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Financial Performance Indicators of Primary Construction Sectors in the Country of Earthquakes

(Depremler Ülkesinde İnşaat Ana Sektörlerinin Finansal Performans Belirleyicileri)

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Abstract

Steel and concrete are at the top of the list of the most used materials in the world, and the main components of these materials are based on the primary metal sector and the cement sector. Currently, the infrastructure of cities, real estate-based construction and industry-based construction are among the leading issues for almost all countries. While this fast-growing trend for construction is fueled by both population growth and the demand for more modern, safe, aesthetic and functional structures, there may be extraordinary demands as well as the usual trend. In a country like Turkey, which has a rapid growth, both the normal population growth and housing demand and the effects of extraordinary natural events with devastating effects such as earthquakes make it necessary to examine the construction-based sectors from all angles. In this study, it is aimed to examine the relevant sectors financially, especially for profit margins and return rates and leverage-liquidity-turnover ratios. Thus, it is aimed to contribute to the research of an important problem with a quantitative analysis.

Anahtar Kelimeler:
Finansal Performans, Çimento Sektörü, Ana Metal Sektörü

Makale türü:
Araştırma

Öz

Dünyada en çok kullanılagelen malzemeler listesinin başında çelik ve beton gelmekte olup söz konusu malzemelerin ana bileşenleri ana metal sektörü ile çimento sektörüne dayalıdır. Halihazırda şehirlerin alt yapıları, emlak ve gayrimenkule dayalı inşaat ve endüstriye dayalı inşaat yapıları neredeyse tüm ülkeler için en önde gelen konuların başında yer almaktadır. İnşaata yönelik söz konusu hızlı büyüyen trend hem nüfus artışı hem de daha modern, güvenli, estetik ve fonksiyonel yapılara yönelik taleple beslenmekle birlikte, söz konusu olağan temayülün yanı sıra olağandışı talepler de söz konusu olabilmektedir. Hızlı bir büyümeye sahip Türkiye gibi bir ülkede de hem olağan nüfus artışı ve konut talebi hem de depremler gibi yıkıcı etkilere sahip olağandışı doğa olaylarının etkileri inşaata dayalı sektörlerin tüm açılardan incelenmesini gerekli kılmaktadır. Bu çalışmada da söz konusu sektörlerin finansal olarak incelenmesi hedeflenmekte, özellikle kar marjları ile getiri oranları ve kaldıraç-likidite-devir hızı oranları analize tabi tutulmaktadır. Böylelikle önemli bir sorunun araştırılmasına kantitatif bir analizle katkıda bulunması hedeflenmektedir.

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Introduction

Turkey is located within one of the most significant earthquake belts in the world, known as the Alp-Himalayan. This geographical region is bordered by the Anatolian Plate, which it lies upon, and the surrounding land masses. It is bounded by the Eurasian Plate to the north, the African and Arabian Plates to the south, the East Anatolian Block to the east, and the Aegean Block to the west. This complex tectonic setting exposes almost the entire Turkey to the risk of earthquakes. According to reports from the United States Geological Survey (USGS), approximately 6% of historical earthquakes worldwide have occurred within the territory of Turkey (Bikçe, 2015). In Turkey, situated within a wide seismic belt, the most devastating earthquake in recent times is the one that occurred on August 17, 1999, with a magnitude of 7.4 on the Richter scale. The earthquake took place in the Marmara region, which is the most densely populated area of Turkey, and it affected an area that includes Istanbul, one of the world's most populous cities. Very recently, Turkey has suffered significant loss of life and property due to the Maras Earthquakes, which were measured at magnitudes of 7.8 and 7.5 (Jalali, 2002). The major earthquakes in Turkey since the 1950s that have resulted in the loss of 50 or more lives are as follows:

Table 1. The major earthquakes in Turkey since the 1950s

Date	Region	Magn.	Deaths	Date	Region	Magn.	Deaths
02.06.2023	Maras	6.3	56.697	24.11.1976	Van	7.3	5.000
02.06.2023	Maras	7.8	56.697	09.06.1975	Diyarbakir	6.7	2.311
02.06.2023	Maras	7.5	56.697	22.05.1971	Bingol	6.7	1.000
30.10.2020	Izmir	7.0	117	05.12.1971	Burdur	5.9	100
23.10.2011	Van	7.1	604	28.03.1970	Kutahya	7.4	1.086
03.08.2010	Elazig	6.1	51	28.03.1969	Manisa	6.5	53
05.01.2003	Bingol	6.4	177	26.07.1967	Tunceli	6.2	97
11.12.1999	Bolu	7.2	894	22.07.1967	Adapazari	7.3	86
17.08.1999	Istanbul	7.6	17.118	19.08.1966	Mus	6.8	2.394
27.06.1998	Adana	6.3	145	26.05.1957	Bolu	7.1	500
10.01.1995	Afyon	6.4	95	18.03.1953	Canakkale	7.5	1.070
13.03.1992	Erzincan	6.9	653	01.03.1952	Erzurum	6.0	103
30.10.1983	Erzurum	6.9	1.342	13.08.1951	Cankiri	6.7	50

Source: *https://www.worlddata.info/asia/turkey/earthquakes.php*

In addition, this study aims to investigate the effects of the pandemic, the Russia-Ukraine conflict, global and local economic crises, interest rates, inflation, and particularly currency exchange rates on the revision and restoration of construction in Turkey, a region prone to frequent earthquakes and experiencing significant devastation in the year 2023. An essential undertaking involves examining the past and current situation in terms of financial performance through a study encompassing the primary metal industry, cement industry, and sectors associated with main substitute inputs, which constitute the foundational components of the construction sector. Identifying strengths and weaknesses within this context and formulating a vision for the future are crucial.

Construction is a main sector that is nurtured by numerous primary and ancillary industries, with the number of these mentioned sectors reaching approximately two hundred (Öcal et al., 2007). The construction sector stands among the most critical industries, contributing significantly to the growth and advancement of the national economy. It operates in a state of constant change and is obligated to respond to increasing needs, making it imperative for supporting the ever-evolving requirements. In this context, the construction sector has emerged as a central axis of development, encompassing a broad spectrum ranging from dams to energy generation facilities, from roads to airports, from urban spaces to factories, hospitals, and other essential facilities. It constitutes the foundational step in the process of constructing the necessary infrastructure to make these areas habitable and functional (Tüzemen & Yıldız, 2018). Strong financial performance holds critical importance for the survival and growth of a firm, or a sector composed of multiple businesses. Profitability not only brings about market share and sustainable competitive advantage but also enables the analysis of a company's financial health from various angles (Yameen & Pervez, 2016). This analysis assists in identifying strengths and weaknesses, thereby providing guidance on areas that require improvement within the context of where improvements should be made. Furthermore, financial ratios help condense vast amounts of financial data and aid in making qualitative judgments about a company's financial performance (Pal & Bhattacharya, 2013).

According to information obtained from the relevant ministry, Turkish steel producers, who hold a competitive position among global steel manufacturers, rank 8th worldwide with a production of 2.7 million tons. In Europe, they stand at the 2nd position, following Germany (Sanayi ve Teknoloji Bakanlığı, 2020):

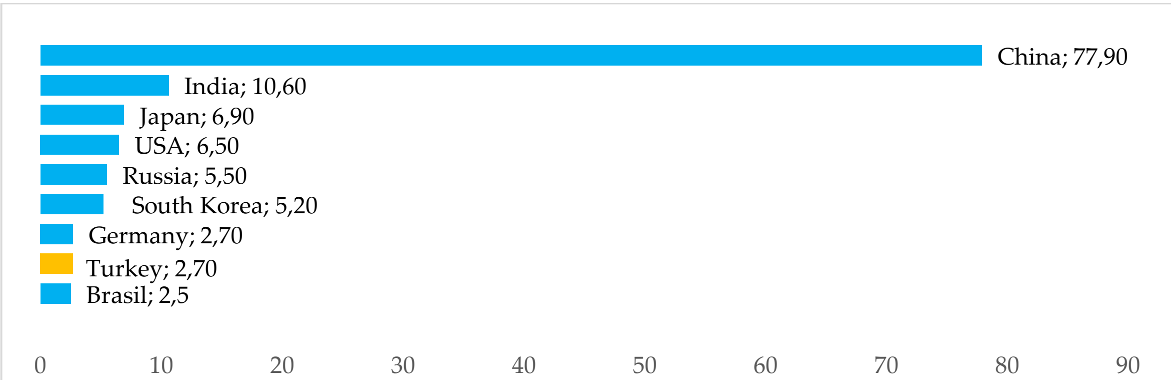

Figure 1. Major Countries in Worldwide Metal Production in 2022 (in million metric tons)

Source: *https://worldsteel.org/media-centre/press-releases/2023/december-2022-crude-steel-production-and-2022-global-totals/*

Steel is a crucial element for the development of any modern economy and forms the foundation of commerce and trade. Iron and steel, perceived as reflections of civilization, modernity, and technology, symbolize a meaningful indicator of a country's socioeconomic advancement and quality of life standards, closely tied to the per capita consumption level. Steel, with its complex production process, is regarded as a product of a technologically sophisticated and massively dimensional industry. The presence of a robust steel industry characterizes all major industrial economies. Therefore, the growth of numerous economies has been determined by the strength of their steel industry during the initial stages of their development (Ranjithkumar, 2017). Because the primary metal industry, particularly iron and steel, plays a significant role in the industrial development of national economies, it is fundamentally recognized as one of the key indicators of the real economy. Iron and steel signify the initial raw materials for various sectors such as construction, automotive industry, and appliance manufacturing. As a result, they are regarded as the driving force behind the real economy, fundamentally pivotal. Looking at the history of the world economy, their significance is particularly evident during crisis periods, as the contraction of this sector leads to negative impacts on employment levels within a country, and consequently, on production (Bakırcı et al., 2014).

Currently, steel producers are under pressure due to the rapid increase in global steel demand, facing challenges both in raw material sourcing and pricing. Considering the unique characteristics of the steel industry, the fundamental challenge goes beyond just improving production procedures; it also involves dealing with supply chain uncertainties. This can lead to uncertainty in raw material sourcing, market demand, and product pricing. The steel industry is highly sensitive to the raw material factor, which significantly affects the overall production costs. The increasing demand for steel products further intensifies the pressure on the availability and pricing of raw materials within the global steel industry (Omondi, 2022). Specifically, in the construction sector, the fundamental inputs are steel mesh and wire rope, which hold particular importance in regions prone to earthquake risks. These outputs are especially highlighted for their significance in the construction industry. Performance evaluation of companies in locomotive sectors such as the basic metal sector is the main source of information for the planning and control activities of company managers. Simultaneously, it holds great importance for various stakeholders such as policymakers, investors, and creditors in numerous fields like development and national economic management (Gönüllü, 2022).

Another essential component of the construction primary sector is the cement industry. The cement industry in Turkey has a deep-rooted history. The first cement factory began its operations in 1912, but prior to that, lime factories producing hydraulic binders were present as early as 1885. In the early stages, the small-capacity factories gradually expanded over time, contributing to the reduction of dependency on imports. Despite facing setbacks during the First and Second World Wars, the sector, particularly after the 1950s due to the influence of liberal policies, experienced significant growth in production capacity. Starting from the 1970s, the surplus production also paved the way for export opportunities (Sümer & Yavuz, 1998). As of 2010, Turkey's annual cement production was approximately 37 million tons, ranking 7th in the global standings. However, by 2020, the production had reached 85 million tons, propelling Turkey to the 5th position in the world rankings. In a relevant study using Double Exponential Smoothing methods, the expectation for the year 2019 was approximately 79.3 million tons (Tüzemen & Yıldız, 2018). However, the actual quantity achieved was even higher. This achieved production quantity indicates that the sector has a notably significant growth rate.

