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Fisnik Morina[1]
Duresa Kilaj[2]
Aulonë Cenaj[3]

DYNAMIC CORRELATION AND CAUSALITY BETWEEN INVESTMENTS AND SALES REVENUES: AN ECONOMETRIC ANALYSIS OF MANUFACTURING ENTERPRISES IN KOSOVO[4]

Purpose: This research aims to analyze the correlation and causality between investments and sales revenues through an econometric analysis of manufacturing enterprises in Kosovo. Since investments are essential for enterprises, studying their impact and sales revenues on manufacturing enterprises is crucial.
Methodology: Empirical data to be used in the research is secondary and will be based on the annual reports of the Minister of Finance. This paper will also refer to many studies by different authors that have analyzed the relationship between investments and sales revenues. The years that will be analyzed in this research are 2018-2019.
Expected results: Through the analysis of this research conducted between investments and sales revenues and other variables, we expect to get some positive results which can tell us that the investments made by a company will positively affect sales income in manufacturing enterprises.
Practical implications: Through the analysis made between these variables, different manufacturing companies in Kosovo can see the effect that investments have on sales revenues and other variables, i.e., the correlation between them. The results of this study will also serve as good scientific and empirical evidence for future studies to be conducted in investments or economics.
Originality: This scientific paper presents actual and consistent results about the relevant conclusions. The analyzed period (2018-2019) is a convincing period for drawing competent conclusions and recommendations.
Keywords: investments; sales revenues; capital; firm size; manufacturing enterprises
JEL: E22; H32; L11; L22

[1] *Prof. Ass. Dr. Fisnik, Morina, Vice – Dean and Professor at Faculty of Business, University "Haxhi Zeka" – Peja, Kosovo, Post – Doc Research in Financial Institutions and Risk Management at the University of Malta. email: fisnik.morina@unhz.eu.*
[2] *MSc. Duresa, Kilaj (corresponding author), Faculty of Business, University "Haxhi Zeka", Peja, Kosovo, email: duresa.kilaj@student.unhz.eu.*
[3] *MSc. Aulonë Cenaj, (coauthor), Faculty of Business, University "Haxhi Zeka" – Peja, Kosovo, email: aulona.cenaj@stuent.unhz.eu.*
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1. Introduction

An investment is the actual commitment of money or other resources to achieve future benefits. For example, an individual may buy securities by predicting that future income from investing in securities will justify the time his money is invested and the investment risk (Bodie et al., 2018). Based on economic science, today, investments are one of the main factors contributing to the development of the economy in both developed and developing countries. The manufacturing industry is the driver of its growth.

Given that this paper deals with the correlation and causality between investments and sales revenues to manufacturing enterprises in Kosovo, the panel data from a sample of 40 manufacturing enterprises will be applied during the period 2018 – 2019. Initially, we construct an econometric model where sales revenues are taken as the dependent variable. The independent variables are investments, capital, firm size, short-term liabilities, long-term liabilities, retained earnings, cash flow from operating activities and cash flow from financial activities. The STATA software program was applied to analyze the data included in this econometric model. Statistical tests were performed, including linear regression, random effect, fixed effect, Hausman – Taylor Regression, and Generalized Estimating Equations (GEE Model).

The structure of this paper will consist of several parts. The first part will include an overview of the investment and its impact on the various elements of a firm. The second part reviews the literature on investments and their impact on sales revenues, productivity, profitability, research and development, and a firm's technology. The third part describes the research methodology and the specification of the econometric model. The fourth part includes the econometric analysis and the study's findings, where all the results obtained through the STATA program will be explored. Finally, the last part of this research presents the discussions, conclusions and recommendations related to this research.

2. Literature Review

A study conducted in South Africa by author Olawale et al. investigated the impact that investment valuation techniques had on the profitability of small manufacturing firms. According to the study, the owners of small manufacturing firms do not use sophisticated investment appraisal techniques when evaluating their proposed projects. Multiple regression analysis was also used during the research to confirm the impact of investment valuation techniques on the profitability of small manufacturing firms. As a result, the study concluded that the use of non-sophisticated investment valuation techniques negatively impacts the profitability of small firms (Olawale et al., 2010).

The objective of the research conducted by Vaisanen et al. (2007) was to determine how investments in Intellectual Capital (IC) affect the productivity and profitability of a company. The study is based on a large set of information from the financial statements presented over three years. In addition, correlation and regression analyses are used to study relationships within the entire data set in different industries, including SMEs and large companies. The study findings suggest that the short-term impact of IC investments on productivity and

profitability turns out to be negative. However, the findings also support previous research evidence suggesting that investing in IC brings benefits, but they may come too late.

Johansson and Lööf (2008), in their study of Swedish manufacturing firms, found that the impact of physical capital (investment) on the profitability of an enterprise is significant and has a positive impact, and is also systematically greater than comparable estimates of labour productivity (Johansso & Loof, 2008).

Kapelko et al. (2015), analyzing research on the case of Spanish manufacturing firms, found that initially, capital investments produce a significant loss of productivity in the first year after the investment is made. However, productivity then improves, resulting in the model of a U-shaped relationship. The impact of investment growth on the firm's productivity remains a question mark for everyone. Investment growths that are expansionary or replacement investments are not expected to affect the firm's productivity in the long run. In contrast, reorganization investments are expected to improve the firm's productivity. Also, the short-term impacts of investment growth are expected to differ from the long-term impacts (Klenow, 1993; Power, 1998; Yorukoglu, 1998).

(Russell, 2011) analyzes the relationship between investment and productivity in US manufacturing industries and shows that time during investment growth is not associated with improved labour productivity. Instead, the impacts of various IT investments made within a firm improve production efficiency on product quality, production costs, profits and productivity. Therefore, IT investments should be claimed to impact productivity positively, and improvements in the quality of the product or service enabled by IT investments should also positively impact the firm (Matt and Jim, 2001).

