

## THE RELATION BETWEEN EARNINGS QUALITY AND CORPORATE PERFORMANCE IN A TRANSITION STOCK MARKET: THE PORTUGUESE CASE

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## **The Relation between Earnings Quality and Corporate Performance in a Transition Stock Market: the Portuguese case**

### **Abstract**

We use a sample of 46 non-financial firms, listed in the Lisbon Stock Exchange between 1987 and 2016 to examine the relation between the valuation of the firms and earnings attributes which reflect information quality to test whether the firms that present higher levels of information quality have greater valuation. We conduct this examination during a period in which the Portuguese stock market transitioned from an emerging market classification into a developed market status in 1997.

We Francis et al (2004) and define seven earnings attributes: Accrual Quality, Persistence, Predictability, Smoothness, Timeliness, Conservatism and Value Relevance. We test these measures against market valuation using Tobin's Q measure and control the results for innate firm characteristics (firm size, capital structure, capital intensity, growth opportunities, insider ownership of shares and holding structures), as well as industry and year fixed effects.

We test the impact of these earning attributes for the full sample as well as for the subsamples before and after the change market development status. The main results for the full sample are that only Persistence is statistically associated with greater firm valuation. The statistical significance of the predictability can be traced to period after the market status change.

## 1) Introduction

The concept of earnings quality is based on two aspects and usefulness for investors. On the one hand, earnings are of high quality if they are able to reflect the firm's economic reality, as stated by Dechow and Schrand (2004). This means that if reported earnings are able to report in an accurate and unbiased manner the operating and financial position of the firm. On the other hand, as Richardson et al (2005) states, if earnings are able to persist and sustain itself into next period, this set of earnings is of high quality as well.

Dechow et al (2010) define higher quality earnings as earnings that provide more information about the features of a firm's financial and operating performance, that are relevant to a decision made by a specific decision maker. In the literature this has meant the following features

- Show persistence, such that they become a good predictor for sustainable long term earnings (Penman and Zhang, 2002; Dechow and Schrand, 2004 and Melumad and Nissim, 2009)
- Show smooth changes over time (Francis et al, 2004; Dechow and Schrand, 2004)
- Are a good predictor of future earnings (Schipper and Vincent, 2003)
- Do not require the use of extraordinary or other non-recurring items (Dechow and Schrand, 2004; McVay, 2006)
- Are determined conservatively, both in the choice of accounting rules and in its application (Watts, 2003a, 2003b)
- Are consistent with the nature of past, current and future Operating Cash Flows (Sloan, 1996; Dechow and Dichev, 2002)
- The dependence on the use of accruals is limited (Dechow et al, 1995; Kothari et al, 2005)

The impact of higher quality earnings can be seen on many levels: in the ability to correctly allocate capital and mitigating information risk, lowering the cost of capital of the firm. Moreover, as Bushman and Smith (2001) say, accounting information is important in order to allow the identification of investment opportunities, be useful as an instrument of internal control and to mitigate the asymmetries of information between managers and investors.

In light of these aspects, Dichev et al (2013) in a survey of 169 CFO's showed that the most relevant features of reported earnings are:

- Sustainability, Consistency, should reflect long term trends
- Free from the impact of extraordinary items and other adjustments
- Are an accurate picture of the firm's economic and financial reality

In addition to this, theoretical models, such as Easley and O'Hara (2004) and Leuz and Verrechia (2004) show that information risk is a non-diversifiable risk category. In fact, as Francis et al (2004) show, higher quality earnings contribute to a reduction of the cost of capital and Bhattacharya et al (2003) show that an increase in earnings opacity leads to an increase in the cost of capital. With respect to firm valuation Bitner and Dolan (1996) show that particular features of earnings (as smoothness) are associated with higher valuation (as measured by Tobin's Q).

In this paper we try to explore this relationship between earnings quality and firm valuation for publicly listed firms in the Portuguese Stock Exchange. For that purpose we use a sample of 46 listed firms, between the years of 1987 and 2016 and use the earnings quality features suggested by Francis et al (2004) in order to determine their impact in firm valuation, as measured by Tobin's Q. In this process we control with firm-level characteristics and for industry and time fixed effects. The majority of the studies are conducted looking at firms using US data or for a cross section of countries, and we would like to test these results for a country with a smaller and less relatively less liquid capital market.

The choice to analyze the Portuguese Stock Market is a contribution to increase the knowledge of the impact of Earnings quality measures by applying it to other data sets. Most of the empirical studies have either been conducted using U.S. data or applied to a cross section of different countries. Recently there have been an increased interest in analyzing stock markets located in emerging economies, as for example Ma and Ma (2017). The Portuguese case is an interesting case in the sense that is a relatively small stock market, located in close proximity of larger stock markets and with respect to the sample period used in this paper it overlaps with the change in classification from an emerging to a developed stock market in 1997.

The remainder of the paper is organized as follows. Section 2 discusses the relative development of the Portuguese Stock market. Section 3 presents the firm valuation, earnings quality and firm characteristics variables used in this paper. Section 4 presents the data and descriptive statistics

of the variables described in Section 3. Section 5 describes the hypothesis being tested; the regression models and discusses the empirical results. Section 7 concludes.