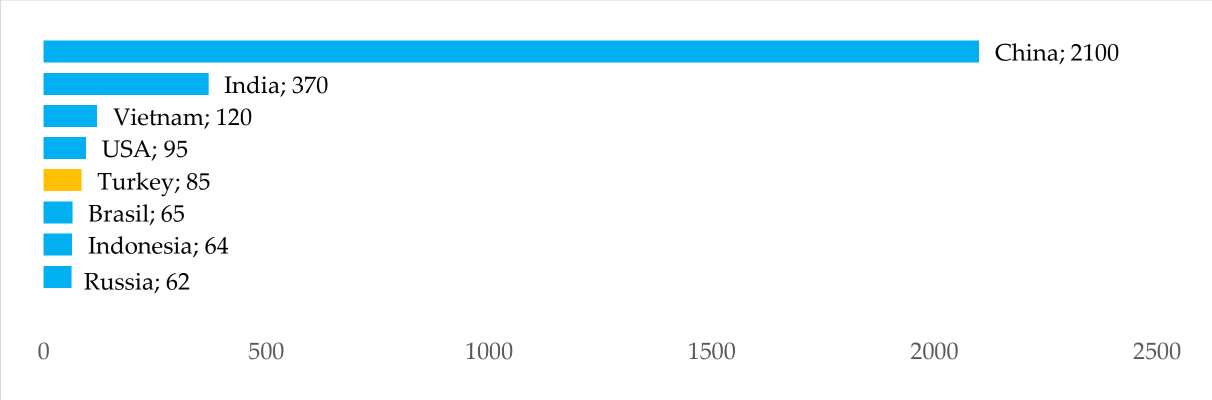

Figure 2. Major Countries in Worldwide Cement Production in 2022 (in million metric tons)

Source: https://www.statista.com/statistics/267364/world-cement-production-by-country/

Due to its role as a major supplier of raw materials in the construction and infrastructure sectors, the cement industry has gained significant importance in the economy (Bektaş & Güleç, 2021). Ready-mixed concrete, a pivotal component of the construction sector, directly influences the demand for cement in construction projects. Turkey holds a significant position in the global cement industry and its cement production has increased over time, largely due to the impact of high cement imports dependency. Factors such as urban renewal projects, mass housing initiatives, large-scale public construction projects, road construction and repairs, new dam constructions, and recent significant projects have significantly contributed to the substantial increase in cement demand.

In conclusion, the growing international economic competition leads to a natural increase in the importance of certain sectors, and at the forefront of these is the steel and cement industry, which are essential for construction. This phenomenon is considered one of the leading indicators of economic growth, particularly for rapidly expanding economies. Steel and cement are vital commercial commodities for these economies and are widely recognized as key components for infrastructure investments worldwide (Alkan & Bilim, 2021). Additionally, unfortunately, earthquakes, which result in loss of life, also lead to unforeseen increases in demand (Yıldırım & Arıöz, 2013; Tüzemen & Yıldız, 2018). In this context, this study encompasses the primary metal and cement sectors, as well as the construction primary substitution sector. The primary substitution sector covers companies operating in the production of low-voltage lines, electrical and communication networks; plumbing pipes, tubes, and hoses; PVC, insulation materials; interior and exterior paints, tiles, floor and wall tiles; varnish and coating; ceramics, and similar products. These companies are listed on the main market of BIST (Borsa Istanbul) and have been active during the research period from 2010 to 2022.

1. Literature

A research study aimed to predict Turkey's cement production by employing various methods and examining the results obtained. In this study, different forecasting methods such as simple exponential smoothing, double exponential smoothing, and three-period double moving average were employed. These methods were compared based on various criteria to evaluate their predictive accuracy. According to the research findings, it was observed that the best performance was achieved using the three-period double moving average method. The results also suggest that cement production in Turkey is expected to continue increasing in the coming years (Tüzemen & Yıldız, 2018). In another study examining the significance of Turkey's cement sector and the necessity of strategic approaches for the future, a focus is placed on using economic growth and foreign trade variables to analyze potential developments in the cement sector for the years 2030 and 2050. The aim is to understand the sector's opportunities and threats through these future projections. The findings indicate that the factors underlying the development in the cement sector are closely linked to macroeconomic variables such as economic growth, inflation, unemployment, and foreign trade (Çağatay, 2021).

In the study conducted by Yıldırım and Arıöz (2013), emphasis was placed on the economic significance of Turkey's cement sector and the uncertainties it faces. The research highlighted that the cement sector is significantly impacted by economic crises and is characterized by various uncertainties. It was demonstrated that the sector is sensitive to fluctuations and economic changes (Yıldırım & Arıöz, 2013). In another study by the authors, the impact of uncertainty on decision-making processes, different types of uncertainty, and discussions about uncertainties in Turkey's cement sector were conducted. The study outlined that uncertainties encompass price, technological, and price-technology uncertainties, which affect future outlooks and shape decision-making processes. Through a SWOT analysis framework, recommendations were emphasized concerning the threats and opportunities related to Turkey's relevant sector (Arıöz & Yıldırım, 2012). In a study aimed at understanding the financial health, competitiveness, and sustainability perspective of the cement sector, financial and non-financial criteria were examined through performance evaluation. The study applied ratio analysis, multiple decision-making techniques, and firm life cycle analyses to the data from 15 cement companies traded on Borsa İstanbul for the years 2008-2019. The results indicate that firms in the sector possess high liquidity, low debt levels, and high profitability ratios. It is also noted that a significant portion of the firms are in the maturity stage of their life cycle (Bektaş & Güleç, 2021).

In a study using the financial statements of 13 primary metal industry companies traded on İstanbul Stock Exchange (IMKB) between 2006 and 2010, the TOPSIS method was employed to evaluate the firms' financial performances. The calculated financial ratios were transformed into a single score representing the overall company performance. The study's conclusion revealed that the performance scores of companies operating in the primary metal industry sector exhibited variability throughout the analysis period (Uygurtürk & Korkmaz, 2012). In a study aiming to measure and analyze the financial performance of companies listed in the BIST Primary Metal Index for the purpose of determining their competitiveness, the TOPSIS Analysis method was employed. The analysis results indicated that the financial performances of companies in the sector varied, and there was variability in the performance of companies between the years 2011 and 2015. The findings obtained from the study provide insights into how the financial health and competitiveness of companies in the sector can change over different time periods (Şit et al., 2017).

In a study examining the existence of this thesis in the Turkish Metal sector, based on the Balancing thesis, which suggests that more financial leverage will be tried to be balanced with lower operating leverage, predicting that both types of leverage will have a positive interaction with market risk, while expecting a negative relationship between operating and financial leverage, the authors examined 32 publicly traded companies in the Turkish Metal sector for the period 2005-2013. Findings show that companies in the sector do not use leverage for market risk stabilization (Ünal & Dube, 2017). In a study aimed at analyzing the financial performance of subsectors within the primary metal sector during the period 2014-2016, various financial performance criteria such as liquidity, financial structure, activity, and profitability ratios were used to evaluate the subsectors. In the study, Analytic Hierarchy Process (AHP) and TOPSIS methods were utilized. The authors determined that for each year, the most successful subsector was the one involved in the manufacturing of other products obtained in the initial processing of steel (Eyüboğlu & Bayraktar, 2019).

In a study aimed at evaluating the financial performance of primary metal industry firms in the Turkish iron and steel sector, fundamental criteria measuring financial performance such as liquidity, efficiency, profitability, and capital structure were employed. In the analysis of these data, the Analytic Hierarchy Process (AHP) method was employed, meticulously evaluating and weighting the criteria and sub-criteria. The main finding of the research is that the financial performance results obtained through the AHP method exhibit similarity with the ranking based on traditional closing prices. The authors highlight that the AHP method provides reliable and consistent results in financial performance evaluation, aligning well with traditional approaches (Acar & Sarıyer, 2021). In a study aimed at investigating the impact of the pandemic on the Turkish metal industry, 15 different criteria, including liquidity, profitability, cost, value, growth, capital structure, and activity ratios, were used. The research delves into how the economic effects of the COVID-19 pandemic have manifested in the overall financial performance of the sector and how this performance is assessed. In the study, the Entropy Method was employed to calculate criterion weights, and the MARCOS Method was used to rank companies based on the determined criteria. The author has noted that the financial performance of firms in this sector significantly affects the decision-making processes of both managers and capital market investors (Gönüllü, 2022).

2. Methodology

The scope of the study encompasses the relevant firms listed in the BIST Metal Primary Index (XMANA), BIST Stone Soil Index (XTAST), and BIST Industrial Index (XUSIN), which were active during the research period from 2010 to 2022. Out of the 23 firms listed in the BIST XMANA index, some firms were excluded from the analysis either because they were not operational throughout the entire period or they were not directly involved in construction-related production. As a result, a total of 8 firms were included in the analysis. The same situation applies to the XTAST index, where out of 24 firms, 10 were included in the analysis. For the XUSIN index, 13 firms were included. The firms that were not operational throughout the entire period are as follows:

Table 2. List of Companies Included in the Analysis:

Base Metal Index	Stone Soil Index	Industrial Index
BRSAN	AFYON	ANELE
BURCE	AKCNS	BRKSN
BURVA	BTCIM	CMBTN
CELHA	BSOKE	DOGUB
ERBOS	BUCIM	DYOBY
EREGL	CMENT	EPLAS
IZMDC	CIMSA	EGPRO
KRDMA	GOLTS	EGSER
	KONYA	GEREL
	NUHCM	INTEM
		MRSLH
		PRKAB
		USAK

The financial ratios used in the study are margin ratios (OPM and NPM), return ratios (ROA, ROE, RONA, and ROIC), leverage ratios (DOL, DR, DER, and ICR), liquidity ratios (Current, Quick, Cash), and cash conversion cycle (CCC). The profitability-related margin ratios are Operating Profit Margin (OPM) and Net Profit Margin (NPM). The return ratios include Return on Assets (ROA), Return on Net Assets (RONA), Return on Equity (ROE), Return on Investment (ROI), and Return on Invested Capital (ROIC). The leverage ratios consist of Degree of Operating Leverage (DOL), Debt Ratio (DR), Debt to Equity Ratio (DER), and Interest Coverage Ratio (ICR). The liquidity ratios encompass Current Ratio, Cash Ratio, and Quick Ratio. Finally, the study also utilized Receivables Turnover Ratio (RTR), Inventory Turnover Ratio (ITR), and Payables Turnover Ratio (PTR) along with Cash Conversion Cycle (CCC) derived from Receivables Collection Period (RCP), Inventory Turnover Period (ITP), and Payable Deferral Period (PDP). Below are the formulas for the ratios:

Table 3. Ratios and Their Formulas Used in the Study:

OPM=	Earnings before Interest and Taxes / Sales
NPM=	Net Profit / Sales
ROA=	Net Income / Total Assets
RONA=	Net Income / Net Assets
ROE=	Net Income / Equity
ROI=	Earnings before Interest and Taxes / Net Assets
ROIC=	Net Operating Profit After Tax (NOPAT) / Perpetual Capital (Equity + Long Liabilities)
DOL=	Δ % Earnings Before Interest and Tax / Δ % Revenue
DR=	Total Debt (Short Liabilities + Long Liabilities) / Total Assets
DER=	Total Debt (Short Liabilities + Long Liabilities) / Equity
ICR=	Earnings Before Interest and Tax / Financial Expenses

CR1=	Current Assets / Short Liabilities
CR2=	Stocks + Marketable Securities / Short Liabilities
QR=	Current Assets – Inventories / Short Liabilities
RTR=	Sales / Receivables
RCP=	365 x Receivables / Sales
ITR=	Cost of Sales / Inventories
ITP=	365 x Inventories / Cost of Sales
PTR=	Cost of Sales / Payables
PDP=	365 x Payables / Cost of Sales
CCC=	RCP + ITP - PDP

The data obtained within the scope of the research were analyzed with the SPSS 25 package program using linear regression method. In addition, to better understand the effects of certain variables in the light of the findings obtained as a result of the regression analysis, one-tailed bivariate correlation was applied where necessary. The models for the research are as follows:

a. Leverage and Profit Margins&Return Ratios
   1. $OPM_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   2. $NPM_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   3. $ROA_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   4. $RONA_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   5. $ROE_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   6. $ROI_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$
   7. $ROIC_t = \beta_0 + \beta_1 DOL_t + \beta_2 DR_t + \beta_3 DER_t + \beta_4 ICR_t + \varepsilon_t$

b. Liquidity Ratios and Profit Margins&Return Ratios
   1. $OPM_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   2. $NPM_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   3. $ROA_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   4. $RONA_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   5. $ROE_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   6. $ROI_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$
   7. $ROIC_t = \beta_0 + \beta_1 CR1_t + \beta_2 QR_t + \beta_3 CR2_t + \varepsilon_t$

c. Turnover Ratios and Profit Margins&Return Ratios
   1. $OPM_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   2. $NPM_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   3. $ROA_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   4. $RONA_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   5. $ROE_t = \beta_0 + \beta_1 RTR + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   6. $ROI_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$
   7. $ROIC_t = \beta_0 + \beta_1 RTR_t + \beta_2 ITR_t + \beta_3 PTR_t + \beta_4 CCC_t + \varepsilon_t$

Table 4. Expansions of Abbreviations in the Equation:

OPM_t:	Operating Profit Margin on t date	DER_t:	Debt to Equity Ratio on t date
NPM_t:	Net Profit Margin on t date	ICRt:	Interest Coverage Ratio on t date
ROA_t:	Return on Assets on t date	CR1t:	Current Ratio on t date
$RONA_t$:	Return on Net Assets on t date	QRt:	Quick Ratio on t date
ROE_t:	Return on Equity on t date	CR2t:	Cash Ratio on t date
ROI_t:	Return on Investment on t date	RTRt:	Receivables Turnover Ratio on t date
$ROIC_t$:	Return on Invested Capital on t date	ITRt:	Inventory Turnover Ratio on t date
DOL_t:	Degree of Operating Leverage on t date	PTRt:	Payables Turnover Ratio on t date

DR_t:	Debt Ratio on t date	CCCt:	Cash Conversion Cycle on t date

3. Findings

Below are descriptive statistics on profit margins, return rates, leverage ratios, liquidity ratios and turnover rates.

