

## Measurement of Financial Performance of Durable Consumer Goods Enterprises Traded on The Stock Exchange by Combined Ratios (Dupont Method)

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### Abstract

In this study, the operating performance of companies listed on the stock exchange and producing consumer durables is analysed by DuPont analysis. Using the balance sheet and income statement data of the companies subject to the analysis for the years 2018-2022, asset turnover rates, net profit margins, return on assets and equity multipliers of each company were calculated respectively. As a result of the analysis, the DuPont performance of the companies was calculated and the companies were ranked according to their financial performance. As a result, it was concluded that the most successful companies among the companies producing and selling consumer durables (household goods) according to the DuPont financial performance analysis method are brlsm, vesbe, arzum and the companies with the lowest DuPont average value are iheva, arclk, vestl, respectively.

**Keywords:** DuPont Analysis, Return on Assets, Return on Equity, Net Profit Margin

## **1. Introduction**

Businesses operating in the field of production have to maintain their profitability by using their resources effectively and efficiently. In order to fulfil these obligations, enterprises should adapt to the business conditions of the changing world and at the same time attach importance to the strategic management process. One of the important elements of the strategic management process is strategic analysis and financial analysis plays an important role in this analysis. Businesses have to make profitability analyses that will keep the company value at the best level within the framework of strategic planning (Arslan and Ülker, 2021:51)

The common point of financially successful enterprises is the enterprises that can finance their operating assets at the lowest cost and provide both debt and equity balance. Measuring and improving financial performance is of great importance in achieving this success. Financial analyses used in measuring financial performance are frequently used in business decisions such as investment, financing and price determination. Financial analysis techniques also provide significant benefits to enterprises in terms of their financial status, profitability analyses and whether they are financially adequate (Işıkçelik at.al, 2021:774).

The concept of profitability in enterprises has an important place in the evaluation of the financial performance of an enterprise or a sector. In the financial decision-making processes of enterprises and the investors and lending institutions that provide funds to them, profitability analyses are performed in addition to liquidity, financial structure and financial risk analyses (Çelik and Digün,2018:458).

Many methods are used to measure the financial performance of enterprises and DuPont method is one of them. In this method, various financial ratios are calculated by considering the balance sheet and income statement of the enterprises. In the DuPont method, return on assets, asset turnover, net profit margin, equity multipliers are calculated to determine the return on equity of the enterprise and its financial performance is analyzed. Thanks to this analysis, similar companies or sector averages can be compared and comparisons can be made on the profitability of the enterprise. Another benefit of DuPont analysis for businesses is to be able to make future-oriented planning and forecasts. (Çakalı, 2021:122).

With the DuPont analysis method, it is possible to make a static evaluation by applying the financial data of an enterprise for a single year, as well as a dynamic evaluation based on periodic financial statement data. In addition, the financial performance results obtained by using DuPont analysis of companies operating in the same sector can be compared and the weaknesses and strengths of the companies against each other can be revealed. (Çelik and Digün, 2018: 459).

In this study, the equity capital efficiencies of consumer durables companies traded in Borsa İstanbul were analyzed with the combined ratios (DuPont) method and the companies with better return on equity were identified and interpreted. This study will provide important findings on how the equity capital of consumer durables companies, which have an important place in the Turkish stock exchange, is managed and how their financial performance changes.

The study is based on the financial data of 10 companies operating in Borsa İstanbul and producing and selling consumer durables for the periods 2018-2022. In the study, firstly, a summary review of the literature was made, then the DuPont analysis technique was explained, and then the analysis findings were interpreted. In the conclusion part of the study, a general evaluation was made and recommendations were tried to be presented.

## **2. Literature Review**

In the literature review conducted within the scope of the study, many academic studies were found in which DuPont analysis was used to measure the financial performance of enterprises. However, in the

research conducted, a financial performance evaluation of enterprises producing and selling consumer durables has not been made. Thus, the idea that this study will contribute to the literature is strengthened.

Koşan and Karadeniz (2013) analyzed the financial performance of companies operating in the Turkish manufacturing sector using the DuPont method. In their study, 2009-2011 periods were taken as basis and as a result, they found that the financial performance of large-scale manufacturing companies is more successful than small-scale companies.

