FINANCE

MEASURING THE EFFECT OF STRATEGIC MANAGEMENT ACCOUNTING TECHNIQUES ON MAKING INVESTMENT DECISIONS OF SMEs: EASTERN ANATOLIAN CASE*

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ABSTRACT
The aim of this study is to measure the effect of the strategic management accounting techniques used by manufacturing firms operating in Erzurum and Erzincan provinces on their investment decisions. The research was conducted on 87 manufacturing SMEs in these two provinces. Quantitative research design was used in the study. A scale developed by Jbarah (2018) was used to collect data. Data were obtained through face-to-face interviews with senior executives of companies. Multiple linear regression analysis was used to test hypotheses in the research model. The dependent variable of the model is investment decisions of firms, whereas the independent variables are components of strategic management accounting techniques (just in time production, balance score card and cost targeting). As a result, it has been observed that the usage of strategic management accounting techniques by manufacturing SMEs in Erzurum and Erzincan has a moderate influence on making investment decisions in a complex and dynamic economic environment.
Keywords: Investment Decisions, Just in Time Production, Balanced Scorecard, Target Costing.

FİNANS

STRATEJİK YÖNETİM MUHASEBESİ TEKNİKLERİNİN KOBİ'LERİN YATIRIM KARARI ALMA ÜZERİNDEKİ ETKİSİNİN ÖLÇÜMÜ: DOĞU ANADOLU ÖRNEĞİ

ÖZ
Bu çalışmanın amacı, Erzurum ve Erzincan illerinde faaliyet gösteren imalatçı firmaların kullandıkları stratejik yönetim muhasebe tekniklerinin yatırım kararları üzerindeki etkisini ölçmektir. Araştırma Erzurum ve Erzincan illerindeki 87 KOBİ niteliğindeki üretici firmalar üzerinde yürütülmüştür. Veri toplamak için Jbarah (2018) tarafından geliştirilen bir ölçek kullanılmıştır. Veriler, şirketlerin üst düzey yöneticileriyle yüz yüze görüşülerek elde edilmiştir. Araştırma modelinde hipotezleri test etmek için çoklu doğrusal regresyon analizi kullanılmıştır. Modelin bağımlı değişkeni firmaların yatırım kararları iken, bağımsız değişkenler tam zamanında üretim, kurumsal karne ve hedef maliyetleme olan stratejik yönetim muhasebesi tekniklerinin bileşenleridir. Sonuç olarak, Erzurum ve Erzincan'daki imalatçı KOBİ'lerin stratejik yönetim muhasebe yöntemlerini kullanmalarının, karmaşık ve dinamik ekonomik ortamda yatırım kararı almaları üzerindeki etkisinin orta düzeyde olduğu görülmüştür.
Anahtar Kelimeler: Yatırım Kararları, Tam Zamanında Üretim, Kurumsal Karne, Hedef Maliyetleme.

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* *Bu makale, 04-08-2018 tarihinde Comrat, Moldovya'da 2nd International Symposium on Humanities and Social Sciences adlı konferansta sunulan "The Effect of Strategic Management Accounting Techniques on Investment Decisions of Smes in Erzurum and Erzincan" adlı bildiri özetinin daha önce yayınlanmamış tam metnidir.*

1. INTRODUCTION

The ultimate goal of all entrepreneurs is to ensure long-term sustainability of their existing assets and to maximize their profits in a competitive environment. The investment decisions determine the limits and possibilities of future developments. The manufacturing companies make investment decisions to increase existing production capacities or to reveal new production capacity. Investment decisions are risk-taking decisions that determine the amount of funds to be allocated for long-term profits. The success of these decisions depends on the accuracy of forecasts made for sales in uncertainty environment subject to the financial and non-financial constraints such as an investor's time available to manage the investment arrangements, accountability as a fiduciary, or legislative requirements (Salem, 2015; Hodgson et. al., 2000). Therefore, investment decisions are strategic decisions i.e. to have unpreventable fixed costs, to carry uncertainty risks and to predict future by interpreting market information correctly. There are many factors affecting investment decisions. It is not possible to make an investment decision on the basis of only one of these factors. The essential goal of this study is to measure the effects of strategic management accounting techniques on investment decisions of small and medium manufacturers in Erzurum and Erzincan provinces. Strategic management accounting aims to ensure that businesses will operate successfully in future. Strategic management accounting has emerged as a result of the increasing complexity of management problems and need to solve these problems. The main functions of strategic management accounting can be listed as the creation of commercial secrets to make management decisions, the economic evaluation of the internal and external environment to define the mission and strategic goals, providing information flow about product variety based on the strategic positioning of the firm and the control of the fulfillment of duties at different business units in firm (Churkina et. al., 2016: 110). While these functions are performed, it is important to take the opinions of all stakeholders in taking strategical and managerial decisions. In other words, the strategic management accounting determines how efficiently the business operates in terms of all stakeholders. In this respect, strategic management accounting supports the decision-making process and provides information for owners or shareholders of business. Strategic management accounting, however, is a system that allows the way of providing information to be changed when existing information do not meet the firm needs (Voloshin, 2007: 24). Especially in the case of Small and Medium manufacturers in Erzurum and Erzincan, the lack of development of the review system related to the pricing, the production system and the evaluation of the investment projects reveals the need for strategic management accounting. Small and Medium manufacturers in Erzurum and Erzincan provinces where the current research is conducted, use strategic management accounting techniques to reduce the costs of their industrial production, to increase their operational efficiencies and to increase their employee motivation (Zhuravleva and Shestakova, 2012: 48). Besides, it is also anticipated that strategic management accounting methods help facilitate and accelerate making the investment decisions. Besides, it is also anticipated that using strategic management accounting methods will help taking the right investment decisions. Therefore, the

research question of the study is determined as "Is there any effect of using strategic management accounting techniques that SME-type industrial manufacturers in making investment decisions?" The emphasis of this study is the need of develop strategic management accounting techniques so that within using strategic management accounting techniques it will be shown that investment decisions can be taken more quickly, easily and efficiently in a competitive environment.

