

A Panel Dupont Regression Approach to Evaluate Financial Performance and Market Value of Transportation Firms in Türkiye*

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ABSTRACT

In this study, we examine the financial performance and market value of transportation firms in Türkiye, by utilizing a combination of panel data models and Dupont analysis. We use data from publicly traded transportation firms, starting from 2017 Q3 to 2022 Q2, and exhibit which factors influence financial performance and market value in the industry. Financial performance model results show that profitability and productivity positively and significantly impact transportation firms' performance whereas debt usage negatively impacts performance. Our findings on market value analysis show that profitability has no impact on the market value of transportation firms whereas debt usage and productivity have a positive effect on market values in the sector. The findings offer many practical implications that can be used for managers, financial investors, and stakeholders in the transportation industry.

Anahtar Kelimeler: Transportation firms, Dupont analysis, Panel data models, Market value, Financial performance

JEL Sınıflandırması: M40, C23, R40

Türkiye’de Ulaştırma Firmalarının Finansal Performansı ve Piyasa Değerini İncelemede Panel Dupont Regresyon Yaklaşımı

ÖZET

Bu çalışmada panel veri modelleri ve Dupont analizinin bir kombinasyonu kullanılarak Türkiye’de yer alan ulaştırma sektörü şirketlerinin finansal performansı ve piyasa değerleri incelenmiştir. Çalışmada halka açık ulaştırma sektörü firmalarının, 2017 Q3 – 2022 Q2 arası dönemleri kapsayan finansal bilgileri kullanılmış ve hangi faktörlerin şirket performansına ve piyasa değerine etki ettiği araştırılmıştır. Finansal performans modeli sonuçları karlılığın ve verimliliğin performansı pozitif yönde etkilediği, öte yandan borç kullanımındaki artışın performansı düşürdüğünü göstermiştir. Piyasa değeri modeli sonuçları şirket karlılığının ulaştırma sektörü firmalarının piyasa değerlerinde anlamlı bir etkisi bulunmadığını, öte yandan borç kullanımının ve verimliliğin artışının şirketlerin piyasa değerlerine pozitif yansıdığını göstermektedir. Araştırmanın bulguları ulaştırma sektöründeki şirket yöneticileri, finansal yatırımcılar ve paydaşlar için birçok pratik uygulamalar ve öneriler sunmaktadır.

Keywords: Ulaştırma firmaları, Dupont analizi, Panel veri analizi, Piyasa Değeri, Finansal performans

Jel Classification: M40, C23, R40

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1. INTRODUCTION

Transportation has been playing a crucial role in human history. The definition of transportation is simply the act of moving people and goods from one location to another. Since ancient times, people have used transportation to get from one location to another and for their life cycles. Since the nineteenth century, with the inventions of steam-powered and diesel-powered engines, transportation has been an important part of national economics as moving goods and services has become easier than before. An important tool that may be employed to ensure economic progress is transportation, which includes economic, social, political, military, societal, and environmental components (Erdoğan, 2016:189). Therefore, policymakers should better examine, analyze and plan the transportation industry in order to use natural resources efficiently, distribute goods and services when desired, and accordingly develop domestic and foreign trade (Akgüngör ve Demirel, 2011: 424; Karadeniz ve Kılıç, 2015: 80), to ensure sustainable development and economic growth. The transportation industry undertakes an important task for all other industries as it is closely related to all economic lines and supply chains. The operation of many business lines can be maintained with the input and product shipments made using transportation companies. Other industries benefit from the efficient management of transportation-related businesses as well. With the increasing trade relations and new trade routes in the globalizing world, the weight of the transportation sector in the functioning of the economy has increased (Pala, 2021: 265).

Humanity has the ability to make development sustainable by meeting the daily needs of the present without compromising the ability of future generations to meet their needs. To achieve these sustainable development goals, transportation is one of the most important components of nations. As in the whole world, transportation systems in Turkey are provided by road rail, sea, airway pipelines, and mixed transportation alternatives. Turkey continues its transportation investments to support economic growth and also to create an attraction center for foreign direct investments, and transportation is among the priority targets in its development policies. Based on the assumption that there is a linear and positive relationship between economic development and the transportation sector, it will not possible to achieve sustainable development in national economies with limited transportation opportunities.