Koşan and Karadeniz (2014) examined the financial performance of the Accommodation and Food Service Sub-Sector for the period 2010-2012 with the help of the Central Bank of the Republic of Turkey (TCMB) Sector Balance Sheets and DuPont financial analysis method. As a result of the analysis, they concluded that the sector's return on sales, assets and equity capital for 2010 and 2011 were high, but 2012 was low.

Çelik and Digün (2018) analyzed the financial performance of cement companies operating in Borsa İstanbul using the DuPont method. Within the scope of the study, the 2012-2017 period was taken as basis and the findings were compared with the sector averages.

Gümüş and Çıbık (2018) analyzed the financial performance of real estate investment trust companies operating in Borsa İstanbul with the DuPont method. Within the scope of the study, the period of 2012-2017 was taken as basis. As a result of the study, the relevant companies are listed in order of success within the scope of return on equity.

Karadeniz et al. (2019), in their study, examined the financial performance of hotels traded in the European market with the DuPont method. In their study, they also analyzed the equity and profitability of the hotels traded in the European market with the panel data method. They concluded that the expenses and costs of the hotels subject to the study did not meet the revenues in the 2007-2016 periods.

Akyüz et.al (2019), the financial performances of the companies operating in the manufacturing sector were evaluated by DuPont analysis based on the financial periods of 2015-2017. As a result, it was determined that some of the companies subject to the research had low financial performance and some had high financial performance.

Akyüz et al. (2020), in their study, analyzed the financial performance of companies operating in the paper and paper products industry operating in Borsa İstanbul with the DuPont method. In their study, they used the financial data of the companies operating in this sector for the years 2012-2022 and analyzed the equity capital efficiency of the companies with the DuPont method and made the success ranking of the companies.

Omağ (2020) analyzed the financial performance of a single company operating in the stationery sector for the period 2013-2018 using the DuPont method and calculated the return on equity. In some periods, the company's equity capital decreased and preventive measures were suggested.

Büyükarıkan and Eryılmaz (2020). In their study, they examined the financial performance of the companies operating in the agricultural sector on the financial statements of the companies operating in the agricultural sector for the 2012-2013 financial period by using DuPont analysis technique. As a result, they found that the low net profit margin of the companies negatively affected the return on investment.

Arslan and Ülker (2021), in their study, analyzed the financial performance of companies operating in the manufacturing sector based on the 2017-2019 financial period with the DuPont method. As a result, they found that the capital adequacy and net profit margin of the companies gave negative results in some periods and positive results in some periods.

Işıkçelik et al. (2021), in their study, analyzed the financial performance of the hospitals group traded in Borsa İstanbul between 2015-2019 with the DuPont method. They compared the profitability ratios of the company with the averages of other companies operating in the same sector. As a result, they concluded that

the profitability ratios of the hospital company are lower than the average of the companies operating in the sector.

Erdoğan (2022) evaluated the financial performance of Jantsa Enterprise, which is traded in Borsa Istanbul, for the period 2013-2021 with ratio and DuPont analysis techniques. As a result, periods with high return on assets and return on equity were determined.

Kefe (2023), in his study, investigated the effect of the Covid 19 period on the financial performance of companies operating in the health sector. In his study, the financial performance of health companies traded in Borsa İstanbul during this period, which is based on 2019-2021, the beginning of the Covid 19 outbreak, was analyzed with DuPont analysis. As a result, it was determined that there was an increase in the return on assets and equity of healthcare companies in the relevant periods.