(Baumann & Kritikos, 2016) examined the relationship between R&D investment, innovation and work productivity based on company size. Their research found that the link between companies' investment in Research and Development and labour productivity in small companies does not differ much from larger ones. Investments in fixed assets represent an essential factor that can serve as a good signal in predicting the future profit of the firm and the return of shares (Lev & Thiagarajan, 1993). However, assessing the impact of investments at the firm level has not always been a consistent research topic because, for many years, it was hampered by a lack of investment data. Only recently have researchers begun to analyze and document the nature of firm investment behaviour (Grazzi et al., 2016).

Sustainable development of manufacturing firms is closely related to the realization of capital investments, or investment projects, whether it is a replacement, modernization, expansion or any other type of investment. Furthermore, sustainable production depends mainly on selecting and implementing investment projects, as they must be selected and implemented based on an assessment of their environmental and social impact. This needs to happen in addition to the assessment of other associated risks – which may are systematized as investment, financial, organizational, technical, technological, technological, operational and informational risks (Shpak et al., 2018). Power (1998), in his study of US manufacturing firms, found no evidence of a robust positive relationship between productivity and tangible investment, which warns against the effectiveness of fiscal policy based on the premise that investment causes high productivity. The authors (Grabowski & Dennis, 1972) also cited that

poor quality investments and low productivity can result if managers maximize their profitability rather than firm profits.

According to the author's results (Govori, 2013), the factors that influence the growth and development of SMEs in Kosovo, including the realization of investments in these enterprises, are: access to finance, lack of capital market, competition, corruption and government policies. The portfolio of the banking sector in Kosovo for manufacturing enterprises reaches up to 25%, which means that the sectors that are very important for the economic development of the country (production, industry and agriculture) face financing difficulties for the realization of real and financial investments.

According to the author (Morina, 2016), investments in technology in manufacturing enterprises in Kosovo will positively affect their financial performance, increase their annual turnover and improve access to external financing for these enterprises through bank loans. Therefore, if investments in technology increase by 1% in production enterprises in Kosovo, then the annual turnover of these enterprises will increase by 0.145%. According to the author (Bajçinca, 2015), the main factors that influence the investments of enterprises in Kosovo are: the age of the firm, the size of the company, and access to bank loans, among others. According to this study, service enterprises in Kosovo decide more easily to invest, while manufacturing enterprises have more difficulties in this process, since they need higher amounts of funds to invest. Based on the study of the authors (Sahiti & Smith, 2017) we can emphasize that factors from the business environment have a very important role in the growth and development of Kosovar firms. The empirical evidence of this study shows that the business environment in Kosovo is characterized by low adaptability, high cost of capital and low volume of investments. In her study, the author (Latifaj, 2018) analyzed the impact of innovative activities on the performance of enterprises in Kosovo. According to the results of this study, we can conclude that investments in the field of innovation have positively influenced the performance of enterprises in Kosovo.

The authors (Morina, Komoni, & Selmonaj, 2022) in their study have analyzed the impact of the capital structure on the credit risk of manufacturing enterprises in Kosovo. According to the findings of this study, if the size of the firm increases by 1 unit, then the credit risk of manufacturing enterprises will decrease by 0.864 units. Such a result means that manufacturing companies in Kosovo have lower exposure to credit risk and these companies can get loans from commercial banks intended for investments, which will positively affect the increase in sales revenue and financial performance of these companies. In their study, the authors (Peci & Shabani, 2020) have found a positive correlation between the variables: age, firm size, business plan with financial performance and increased investment in small and medium enterprises in Kosovo. Firms that make higher investments and operate with more owners have a greater chance of obtaining bank loans. According to the authors' study (Ismajli & Shkodra, 2012) the factors that have caused the failure of businesses in Kosovo are: unfavourable business environment, lack of investments, lack of adequate economic policies, neglect of the compilation of the business plan, which helps in forecasting business risk, and lack of application of cash flow and commercial analysis. In their study, the authors (Shabani, Morina, & Berisha, 2021) have concluded that small and medium-sized enterprises in Kosovo are very liquid and these companies carefully manage their cash flow in order to

carry out their activities in the future, protect their investment and ensure an optimal capital structure.

3. Meta-Analysis of Scientific Research

This part of the paper will review a series of articles. Then, the meta-analysis of the research will be built based on works by different authors who have analyzed works similar to the topic that we have analyzed and will look at the findings taken from this research.

Table 1

Meta-analysis of the research

Author	Year	Variables	Methods	Findings
(Santoso, 2019)	2010-2017	Firm performance, firm value and financial performance.	Path analysis technique	The results of the data analysis show that investments in Indonesia's consumer sector have a positive impact on company performance and firm value.
(Hashmati & Loof, 2006)	1992-2000	Sales, R&D, investments, CF, capital structure, tangible investment stock etc.	CDM-mode	The results based on the SME sample showed evidence of different relationships between investment and performance variables where we see that we have a positive effect.
(Grozdic et al., 2020)	2004-2016	ROA, Capital investment, firm size, investment overdue capital, leverage, total turnover of assets.	OLS model	The relationship between capital investment and firm performance is positive because of the definition, nature and timing of capital investment – they may bring losses to the firm in the short term. However, they should enhance the firm's performance in the long run.
(Lee et al., 2016)	2011-2014	Firm purchases, industry, capital, workers, growth, firm size.	RBV method	The investment in wireless technology has contributed significantly to the growth of the business over the years. On the other hand, data centre technology investment affects business growth after two years, while collaboration is found paradoxically in 2 years.
(Kapelko et al., 2015)	2000-2010	Fixed assets, cost of employees, the cost of the material, investments, outputs.	Method of impulse responses by local Projection	The results of the impulse response analysis show that an increase in investment has a significant negative effect on dynamic productivity growth and dynamic technical change in the first year after growth.
(Kotsina & Hazak, 2012)	2001-2009	Investments and returns on assets (ROA).	Regression Analysis (OLS)	Based on the preliminary results obtained from the current phase of the study, no strong negative (or positive) impact of the companies' investment intensity on the future rate of return on assets has been identified yet, compared to some previous studies.

