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Information Quality and Firm Age

Masters' Dissertation

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by

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Abstract

This study aims to approach the impact of firms' age in regard to their financial information quality within a sample of 612.899 non-financial Portuguese and Spanish companies referring to the time period expanding from 2007 to 2012. The main focus is in contrasting startup firms (determined as those established after 2007) and mature firms (determined as those established before 2007), in respect to differences as to their respective levels of discretionary accruals prevailing throughout their distributions. This is achieved through the estimation of the Dechow-Dichev Model, and, ultimately and subsequently, in their due information quality. Furthermore, two Versions of the Model are estimated, considering different forms of external financing (loans and liabilities). It appears that accruals-based earnings management does differ whether startup firms or mature firms are considered, with higher levels of discretionary accruals prevailing within startups, although mature firms ultimately seem to provide for lower levels of information quality, being these findings congruent with the notion that mature firms rely on a much larger pool of resources and are able to manage their accounts more effectively if they choose to do so.

Keywords: Information quality; Earnings management; Age; Financing needs; Accruals.

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Introduction

In a speech delivered in 1998, former Chairman of the Securities and Exchange Commission, Arthur Levitt, warned that a "numbers game" was being played in the business world, stating that, "In the zeal to satisfy consensus earnings estimates and project a smooth earnings path, wishful thinking may be winning the day over faithful representation. Managing may be giving way to manipulation; integrity may be losing out to illusion" (Levitt, 1998).

Information quality characterizes a firm in terms of accuracy of its financial statements, being financial reporting of key interest to investors, analysts and board members, or simply to those relying on financial figures to reach investment decisions (DeGeorge et al, 1999).

In this sense, the extent to which firms alter reported earnings in their own benefit prevails has a central issue to both theoretical and empirical research in accounting.

Within accounting literature, a variety of terms are presented as synonymous to earnings management, providing for lack of consensus as to their exact definition. However, Healy and Wahlen enable the establishment of a comprehensive definition by stating that 'Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers' (Healy and Wahlen, 1999).

Chittendem, Hall and Hutchinson (1995) expose the extent to which financial structure relates to a firm's age, while raising broader issues on the prevailing relationship between financial structure and stage of development, as well as on size, growth rate and access to the capital market. Their results point to significant relationships between firms' financial structure and age, and to the containment of economic growth within firms deriving from over-reliance on internally-available funds.

In this sense, finance literature widely regards mature firms with deteriorating earnings, as the variability of stock returns presents itself negatively related with incorporation age (Adams, Almeida and Ferreira, 2005), while, simultaneously, investors' uncertainty appears to lessen as firms grow older (Pástor and Veronesi,

2003). Furthermore, financial constraints, more prevalent within startup firms, prevent firms from raising all the funds necessary for the marginal product of capital to equal its opportunity cost (Cooley and Quadrini, 2001).

In light of the above, this study aims to investigate the prevalence of the use of accruals to temporarily improve or reduce reported earnings, depicted as a mechanism for earnings management, by startup and mature non-financial firms, established in Spain and Portugal, through analyzing performances through the years 2007 to 2012.

By engaging in accruals-based earnings management, it becomes possible for a firm to increase or decrease their income as they see fit by creating accruals. Thus, firms can create accruals in order to manipulate changes in reported earnings (discretionary accruals), which fall into the category of earnings management and impact cash flows. Being that information quality can be questioned from the moment earnings figures are interfered with, analyzing firms in regard to accruals-based earnings management becomes compliant with this dissertation's premise.

In line with these motivations, the present study embraces the following research questions: i) is there a difference between accruals-based earnings management within startup firms and mature firms?; and, ii) do startup firms manage their earnings more than mature firms?

The study by Francis et al (2005) if relied upon in examining firms' information quality and earnings management behavior across different years of establishment. This study relies on the Dechow-Dichev Model enhanced through the modified Jones Model approach, which reducing the pre-existing link to information risk.

As far as results are concerned, preliminarily, startup firms appear to present higher levels of discretionary accruals prevailing within them, as, through the estimation of the Dechow-Dichev Model's residuals, which isolate discretionary accruals.

Onwards, the estimated standard deviation in regard to residuals (which provides for a measure to information quality) presents an average value superior within mature firms compared to that obtained in regard to startup firms, thus entailing lower levels of information quality prevailing, in average, within the former, rather than the latter.

Firms' year of establishment ultimately influences negatively their information quality, providing for a more substantial negative effect upon startup firms.

The remaining of this dissertation is as follows: chapter 1 discusses information quality and earnings management, presenting the theoretical component behind the regressions to be performed, also addressing the impact of financial instability within earnings quality; chapter 2 outlines the data and sample from which the metrics in the dissertation are derived; chapter 3 provides the results and findings from the statistical analysis performed, enabling the comparison of startup firms and mature firms; finally, the conclusion chapter presents the summary and conclusions as to its findings.

Chapter 1: Background

1.1 – Information quality and earnings management

Business decisions base themselves upon provided information, whether they're made by large corporations or by individual investors.

