
GROSS CAPITAL FORMATION AND THE RISE OF FAIR VALUE ACCOUNTING AMONG TURKISH MANUFACTURING FIRMS: A QUANTITATIVE ANALYSIS

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Abstract

The purpose of this quantitative analysis was to determine the extent of the relationship, if any, between the pace of gross capital formation and the adoption of fair value accounting among Turkish manufacturing firms. The hypothesis tested in the study was as follows: The faster a business employing historical cost accounting accumulates gross capital, the likelier it is to adopt fair value accounting. Based on an analysis of 32 Turkish manufacturing companies, it was discovered that the difference between the mean gross capital accumulation rate of historical cost users and the mean gross capital accumulation of fair value users was significant at an α of .010. These findings offer tentative support for the conclusion that the spread of fair value accounting is in some degree associated with the increase of gross capital, for reasons that were further explored in the study.

Key Words: Fair Value Accounting, Historical Cost, Gross Capital, Accounting.

NET ÇALIŞMA SERMAYESİNİN ARTIŞI VE GERÇEĞE UYGUN DEĞER MUHASEBESİNİN TÜRKİYE'DEKİ ÜRETİM FİRMALARINDA YAYGINLAŞMASI: SAYISAL BİR ÇALIŞMA

Öz

Bu sayısal çalışmanın amacı, Türkiye'deki üretim firmalarında öz sermayedeki artış ile gerçeğe uygun muhasebe uygulamaları arasındaki ilişkinin boyutunu belirlemektir. Bu çalışmada incelenen varsayım şudur: Çalışma sermayesi artan bir işletmede defter değeri muhasebesi ne kadar çabuk uygulanabilirse, o işletmede gerçeğe uygun muhasebenin benimsenmesi de o kadar muhtemeldir. Türkiye'deki 32 üretim işletmesi üzerinden yapılan bu incelemeye göre, defter değeri üzerinden muhasebe yapan işletmelerin ortalama çalışma sermayesi artış hızı ile gerçeğe uygun değer üzerinden muhasebe yapan işletmelerin ortalama çalışma sermayesi artış hızı arasındaki fark %1'dir. Çalışmada ayrıntılı bir şekilde izah edildiği üzere, burada ortaya çıkan bulgular gerçeğe uygun muhasebe uygulamalarının işletmelerde yaygınlaşmasının çalışma sermayesindeki artışla bağlantısının düzeyi hakkında bir sonuca ulaşılabilmesinde kullanılabilir önermelerdir.

Anahtar Kelimeler: Gerçeğe Uygun Muhasebe, Defter Değeri, Çalışma Sermayesi, Muhasebe.

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INTRODUCTION

Economic theory suggests that the spread of fair value accounting is in some degree associated with the increase of gross capital formation. As gross capital formation has grown, companies have also grown larger and come to require the kind of large-scale financing that is only possible with participation in the capital markets. In such conditions, stockholders and regulators demand a fuller accounting from companies, including a disclosure of asset values. As Previts, Walton, and Wolnizer (2011) stated,

At the end of the 19th century, businesses were often large and widely held, with capital from a vast network of stakeholders. Thus, demand for financial reports continually increased and the ledger was no longer the end product of accounting. Investors craved summaries that were concise, succinct, uniform in arrangement, and understandable. (p. 109).

It is difficult to study the association, if any, between fair value accounting and gross capital formation on a country level, because there is no index of national adoption of fair value accounting. However, there is an alternate way to study the association between these two variables—at the business rather than the country level. Consider the hypothesis below:

H1: The faster a business employing historical cost accounting accumulates gross capital, the likelier it is to adopt fair value accounting.

H1 suggests that historical cost accounting-utilizing companies will face pressures to adopt fair value accounting as a function of their rate of gross capital accumulation. The purpose of this quantitative analysis is to test this hypothesis against data from manufacturing companies in Turkey.