Author	Year	Variables	Methods	Findings
(Li, 2004)	1962-2002	Investments, ROA, sales growth, industry.	OLS regression	From the results, we see a positive relationship between these variables. However, this relationship worsens when firms have high free cash flow and low leverage, in line with building the empire of managing incentives.
(Jun, 2006)	1991-2001	Investments, debt ratio, the loan-deposit rate spread, the equity ration, reserve ratio, credit/deposit ratio	Panel cointegration testing and evaluation techniques	In the analysis of the group of banks based on IT investments, IT investments in both high and low IT banks have positive effects on improving profitability, but that in low IT banks show a slightly stronger impact on bank returns.
(Indjikian & Siegel, 2005)	2003	Increase total factor productivity, Investments in R&D and rate of investment in computers.	Multiple regression model	The empirical findings on IT and economic performance examined in this paper are pretty strong, in the sense that the vast majority of researchers have found a positive correlation between some approximations for IT investments and some approximations for economic performance at each level of aggregation (e.g., plant, firm, industry and country)
(Nguyen & Nguyen, 2020)	2014-2017	Firm size, liquidity, payment, financial leverage, financial sufficiency, ROA, ROE and ROS.	Multiple regression model	From the results obtained, the authors concluded that the firm's size has a positive impact on ROA but a slight impact on ROS and a negative impact on ROE. The adequacy ratio positively affects ROA and ROS but negatively affects ROE. Liquidity is an indicator with a positive impact on ROA and ROE, while financial leverage has a strong positive impact on ROA compared to a significant negative impact on others. Finally, solvency positively impacts ROA and ROS but has a negative impact on ROE.
(Babalola, 2013)	2000-2009	Firm size, profitability, total assets, total sales, financial leverage, liquidity.	Fixed effect method	According to the results, in terms of total assets and total sales, the firm's size positively impacts the profitability of Nigerian manufacturing companies. However, a negative correlation was found between the ratio of total liabilities to total assets and profitability regarding control variables. In addition, a high level of debt has a negative effect on profitability. This result may be due to the relatively high-interest rates in Niger.
(Mule et al., 2015)	2010-2014	Firm size, profitability and firm value.	Data panel	From the results obtained, the authors concluded that firm size is a significant positive predictor of profitability measured in terms of ROE.

Source: Data analyzed by the authors (2022).

Following the meta-analysis, we will provide some convincing arguments as to why the correlation and causality between investments and sales revenues have been studied in this scientific paper. In the context of all the studies that have been analyzed in the literature review and in the meta-analysis, one can notice that investments have influenced the financial performance, productivity and efficiency of these enterprises.

In their study, the authors (Capon, Farley, & Hoenig, 1990) concluded that the variables that positively affect the performance of companies in different sectors of the economy are: sales revenues, asset growth, capital structure, investments in research & development, quality of products and services, vertical integration and corporate social responsibility. Whereas, the variables that have had a negative impact are: capital investments, debt, diversification and export/import of the industry. In this study, an important significant relationship was found between investments, sales revenues and financial performance. Therefore, the authors have analyzed approximately 88 studies by other researchers that have found a significant positive relationship between sales revenue growth, investment and financial performance of companies. Considering the result obtained in these studies, we have been very interested in analyzing the correlation and causality between investments and sales revenues in manufacturing enterprises in Kosovo. Manufacturing enterprises make real long-term investments in machinery, equipment, information technology, and research and development, which allows them to generate sales revenues for many years by adding or improving production facilities and increasing operational efficiency. A business does not see an immediate increase in sales revenues when it makes investments in capital goods. Therefore, based on this fact, the focus of this study is the causality and dynamic correlation between investments and sales revenues.

According to the study, carried out by the authors (Doh & Prince, 2015), they concluded that investments in research & development in information technology corporations will generate more revenue from sales. So, through the increase of investments in these corporations, the value of these firms will also increase and it is expected that higher profits will be generated in the future.

The author (Stubelj, 2014) found in his study that investment determines profits in a national economy. It is indisputable that investment, sales revenues and profits are important for the economic system and the investments – sales revenues correlation is very high. The authors (Abel & Blanchard, 1988) in their study found that there is a significant positive correlation and causality between investment, sales revenues and capital stock in various manufacturing industries in the US economy.

In this study, the authors have based their calculations and referred on the econometric model, used by the following authors: (Stubelj, 2014), (Hashmati & Loof, 2006), (Gala & Julio, 2016), (Baumol & Wolff, 1983), (Lev & Thiagarajan, 1993), (Santoso, 2019).

4. Scientific Research Methodology and Specification of the Econometric Model

This research aims to analyze the correlation and causality between investments and sales revenues in manufacturing enterprises in Kosovo. For this research, various scientific works

and books of different authors have been analyzed. In addition, they have themselves analyzed the issues related to investments and other variables included in the research and other materials from electronic sources and websites such as that of the Ministry of Finance.

The data included in the paper are secondary data. The period included in this study is two years (2018 – 2019); the number of enterprises included in the analysis is 40. Given that the Ministry of Finance has not yet published all the annual financial statements for the last two years (2020 – 2021), this study will focus on the published annual financial statements for the time period (2018-2019). Based on the statistical reports of the Statistics Agency of Kosovo for the year 2022, there are 10 large manufacturing enterprises and 71 medium manufacturing enterprises in the economy of Kosovo. Our main focus in this study is to include in the sample the 10 largest manufacturing enterprises in the economy of Kosovo, and from 71 medium-sized manufacturing enterprises, we have selected 30 of them, whose audited financial statements were easily accessible. Econometric results and conclusions are valid, consistent, scientifically and empirically proven. Also, these study findings represent almost the entire manufacturing enterprise sector in Kosovo, because the sample includes all large manufacturing enterprises and approximately 50% of the medium-sized manufacturing enterprises.