In accordance with the structure above, this study examines the transportation industry in Türkiye with two dimensions; financial performance and market value. This study utilizes a combination of panel data methods and Dupont analysis to investigate the two above mentioned topics and suggest some policies for business managers in the sector. This study contributes to the literature in two ways. Firstly, it suggests using the classical accounting method, Dupont analysis, with a well-known econometric method, panel data analysis, to investigate financial performances and market values of firms. Secondly, businesses are the most important components of economies. Having well-performed firms in the transportation sector, a nation's economic development and growth will catch sustainable progress. In this context, the second contribution of this study is that it suggests some policy implications for business managers and stakeholders in the sector.

2. THEORETICAL BACKGROUND AND REVIEW OF LITERATURE

In this part of the study, we will first discuss the logic of financial performance evaluation, the Dupont Analysis concept, and its importance for corporate management. Afterward, the studies on performance evaluation of transportation firms will be summarized.

2.1. Dupont Analysis and Financial Performance Evaluation

Financial performance analysis is a key component of business management. According to modern finance theory, a firm’s goal is defined as maximizing its value for shareholders. Of course, this value maximization is a long-run purpose and needs strategic planning and control. On the other hand, any long-run targets require successful short-term management. In business management, this process is defined as financial performance.

The management should focus on maximizing the firm’s value for its current shareholders. However, this strategic goal is a long-run achievement; since there is no limit, it is also a continuous process. As modern finance theory indicates, firm value is directly related to a firm’s future free cash flows, capital structure, and cost of capital. These factors can be represented as follows in equation 1.

$$Firm\ Value = \sum_{t=1}^{\infty} \frac{FCF_t}{(1 + WACC)^t}, t = 1,2, \dots \tag{1}$$

$$WACC = w_d * r_d * (1 - T) + w_e * r_e \tag{2}$$

In equation 1, FCF represents free cash flows to the firm at time *t*, and WACC represents the weighted average cost of capital of a firm. Besides, equation 2 shows the calculation of WACC. It is simply the weighted average of a firm’s capital sources. In equation 2, *w_d* and *w_e* stand for the weight of debt and equity in a firm’s capital respectively while *r_d* and *r_e* hold for the cost of debt and the cost of equity. The last term, *T*, is the firm’s corporate tax rate. One may notice that all variables in equations 1 and 2 are either long-run achievements such as free cash flows, target capital structure and cost of capital or out of the firm’s jurisdiction such as tax rates. To conclude on firm value theory, as the discussion above displays, firm value maximization is a long-term goal.

To achieve its long-run purposes, a firm should be successful in the short-run. Firms should have a profitable year, generate sufficient accounting cash flows to meet their debt and interest payments as well as fixed asset investments, and finally manage their operations and risks such as; short-term debts, bankruptcy risks, working capital, operations, fluctuating (short-term) financial structure, satisfy shareholders’ need such as dividend payments and propose strategic planning, etc. This short-term management success, thanks to accounting literature and academicians, can be evaluated by financial analysis tools such as profitability, leverage, productivity, liquidity, and some accounting-market-based ratio analysis such as price-to-earning ratio, market-to-book ratio, etc. Evaluating these financial analysis tools at once, by building multivariate mathematical or statistical models gives magnificent results to understand a firm’s overall performance, which is called financial performance evaluation.

The researchers have developed many tools and techniques for financial performance evaluation. The most used ones are multicriteria decision-making methods and Dupont analysis. The main advantage of these techniques is that these evaluation tools are based on multivariate models that highlight many different features and characteristics of the appraise.