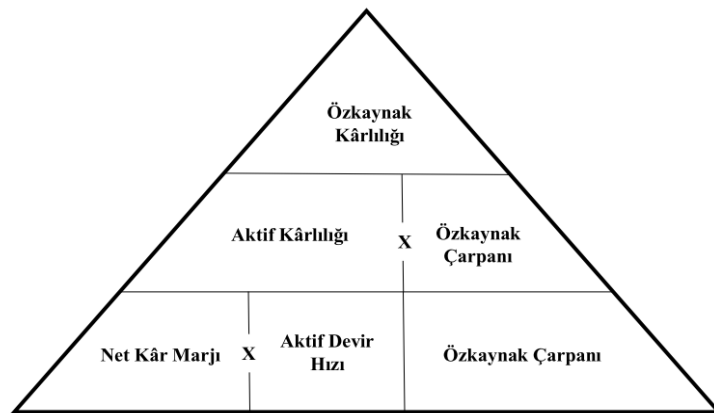
The desire to carry out this study arose due to the lack of studies in the related field in Turkey and foreign literature information on the subject was not included.

### 3. Dupont Analyses

There are many factors affecting financial performance in enterprises and DuPont method is a widely used method to evaluate these factors. It is a financial performance evaluation method developed for the first time in the world in 1918 based on the ratios of Du-Pont de Nemours & Co. The main purpose of the DuPont method is to analyse the return on investment in enterprises and the selected ratios are mainly based on these ratios. Since DuPont company makes financial performance profitability analyses using ratios aimed at investment profitability, the method is referred to as DuPont analysis or method (Koşan and Karadeniz, 2013:47).

In the ratio ratio method, which is one of the financial analysis techniques, ratio calculations are made separately for each situation and the ratios found are interpreted individually. In the DuPont method, on the other hand, the financial success measure of companies is found by calculating multiple ratio ratios at the same time and in close relationship with each other. The main reason why this system is called DuPont (Combined Ratios) method is due to the inclusion and interpretation of multiple ratio ratios at the same time (Gümüş and Çıbık, 2018:2182).

Some sources in the literature refer to this system as the combined triangular ratio system or the three-component DuPont triangle. Because in this system, three basic ratios are used together to calculate the return on equity ratio. These ratios used together consist of the profitability structure of the enterprise, asset management and financial leverage (Ceylan and Korkmaz, 2017:88).



**Figure 1. The Three-Component DuPont Triangle**

**Source:** (Botika, transfer: Karadeniz at, 2019:23)

Three financial ratios are basically used in the DuPont method. These ratios are net profit margin, asset turnover rate and equity capital multiplier. With the calculation of these ratios, the return on equity of the enterprises is calculated. In DuPont method, the basic profitability and performance measure is return on equity. Return on equity is;

- Net profit margin (Net profit/Net Sales)
- Asset turnover (Net Sales /Total Assets)
- Equity Multiplier (Total Assets / Equity)

It consists of its components (Çakalı, 2021:126). Return on equity formula = Net Profit Margin\* Asset Turnover Rate\* Equity Multiplier (Ceylan and Korkmaz, 2017:88). These three important ratios are generally used in the DuPont (Combined Ratios) analysis system and these ratios measure the return on equity of enterprises. These ratios will be briefly mentioned below.

**Net Profit Margin:** It is an important indicator in the evaluation of financial performance of enterprises. Net profit shows the amount of profitability reached after deducting all expenses, costs and taxes of the enterprises. Net profit margin; It shows what percentage of one lira of sales constitutes net profit. Increasing the net profit margin in businesses is an important measure of success (Okka, 2015:111). Net profit margin is calculated by dividing net profit after tax by net sales. **Net profit Margin = Net Profit / Net Sales** (Bolak, 2005:40).

This ratio shows the net profit margin arising from the activities of the enterprise and it is desirable that the ratio is high. However, there is no certain standard for this ratio and it is important to make comparisons with enterprises operating in the same sector.

**Asset Turnover Rate:** It is the ratio that shows the extent to which enterprises use their current and fixed assets effectively. Asset turnover rate also shows which of the capital- and labor-intensive technology is used more intensively in the assets of the company. While the asset turnover rate is low in companies using capital intensive technology, it is high in companies using less intensive technology. In order to analyse the asset turnover ratio, it is necessary to compare it with sector averages and competitors (Okka, 2015:106). Asset turnover ratio is calculated by the following formula.

#### **Asset Turnover Rate: Net Sales/Total Asset**

As a result, it is a financial ratio that shows how effectively the assets owned by the enterprise are used and is an important ratio used in DuPont financial performance analysis technique.