The data included in the research were processed in the STATA program, and we applied the following statistical tests: linear regression, random effect, fixed effect, Hausman – Taylor Regression, General Assessment Equations (GEE Model), Johansen Cointegration Test, Autoregressive Vector Regression (VAR) and Granger Causality Wald Tests. In this study, more statistical tests are applied through panel data and time series models. The main purpose that all these statistical tests have been applied is to have greater consistency and significance in the econometric results and findings for this study. Since the main focus of this study is to analyze the dynamic correlation and causality between investments and sales revenues, we have also applied some other statistical tests through time series models, which have given an added value in view of the comprehensibility of the results of this study.

The application of all these statistical tests in this study was carried out with the sole intention of having higher reliability and so that there can be comparability between the econometric results through different statistical tests.

The research questions of this study are:

1. How have investments affected sales revenues in manufacturing enterprises in Kosovo?

The main hypotheses of this study are:

H1: *Investments positively impact sales revenues in manufacturing enterprises in Kosovo.*

Quantitative methods based on the secondary data of the annual reports of the Ministry of Finance have been applied to test the hypotheses. However, to analyze the effect of investments, it is necessary to consider many other factors that explain these variables' correlation. Therefore, for the specification of the econometric model, we have based our research on several studies by different authors who have analyzed the effect of investments on different firms in the world.

Table 2

Description of the variables included in the econometric model

Variables	Description of variables	Data source
Dependent variable (Y)	Sales revenues (SR)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_1)	Investments (INV)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_2)	Equity (E)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_3)	Firm Size (FS) – The natural logarithm of total assets	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_4)	Short-term liabilities (SHTL)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_5)	Long-term liabilities (LTL)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_6)	Retained Earnings (RE)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_7)	Cash flow from operating activities (CFO)	Annual Reports of the Ministry of Finance (2018 – 2019)
Independent variable (X_8)	Cash flow from financial activities (CFF)	Annual Reports of the Ministry of Finance (2018 – 2019)

Source: Data analyzed by the authors (2022).

The econometric model of this research is as follows:

$$SR = \beta_0 + \beta_1 I_{it} + \beta_2 E_t + \beta_3 FS_t + \beta_4 ShTL_{it} + \beta_5 LTL_t + \beta_6 RE_t + \beta_7 CFO_t + \beta_8 \text{CFF} + \gamma_{it} \quad (1)$$

The dependent variable in this study is **sales revenues**, which is the revenue received by a company from the sale of goods or the provision of services. It is important to note that income does not necessarily mean money received. Part of the sales revenues can be paid in cash, and part can be paid on credit through accounts receivable.

The primary independent variable is **investment,** which is important because it means investing financial assets in various investments, whether in securities, investment projects, or anywhere. The rate of return from this investment is greater than the amount invested or at least the same. Data on investments as the main independent variable in this study were obtained from audited financial statements of manufacturing enterprises in Kosovo. These financial statements are audited by the Office of the Auditor General and published by the Ministry of Finance. The investment data are based on the balance sheet of 40 manufacturing companies, more specifically on the balance sheet assets, where all types of investments made by these manufacturing companies are calculated and taken into account. These investments are as follows: investments in machinery and equipment, investments in securities, investments in information technology, investments in real estate, investments in partnerships, investments in research and development, investments in the field of innovation, etc.

The second independent variable is **equity**, which usually represents cash or liquid assets held or received for expenses. Alternatively, equity includes all active assets in a company with monetary value.

The third independent variable is the **firm**'s size, determined by the turnover limits, the total balance sheet, the average number of employees, and the quality factors taken into account. In this study, firm size is determined based on total assets.

The fourth independent variable is **current liabilities**, which are current liabilities, meaning debts or liabilities that are expected to be settled within a year. These include short-term debts, accrued expenses and customer deposits.

The fifth independent variable is **long-term liabilities**, which have been outstanding for the last 12 months or the company's operating cycle if it is longer than one year.

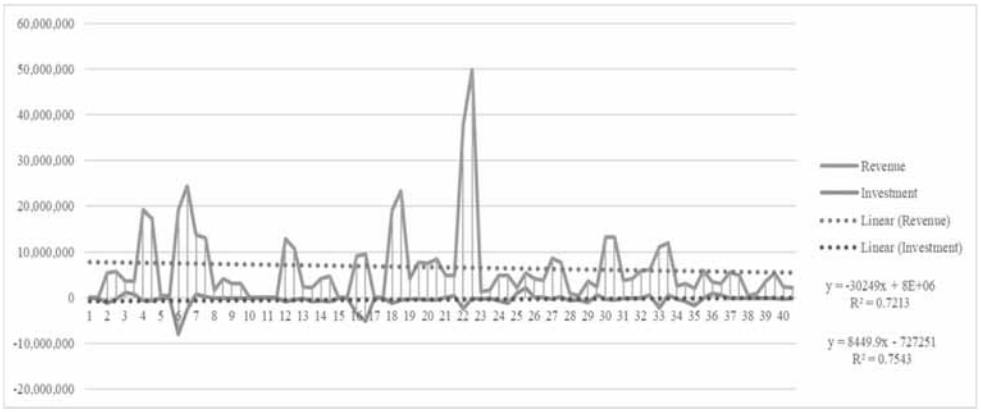
The sixth independent variable is **retained earnings**, which means retaining the firm's profits, i.e. reinvesting them in the company and not distributing them as dividends to shareholders.

The seventh independent variable is the **cash flow from operating activities**, which indicates the amount of money a company brings from its ongoing, regular business activities, such as producing and selling goods or providing a service to customers.

The eighth independent variable is the **cash flow from financial activities**, representing a part of a company's cash flow statement, which shows the net cash flows used to finance the company.