1. METHODOLOGY

H1 is a hypothesis about the relationship between the rate of gross capital formation and the adoption of fair value accounting. At the heart of the hypothesis is the tentative assumption that manufacturing companies with a faster rate of gross capital accumulation are likelier to adopt fair value accounting. In order to test this hypothesis, it is necessary to compare two cases, as follows:

Table 1: Case and Control Group

	Case Group	Control Group
Description	Manufacturing companies that adopted fair value accounting after using historical cost accounting	Manufacturing companies that have always used historical cost accounting
Significance of Change (α) of Gross Capital Accumulation over Time	a	d
Steepness of Change (β) of Gross Capital Accumulation over Time	b	e
Effect Size of Change (R^2) of Gross Capital Accumulation over Time	c	f

During the study we will analyze **a, b, c, d, e,** and **f**.

H1 suggests that, for the case group, the steepness of change (as measured by the β value in a linear regression equation taking the form $y = mx + b$) will be higher than for the control group. Both the α and R^2 values in the case and control groups also need to be compared.

In order to conduct this study, contact was made with 40 Turkish manufacturing companies that are publicly listed. Of these companies, 32 agreed to participate in the data collection (response rate = 80%). Of the 32 participants, 16 were fair value accounting adopters while the remainder was historical cost adopters. For each company in the sample, gross capital accumulation data were collected for the eight years immediately prior to the company's public listing. Gross capital accumulation (GCA) was operationalized as an index value starting at 100 for the first year and adjusted accordingly over the remaining seven years in the data set. This data collection and preparation procedure made it possible to test the hypothesis of the study.

2. FINDINGS

First, a regression analysis was conducted with the independent variable = year and the dependent variable = GCA. The regression analysis was conducted on the entire sample.

2.1. Analysis of Entire Sample

Table 2: Regression Analysis, Entire Sample

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.916 ^a	.839	.838	26.926

a. Predictors: (Constant), YEAR

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	956907.027	1	956907.027	1319.833	.000 ^b
	Residual	184155.411	254	725.021		
	Total	1141062.438	255			

a. Dependent Variable: GCA

b. Predictors: (Constant), YEAR

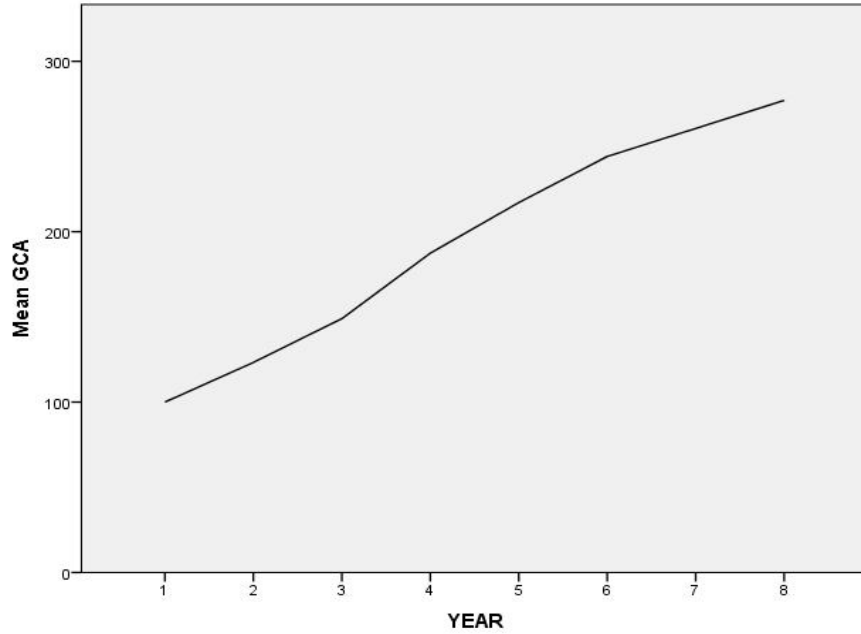
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	74.754	3.709		20.155	.000
	YEAR	26.683	.734	.916	36.330	.000

a. Dependent Variable: GCA

The regression was significant ($p < .001$). There was a clear trend towards GCA growth over time, regardless of which accounting method was used:

Figure 1. Mean GCA Growth over Time, Entire Sample



The data were not normally distributed:

Table 3: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GCA	.107	256	.000	.929	256	.000

a. Lilliefors Significance Correction

Table 4: Measures of Central Tendency in Gross Capital Accumulation, Entire Sample