Several authors have expressed their thoughts on what information quality regards, with Kahn et al (2002) establishing it as the intrinsic characteristics needed to meet or exceed customers' expectations while obeying to specific requirements or specifications; English (1996) determining that it means "consistently meeting customers' expectations and through information and information services enabling them to perform their job effectively"; and, Eppler (2002) describing it as those informational characteristics needed to fulfill its users' requirements.

Despite how disperse information quality's meanings may be, it becomes possible to state that all revolve around the same metrics, with Wang and Strong (1996) grouping them in a hierarchical form (refer to Figure 1 in Appendix I). This interpretation presents itself pertinent in terms of how well it captures today's view of what a firm's characteristics should be, closely resembling much of those assumptions verified in an audit to a company's financial statements and those that can be stated as "socially desirable", as are intrinsic, representational, accessibility and contextual data quality.

Dechow, Ge and Schrand (2010) establish what earnings quality is by adopting Statement of Financial Accounting Concepts No. 1's language, stating that higher earnings quality shall translate into more and relevant information regarding features of a firm's financial performance being provided.

Firms are ultimately meant to prepare financial statements that meet the specified characteristics herein, being the quality of their financial information output reliant on how they fulfill their informational users' needs.

In this sense, information quality becomes the object of questions when the above specified requirements are not met, leading its users and the market to misinformed conclusions and subsequently misinformed decisions.

Being the single most important item found in any company's financial statements undoubtedly earnings, as they signal firms in terms of their value, due

to their stock's theoretical value corresponding to the present value of their future earnings, a firm's maintenance relies on them and the incentives to keep earnings up are obvious. Thus, it becomes feasible that a firm's financial information loses quality when their earnings are misrepresented.

Prior to discussing what earnings management and, ultimately, financial information quality regard, it becomes crucial to establish the distinction between manipulation and fraud.

Fraud involving a firm's finances is commonly classified as white-collar crime, which, according to Gottschalk (2012), presents clear components, such as: deceitfulness; intentionality; trust breaching; involves losses; the possibility to be concealed; and, an appearance of outward respectability. The underlying psychology of a fraud can be described as fraud's triangle, which involves three dimensions: motivation (from one's living condition to ego), rationalization and opportunity. When a fraud actually takes place, a firm can become one of two: a perpetrator or a victim of the crime. A firm becomes a perpetrator of the crime when its employees or managers are the ones committing financial crime, and it becomes the victim of the crime when suffering a loss due to offenses committed by employees or managers, compounding a situation commonly referred to as occupational fraud.

Li, McDowell and Moore (2008) define earnings management as the selection of accounting policies to achieve a desired financial reporting result, becoming possible to state that, usually, earnings management does not occur because of intentional fraud, but rather due to the zenith of a sequence of aggressive interpretations of accounting rules combined with a sequence of aggressive operating activities.

Shedding light on how much firms "invest" in maintaining high earnings or, at most, avoiding losses, Burgstahler and Dichev (1997) provide evidence on firms' management of their reported earnings through cash flow from operations and working capital in order to avoid losses and prevent earnings from decreasing; Hayn (1995) reports on a point of discontinuity around zero for firms' earnings, concluding on the lengths firms go to manage their earnings from being negative; and Cunha (2013) also sheds light on the discontinuity of firms' earnings around zero, although in a perspective of methods for detecting earnings management.

In this sense, recent research, as provided by Libby et al (2009), shows that it is the discretionary vacuity in accounting standards that allows for earnings

management decisions. Gaps left for decisions to be made come to depend on the accounting model a country follows. Nelson, Elliot and Tarpley (2002) compare accounting standards to types of earnings management, indicating that managers are actually more likely to make earnings management decisions through transactions in a rules-based setting (the most prominent example of a country with a rules-based accounting system being the United States) and that, in a principles-based setting (as Europe largely has), accounting decisions are more likely to be made. Van Beest (2009) ultimately finds that neither rules-based, nor principles-based accounting standards are able to eliminate earnings management decisions.

In the United States, the Sarbanes-Oxley Act came in response to several corporate scandals taking place from 2002 on and involving firms as Enron, Arthur Andersen, WorldCom, and others, which provided for subsequent retrenchment in investor confidence, and enabled the targeting of earnings manipulation.

Moreover, the specific purpose of this act was to improve transparency and corporate governance, specifically related to the auditing of Securities and Exchange Commission registrants. The Sarbanes-Oxley Act's key implications consisted in the creation of the Public Company Accounting Oversight Board in order to regulate accounting firms responsible for regulations companies subjected to Securities and Exchange Commission reporting requirements (or Securities and Exchange Commission issuers); in expanded auditor independence requirements; in enhanced financial disclosure requirements for Securities and Exchange Commission issuers; enhanced the role and independence of audit committees; mandated corporate governance reforms; and, created new criminal laws relating to corporate misconduct.

Cohen, Dey and Lys (2008) actually expose how earnings management prevailed in different forms before and after the passage of the Sarbanes-Oxley Act, due to the above mentioned changes in government and accounting policies. A prevalence of accrual-based earnings management before the passage of the act versus a prevalence of real earnings management after the said passage is exposed, thus shading light on how the United States' policies have helped change the course of malpractices incurred by firms.