Begin with Dupont Analysis, developed in 1918 by evaluation of the financial performance of Du-Pont de Nemours & Co, it is one of the oldest financial performance evaluation techniques of all. The method aims to evaluate a firm's performance by three factors; profitability, productivity, and capital structure. The Dupont analysis is a magnificent framework that decomposes and evaluates financial performance into three dimensions. The Dupont formula is given below in equations 3-5.

$$\text{Financial Performance} = f(\text{Profitability, Productivity, Capital Structure}) \quad (3)$$

$$ROE_{i,t} = \frac{\text{Net Profit}_{i,t}}{\text{Total Sales}_{i,t}} * \frac{\text{Total Sales}_{i,t}}{\text{Total Assets}_{i,t}} * \frac{\text{Total Assets}_{i,t}}{\text{Total Equity}_{i,t}} \quad (4)$$

$$ROE_{i,t} = \text{Net Profit Margin}_{i,t} * \text{Asset Turnover Ratio}_{i,t} * \text{Equity Multiplier}_{i,t} \quad (5)$$

2.2. Related Literature on Dupont Analysis

Dupont analysis has been a widely used technique in the literature and has been utilized for the evaluation of firms from different countries and industries. For instance, Koşan and Karadeniz (2013, 2014, 2017) have applied Dupont analysis many times in different studies to appraise industry performances by utilizing industry averages data from The Central Bank of the Republic of Türkiye. Firstly, Koşan and Karadeniz (2013) applied Dupont analysis to the manufacturing industry while Koşan and Karadeniz (2014)'s study focused on the accommodation and food services sector. Lastly, Karadeniz and Koşan (2017) repeated their research on the hospital services sector.

In addition to the industry evaluation studies above, there are two more mainstream applications of Dupont analysis that we have detected in the review process of related literature. These are firm-specific studies that focused on only one firm, and evaluation of a group of publicly traded firms.

Gümüş and Çıbık (2018) evaluated publicly traded real estate investment trusts in Turkey by using Dupont analysis and ranked from the most successful to the least ones among all. Akyüz et al. (2019) applied the same methodology to publicly traded manufacturing firms while Büyükarıkan and Eryılmaz (2020) focused on agriculture firms by using a similar method. Lastly, Akyüz et al. (2020) analyzed paper companies with Dupont analysis. Although these aforementioned studies are very important papers for accounting and finance literacy, they have a vital deficiency. They do not demonstrate the source of performance and do not put any logical theoretical findings or practical implications forward. They only focus on which firm is better than others or which firm's/industry's profitability ratios have increased between periods. But again, they lack to assert any theoretical progress or reasonable practical implications. On the other hand, there are few important studies in the literature that utilizes DuPont analysis information to examine operating characteristics and stock market performances of the firm. These studies are abstracted below.

Soliman (2008) tested the usefulness of DuPont analysis comprehensively. He examined how market participants utilize DuPont analysis components while evaluating the prospects of the firms. Soliman found that stock market participants such as equity analysts and investors recognize information of future DuPont components. The findings show that stock returns are positively related with changes in asset turnover in long-run. To conclude, Soliman indicates that DuPont components represents a viable form of knowledge on the operating performance of a firm.

In their study, Dehning and Stratopoulos (2002) claimed that successful usage of information technology (IT) will provide companies with competitive advantage compared to their competitors. According to the researchers, the firms with effective use of IT increments profitability and efficiency. To test their hypothesis, Dehning and Stratopoulos (2002) utilized DuPont analysis components. Using a matched pair design, they compared companies who effectively use of IT to their competitors. They found that the firms whose IT processes are successfully managed increased their profitability and efficiency compared to their direct competitors.

Chang et al. (2014) examined the usefulness of DuPont analysis information for equity analysts and stock market participants in health care industry. Similar to Soliman (2008), they also found that DuPont components provides useful information for market participants in the industry. Finally, the findings of Cheng et al. (2014) exhibited that profitability supplies better information for the market than other components of DuPont analysis.

2.3. Related Literature on Financial Performance of the Transportation Industry

We also conducted a literature review on the studies whose research focuses on the performance of transportation firms. Compared with the crucial role of the transportation industry in the national economy, the literature on the topic is rather insufficient. The vast majority of these studies imply multicriteria decision-making (MCDM) methods to evaluate the performance of transportation firms. We summarize these studies in Table 1 below.