Table 5. Descriptive Statistics of Primary Metal Industry (2010-2022)

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OPM	104	0,078	0,090	0,400	0,237	1,363	0,469
NPM	104	0,031	0,088	-0,295	0,237	1,651	0,469
ROA	104	0,028	0,071	0,008	0,237	0,303	0,469
RONA	104	0,029	0,150	-1,240	0,237	3,672	0,469
ROE	104	-0,010	0,315	-2,811	0,237	9,503	0,469
ROI	104	0,135	0,173	1,713	0,237	4,537	0,469
ROIC	104	0,105	0,132	1,580	0,237	4,032	0,469
DOL	104	11,300	137,244	8,641	0,237	86,210	0,469
DR	104	0,567	0,171	0,306	0,237	-0,552	0,469
DER	104	2,202	3,155	4,448	0,237	25,853	0,469
ICR	104	5,593	23,088	8,315	0,237	75,165	0,469
Current	104	1,478	0,678	0,822	0,237	-0,443	0,469
Quick	104	0,811	0,453	1,128	0,237	0,486	0,469
Cash	104	0,295	0,307	1,786	0,237	2,863	0,469
RTR	104	8,556	8,862	3,702	0,237	15,445	0,469
ITR	104	3,601	1,731	1,301	0,237	2,619	0,469
PTR	104	12,016	18,143	3,697	0,237	17,594	0,469
CCC	104	118,510	108,805	1,522	0,237	3,015	0,469

Table 6. Descriptive Statistics of Cement Industry (2010-2022)

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OPM	130	0,107	0,107	-1,338	0,212	3,844	0,422
NPM	130	0,057	0,195	-2,617	0,212	9,639	0,422
ROA	130	0,056	0,100	-0,525	0,212	2,143	0,422
RONA	130	0,069	0,165	-1,678	0,212	8,782	0,422
ROE	130	-0,180	2,845	-8,953	0,212	91,127	0,422
ROI	130	0,103	0,106	0,447	0,212	1,483	0,422
ROIC	130	0,081	0,082	0,315	0,212	1,219	0,422
DOL	130	-65,045	921,633	-11,221	0,212	127,370	0,422
DR	130	0,393	0,197	0,997	0,212	0,684	0,422
DER	130	1,702	9,713	8,004	0,212	76,842	0,422
ICR	130	13,096	55,822	6,705	0,212	47,018	0,422
Current	130	2,014	1,399	1,737	0,212	4,882	0,422
Quick	130	1,523	1,120	1,928	0,212	5,784	0,422
Cash	130	0,600	0,881	2,973	0,212	10,520	0,422
RTR	129	24,904	231,894	11,357	0,213	128,991	0,423
PTR	130	5,478	2,586	1,037	0,212	0,879	0,422
ITR	130	7,102	10,736	8,124	0,212	69,709	0,422
CCC	129	74,500	47,268	-0,471	0,213	0,554	0,423

Table 7. Descriptive Statistics of Primary Substitution Industry (2010-2022)

Descriptive Statistics							
	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OPM	169	0,021	0,191	-3,370	0,187	13,369	0,371
NPM	169	-0,023	0,249	-5,231	0,187	36,513	0,371
ROA	169	0,022	0,073	0,682	0,187	2,187	0,371
RONA	169	0,056	0,632	1,601	0,187	40,528	0,371
ROE	169	-0,024	1,123	-10,473	0,187	126,557	0,371

ROI	169	0,211	1,335	7,280	0,187	66,610	0,371
ROIC	169	0,164	1,046	7,332	0,187	68,611	0,371
DOL	169	4,813	57,409	-2,866	0,187	48,580	0,371
DR	169	0,636	0,241	0,436	0,187	0,840	0,371
DER	169	1,538	21,857	-8,199	0,187	107,673	0,371
ICR	164	14,379	82,496	10,339	0,190	117,232	0,377
Current	169	1,445	1,071	5,625	0,187	41,949	0,371
Quick	169	1,027	0,555	2,534	0,187	14,585	0,371
Cash	169	0,213	0,396	7,868	0,187	79,580	0,371
RTR	169	5,335	7,467	4,195	0,187	18,316	0,371
PTR	169	20,936	206,480	12,992	0,187	168,855	0,371
ITR	169	14,724	27,143	2,783	0,187	7,144	0,371
CCC	169	99,986	144,711	0,481	0,187	6,489	0,371

When examining descriptive statistics, the average operating profit margin for companies in the metal sector is approximately 8%, whereas it is around 11% for the cement sector. The net profit margins, on the other hand, are around 3% for the metal sector and approximately 6% for the cement sector. In terms of return of asset, the cement sector is approximately twice that of the metal sector (5.6% and 2.8% respectively). Companies in the cement and metal sectors have ROI and ROIC ratios at approximately 10%. In terms of equity returns, all three sectors have negative values (metal sector: -1%, cement sector: -18%, and substitute sector: 2.4%). The mentioned ratio for the cement sector has been subjected to explanatory rationale through regression and correlation analyses below to reach insightful conclusions. Furthermore, the Debt Ratio (DR) and Debt-to-Equity Ratio (DER) for the metal and cement sectors also provide hints in this regard. For instance, companies in the metal sector have a total liability to total equity ratio of approximately 2, while the same ratio is 1.7 for the cement sector. And the Debt-to-Total-Assets Ratio is 56.7% for the metal sector and 39.3% for the cement sector. It is evident that the leverage utilization ratios significantly differ between the sectors. Examining the effects of these policies on capital structure in more detail through regression analyses can provide more explanatory findings regarding the outcomes of these preferences. The working capital ratio is approximately 1.5 for the metal sector, whereas it is around 2 for the cement sector. Additionally, the cash ratios are 29.5% and 60% respectively, indicating a notable difference between the sectors from an industry perspective. Lastly, the cash conversion cycles for the firms are 118.5 days for the metal sector, 74.5 days for the cement sector, and approximately 100 days for the substitute sector.

Below are the results of the factor analysis for the sectors. As seen from Table 8, the Kaiser-Meyer-Olkin (KMO) values are 71.4% for the first sector, 63.7% for the second sector, and 52.2% for the third sector:

Table 8. KMO and Bartlett's Test Values of the Sectors

KMO and Bartlett's Test		**Metal**	**Cement**	**SUB**
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,714	,637	,522
Bartlett's Test of Sphericity	Approx. Chi-Square	2687,895	3590,898	3024,152
	Df	153	153	153
	Sig.	,000	,000	,000

The explained total variance, according to the conducted factor analysis, is shown in Table X. According to this, a total of 5 factors have been created for the metal sector, while 6 factors have been identified for both the cement and substitute sectors. The cumulative values are 81.8% for the metal index, 81.2% for the cement index, and 71.7% for the substitute sector.

Table 9. Values of Total Variance Explained

Total Variance Explained									
Metal Ind.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	6,812	37,842	37,842	6,812	37,842	37,842	4,010	22,279	22,279
2	3,360	18,668	56,509	3,360	18,668	56,509	3,952	21,958	44,236
3	1,960	10,890	67,400	1,960	10,890	67,400	3,103	17,237	61,473
4	1,502	8,344	75,744	1,502	8,344	75,744	1,987	11,037	72,511
5	1,094	6,077	81,821	1,094	6,077	81,821	1,676	9,310	81,821
Cement Ind.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	5,779	32,107	32,107	5,779	32,107	32,107	4,623	25,684	25,684
2	3,483	19,348	51,455	3,483	19,348	51,455	3,277	18,205	43,889
3	1,893	10,518	61,973	1,893	10,518	61,973	2,482	13,791	57,680
4	1,321	7,339	69,312	1,321	7,339	69,312	2,030	11,279	68,959
5	1,138	6,322	75,634	1,138	6,322	75,634	1,171	6,505	75,465
6	1,008	5,599	81,233	1,008	5,599	81,233	1,038	5,768	81,233
Sub Ind.	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	3,883	21,574	21,574	3,883	21,574	21,574	3,151	17,506	17,506
2	3,077	17,093	38,667	3,077	17,093	38,667	2,789	15,492	32,998
3	2,355	13,084	51,751	2,355	13,084	51,751	2,710	15,053	48,051
4	1,295	7,194	58,945	1,295	7,194	58,945	1,632	9,068	57,120
5	1,225	6,806	65,751	1,225	6,806	65,751	1,407	7,816	64,935
6	1,076	5,975	71,726	1,076	5,975	71,726	1,222	6,791	71,726

When examining the rotated component matrix for the companies in the metal index, it can be observed that the return rates and leverage ratios form distinct two groups of factors. In the cement sector, what stands out is that the profit margins and return rates form a closely related group of factors. In the substitute sector, the profit margins and return rates roughly create three main factor groups.

Table 10. Values of Rotated Component Matrix

Rotated Component Matrix[a] METAL					
	1	2	3	4	5
Cash	,881				
Quick	,866				
Current	,851				
DR	-,698	-,557			
NPM	,583	,580	,437		
ROE		,940			
RONA		,879			
DER		-,781	,466		
ROA	,519	,702	,415		
ROIC			,938		
ROI			,936		
OPM	,522		,607		
CCC				,885	
ITR				-,709	
DOL				,617	

PTR					,735
ICR					,695
RTR		-,409			,637

Rotated Component Matrix[a] CEMENT						
	1	**2**	**3**	**4**	**5**	**6**
ROIC	,951					
ROI	,950					
OPM	,884					
ROA	,854					
RONA	,791		,482			
NPM	,745		,415			
Cash		,954				
Quick		,942				
Current		,925				
DR		-,549		-,513		
ROE			,964			
DER			-,964			
CCC				,845		
PTR				,733		
ITR					,944	
DOL						,647
RTR				-,441		,643
ICR						

Rotated Component Matrix[a] SUB						
	1	**2**	**3**	**4**	**5**	**6**
Current	,933					
Quick	,918					
Cash	,897					
DR	-,609					
NPM		,919				
OPM		,915				
ROA		,810				
ROI			,973			
ROIC			,968			
DER			-,673			
ROE				,795		
RONA			,493	,653		
DOL				,611		
ITR					,703	
CCC		-,521			-,626	
PTR					-,497	
RTR						,828
ICR						-,456

3.1. Primary Metal Sector

For the primary metal-producing firms in the construction sector, significant results were obtained between leverage ratios and profitability indicators, as shown in Table 11. The explanatory power of the models for ROE and ROA, from these models, is 55% and 44.4%, respectively[1].

Table 11. Primary Metal Sector – Leverage Ratios – ANOVA

ANOVA	**OPM**	**NPM**	**ROA**	**RONA**	**ROE**	**ROI**	**ROIC**

[1] Detailed analysis results are available in Appendix-A.

Sig. Values	.000	.000	.000	.000	.000	.000	.000
Adjusted R^2	%22.4	39.7%	44.4%	43.2%	55%	38%	36.4%

According to the findings obtained from the models formulated for the primary metal sector, there is an insignificant relationship between ICR and DER and profitability indicators. However, the relationship between DR and profitability indicators shows a clear and negative correlation. Accordingly, an increase of 1 unit in the ratio of total liabilities to total assets, in other words, the ratio of long and short-term liabilities to total assets, results in a decrease of 31.6% in OPM and 39.4% in NPM. And the aforementioned change leads to a decrease of 30.1% in ROA, 33.7% in RONA, 35.4% in ROE, 34.3% in ROI, and 26% in ROIC.