Strategic management accounting techniques, which are thought to have an impact on investment decisions in the study, have been examined under three headings: target costing, balanced scorecard and just in time production. The target costing, the first of these, is a method that focuses on controlling the target costs related to the future. This method aims to reduce costs while producing new products in order to reach the targeted profit level by taking into account the characteristics of the product (Babkina, 2015: 50). Target costing, unlike traditional methods, calculates the cost of a product on the basis of a predetermined sales price (Golikov and Nikolaev, 2014: 28). This price represents the expected market price of the product as it is detected with the help of marketing researches. The advantage of this method is that it is able to operate successfully in a competitive environment (Babkina, 2015: 50). Target costing is one of the most influential factors affecting investment making decisions since many of the costs related to production are fixed before the production process is started, and subsequent replacement of resources designated for production will lead to extra costs to the operations. The second of the strategic management accounting techniques discussed in the study is just-in-time production, a method of optimizing supply chain and logistics of commercial activities. This method is intended to reduce the amount of stock. According to this method, the required components and materials are supplied in the required quantity, place and time. Production efficiency is increasing based on the reduction of losses through the application of just-in-time production. Losses such as unnecessary transportation and stock include all transactions that increase the product price without increasing the value of the product. The main goal of this system is resolving the problem instead of trying to reduce the negative effects of problems arising from uncertainty in the production environment. For example, enterprises operating with conventional production approach are trying to reduce the effects of uncertainties by keeping security stakes at a high level rather than solving the problems that may interfere with production. Just in time production system focuses on product quality, the physical structure of production environment, product design, zero stock, employee participation and continuous development (Özkan Bakmay, 2008). It is anticipated that just-in-time production will also impact on making investment decisions as reduces stocks, reduces losses, increases business performance and focuses on improving operating performance. Last of the strategic accounting management techniques examined is the balanced scorecard. Balanced scorecard associates the mission statement with the development strategy of the firm, in other words, balanced scorecard transforms the business strategy and mission into specific financial objectives. Balanced scorecard encompasses all the structural units of the firm and provides coordinated functioning of all these units (Asaturova, 2016: 66). This component of strategic management accounting is more effective in making

decisions on resource allocation. It also ensures that the efficiency of the economic activity of the firms is at an optimal level (Asaturova and Zhirnova, 2015: 355). The success of an investment of a firm depends not only on product quality but also on its strategies, organizational structure and performance management. Corporate performance management focuses specifically on audit and management processes. Strategy oriented quality understanding is dominant in corporate performance management. It focuses on performance in business valuation, and the goal in business is to have multi-skilled human resources. When senior executives develop their abilities of corporate performance management to adapt to dynamic environmental conditions, they can make investment decisions more easily and quickly. Corporate performance management also improves the efficiency of making investment decisions because it has the chance to benchmark process innovations with the best both in production and management (Akın, 2014).

In the study, literature and survey method are used. The questionnaire of the current research is designed on the basis of the study of Jbarah (2018). Participants are the owners or senior managers of small and medium industrial manufacturers in Erzurum and Erzincan provinces of Turkey. The universe of the research has been reached from the lists of the Province Chambers of Commerce. From these lists, a total of 114 firms' addresses and telephone numbers have been obtained. In the list, there are 51 firms from Erzurum and 63 firms from Erzincan. The 5-likert scale has been filled with hand by participants in Erzurum and Erzincan. Totally, 87 valid surveys are obtained, (40 for Erzurum and 47 for Erzincan). 11 firms in Erzurum and 16 firms in Erzincan have not been excluded from the survey due to insolvency, relocation or unwillingness of answering. Scale results are evaluated in three categories using the IBM SPSS v23 statistical program.

Survey form is designed as of three categories. In the first category of the survey, the demographic characteristics of the SMEs (age of the firm, amount of initial investment cost, average annual turnover, number of employees and activity areas) are examined. In the second category of the survey, opinions of participants on strategic management accounting techniques are asked using closed-ended 5-likert scale. In the third category of the scale, the effects of strategic management accounting techniques on making investment decisions in terms of efficiency, speed and ease are tried to be determined by the closed-ended 5-likert scale. Quantitative research methods have been applied in the research. Descriptive analysis and multiple linear regression analysis are used as a research design. A descriptive analysis is performed for the data in the first category of the scale. After the reliability and validity analysis, data in the second category have been seen to be collected into three dimensions named just-in-time production, target costing and balanced scorecard. Validity and reliability are two fundamental elements in the evaluation of a measurement instrument. Validity is concerned with the extent to which an instrument measures what it is intended to measure. Reliability is concerned with the ability of an instrument to measure consistently. Cronbach's alpha is the most widely used objective measure of reliability. It is a measure of the internal consistency of a test or scale; it is expressed as a number between 0 and 1.

Internal consistency describes the extent to which all the items in a test measure the same concept or construct (Tavakol and Dennick, 2011).

There are several types of validity, such as content validity and criterion-related validity. Content validity addresses how well the items developed to operationalize a construct provide an adequate and representative sample of all the items that might measure the construct of interest. Criterion-related validity provides evidence about how well scores on the new measure correlate with other measures of the same construct or very similar underlying constructs that theoretically should be related (Kimberlin and Winterstein, 2008). Scale consists of 13 items totally and items have been collected four under the just in time production dimension, five under the target costing dimension and four under the balanced scorecard dimension. Analytical tables have been created for each factor. Three various multi-linear regression models have been constructed by considering the questions in the third category as dependent variable and three dimensions in the second category as independent variables. Within the multi-linear regression models, the effects of strategic management accounting techniques on making investment decisions have been determined within the scope of efficiency, speed and ease.

The null hypotheses of the research are:
H1: Strategic management accounting techniques have no impact on the efficiency of making investment decision.
H2: Strategic management accounting techniques have no impact on the speed of making investment decision.
H3: Strategic management accounting techniques have no impact on the ease of making investment decision.

As a result, it is seen that these three hypotheses have been rejected based on the results of multiple regression models. In other words, it can be said that strategic management accounting techniques contribute positively to the investment decisions of firms. According to the results of the analysis, small and medium industrial manufacturers in Erzurum and Erzincan who use strategic management accounting techniques effectiveness, easiness and speed of making investment decisions in medium degree. In conclusion, using strategic management accounting techniques more effectively will provide development of industrial investments in eastern region of Turkey.

2. THEORITICAL FRAMEWORK

Manufacturers make their investment decisions by evaluating the industrial structure of the region, of their firms' business performance, the existing resources and the costs. Literature shows that firm size has the effect on success of strategic management accounting applications (Joshi, 2001). Generally large firms apply strategic management accounting techniques more easily and efficiently from SMEs. There are a small number of studies about the SMEs' strategic management accounting application of their investment decisions and business performance

(Santini, 2013; Jbarah, 2018). Santini (2013) studies the use of strategic management accounting tools by SMEs in Italy. Other empricial studies are about strategic management accounting applications of small and medium manufacturers at their business performance and cost management (Ahmad, 2014; Isa, Saleh and Sapiei, 2008; Maziriri and Mapuranga, 2017; Lucas and Lowth, 2013). Common result of these studies is that even SMEs just as large companies need strategic management accounting practices at their business performance and cost management. However, SMEs have some difficulty in applications of strategic management accounting because of their limitedness in structures of capital, technology, labor, knowledge and resource (Langfield-Smith, 2008).

