

ANALYSIS OF VALUE RELEVANCE OF INTANGIBLE ASSETS UNDER INTERNATIONAL FINANCIAL REPORTING STANDARDS: EVIDENCE FROM BORSA İSTANBUL

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Abstract

In the current business climate, intangible assets play a vital role in business success. IAS 38 Intangible Assets was published to enhance the usefulness of financial information about intangible assets from an investor perspective. This paper analyzes intangible assets' value relevance in the pre and post International Financial Reporting Standards (IFRS) period in Turkey by using a sample that includes 108 firms over the period 2000 to 2016. The results of panel data analysis show that the amount of intangible assets is significantly associated with the stock price. The results also indicate that value relevance of intangible assets of Turkish manufacturing firms is significantly higher under IFRS than Turkish GAAP. This study aims to fill a gap by specifically analyzing the value relevance of intangible assets reported by Turkish listed firms over the pre and post IFRS period, since the most of previous research studies focus on either one of the two periods.

Keywords: Value relevance, Intangible assets, International Financial Reporting Standards

ULUSLARARASI FİNANSAL RAPORLAMA STANDARTLARINA GÖRE MADDİ OLMAYAN DURAN VARLIKLARIN DEĞER İLGİLİLİĞİNİN İNCELENMESİ: BORSA İSTANBUL'DAN BULGULAR

Özet

Günümüzün iş dünyasında, maddi olmayan duran varlıklar işletmelerin başarısında önemli rol oynamaktadır. IAS 38 maddi olmayan duran varlıklar ile ilgili olan muhasebe bilgilerinin yatırımcılar açısından daha faydalı olması amacıyla yayınlanmıştır. Bu çalışmada, Uluslararası Finansal Raporlama Standartlarının maddi olmayan duran varlıkların değer ilgililiği üzerindeki etkisi 108 firmanın 2000-2016 yılları arasındaki muhasebe verileri kullanılarak analiz edilmektedir. Panel veri analizinin sonucunda, maddi olmayan duran varlıklar ile şirketlerin hisse senedi fiyatları arasında önemli bir ilişki olduğu ortaya çıkmıştır. Ayrıca, sonuçlar, Uluslararası Finansal Raporlama Standartlarının maddi olmayan duran varlıkların değer ilgililiğini önemli bir oranda arttırdığını ortaya koymaktadır. Bu çalışma, Uluslararası Finansal Raporlama Standartlarının öncesinde ve sonrasında maddi olmayan duran varlıkların değer ilgililiğini analiz ederek literatüre katkıda bulunmayı amaçlamaktadır.

Anahtar Kelimeler: Değer ilgililiği, Maddi olmayan duran varlıklar, Uluslararası Finansal Raporlama Standartları

1. Introduction

The investors, creditors, stockholders, employees, suppliers and government agencies use financial statements to have information regarding the firms' financial performance and position. The financial statements users deeply analyze the components of assets, liabilities and equity of firms to make rational and accurate decisions. Generally speaking, firms classify assets into two categories; tangible assets and intangible assets. IAS 38 defines an intangible asset as "a non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes".

The globalization of world economy has dramatically changed the role of intangible assets in the business operations. The last 30 years have witnessed a substantial growth of intangible assets in the emerging countries. In the recent decades, accounting research has paid massive attention to the analysis of intangible assets reported on the firms' financial statements. Lev (2001) stated that with the advent of new business technology, intangible assets has become one of the major determinants of firm value. In the current business climate, if expenditures on intangible assets such as research, development and patent are related with future economic benefits, investors view them as assets. The intangible assets owned by firms have a massive impact on firms' competitive power in global business environment. Yang et al. (2015) state that intangible assets play a pivotal role in firm success. It is worth mentioning that intangible assets are among driving forces that stimulate economic growth and social welfare.

Barth et al. (2001) state that research studies on value relevance are primarily designed to provide evidences to accounting standard setting bodies that may update their opinions about how accounting numbers are reflected in security prices. Brahim and Arab (2012) point out that accounting information is relevant if it has a potential to confirm or alter the predictions of financial market participants. Paglietti (2009) claimed that higher value relevance of accounting information prominently raises the quality of firms' financial statements. Barth et al. (2008) and Martinez et al. (2014) stated that firms that employ IFRS in the preparation of financial statements experience an increase in the value relevance of accounting information.