## 2) The relative development of the Portuguese Stock Market

The most traditional the development of a financial market is measured is by measures of financial depth and size, namely the ratio of market capitalization and GDP. Most recently however, financial development began to be seen as a multidimensional process not just restricted to a measurement of size. Cihak et al (2012) proposed a multidimensional benchmarking of financial development based on four pillars: Depth (size and liquidity), Access (ability of individuals and companies to access financial services), Efficiency (ability of institutions to provide services at a low cost) and Stability (measuring systemic risk and best practices). Key variables for each of these dimensions for Equity markets are for instance Market Capitalization to GDP for Depth, Concentration of market capitalization and trading volume in the top 10 firms for Access, Turnover ratio and Rate of Return for Efficiency and Return volatility for Stability.

Building on this approach, Svirydzenka (2013) introduced a new broad based index of Financial Development based on Depth, Access and Efficiency. In the figure below we present Portugal score in this index between the years of 1980 and 2016

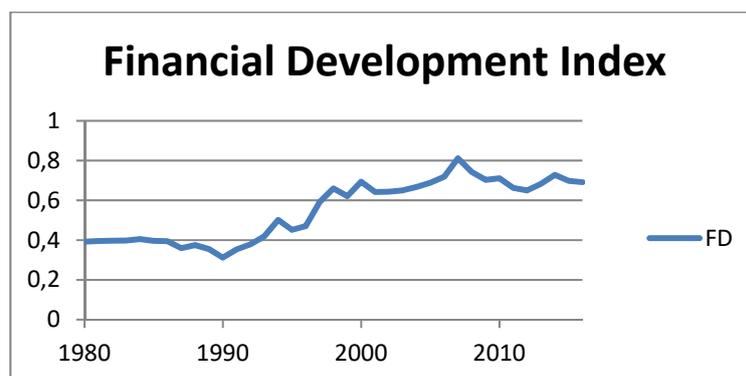


Figure 1: Financial Development Index (source: Svirydzenka, 2013)

From the values of this index it is noticeable that the index had an improvement during the end of the nineties. In fact, by November 1997 the Portuguese stock market was reclassified as developed by Standard and Poor's (S&P) and Morgan Stanley Capital International (MSCI). Today, the Portuguese stock market is classified as developed by the FTSE Group, S&P and

MSCI. In order to achieve this status, the stock market must meet a set of criteria associated with Size of the economy, Market and Regulatory Environment, Custody and Settlement practices, Dealing Landscape, Market Size and having a developed derivatives market.

Some previous research has been conducted with respect to earning quality attributes in emerging and developing markets. Lam et al (2013) finds that higher disclosure and higher quality financial information has improved Value relevance in China. Chebaane and Othman (2014) have found that mandatory adoption of IFRS increased the level value relevance in emerging markets. In the specific case of Portugal, Dias Curto and Morais (2008) found the that the adoption of IASB reporting standards in 2004 improved earnings quality.

In this paper, although we are interested in earnings quality attributes, we propose a different perspective: we are not necessarily interested in how the values of the earning attributes changed with the change in market classification, but we are more interested in whether those earning attribute measures became more useful to investors. In order to do that we will investigate if the impact of those measures in firm valuation changed when the Portuguese stock marked obtained all the features required to be classified as developed and was no longer classified as an emerging market.

### **3) Methodology**

#### **2.1) The measure of firm valuation**

We use Tobin's Q as our measure of firm valuation. This measures market valuation premiums over the replacement value of assets. In that way we calculate this measure as the ratio of market value of assets to their replacement value.

$$Q_{j,t} = \frac{BVA_{j,t} + MVE_{j,t} - BVE_{j,t}}{BVA_{j,t}}$$

where BVA is the book value of assets, BVE is the book value of equity and MVE is the market value of assers.

#### **2.2) The measures of earnings quality**

Across the literature there have been many dimensions by which earnings quality are measured. We decided to use seven the measures proposed by Francis et al (2004). The measures they use are accruals quality, persistence, predictability, smoothness, value relevance, timeliness and conservatism.

These measures can be further categorized into two groups. The first four measures considered are called accounting-based measures as they only use accounting data to be constructed. These measures assume that the role of earnings is to correctly allocate operating cash flows using accruals. In that way, the uncertainty of earnings can interpreted as a signal about earnings are proxies for the uncertainty investors have about the payoff.

On the other hand, the last three measures are called market-based, which use both accounting and market data for its determination. These measures try to capture the investor's perception of earnings uncertainty as expressed in market returns.

#### **i) Accrual Quality**

The measure of accrual quality used is measure proposed originally by Dechow and Dichev (2002), which propose that earnings that map more closely into cash flows are more desirable. For this reason, we regress total current accruals (scaled by total assets at the beginning of the year) on past, current and future operating cash flows (also scaled by total assets at the beginning of the period relative to the total current accruals).

$$\frac{TCA_{j,t}}{Asset_{j,t-1}} = \alpha_0 + \alpha_1 \frac{CFO_{j,t-1}}{Asset_{j,t-1}} + \alpha_2 \frac{CFO_{j,t}}{Asset_{j,t-1}} + \alpha_3 \frac{CFO_{j,t+1}}{Asset_{j,t-1}} + \varepsilon_{j,t}$$

The accrual quality metric is the standard deviation of firm j's estimated residuals. A large (small) value of this measure corresponds to a poor (good) accrual quality

#### **ii) Persistence**

This measure tries to capture earnings sustainability, which investors view as desirable. We measure persistence by regressing current earnings (measure as net income before extraordinary

items, scaled by total assets in the beginning of the year) on current earnings of the previous period.

$$\frac{NIBE_{j,t}}{Asset_{j,t-1}} = \beta_0 + \beta_1 \frac{NIBE_{j,t-1}}{Asset_{j,t-1}} + \vartheta_{j,t}$$

The persistence measure is the slope coefficient  $\beta_1$  of this regression. A higher (lower) value of this measure corresponds to more (less) sustainable, and therefore represents higher (lower) quality earnings.