Table 12. Primary Metal Sector – Leverage Ratios – Coefficients

Coefficients	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
DR* Sig. / B	.000/-31.6%	.000/-39.4%	.000/-30.1%	.001/-33.7%	.048/-35.4%	.003/-34.3%	.004/-26%
ICR* Sig. / B	.013/0.1%	p>0.05	.013/0.1%	.043/0.1%	.028/0.2%	.000/0.4%	.000/0.3%
DER* Sig. / B	p>0.05	p>0.05	p>0.05	.002/-1.6%	.000/-5.9%	.000/3.2%	.000/2.4%

In this context, a correlation analysis has been conducted to examine the relationship between short-term liabilities (SL), long-term liabilities (LL), equity (EQ), and sales, gross profit, operating profit, earnings before interest and taxes, and net profit. The findings obtained from the analysis, as shown in Table 13, indicate a positive and significant relationship between equity and all variables. However, for short-term liabilities, a negative and significant relationship is observed. There doesn't appear to be any significant relationship with long-term liabilities. A 1,000 TL increase in equity of the companies in the primary metal sector leads to an increase of 265 TL (p-value .003) in sales, 300 TL (p-value .001) in gross profit, 299 TL (p-value .001) in earnings before interest and taxes (EBIT), and 334 TL (p-value .000) in net income. On the other hand, a 1,000 TL increase in short-term liabilities of these companies leads to a decrease of 241 TL (p-value .007) in sales, 271 TL (p-value .003) in gross profit, 268 TL (p-value .003) in earnings before interest and taxes (EBIT), and 297 TL (p-value .001) in net income.

Table 13. Correlation Between EQ/SL/LL with Sales/Gross Profit/EBIT/Net Profit

		EQ	LL	SL
Sales	Pearson Correlation	,265	-,044	-,241
	Sig. (1-tailed)	,003	,328	,007
	N	104	104	104
		EQ	**LL**	**SL**
Gross Profit	Pearson Correlation	,300	-,054	-,271
	Sig. (1-tailed)	,001	,293	,003
	N	104	104	104
		EQ	**LL**	**SL**
EBIT	Pearson Correlation	,299	-,058	-,268
	Sig. (1-tailed)	,001	,281	,003
	N	104	104	104
		EQ	**LL**	**SL**
Net Profit	Pearson Correlation	,334	-,069	-,297
	Sig. (1-tailed)	,000	,244	,001
	N	104	104	104

Therefore, based on this correlation, during periods when equity increases and short-term liabilities decrease, ceteris paribus, we can expect the hypothesis to be partially confirmed to some extent. The increase in equity ratio and the decrease in short-term liabilities ratio within total resources can be correlated with a significant increase in net income during the years 2010-11 and 2017-18, as depicted in the graphs 3-4 below. However, despite fulfilling this condition, it can be observed that the validity of this assumption was violated during the years 2014-15. Again, during the years 2018-19, when the equity ratio decreased and the short-term liabilities ratio increased, it can be observed that there was a significant decrease in net income in line with the hypothesis. However, during the years 2015-16 and 2020-21, despite fulfilling this condition, the expected outcome could not be achieved. Given the well-known fact that clear causations cannot be established, especially in social sciences, and considering the complexity of the analysis, it is important to refrain from direct interpretation. However, it can be stated that the effects of long-term liabilities are certainly evident during both correlated and uncorrelated periods, without making definitive claims. On the other hand, since it is not possible to include the effects of foreign exchange and interest rates, demand, input costs and political and economic conjuncture in the relevant periods, in the end of the day it would not be entirely wrong to say that the capital structure in general, or the ratio of short-term liabilities and equities in particular, have a partial explanatory power in terms of net profit, earnings before interest and tax, gross profit and sales of the companies operating in the basic metal sector for construction.

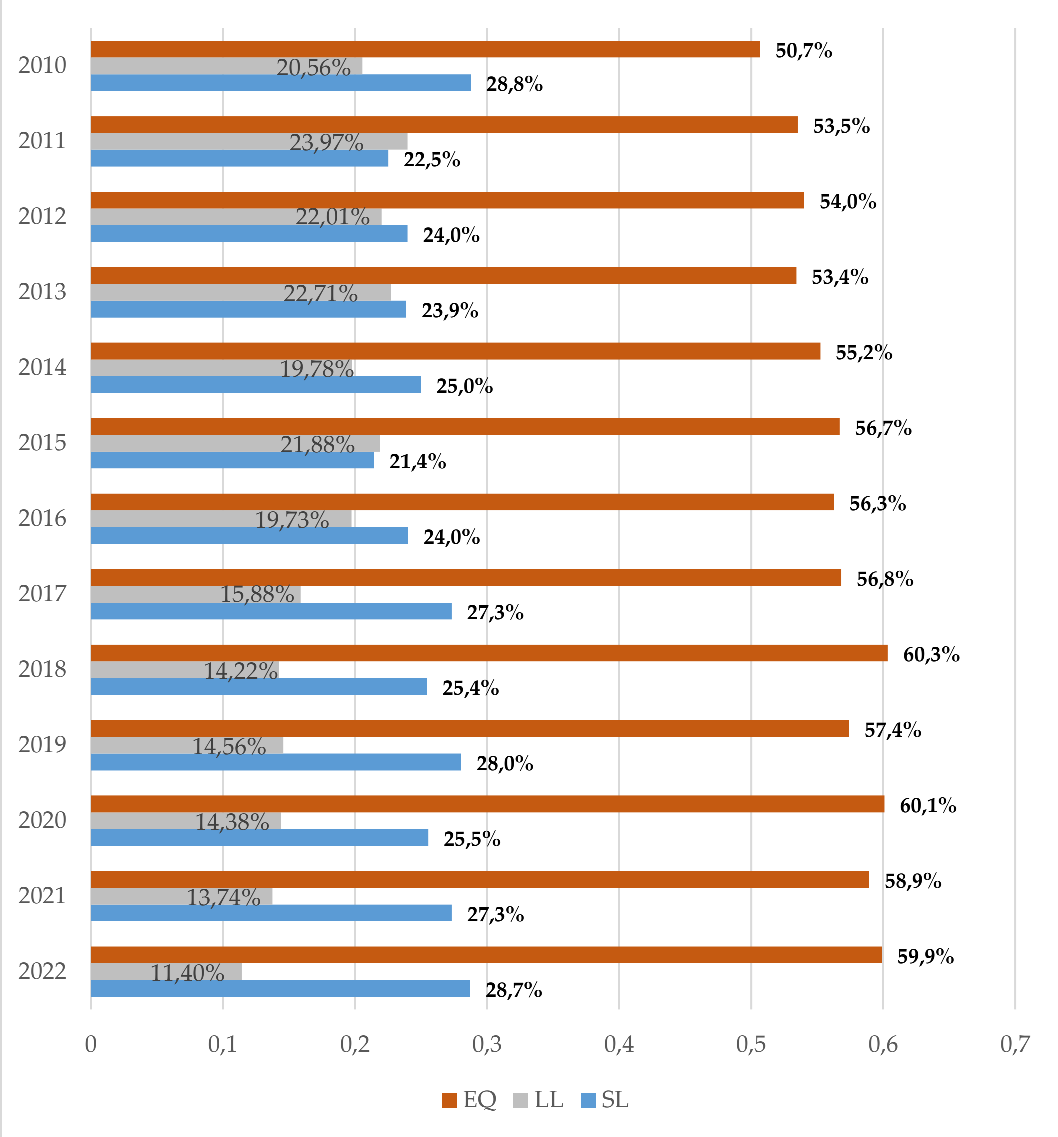

Figure 3. Short-Term Liabilities, Long-Term Liabilities and Equities by years

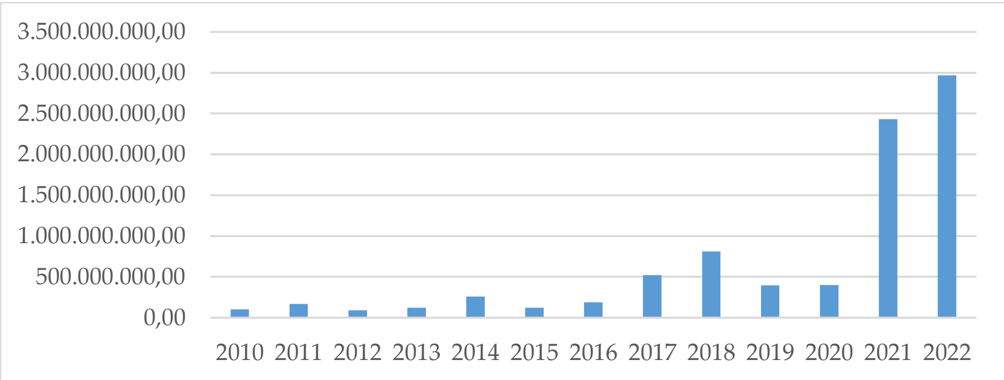

Figure 4. Net Profit by years

The relationship between the liquidity ratios of the primary metal producer companies for the construction sector and their profit margin and return rates is as shown in Table 14-15:

Table 14. Primary Metal Sector – Liquidity Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.000	.000	.000	.000	.000	.004	.002
Adjusted R^2	37.4%	49.2%	52.1%	35.2%	22.5%	10%	10.9%

Table 15: Primary Metal Sector – Liquidity Ratios – Coefficients

Coefficients	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Quick* Sig. / B	.000/13.7%	.000/16.9%	.000/16.4%	.000/31.4%	.001/50.6%	.001/29.8%	.000/23.5%
Current* Sig. / B	p>0.05	.037/-3.9%	p>0.05	p>0.05	p>0.05	.005/-14%	.004/-10.9%
Cash* Sig. / B	p>0.05	p>0.05	p>0.05	.027/-15.2	.049/-30.9%	p>0.05	p>0.05

As indicated in Table 14, there is a significant relationship between liquidity ratios and all profitability and return ratios. According to this, in terms of explaining the variance, ROA has a power of 52.1% and NPM has a power of 49.2%. Significant findings related to the current ratio and cash ratio are not of substantial magnitude and are not correlated with all variables. According to Table 15, the quick ratio is significantly and positively correlated with all profitability ratios. According to the relationship, a 1-unit increase in the quick ratio leads to an increase of approximately 13.4% in OPM, 16.9% in NPM, and 16.4% in ROA. And this situation results in an increase of approximately 31.4% in RONA, 29.8% in ROI, and 23.5% in ROIC. An increase of 1 unit in the quick ratio, which corresponds to a 1 unit increase in current assets excluding inventory relative to short-term liabilities, results in a 50.6% increase in ROE.

There is a significant relationship between inventory turnover ratios and all variables for the firms in the primary metal sector, as indicated in Tables 16 and 17; however, there is no substantial relationship observed.

Table 16. Primary Metal Sector – Turnover Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.012	.001	.000	.000	.000	.000	.000
Adjusted R^2	8.5%	13.8%	18%	22.7%	25.5%	16.2%	15.7%

Table 17. Primary Metal Sector – Turnover Ratios – Coefficients

Coefficients	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
RTR* Sig. / B	.000/-0.2%	.001/-0.3	.000/-0.3%	.000/-0.9%	.000/-1.9%	p>0.05	p>0.05
PTR* Sig. / B	.048/0.2%	.028/0.1%	.002/0.1%	p>0.05	p>0.05	.000/0.4%	.000/0.3%
ITR* Sig. / B	.005/-1.6%	.020/-1.4%	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05
CCC*Sig. / B	.013/0%	.001/0%	.002/0%	.019/0%	p>0.05	.041/0%	.042/0%

3.2. *Cement Sector*

No significant relationship could be identified between leverage ratios and OPM, ROI, and ROIC in the cement sector based on stone and soil. There is a significant relationship between leverage ratios and NPM, ROA, RONA, and ROE. According to the regression analysis, except for one exception (ROE and DR), all relationships between these four ratios and DR and DER are negatively correlated. According to this, a decrease of 1 unit in the total debt to total equity ratio leads to an increase of 0.504 units in NPM and ROA, and an increase of 0.325 units in RONA. Additionally, a 1-unit increase in ROE results in a 0.573-unit increase. An increase of 1 unit in the total debt to equity ratio results in a very small change in NPM, ROA, and RONA (-0.005, -

0.005, and -0.006 respectively), while it leads to a decrease of 0.295 units in ROE. The findings from the regression analysis indicate a significant relationship between the short and long-term debts of the companies and their equities, suggesting a notable connection between the capital structure and profitability ratios.