Figure 1

Linear trend of investment and sales revenues



Source: Authors' calculations (2022)

Figure 1 shows the linear trend between investments and sales revenues for the 40 manufacturing enterprises analyzed in this study. The investments variable during the 2018-2019 time period for all these enterprises has a positive downward trend and the coefficient of determination of this linear trend is high in the value of $R^2 = 75.43\%$. The income variable for this time period consists of a positive downward trend and has a coefficient of determination in the value of $R^2 = 72.13\%$. Taking into account the fact that during this time period, there is a downward trend in investments and a positive downward trend in sales

revenues, these enterprises are faced with an increase in short-term liabilities and long-term liabilities.

Such an increase in the liabilities of these manufacturing enterprises has influenced all the activities of the enterprises to focus on the operational and financial level, so that the enterprises show a good degree of liquidity and solvency. Therefore, such a fact has influenced these companies to orient their financial policies in order to preserve liquidity and solvency, and for this fact, we have a downward trend in investments and sales revenues. Manufacturing companies in Kosovo need to orient financial policies to investments that will generate higher income from sales as a function of increasing the productivity and efficiency of the company. These investments seem to be realized in production machinery, information technology, research & development and innovation.

5. Econometric Analysis and Study Findings

This part of the econometric analysis will present the results of descriptive statistics, correlation coefficient and hypothesis testing through statistical tests for variables included in econometric models. In addition, this part of the study will verify the validity of the hypotheses and the interpretation of the study findings.

Table 3

Descriptive statistics for the variables included in the econometric model

Variables	Obs.	Mean	Std. Deviation	Minimum	Maximum
Sales Revenues	80	6652816	8268747	819	5.00e+07
Investments	80	-385031.6	1292662	-7865089	2274838
Equity	80	1727040	5715714	0	5.00e+07
Firm Size	80	14.68278	2.205527	7.805882	17.26748
Short-term liabilities	80	1699711	1688163	2840	6022114
Long-term liabilities	80	1402328	2824706	0	1.56e+07
Retained earnings	80	1986694	3655074	-734734	2.33e+07
CFO	80	638922.1	1381267	-1042847	7676887
CFF	80	274038.7	839346.3	-1547584	4056971

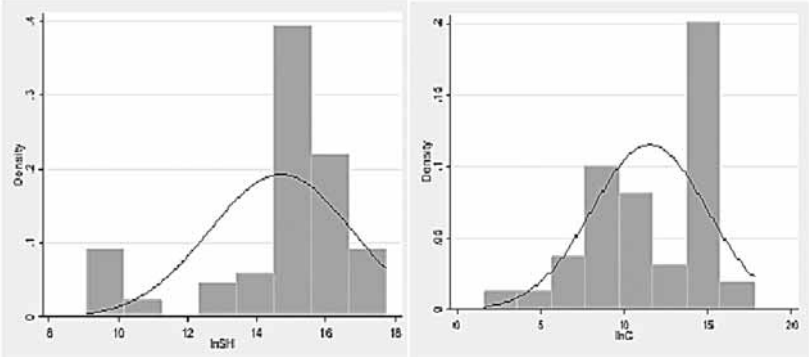
Source: Authors' calculations (2022).

The data obtained through descriptive statistics analysis shows that the research included 80 observations. Each variable has presented an average that differs from each other, as in investments with a negative average value. The standard deviation, the minimum and the maximum of each variable are incorporated in the research.

Based on the graphical representation of the histogram, we see that between the dependent variable sales revenues and the independent capital variable, there is an almost normal distribution of these variables included in the analysis.

Figure 2

Graphic presentation of the histogram



Source: Authors' calculations (2022).

Table 4

Correlation analysis for the variables included in the econometric model

Variables	SR	INV	E	FS	SHTL	LTL	RE	CFO	CFF
SR	1.0000								
INV	0.3341	1.0000							
E	0.2752	-0.7186	1.0000						
FS	0.451 6	-0.2292	0.2490	1.0000					
SHTL	0.6221	-0.0776	0.0639	0.5533	1.0000				
LTL	0.0353	-0.2327	0.1855	0.3525	0.0989	1.0000			
RE	0.5305	-0.4710	0.5498	0.3930	0.1840	-0.271	1.0000		
CFO	0.3717	-0.5478	0.6223	0.3311	0.2362	0.1189	0.6333	1.0000	
CFF	-0.0142	-0.3327	0.2069	0.1427	-0.0334	0.1920	0.0623	0.0070	1.0000

Source: Authors' calculations (2022).

From the data presented in the correlation analysis table, we notice that all the variables included in the econometric model are correlated. For example, if we analyze the correlation between sales revenues and investments, these two variables have a very weak correlation of (0.3341), but this still means that investments, in most cases, have a positive effect on sales revenues in an enterprise.

The value of the correlation between sales and capital has a very weak correlation of (0.2752), which means that with the increase of capital of an enterprise, the revenues from sales also increase. However, if we analyze the correlation between sales revenues and firm size, we see that these two variables have a positive average correlation (0.4516). This means that the enterprise will also increase sales revenues by increasing firm size, including the share of total assets.

Revenues from sales and short-term liabilities have a positive average correlation (0.6221), which means that with the increase in short-term liabilities of the enterprise, revenues from sales will also increase. In addition, the correlation between sales revenues and retained earnings is positive (0.5305), which means that sales revenues will also increase as retained earnings increase. We also have a positive average correlation between sales revenues and CFO variables in the amount of (0.57170), which means that with the increase of cash flow from operating activities, we will also have sales revenues. We find a very weak negative correlation of (-0.0142) between CFF variables and Revenues from sales, which means that with the increase in cash flow from financial activity, we have a decrease in sales revenues.

There is an average positive correlation between the variables capital and cash flow from operating activities in the value of R = 62.23%, which means that with the increase in the capital of these enterprises, the cash flow from operating activities will increase. Such a correlation means that these manufacturing enterprises will experience a positive effect on the generation of cash flows from operating activities, especially when they inject real and financial investments into the company.