2.1. Strategic Management Accounting

During the 1980s and 1990s, it had been noticed that management accounting couldn't be adapting to changes in the modern business environment and was not fulfilling its function to aid managers. In recent era, traditional management accounting has lost its importance as a result of the development of technology, growing competitive market conditions, the emergence of new management techniques to rationalize the cost of production and consumption, increased customer awareness about price, quality, products and services (Johnson and Kaplan, 1987; Bromwich and Bhimani, 1989; Wallace,1990) Eventually, management accounting has been in need of conversion into strategically-orientated decision making and strategic information is integrated into firm management accounting systems (Kamal, 2015; Hansen and Mouritsen, 2005). Strategic management accounting has started to provide more externally oriented information, more market driven and customer-oriented tools and techniques for firms. Strategic management accounting generally focuses on product life cycle, quality of product, market shares and growth rates of rivals, firms' investment amounts, profitability ratios, business performances, personnel managements and cost structures.

Strategic management techniques can be collected into five categories: costing, planning, control and performance measurement, strategic decision making, competitor analysis and customer analysis. Cadez and Guilding (2008) has dropped investment appraisal from these recent lists of strategic management accounting techniques. Most of the study conducted in world in relation to strategic management accounting techniques are about cost and financial performance of manufacturing firms (Adler et. al., 2000; Anand et al. 2005; Sharkar et. al., 2006; Khajavi and Nazemi, 2006; Bidhan, 2007). These techniques vary by business strategy type and by country (Guilding et. al., 2000, bt. Sulaiman et. al, 2004). The limitations of these studies are lack of information about how the SMA techniques are used, by whom and for whom (Nixon and Burns, 2012: 21). This study makes a contribution in the point of linking of SMA techniques and investment decisions of industrial manufacturer SMEs.

2.2. Strategic Management Accounting Techniques

There are three techniques of strategic management accounting used for the purpose of this study. These are target costing, balanced scorecard and just in time

production. There is a non-linear cause and effect relationship between them. For example, while applying target cost techniques in a production design, the balanced scorecard helps the product designers to determine how their decisions affect the design work by providing information and measurement tools for production (Sandström and Toivanen, 2002: 81-82). Although the balanced scorecard may help produce qualitative targets such as product quality, customer satisfaction, employee motivation and reward system, and target cost may help producers to determine future costs, sometimes the managers' subjective opinions and time delays from planning to action make the cause and effect relationship between these techniques nonlinear. On the other side, balanced scorecard is suitable for firms used just-in-time production. Such firms can choose comparative performance measures consistent with their corporate strategy and action plans.

2.2.1. Target Costing

Target costing is the process of controlling quantity and price by specifying the costs throughout a product of life (Jabarah, 2018; Horngren et. al., 2005, Kato, 2003). Target costing technique estimates a cost of a product by subtracting a desired profit margin from an estimated (or market-based) price during production and process design to achieve desired production, engineering or market cost in future. Then the production is designed to meet that cost (Guilding et al., 2000). There are two main phases that named planning costs and cost reduction activities in a development cycle of a product. In these cycles, manufacturers try to attain their established costs (Jiang and Hansen, 2016; Cooper, 1996; McMann and Nanni, 1995; Tani et al., 1994).

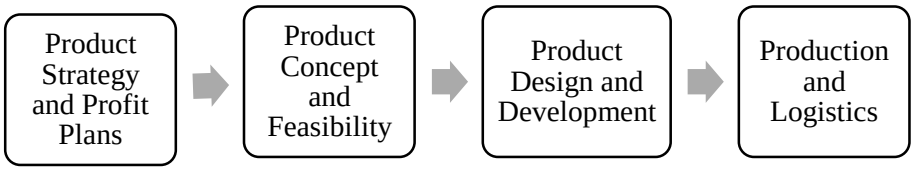


Figure 1: Target Costing and The Product Development Cycle

Reference: Jiang and Hansen, 2016: 11

At the first phase or in the planning process: Manufacturers define product or service features based on market research and customer insights to understand customers' requirements and their willingness to pay for a product. Then they establish the selling price given product's quality and functionality and finally they set the target profit margin.

At the second phase or cost reduction activities performed by manufacturers: They first determine the target cost and estimate the initial cost on the basis of the current cost factors to estimate the cost gap between target cost and current cost. Then they design product to close this cost gap. When attaining the target cost, they

release the cost-effective design and undertake continuous improvement on cost reduction.

Dekker and Smidt (2010) explains how non-Japan manufacturer firms such as Dutch firms, use target costing technique for their development product process. Yazdifar and Askarany (2011) reports that UK, Australian and New Zealand manufacturing firms focus cost-reducing strategies at the planning stage and adoption of value engineering to incorporate customer requirements rather than focusing on the adoption of cost-cutting strategies at the production stage. Fowzia (2011) found that target costing techniques is substantial to achieve strategic effectiveness for manufacturing firms in Bangladesh. Taking the product development cycle into account, it is obvious that firms should focus product properties and prices which stand of customer demand and capacity of rivals rather than financial viability of investing (Roslender and Hart, 2003: 258). Zengin and Ada (2010) creates a target costing module as a new business strategy and cost competition model for SMEs which aims to be a cost leader in market without sacrificing quality and functionality of the products. Target costing exhibited a strong external emphasis, not simply on competitors but also on customers and the marketplace (Hiromoto, 1988). The company has gained an enhanced understanding of a customer perspective by implementing target costing. Therefore, customer feedback is one of the key drivers of a firm for success. Hibbets, Albright and Funk (2003) emphasize the importance in the cost structure of buyer's offering for steel manufacture firm.

2.2.2. Balanced Scorecard

Balanced scorecard is introduced first in the early 1990s from Norton and Kaplan (1992). Balanced scorecard is a performance measurement system that takes a basis for non-financial measures i.e. customer satisfaction, internal business processes and organizational innovation and development, as well as the financial reporting systems. A balanced scorecard consists of an integrated set of performance measures derived from the company's strategy. Under the balance scorecard approach, top managers translate their long-term strategy into performance measures that employees can understand and can do something about. It has four dimensions such as financial performance, customer satisfaction, internal business process and organizational learning and growth. There is a circular reasoning relationship between these dimensions (Norton and Kaplan, 1996: 11):