**Equity Multiplier:** It is a financial ratio showing the share of total assets in equity capital. In other words, it is a ratio that shows how much of a company's assets are covered by equity capital. In general, a high equity multiplier indicates that the company's assets are mainly financed by debt, while a low equity multiplier indicates that the company is less dependent on external sources for the provision of assets. The equity capital multiplier shows how much of total assets are financed by equity capital ([www.algolab.com.tr](http://www.algolab.com.tr)). This ratio is calculated by the following formulae.

#### **Equity Multiplier: Total Assets /Equity**

There is no ideal ratio for financial analysis with the equity multiplier. It varies according to the sector to which a company is affiliated, and comparisons with the sector averages of the relevant companies will give more meaningful results ([www.algolab.com.tr](http://www.algolab.com.tr)).

#### **4. Data Set and Method**

In this study, the financial performance of the enterprises traded in Borsa İstanbul that produce and sell consumer durables was analyzed by using the combined ratios (DuPont) method. For this purpose, the financial data of the enterprises producing and selling consumer durables for the years 2018-2022 were obtained from KAP (Public Disclosure Platform) and their financial performances for the relevant periods

were analyzed by DuPont method (kap.org.tr). In the study, asset turnover rates, net profit margins, return on assets, return on assets, equity multiplier averages of the relevant companies were calculated and their financial performances were ranked according to DuPont values. The calculation results are shown in tables and graphs.

The list of companies analyzed within the scope of the study is shown in Table 1.

**Table 1. Companies Covered in the Study**

	<b>Bist Code</b>	<b>Firms</b>
1	alcar	Alarko Carrier Sanayi ve Ticaret A.Ş.
2	arclk	Arçelik A.Ş.
3	arzum	Arzum Elektrikli Ev Aletleri Sanayi ve Ticaret A.Ş.
4	brlsm	Birleşim Mühendislik Isıtma Soğutma Haval San. Ve Tic. A.Ş.
5	klmsn	Klimasan Klima Sanayi ve Ticaret A.Ş.
6	vesbe	Vestel Beyaz Eşya Sanayi ve Ticaret A.Ş.
7	iheva	İhlas Ev Aletleri
8	safkr	Safkar Ege Soğutmacılık
9	snica	Sanica Isı Sanayi
10	vestl	Vestel Elektronik

**Source:** KAP (Public Disclosure Platform)

The financial statements of the companies within the scope of the analysis for 5 years (2018-2022) were analyzed and net profit margin, asset turnover, equity multiplier and return on equity were calculated for these periods.

## 5. Results

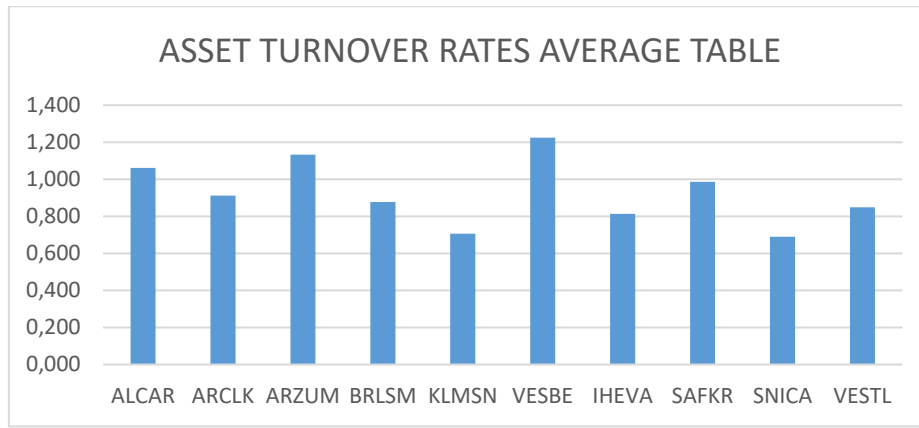
The ratios showing the financial performance of the enterprises for the periods analyzed were calculated and interpreted.

Asset Turnover Rates and Averages: The average asset turnover rates of the companies for the relevant periods are calculated and shown in the table and figure below.