Table 1. Studies on Financial Performance of Transportation Firms

Study	Method
Ömürbek and Kınay (2013)	TOPSIS
Akgün and Temür (2016)	TOPSIS
Avcı and Çınaroğlu (2018)	AHP-TOPSIS
Başdeğirmen and Işıldak (2018)	Gray Relational Analysis
Gümüş and Çıbık (2019)	MOORA and VIKOR
Oral and Kıpkip (2019)	TOPSIS and PROMETHEE
Ersoy (2020)	Gray Relational Analysis
Orhan et al. (2020)	CRITIC and TOPSIS
Macit and Göçer (2020)	Gray Relational Analysis
Sakarya and Aksu (2020)	Entropy-TOPSIS
Alpınak and Kale (2021)	OCRA
Elmas and Özkan (2021)	SWARA-OCRA
Pala (2021)	IDOCRIW and MARCOS

To mention multicriteria decision-making methods (MCDM) such as TOPSIS, VIKOR, WASPAS, OCRA, Gray Relational Analysis, SWARA, etc., these models utilize a static methodology that evaluates multiple alternatives (usually firms and their performances in business literature) with many different financial ratios. The main purpose of these models is to select the best ones among alternatives and rank the rest based on different financial analysis ratios. Although these models are used widely in accounting and business literature, they usually lack a theoretical background in academic studies. The selection and ranking of a group of firms do not provide any scientific knowledge unless this analysis is based on a business/accounting/finance theory and used for testing a hypothesis based on the literature.

Besides the vast majority of studies above, there are few studies exist that examine the performance of transportation firms. For example, Brown (2016) investigate the relationship between the financial performance of air transportation firms and political actions with a panel data approach. He chooses financial performances as a dependent variable while lobbying expenditures and political connectedness as independent variables with five control variables; gross domestic product, fixed assets, firm size, firm liquidity, and firm age. Brown's (2016) study shows that lobbying activities, political activities, U.S. gross domestic product, firm size and age, and liquidity have a positive and significant impact on the financial performances of air transportation firms.

Do et al. (2021) come up with a different point of view on the financial performance of transportation firms. In their study, Do et al. (2021) analyze transportation firms in emerging markets from a corporate governance perspective. Their study implies that corporate governance practices have a negative or no significant impact on the performance of Vietnamese transportation firms. A similar study was conducted by Budiman and Krisnawati (2021) on Indonesian transportation firms. Their study aims to examine whether good corporate governance practices affect the financial performance of transportation firms or not. The results show that the components of corporate governance practices do not have any statistically significant effect on financial performance.

3. RESEARCH METHODOLOGY

This study aims to examine the determinants of financial performance and market value of transportation firms in Türkiye. To do this, this study utilizes a combination of Dupont Analysis and panel data analysis.

3.1. Data

In line with the research questions, we use financial data of publicly traded transportation firms in Borsa Istanbul. Our dataset consists of quarterly data from the third quarter of 2017 to the second quarter of 2022. In this period, there exist eight firms with available data in the stock market. So, the dataset consists of eight units (firms) with twenty periods, ending up with panel data of 160 observations. We collect study data from financial statements of firms by using the Public Disclosure Platform. Also, stock prices are collected from the Borsa Istanbul database.

3.2. Econometric Models and Variables

This study consists two research model. We firstly analyzed the factors affect financial performance of the firms with Panel-Dupont-Regression analysis. In equation 6 and 7, we present mathematical and econometric models¹ for this research question.

$$ROE_t = f(NPM_t, ATR_t, EM_t) \tag{6}$$

$$ROE_{i,t} = \alpha + \beta_1 * NPM_{i,t} + \beta_2 * ATR_{i,t} + \beta_3 * EM_{i,t} + \varepsilon_{i,t} \tag{7}$$