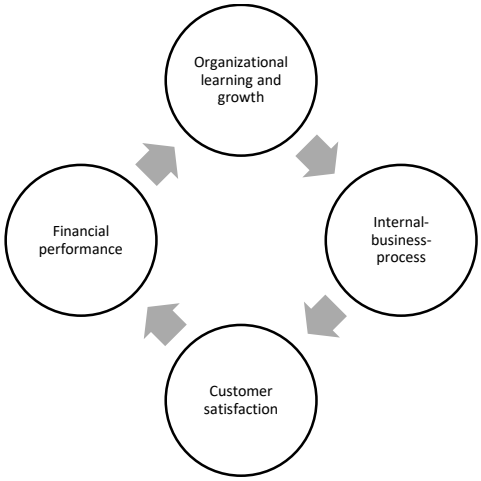


Figure 2: The Relationship between Balanced Scorecard Dimensions

Reference: Norton and Kaplan, 1996: 5

Financial performance identifies how the company wishes to be viewed by its shareholders. The customer satisfaction determines how the company wishes to be viewed by its customers. The internal-business-process describes the business processes at which the company has to be particularly adapt in order to satisfy its shareholders and customers and the organizational learning and growth involves the changes and improvements which the company needs to realize if it is to make its vision come true (Norreklit, 2000: 67). Balanced scorecard implementation may help reduce information asymmetry and dysfunction between the top management and employees and it may also reduce role complexity and job stress in the internal environment of firms. Firms have various business environments, products, market competitive conditions and customer segments. For this reason, they should use a balanced scorecard model valid for their operations (Hansen and Mouritsen, 2005). For example, the balanced scorecard model may not be suitable for developing strategic interfaces between the top management and workers at large firms with split systems. Balanced score card usage doesn't meet the expectation that large firms need the balanced scorecard more than SMEs at weak market conditions (Hoque and James, 2000: 11-12).

2.2.3. Just in Time (JIT) Production

JIT is a managerial philosophy of organizational innovation, such as continuous improvement, controlling material flow and production scheduling. It has direct impact on increased productivity, reduced cost and improved quality. JIT has become more important because of steadily increasing the value of input costs such as labor, operating and raw material. When procurement costs are controlled by Just in time production system, the production has become more quality, independence, flexible and innovative (Humphreys, Mak and Yeung, 1998: 181).

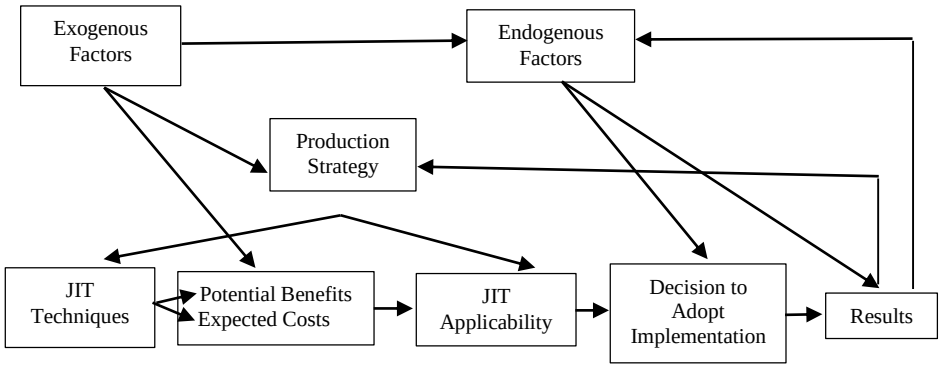


Figure 3: The Application Process of Just in Time Production System

Reference: Bartezzaghi and Turco,1989:42

JIT techniques can be described and measured by the potential benefits of the system and the expected costs to sustain the implementation of the system. JIT depends on exogenous factors, the degree of awareness and management orientation and endogenous factors, the degree of success or failure of JIT interventions in the presence of similar environmental conditions and potential benefits. These factors underlie the decision to adopt JIT. JIT aims at coordinating interventions in the areas of product structure, production process, organization and personnel, production planning and control, supplier relationships (Bartezzaghi and Turco,1989: 41-42). For example, the tendency of manufacturers to hold security stocks against delays and the unexpected shrinking of market is completely management's failure in planning. Generally, the high level of security stocks not only reduces productivity but also reduces profitability. JIT can't be considered in only stock limitations and quality control applications, however also it solves security stocks and pre-manufacturing time problems. Just in Time Production adopters have enhanced earnings (Huson and Nanda, 1995; Kinney and Wempe, 1998). The advantages of using Just in Time Production are waste reduction and increased ability to remain competitive. Just in Time Production improved working relations between employees and suppliers. Just in Time Production provides a high profits and customer satisfaction (Cheng and Podolsky, 1996). Tangible and intangible benefits of Just in Time Production have been observed in European manufacturing organizations (Kazazi and Keller, 1994; Bartezzaghi, Turco and Spina, 1992) and financial benefits of JIT have been revealed in the study of Inman and Mehra (1993). Despite high awareness of JIT techniques in the USA and UK, awareness of implementation is not at the same level. Success stories about implementation of JIT seems to depend on many factors, i.e. a firm size, turn-over and plant size. It shouldn't be expected that all firms' success is at the same level despite of implementation same procedures in their JIT system. To benefit from JIT, it must be applied on a holistic rather than on an ad hoc basis. Finally, developing countries

can gain a lot by adopting JIT, since in these countries quality, worker motivation, delivery times and scrap rates may be the key elements in implementation of JIT (Goyal and Deshmukh, 1992: 20).

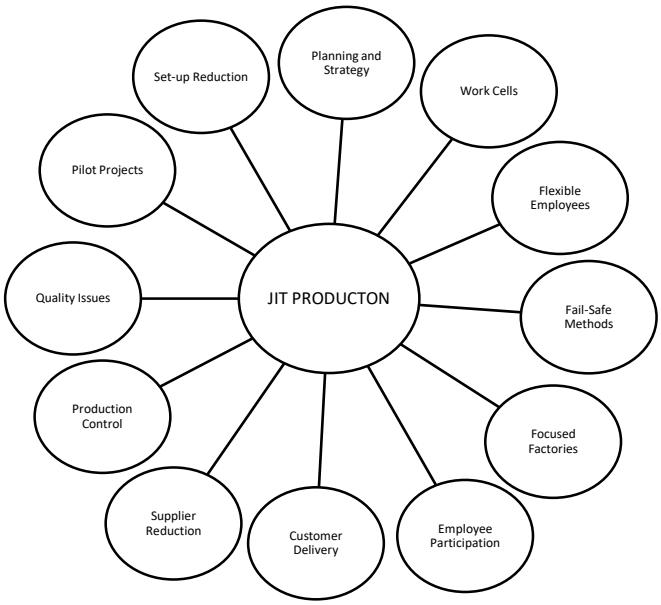


Figure 4: JIT Production Elements

Reference: Cheng and Podolsky, 1996: 26

JIT method would be successful if there are minimum number of suppliers, close and strong link with existing suppliers, adequate production depends on the demand, buyers' satisfaction, team work and product quality. Just in time production is simple in theory but hard to achieve in practice. If there is a problem wherein the anywhere in the system such as failure of providing required materials from suppliers or machine failure, then all production may be stop totally (Stefanic et. al., 2008: 178)

