which can lead to continuous growth. They also do not have many operational resources available to ensure a sustainable business. With an insignificant amount of financial and managerial resources, they cannot easily expand into foreign markets, where they have access to new resources and opportunities compared to the domestic market. Considering other authors, our results also fit with the results of Mumu et al. (2019), and Seen (2022) but not with the results of Memon et al. (2011), Mukherjee, and Sen (2015).

The study finds that the variable SGr, which measures a company's sales growth, had a statistically significant positive impact on the sustainable growth rate (SGR). A one-unit increase in sales growth corresponds to a 0.152-unit rise in SGR, according to the regression coefficient. The p-value of 0.046 and the t-ratio of 4.463, indicate that the relationship between sales growth and the SGR is statistically significant at the 5% level. According to our study, there is evidence to support the hypothesis that sales growth has a statistically positive significant impact on the sustainable growth rate of manufacturing and construction companies. This result is consistent with (Kijewska. 2016), which states that if sales growth exceeds the financial resources needed to maintain its SGR, the company does not need to seek additional financing either through retained

earnings (internal financing) or through issuing new shares or borrowing (external financing), but is not in line with Nugroho (2020). On the other hand, this result is opposite to the results of Mumu et al. (2019), Pratama (2019), and Rahim (2017).

In terms of control variables, Table 7 shows that variable financial distress (FD) has a statistically significant negative impact on the SGR. This link is significant at the 5% level, as evidenced by the p-value of 0.047 and the t-ratio of -4.428. The low p-value means that the observed association between financial difficulty and SGR is unlikely to be attributable to chance, and the t-ratio reflects the strength and importance of the relationship. As a result of the information and analysis provided, it is possible to conclude that there is evidence to support the claim that financial distress has a statistically significant negative influence on the sustainable growth rate of manufacturing and construction companies.

A summary of the set hypotheses, along with the choice regarding their acceptance or rejection, can be seen in Table 8.

6. Conclusions

The primary goal of this research was to examine the sustainable growth of manufacturing and construction firms operating in selected Western Balkan countries. This study adds to the current body of literature by focusing on a key topic that has attracted little attention, particularly in the context of these countries' marketplaces, which are considered to be rising and emergent. Using panel data, the Fixed effects (FE) model was chosen as the best strategy for analyzing the influence of the sustainable growth rate.

Table 8. Hypothesis consideration

Hypothesis	Statement	Hypothesis impact	Results Impact	Impact decision
H_1	Profitability has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.	Positive	Negative	Not accepted
H_2	Liquidity has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.	Positive	Negative	Not accepted
H_3	The asset efficiency of manufacturing and construction firms has a statistically significant positive effect on their sustainable growth rate.	Positive	Positive	Accepted at a 5% level of significance
H_4	The leverage has a statistically significant negative impact on the sustainable growth rate of manufacturing and construction companies.	Negative	Negative	Accepted at a 5% level of significance
H_5	The sustainable growth rate of manufacturing and construction companies is significantly and positively affected by the size of the company	Positive	Positive	Not any level of significance
H_6	Sales growth has a statistically significant positive impact on the sustainable growth rate of manufacturing and construction companies.	Positive	Positive	Accepted at a 5% level of significance

Source: author's calculation

The empirical data show that the SGR has a notable and statistically significant positive relationship with both asset efficiency and sales growth. This implies that organizations with higher levels of asset efficiency and sales growth have a better rate of sustainable growth. Furthermore, the SGR has a statistically significant inverse relationship with variables such as leverage. In essence, organizations with lower levels of leverage have a higher rate of sustainable growth.

The study's findings underscore the need for manufacturing and construction firms in certain Western Balkan countries to adopt efficient management practices in order to achieve sustainable growth. This is essential for these countries' general economic health as well as for the success of individual firms. Adopting such approaches can result in more jobs being available, more tax money being collected, and a stronger economy on a national scale.

Additionally, the influence is felt on a global scale. These countries can draw in foreign investment and improve their competitiveness in the global economy by guaranteeing that the manufacturing and construction sectors continue to grow sustainably. By compiling a thorough database of businesses ranked according to their rate of sustainable development, the proactive step that has been suggested may draw in foreign investors and spark business alliances and partnerships. Through fostering cross-border investments and economic stability, this international engagement can aid in the region's integration into the global economy. Additionally, the study recommends that researchers extend their investigations by applying similar models to analogous markets, utilizing either the same statistical techniques or alternative methodologies. By comparing results across various market contexts, researchers can uncover nuanced differences and better understand the relationships between sustainable growth and its determinants.

Future research should consider expanding its analyses to include a broader range of financial and non-financial factors. In addition, increasing the sample of organizations involved in the study could improve the robustness and reliability of the results. Including macroeconomic aspects would improve the research and make it more complete, insightful, and helpful to all stakeholders.

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