The European Union has also taken steps to increase transparency and improve corporate governance practices. The most important examples include: the

European Union Transparency Directive, which increases the transparency obligations of firms whose securities are admitted to trading within a regulated market and it also has the twofold aim of improving the quality and punctuality of information made available to investors as well as removing national barriers imposed on issuers and thereby helping to integrate the EU's securities market; the Money Laundering Directive, imposesing that financial institutions and accountants, tax advisers, lawyers and notaries are required to identify their clients, as well as cooperating fully with authorities responsible for combating money laundering by informing those authorities of any fact which might indicate money laundering; and, the EU Statutory Audit Directive, which is the most comprehensive single European Union legislative initiative to impact the audit profession, with key provisions being introduced in areas such as auditing standards, public oversight, auditor independence, third country auditors, definition of a network and ownership and control of audit firms, thus aiming to ensure reliance on the accuracy of audited accounts for investors and other interested parties.

Approaching real earnings management, Schipper (1989) describes them as an intended intervention in the financial reporting process through timing investment or financial decision to alter reported earnings or part of them. As Roychowdhury (2006) exposes, real earnings management can be achieved through activities such as price discounts (temporarily increasing sales), overproduction (originating a lower cost of goods sold) and reduction of discretionary expenditures (in order to improve reported margins), among others, with Graham et al (2004) actually finding that 78% of executives are willing to incur in these to manage financial reporting perceptions. Real earnings management usually ends up hurting long term financial results in benefit of short term ones.

In regard to accruals-based earnings management, it can be stated that accruals equal to the difference between a firm's net income and its cash flows. By engaging in accruals-based earnings management, it becomes possible for them to increase or decrease their income as they see fit by creating accruals, and to actually create accruals in order to manipulate changes in reported earnings (discretionary accruals), which fall into the category of earnings management.

Earnings manipulation through discretionary accruals can be carried on through different methods: Moehrle (2002) reported firms using restructuring accruals reversals to beat analysts' forecasts; Robb (1998) exposed the greater use of loan

loss provisions made by bank managers to manage earnings upwards when analysts reach a consensus regarding a firm's earnings' prediction; and Payne & Robb (2000) concluded that firms showing pre-managed earnings below analysts' expectations tend to have greater positive abnormal accruals. When compiling evidence from different countries, Li, McDowell and Moore (2008) find an indication that earnings management appears to be a universal phenomenon.

Other than the methods to achieve them, real earnings management and accruals-based earnings management differ on their impact, with the first impacting earnings and the latter impacting cash flows. Being that information quality can be questioned from the moment earnings figures are interfered with, analyzing firms regarding accruals-based earnings management becomes compliant with this dissertation's premise.

The willingness to engage in earnings management, regardless of what kind, can be said to have general incentives and subjective ones. Dechow et al (1995) find that factors as corporate control contests, capital market motives, competitive considerations, contractual motives and personal considerations make up incentives motivating companies to engage in earnings management. DeGeorge et al (1999) present incentives based on thresholds companies must fulfill: report positive profits, sustain recent performances and meet analysts' forecasts.

From a general to a subjective basis, we can say that differently aged firms' incentives come from the different needs and market expectations characterizing them. Raising capital comes differently for those firms starting up and those who have already established themselves. Different stages of a firms' life therefore mean different capital raising methods. The hypothesis to be developed throughout this dissertation places different sources of financing and different capital structure needs as the basilar reason why different accruals-based earnings management might prevail.

Recent surveys on current and potential entrepreneurs indicate that gaining adequate access to capital is one of the biggest hurdles of starting a new business (Kerr and Nanda, 2009). While theoretical research and empirical investigations have centered themselves on large mature firms, which are able to finance themselves through various channels, from stock equity to commercial paper, not much is known about the capital structure of startup firms. Knowing,

however, that startup firms mainly struggle to get initial funding, the question arises: do startup firms manage their earnings more than mature firms?

1.2 – Financial crisis and earnings quality

As this dissertation covers the periods relating to the last global financial crisis, it should be expected that information quality's evolution within firms is interpreted accounting for the above specified context, thus allowing for a *vis-à-vis* understanding.

The 2007/8 global financial crisis deeply impacted Portugal and Spain, and it can be traced back to August 2007, when the first phase of the global financial crisis erupted, enabling the initiation of liquidity operations performed by the European Central Bank, and being deeply correlated with the high exposure of European banks to losses within the United States market, as developed by McGuire and von Peter (2009), Acharya and Schnabl (2010) and Shin (2012), having posteriorly developed in 2008 into a more acute phase, due to the collapse of Lehman Brothers.

In regard to the effect of financial crisis within earnings quality, Kousenidis et al (2013) focus on European countries characterized by a weak fiscal sustainability while under the supervision of the European Union, achieving findings supporting the hypothesis that earnings management appears to decrease during the financial crisis. However, Chen et al (2010), as well as Habib et al (2013), provide for support on how firms appear to manage their respective earnings downward during financial crises, more specifically when experiencing financial distress or losses.

Furthermore, additional empirical evidence suggests that firms do engage in aggressive earnings management throughout periods of financial crisis (Chia et al, 2007; Johl et al, 2007). Since a financial crisis will generally provide for a systematic decline in firms' income, engaging in earnings management might be triggered or magnified (Kim and Yi, 2006), with firms disregarding losses as they appear to derive from the macroeconomic shock.