3. METHODOLOGY

The study was conducted using a questionnaire survey. The sample of firms selected for this study was taken from the member list of Commerce Chambers in Erzurum and Erzincan. In the list, there were 114 firms which all of them are industrial manufacturer SMEs whose number of labor was less than 200 in the year 2018 and whose head offices were located in Erzurum and Erzincan provinces. 11 firms in Erzurum and 16 firms in Erzincan were not included in the research due to

insolvency, relocation or refusing the survey. Participants of the survey were the owners or senior managers of industrial manufacturer SMEs in Erzurum and Erzincan. Therefore, the current research was conducted on 87 industrial manufacturer SMEs (40 firms were from Erzurum and the rest of 47 firms were from Erzincan) based on their sales turnover, number of labor and initial investment costs. The list of the selected firms represented different industry sectors, such as textiles and clothing, energy, food and beverage, plastics and chemicals, products of forest and construction. The study design was modeled based on the survey of Jbarah (2018). The questionnaire survey in the study included three strategic management accounting techniques. In the first phase of the study, data was collected through face to face interviews with senior executives or owners of industrial manufacturer SMEs in Erzurum and Erzincan, during June-July 2018. The questionnaire survey form comprised three parts. Part A consisted of questions related to demographic characteristics of the industrial manufacturer SMEs (age of the firm, amount of investment cost, annual average financial turnover, number of employees and activity areas) in Erzurum and Erzincan. Part B consisted of questions relating to participate perceptions on strategic management accounting techniques, such as just in time production, balanced scorecard and target costing. Part C consisted of questions relating to the effects of strategic accounting techniques on efficiency, speed and easiness of making investment decisions made by industrial manufacturer SMEs in Erzurum and Erzincan. In other words, respondents were asked to indicate whether strategic management accounting techniques used by industrial manufacturer SMEs in Erzurum and Erzincan have an effect on speed, easiness and efficiency of making investment decisions or not. A Likert-type scale used for measurement range from (5) agree-strongly to (1) disagree-strongly.

3.1. Analyses

Firstly, the industrial manufacturer SMEs in Erzurum and Erzincan were analyzed descriptively by their age, size and field of activity. Firm size was determined according to their investment cost, average financial turnover and number of labor. Then reliability and validity of the evaluated firms were checked before implementation and testing the hypotheses of the models. Explanatory factor analysis on the basis of principal component extraction method and Varimax rotation method, which is used to more easily interpret factor loadings, were used for the reliability and the validity of the scale. Factor loading was estimated as the correlation between a variable and a factor in the factor analysis. The number of factors suitable for the factor analysis was found based on eigenvalues greater than unity. The reliability of the scale was 0.712.

Explanatory factor analysis could be defined in matrix form as follows:

$$Z_{px1} = \lambda_{pxm} F_{mx1} + E_{px1} \quad (1)$$

Where,

Z is a *px1* vector of independent variables, λ is a *pxm* matrix associated to factor loadings, *F* is a *mx1* vector of factors, and *E* is a *px1* vector of error factors. In factor analysis, eigenvalues were used to obtain a correlation matrix.

There were four questions for Just in Time Production (JIT), five questions for Target Costing (TC) and 4 questions for Balanced Scorecard (BSC) were taken in consideration in order to provide reliability and validity of the scale.

Finally, three models and a hypothesis for each model were conducted for research. Multiple linear regression analysis was used to test hypotheses in the research models. There were three different models and each of model has different dependent variable and same independent variables. The dependent variables of the models were efficiency of making investment decisions, easiness of making investment decisions and speed of making investment decisions, while the independent variables for each model were components of strategic management accounting techniques, just in time production, targeting cost and balanced scorecard.

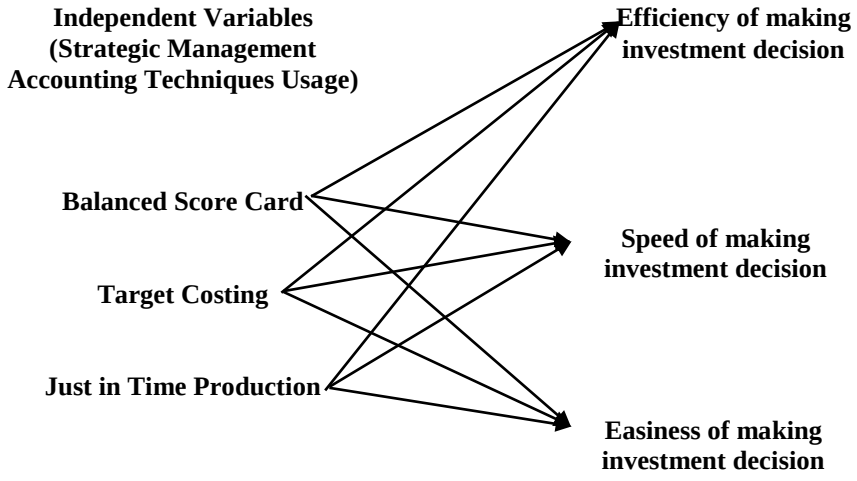


Figure 5: Models of The Research

3.2. Research Models

MODEL 1: In the first model of the research, the effects of strategic management accounting techniques on taking efficiency investment decision was investigated by multiple regression model. The null hypothesis of the model was "*Strategic*

management accounting techniques have no impact on the efficiency of making investment decision".

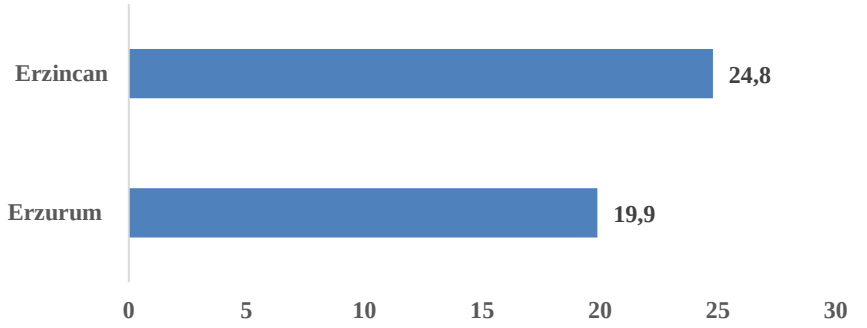
MODEL 2: In the second model of the research, the effects of strategic management accounting techniques on speed of making investment decision was investigated by multiple regression model. The null hypothesis of the model was *"Strategic management accounting techniques have no impact on the speed of making investment decision*".

MODEL 3: In the third model of the research, the effects of strategic management accounting techniques on easiness of making investment decision was investigated by multiple regression model. The null hypothesis of the model was *"Strategic management accounting techniques have no impact on the easiness of making investment decision".*

Scale results were evaluated using the IBM SPSS v23 statistical program (IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp).