N	Valid	256
	Missing	0
Mean		194.83
Std. Deviation		66.894
Skewness		-.086
Std. Error of Skewness		.152
Kurtosis		-1.348
Std. Error of Kurtosis		.303
Range		231
Minimum		85
Maximum		316

Figure 2. GCA Histogram, Entire Sample

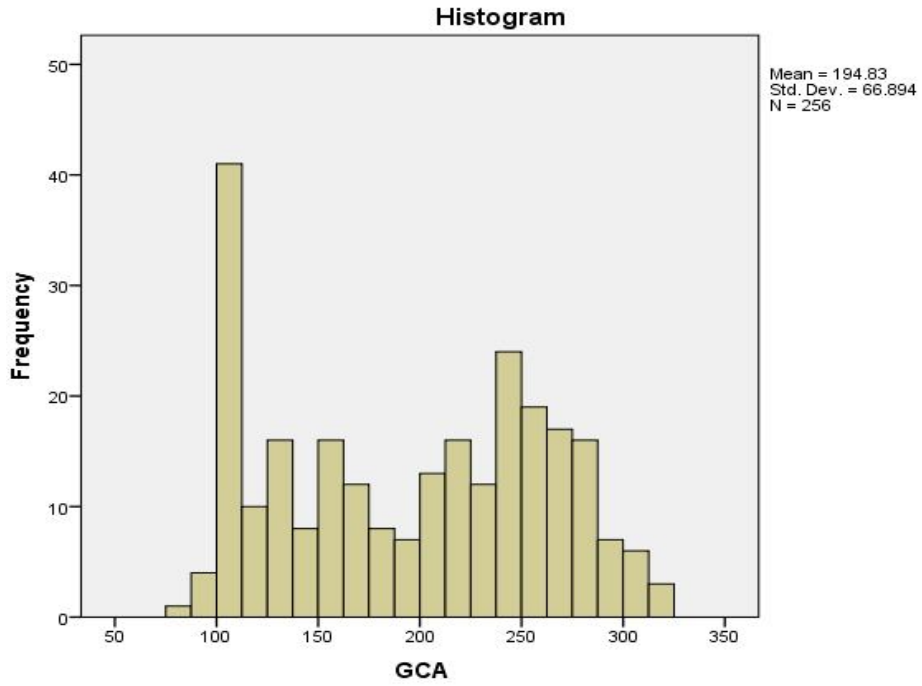
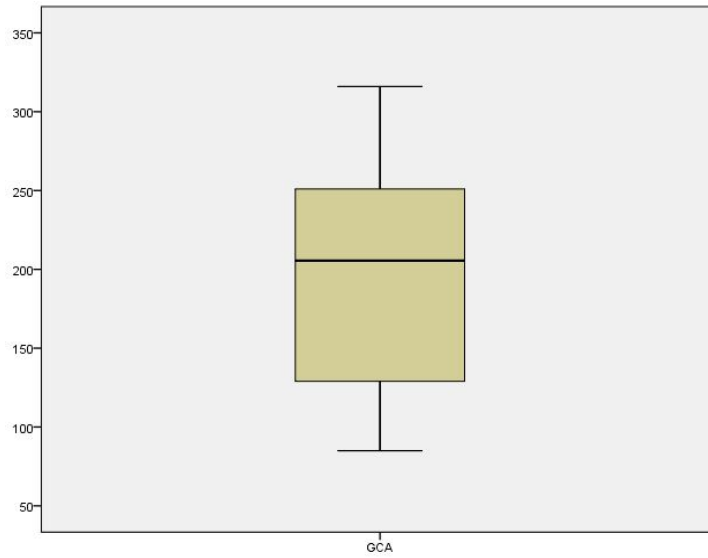


Figure 3. GCA Boxplot, Entire Sample



The analysis of the entire sample revealed that Turkish manufacturing companies accumulated gross capital rapidly regardless of whether they used fair value or historical cost accounting, governed by the following equation (bearing in mind that GCA was measured as an index value):

$$\text{Gross Capital Accumulation} = (\text{Year})(26.683) + 74.754$$

It remained to perform this analysis for fair value users and historical cost accounting users separately.