Jennings et al. (1996) and Godfrey and Koh (2001) state that accounting for intangible assets is among the most debated issues that accounting standard setting bodies face. Oliveria et al. (2010) propose that increasing reliance on intangible assets and the substantial growth of knowledge economy have urged International Accounting Standards Board (IASB) to respond to these challenges. Moreover, the value relevance of intangibles has strongly grabbed the attention of financial market participants. More accurate and relevant information about intangible assets increases the accuracy of financial statements users' decisions. Research studies examining the value relevance of intangible assets reported by firms will enable accounting standard setting bodies to develop more effective standards.

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Turkey moved from rule-based accounting to a principle-based accounting system called as International Financial Reporting Standards on January 1, 2005. Over the last decades, numerous research studies have analyzed value relevance of intangible assets. The different findings concluded by these research studies have sped up future studies. Value relevance of intangible assets has been deeply analyzed for developed countries, yet there are few studies that have analyzed value relevance of intangible assets for emerging countries. The ultimate goal of this study is to shed light on the value relevance of intangible assets reported in the financial statements of Turkish manufacturing firms traded on Borsa Istanbul. This paper also analyzes whether the IFRS adoption raises the value relevance of intangible assets in Turkey. In this paper, two primary research questions are investigated. First, are intangible assets reported by firms operating in Turkey value relevant to the financial statement users? Second, has the formal IFRS adoption in Turkey improved value relevance of firms' intangible assets?

The original model developed by Ohlson (1995) is adjusted to investigate value relevance of intangible assets. Panel data regression is employed to analyze the value relevance of intangible assets by using a sample that includes 108 manufacturing firms listed on Borsa İstanbul, 2000-2016.

The rest of this study is organized as follows. Section 2 clarifies the prior literature on value relevance of intangible assets and development of hypothesis. Section 3 reveals the research design and sample data used in the empirical analysis. Section 4 argues the empirical results. The last part of the study concludes and makes recommendations for future studies.

2. Literature Review and Hypothesis Development

The value relevance is one of the prominent topics in the accounting literature. Barth et al. (2001) and Ohlson (1999) defined value relevance as a relationship between financial markets and accounting numbers. Aboody et al. (2002) stated that there is a significant relationship between value relevance and present value of future dividends. Research studies on value relevance analyze the usefulness of information reported in the financial statements to financial market participants. Ulsan and Ata (2014) stated that high quality accounting information has higher value relevance.

Intangible assets are classified as the long-term assets. Intangible assets are viewed as a driving force for the competition. In the new economy, intangible assets are heavily needed by firms to create sustainable growth. Intangible assets such as knowledge, intellectual property or experience can contribute to increased the shareholders' wealth.

In this section of the study, prior studies that analyzed the value relevance of intangible assets are discussed. There have been substantial research efforts for analyzing the impacts of IFRS adoption on value relevance of intangible assets. Some of previous studies have proved that the IFRS adoption has significantly improved

the value relevance of intangible assets reported by firms. This is because IFRS improves the disclosure requirements, provides more reliable and accurate information and supports market-based accounting practices.

Holthausena and Watts (2009) point out that the IFRS adoption has prominently raised the value relevance and reliability of intangible assets reported by Australian firms. Godfrey and Koh (2001) investigated the value relevance of intangible assets for a sample of 172 firms operating in Australia. They claimed that intangible assets of sample firms are much more value relevant than any other information disclosed by sample firms. The results provided by Godfrey and Koh (2001) were confirmed by Shahwan (2004). Based on a sample that includes 993 firms, Shahwan (2004) found that there is a positive and statistically significant relationship that exists between intangible assets and market value of equity.