### iii) Predictability

This measure tries to capture the ability of earnings to predict itself in the future. This measure is a desirable feature of earnings from the point of view of investors.

This feature is measured using the same equation used to measure persistence, but using the square root of the error variance. Higher (lower) values for this measure show a lower (better) ability of current earnings to predict future values and therefore represent lower (higher) quality earnings.

### iv) Smoothness

As earnings variability is generally seen as undesirable, and therefore more smooth earnings are more useful. Moreover, managers may, by use of accruals, smooth out transitional variability and report to investors a more representative sequence of earnings. Leuz et al (2003) propose as a measure for smoothness the ratio of variability of earnings to the variability of operating cash flows

$$\frac{\sigma\left(\frac{NIBE_{j,t}}{Assets_{j,t-1}}\right)}{\sigma\left(\frac{CFO_{j,t}}{Assets_{j,t-1}}\right)}$$

Higher (lower) values for this measure reveal a greater (smaller) variability of earnings relative to cash flows and, therefore, lower (higher) quality earnings.

#### v) Value Relevance

Earnings will be more useful for investors if they are better able to explain the observed variation in returns. We use the measure proposed by Francis and Schipper (1999), that regress returns (measured as firm  $j$ 's 15 month return ending 3 months after the end of the period) on current earnings (scaled by total assets at the beginning of the year) and the current variation of earnings (also scaled by total assets)

$$RET_{j,t} = \gamma_0 + \gamma_1 \frac{NIBE_{j,t}}{Assets_{j,t-1}} + \gamma_2 \frac{\Delta NIBE_{j,t}}{Assets_{j,t-1}} + \mu_{j,t}$$

This feature is measured using the coefficient of determination of this regression. Higher (lower) values of R-squared mean a greater (smaller) ability of earnings and earnings variation to explain current rates of return and, therefore, are associated with higher (lower) quality earnings.

#### vi) Timeliness

This measure of earnings quality tries to measure the ability of earnings to account in timely fashion, for changes in economic value, as measured as changes in market value of equity, which is a desirable feature of earnings. In that sense, we regress earnings on returns in this particular specification:

$$\frac{NIBE_{j,t}}{Assets_{j,t-1}} = \varphi_0 + \varphi_1 NEG_{j,t} + \varphi_2 RET_{j,t} + \varphi_3 NEG_{j,t} \cdot RET_{j,t} + \eta_{j,t}$$

In this regression NEG corresponds to a dummy variable with value 1 if the firm presents negative returns and zero otherwise.

The timeliness measure is captured by the explanatory power of this regression, as measured by the determination coefficient. Therefore, higher (lower) values of R-squared are associated with higher (lower) quality earnings

#### vii) Conservatism

This earnings measure tries to capture the differential way in which economic gains and economic losses are incorporated into earnings. A desirable attribute of earnings, called conservatism, is to equally reveal positive and negative information, and not to hide the latter.

Using economic gains as positive returns and economic losses as negative returns, and the regression used to measure timeliness, Basu (1987) measure conservatism as the ratio of the slope coefficient of negative returns ( $\varphi_2 + \varphi_3$ ) with the slope coefficient of positive returns ( $\varphi_2$ ).

Higher (smaller) values for this measure reveals more (less) conservatism in earnings reporting and, therefore, higher (lower) quality earnings.

### **2.2.1) Limitations of Earnings Quality Measures**

Some criticism and concerns over the usefulness of the measures we presented have been presented in the past. For example, regarding the accruals quality measure derived from Dechow and Dichev (2002) has problems capturing earnings quality because of the strong negative correlation between contemporaneous cash flows and accruals. Francis et al (2004) point that while Smoothness and Predictability generate a pattern of earnings that is helpful in eliminating uncertainty, may also be the outcome of opportunistic reporting choices which reduce the ability to convey useful information for investors. Battacharya et al (2003) include smoothness in a composite opacity earnings measure. Gaio and Raposo (2011) also point out that the relation between firm valuation and smoothness is still an open empirical question. Allyannis et al (2008) show that investors do not value earnings smoothness after controlling for the volatility of cash flows.

Concerning market based earning measures, Gaio and Raposo (2011) in a study across many countries, point out that for less liquid capital markets, in which stocks returns will be less able to proxy economic income, these measures may become less informative and useful. This problem is indeed one of the motivations for this research paper.

### **2.3) Firm-level characteristics**

In order to more rigorously study the relation between firm value and earnings we use as controls a set of firm characteristics that have a relation with firm valuation. Those firm level

characteristics are firm size, growth opportunities, investment opportunities, financial leverage, insider ownership and control if the firm listed is a holding group.

According to, among others, Durnev and Kim (2005) and Allayanis et al (2008), growth and investment opportunities are positively related to firm value. Firm size is represented by the log of total assets. We expect this variable to be negatively related to firm valuation as smaller firms will tend to have greater growth opportunities, which is positively associated with valuation. Growth rate of sales is a proxy for growth opportunities, which should be positively related to firm value and CAPEX scaled by total assets is a proxy for investment opportunities. We expect this variable to be positively related to firm value.

Agency problems are represented by measures of insider control and financial leverage. Insider control is represented by the ratio of shares held by insiders to total shares. Insider ownership of shares is related to firm valuation either positively by the fact that the interests of the stakeholders are more easily aligned or negatively by the fact that it may increase management entrenchment. For this reason, as with Gaio and Raposo (2011), who also use this measure, we do not have a clear relationship, but rather a U-shaped relationship between this variable and firm valuation. Financial leverage, also is a variable that is related to agency issues, as it, on the one hand can be associated with a disciplining tool of management, but on the other hand can be the source of agency conflicts between management and the various stakeholders in the firm.