**Table 2. Asset Turnover Rates Average Table**

<b>Firms</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Average</b>
alcar	1,141	1,011	1,091	1,091	0,974	1,062
arclk	0,948	0,920	0,878	0,801	1,013	0,912
arzum			1,144	1,096	1,160	1,133
brlsm	0,983	0,916	1,104	0,697	0,685	0,877
klmsn	0,815	0,865	0,6611	0,539	0,652	0,706
vesbe	1,215	1,398	1,143	1,14	1,229	1,225
iheva	0,707	0,479	0,737	0,89	1,254	0,813
safkr	1,015	1,295	0,925	0,772	0,925	0,986
snica		0,756	0,661	0,736	0,608	0,690
vestl	0,883	0,883	0,796	0,754	0,928	0,849

**Source:** Table created by the author.



**Figure 2. Asset Turnover Rates Average Table**

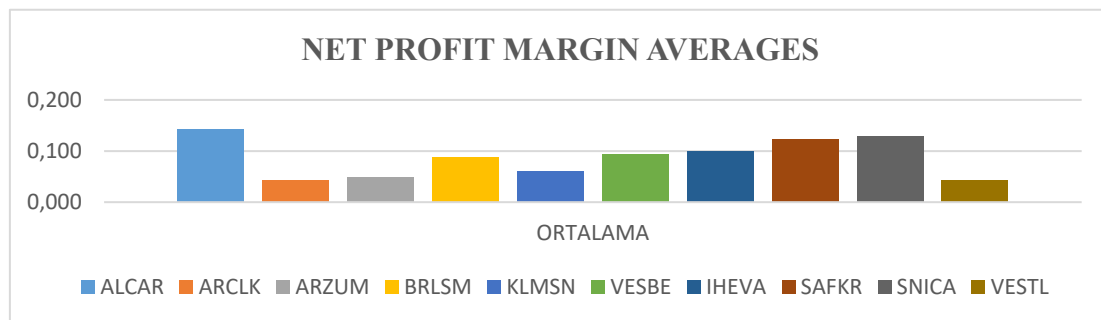
In Figure 2, the asset turnover rates of the relevant companies for the years 2018-2022 are calculated and their averages are shown in the figure. According to Figure 2, the companies with the highest asset turnover rates are vesbe, arzum, alcar and the companies with the lowest asset turnover rates are klmsn, snica, iheva.

**Net Profit Margin Averages:** The average net profit margins of the companies for the relevant periods are calculated and shown in the table and figure below.

**Table 3. Net Profit Margin Averages Table**

Firms	2018	2019	2020	2021	2022	Average
alcar	0,078	0,228	0,078	0,057	0,268	0,142
arclk	0,032	0,029	0,070	0,048	0,035	0,043
arzum			0,060	0,062	0,026	0,049
brlsm		0,071	0,103	0,051	0,129	0,088
klmsn	0,084	0,109	0,050	0,012	0,049	0,061
vesbe	0,109	0,082	0,141	0,094	0,045	0,094
iheva	0,007	0,024	0,1	0,17	0,197	0,100
safkr	0,141	0,045	0,115	0,095	0,222	0,124
snica		0,167	0,187	0,112	0,046	0,128
vestl	0,023	0,019	0,089	0,066	0,019	0,043