Table 18. Cement Sector – Leverage Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.133	.000	.000	.000	.000	.535	.486
Adjusted R^2	p>0.05	38.6%	30%	35.3%	98.7%	p>0.05	p>0.05

Table 19. Cement Sector – Leverage Ratios – Coefficients

Coefficients	NPM	ROA	RONA	ROE
DR* Sig. / B	.000/-50.4%	.000/-50.4%	.000/-32.5%	.000/57.3%
DER* Sig. / B	.001/-0.5%	.001/-0.5%	.000/-0.6%	.000/-29.5%

In this context, when examining the relationship between net income and resources, it is observed that long-term liabilities have a negative correlation with net income (-50.5%), while short-term liabilities (10.6%) contribute relatively weaker to net income compared to equity (42.4%).

Table 20. Regression between Net Profit and SL/LL/EQ

MODEL SUMMARY				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,924[a]	,854	,850	177809509,385

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23241666824326873000	3	7747222274775624700	245,039	,000[b]
	Residual	3983643925113532400	126	31616221627885176		
	Total	27225310749440406000	129			

COEFFICIENTS[A]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-163017993,224	24206064,743		-6,735	,000
	SL	,106	,041	,165	2,591	,011
	LL	-,505	,055	-,396	-9,238	,000
	EQ	,424	,029	,810	14,693	,000

a. Dependent Variable: Net Profit

b. Predictors: (Constant), SL, LL, EQ

The relationship can also be understood from the graph below, which shows that during periods when the long-term debt ratio increases and the equity ratio decreases, there is a decreasing effect on net income.

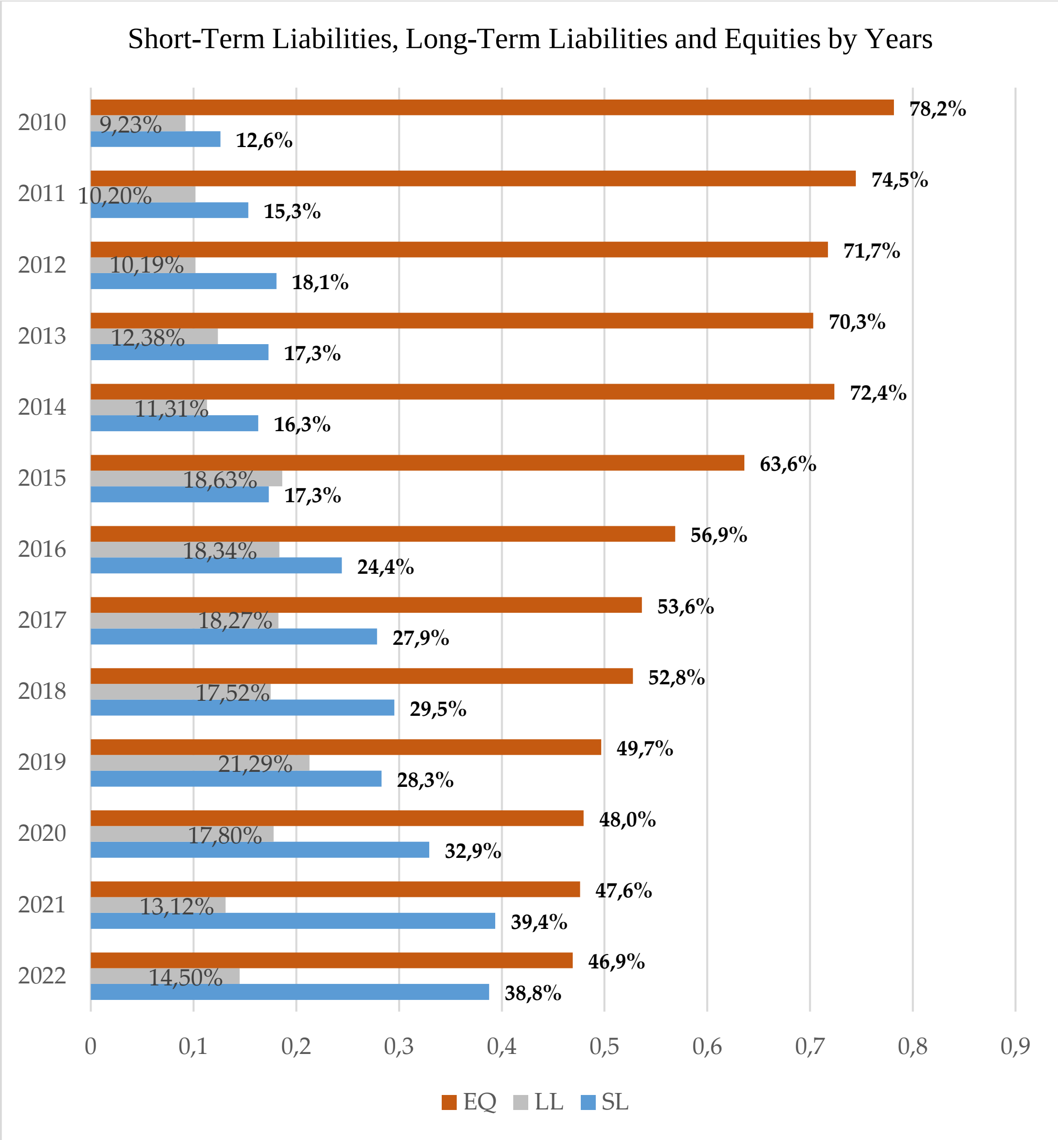

Figure 5. Short-Term Liabilities, Long-Term Liabilities and Equities by years

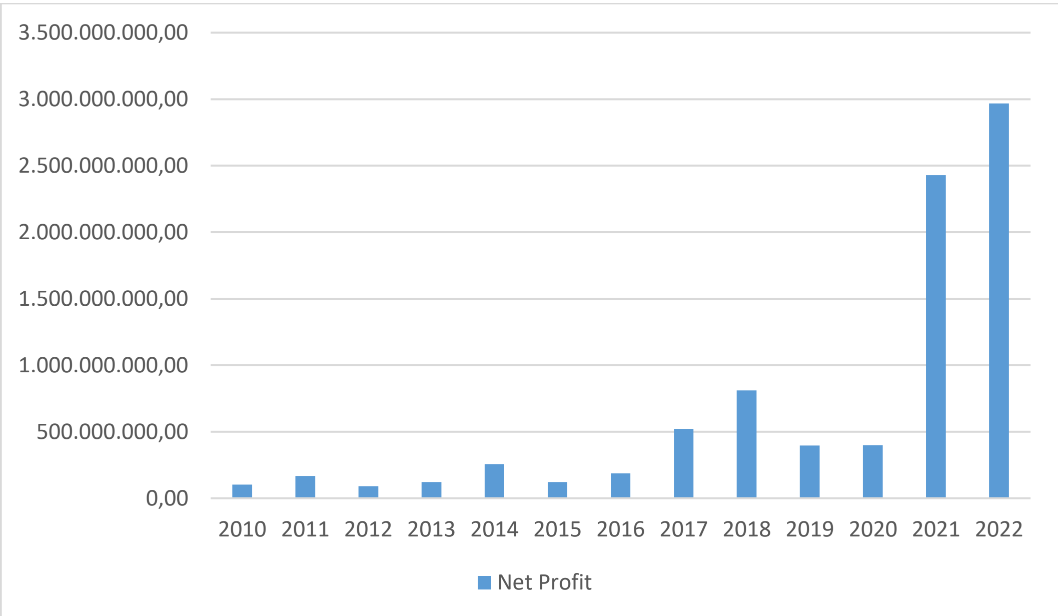

Figure 6. Net Profit by years

When examining the liquidity ratios of the companies in the cement sector, it can be observed that they are related to NPM, ROA, and RONA. However, there is no significant relationship with OPM, ROE, ROI, and ROIC (0.377, 0.415, 0.299, and 0.267 respectively). Nevertheless, considering the coefficients and adjusted R-squared values of the related ratios (with explanatory power of models being 9.6%, 9.3%, and 5.8% respectively), this relationship does not seem to possess substantial significance.

Table 21. Cement Sector – Liquidity Ratios – ANOVA

ANOVA	**OPM**	**NPM**	**ROA**	**RONA**	**ROE**	**ROI**	**ROIC**
Sig. Values	.377	.001	.002	.015	.415	.299	.267
Adjusted R^2	p>0.05	9.6%	9.3%	5.8%	p>0.05	p>0.05	p>0.05

However, the findings regarding the relationship between ROA and liquidity indicate that as the current assets increase as a second factor, NPM decreases. In other words, with a significance level of 0.009, for every 1-unit increase in the ratio of current assets to short-term liabilities, there is a corresponding decrease of approximately 0.061 in the net income to asset ratio. This situation, with short-term liabilities being constant, might indicate a sluggishness in current assets, which in turn could lead to a decrease in financing income. The findings up to this point suggest that both financing income and financing expenses may not be well managed by the companies in the cement sector. Indeed, a positive relationship (Pearson coefficient 41.6%) has been observed between financing income and net profit, while a negative relationship (Pearson coefficient 22.6%) has been observed between financing income and financing expenses.

Table 22. Correlation between Net Profit with Financial Incomes/Expenses

CORRELATIONS				
		Financing Incomes	Financing Expenses	Net Profit
Financing Incomes	Pearson Correlation	1	-,226**	,416**
	Sig. (2-tailed)		,010	,000
Financing Expenses	Pearson Correlation	-,226**	1	,082
	Sig. (2-tailed)	,010		,356
Net Profit	Pearson Correlation	,416**	,082	1
	Sig. (2-tailed)	,000	,356	
***. Correlation is significant at the 0.01 level (2-tailed).*				
b. Listwise N=130				

A similar pattern is evident in the relationship between turnover ratios and profitability indicators as shown in the table below. Although there appears to be a relationship between NPM and ROA with turnover ratios, the explanatory power of the models is quite weak (15.1% and 11.3%, respectively). There is no significant relationship between OPM, RONA, ROE, ROI, and ROIC with turnover ratios.

Table 23. Cement Sector – Turnover Ratios – ANOVA

ANOVA	**OPM**	**NPM**	**ROA**	**RONA**	**ROE**	**ROI**	**ROIC**
Sig. Values	.285	.000	.000	.082	.825	.519	.482
Adjusted R^2	p>0.05	15.1%	11.3%	p>0.05	p>0.05	p>0.05	p>0.05

3.3. Primary Substitution Sector

Significant findings have been obtained between leverage ratios related to integrated primary substitutes in the construction sector and profit margins and return ratios, except for ROA (p-value .44). The explanatory power of the model for ROI is 35.5%, for ROIC is 32.9%, and for ROE is 24.8%.

Table 24. Substitution Sector – Leverage Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.001	.004	.440	.000	.000	.000	.000
Adjusted R^2	9.5%	6.7%	p> 0.05	10.8%	24.8%	35.5%	32.9%

In the context of leverage ratios for the primary substitute sector, a partial and not statistically significant relationship has been identified between DER and DOL. However, according to the findings, a 1-unit increase in the ratio of total liabilities to total assets leads to a 0.271 increase in OPM, 0.311 increase in NPM, 1.045 increase in ROI, and 0.818 increase in ROIC. Based on this, it can be inferred that in contrast to the previously examined primary metal and cement firms, in the case of integrated primary substitute firms, it is the short and long-term liabilities rather than equity that exhibit a significant and positive relationship with some of the mentioned profitability ratios. In both the primary metal and cement sectors, a negative relationship has been identified between the debt ratio (DR) and profitability ratios. This suggests that the cost of borrowing is significantly higher than the cost of equity and has a detrimental impact on profitability ratios.

Table 25. Substitution Sector – Leverage Ratios – Coefficients

Coefficients	OPM	NPM	RONA	ROE	ROI	ROIC
DR* Sig. / B	.000 / 27.1%	.000 / 31.1%	p> 0.05	p> 0.05	.003 / 104.5%	.004 / 81.8%
DER* Sig. / B	p> 0.05	p> 0.05	.003 / -0.7%	.000 / -2.5%	.000 / -3.5%	.000 / -2.6%
DOL* Sig. / B	p> 0.05	p> 0.05	.002 / 0.3%	p> 0.05	p> 0.05	p> 0.05

Regression results regarding the relationship between profitability ratios and liquidity ratios for the construction primary and substitute sector are shown in the table. According to this, p-value for OPM, NPM, and ROA with liquidity ratios is 0.00 for all three ratios. The explanatory power of the model is indicated by the R-squared values, which are 36.5% for OPM and 37.4% for NPM.