Following Dupont analysis methodology, we model return on equity as a function of three components of financial performance; net profit margin (NPM), asset turnover ratio (ATR) and equity multiplier (EM). Our mathematical model defines financial performance as a function of NPM, ATR and EMR. After defining mathematical model, we set the first econometric model for this study. In equation 7, $ROE_{i,t}$ stands for return on equity of i^{th} firm at time t while $NPM_{i,t}$, $ATR_{i,t}$ and $EM_{i,t}$ refers to abovementioned variables of i^{th} firm at time t . Lastly, $\varepsilon_{i,t}$ is the i.i.d. error term of the model with zero mean and unit variance.

$$MVBV_t = f(NPM_{t-1}, ATR_{t-1}, EM_{t-1}) \tag{8}$$

$$MVBV_{i,t} = \delta + \gamma_1 * NPM_{i,t-1} + \gamma_2 * ATR_{i,t-1} + \gamma_3 * EM_{i,t-1} + \mu_{i,t} \tag{9}$$

Equation 8 and 9 exhibits mathematical and econometric models to test the second research question of this study². In equation 8, we use Dupont analysis components to model market value of transportation firms. We model market value (MVBV- Market-to-book-ratio) of the firms as a function of profitability, productivity and capital structure. Similarly, in equation 9, we define our second econometric model where MVBV represents the market value of i^{th} firm at time t while $NPM_{i,t-1}$, $ATR_{i,t-1}$, $EM_{i,t-1}$ are the classical Dupont analysis components. Finally, $\mu_{i,t}$ stands for i.i.d. disturbance term of the model with zero mean and unit variance. For market value model, we use market values of the firms at time t while other variables belong to time $t-1$. In Türkiye, financial reports of publicly traded firms are generally published two or three months after accounting period. Thus, the impact of current accounting information can only be observable 2-3 months after the period. For this reason, we put a quarter difference between market data and accounting information to catch the impact of this fact.

3.3. Preliminary Analysis

Tables 2 and 3 exhibits unconditional Pearson correlation between study variables and descriptive statistics respectively. Research variables do not show any strong pairwise correlation, both among dependent-independent variables and between independent variables. NPM display positive and moderate level correlation with ROE but other variables do not show any strong or moderate level correlation coefficient.

¹ We will call this model as “Model 1” in short for the following parts of the study.

² This model with market value as dependent variable will be called “Model 2” for the following parts of the study.

Table 2. Unconditional Pearson Correlation Matrix

	NPM	ROE	MVBV	EM	ATR
NPM	1				
ROE	0,44	1			
MVBV	-0,04	-0,04	1		
EM	-0,28	-0,24	0,30	1	
ATR	-0,09	0,09	0,31	-0,15	1

Table 3. Descriptive Statistics

	NPM	ROE	MVBV	EM	ATR
Mean	0,12	0,15	3,26	5,17	0,89
Median	0,05	0,16	1,66	3,55	0,48
Std. Dev.	0,30	0,58	4,65	6,59	1,18
Variance	0,09	0,34	21,58	43,38	1,40
Kurtosis	0,91	32,85	23,54	17,92	4,74
Skewness	0,83	1,96	4,37	4,03	2,38
# of Obs.	160	160	160	160	160

According to descriptive statistics results, on average, a transportation firm has %12 net profit margin and %15 return on equity. The equity multiplier has the highest mean among all. MVBV and EM show high deviations from their mean with 4,65 and 6,59 standard deviations respectively.

4. RESULTS

In this study, we employ two-panel data models to evaluate; (1) financial performance, and (2) market value of transportation firms in Türkiye. Thus, we will present the research findings separately below. After presenting the research findings, we will discuss the research findings based on our econometric analysis results.

In the application of panel data regression analysis, the first step is to select the most appropriate estimator for the research sample. For this reason, we test three panel data estimators; (i) pooled OLS method, (ii) fixed effect method, and (iii) random effect method. We use several tests to compare these methods for choosing the most appropriate estimator for models. After deciding on panel data estimators, we apply methods to estimate our research models and present the results. Lastly, we will evaluate and discuss the findings.