Dahmash et al. (2009) investigated value relevance of intangible assets under Australian GAAP during the ten year period of 1994-2003. They reported that information provided by Australian firms for intangible assets is value relevant. Sahut et al. (2011) employed multivariate regression models to investigate value relevance of intangible assets under local GAAP and IFRS for European listed firms. Using a sample of 1855 European firms in a six-year period, they found that value relevance of intangible assets is higher under IFRS than local GAAP. The research conducted by Garanina and Pavlova (2011) indicated that intangible assets of sample firms are value relevant in explaining firms' market value. They used accounting data of firms listed in Moscow Stock Exchange and London Stock Exchange.

Several studies also analyzed the relationship between types of intangible assets and market value. Using a sample that comprises 163 software firms, Aboody and Lev (1998) analyzed whether capitalized software is related with capital market variables. They found that capitalized software provides value-relevant information for investors of these firms. Shah et al. (2013) analyzed the value relevance of capitalized research and development for UK firms. They support the assertion that the introduction of IFRS has significantly worsened the value relevance of research and development. Hirschey et al. (2001) provided evidence that patent reported by firms are value relevant to the investors. Lev and Sougiannis (1996) investigated the value relevance of intangible assets under US GAAP. The final sample data they used in empirical analysis includes 2600 non-financial firms. They documented that there is a statistically significant relationship between intangible assets and subsequent stock returns, confirming the findings of the previous studies (Bublitz and Ettredge, 1989; Sougiannis, 1994).

Oliveria et al. (2010) investigated the value relevance of intangible assets disclosed by firms listed on Lisbon stock exchange from 1998 to 2008. They found that the value relevance of intangible assets under IFRS significantly differs from value relevance of intangible assets under Portuguese GAAP. They put the forward claim that the adoption of IFRS has an adverse effect on the value relevance of intangible assets. Morricono et al. (2009) used a sample that includes 267 firms

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operating in Italy in the period of 1996-2006 to analyze the impacts of IFRS adoption on value relevance of intangible assets. The empirical evidence they found indicates that there is a decrease in intangible assets' value relevance after IFRS adoption.

Joos and Lang (1994) and Alford et al. (1993) develop the claim that the mix conclusions on value relevance of intangible assets stem from cross country differences in accounting measurement and financial reporting practices. Based on prior research studies, the value relevance of intangible assets is analyzed. The first question of this paper analyzes whether intangible assets disclosed by firms are useful in explaining firms' stock price. Consistent with Holthausena and Watts (2009), Godfrey and Koh (2001) and Sahut et al. (2011), it is expected that intangible assets of manufacturing firms listed on Borsa Istanbul are value relevant in explaining the stock price. Thus, the first hypothesis is as follows;

H1: The reported intangible assets are value relevant to financial statement users when evaluating the value of firms.

Turkish GAAP is designed to be debt and tax oriented. According to International Accounting Standards Board (IASB), the investors are the primary users of financial statements disseminated by firms. Based on this factor, it is expected that the IFRS adoption inflates accounting quality. In other words, the balance sheet items become much more value relevant under IFRS. Following Sahut et al. (2011) and Oliveria et al. (2010), the research hypothesis below is formulated as follows.

H2: The adoption of IFRS in Turkey has led to an improvement in value relevance of intangible assets.

3. Research Design

3.1. Data

In this part of the study, the sample data and research method are presented. The years from 2000 to 2005 refer to Turkish GAAP period, the years from 2005 to 2016 refer to IFRS period. This study examines a panel data over the sixteen-year period from 2000 to 2016. The sample comprises 108 non-financial firms listed in Borsa İstanbul. The annual reports of sample firms are available at the website of public disclosure platform and Borsa İstanbul. Firms that were delisted and have filed bankruptcy were excluded from the sample. Additionally, firms with negative book value are not included in the sample, since the inclusion of firms with negative book value could jeopardize the empirical results (Dahmash et al., 2009: 128).

In parallel with prior studies, firms that operate in the financial industry are excluded from the sample. This is because accounting rules they have to follow are significantly different. To be included in the final sample, common stocks of the firm should be traded on Borsa İstanbul since 2000 and its financial statements should be prepared on the basis of International Financial Reporting Standards.

Table 1 reports the sector classification of sample firms. According to the Table 1, the most excessively represented sector in the sample is fabricated metal products, machinery and equipment (30%), followed by chemicals, petroleum

rubber and plastic products (19%). Paper and paper products, printing and publishing sector has the lowest representation rate in the sample (5%). The broad sample can be viewed as a representative of manufacturing firms operating in Turkish business climate.