Table 26. Substitution Sector – Liquidity Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.000	.000	.000	.979	.501	.431	.440
Adjusted R^2	36.5%	37.4%	11.5%	p> 0.05	p> 0.05	p> 0.05	p> 0.05

According to Table 27, there is a negative and significant relationship between current ratio and profitability ratios. In other words, a 1 unit increase in the current ratio leads to a decrease of 0.181 in OPM, 0.259 in NPM, and 0.026 in ROA. On the other hand, there is an opposite relationship between these profitability ratios and the quick ratio. In other words, a 1 unit increase in the quick ratio leads to an increase of 0.345 in OPM, 0.49 in NPM, and 0.094 in ROA. Considering these two liquidity ratios, that is, an increase in the ratio of current assets to short-term liabilities enhances profitability ratios, whereas an increase in the ratio of quick assets to short-term liabilities reduces the same profitability ratios.

Table 27. Substitution Sector – Liquidity Ratios – Coefficients

Coefficients	OPM	NPM	ROA
Current* Sig. / B	.000 / -18.1%	.000 / -25.9%	.014 / -2.6%
Quick* Sig. / B	.000 / 34.5%	.000 / 49%	.000 / 9.4%
Cash* Sig. / B	.020 / -11.8%	p> 0.05	p> 0.05

In the context of the primary substitution sector, except for the relationships between turnover ratios and OPM and NPM, no significant relationships have been observed. As shown in Table 28, 32.2% of the variance in the constructed models can be explained by OPM, and 32.6% by NPM. Looking at the coefficients, it can be observed that there is a negative but very low (0.001) relationship between NPM and CCC. Similarly, there is a negative and statistically insignificant relationship (0.001) between OPM and ITR as well as CCC.

Table 28. Substitution Sector – Turnover Ratios – ANOVA

ANOVA	OPM	NPM	ROA	RONA	ROE	ROI	ROIC
Sig. Values	.000	.000	.072	.953	.990	.517	.520
Adjusted R^2	32.2%	32.6%	p>0.05	p>0.05	p>0.05	p>0.05	p>0.05

Table 29. Substitution Sector – Turnover Ratios – Coefficients

Coefficients	OPM	NPM
ITR* Sig. / B	.002 / -0.1%	p>0.05
CCC* Sig. / B	.000 / -0.1%	.000 / -0.1%

4. Conclusion

The construction industry continues its evolution for the world and Turkey, in line with the changing needs and infrastructure requirements due to the increasing population, as well as the extraordinary needs occurring globally and regionally. While that sector, which represents a huge sector, is exposed to macroeconomic effects, on the other hand, it tries to cope with both systematic and non-systematic risks with a more efficient business management. The construction sector, as discussed in this study, is basically a sector dependent on metals such as cement and iron and steel. Turkey has a production that will rank first in the world in terms of both cement and base metal production (as of 2022, it is 5th in the world in cement production and 8th in the world in metal production). However, these huge sectors and their productions continue under certain conditions as of the recent and current period. At the forefront of these is energy expenses, while many global events and phenomena seriously affect this process. In the cement sector, approximately 60% of the costs consist of energy expenses, and approximately 10% labor and 10% raw material costs (Yıldırım & Arıöz, 2013). For example, energy costs are around 35% in India, the world's second largest cement producer (Burange & Yamini, 2009). Energy expenses are based on fossil fuels as well as electricity, and while energy expenses constitute the most important input costs for companies, on the other hand, energy represents a remarkable risk due to the fact that price volatility is a very high item in Turkey. Another issue is that the industry is cyclical in nature, as the market and consumption are tightly associated with economic and climatic cycles. This circular nature combines with factors such as economies of scale, operational efficiency, centrally controlled distribution systems and geographic diversity (Burange & Yamini, 2009). In this respect, this situation also represents a systematic risk for the construction industry in Turkey and geographies like it, where seasons are evident. On the other hand, research shows that the pandemic directly affects a large number of sectors. The first of these is naturally the metal sector (Gönüllü, 2022). However, the construction sector is a sector that provides added value to the country's economies in particular or in many sectors, and also requires high capital and is seriously affected by the general economic conditions (Şit, Ekşi, & Hacıevliyagil, 2017).

Considering the leverage ratios of companies in the metal sector, in particular, the findings obtained from the study indicate that equities are positive and short-term liabilities point to a negative and significant relationship, in other words, the increase in the equity of the companies contributes to the positive profitability indicators in general. A similar situation is also valid for the cement sector. It is understood that while long-term liabilities have a negative effect on the profit for the period in the mentioned sector, the equity has a significant positive effect. On the other hand, ROE values were found to be negative for all three sectors examined within the scope of the study. At this point, it seems possible that the equity ratio in the capital structure of the firms, and the external resource costs and equity costs have obviously affected the efficiency, productivity and performance of the firms. In addition, it can be expected that the composition of internal and external resources in terms of capital structure, as well as the costs of internal and external resources, will more clearly affect the picture in the analyzed 12 years, regarding the combination of the demand for housing needs and the demand that emerged after the earthquake.

Contribution Rate and Conflict of Interest Statement

All stages of the study were designed by the author(s) and contributed equally. There is no conflict of interest in this article.

Ethics Statement and Financial Support

Ethics committee principles were followed in the study. Ethics Committee Report is not required in the study. There has been no situation requiring permission within the framework of intellectual property and copyrights.

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Appendix-A

CONSTRUCTION PRIMARY METAL INDUSTRY

OPERATING PROFIT MARGIN

OPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,505[a]	,255	,224	,079201652239790

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,212	4	,053	8,451	,000[b]
	Residual	,621	99	,006		
	Total	,833	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,238	,033		7,202	,000
	DOL	6,970E-5	,000	,106	1,217	,226
	DR	-,316	,066	-,603	-4,764	,000
	DER	,006	,004	,216	1,704	,091
	ICR	,001	,000	,222	2,543	,013

a. Dependent Variable: OPM

b. Predictors: (Constant), ICR, DOL, DER, DR

OPM*Liquidity

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,626[a]	,392	,374	,071176837236133

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,326	3	,109	21,479	,000[b]
	Residual	,507	100	,005		
	Total	,833	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,008	,018		,454	,651
	Current	-,040	,021	-,300	-1,902	,060
	Quick	,137	,037	,691	3,659	,000
	Cash	,060	,040	,206	1,513	,133

a. Dependent Variable: OPM

b. Predictors: (Constant), Cash, Current, Quick

OPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,347[a]	,120	,085	,086048635073142

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,100	4	,025	3,377	,012[b]
	Residual	,733	99	,007		
	Total	,833	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,167	,033		5,118	,000
	RTR	-,002	,001	-,207	-2,002	,048
	PTR	,002	,001	,315	2,888	,005
	ITR	-,016	,006	-,311	-2,523	,013
	CCC	,000	,000	-,321	-2,508	,014

a. Dependent Variable: OPM
b. Predictors: (Constant), CCC, RTR, PTR, ITR

NET PROFIT MARGIN

NPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,648[a]	,420	,397	,068563492846935

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,338	4	,084	17,949	,000[b]
	Residual	,465	99	,005		
	Total	,803	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,240	,029		8,383	,000
	DOL	6,644E-7	,000	,001	,013	,989
	DR	-,394	,058	-,766	-6,860	,000
	DER	,005	,003	,177	1,591	,115
	ICR	,001	,000	,149	1,929	,057

a. Dependent Variable: NPM
b. Predictors: (Constant), ICR, DOL, DER, DR

NPM*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,712[a]	,507	,492	,062899817429370

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,407	3	,136	34,313	,000[b]
	Residual	,396	100	,004		
	Total	,803	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,057	,016		-3,583	,001
	Current	-,039	,019	-,300	-2,111	,037
	Quick	,169	,033	,866	5,094	,000
	Cash	,032	,035	,109	,895	,373

a. Dependent Variable: NPM
b. Predictors: (Constant), Cash, Current, Quick

NPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,414[a]	,172	,138	,081966642642788

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,138	4	,034	5,127	,001[b]
	Residual	,665	99	,007		
	Total	,803	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,139	,031		4,475	,000
	RTR	-,003	,001	-,337	-3,350	,001
	PTR	,001	,001	,236	2,224	,028
	ITR	-,014	,006	-,283	-2,367	,020
	CCC	,000	,000	-,430	-3,467	,001

a. Dependent Variable: NPM
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON ASSETS

ROA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,682[a]	,465	,444	,053202280013470

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,244	4	,061	21,533	,000[b]
	Residual	,280	99	,003		
	Total	,524	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,192	,022		8,622	,000
	DOL	3,229E-6	,000	,006	,084	,933
	DR	-,301	,045	-,723	-6,742	,000
	DER	,001	,002	,063	,590	,557
	ICR	,001	,000	,188	2,542	,013

a. Dependent Variable: ROA
b. Predictors: (Constant), ICR, DOL, DER, DR

ROA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,731[a]	,535	,521	,049384089005361

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,280	3	,093	38,289	,000[b]
	Residual	,244	100	,002		
	Total	,524	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,061	,013		-4,841	,000
	Current	-,022	,015	-,207	-1,498	,137
	Quick	,164	,026	1,045	6,326	,000
	Cash	-,042	,028	-,182	-1,533	,128

a. Dependent Variable: ROA
b. Predictors: (Constant), Cash, Current, Quick

ROA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,461[a]	,212	,180	,064574425849429

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,111	4	,028	6,667	,000[b]
	Residual	,413	99	,004		
	Total	,524	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,105	,025		4,289	,000
	RTR	-,003	,001	-,433	-4,417	,000
	PTR	,001	,000	,333	3,222	,002
	ITR	-,009	,005	-,229	-1,963	,052
	CCC	,000	,000	-,377	-3,114	,002

a. Dependent Variable: ROA
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON NET ASSETS

RONA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,674[a]	,454	,432	,113117783525891

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,054	4	,264	20,602	,000[b]
	Residual	1,267	99	,013		
	Total	2,321	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,250	,047		5,277	,000
	DOL	4,052E-5	,000	,037	,496	,621
	DR	-,337	,095	-,385	-3,553	,001
	DER	-,016	,005	-,337	-3,115	,002
	ICR	,001	,000	,153	2,046	,043

RONA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,609[a]	,370	,352	,120884132925123

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,860	3	,287	19,615	,000[b]
	Residual	1,461	100	,015		
	Total	2,321	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,137	,031		-4,438	,000
	Current	-,030	,036	-,134	-,836	,405
	Quick	,314	,064	,948	4,936	,000
	Cash	-,152	,068	-,310	-2,244	,027

a. Dependent Variable: RONA
b. Predictors: (Constant), Cash, Current, Quick

RONA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,507[a]	,257	,227	,131948935335278

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,598	4	,149	8,581	,000[b]
	Residual	1,724	99	,017		
	Total	2,321	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.