The global financial crisis' effects deepened within European economies since 2008, with specificities within European countries exacerbating the situation, as occurs within Spain, whose economy had developed a so-called property bubble fuelled by artificial low interest rates (Karanikolos et al, 2013), and Portugal, which suffers from low growth rates and stagnation since 2001 (Lourtie, 2015),

and with both countries combining said setups with undertaking significant debt.

The countries' sovereign debt levels began growing at a rapid pace in 2009 (World Bank, 2015), due to falling tax revenues and increased spending, mainly reporting to bank bailouts and costs of unemployment, being followed by the undertaking of austerity policies, which account for an extremely controversial matter, due to the negative pressure placed on economic growth (International Monetary Fund, 2012).

Chapter 2: Data

2.1 - Database

The database used for the purposes of this study was obtained through SABI database, which, at the time, comprises information regarding to two thousand Spanish firms and five-hundred thousand Portuguese firms, with the date of establishment of envisaged firms expanding from 1498 to 2013, inclusively.

Due to the substantially higher proportion of Spanish firms in relation to Portuguese firms present in this database, it is acceptable to express that Spanish firms ultimately prevail over Portuguese ones, as far as the applicability of this study's findings is concerned.

For the purposes of this study, and in concern to the stratification of each firm, multiple selection criterions were applied, therefore reducing the envisaged original sample (refer to Table 1 in Appendix II). Selection criterion aims to exclude firms reporting absent, non-provided or unavailable data, and those firms that present themselves as distinct outliers.

Thus, firm-year observations related to variables reporting current and total assets, cash, profit and losses before and after tax, which present no information, were excluded. Furthermore, provided the construction of those variables necessary to enable the replication of the Dechow-Dichev Model, unavailable data was also excluded from the following generated variables: total current accruals, cash flow from operations from the previous year, cash flow from operations from the following year and property, plant and equipment. In addition, outliers reported within the sample's 1st and 99th percentiles were also excluded, hence allowing for the normalization of the envisaged sample.

Despite the original sample incorporating financial information reprising from 2005 to 2013, as a result of applying selection criterion and creating variables comprising change within periods, the final sample is analyzed from year 2007 through to 2012. As such, findings achieved here shall report to those years and will be analyzed considering macroeconomic developments within them.

2.2 - Summary statistics

Descriptive statistics of the variables is provided within Table 4 (please refer to Appendix II) and throughout this section an interpretation of variables deemed relevant is delivered.

When estimating the Dechow-Dichev Model a division occurs creating two Versions of the Model, which are equivalent with exception to the variable used as debt (refer to Section 3.1.2 for further insight). Following the creation of two Versions, variables total current accruals, cash flow from operations, change in debt and total accruals, become specific to each Version, while variables change in revenue, property, plant and equipment, change in current assets, change in

current liabilities, change in cash, depreciation and net income, are common to both.

To the effect of this study, the interpretation of variables will only enclose those specific to Version 1 and Version 2 of the Dechow-Dichev Model, due to their central and dependent role.

In regard to the dependent variable within the Dechow-Dichev Model, total current accruals, it presents a maximum value of Euro 2.941,18 under Version 1 and a larger maximum value of Euro 4.576,21 under Version 2. For both Versions, the minimum value is negative, with Version 2 presenting a minimum value of Euro 4.712,95, thus surpassing Version 1, which presents a minimum value of Euro 3.020,95. This variable's mean reprises a negative value, also under both Versions, presenting a value of Euro -0,11 under Version 1 and Euro -0,42 under Version 2. Version 1 presents a median value of Euro 0,04, while Version 2's median value is null.

The variables interpreted hereinafter compose explanatory variables in the Dechow-Dichev Model, being those cash flow from operations, change in debt and total accruals.

The variable cash flow from operations presents a maximum value of Euro 4.038,93 under Version 1 and a larger maximum value of Euro 5.804,09 under Version 2. Relating to the minimum, under Version 1 it assumes a negative value of Euro 2.599,64, while under Version 2 it assumes an also negative but larger value of Euro 4.293,01. This variable's mean assumes a value of Euro 32,71 for Version 1 and a value of 33,03 for Version 2. Both Versions present similar median values, with Version 1 presenting a value of Euro 10,44 and Version 2 presenting a value of Euro 10,25.

Regarding the variable change in debt, it reprises a maximum value of Euro 1.431,87 under Version 1 and a larger maximum value of Euro 2.129,58 under Version 2. Both Versions present a negative minimum value, with Euro 1.414,79 under Version 1 and, a larger value, Euro 2.107,96 under Version 2. Version 1 presents a mean value of Euro 0,37, larger than Version 2, which presents a mean value of Euro 0,05. Both Versions present a null median value.

The variable total accruals presents a maximum value of Euro 2.554,17 under Version 1 and a larger maximum value of Euro 4.322,24 under Version 2. Both Versions present a negative minimum, with Version 1 presenting a value of Euro

3.511,43 and Version 2 presenting a larger value of Euro 5.303,33. Under Version 1, the mean is negative, assuming a value of Euro 24,59, while under Version 2, the mean assumes a similar negative value to Version 1, of Euro 24,91. In addition, both Versions present negative medians, with Version 1 presenting a value of Euro 8,11 and Version 2 presenting a value of 7,66.