**Source:** Table created by the author.



**Figure 3. Net Profit Margin Averages**

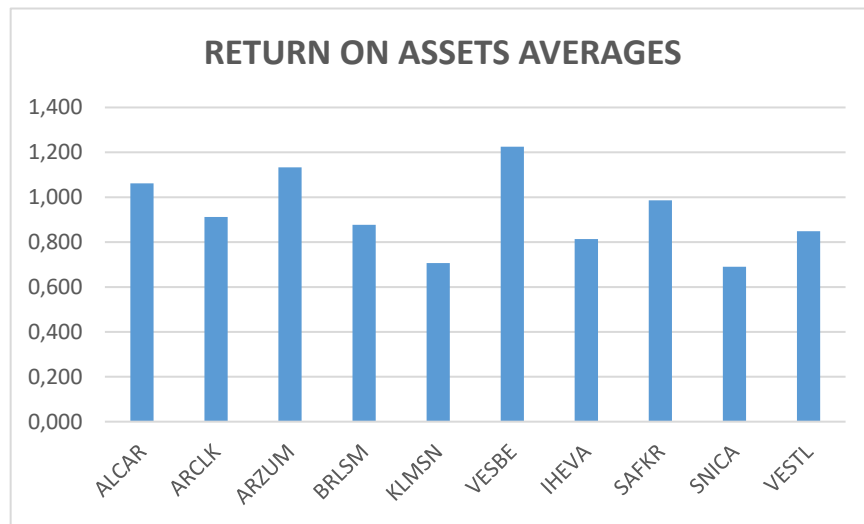
According to the average net profit margins of the companies for the 2018-2022 periods, the three companies with the highest net profit margins are alcar, snica, iheva and the companies with the lowest net profit margins are arclk, vestl, arzum.

**Return on Assets Averages:** Return on assets averages of the companies for the relevant periods are calculated and shown in the table and figure below.

**Table 4. Return on Asset Averages Table**

<b>Firms</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>Average</b>
alcar	0,088	0,028	0,085	0,061	0,262	0,105
arclk	0,030	0,027	0,062	0,038	0,036	0,038
arzum			0,069	0,067	0,031	0,056
brlsm		0,065	0,114	0,036	0,088	0,076
klmsn	0,068	0,094	0,033	0,007	0,032	0,047
vesbe	0,133	0,114	0,162	0,107	0,056	0,114
iheva	0,025	0,090	0,074	0,151	0,247	0,117
safkr	0,143	0,058	0,106	0,073	0,206	0,117
snica		0,127	0,124	0,082	0,028	0,090
vestl	0,02	0,016	0,07	0,05	0,018	0,035

**Source:** Table created by the author.



**Figure 4. Return on Assets Averages**

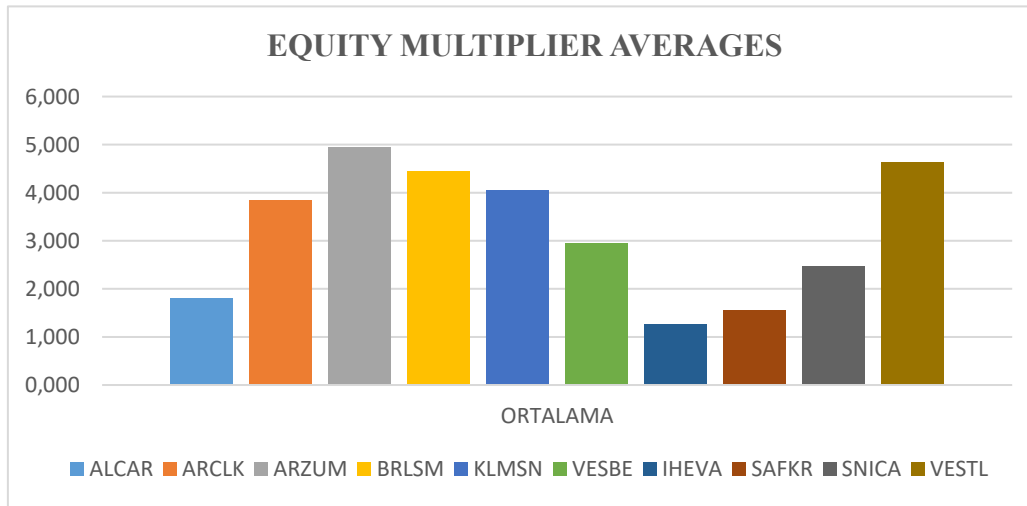
According to the companies' 2018-2022 return on assets averages, the three companies with the highest net profit margin are safkr, iheva, vesbe and the companies with the lowest net profit margin are vestl, arclk, klmsn.

**Equity Multiplier Averages:** Equity multipliers of the companies for the relevant periods are calculated and shown in the table and figure below.