4.1. Results of Financial Performance Analysis

For our first model, we test and exhibit estimator selection results in Table 4. F-Test result implies that pooled OLS is better than the fixed effects method. Hausman Test results show that the random effects method is preferable to fixed effects. The final test is the Breusch-Pagan LM test which indicates that Pooled OLS should be chosen over the random effects method. Considering all three tests together, the results suggest that pooled OLS should be used.

Table 4. Estimator Selection for Model 1

Pairwise Estimator Evaluation	Test	Null Hypothesis	Test Results	Decision
Fixed Effect vs Pooled OLS	F-Test for Individual Effects	No significant effects of cross-sections	F-value=1,5217 p-value=0.164	Choose Pooled OLS over Fixed Effects
Fixed Effect vs Random Effect	Hausman Test	A random effect is more consistent	Chi-square=1,0241 p-value=0,7954	Choose Random Effects over Fixed Effects
Random Effect vs Pooled OLS	Breusch-Pagan Lagrange Multiplier Test	Pooled OLS is more consistent than Random Effects	Chi-square=0,1915 p-value<0,6617	Choose Pooled OLS over Random Effects

We present model 1 results in Table 5. The model results show that all variables are significant at a %95 confidence interval. All Dupont analysis components can explain the financial performance of transportation firms. Firstly, model variables explain %22 of the variation in the dependent variable. NPM and ATR variables have positive coefficients whereas EM has a negative coefficient. A unit increase in NPM and ATR causes 0,82 and 0,06 unit increase in ROE of transportation firms respectively. On the other hand, an increase in the EM variable decreases ROE by -0,009 units.

Table 5. Model 1 Estimation

	Estimate	Std. Error	t-value	p-value
Intercept	0,0445	0,0574	0,7745	0,4397
NPM	0,8184	0,2235	3,6611	0,0000
EM	-0,0094	0,0015	-6,2123	0,0000
ATR	0,0577	0,0236	2,4501	0,0153
R ²	0,2212			
Adj. R ²	0,2062			
F-statistics	F-stat=14,771 p-value=1,6322e-08			

4.2. Results of Market Value Analysis

In the second model of this study, we evaluate the market value of transportation firms by using combining the Dupont analysis technique with panel data analysis. Table 6 displays the F-Test, Hausman Test, and Breusch-Pagan Lagrange Multiplier Test results for the selection of panel data estimators. Considering all results together, tests suggest that we should use the random effects model for model 2.

Table 6. Estimator Selection for Model 2

Pairwise Estimator Evaluation	Test	Null Hypothesis	Test Results	Decision
Fixed Effect vs Pooled OLS	F-Test for Individual Effects	No significant effects of cross-sections	F-value=3,7142 p-value=0,0011	Choose Fixed Effects over Pooled OLS
Fixed Effect vs Random Effect	Hausman Test	Random effect is more consistent	Chi-square=7,5726 p-value=0,0557	Choose Random Effects over Fixed Effects
Random Effect vs Pooled OLS	Breusch-Pagan Lagrange Multiplier Test	Pooled OLS is more consistent than Random Effects	Chi-square=4,6503 p-value<0,0310	Choose Random Effects over Pooled OLS

Table 7. Model 2 Estimation

	Estimate	Std. Error	t-value	p-value
Intercept	0,236759	0,7516	0,3150	0,7532
NPM _{t-1}	0,972152	1,1684	0,8320	0,4067
EM _{t-1}	0,357755	0,0130	27,3672	0,0000
ATR _{t-1}	1,204698	0,1784	6,7508	0,0000
R ²	0,2132			
Adj. R ²	0,1973			
Chi-Square Statistics	Chi-square=40,1178 p-value= 1,006e-08			

In table 7, we report model 2 results. Firstly, Dupont analysis components can explain %21 of the variation of the dependent variable. Model results show EM and ATR variables positively and significantly impact the market value of transportation firms. A unit increase in EM causes a 0,35 unit increase in MVBV and similarly, a unit increase of the ATR variable induces a 1,20 unit increase in MVBV. On the other hand, we could not detect any significant relationship between NPM and MVBV.