The choice if these variables are also linked earnings reporting and not just firm value. Agency issues affect the business' risk and as a consequence the firm's reporting and accrual accounting. Firm size, as Ma and Ma (2017) point out is related to operation efficiency and with amount of cash flow and accruals. Investment and growth opportunities can also affect reporting given that discretionary accounting may smooth out the firm's prospects.

We additionally use the two-digit SIC code, in order to control for industry differences that may reflect different valuation and cash flow and reporting practices differences. Finally in all our regressions we control for time effects using a Year dummy variable.

#### **4) Data Sample and Descriptive Statistics**

The sample covers 30 years, from 1987 to 2016 for all non-financial firms listed in the Lisbon Stock Exchange. We collected accounting and financial data from the Worldscope database in order to compute earnings attributes measures as well as the firm-characteristics controls.

The sample included information for 46 firms with a total of 938 firm/year observations. We calculated the earnings measures over firm-specific seven-year rolling windows. In this method, a measure is calculated for a firm for period  $t$  if there is data available in years  $(t - 6)$  to  $t$ . This firm-year specific treatment prevents that differences in firms within the same industry may generate noisy measures in the constructs. The firm-specific control for a given period is the value of the variable for that specific period.

After each measure and firm specific controls are determined we eliminated extreme values by applying a rule of 3 times the standard deviation plus or minus the average value of the construct. In order to capture the change in capital market classification, we also included a dummy variable with value zero for the years before 1997 and 1 for the years after that year.

In order to have all earnings measures to be consistent in terms on how they describe greater earnings quality, we, as Francis et al (2004) or Gaio and Raposo (2011) defined that higher (lower) values for the attributes to represent lower (higher) earnings quality. For this reason, with respect to the measures presented earlier in the paper, the values for Persistence, Value Relevance, Timeliness and Conservatism are the negative of those specifications.

Table 1: Descriptive Statistics for the Earnings Attributes

	Panel A: Descriptive Statistics (full sample)					
	Mean	Median	Standard Deviation	Min	Max	N
Accrual Quality (AQ)	0.0270	0.0198	0.0231	0.0001	0.1187	509
Persistence (PS)	-0.3075	-0.2909	0.4296	-1.6961	1.1902	609
Predictability (PD)	0.0352	0.0249	0.0333	0.0012	0.2353	609
Smoothness (SM)	0.5096	0.4417	0.3210	0.0219	1.6422	588

Value Relevance (VR)	-0.3801	-0.3327	0.2468	-0.9633	-0.0010	511
Timeliness (T)	-0.5175	-0.5083	0.2659	-0.9963	-0.0058	511
Conservatism (C)	2.5056	-0.5766	101.6290	-338.8650	2149.3602	498

Panel B: Descriptive Statistics (before 1997)						
	Mean	Median	Standard Deviation	Min	Max	N
Accrual Quality (AQ)	0.0296	0.0273	0.0140	0.0140	0.0804	19
Persistence (PS)	-0.4878	-0.4043	0.4010	-1.6715	-0.0152	33
Predictability (PD)	0.0375	0.0329	0.0203	0.0136	0.0784	32
Smoothness (SM)	0.5337	0.5017	0.3613	0.0683	1.3579	31
Value Relevance (VR)	-0.2667	-0.2043	0.2239	-0.7947	0.0217	20
Timeliness (T)	-0.5220	-0.4752	0.2467	-0.8910	-0.0488	20
Conservatism (C)	-14.2838	-0.6531	78.2139	-338.8650	47.6469	20

Panel C: Descriptive Statistics (after 1997)						
	Mean	Median	Standard Deviation	Min	Max	N
Accrual Quality (AQ)	0.0269	0.0193	0.0234	0.0010	0.1187	490
Persistence (PS)	-0.2972	-0.2842	0.4293	-1.6961	1.1902	576
Predictability (PD)	0.0351	0.0242	0.0339	0.0012	0.2353	571
Smoothness (SM)	0.5083	0.4395	0.3189	0.0219	1.6422	557
Value Relevance (VR)	-0.3847	0.3486	0.2468	-0.9633	-0.0010	491
Timeliness (T)	-0.5173	-0.5108	0.2669	-0.9963	-0.0058	491
Conservatism (C)	3.2081	-0.5685	102.4965	-294.4118	2149.3602	478

This table presents descriptive statistics of the earnings attributes. The sample period is from 1987 to 2016. Panels A, B and C reports Mean, Median, Standard Deviation, Minimum, Maximum and number of observations (N) for each variable respectively for the full sample, the period before 1997 and for the period after 1997. All variables were estimated using seven-year rolling windows.

See Appendix for further details about the variables

Table 1 shows the descriptive statistics for the earnings quality and the correlations between those measures (using the full sample of values, excluding outliers).