**Table 5. Table of Equity Multiplier Averages**

Firms	2018	2019	2020	2021	2022	Average
alcar	1,461	1,460	1,598	2,368	2,146	1,806
arclk	3,451	3,538	3,320	4,041	4,879	3,846
arzum			4,031	4,236	6,564	4,943
brlsm	6,518	5,998	3,499	2,599	3,603	4,443
klmsn	4,201	3,751	4,331	5,291	2,629	4,040
vesbe	2,5862	2,7592	2,448	2,9	4,04	2,947
iheva	1,428	1,199	1,173	1,215	1,262	1,255
safkr	1,531	1,518	1,592	1,451	1,654	1,549
snica		2,088	2,781	2,968	2,062	2,475
vestl	5,413	5,146	4	4,179	4,765	4,630

Source: Table created by the author

**Figure 5. Equity Multiplier Averages**

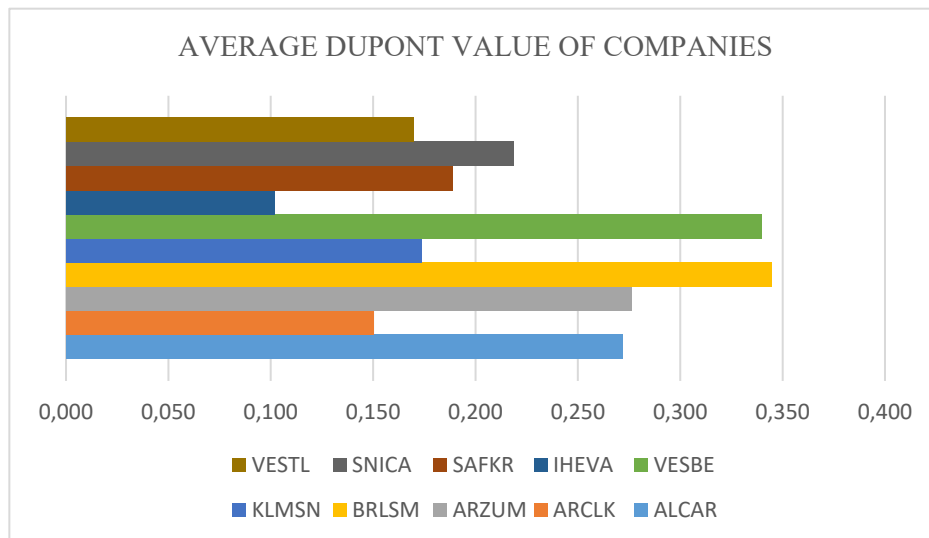
According to the average equity multipliers of the companies for the periods 2018-2022, the three companies with the highest equity multipliers are arzum, vestl, brlsm and the companies with the lowest equity multipliers are iheva, safkr, alcar.

**DuPont Averages:** Using the balance sheet and income statement annexes belonging to the relevant periods of the above-mentioned companies, DuPont success ranking was made according to the average DuPont values and financial performances of the companies whose ratio analyses were made. These data are simplified and the results are interpreted.

**Table 6. Averages DuPont Tables**

Firms	Asset Turnover Rates	Net Profit Margin	Equity Multiplier Averages	Dupont Rate
alcar	1,062	0,142	1,806	0,272
arclk	0,912	0,043	3,846	0,150
arzum	1,133	0,049	4,943	0,276
brlsm	0,877	0,088	4,443	0,345
klmsn	0,706	0,061	4,040	0,174
vesbe	1,225	0,094	2,947	0,340
iheva	0,813	0,100	1,255	0,102
safkr	0,986	0,124	1,549	0,189
snica	0,690	0,128	2,475	0,219
vestl	0,85	0,04	4,63	0,170