It is possible to state, in relation to the variables interpreted here, that, although Version 1 and Version 2 vary across the percentiles in a close manner, Version 2's values range to a wider spectrum of values, both on maximum and minimum levels, when compared to Version 1.

2.3 - Testing requirements

As it is stated by DeVocht (2002) a regression is not to be used to estimate residuals if it does not meet one or more of three of the following requirements: normality, homoskedasticity and linearity.

Firstly, data is analyzed in regard to its normal distribution. Therefore, histogram charts are created, graphically presented the spread of total current accruals over total assets for both Versions of the Dechow-Dichev Model. Through verifying Graphics 1 and 2 (refer to Appendix III), the considered ratio presents an almost perfectly bell-shaped curve under both Versions, partially supporting the normal distribution characterizing this Model.

Secondly, Probability-Probability (or, "P-P") plots are created for both variations of the Model, thus comparing the empirical cumulative distribution function of the data set with a specified theoretical cumulative distribution function. Since the normal functions total current accruals over total assets seem to follow a straight line under both Versions, the normal distribution of the data can be confirmed (refer to Graphics 3 and 4 in Appendix III).

Being normality confirmed, there is a need to test data for homoskedasticity, or the "constant variance" assumption, which states that the unobservable (or error) has the same variance given any value of the explanatory variable, thus $Var(u|x) = \sigma^2$. Homoskedasticity is tested by creating a scatter plot of the predicted variable and the regression residuals. It is possible to conclude through Graphics 5 and 6 (refer to Appendix III) that heteroskedasticity is present in this data sample. Additionally we can conclude the data also presents a non-linearity characteristic.

As a solution for the heteroskedasticity and non-linearity problems presented, White's correction is implemented in all regressions.

Chapter 3: Empirical Analysis

3.1 – Hypothesis

Being the primary focus of this dissertation to study differently aged firms regarding accruals-based earnings management incurrence and, ultimately, their information quality, firms are firstly divided into startup firms and mature firms, and subsequently a measure of accruals quality Model is performed upon them. Because startups account for a more volatile type of firm, we can determine that their incentives to manage earnings can exceed mature firms' incentives to manage theirs, and so determine our hypothesis to be:

> ***H0***: Startup firms present stronger evidence of accruals-based earnings management (and, thus, less information quality) than mature firms

Additionally, firms' behavior throughout pre and post-crisis periods is analyzed throughout the dissertation, with startup firms being constantly compared to mature ones. Towards the end, information quality is also analyzed in terms of the terms of financing a company incurs in and its size. It is expected that a conclusion is reached regarding the above specified main hypothesis and to perceive how intrinsic and extrinsic environment plays a role, additionally to a firm's age.

3.1.1 – Theoretical Model

Measuring accruals quality will entail the use of the measure of accruals quality developed by Dechow and Dichev (2002). This Model measures abnormal accruals (discretionary accruals) as the residuals from regressions of changes in working capital on past, present and future operating cash flows, as stated by Shi & Zhou (2012).

As Dechow & Dichev (2002) state, accurate accruals estimates imply a solid match between current accruals and past, present and future cash flow realizations, while imprecise or erroneous estimates actually reduce the beneficial role of accruals.

As suggested in Francis et al (2005), because the Dechow-Dichev Model is limited to current accruals, this dissertation also considers proxies for accruals quality that are based on the absolute value of abnormal accruals. Those will be estimated through the modified Jones Model (Dechow et al, 1995). The modified Jones approach suggests that accruals quality is related to the extent to which accruals are well captured by fitted values obtained by regressing total accruals on changes in revenues and property, plant and equipment, being that it identifies abnormal accruals as those that are not explained by the said change in revenues and property, plant and equipment. The limitation prevailing within the Dechow-Dichev Model is addressed by applying the modified Jones approach, thus reducing the link to information risk (Francis et al, 2005).

Therefore, the metric used throughout this dissertation bases itself on the cross-sectional Dechow-Dichev Model, augmented with the fundamental variables from the modified Jones Model, as used in Francis et al (2005):

$$TCA_{j,t} = \beta_{0,j} + \beta_{1,j}CFO_{j,t-1} + \beta_{2,j}CFO_{j,t} + \beta_{3,j}CFO_{j,t+1} + \beta_{4,j}\Delta Rev_{j,t} + \beta_{5,j}PPE_{j,t} + u_{j,t}\ ,$$

Where,

$TCA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta Debt_{j,t}$ = Total Current Accruals in year *t*;
$CFO_{j,t} = NI_{j,t} - TA_{j,t}$ = Firm *j*'s Cash Flow from Operations in year *t*;
$NI_{j,t}$ = Firm *j*'s Net Income in year *t*;
$TA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta Debt_{j,t} - DEP_{j,t}$ = Firm *j*'s total accruals in year *t*;
$\Delta CA_{j,t}$ = Firm *j*'s change in current assets between year *t-1* and year *t*;
$\Delta CL_{j,t}$ = Firm *j*'s change in current liabilities between year *t-1* and year *t*;
$\Delta Cash_{j,t}$ = Firm *j*'s change in cash between year *t-1* and year *t*;
$\Delta Debt_{j,t}$ = Firm *j*'s change in debt between year *t-1* and year *t*;
$DEP_{j,t}$ = Firm *j*'s depreciation and amortization expense in year *t*;
$\Delta Rev_{j,t}$ = Firm *j*'s change in revenues between year *t-1* and year *t*;
$PPE_{j,t}$ = Firm *j*'s gross value of *PPE* in year *t*.