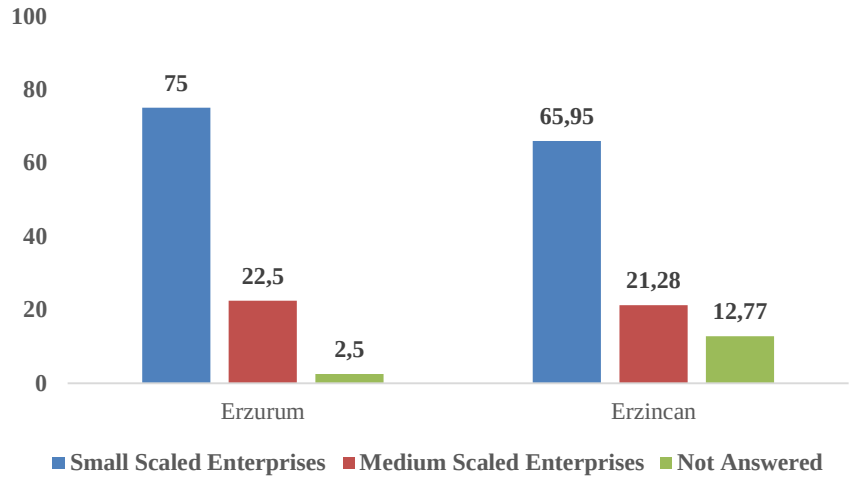
4. RESULTS

The average age of the industrial manufacturer SMEs in Erzurum is 19.9 years whereas the average age of the industrial SMEs in Erzincan is 24.8 years. %12,77 of participant In Erzincan did not state their firm's age.



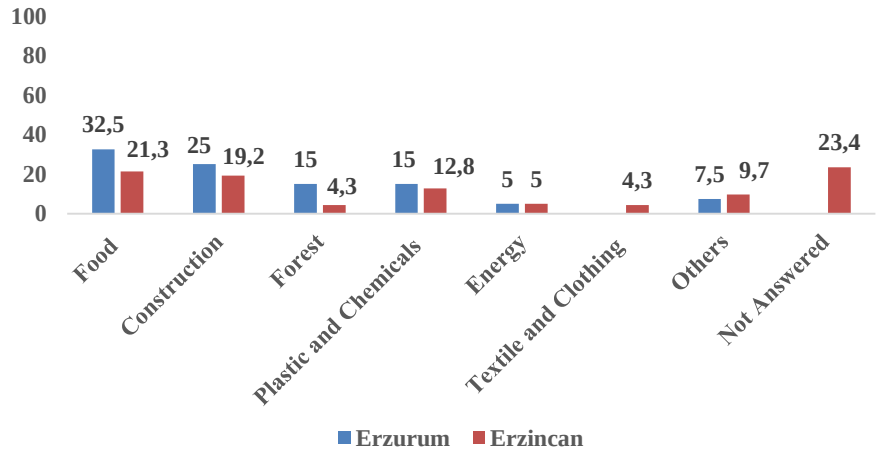
Graph 1: The ages of industrial manufacturer SMEs in Erzurum and Erzincan (Average Age)

When industrial manufacturer SMEs in Erzurum and Erzincan provinces were classified according to the average number of employees. The SMEs whose employees' number is lower than 50 called small scaled enterprise and whose employees' number is between 50 and 200 called medium scaled enterprise.



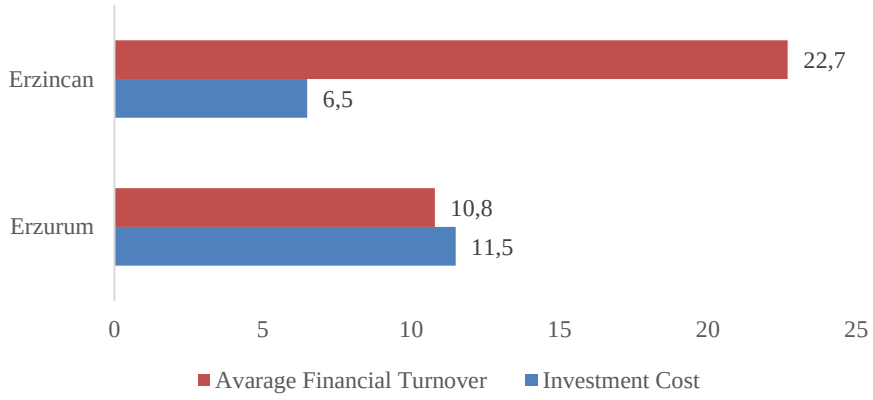
Graph 2: Firm Sizes of industrial manufacturer SMEs in Erzurum and Erzincan (%)

%75 of firms whose number of labors was lower than 50 called small scaled firms and %22,5 of firms whose number of labors was between 50 and 200 called medium scaled firms in Erzurum whereas %65,95 of firms whose number of labors was lower than 50 called small scaled firms and %21,28 of firms whose number of labors was between 50 and 200 called medium scaled firms in Erzincan. In the research, %2,5 of participants in Erzurum and %12,77 of participants in Erzincan did not state their firm size.



Graph 3: Activity Fields of industrial manufacturer SMEs in Erzurum and Erzincan (%)

When industrial manufacturer SMEs in Erzurum and Erzincan were classified according to their activity field, it was seen that %32,5 of firms were in food and beverage producers, %25 of firms were construction material producer, %15 of firms were forest products producers, %15 of firms were plastics materials and chemicals producers, %5 of firms were energy products producers and %7,5 of firms produced other goods and materials in Erzurum whereas %21,3 of firms were in food and beverage producers, %19,2 of firms were construction material producer, %4,3 of firms were forest products producers, %12,8 of firms were plastics materials and chemicals producers, %5 of firms were energy products producers, %4,3 of firms were textile and clothing producers and %9,7 of firms produced other goods and materials in Erzincan. %23,4 of the firms in Erzincan didn't state their activity fields.



Graph 4: Balance of Investment Cost and Average Financial Turnover of industrial manufacturer SMEs in Erzurum and Erzincan (Million TL)

40% of the SMEs in Erzurum did not state their investment cost and 27.5% did not state their average financial turnover. 40,43% of the SMEs in Erzincan did not state their investment cost and 44,7% did not state their average financial turnover. The investment costs and financial turnovers of industrial manufacturer SMEs in Erzurum and Erzincan Provinces are shown difference because of their investment zones. Although they are in the same geographical region, Erzurum is at the 5th region and Erzincan is at the 4th region by their investment incentive zones. It was determined that the production fields of firms in Erzurum and Erzincan are similar but the number of medium scale of firms in Erzincan is greater than those in Erzurum, therefore the possibility of benefit of medium-sized firms in Erzincan from investment incentives are higher than those in Erzurum. Use of investment incentives may reduce the investment cost of firms in Erzincan. The Free Zone in Erzurum, located in Eastern Anatolia, was closed in 2009 because it could not operate. On the other side, there are many new support and incentives that are given

in order to reduce the investment costs for Organized Industrial Zones in Erzincan for OIZs. In addition, Erzincan is at the intersection of the main road in the Black Sea and Mersin Port through north-south and east-west line which facilitate access to domestic and overseas markets and provide to increase the trade volume. Against, in Erzurum, the production is not enough to meet the investment costs because the products are not high value added and the geographic position of Erzurum increases the transport costs.