**Source:** Table created by the author.



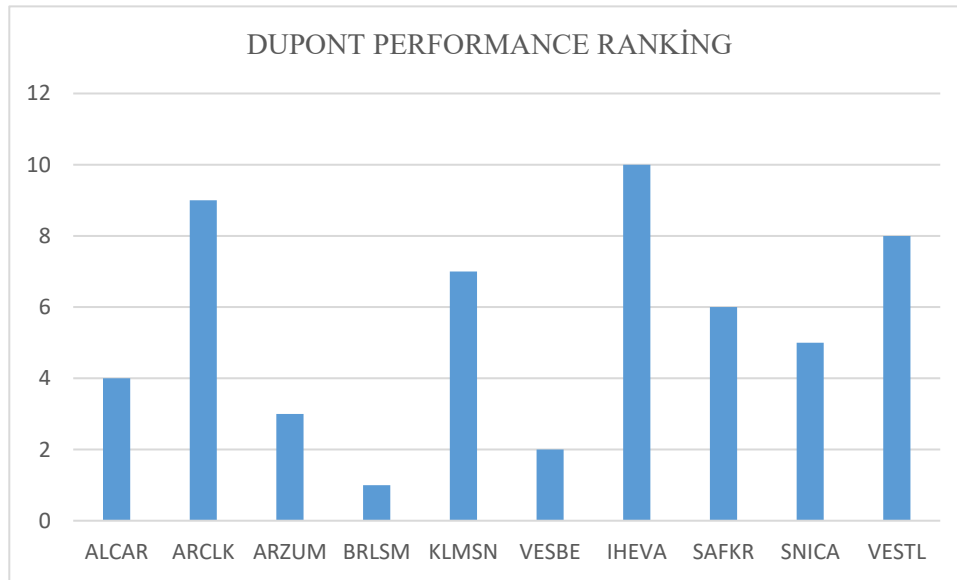
**Figure 6. Average Dupont Value of Companies**

Figure 6 shows the DuPont averages of the companies taking into account the financial ratios of the relevant companies for the years 2018-2022, which are subject to examination. In the analysis, it is concluded that the companies with the three highest DuPont average values are brlsm, vesbe, arzum, respectively. the companies with the lowest dupont average values are iheva, arclk, vestl, respectively. The DuPont success ranking of the related companies subject to the study is shown with the help of tables and figures. The table below shows the DuPont performance ranking of the related companies.

**Table 7. DuPont Performance Ranking**

Firms	Asset Turnover Rates	Net Profit Margin	Equity Multiplier	DuPont Rate	Ranking
alcar	1,062	0,142	1,806	0,272	4
arclk	0,912	0,043	3,846	0,150	9
arzum	1,133	0,049	4,943	0,276	3
brlsm	0,877	0,088	4,443	0,345	1
klmsn	0,706	0,061	4,040	0,174	7
vesbe	1,225	0,094	2,947	0,340	2
iheva	0,813	0,100	1,255	0,102	10
safkr	0,986	0,124	1,549	0,189	6
snica	0,690	0,128	2,475	0,219	5
vestl	0,85	0,04	4,63	0,170	8

**Source:** Table created by the author.

**Figure 7. DuPont Performance Ranking**

Both Table 2 and Figure 7 show the financial performance ranking of the companies subject to financial analysis. As a result of the financial analysis, the highest DuPont values are brlsm, vesbe, arzum and the lowest financial performances are iheva, arclk, vestl, respectively.

## 6. Conclusion and Evaluation

One of the most important methods used in measuring financial performance in enterprises is ratio analysis. By using certain ratios together, DuPont analysis (combined ratios) method can measure the financial performance of enterprises and evaluate their equity capital efficiency (Gümüş and Çıbık, 2018:2192).

DuPont analysis is frequently used in both holistic audits and departmental audits in enterprises. With this analysis method, the financial performance of enterprises and departments and their contribution to company profitability are determined. Since it is easy and practical to apply, it is frequently used by large enterprises and is used to identify unsuccessful departments and to reward successful units. In addition, it contributes to reviewing the activities of unsuccessful departments and identifying errors (Koşan and Karadeniz, 2014:86).

In the study, the asset turnover rates, net profit margins, return on assets, return on assets, and equity multipliers of 10 companies traded in Borsa Istanbul that produce and sell consumer durables (household goods) were calculated for the 2018-2022 financial periods. With the DuPont (combined ratios) method, which is a financial valuation model, return on equity levels were calculated and financial success ranking was made.

As a result, according to DuPont financial performance analysis method among the companies producing and selling consumer durables (household goods), the most successful companies are brlsm, vesbe, arzum, and the companies with the lowest DuPont average value are iheva, arclk, vestl, respectively.

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