2.2. Analysis of Fair Value Users

Regression analysis conducted on the fair value users revealed significant relationships between time and gross capital accumulation:

Table 5: Regression Analysis, Fair Value Users

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.927 ^a	.859	.858	25,815

a. Predictors: (Constant), YEAR

ANOVA ^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	510044,170	1	510044,170	765,333	.000 ^b
	Residual	83970,697	126	666,434		
	Total	594014,867	127			

a. Dependent Variable: GCA

b. Predictors: (Constant), YEAR

Coefficients ^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	78,205	5,029		15,552	.000
	YEAR	27,550	,996	.927	27,665	.000

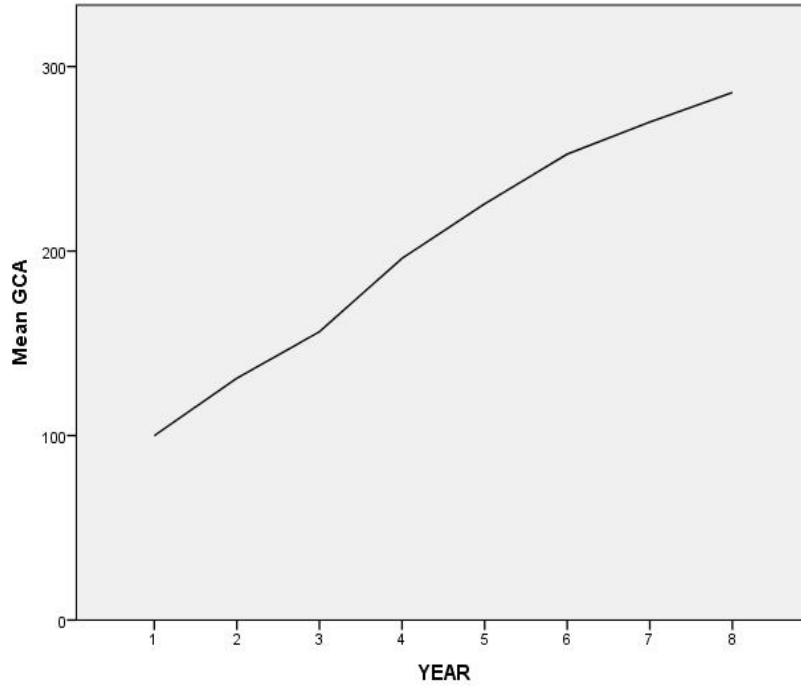
a. Dependent Variable: GCA

The regression was significant ($p < .001$). There was a clear trend towards GCA growth over time for fair value accounting users, such that:

$$\text{Gross Capital Accumulation} = (\text{Year})(27.550) + 78.205$$

The trend was apparent in the line graph:

Figure 4. Mean GCA Growth over Time, Fair Value Users



The data were not normally distributed:

Table 6: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GCA	.117	128	.000	.923	128	.000

a. Lilliefors Significance Correction

Table 7: Measures of Central Tendency in Gross Capital Accumulation, Fair Value Users

		Statistic	Std. Error
GCA	Mean	202.18	6.045
	95% Confidence Interval for Mean	Lower Bound	190.22
		Upper Bound	214.14
	5% Trimmed Mean	201.92	
	Median	213.50	
	Variance	4677.282	
	Std. Deviation	68.391	
	Minimum	100	
	Maximum	316	
	Range	216	
	Interquartile Range	129	
	Skewness	-.141	.214
	Kurtosis	-1.357	.425