Table 2: Descriptive Statistics for Firm Characteristics and Correlation Matrix between Earnings Attributes and Firm Characteristics

Panel A: Descriptive Statistics						
	Mean	Median	Standard Deviation	Min	Max	N
Tobin's Q (Qm)	1.1391	1.0352	0.4386	0.4911	4.5496	862
Size (LnA)	13.0642	12.9123	1.7317	8.9963	17.5809	938
Growth Rate of Assets (GrS)	0.0557	0.0528	0.2421	-1.4505	1.1737	881
CAPEX/Assets (CA)	0.0417	0.0301	0.0426	-0.0011	0.2086	923
Insider Ownership (PIS)	0.4358	0.5216	0.3452	0.0000	1.0000	930
Leverage Ratio (Lev)	0.3806	0.3680	0.1813	0.0000	1.0163	929

Panel B: Correlation Matrix						
	LnA	GrS	CA	PIS	Lev	R <sup>2</sup>
Q	0.0969	0.1126	0.2184	-0.0069	-0.0489	
AQ	-0.5373	0.0346	-0.1936	-0.2207	0.1985	34.0%
PS	-0.1832	-0.0406	-0.2244	0.0507	0.0500	5.8%
PD	-0.4358	0.0607	-0.1869	-0.0789	0.1958	20.9%
SM	-0.0959	0.0167	-0.0218	-0.0166	0.1326	5.6%
VR	0.0258	0.0162	-0.1026	0.0763	-0.0080	1.5%
T	-0.0017	-0.0092	-0.0371	0.0008	0.0661	2.6%
C	-0.0170	-0.0448	-0.0293	-0.0164	-0.0829	0.4%

This table presents descriptive statistics and correlations among firm level variables. The sample period is from 1987 to 2016. Panel A reports Mean, Median, Standard Deviation, Minimum, Maximum and number of observations (N) for each variable. Panel B reports correlations among the Tobin's Q and the firm characteristics and the Earning Attribute variables and the coefficient of determination for regressing each earning attribute on the firm characteristics. See Appendix for further details about the variables

Table 2 Panel A shows the descriptive statistics for the valuation measure and the firm-specific controls (including outliers) and Panel B shows the correlations between the valuation measure, the earnings quality attributes and the firm controls.

With regard to the relation between Firm characteristics and Firm Valuation, the correlations have the expected. There is a positive relation between firm size and valuation and between Investment Opportunities (as measured by CAPEX scaled by total Assets and Growth rate of Sales) and firm Valuation. On the other hand, there is a negative correlation (although very small) between Leverage and Insider Control and Firm Valuation.

Looking for relation between the Earning quality measures and the firm level characteristics, we are interested to look at the coefficient of determination of the regressions of each earning attribute measure and the firm controls. This coefficient will tell us the importance of those firm characteristics in explaining the earnings quality measures. The results show that these variables only have some explanatory power regarding Accrual Quality and Predictability. Overall, these characteristics are able to explain part of the behavior of the accounting-based measures and little or nothing of the behavior of the market-based measures. In any case, in the regressions that follow, where we include both earnings attributes and firm level characteristics, we can interpret the regression coefficients as the discretionary portion of each attribute.

## 5) Main Tests and Results

Given what we described before, we hypothesize that there will be a positive relation between earnings quality, as measured by the different earnings attribute measures and firm valuation, as measured by Tobin's Q.

To test this hypothesis, we estimate the following regression

$$Q_{i,t} = b_0 + b_1X_{i,t} + b_2Y_{i,t} + b_3Z_{i,t} + \varepsilon_{i,t}$$

In this regression,  $i$  represents a firm and  $t$  represents a year; Q corresponds to the valuation measure; X corresponds to a specific or a set of earnings attribute measure; Y corresponds to the set of firm-level characteristics and Z is a set of dummy variables (which include Industry codes and Year). We will propose several different specifications for this regression: we will run one regression for each individual earnings quality measures, a regression considering only the accounting-based earnings quality measures, a regression considering only the market-based earnings quality measures and a final regression considering all seven earnings quality measures. For all different model specifications we will include all the firm-characteristic controls and the Industry and Year dummy variables. This will correspond to a total of ten different model specifications.

Table 3 summarizes the regression results. For convenience we divided Table 3 in three panels. Panel A presents the regression results for the model specifications using individually the accounting-based earning quality measures. Panel B presents the regression results for the model specifications using individually the market-based earning quality measures. Panel C uses the specifications using the accounting measures together, the market measures together and the final specification using all seven earning quality measures. For each specification we present two sets of results: one using the full sample and another using a sub-sample starting in 1997, the year the Portuguese stock market became classified as developed.

Table 3 Panel A: Results for Regression of Firm Valuation on Earnings Attributes and Firm Characteristics and industry and yearly fixed effects

	Spec1 (full)	Spec1 (>1996)	Spec2	Spec2 (>1996)	Spec3	Spec3 (>1996)	Spec4	Spec4 (>1996)
Intercept	0.5218 (0,056)	1.1368 (0.001)	1.0800 (0,000)	Omitted	0.6186 (0,007)	1.5443 (0.001)	0.8446 (0,001)	Omitted
Accrual quality	3.0478 (0,001)	2.6483 (0.005)						