A first estimation of the Dechow-Dichev Model will allow us to separate non-discretionary accruals and discretionary accruals, which are presented in the form of residuals $u_{j,t}$. By isolating the residuals' standard deviation, we achieve a quality measure for firm information, thus fulfilling the primary goal of this dissertation.

3.1.2 – Specifications

Throughout this study, the chosen Model presented above will be estimated twice within each step incurred, its residuals and, ultimately, its residuals' standard deviation.

The first estimation will regard the variable loans as debt, thus originating Version 1 of the Dechow-Dichev Model, while the second estimation will regard liabilities as debt, making Version 2 of the same Model.

This takes place due to the different interpretations debt is subject to across different economies. European countries tend to regard debt as liabilities, while countries such as the United States regard it as loans. As such, Version 1 applies the Anglo-Saxony perspective, under which debt corresponds to a firm's loans, and Version 2 adopts the European standpoint, under which debt refers to a firm's liabilities. This specification is perceived to further enrich this dissertation, while allowing for more accurate and realistic findings.

In addition, assessing information quality within differently aged firms translates into dividing those under analysis.

To the effect of the present study, firms are divided between startup firms and mature firms, being the former determined as those established after 2007, and

the latter as those established before the said year (note that, as specified previously, analyzed data covers the years from 2007 through to 2012).

3.2 – Graphical Evidence

This section introduces precedes the empirical analysis by presenting evidence through contrasting the evolution of discretionary accruals calculated under both estimated Versions for the Dechow-Dichev Model with both countries' Gross Domestic Product's evolution from 2007 to 2012, obtaining a fair comparison between the evolution of accruals suggesting discretionarity and the respective countries' environment.

In this sense, Graphics 7 and 8 (refer to Appendix III) were obtained, with the first presenting change in discretionary accruals throughout the years 2007 to 2012 in regard to the yearly average of considered Portuguese and Spanish companies and the latter projecting each considered country's Gross Domestic Product.

Average discretionary accruals calculated per year present different evolutions throughout the considered time period when estimated under Versions 1 and 2 of the Dechow-Dichev Model.

In regard to the year 2007, average discretionary accruals present significant (in context to the remaining years under analysis) positive values under both Versions, with Version 1 presenting, however, a larger positive value than Version 2. From 2007 to 2008, average discretionary accruals assume a negative trend under both Versions of the Model, while, in regard to the countries' Gross Domestic Product, both show a positive trend from 2007 to 2008.

In the year 2008, average discretionary accruals under Version 2 become negative and remain just over zero under Version 1, experiencing a steep decrease from the average value in 2007, while, in regard to Spain and Portugal's Gross Domestic Product, in line with economic developments throughout 2008, a negative trend arises and is maintained through to 2011.

From 2008 to 2009, Version 1 and Version 2 present opposite trends, with average discretionary accruals for the year 2009, under Version 1, rising from 2007's value, while, under Version 2, the negative trend appears to deepen. Between 2009 and 2010, opposite trends characterize average discretionary accruals again, although the roles are inverted, with Version 1's average discretionary accruals

for the year 2010 coming close to zero, although remaining positive, and Version 2's remaining negative, though with a lesser value. Both Versions' trends are reprised from 2010 to 2011, with Version 1's average discretionary accruals for the year 2010 assuming a negative value and a more explicit change than Version 2's, which remain negative. Between 2010 and 2011, a change in trend occurs in relation to both countries' Gross Domestic Product, which evolves positively. Lastly, from 2011 to 2012, Version 1's average discretionary accruals maintains a negative trend to more explicit negative values, while, under Version 2, average discretionary accruals for the year reprise the positive trend happening since 2009, becoming closer to zero, although remaining negative. From 2011 to 2012, both countries' Gross Domestic Product return to a negative trend.

Opposing average discretionary accruals throughout the considered years under both Versions shows a different evolution deriving from distinct forms of debt. Version 1 of the Dechow-Dichev Model, which accounts for loans as debt, provides for larger fluctuations than Version 2, which considers liabilities as debt. An analysis to the former's evolution leads to conclude that two steep decreases occur, with a mild upwards fluctuation in between, while the same analysis conducted towards the latter verifies that, although from 2007 to 2008 a steeper decrease than that verified under Version 1 occurs, average discretionary accruals remain negative, without explicit fluctuations, evolving from a negative trend to a positive trend.