4.1. The Reliability and Validity of the Scale

The reliability of the scale, also known as a Cronbach alpha coefficient, was 0.712. There were four questions for JIT, five questions for TC and four questions for BSC were taken into consideration in order to provide the reliability and validity of the scale. Kaiser-Meyer-Olkin (KMO) value was 0.661>0,600. This means that sampling is adequacy for overall scale. Probability value of Barlett's test of sphericity was estimated 0.000<0.05, which means that data is suitable for factor analysis. Item total statistics results show that deleting an item form the scale didn't increase Cronbach Alpha value anymore.

Then to determine the number of factors in the scale, the explanatory factor analysis was used. It was seen that there were three dimensions in the scale. JIT dimension explained %20,673 of the explained variance of the scale, TC dimension explained %18,111 of the explained variance of the scale and BSC explained %17,015 of the explained variance of the scale. Cumulatively the total explained variance of the scale was %55,799.

The item named "The just in time production systems shortens the time to reach the final customer of the product" took the first rank with an arithmetic mean of (4.20) and a standard deviation of (.673), while the item maned "Products are tested after they are manufactured to ensure customer satisfaction, high quality and affordable product price" took the last rank with an arithmetic mean of (3.67) and a standard deviation of (1.264). The manufacturer SMEs in Erzurum and Erzincan give importance to shorten deliver time of products to customers, to work with small number of suppliers, to reduce production and storage costs, to determine product prices according to demand conditions and internal organizational communication and management systems such as accounting information systems, budgeting and investment planning to make long term strategies of their companies. The manufacturer SMEs in Erzurum and Erzincan provinces find business engineering expensive because of their industrial structure and production fields. The manufacturing industrial structure mostly stands on food and animal products which does not require high technology and the price of products more or less similar in local or national markets.

Table 1: The Reliability and Validity of the Scale

Factors	Items	Factor Loads	Factor Loads	Factor Loads	Mean	Standart Deviation	Cronbach Alpha	
Just-in-Time	The just in time production system shortens the time to reach the final customer of the product	.814			4,26	.673	.707	.712
	The just-in-time production system allows firms to work with a small number of suppliers.	.780			4,25	.669		
	The just-in-time production system ensures product quality improvement and reduction in cost of product through testing and control procedures.	.670			4,11	.706		
	The just-in-time production system allows the firm to produce its products according to the number of orders.	.666			4,03	.921		
Target Costing	Products are tested after they are manufactured to ensure customer satisfaction, high quality and affordable product price.		.758		3,67	1.264	.766	
	Business engineering is used to reduce production costs and to design new models in the future.		.758		3,82	1.317		
	Costs of products are affected by the storage costs of the raw materials, the requirements used in the production process.		.714		4,13	.900		
	Demands are considered to determine the most appropriate product price in the market.		.674		4,24	1.000		
	A transport systems is used according to the raw materials and materials used in the product process.		.673		4,00	1.100		
Balanced Scorecard	The long-term strategies of the firm are determined under the control of management systems such as accounting information systems, budgeting and investment planning.			.805	4,20	.805	.740	
	The firm has strong corporate knowledge that ensures employee-manager harmony			.751	4,11	.841		
	Performance metrics provide continuous learning and personnel skills development for all employees.			.715	4,05	.888		
	All decisions taken in the firm are communicated to employees. Internal organizational communication encourages organizational change and continuous learning.			.701	4,20	.860		

4.2. Research Models and Hypothesis Tests

Model 1: The effect of Strategic Management Accounting Techniques on Efficiency of Making Investment Decisions

The results of the Pearson correlation revealed that there is a positive and moderate relationship between the strategic management accounting techniques dimensions (target costing, balanced scorecard, JIT production system) with efficiency of making investment decisions of manufacturer SMEs in Erzurum and Erzincan.

Table 2: Pearson Correlation Between Strategic Management Accounting Techniques and Taking Efficient Investment Decisions of Manufacturer SMEs in Erzurum and Erzincan

Correlations					
		$TID_{efficiency}$	**JIT**	**TC**	**BSC**
Pearson Correlation	$TID_{efficiency}$	1.000	.454	.531	.456
	JIT	.454	1.000	.130	.084
	TC	.531	.130	1.000	.128
	BSC	.456	.084	.128	1.000
Sig. (1-tailed)	$TID_{efficiency}$	.	.000	.000	.000
	JIT	.000	.	.116	.221
	TC	.000	.116	.	.119
	BSC	.000	.221	.119	.

It is seen that target costing is more related with efficiency of making investment decisions than just-in-production and balanced scorecard.

Model 1: $TID_{efficiency} = -3{,}268 + 0.657\ JIT_i + 0.527\ TC_i + 0.569\ BSC_i$ (2)

If the effect of target costing and balanced scorecard on efficiency of making investment decision are fixed then just in time technique increases the efficiency of making investment decision. If the effect of just in time and balanced scorecard on efficiency of making investment decision are fixed, then target costing technique increases the efficiency of making investment decision. If the effect of target costing and just in time on efficiency of making investment decision are fixed, then balanced scorecard technique increases the efficiency of making investment decision.

Table 3: The Effect of Strategic Management Accounting Techniques on Efficiency of Making Investment Decisions

	Coeffients	**Standardized Coefficients**	**Std. Dev.**	**T ist.**	**Prob**
Constant	−3,268	-	.722	-4.523	.000
JIT	0.657	0.367	.131	5.027	.000
TC	0.527	0.436	.089	5.947	.000
BSC	0.569	0.370	.112	5.072	.000
R squared	.567				
Prob (F sta.)	0.000				
Durbin Watson	1.896				

JIT is the most effective technique to increase efficiency of making investment decisions than other techniques such as TC and BSC. Because JIT process focuses on to minimize the stocks. JIT system reduces the organization's investment in storage space for raw materials and in the materials, themselves. A manager of a SME using the JIT approach orders materials and parts more often and in smaller quantities, thereby reducing investment in both storage space and actual inventory. JIT reduces the obsolescence and increases flexibility by making use of factory capacity. The hypothesis 1 was rejected. Therefore, strategic management accounting techniques has a positive effect on the efficiency of the making investment decisions.