Another important correlation between independent variables is between capital and investments. Between these two variables, there is a high negative correlation in the value of R = -71.86%. Therefore, with the increase of investments, the amount of capital of these production enterprises will decrease. Such a correlation is justified by the fact that there is a positive downward trend of investments for these enterprises and the financial policies of these enterprises during the analyzed time period (2018-2019) have been focused on maintaining a position of liquidity and solvency.

Between capital and retained earnings, there is an average positive correlation of R = 54.98%. So, with an increase in the amount of capital, a lot of retained profits will be generated, which will also positively affect the financial performance of the manufacturing companies in Kosovo. An increase in retained earnings creates the possibility of reinvesting these amounts in different forms in order to contribute positively to sales revenues, but also to the productivity and performance of these manufacturing enterprises in Kosovo.

A moderate positive correlation exists between short-term liabilities and firm size. As the size of the firm increases, short-term liabilities will also increase. This means that when manufacturing companies carry out business activities that affect the increase in total wealth, then consequently, such an effect also affects the increase in short-term liabilities of these companies and an increase in cash outflows from operating, financial and investment activities. Between the variables retained earnings and cash flows from operating activities, there is an average positive correlation of R = 63.33%. So, an increase in retained earnings will have positive effects on cash flows from operating activities due to the increase in sales revenues.

The following is the analysis of statistical tests performed through the STATA program, such as linear regression, random effect, fixed effect, Hausman – Taylor Regression, GMM Model – Arellano Bond Estimation, Generalized Estimating Equations (GEE Model), Johansen Test for Cointegration, Autoregressive Vector Models (VAR) and Wald Granger Causality Tests.

$$SR = \beta_0 + \beta_1 INV + \beta_2 E_{it} + \beta_3 \ln FS_{it} + \beta_4 SHTL_{it} + \beta_5 LTL_{it} + \beta_6 RE_{it} + \beta_7 CFO + \beta_8 CFF + \gamma_{it}$$

$$SR_{it} = 850494 + 1.330357 INV_{it} + 0.1664133 E_{it} - 85545.81 FS_{it} + 1.175876 SHTL_{it} - 0.1476992 LTL_{it} - 1.271019 RE_{it} - 0.1233481 CFO_{it} + 0.4343036 CFF + \gamma_{it}$$

Table 5

Econometric results and empirical findings of the study

Variables	Linear Regression	Random Effects – GLS Regression	Fixed–Effects Regression	Hausman – Taylor Regression	GEE Model
SR	-	-	-	-	-
INV	-1.318831* (0.089)	1.266254*** (0.006)	1.69068*** (0.007)	1.726243*** (0.000)	1.330357*** (0.002)
E	-0.117887 (0.509)	0.1587564** (0.025)	0.3556463*** (0.004)	0.2153118*** (0.001)	0.1664133* (0.010)
FS	-81426.85 (0.843)	90973.7 (0.748)	-0.86950.71 (0.776)	44252.97 (0.855)	85545.81 (0.741)
SHTL	2.772377*** (0.000)	1.283837*** (0.002)	0.0975121 (0.847)	0.7072028 (0.061)	1.175876*** (0.002)
LTL	-0.0603019 (0.815)	0.121141 (0.713)	0.6574753 (0.358)	0.3856779 (0.331)	0.1476992 (0.642)
RE	.9960797*** (0.000)	1.246567*** (0.000)	2.713095*** (0.004)	1.452513*** (0.000)	1.271019*** (0.000)
CFO	-0.5584583 (0.412)	-0.1416822 (0.703)	0.1412959 (0.709)	0.0019064 (0.995)	-0.1233481 (0.715)
CFF	-0.1173869 (0.891)	0.4240956 (0.303)	0.4335449 (0.345)	0.5224858 (0.135)	0.4343036 (0.246)
Const.	1326591 (0.805)	676166.7 (0.866)	1279333 (0.780)	1434117 (0.738)	850494 (0.819)
R Square	0.5871	0.4311	0.5474	-	-
Adj.R^2	0.5406	0.4464	0.2571	-	-

*Explanation: P-values are shown in parentheses: *** indicates statistical significance at the level of 1%; ** indicates statistical significance at 5% level, and * indicates statistical significance at 10%.*
Source: Authors' calculations (2022)

Based on the econometric results in the table above, we can conclude that some of the independent variables (CFI, Retained Earnings. Equity, Short-Term Liabilities) are significant at the levels of 1%, 5% and 10%. For the interpretation of the econometric results, we have only applied the GEE model and this has facilitated the understanding of these econometric results of this study.

β₀ – If all other factors are constant, then the value of sales revenues will be 850494 units.

β₁ – If the net investment flow increases by 1 unit, keeping the other independent variables constant, sales revenues will increase by 1,330 units. This statement turns out to be correct since the significance value is within the range of statistical significance (p-value = 0.002 < 0.05). This means that the moment an enterprise makes investments within its business, whether in machinery, portfolio, research, development or anywhere else, it will affect its increase in the share of sales revenues.

β_2 – If equity increases by 1 unit, keeping the other independent variables constant, sales revenues will increase by 0.1664 units. This statement is correct since the significance value (p-value = 0.010 < 0.05) is at the level of statistical significance. Therefore, an enterprise's increase in capital will also positively secure profit from sales revenues.

β_3 – If the firm size increases by 1 unit, keeping the other independent variables constant, sales revenues will increase by 8554 units. This statement is not correct since the significance value (p-value = 0.741 > 0.05) is not in the range of statistical significance. The firm's size, which represents the total wealth of an enterprise, plays a big role. The firm's size can positively impact sales revenues. This is because the enterprise's wealth increases the turnover within the enterprise and even increases sales revenues.