1	(Constant)	,178	,050		3,564	,001
	RTR	-,009	,002	-,530	-5,570	,000
	PTR	,002	,001	,190	1,896	,061
	ITR	-,013	,010	-,146	-1,285	,202
	CCC	,000	,000	-,281	-2,390	,019

a. Dependent Variable: RONA
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON EQUITY

ROE*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,753[a]	,567	,550	,211233767698235

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,788	4	1,447	32,430	,000[b]
	Residual	4,417	99	,045		
	Total	10,205	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,307	,088		3,478	,001
	DOL	,000	,000	,071	1,074	,286
	DR	-,354	,177	-,193	-1,998	,048
	DER	-,059	,010	-,593	-6,148	,000
	ICR	,002	,001	,149	2,235	,028

a. Dependent Variable: ROE
b. Predictors: (Constant), ICR, DOL, DER, DR

ROE*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,498[a]	,248	,225	,277039179610952

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,530	3	,843	10,989	,000[b]
	Residual	7,675	100	,077		
	Total	10,205	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,317	,071		-4,497	,000
	Current	-,009	,082	-,018	-,105	,917
	Quick	,506	,146	,729	3,473	,001
	Cash	-,309	,155	-,301	-1,991	,049

a. Dependent Variable: ROE
b. Predictors: (Constant), Cash, Current, Quick

ROE*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,533[a]	,284	,255	,271638759397419

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,900	4	,725	9,827	,000[b]
	Residual	7,305	99	,074		
	Total	10,205	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,325	,103		3,153	,002

	RTR	-,019	,003	-,527	-5,638	,000
	PTR	,001	,002	,074	,756	,451
	ITR	-,032	,020	-,175	-1,576	,118
	CCC	-,001	,000	-,222	-1,924	,057

a. Dependent Variable: ROE
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON INVESTMENT

ROI*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,635[a]	,404	,380	,136029726659945

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,240	4	,310	16,758	,000[b]
	Residual	1,832	99	,019		
	Total	3,072	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,237	,057		4,176	,000
	DOL	,000	,000	,093	1,186	,238
	DR	-,343	,114	-,340	-3,003	,003
	DER	,032	,006	,588	5,201	,000
	ICR	,004	,001	,477	6,098	,000

a. Dependent Variable: ROI
b. Predictors: (Constant), ICR, DOL, DER, DR

ROI*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,355[a]	,126	,100	,163864117392015

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,387	3	,129	4,806	,004[b]
	Residual	2,685	100	,027		
	Total	3,072	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,119	,042		2,847	,005
	Current	-,140	,048	-,550	-2,904	,005
	Quick	,298	,086	,782	3,454	,001
	Cash	-,061	,092	-,108	-,664	,508

a. Dependent Variable: ROI
b. Predictors: (Constant), Cash, Current, Quick

ROI*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,441[a]	,194	,162	,158126061451626

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,597	4	,149	5,968	,000[b]
	Residual	2,475	99	,025		
	Total	3,072	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,147	,060		2,450	,016

	RTR	-,002	,002	-,078	-,782	,436
	PTR	,004	,001	,460	4,404	,000
	ITR	-,001	,012	-,010	-,082	,935
	CCC	,000	,000	-,254	-2,075	,041

a. Dependent Variable: ROI
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON INVESTED CAPITAL

ROIC*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,623[a]	,388	,364	,104969578523677

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,692	4	,173	15,710	,000[b]
	Residual	1,091	99	,011		
	Total	1,783	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,183	,044		4,178	,000
	DOL	9,102E-5	,000	,095	1,200	,233
	DR	-,260	,088	-,339	-2,953	,004
	DER	,024	,005	,578	5,043	,000
	ICR	,003	,000	,468	5,911	,000

a. Dependent Variable: ROIC
b. Predictors: (Constant), ICR, DOL, DER, DR

ROIC*Liquidity

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,367[a]	,135	,109	,124194209879813

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,241	3	,080	5,204	,002[b]
	Residual	1,542	100	,015		
	Total	1,783	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,090	,032		2,851	,005
	Current	-,109	,037	-,562	-2,984	,004
	Quick	,235	,065	,810	3,600	,000
	Cash	-,050	,070	-,117	-,722	,472

a. Dependent Variable: ROIC
b. Predictors: (Constant), Cash, Current, Quick

ROIC*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,436[a]	,190	,157	,120784959181383

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,339	4	,085	5,808	,000[b]
	Residual	1,444	99	,015		
	Total	1,783	103			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,113	,046		2,467	,015
	RTR	-,001	,001	-,083	-,840	,403

	PTR	,003	,001	,453	4,323	,000
	ITR	,000	,009	-,002	-,019	,985
	CCC	,000	,000	-,253	-2,064	,042

a. Dependent Variable: ROIC
b. Predictors: (Constant), CCC, RTR, PTR, ITR

CONSTRUCTION CEMENT INDUSTRY

OPERATING PROFIT MARGIN

OPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,233[a]	,054	,024	,105481463294516

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,080	4	,020	1,801	,133[b]
	Residual	1,391	125	,011		
	Total	1,471	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,140	,022		6,396	,000
	DOL	-1,655E-5	,000	-,143	-1,641	,103
	DR	-,076	,051	-,140	-1,501	,136
	DER	-,001	,001	-,061	-,656	,513
	ICR	,000	,000	-,106	-1,202	,232

a. Dependent Variable: OPM
b. Predictors: (Constant), ICR, DOL, DER, DR

OPM*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,156[a]	,024	,001	,106731620098069

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,036	3	,012	1,042	,377[b]
	Residual	1,435	126	,011		
	Total	1,471	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,095	,020		4,692	,000
	Current	-,046	,034	-,609	-1,350	,179
	Quick	,073	,049	,765	1,482	,141
	Cash	-,009	,026	-,076	-,363	,717

a. Dependent Variable: OPM
b. Predictors: (Constant), Cash, Current, Quick

OPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,173[a]	,030	,006	,106834592807576

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,044	3	,015	1,278	,285[b]
	Residual	1,427	125	,011		
	Total	1,470	128			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,087	,023		3,755	,000
	RTR	1,118E-6	,000	,002	,026	,979
	PTR	,002	,005	,056	,453	,651
	ITR	-,001	,001	-,056	-,559	,577
	CCC	,000	,000	,070	,569	,571

a. Dependent Variable: OPM
b. Predictors: (Constant), CCC, ITP, RCP

NET PROFIT MARGIN

NPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,636[a]	,405	,386	,152610246200495

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,982	4	,495	21,270	,000[b]
	Residual	2,911	125	,023		
	Total	4,893	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,265	,032		8,408	,000
	DOL	-1,990E-5	,000	-,094	-1,363	,175
	DR	-,504	,073	-,510	-6,894	,000
	DER	-,005	,001	-,247	-3,374	,001
	ICR	,000	,000	-,061	-,878	,382

a. Dependent Variable: NPM
b. Predictors: (Constant), ICR, DOL, DER, DR

NPM*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,342[a]	,117	,096	,185190629515219

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,572	3	,191	5,555	,001[b]
	Residual	4,321	126	,034		
	Total	4,893	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,058	,035		-1,665	,098
	Current	-,029	,060	-,207	-,481	,631
	Quick	,146	,085	,841	1,712	,089
	Cash	-,082	,044	-,369	-1,841	,068

a. Dependent Variable: NPM
b. Predictors: (Constant), Cash, Current, Quick

NPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,413[a]	,171	,151	,176202784418714

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,798	3	,266	8,570	,000[b]
	Residual	3,881	125	,031		
	Total	4,679	128			

COEFFICIENTS^A

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,041	,040		-1,015	,312
	RTR	-4,156E-5	,000	-,050	-,563	,574
	PTR	,013	,009	,177	1,476	,142
	ITR	4,792E-5	,002	,003	,028	,978
	CCC	,000	,000	,101	,853	,395

a. Dependent Variable: NPM
b. Predictors: (Constant), CCC, ITP, RCP

RETURN ON ASSETS

ROA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,567a	,321	,300	,083628612336066

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,414	4	,104	14,799	,000b
	Residual	,874	125	,007		
	Total	1,288	129			

COEFFICIENTS^A

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,265	,032		8,408	,000
	DOL	-1,990E-5	,000	-,094	-1,363	,175
	DR	-,504	,073	-,510	-6,894	,000
	DER	-,005	,001	-,247	-3,374	,001
	ICR	,000	,000	-,061	-,878	,382

a. Dependent Variable: ROA
b. Predictors: (Constant), ICR, DOL, DER, DR

ROA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,338a	,114	,093	,095151818887909

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,147	3	,049	5,428	,002b
	Residual	1,141	126	,009		
	Total	1,288	129			

COEFFICIENTS^A

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,008	,018		-,464	,643
	Current	,006	,031	,083	,194	,847
	Quick	,058	,044	,650	1,322	,188
	Cash	-,061	,023	-,534	-2,661	,009

a. Dependent Variable: ROA
b. Predictors: (Constant), Cash, Current, Quick

ROA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,365a	,134	,113	,092474899994715

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,165	3	,055	6,424	,000b
	Residual	1,069	125	,009		
	Total	1,234	128			

COEFFICIENTS^A

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,041	,040		-1,015	,312
	RTR	-4,156E-5	,000	-,050	-,563	,574
	PTR	,013	,009	,177	1,476	,142
	ITR	4,792E-5	,002	,003	,028	,978
	CCC	,000	,000	,101	,853	,395

a. Dependent Variable: ROA
b. Predictors: (Constant), CCC, ITP, RCP

RETURN ON NET ASSETS

RONA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,611[a]	,373	,353	,132867014863418

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,312	4	,328	18,582	,000[b]
	Residual	2,207	125	,018		
	Total	3,519	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,208	,027		7,582	,000
	DOL	-1,196E-5	,000	-,067	-,941	,348
	DR	-,325	,064	-,388	-5,103	,000
	DER	-,006	,001	-,361	-4,804	,000
	ICR	,000	,000	-,062	-,863	,390

a. Dependent Variable: RONA
b. Predictors: (Constant), ICR, DOL, DER, DR

RONA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,282[a]	,079	,058	,160336148522518

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,280	3	,093	3,627	,015[b]
	Residual	3,239	126	,026		
	Total	3,519	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,019	,030		-,628	,531
	Current	,003	,052	,025	,058	,954
	Quick	,089	,074	,602	1,200	,233
	Cash	-,089	,038	-,474	-2,318	,022

a. Dependent Variable: RONA
b. Predictors: (Constant), Cash, Current, Quick

RONA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,253[a]	,064	,034	,158596204436109

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,213	4	,053	2,121	,082[b]
	Residual	3,119	124	,025		
	Total	3,332	128			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		

1	(Constant)	-,003	,034		-,093	,926
	RTR	-6,945E-5	,000	-,100	-1,113	,268
	PTR	,011	,007	,178	1,486	,140
	ITR	,000	,001	-,012	-,126	,900
	CCC	,000	,000	,067	,563	,575

a. Dependent Variable: RONA
b. Predictors: (Constant), CCC, ITR, RTR, PTR

RETURN ON EQUITY

ROE*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,994[a]	,988	,987	,322214875112390

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1031,359	4	257,840	2483,470	,000[b]
	Residual	12,978	125	,104		
	Total	1044,337	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,098	,067		1,473	,143
	DOL	-9,302E-6	,000	-,003	-,302	,763
	DR	,573	,154	,040	3,713	,000
	DER	-,295	,003	-1,006	-95,078	,000
	ICR	,000	,001	-,003	-,346	,730

a. Dependent Variable: ROE
b. Predictors: (Constant), ICR, DOL, DER, DR

ROE*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,149[a]	,022	-,001	2,846703360251598

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23,269	3	7,756	,957	,415[b]
	Residual	1021,069	126	8,104		
	Total	1044,337	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,981	,540		-1,816	,072
	Current	,059	,918	,029	,064	,949
	Quick	,722	1,313	,284	,550	,583
	Cash	-,698	,681	-,216	-1,025	,307

a. Dependent Variable: ROE
b. Predictors: (Constant), Cash, Current, Quick

ROE*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,110[a]	,012	-,020	2,884218368947868

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12,520	4	3,130	,376	,825[b]
	Residual	1031,521	124	8,319		
	Total	1044,040	128			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,857	,616		-1,390	,167

	RTR	7,248E-5	,001	,006	,064	,949
	PTR	,085	,136	,077	,623	,534
	ITR	,002	,026	,008	,077	,939
	CCC	,003	,007	,044	,359	,721

a. Dependent Variable: ROE
b. Predictors: (Constant), CCC, ITR, RTR, PTR

RETURN ON INVESTMENT

ROI*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,157[a]	,025	-,007	,106459888791230

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,036	4	,009	,787	,535[b]
	Residual	1,417	125	,011		
	Total	1,452	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,119	,022		5,391	,000
	DOL	-1,019E-5	,000	-,089	-1,001	,319
	DR	-,033	,051	-,062	-,657	,512
	DER	-,001	,001	-,080	-,856	,394
	ICR	,000	,000	-,071	-,791	,430

a. Dependent Variable: ROI
b. Predictors: (Constant), ICR, DOL, DER, DR

ROI*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,169[a]	,029	,005	,105817410928204

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,042	3	,014	1,237	,299[b]
	Residual	1,411	126	,011		
	Total	1,452	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,082	,020		4,073	,000
	Current	-,004	,034	-,049	-,108	,914
	Quick	,038	,049	,399	,775	,440
	Cash	-,048	,025	-,401	-1,911	,058

a. Dependent Variable: ROI
b. Predictors: (Constant), Cash, Current, Quick

ROI*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,160[a]	,026	-,006	,106808928912119

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,037	4	,009	,813	,519[b]
	Residual	1,415	124	,011		
	Total	1,452	128			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,072	,023		3,170	,002
	RTR	1,942E-5	,000	,042	,462	,645
	PTR	,003	,005	,063	,518	,606