Model 2: The effect of Strategic Management Accounting Techniques on easiness of Making Investment Decisions

The results of the Pearson correlation coefficient revealed that there is a positive and moderate relationship between the strategic management accounting techniques dimensions (target costing, balanced scorecard, JIT production system) with easiness of making investment decisions of manufacturer SMEs in Erzurum and Erzincan provinces.

Table 4: Pearson Correlation between Strategic Management Accounting Techniques and Easiness of Making Investment Decisions of Manufacturer SMEs in Erzurum and Erzincan

Correlations					
		TID_{ease}	**JIT**	**TC**	**BSC**
Pearson Correlation	TID_{ease}	1.000	.425	.538	.481
	JIT	.425	1.000	.130	.084
	TC	.538	.130	1.000	.128
	BSC	.481	.084	.128	1.000
Sig. (1-tailed)	TID_{ease}	.	.000	.000	.000
	JIT	.000	.	.116	.221
	TC	.000	.116	.	.119
	BSC	.000	.221	.119	.

It is seen that target costing is more related with easiness of making investment decisions than just-in-production and balanced scorecard.

Model 2: $TID_{ease} = -4.252 + 0.661\ JIT_i + 0.592\ TC_i + 0.672\ BSC_i$ (3)

If the effect of target costing and balanced scorecard on easiness of making investment decision are fixed then just in time technique increases the ease of making investment decision. If the effect of just in time and balanced scorecard on ease of making investment decision are fixed, then target costing technique increases the ease of making investment decision. If the effect of target costing and just in time on ease of making investment decision are fixed, then balanced scorecard technique increases the ease of making investment decision.

Table 5: The Effect of Strategic Management Accounting Techniques on Easiness of Making Investment Decisions

	Coeffients	**Standardized Coeff.**	**Std. Dev.**	**T ist.**	**Prob**
Constant	−4.252	-	.793	-5.365	.000
JIT	0.661	0.335	.143	4.607	.000
TC	0.592	0.444	.097	6.088	.000
BSC	0.672	0.396	.123	5.457	.000
R squared	.572				
Prob (F sta.)	0.000				
Durbin Watson	1.833				

It is seen that BSC is the most effective technique to make easier investment decision. Because BSC is used to measure firm performance and to set strategy. The balanced scorecard can help managers direct their employees to certain goals since the scorecard make easy to take investment decisions. The balanced scorecard can be used to relay investment decisions and implications of these decisions to shareholders and to show how managers are steering the company to investment decisions that are taken. The hypothesis 2 was rejected. Therefore, strategic management accounting techniques has a positive effect on the ease of making investment decisions.

Model 3: The effect of Strategic Management Accounting Techniques on speed of making Investment Decisions

The results of the Pearson correlation revealed that there is a positive and moderate relationship between the strategic management accounting techniques dimensions (target costing, balanced scorecard, JIT production system) with speed of making investment decisions of manufacturer SMEs in Erzurum and Erzincan.

Table 6: Pearson Correlation between Strategic Management Accounting Techniques and Speed of Making Investment Decisions of Manufacturer SMEs in Erzurum and Erzincan

Correlations					
		TID_{speed}	**JIT**	**TC**	**BSC**
Pearson Correlation	TID_{speed}	1.000	.427	.550	.357
	JIT	.427	1.000	.130	.084
	TC	.550	.130	1.000	.128
	BSC	.357	.084	.128	1.000
Sig. (1-tailed)	TID_{speed}	.	.000	.000	.000
	JIT	.000	.	.116	.221
	TC	.000	.116	.	.119
	BSC	.000	.221	.119	.

It is seen that target costing is more related with speed of making investment decisions than just-in-production and balanced scorecard.

Model 3: $TID_{velocity} = -2.454 + 0.589\, JIT_i + 0.545\, TC_i + 0.396\, BSC_i$ (4)

If the effect of target costing and balanced scorecard on velocity of making investment decision are fixed then just in time technique increases the velocity of making investment decision. If the effect of just in time and balanced scorecard on velocity of making investment decision are fixed, then target costing technique increases the velocity of making investment decision. If the effect of target costing and just in time on velocity of making investment decision are fixed, then balanced scorecard technique increases the velocity of making investment decision.

Table 7: The Effect of Strategic Management Accounting Techniques on Speed of Making Investment Decisions

	Coeffients	**Standardized Cofficient**	**Std. Dev.**	**T ist.**	**Prob**
Constant	−2.454	-	.743	-3.302	.001
JIT	0.589	0.344	.134	4.384	.000
TC	0.545	0.471	.091	5.980	.000
BSC	0.396	0.268	.115	3.427	.001
R squared	.501				
Prob (F sta.)	0.000				
Durbin Watson	1.833				

It is seen that JIT and TC techniques accelerate making investment decision. Investment decisions need to be thought through before product design and development decisions are finalized. In this sense TC is driving investment decisions in a competitive market environment and accelerates making investment decisions. Target costing is usually applied to new product planning, which frequently requires investments in tooling, equipment, and other assets influencing costs. The level of investment is required to support the product. Besides, JIT activates production helps investors to react fast toward different product demand. The hypothesis 3 was rejected. Therefore, strategic management accounting techniques has a positive effect on speed of making investment decisions.

5. CONCLUSION AND SUGGESTIONS

Strategic management accounting provides a harmony between organizational designs with strategic factors (strategic planning, strategic formulation, strategic control, etc.) using performance measurement, cost management and process innovation in production (Shields, 1997). The objective of the study is to measure the effect of using strategic management accounting techniques on making investment decisions of manufacturer SMEs in Erzurum and Erzincan. To test hypothesis of the study, Multiple Linear Regression Analysis was used. Three hypotheses had been rejected. This means that strategic management accounting techniques seem to contribute positively to efficiency, easiness and speed of making investment decisions of industrial manufacturer SMEs in Erzurum and Erzincan. The findings of this study indicate that JIT had the highest rate of effect on efficiency of making investment decision followed by BSC and TC. BSC had the highest rate of effect on easiness of making investment decision followed by JIT and TC. JIT had the highest rate of effect on speed of making investment decision followed by TC and BSC. As a result, in Erzurum and Erzincan the strategic management accounting techniques affect moderately making investment decisions.

Therefore, the use of the strategic management accounting techniques provides SMEs to develop themselves and improve industrial investments in the eastern regions of Turkey. The study shows similar results with Jbarah (2018) and Santini (2013). Comparing to the results of a previous research carried out on Jordian industrial companies in Jordan (Jbarah, 2018), this study's findings indicate that there is a moderate effect of the management accounting techniques with its variables (target costing, balanced scorecard, JIT production system) in making investment decisions. The study of Santini (2013) indicates that regardless of firm size, SMEs strongly need strategic management accounting techniques while they are making investment decision. Increasing awareness of industrial manufacturer SMEs in usage strategic management accounting methods helps investors to make investment decisions in complex and dynamic economic environment.

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