Persistence			- 0.1480 (0,000)	-0.1592 (0.000)				
Predictability					1.1568 (0,026)	0.7552 (0.183)		
Smoothness							0.1354 (0,005)	0.1481 (0.004)
Logarithm of assets	0.0117 (0,536)	-0.0189 (0.421)	- 0.0388 (0,019)	-0.0467 (0.006)	0.0099 (0,528)	-0.0513 (0.070)	-0.0201 (0,241)	-0.0245 (0167)
Leverage ratio	0.0024 (0,022)	0.0012 (0.254)	0.0033 (0,000)	0.0029 (0.003)	0.0031 (0,000)	0.0005 (0.594)	0.0024 (0,015)	0.0019 (0.057)
Growth of sales	0.0487 (0,484)	0.0102 (0.876)	0.0695 (0,240)	0.0711 (0.241)	0.0579 (0,287)	0.0282 (0.556)	0.0566 (0,365)	0.0584 (0.362)
Prop. Insider Shares	0.0276 (0,629)	0.0375 (0.516)	0.0355 (0,476)	0.0262 (0.616)	-0.0406 (0,378)	0.0195 (0.684)	0.0112 (0,829)	0.0008 (0.988)
CAPEX to Assets	2.5646 (0,000)	1.9763 (0.000)	2.2996 (0,000)	2.5175 (0.000)	1.9348 (0,000)	1.0866 (0.003)	2.3457 (0,000)	2.5510 (0.000)
SGPS dummy	-0.0483 (0,364)	0.0381 (0.595)	0.0258 (0,588)	0.0282 (0.566)	-0.0774 (0,080)	0.0647 (0.686)	0.0035 (0,945)	0.0048 (0.927)
Year	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
Industry	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
<i>Adjusted R-square (%)</i>	38.7	36.9	33.0	39.5	39.4	0.344	37.5	37.5

This table presents the estimates of coefficients from the regression at the firm level of

$$Q_{i,t} = b_0 + b_1X_{i,t} + b_2Y_{i,t} + b_3Z_{i,t} + \varepsilon_{i,t}$$

p-values are presented in parenthesis. See Appendix for further details about the variables

Table 3, Panel B: Results for Regression of Firm Valuation on Earnings Attributes and Firm Characteristics and industry and yearly fixed effects

	Spec5	Spec5 (>1996)	Spec7	Spec6 (>1996)	Spec8	Spec7 (>1996)
Intercept	0.8467 (0,003)*	omitted	0.8654 (0,002)*	Omitted	0.8690 (0,002)*	omitted
Accrual quality						

Persistence						
Predictability						
Smoothness						
Timeliness	-0.0103 (0,857)	-0.0069 (0.906)				
Conservatism			0.0000 (0,813)	0.0000 (0.820)		
Value relevance					0.0267 (0,660)	0.0390 (0.530)
Logarithm of assets	-0.0085 (0,650)	-0.0125 (0.520)	-0.0081 (0,662)	-0.0122 (0.536)	-0.0094 (0,617)	-0.0136 (0.483)
Leverage ratio	0.0036 (0,000)	0.0032 (0.002)	0.0035 (0,001)	0.0031 (0.004)	0.0036 (0,000)	0.0032 (0.002)
Growth of sales	0.0575 (0,399)	0.0621 (0.374)	0.0504 (0,465)	0.0551 (0.436)	0.0584 (0,392)	0.0635 (0.363)
Prop. Insider Shares	-0.0123 (0,827)	-0.0225 (0.699)	-0.0106 (0,853)	-0.0217 (0.715)	-0.0100 (0,854)	-0.0211 (0.717)
CAPEX to Assets	2.2268 (0,000)	2.2372 (0.000)	2.2439 (0,000)	2.2563 (0.000)	2.2334 (0,000)	2.2469 (0.000)
SGPS	-0.0430 (0,043)	-0.0386 (0.492)	-0.0521 (0,350)	-0.0474 (0.408)	-0.0400 (0,431)	-0.0390 (0.487)
Year Industry	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)
<i>Adjusted R-square (%)</i>	36.0	35.6	36.0	36.0	36.0	35.7

This table presents the estimates of coefficients from the regression at the firm level of

$$Q_{i,t} = b_0 + b_1 X_{i,t} + b_2 Y_{i,t} + b_3 Z_{i,t} + \varepsilon_{i,t}$$

p-values are presented in parenthesis. See Appendix for further details about the variables

Table 3, Panel C: Results for Regression of Firm Valuation on Earnings Attributes and Firm Characteristics and industry and yearly fixed effects

	Spec8	Spec8 (>1996)	Spec9	Spec9 (>1996)	Spec10	Spec10 (>1996)
Intercept	0.4459 (0,079)	omitted	0.8485 (0,003)*	omitted	0.3469 (0,241)	omitted
Accrual quality	1.3932 (0,203)	0.9470 (0.404)			1.6794 (0,179)	1.4037 (0.280)

Persistence	-0.1517 (0,000)	-0.1605 (0,000)			-1.5418 (0,000)	-0.1564 (0,000)
Predictability	1.2785 (0,138)	1.4590 (0,102)			0.8209 (0,406)	0.9258 (0,366)
Smoothness	0.0252 (0,650)	0.0272 (0,639)			0.0564 (0,358)	0.0550 (0,389)
Timeliness			-0.0363 (0,557)	-0.0372 (0,560)	-0.0091 (0,882)	-0.0081 (0,898)
Conservatism			0.0000 (0,848)	0.0000 (0,851)	0.0000 (0,779)	0.0000 (0,762)
Value relevance			0.0597 (0,363)	0.0744 (0,270)	0.0773 (0,231)	0.0894 (0,175)
Logarithm of assets	0.0158 (0,037)	0.0123 (0,506)	-0.0082 (0,669)	-0.0126 (0,527)	0.0241 (0,218)	0.0199 (0,327)
Leverage ratio	0.0023 (0,025)	0.0022 (0,038)	0.0034 (0,001)	0.0031 (0,005)	0.0024 (0,003)	0.0022 (0,061)
Growth of sales	0.1430 (0,825)	0.0150 (0,821)	0.0516 (0,455)	0.0567 (0,423)	0.0009 (0,989)	-0.0001 (0,998)
Prop. Insider Shares	-0.0194 (0,722)	-0.0292 (0,605)	-0.0112 (0,845)	-0.0227 (0,704)	-0.0126 (0,832)	-0.0222 (0,720)
CAPEX to Assets	2.0290 (0,000)	2.1255 (0,000)	2.2607 (0,000)	2.2701 (0,000)	2.0895 (0,000)	2.1165 (0,000)
SGPS	-0.0635 (0,224)	-0.0667 (0,214)	-0.0453 (0,032)	-0.0506 (0,379)	-0.0948 (0,101)	-0.0888 (0,135)
Year Industry	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)	(Yes) (Yes)
<i>Adjusted R-square (%)</i>	41.4	41.2	36.5	36.2	41.6	41.0