From 2007 to 2008, negative trends for average discretionary accruals under both Versions compare the positive trend presented for the countries' Gross Domestic Product. However, from 2008 to 2011, only Version 1's evolution remains largely opposing those within the countries' Gross Domestic Product, with Version 2's largely changing in the same direction. From 2011 to 2012, there is a reversion, with Version 1 following the Gross Domestic Product's evolution and Version 2 opposing it.

Graphical evidence presented within this section enables to conclude how the 2007-2008 global financial crisis affected the accounting of Total Current Accruals, with its effects becoming expressively clear when it comes to discretionary accruals, as their medium yearly values under both Versions fall from positive levels to values close to zero (positive and negative). As the global financial crisis broke in 2007, it is possible to interpret this as a delay within discretionary accruals in regard to its response to an economic downturn. Additionally, the decrease of discretionary accruals in the midst of a financial

crisis broke is compatible with the methodology underlying earnings management, since it is expected that companies take advantage of an economic downturn to present as much losses as possible, thus creating accruals to be reversed in the following years, and enabling them to afterwards present positive earnings.

3.3 – Pearson's Correlation Test

Pearson's correlation test is widely regarded to verify prevailing correlations between variables when estimating residuals. Said correlations can be used to assess the explanatory power of variables, assuming negative, positive or null values, with the latter indicating the absence of correlation. A correlation presenting a positive value of 1 indicates a perfect positive correlation, while a correlation presenting a negative value of -1 indicates the opposite, a perfect negative correlation. The correlation value is shown by Model with the significance value in the form of a P value.

The Pearson correlation test is performed for both Versions of the Dechow-Dichev Model, with those relationships deemed most significant being identified with double asterisk (refer to Tables 2 and 3 in Appendix II) and analyzed here.

Within both Versions of the Dechow-Dichev Model, the relationship between total and discretionary accruals' variables is presented as being negative and highly significant (Version 1: -0,01 p=0,00; Version 2: -0,01 p=0,00). The constituted negative relationship between these variables entails that, if total current accruals increase (or decrease) the discretionary accruals will decrease (or increase) accordingly.

Total current accruals similarly present a significant relationship with the cash flow from operations' variables included in the Dechow-Dichev Model. Firstly, under Versions 1 and 2 the relationship between cash flow from operations from the previous year (n-1) and total current accruals is positive and highly significant (Version 1: 0,05 p=0,00; Version 2: 0,06 p=0,00).

Secondly, the same positive and highly significant relationship prevails within cash flow from operations for the following year and total current accruals (Version 1: 0,07 p=0,00; Version 2: 0,08 p=0,00). Both relationships present themselves weaker under Version 2, when compared to Version 1, as it should be noted that, a positive relationship between variables provides for an increase (or decrease) in one variable when the other increases (or decreases).

Although cash flow from operations from the previous and following years correlate positively with total current accruals, lastly, and in regard to cash flow from operations for the current year's relationship with total current accruals, a negative and highly significant one is presented for both versions (Version 1: -0,97 p=0,00; Version 2: -0,93 p=0,00), thus counteracting the pattern for the prior and following years. Furthermore, both Versions present, under this last relationship, correlation values close to -1, indicating an almost perfect negative correlation.

The above stated relationships between total current accruals and cash flow from operations for the years prior, current and posterior provide insight on how time preponderates in relation to cash flow and accruals, by presenting a mild but significant positive correlation between cash flow obtained in the years prior and posterior and total accruals and an almost perfect negative correlation when the year under analysis is the current one.

Moreover, change in revenue and total current accruals present a positive and significant relationship under both Versions (Version 1: 0,02 p=0,00; Version 2: 0,01 p=0,00), thus entailing that change in revenue varies in line with total current accruals under both. It should be noted that, although this relationship remains positive for Versions 1 and 2, it is weaker under the latter. As Versions 1 and 2 differ only in the variable assumed as debt, these difference might indicate how forms of financing ultimately determine how total accruals and revenue affect each other.

Property, plant and equipment and total current accruals present a negative and significant relationship under both versions (Version 1: -0,01 p=0,00; Version 2: -0,03 p=0,00), with the former, thus, varying oppositely to the latter, and with the relationship under Version 2 presenting itself stronger than the same relationship under Version 1.

The correlation value for the age dummy variable and total current accruals gives an indication of a possible trend. Under both Versions the correlation value is found to be insignificant (Version 1: 0,00 p=0,71; Version 2: 0,00 p=0,50), which could indicate that there is no relationship between total accruals and a company's age.

The Pearson correlation test performed provides for a first indication of absence of correlation between the dummy variable Age, which splits the timeline into

companies founded before 2007 and from 2007 on, and total current accruals, as well as residuals (or discretionary accruals).

3.4 – Testing the hypothesis

3.4.1 - Estimating the Dechow-Dichev Model

Herein, the results for both estimated Versions of the Dechow-Dichev Model are presented in the form of a table (refer to Table 5 in Appendix II) becoming important to reiterate that the existence of two Versions of the same Model arises from the different outtakes that prevail in regard to debt across different economies. With the Model's estimation regarding this distinction, findings are enabled, not only in regard to the prevalence of discretionary accruals within startup firms and mature firms, but also in relation to how different stages of a company's lives and, thus, their external financing interfere.