Figure 5. GCA Histogram, Fair Value Users

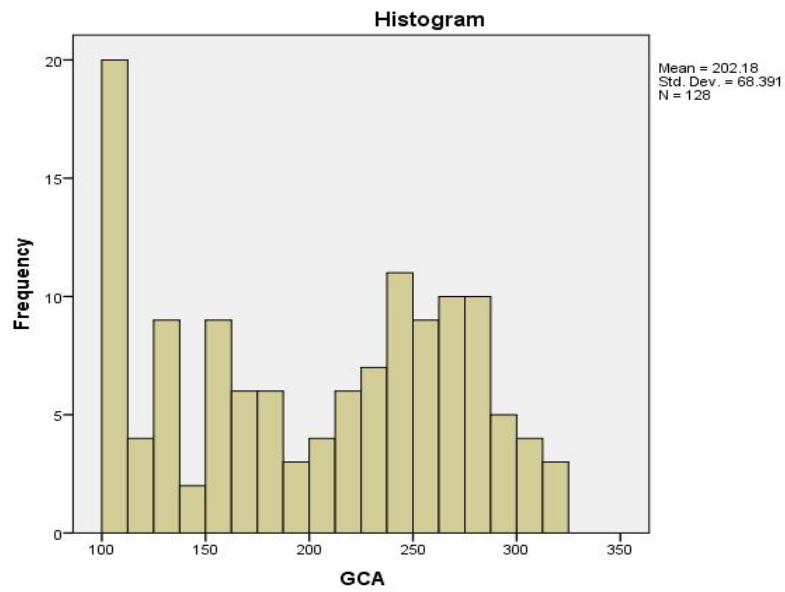
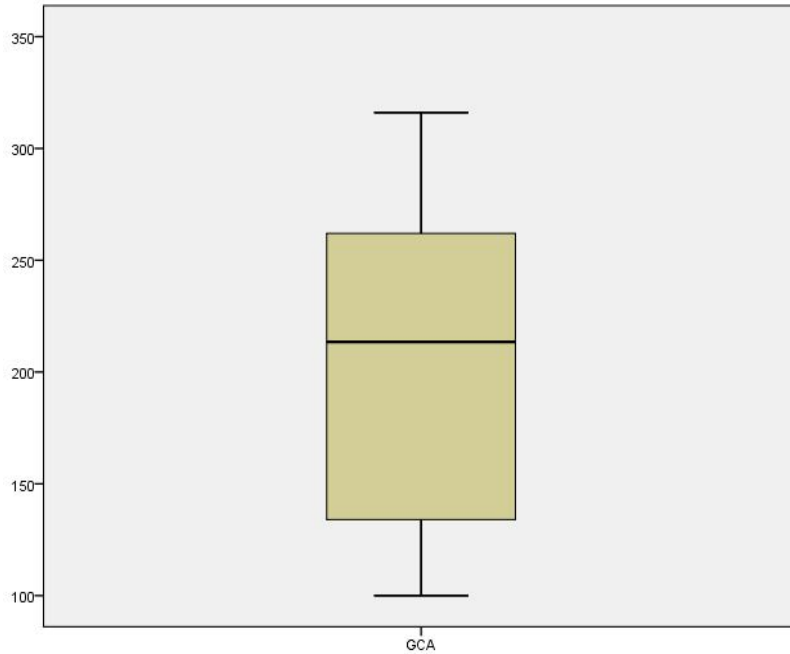


Figure 6. GCA Boxplot, Fair Value Users



2.3. Analysis of Historical Cost Users

Regression analysis conducted on the historical cost users revealed significant relationships between time and gross capital accumulation. The regression was significant ($p < .001$). There was a clear trend towards GCA growth over time for historical cost accounting users, such that:

$$\text{Gross Capital Accumulation} = (\text{Year})(25.816) + 71.304$$

Table 8: Regression Analysis, Historical Cost Users

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.916 ^a	.840	.839	26.025

a. Predictors: (Constant), YEAR

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	447872.697	1	447872.697	661.266	.000 ^b
	Residual	85339.233	126	677.295		
	Total	533211.930	127			

a. Dependent Variable: GCA

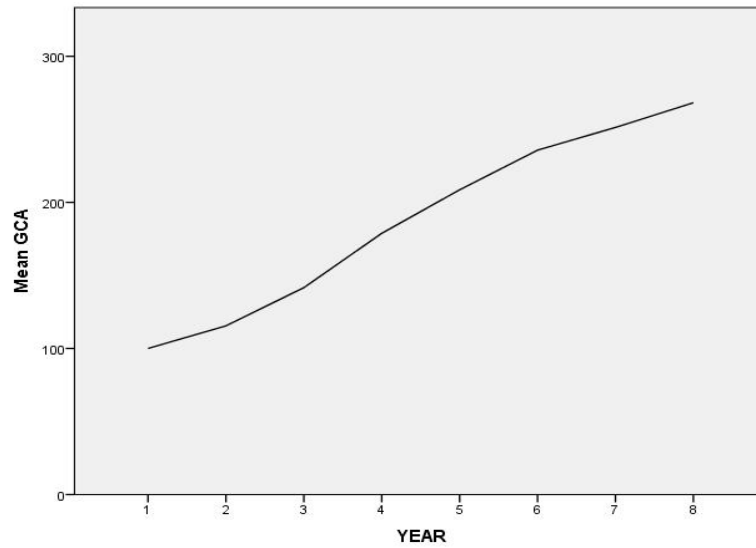
b. Predictors: (Constant), YEAR

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	71.304	5.070		14.065	.000
	YEAR	25.816	1.004	.916	25.715	.000