β_4 – If current liabilities increase by 1 unit while keeping the other independent variables constant, sales revenues will increase by 1,175 units. This statement turns out to be correct since the significance value is within the range of statistical significance (p-value = 0.002 < 0.01). If we have an increase in any of the components of short-term liabilities, such as accounts payable, we automatically increase the operating money cycle. When this cycle is extended, the possibility of using the assets for the entity increases, and the probability increases that the sales revenues increase.

β_5 – If long-term liabilities increase by 1 unit while keeping the other independent variables constant, sales revenues will increase by 0.147 units. This statement is not correct since the significance value (p-value = 0.642 > 0.05) is not in the range of statistical significance.

β_6 – If retained earnings increase by 1 unit while keeping the other independent variables constant, sales revenues will not increase by 1,271 units. The significance value is within the range of statistical significance (p-value = 0.000 < 0.001) and the statement is correct.

β_7 – Whereas when the net cash flows from operating activities increase by 1 unit, sales revenues will decrease by -0.123 units. The statement is incorrect as the values are not within the confidence interval because (p-value 0.715 > 0.05).

β_8 – If the net cash flow from financial activities increases by one unit keeping other factors constant, sales revenues will increase by 0.434 units. However, the values are outside the level of statistical significance (p-value = 0.246 > 0.05). The financing activities also include long-term loans, which tend to extend for more than one year. Therefore, the entity's financial statements, in this case, the sales revenues, which are presented on the balance sheet in annual periods, may have caused discrepancies between the variables and led to the non-significance of these variables.

To verify the validity of the hypotheses presented in this study and give more support to the econometric results, we have performed some additional tests related to the analysis of the VAR model (Vector Auto-Regression Model). In these analyzes, we have also used the models of time series.

The results of three statistical tests will be given in this section:

1. Johansen Test for Cointegration
2. Vector Auto-Regression Model (VAR)

3. Wald Granger Causality Tests

The Johansen Cointegration Test analyzes whether the key variables in this study, "sales revenues" and "investments", are integrated. At the same time, the second VAR analysis shows whether the main variables explain each other or not. Furthermore, the third test, the "Granger Causality Wald Test", was analyzed as part of the time series model. Through this test, the authors analyzed whether these variables have long-term or short-term causality with each other.

The following table shows the results of the first test, where two hypotheses are constructed:

H_0 *– There is no dynamic correlation and cointegrating link between "sales revenues" and "investments".*

H_A *– There is a dynamic correlation and cointegrating link between "sales revenues" and "investments".*

Table 6

Johansen Tests for Cointegration

Johansen Tests for Cointegration					
Trend: constant			Number of OBS = 81		
Sample: 4 – 84			Lags = 3		
Maximum rank	Parms	LL	Eigenvalue	Trace statistic	5% critical value
0	10	-2522.1003	.	42.8168	15.41
1	13	-2507.9448	0.30766	14.5059	3.76
2	14	-2500.6919	0.17171		
Maximum rank	Parms	LL	Eigenvalue	max statistic	5% critical value
0	10	-2522.1003	.	28.3110	14.07
1	13	-2507.9448	0.30766	14.5059	3.76
2	14	-2500.6919	0.17171		

Source: Authors' calculations (2022).

Since the value of trace statistics is greater than the critical value of 5%, we can say that there is a cointegration between these two variables (sales revenues and investments). So, in this case, the H1 hypothesis is accepted. Also, since the value of "statistics max" is greater than the "critical value 5%", we can say that there is cointegration between these two variables.

Given that the variables "sales revenues" and "investments" are integrated, we can conclude that there is a long-term cause between sales revenues and investments in manufacturing enterprises in Kosovo.

Table 7

Vector Auto-Regression Model (VAR)

Variables	Coef.	Std. Err.	Z	p > |z|	95% Conf. Interval	
Sales Revenues L1.	.6318769	.1118042	5.65	0.000	.4127447	.8510091
Sales Revenues L2.	.476366	.1206511	-3.95	0.000	-.7128378	.-239842
Sales Revenues L3.	.1694372	.1080762	1.57	0.117	-.0423883	.3812627
Investments L1.	-.9243182	.6313532	-1.46	0.143	-2.161748	.3131113
Investments L2.	1.21606	.6473662	1.88	0.060	-.0527545	2.484874
Investments L3.	-1.708962	.6328762	-2.70	0.007	-2.949377	-.4685476
cons	4041421	1206688	3.35	0.001	1676356	6406486

Source: Authors' calculations (2022).

Referring to the data in the table above, we can conclude that sales revenues depends on itself in the time distance 1 in the long run, as the significance values are at the standard level of 5%.

Revenues from sales – Lag_1: (P- value = 0,000 < 0.05)

Revenues from sales – Lag_2: (P- value = 0,000 < 0.05)

Revenues from sales – Lag_3: (P- value = 0,117 > 0.05)

If the sales revenues in the previous year increase by one unit, then the sales revenues in the current year will increase by 0.631 units, so this in the time distance 1 has causality because the sales revenues from the previous year will affect revenues from the current year's sales. This is also important based on the level of significance since 0.000 < 0.05.

Suppose the sales revenues in the previous year increase by one unit. In that case, the sales revenues in the following year will increase by 0.476 units, so this in the time distance 2 has causality because the sales revenues of the previous year will affect the revenues from next year's sales. This is also important in the statistical range after 0.000 <05.

Suppose the sales revenues in the previous year increase by one unit. In that case, the sales revenues in the following year will cause a negative effect because the sales revenues decrease by 0.169 units, so there is causality in the time distance 2. However, based on the statistical aspect, this is not significant after 0.117 > 0.05.

Based on the table above, we can conclude that the variable "sales revenues" does not depend on the values of the variable "investments" in previous periods (lag_2) in the long run, as the values are not within the statistical level anymore, except for time period 3.