This table presents the estimates of coefficients from the regression at the firm level of

$$Q_{i,t} = b_0 + b_1 X_{i,t} + b_2 Y_{i,t} + b_3 Z_{i,t} + \varepsilon_{i,t}$$

p-values are presented in parenthesis. See Appendix for further details about the variables

The results on the two sets of equations are very similar. Based on what was described before, we expect that the regression coefficients for the earnings quality measures to be smaller than zero, showing higher valuation for firms with better outcomes for the earnings quality measures. However, when we look at the regression results in Panel A we notice something quite different: in the model specification (1) to (4), which correspond to the regression using a single accounting-based earning attribute, the regression coefficients are positive and statistically significant (p-values lower than 1%), with the exception of the Persistence measure, which is negative and statistically significant.

This means that, when taken separately, better outcomes of Accrual Quality, Predictability and Smoothness, are associated with lower firm valuation values. However, when we implement model specification (5), which includes all four accounting-based earning quality measures, the

regression coefficients for Accrual Quality, Predictability and Smoothness, although still greater than zero, lose statistical significance (p-values greater than 13%). In this model specification, the regression coefficient for Persistence is still negative and statistically significant (p-value lower than 0.1%). We also notice that, on top of eliminating statistical significance, adding all the accounting-based measures in the same regression, reduces the regression coefficient for Accrual Quality and Smoothness. On the other hand, the regression coefficient and statistical significance of Persistence are not affected by adding the other earnings quality measures.

Looking at the regression results presented in Panel B, we find that whether taken individually (in model specifications (6) to (8)) or taken together (in model specification 9), all regression coefficients associated with the market-based earnings attributes are not statistically significant different to zero (with p-values never smaller than 36%). On top of that only the regression coefficient associated with Timeliness is smaller than zero. These results point to the concerns raised about the market-based attributes for less liquid capital markets.

Finally, when the implement model specification (10), the results are consistent with the previous model specifications: All earnings attributes, with the exception of Persistence are not statistically significant (with p-values greater than 18%). The regression coefficient for Persistence continues to be highly significant (p-value smaller than 0.1%) and negative, showing a positive relation firm valuation and the ability of reported earnings to be sustainable over time.

Looking at the contribution of our firm-characteristic controls to market valuation, we find that most of them are not statistically different to zero. The exceptions are Leverage, which in all specification is positively associated with firm valuation (with p-values never greater than 2.5%) and CAPEX/Assets, which capture Investment Opportunities. This measure is positively related with firm valuation (with p-values for all specifications never greater than 0.1%)

This set of results show that after controlling for firm-specific characteristics, yearly and industry effects only the Persistence attribute has a positive contribution for firm valuation. The discretionary actions to increase earnings predictability and smoothness are not rewarded with higher valuation. Additionally, the market-based earnings attributes do not seem to be relevant. This fact may be due to the fact that, with a less liquid stock market, stocks returns are less able to proxy economic income, making these measures less informative and useful.

However, given that the results obtained for the full sample and for the sample after 1996 are very similar, we tested a different model in which we introduce a dummy variable with the value 1 for the years starting in 1997 and zero for the years before. Using this new variable and with the goal to determine if the impact of the earnings attributes changed after the classification modification, we created a new variable, for each of the attributes, by multiplying this dummy variable with each attribute. This variable is identified in the next results with the name of the earning attribute added with the suffix “\*D”. This new variable will isolate the for each earning attribute the effect of the change in market classification of the Portuguese stock market. The results are presented in Table 4, Panels A and B, for the same specifications used before.

In all the specifications, the impact of the earning attribute combined with the dummy variable is not significant. The only exception is what happens in specification 2, where the regress the attribute persistence. We find that the regression coefficient associated with Persistence is positive and not statistically significant, unlike in the previous model, but the combined effect of this earning attribute and the dummy variable is negative and statistically significant at the 5% level. We conclude that the result obtained for the full sample, in which better outcomes of earnings persistence are associated with higher valuations is fully attributed to the sample period after the change in classification from emerging market to developed market. In addition to this result, we notice that the negative impact of the predictability and smoothness attributes only happens after the change in market classification as well (although not statistically significant at the 10% level). As far as the market based earning attributes, the lack of statistical significance is once more observed under this methodology.