4.3. Discussion and Practical Implications of Findings

In this study, we combine classical Dupont analysis with a panel data approach and employ two models. The first one uses financial performance (return on equity) as a dependent variable and profitability, capital structure, and productivity as explanatory variables. The results show that all variables are statistically significant with at least %95 confidence interval.

To comment on the results, firstly, profitability and productivity significantly increase the short-term financial performance of transportation firms. A sustainable, consistent increase in profitability is a hard achievement for management but not impossible. The managers of transportation sector firms should either focus on cost management processes to decrease production and operational costs, analyze the market and industry better to increase

market share, or an optimal combination of those options. In this way, they will be able to increase corporate profitability as well as financial performance.

The second finding of Model 1 is that there is a linear and positive relationship between productivity and the financial performance of transportation firms. Productivity is directly related to the usage of assets, both current and noncurrent ones. For those who aim to increase corporate performance, we recommend that the managers may revise their business processes and try to get the best effort from noncurrent assets. On the current assets side, the firms should optimize their working capital policies in the transportation sector.

Lastly, on the financial performance model, the results show that debts hurt firm performance. When we investigate the reason for this, we suggest that this may be due to the financial structure in the industry. Preliminary analysis shows that on average, a transportation firm uses %20 equity while debt has %80 weight in financial structure. We may say that a high level of debt usage in financial structure is very common in the transportation industry of Türkiye. So, having this much debt weight in financial structure, transportation firms may suffer from a high level of debt cost and as a consequence, cost of capital may arise. This may be the primary reason that usage of a high level of debt negatively affects financial performance. We suggest that transportation firms should evaluate their financial distress levels, decrease the debt ratio in total assets step-by-step, and find their optimal capital structure which sets the cost of capital minimum.

The second model utilizes a combination of Dupont analysis and panel data models to explain the variation of market value in the industry. In this model, the results show that profitability does not influence the market value of transportation firms. These results may not be surprising since profitability is a short-run indicator that only exhibits current accounting period results. On the other hand, financial investors are more sophisticated and take their buy/sell decision based on future expectations. Therefore, market participants may be interested in some other, intangible features (i.e. brand value, intellectual capital, etc.) that will create value for them, rather than very short-run, one-period profitability indicators.

Secondly, the findings exhibit that debt usage and productivity significantly affect the market value of transportation firms. We detect a positive relationship between these variables and market value in the industry. Considering the previous model, it is apparent that productivity is an important feature of success in the sector. Financial investors do notice changes in productivity levels and react to these changes when they evaluate the stocks of transportation firms. Thus, we reply to our previous suggestions on productivity to managers in the industry. The last finding on the market value model is about debt usage in this industry and its interaction with market values. The results show that debt usage has a positive impact on the market value of transportation firms. Market participants show positive reactions to financial leverages. It is most probably due to the reason that capital expenditures in this sector highly value creation projects from equity investors' perspective. Even though analysis results encourage increased financial leverage, transportation firms should still be careful when they expand capacity by debt.

5. CONCLUSION

Due to its close ties to the agricultural, service, and industrial sectors, transportation is a nation's economic engine (Ersoy, 2020: 224). An important tool that may be employed to ensure economic development is transportation, which includes economic, social, political, military, societal, and environmental elements (Erdoğan, 2016: 189). So, the transportation industry is one of the most important sectors in national economies, especially in developing countries. Because of these reasons, analyzing the dynamics of this sector will contribute to the literature on economics and business.

In this study, we analyze the financial performance and market value of transportation sector firms in Türkiye by utilizing Dupont analysis and panel data approach. The findings show that profitability, productivity, and financial leverage have a significant impact on financial performance in the sector. While debt usage negatively impacts financial performance, profitability and productivity enhance the performances of the firms. Secondly, our results on market value analysis exhibit that financial investors do not pay attention to short-term accounting performances such as profitability. On the other hand, market participants positively react to productivity increases and financial leverages in the sector.

This study focuses on the transportation industry in Türkiye. For further studies, we suggest that the study methodology may be applied for other sectors and/or countries to understand industry dynamics better and enhance policymaking processes for managers and political decision-makers.

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