Revenues from sales – Investments Lag_1: (P-value = 0.143 > 0.05)

Revenues from sales – Investments Lag_2: (P-value = 0.060 > 0.05)

Revenues from sales – Investments Lag _3: (P-value = 0.007 < 0.5)

In time distance 1 we have no statistical significance since 0.143 > 0.05, so here we have no causality between investments and sales revenues as different factors in long periods of time can have an impact and this also affects the share of investments and sales revenues.

At time distance 2, we have no statistical significance between these variables at the significance level of 5%, but at the significance level of 10%, it has statistical significance because 0.060 < 0.10. So, if investments increase per unit, sales revenues will increase by 1,216 units.

If investments in time distance 3 increase per unit, then these will cause negative effects in reducing sales revenues by -1.708, while at the statistical level, this statement is important because 0.007 < 0.05. Investments made in advance will positively impact sales revenues but may have a negative impact, as in our case. However, the financial benefit of any company is from the investments they make to accumulate or earn more revenue.

Based on the results of the VAR analysis, an increase in investments, which is an essential component of the balance sheet, will have a significant impact on sales revenues because it

is a catalyst for money generation and acceleration of the operating cycle. However, the impact of investments on sales revenues can be both short-term and long-term. For example, when real estate is bought, its impact on sales revenues may be slower. However, investments such as upgrading the production line, expanding it, investing in research and developing easier and faster methods of production may reduce the costs while increasing the quality.

To verify the hypothesis of whether there is any long-term causality between the variables "sales revenues" and "investments" for manufacturing enterprises in Kosovo, we have applied the Granger Causality Wald Test.

H0: *There is no long-term causality between sales revenues and investments in manufacturing enterprises in Kosovo.*

H1: *There is a long-term causality between sales revenues and investments in manufacturing enterprises in Kosovo.*

Table 8

Granger Causality Wald Tests

Equation	Excluded	Chi2	Df	Prob > Chi2
Sales Revenues	Investments	9.7247	3	0.021
Sales Revenues	ALL	9.7247	3	0.021

Source: Authors' calculations (2022).

Based on the Granger Causality Wald Tests results, we can conclude that there is a long-term causality between sales revenues and investments. So, we say there is a long-term causality between sales revenues and investments, so H1 is accepted (p-value = 0.021 < 0.05). The chi-square value between the two variables is 9.7247. Thus, all companies should be careful because their investments in advance will affect subsequent sales revenue periods. Cash flow from investing activities represents how expenditures have been made on resources intended to generate income in a future period.

Based on the three analyzed tests: Johansen Test for Cointegration, Vector Autoregressive Test and Wald Causality Granger Test, it is confirmed that the two main variables of this study (sales revenues and investments) are integrated, explicable, and between them have a causality expressed in the long run. This implies that manufacturing enterprises in Kosovo must have prudent investment management so that all those investments they make can positively impact enterprise sales.

6. Discussions

According to the econometric results of this study, we can conclude that an increase in investments has had a positive effect on the increase in revenues from sales in production enterprises in Kosovo. The authors can also conclude that during the current period of study, manufacturing companies in Kosovo that invested in their business (investments in machinery, portfolio, research & development, innovation, real estate, etc.) saw higher sales overall. Such an effect shows a causality in the long term between investments and sales, because investments have influenced the increase in productivity and efficiency in these

enterprises, enabling wider sales in several different market segments and an increase in the number of units produced and sold in local and international markets. These econometric results are comparable to some of the studies of other authors that are presented in the next section of the discussion.

(Stubelj, 2014) analyzed the links between investments and profit in businesses and concluded that these two variables have a positive relationship. While this relationship could not be proven in some cases, our research shows that the variables of investments and sales income are related and have a positive relationship.

(Hashmati & Loof, 2006) analyzed the correlation and causality between investments and firm performance. They used the same variables, namely investments and sales, and they also concluded that these variables positively impact each other and are automatically related to profitability. Moreover, most of the statistical tests carried out in this research have confirmed a positive relationship between these two variables.

(Gala & Julio, 2016) analyzed the firm's size and investments, which are variables similar to those in our paper. They found a negative relationship between firm size and investments, aligning with our research findings.

(Baumol & Wolff, 1983) analyzed investments and firm performance. They concluded that these two variables had a causality between them because they affected each other positively. So when we look at our two main variables – investments and revenues from sales – these directly affect performance. Therefore we concluded that we also have causality or a positive effect on these two variables.

(Lev & Thiagarajan, 1993) analyzed the relationship between investments in fixed assets and enterprise profitability. They concluded that these two variables provided more value and positive impact since they can predict the future profit of the firm and the return of shares. This aligns with our research because the investments made by manufacturing companies in Kosovo, in most cases, had a positive impact on enterprises.

7. Conclusions and Recommendations

This study focused on analyzing the correlation and causality between investments and sales revenues through an econometric analysis of manufacturing enterprises in Kosovo. This section of the paper presents the conclusions and recommendations of this research. Given that the research was fundamental, especially for the companies analyzed, we saw that the variables were generally interrelated, especially the two main variables, sales revenues and investments. These were seen to positively impact each other, were correlated and had causality. While some of the research variables were not significant, this can be due to the limited number of years that directly affected the results and the Covid-19 pandemic, which might have influenced companies to change their profits. However, in general, the work was productive and provided reasonable results. Our recommendations are as follows:

Based on the results obtained, we can recommend that to increase sales revenues, we should increase the investments, capital and short-term liabilities of the entity.

Throughout the process of increasing long-term and short-term liabilities, we recommend that the entity be extra careful not to have liquidity problems in the short run and solvency problems in the long run.

We recommend that the entity focus more on the increase of share capital because the results show that the increase of share capital has the highest impact on the increase of sales revenues.

For the manufacturing enterprises, they must identify the factors that affect the profitability of their operations. Otherwise, they will not be able to achieve their financial goals.

Enterprises are required to contribute to the growth part of the firm. This enables the advancement of competitive advantage and the enterprise's dominance of the target market.

It is also recommended that companies analyze the investments element very carefully because it is an essential factor that affects the growth of profits.

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