Table 1: Sector Classification of Sample Firms

Sectors	Number of Firms	Percentage
Fabricated Metal Products, Machinery and Equipment	32	30
Chemicals, Petroleum Rubber and Plastic Products	20	19
Non- Metallic Mineral Products	18	17
Food, Beverage and Tobacco	17	16
Basic Metal Industries	8	7
Wood Products	7	6
Paper and Paper Products, Printing and Publishing	6	5
Total	108	100%

3.2. Model Specifications

In this study, value relevance of intangible assets reported by sample firms is tested through employing Ohlson (1995) model, in which firms' market value is a function of earnings and book value of stockholders' equity. The choice of an empirical model mainly depends on hypotheses (Kothari and Zimmerman, 1995). As in previous studies on the value relevance of intangible assets (Oliveria et al., 2010; Sahut et al., 2011; Morricono et al., 2009), the value relevance of intangible assets is tested by analyzing the significance levels of estimated coefficients on variables. Following the previous studies (Barth and Clinch, 2009; Tsofigkas and Tsalavoutas, 2011; Ahmed and Falk, 2006; Shah et al., 2013), all variables in empirical models are deflated with the number of shares to eliminate large scale problems.

To investigate the first hypothesis, the following model is estimated. Model (1.a) tests the value relevance of intangible assets. If the association is positive, it can be concluded that financial statement users consider intangible assets an important factor in firms' value creation.

$$\text{Model 1: } P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \epsilon_{it} \quad (1.a)$$

in which:

P_{it} = the share price of firm i at time t , that is measured three months after the end of fiscal year t

$(BV-IA)_{it}$ = book value of equity minus intangible assets per share of firm i at the end of year t

$NIPS_{it}$ = net income per share for firm i at the end of year t

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IA_{it} = the intangible assets per share recognized in the financial statement of firm i at the end of year t

ε_{it} = error term

To test H2, models (2.a and 2.b) analyze the value relevance of intangible assets in the stock market. Following Hamberg and Beisland (2014), Aharony et al. (2010) and Morricone et al. (2009), two following regressions are run: the first for the Turkish GAAP period (2000-2005), and the latter one for IFRS period (2005-2016). This procedure enables us to analyze the value relevance of intangible assets reported by firms under two accounting regimes.

$$\text{Turkish GAAP: } P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \varepsilon_{it} \quad (2.a)$$

$$\text{IFRS: } P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \varepsilon_{it} \quad (2.b)$$

in which:

P_{it} = the share price of firm i at time t , that is measured three months after the end of fiscal year t

$(BV-IA)_{it}$ = book value of equity minus intangible assets per share of firm i at the end of year t

$NIPS_{it}$ = net income per share for firm i at the end of year t

IA_{it} = the intangible assets per share recognized in the financial statement of firm i at the end of year t

ε_{it} = error term

In accordance with prior studies (Hung and Subranyum, 2007; Palea, 2014; Gjerde et al., 2008), value relevance is measured by analyzing the explanatory power of accounting numbers for security prices, the accounting numbers with high R-squared are considered to be more value relevant.

4. Empirical Results

4.1. Descriptive Statistics and Correlation Analysis

Table 2 provides descriptive statistics for independent and dependent variables. In table 2, the sample firms are split into Turkish GAAP period and IFRS period. The results of descriptive statistics indicate that book value per share, net income per share and intangible assets per share exhibit increasing trends. The average price per share of sample firms in IFRS period is two times greater than in Turkish GAAP period. It is believed that strong foreign interest in Borsa İstanbul and sustainable economic development have led to a substantial rise in security prices. Intangible assets per share reported by sample firms in IFRS period is significantly higher than in Turkish GAAP period. In other words, firms listed on Borsa Istanbul have invested in more intangible assets during the years from 2005 to 2016.