Table 4 Panel A: Results for Regression of Firm Valuation on Earnings Attributes and Firm Characteristics and industry and yearly fixed effects

	Spec1	Spec2	Spec3	Spec4	Spec8
Intercept	0.3551 (0.275)	1.3104 (0.000)	0.7190 (0.006)	1.0474 (0.000)	0.7656 (0.079)
Accrual Quality	8.3537 (0.143)				4.3794 (0.461)

Accrual Quality*D	-5.4321 (0.345)				- 3.3921 (0.573)
Persistence		0.1410 (0.342)			0.1630 (0.427)
Persistence*D		- 0.3050 (0.045)			-0.3272 (0.116)
Predictability			-1.0165 (0.716)		-3.8930 (0.484)
Predictability*D			2.2281 (0.429)		5.4074 (0.337)
Smoothness				-0.1527 (0.410)	0.0812 (0.789)
Smoothness*D				0.3093 (0.107)	-0.0530 (0.864)
Firm controls	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
Year	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
Industry	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
<i>Adjusted R-square (%)</i>	38.8	39.7	39.5	37.8	42.0

This table presents the estimates of coefficients from the regression at the firm level of

$$Q_{i,t} = b_0 + b_1 X_{i,t} + b_2 Y_{i,t} + b_3 Z_{i,t} + \varepsilon_{i,t}$$

p-values are presented in parenthesis. See Appendix for further details about the variables

Table 4, Panel B: Results for Regression of Firm Valuation on Earnings Attributes and Firm Characteristics and industry and yearly fixed effects

	Spec5	Spec6	Spec7	Spec8	Spec10
Intercept	0.9062 (0.005)	0.8655 (0.002)	0.8017 (0.004)	0.9390 (0.006)	0.4735 (0.467)
Accrual quality					4.4138 (0.546)

Accrual Quality*D				-2.9668 (0.689)	
Persistence				0.0800 (0.839)	
Persistence* D				-0.2381 (0.548)	
Predictability				1.0279 (0.925)	
Predictability* D				-0.0696 (0.995)	
Smoothness				-0.0332 (0.939)	
Smoothness* D				0.0881 (0.841)	
Timeliness	0.1064 (0.740)			0.3113 (0.409)	0.2043 (0.692)
Timeliness*D	-0.1206 (0.711)			-0.3549 (0.354)	-0.2126 (0.683)
Conservatism		-0.0001 (0.945)		-0.0007 (0.515)	-0.0003 (0.775)
Conservatism *D		0.0000 (0.973)		0.0006 (0.533)	0.0004 (0.749)
Value Relevance			-0.3835 (0.252)	-0.5006 (0.173)	-0.6079 (0.288)
Value Relevance*D			0.4228 (0.213)	0.5775 (0.120)	0.6983 (0.225)
Firm Controls	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
Year	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
Industry	(Yes)	(Yes)	(Yes)	(Yes)	(Yes)
<i>Adjusted R-square (%)</i>	36.0	36.4	36.2	36.9	42.2

This table presents the estimates of coefficients from the regression at the firm level of

$$Q_{i,t} = b_0 + b_1 X_{i,t} + b_2 Y_{i,t} + b_3 Z_{i,t} + \varepsilon_{i,t}$$

p-values are presented in parenthesis. See Appendix for further details about the variables

## 6) Conclusion

In this paper we explore the relationship between the quality of reported earnings and firm valuation for the firms listed in the Lisbon Stock Exchange between 1987 and 2016. In order to represent the quality of earnings we use the earnings quality measures suggested by Francis et al (2014): Accrual Quality, Persistence, Predictability, Smoothness, Value Relevance, Timeliness and Conservatism.

This analysis is made in the context of implementing these attributes measures to a relatively small and less developed financial market which underwent a change in classification from

emerging to developed and to understand if this fact has an impact in the effectiveness that earnings attributes have in conveying information to investors and other market participants.

The results we obtain show that of these earnings attributes only Persistence has a positive and statistically significant impact in firm valuation (as measured by Tobin's Q), after controlling for a set of firm characteristics and industry and time fixed effects. We find that the subset of earnings attributes that use market information may suffer from the fact that in a smaller and less liquid stock market, rates of return may not be a good proxy for economic value and that the Predictability and Smoothness measures may suffer from opportunistic reporting choices which makes them less useful in mitigating information risk. Most importantly, these results are driven by the impact of these earning attribute measures in the period after the change in market classification.

In conclusion, we find that, within the several dimensions the quality of reported earnings can be associated with, investors seem to reward those firms who present earnings which are sustainable over time and therefore we see a positive and statistically significant relation between this attribute and firm valuation.

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#### Appendix: Variable Definitions

**Tobin's Q (Q):** total assets plus market value of equity minus book value of equity over total assets

**Corporate Performance (EA):** ratio of Net income before extraordinary items scaled by total assets

**Accrual Quality (AQ):** the standard deviation of firm j's residuals from a regression of current accruals (scaled by assets) on lagged, current and future cash flows from operations (scaled by assets)

**Persistence (PS):** the negative of firm  $j$ 's slope coefficient from a AR1 model of annual earnings (scaled by assets)

**Predictability (PD):** the square root of the error variance from firm  $j$ 's AR1 model

**Smoothness (SM):** the ratio of firm  $j$ 's standard deviation of earnings before extraordinary items (scaled by assets) to the standard deviation of cash flows from operations (scaled by assets)

**Value Relevance (VR):** the negative of the adjusted R2 from a regression of 15-month returns on the level and change in annual earnings before extraordinary items

**Timeliness (T):** the negative of the adjusted R2 from a reverse regression of annual earnings before extraordinary items on variables capturing positive and negative 15-month returns

**Conservatism (C):** the negative of the ratio of the coefficient on bad news (negative returns) to good news (positive returns) in the reverse regression

**Size (LnA):** the log of total assets

**Leverage (Lev):** the ration of total debt to total assets

**Growth of Sales (GrS):** Annual Sales Growth

**Proportion of Insider Shares (PIS):** Insider ownership measured by percentage of shares held by insiders

**Investment Opportunities (CA):** the ratio of Capital Expenditures (CAPEX) to Total Assets

**Industry (SIC1):** Two-digit Standard Industry Code