a. Dependent Variable: GCA

Figure 7. Mean GCA Growth over Time, Historical Cost Users



The data were not normally distributed:

Table 9: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
GCA	.114	128	.000	.924	128	.000

a. Lilliefors Significance Correction

Figure 8. GCA Histogram, Historical Cost Users

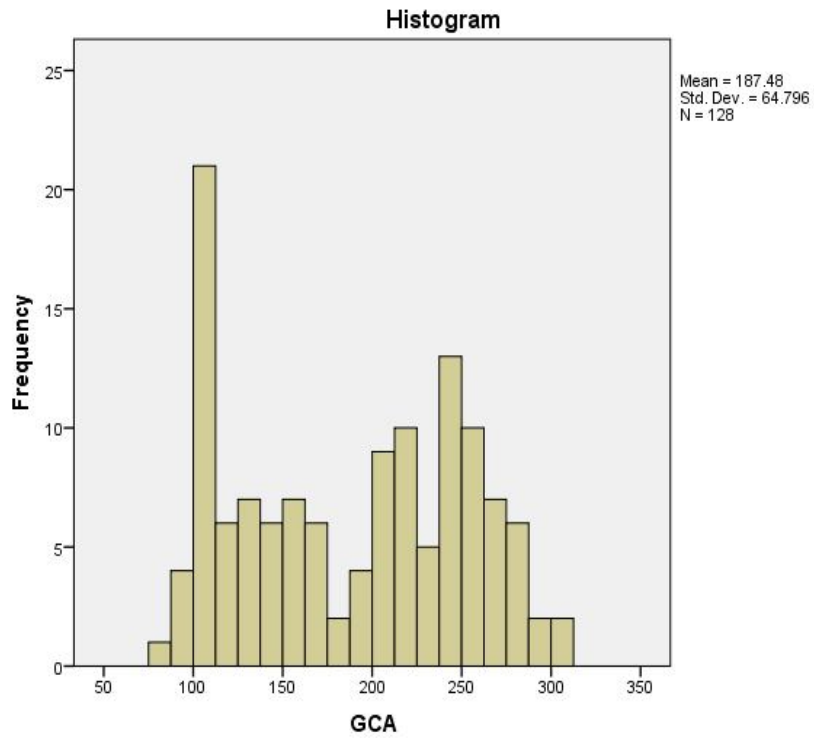
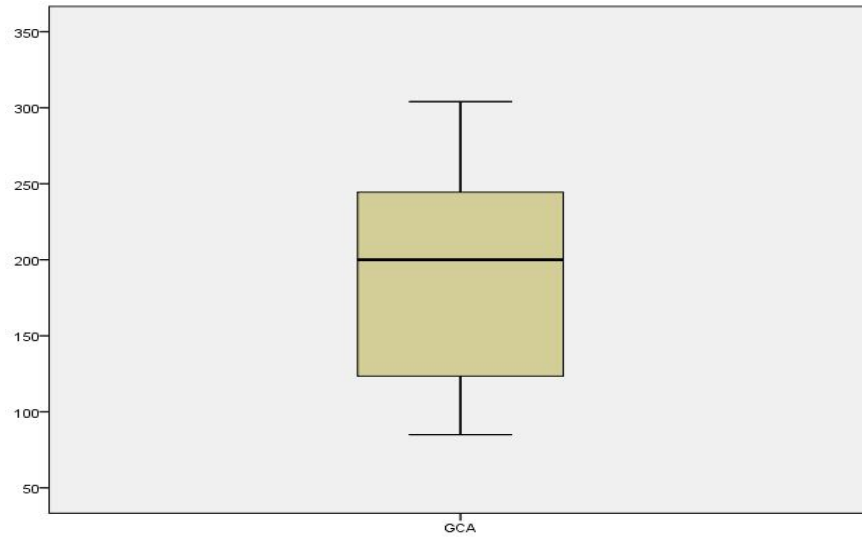