As shown in Table 2, the profitability of sample firms in IFRS period (2005-2016) has substantially increased compared to Turkish GAAP period (2000-2005). Empirical data shows large variation across the sample data. Share prices of firm

during the period between 2000 and 2016 range from \$0.110 to \$180 with a mean of \$6.451; BV-IA ranges from \$0.036 to \$8.414; while NIPS ranges from \$0.002 to \$5.493, with a mean of \$0.402. Share prices of sample firms are also volatile, as evidenced by high standard deviations.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Pooled Sample (2000-2016)				
P	6.451	8.123	0.110	180
BV-IA	2.136	2.972	0.036	8.414
NIPS	0.402	0.922	0.002	5.493
IA	0.323	0.784	0.001	2.158
Turkish GAAP Period (2000-2005)				
P	4.207	7.510	0.180	29
BV-IA	1.860	1.926	0.036	6.319
NIPS	0.223	0.264	0.003	1.125
IA	0.149	0.313	0.008	0.947
IFRS Period (2005-2016)				
P	9.511	9.665	0.110	180
BV-IA	2.468	3.568	0.049	8.414
NIPS	0.447	1.451	0.002	5.493
IA	0.471	1.361	0.001	2.158

Notes: P_{it} = the share price of firm i at time t , that is measured three months after the end of fiscal year t ; $(BV-IA)_{it}$ = book value of equity minus intangible assets per share of firm i at the end of year t ; $NIPS_{it}$ = net income per share for firm i at the end of year t ; IA_{it} = the intangible assets per share recognized in the financial statement of firm i at the end of year t .

Variance inflation factors (VIF) are employed to detect multicollinearity among research variables. A high VIF indicates the presence of high multicollinearity that decreases the reliability of empirical results. Baum (2006) and Yan and Su (2009) suggest that a VIF greater than 10 may be a serious multicollinearity problem. According to Table 3, there is no multicollinearity problem in the sample data.

Table 3: Variance Inflation Factors

Variable	VIF	1/VIF
P	1.16	0.86207
BV-IA	2.65	0.37736
NIPS	1.35	0.74074
IA	2.08	0.48077

The results of unit root tests are provided in Table 4. Levin, Lin and Chu and Augmented Dickey-Fuller (ADF) tests are performed to analyze the nonstationary of

research variables. According to the results of Levin, Lin and Chu and ADF test, the null hypothesis that each research variables contain a unit root is rejected.

Table 4: Unit Root Tests of Panel Data

Variable	ADF Test	Levin, Lin and Chu Test
P	63.14***	-18.46***
BV-IA	114.52***	-74.16***
NIPS	79.45***	-35.84***
IA	105.46***	-23.95***

* Statistical significance at the 10% level

** Statistical significance at the 5% level

*** Statistical significance at the 1% level

A set of tests around the panel estimation techniques is presented in the Table 5. These tests are F test, Breusch- Pagan LM test and Hausman test. The result of F test states that null hypothesis of no individual effects should be rejected. It also means that empirical data should not be pooled and ordinary least square estimators are biased. According to the result of Breusch- Pagan LM test, null hypothesis is rejected thus random effects exist in the panel data. Hausman test is conducted to select between random effects model and fixed effects model. The p-value is above 0.05 thus it is safe to employ random effects model.

Table 5: Diagnostic Tests

Test Statistics	value	p-value
F test	34.56	0.00
Breusch- Pagan LM test	23.91	0.01
Hausman test	0.67	0.41

4.2. Regression Results

In this study, panel data regression analysis is used. Since, the empirical data includes observations over multiple time periods for sample firms. The results of panel data regression are presented in Table 6. Model I.a. is employed to analyze the value relevance of intangible assets for the pooled sample from year 2000 to 2016. The number of observations in IFRS period is greater than that in Turkish GAAP period. In this study, since there is an increase of intangible assets coefficient from Turkish GAAP period to IFRS period, one can draw the conclusion that the implementation of IAS 38 increases value relevance of intangible assets. Additionally, there is an increase of net income coefficient from Turkish GAAP period to IFRS period.