	ITR	,000	,001	-,039	-,389	,698
	CCC	,000	,000	,111	,917	,361

a. Dependent Variable: ROI
b. Predictors: (Constant), CCC, ITR, RTR, PTR

RETURN ON INVESTED CAPITAL

ROIC*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,164[a]	,027	-,004	,082117087731626

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,023	4	,006	,867	,486[b]
	Residual	,843	125	,007		
	Total	,866	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,094	,017		5,551	,000
	DOL	-8,325E-6	,000	-,094	-1,060	,291
	DR	-,030	,039	-,072	-,757	,451
	DER	-,001	,001	-,079	-,838	,403
	ICR	,000	,000	-,074	-,828	,410

a. Dependent Variable: ROIC
b. Predictors: (Constant), ICR, DOL, DER, DR

ROIC*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,175[a]	,031	,008	,081634655800504

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,027	3	,009	1,331	,267[b]
	Residual	,840	126	,007		
	Total	,866	129			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,063	,015		4,085	,000
	Current	-,005	,026	-,080	-,177	,859
	Quick	,033	,038	,449	,873	,385
	Cash	-,039	,020	-,418	-1,991	,049

a. Dependent Variable: ROIC
b. Predictors: (Constant), Cash, Current, Quick

ROIC*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,166[a]	,027	-,004	,082403993931819

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,024	4	,006	,874	,482[b]
	Residual	,842	124	,007		
	Total	,866	128			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,056	,018		3,189	,002
	RTR	1,408E-5	,000	,040	,434	,665
	PTR	,002	,004	,062	,508	,613
	ITR	,000	,001	-,037	-,377	,707

	CCC	,000	,000	,119	,983	,328

a. Dependent Variable: ROIC
b. Predictors: (Constant), CCC, ITR, RTR, PTR

CONSTRUCTION PRIMARY SUBSTITUTION SECTOR

OPERATING PROFIT MARGIN

OPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,342[a]	,117	,095	,184275300623650

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,716	4	,179	5,272	,001[b]
	Residual	5,399	159	,034		
	Total	6,115	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,150	,041		-3,692	,000
	DOL	1,384E-5	,000	,004	,055	,956
	DR	,271	,060	,340	4,547	,000
	DER	,000	,001	-,026	-,346	,729
	ICR	-2,108E-5	,000	-,009	-,120	,905

a. Dependent Variable: OPM
b. Predictors: (Constant), ICR, DER, DR, DOL

OPM*Liquidity

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,613[a]	,376	,365	,152083496073893

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,299	3	,766	33,139	,000[b]
	Residual	3,816	165	,023		
	Total	6,116	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,047	,029		-1,614	,109
	Current	-,181	,023	-1,016	-7,705	,000
	Quick	,345	,042	1,004	8,169	,000
	Cash	-,118	,051	-,245	-2,342	,020

a. Dependent Variable: OPM
b. Predictors: (Constant), Cash, Quick, Current

OPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,582[a]	,338	,322	,157085867142980

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,069	4	,517	20,961	,000[b]
	Residual	4,047	164	,025		
	Total	6,116	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,128	,020		6,378	,000
	RTR	-,001	,002	-,046	-,719	,473
	PTR	9,012E-5	,000	,098	1,516	,131

Model		B	Std. Error	Beta	t	Sig.
	ITR	-,001	,000	-,208	-3,106	,002
	CCC	-,001	,000	-,618	-9,146	,000

a. Dependent Variable: OPM
b. Predictors: (Constant), CCC, RTR, PTR, ITR

NET PROFIT MARGIN

NPM*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	v	,090	,067	,244063562499738

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,938	4	,234	3,936	,004[b]
	Residual	9,471	159	,060		
	Total	10,409	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,220	,054		-4,084	,000
	DOL	4,789E-5	,000	,011	,145	,885
	DR	,311	,079	,299	3,934	,000
	DER	1,522E-5	,001	,001	,018	,986
	ICR	-4,127E-5	,000	-,013	-,177	,859

a. Dependent Variable: NPM
b. Predictors: (Constant), ICR, DER, DR, DOL

NPM*Liquidity

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,621[a]	,386	,374	,196949299230904

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,017	3	1,339	34,521	,000[b]
	Residual	6,400	165	,039		
	Total	10,417	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,133	,038		-3,499	,001
	Current	-,259	,030	-1,114	-8,513	,000
	Quick	,490	,055	1,091	8,945	,000
	Cash	-,088	,065	-,140	-1,343	,181

a. Dependent Variable: NPM
b. Predictors: (Constant), Cash, Quick, Current

NPM*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,585[a]	,342	,326	,204385575796070

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,566	4	,892	21,344	,000[b]
	Residual	6,851	164	,042		
	Total	10,417	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,103	,026		3,956	,000
	RTR	-,001	,002	-,027	-,423	,673
	PTR	,000	,000	,085	1,329	,186
	ITR	-,001	,001	-,125	-1,871	,063

	CCC	-,001	,000	-,619	-9,184	,000

a. Dependent Variable: NPM
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON ASSETS

ROA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,152[a]	,023	-,001	,074417807578875

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,021	4	,005	,944	,440[b]
	Residual	,881	159	,006		
	Total	,901	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,043	,016		2,601	,010
	DOL	,000	,000	-,089	-1,123	,263
	DR	-,032	,024	-,106	-1,348	,180
	DER	,000	,000	-,064	-,806	,422
	ICR	2,795E-5	,000	,031	,394	,694

a. Dependent Variable: ROA
b. Predictors: (Constant), ICR, DER, DR, DOL

ROA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,361[a]	,131	,115	,068956295710453

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,118	3	,039	8,257	,000[b]
	Residual	,785	165	,005		
	Total	,902	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,028	,013		-2,087	,038
	Current	-,026	,011	-,386	-2,481	,014
	Quick	,094	,019	,711	4,902	,000
	Cash	-,041	,023	-,222	-1,797	,074

a. Dependent Variable: ROA
b. Predictors: (Constant), Cash, Quick, Current

ROA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,225[a]	,051	,028	,072266501691913

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,046	4	,011	2,196	,072[b]
	Residual	,856	164	,005		
	Total	,902	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,042	,009		4,525	,000
	RTR	-,001	,001	-,065	-,845	,399
	PTR	-3,148E-6	,000	-,009	-,115	,909
	ITR	,000	,000	-,138	-1,718	,088
	CCC	,000	,000	-,218	-2,692	,008

a. Dependent Variable: ROA

b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON NET ASSETS

RONA*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,361[a]	,130	,108	,605233510021036

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8,713	4	2,178	5,947	,000[b]
	Residual	58,243	159	,366		
	Total	66,956	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,093	,133		-,698	,486
	DOL	,003	,001	,241	3,225	,002
	DR	,225	,196	,085	1,149	,252
	DER	-,007	,002	-,226	-3,028	,003
	ICR	,000	,001	,013	,177	,859

a. Dependent Variable: RONA
b. Predictors: (Constant), ICR, DER, DR, DOL

RONA*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,034[a]	,001	-,017	,636938217181815

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,078	3	,026	,064	,979[b]
	Residual	66,939	165	,406		
	Total	67,016	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,043	,123		,352	,725
	Current	-,030	,098	-,050	-,301	,764
	Quick	,061	,177	,053	,344	,731
	Cash	-,032	,212	-,020	-,151	,880

a. Dependent Variable: RONA
b. Predictors: (Constant), Cash, Quick, Current

RONA*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,064[a]	,004	-,020	,637919750697333

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,278	4	,070	,171	,953[b]
	Residual	66,738	164	,407		
	Total	67,016	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,054	,082		,659	,511
	RTR	,004	,007	,052	,671	,503
	PTR	-9,972E-6	,000	-,003	-,041	,967
	ITR	,000	,002	-,018	-,220	,826
	CCC	,000	,000	-,034	-,415	,679

a. Dependent Variable: RONA
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON EQUITY

ROE*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,516[a]	,266	,248	,988052921022906

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56,385	4	14,096	14,439	,000[b]
	Residual	155,224	159	,976		
	Total	211,609	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,366	,218		1,682	,095
	DOL	,002	,001	,088	1,277	,203
	DR	-,584	,320	-,125	-1,827	,070
	DER	-,025	,004	-,484	-7,072	,000
	ICR	,000	,001	,009	,137	,891

a. Dependent Variable: ROE
b. Predictors: (Constant), ICR, DER, DR, DOL

ROE*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,119[a]	,014	-,004	1,124882359670843

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,998	3	,999	,790	,501[b]
	Residual	208,784	165	1,265		
	Total	211,782	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,316	,216		-1,461	,146
	Current	-,062	,174	-,059	-,356	,722
	Quick	,422	,313	,209	1,350	,179
	Cash	-,244	,374	-,086	-,652	,515

a. Dependent Variable: ROE
b. Predictors: (Constant), Cash, Quick, Current

ROE*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,043[a]	,002	-,023	1,135347463037472

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,384	4	,096	,074	,990[b]
	Residual	211,398	164	1,289		
	Total	211,782	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,076	,145		-,523	,602
	RTR	,002	,012	,012	,151	,880
	PTR	-2,697E-5	,000	-,005	-,063	,950
	ITR	,001	,003	,015	,181	,856
	CCC	,000	,001	,044	,530	,597

a. Dependent Variable: ROE
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON INVESTMENT

ROI*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,609[a]	,371	,355	1,088295433196827

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	110,896	4	27,724	23,408	,000[b]
	Residual	188,318	159	1,184		
	Total	299,213	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,403	,240		-1,682	,095
	DOL	,001	,001	,044	,697	,487
	DR	1,045	,352	,187	2,966	,003
	DER	-,035	,004	-,569	-8,977	,000
	ICR	,000	,001	,008	,127	,899

a. Dependent Variable: ROI
b. Predictors: (Constant), ICR, DER, DR, DOL

ROI*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,128[a]	,017	-,001	1,335697746582769

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4,939	3	1,646	,923	,431[b]
	Residual	294,375	165	1,784		
	Total	299,313	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,593	,257		2,308	,022
	Current	-,078	,206	-,062	-,376	,708
	Quick	-,371	,371	-,154	-1,001	,319
	Cash	,523	,444	,155	1,179	,240

a. Dependent Variable: ROI
b. Predictors: (Constant), Cash, Quick, Current

ROI*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,140[a]	,020	-,004	1,337708928985696

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,841	4	1,460	,816	,517[b]
	Residual	293,472	164	1,789		
	Total	299,313	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,306	,171		1,791	,075
	RTR	,012	,014	,070	,896	,371
	PTR	3,566E-5	,001	,006	,070	,944
	ITR	-,004	,004	-,085	-1,046	,297
	CCC	-,001	,001	-,110	-1,331	,185

a. Dependent Variable: ROI
b. Predictors: (Constant), CCC, RTR, PTR, ITR

RETURN ON INVESTED CAPITAL

ROIC*Leverage

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,588[a]	,346	,329	,869428856472398

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	63,549	4	15,887	21,018	,000[b]
	Residual	120,189	159	,756		
	Total	183,738	163			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-,319	,192		-1,666	,098
	DOL	,001	,001	,048	,739	,461
	DR	,818	,281	,187	2,908	,004
	DER	-,026	,003	-,547	-8,457	,000
	ICR	,000	,001	,008	,121	,904

a. Dependent Variable: ROIC
b. Predictors: (Constant), ICR, DER, DR, DOL

ROIC*Liquidity

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,127[a]	,016	-,002	1,046830932476736

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2,978	3	,993	,906	,440[b]
	Residual	180,816	165	1,096		
	Total	183,794	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,461	,201		2,292	,023
	Current	-,057	,162	-,059	-,355	,723
	Quick	-,292	,291	-,155	-1,004	,317
	Cash	,401	,348	,152	1,152	,251

a. Dependent Variable: ROIC
b. Predictors: (Constant), Cash, Quick, Current

ROIC*Turnover

MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,139[a]	,019	-,005	1,048316994259988

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3,563	4	,891	,811	,520[b]
	Residual	180,231	164	1,099		
	Total	183,794	168			

COEFFICIENTS[A]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	,235	,134		1,753	,081
	RTR	,010	,011	,072	,923	,357
	PTR	2,732E-5	,000	,005	,069	,945
	ITR	-,003	,003	-,085	-1,039	,300
	CCC	-,001	,001	-,107	-1,301	,195

a. Dependent Variable: ROIC
b. Predictors: (Constant), CCC, RTR, PTR, ITR