Table 10: Measures of Central Tendency in Gross Capital Accumulation, Historical Cost Users

		Statistic	Std. Error
	Mean	187,48	5,727
	95% Confidence Interval for Mean	Lower Bound 176,14	
		Upper Bound 198,81	
	5% Trimmed Mean	186,96	
	Median	200,00	
	Variance	4198,519	
GCA	Std. Deviation	64,796	
	Minimum	85	
	Maximum	304	
	Range	219	
	Interquartile Range	122	
	Skewness	-.064	.214
	Kurtosis	-1,384	.425

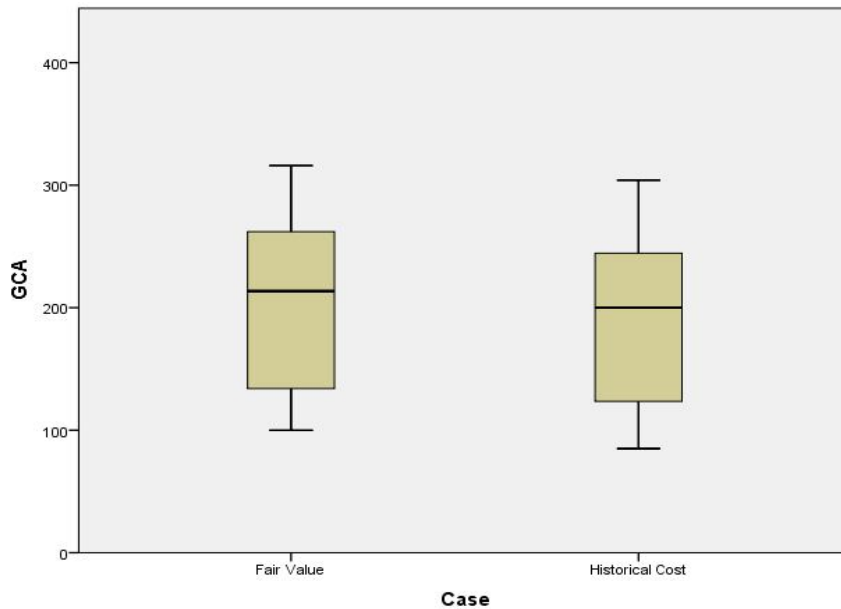
Figure 9. GCA Boxplot, Historical Cost Users



2.4. Comparison of Fair Value and Historical Cost Users

The last step in the analysis was to determine whether there were significant differences between the gross capital accumulation rates of fair value users and historical cost accounting users.

Figure 10. GCA Boxplot, Fair Value versus Historical Cost Users



Analysis revealed that the gross capital accumulation rates of these two types of accounting users was similar in terms of α , β , and R^2 , as apparent in Table 11. However, an independent samples t -test was necessary to determine whether observed differences in GCA means between these two groups were statistically significant.

Table 11: Case and Control Group Comparison

	Case Group	Control Group
Description	Manufacturing companies that adopted fair value accounting after using historical cost accounting	Manufacturing companies that have always used historical cost accounting
Significance of Change (α) of Gross Capital Accumulation over time	$p < .001$	$p < .001$
Steepness of Change (β) of Gross Capital Accumulation over time	.927 (standardized)	.916 (standardized)
Effect Size of Change (R^2) of Gross Capital Accumulation over time	.858 (adjusted)	.839 (adjusted)

The independent samples t -test revealed that the difference between the mean gross capital accumulation of historical cost users ($M = 187.48$, $s = 64.796$) and the mean gross capital accumulation of fair value users ($M = 202.18$, $s = 68.391$) was significant at an α of .010 ($p = .079$). H_1 was therefore supported.

CONCLUSION

Among Turkish manufacturing companies, the rate of gross capital formation was faster among adopters of fair value accounting than among adopters of historical cost accounting, which supports the theory that fair cost accounting is a response to the increased complexity of reporting on rapidly-accumulating capital—even after controlling for industry, revenue, and country.

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