From Table 6, it can be seen that net income has a significant positive effect on stock price for all models. In other words, firms with high earnings strongly grab the attention of investors. The coefficients on net income reported by sample firms under Turkish GAAP period and IFRS period are statistically significant (0.1 and 0.01,

respectively). The adjusted R-squared of 0.356 and 0.461 show that intangible assets are strongly associated with stock price in Turkish GAAP period and IFRS period. Additionally, the coefficients on intangible asset in IFRS period and Turkish GAAP period are positive and statistically significant at the 0.01, implying that firms' intangible assets are incorporated into stock prices in the following accounting period. Findings from regression (Model II.b) provide empirical support for the second hypothesis that IFRS adoption in Turkey has led to an improvement in the value relevance of intangible assets. It appears that IAS 38 has contributed to an increased value relevance of sample firms' intangible assets. Although this finding is consistent with previous research studies (Holthausena and Watts, 2009; Sahut et al., 2011), it contradicts with the findings of Oliveria et al. (2010) and Morricono et al. (2009).

Table 6: Regression Results

Variables	Model I.a	Model II.a	Model II.b
Intercept	2.891***	2.337***	3.710***
BV-IA	1.528**	1.613**	1.508**
NIPS	2.173***	1.357*	3.508***
IA	8.253***	2.641***	11.073***
F test	20.37***	35.48***	17.58***
Adjusted R-squared	0.410	0.356	0.461
DW test	2.065	2.170	2.089

Notes:

* Statistical significance at the 10% level

**Statistical significance at the 5% level.

*** Statistical significance at the 1% level.

Regression Model: $P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \epsilon_{it}$ (Model I.a.)

Regression Model: $P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \epsilon_{it}$ (Model II.a)

Regression Model: $P_{it} = \alpha_0 + \beta_1 (BV-IA)_{it} + \beta_2 NIPS_{it} + \beta_3 IA_{it} + \epsilon_{it}$ (Model II.b)

For the pooled sample, all coefficients are statistically significant (0.05, 0.01 and 0.01, respectively) and the R-squared is 0.410, which means the accounting numbers are able to clarify the 41% of the firms' stock price. The results of empirical analysis indicate that intangible assets provide value relevant information to financial statements users and explain the majority of variation in security prices. Hence, hypothesis 1 is supported. This result is consistent with the findings of Godfrey and Koh (2001), Shahwan (2004), Garanina and Pavlova (2011), Hirschey et al. (2001) and Dahmash et al. (2009).

Durbin–Watson test is employed to determine whether there is an autocorrelation. According to the results of Durbin-Watson test, null hypothesis of existing no autocorrelation is accepted for all empirical models.

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Taken together, the empirical evidences support a conclusion that the change to IFRS significantly increased the value relevance of intangible assets reported by sample firms. It is also found that the intangible assets disclosed by sample firms are value relevant to the financial statement users when evaluating the value of firms. The increase in value relevance of intangible assets will bring future economic benefits. The increased value relevance of accounting data enables financial market participants to make more rational and accurate investment decisions. The results of empirical analysis are in line with expectations.

5. Conclusion

The adoption of IFRS has brought dramatic changes to financial reporting environment. The advocates of IFRS claim that IFRS significantly has increased the quality of financial statements disseminated by firms. As the world economy is becoming much more competitive than before, intangible assets of firms grab investors' attention. Therefore, new economy firms hold a significant amount of intangible assets which are heavily used in business operations.

In this paper, the value relevance of intangible assets under IFRS and Turkish GAAP is compared. Using accounting data of manufacturing firms for 2000-2016, it is concluded that the intangible assets reported by manufacturing firms are value relevant to financial statement users and the value relevance of intangible assets appears to increase from Turkish GAAP period to IFRS period. In other words, International Accounting Standard 38 allows for a better representation of intangible assets than Turkish GAAP. It should also be noted that the pure adoption of IFRS may not increase the value relevance of accounting information unless firms provide enough information on the impacts of IFRS adoption to the financial statement users. Undoubtedly, the stronger law enforcement contributes to the increased value relevance.

This is the first research paper on the value relevance of intangible assets involving Turkish GAAP period and IFRS period in the Turkey. The research within Turkish context could provide valuable input to the international debate on the value relevance of intangible assets. Future research studies may provide further evidence on whether the introduction of IFRS increased the value relevance of intangible assets.

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