Within the Dechow-Dichev Model, and as established priory, the dependent variable is total current accruals, which will be explained by a set of explanatory variables, as well as an error. Through a first estimation the Model's constituted Versions insight is enabled in regard to the said variable as a whole, including both discretionary and non-discretionary accruals. The remaining residuals present an estimation of the error itself capturing discretionary accruals only, as exposed in the following section.

Focusing first on Version 1 for the Dechow-Dichev Model, it is possible to state, in regard to the constant value, that, when all regressors equal zero, the value Euro 9.33 translates the medium total current accruals value for startup firms. The same value for mature firms equals Euro 16,72, considerably larger. Secondly, and in regard to the estimated Version 2 of the Dechow-Dichev Model, Euro 11,23 reports to the medium value of total current accruals for startup firms, presenting itself larger than under Version 1. For mature firms, the same value, under the same conditions, equals Euro 19,39, also exceeding the same value when estimated under Version 1 and, in line with said Version 1, surpassing startup firms' constant.

The estimated coefficient for cash flow from operations for the previous year under Version 1 indicates that, in average, *ceteris paribus*, an additional unit of cash flow from operations in the previous year is associated with an additional percentage of 9% $\left(\frac{\partial TCA1}{\partial CFO_{n-1}} = \beta_1\right)$ of total current accruals when it comes to startup

firms, while under Version 2, the additional percentage is 4%. Regarding mature firms, this value decreases to 4% under Version 1 and presents itself null under Version 2.

When cash flow from operations regards the current year, in average, *ceteris paribus*, an additional unit is associated with a reduced percentage of 85% $\left(\frac{\partial TCA1}{\partial CFO_n} = \beta_2\right)$ of total current accruals in regard to startup firms under Version 1 and a reduced percentage of 92% under Version 2. Mature firms present an equally reduced percentage with larger values of 87% under Version 1 and of 95% under Version 2.

In regard to the estimated coefficient for cash flow from operations from the following year, it indicates that, in average, *ceteris paribus*, an additional unit of is associated with an additional percentage of 9% $\left(\frac{\partial TCA1}{\partial CFO_{n+1}} = \beta_3\right)$ of total current accruals for startup firms under Version 1 and an additional percentage of 5% under Version 2. The same coefficient for mature firms presents a value of 4% under Version 1 and a value of 1% under Version 2.

These results are in line with those correlations identified within the previous section, stating a proportionally stronger negative impact on total current accruals from cash flow from operations obtained in the current year and a proportionally weaker positive impact deriving from cash flow from operations obtained in the years prior and posterior.

The estimated coefficient for change in revenue indicates that, as estimated under Version 1, in average, *ceteris paribus*, an additional unit between the previous and the present year in terms of revenue is associated with an additional percentage of 5% $\left(\frac{\partial TCA1}{\partial CRev} = \beta_4\right)$ of total current accruals in regard to startup firms and a similar additional percentage of 6% in regard to mature Firms. In regard for Version 2, change in revenue's impact is similar to that obtained under Version 1, with a positive impact of 6% on startup firms and a positive impact of 7% on mature firms.

The estimated coefficient for property, plant and equipment, as estimated under Version 1, indicates that, in average, *ceteris paribus*, an additional unit is associated with a reduced percentage of 2% $\left(\frac{\partial TCA1}{\partial PPE} = \beta_5\right)$ for total current accruals when it comes to startup firms and a reduced percentage of 4% for mature firms. Under Version 2, values present themselves in line with Version 1,

although minimally larger, as an additional unit of property, plant and equipment induces a reduced percentage of 3% of total current accruals on startup firms and a reduced percentage of 5% on mature firms.

Despite results obtained under Versions 1 and 2 being, in general terms, in all similar, mainly in regard to the estimated coefficients for change in revenue and property, plant and equipment, it is possible to denote that cash flow from operations presents a more significant negative impact in regard to the current year and a lesser positive impact in regard to the years prior and posterior under the same, under Version 2. Furthermore, although in absolute terms the medium value for total current accruals is larger as a difference between startup firms and mature firms under Version 2, it presents higher levels for both under said Version, when compared to Version 1, thus associating higher levels of accruals when debt is taken into account as referring to liabilities, as is under Version 2.

3.4.2 - Analyzing the Model's residuals

Through estimating Versions 1 and 2 constituted within the Dechow-Dichev Model, apart from obtaining coefficients for the explanatory variables, an error, or residuals, is also obtained. In this context, residuals compound discretionary accruals, which will be analyzed herein.

Table 6 (refer to Appendix II) provides insight in regard to the prevalence of discretionary accruals in both startups and mature firms. For both estimated Versions of the Dechow-Dichev Model, coefficients for discretionary accruals in regard to mature firms assume values that translate into zero, in laic terms. As for startup firms, both Versions similarly present negative coefficients, with Version 2's exceeding Version 1's, translating the negative correlation prevailing between residuals and total current accruals (refer to Section 3.2).

Through this opposition it becomes perceivable that discretionary accruals seem to play a bigger role within startup firms than within mature firms. Furthermore, results of the Dechow-Dichev Model's estimation provide deeper insight relating to changes within discretionary accruals happening between differently aged firms. Through estimating the Model's residuals, it is concluded that startup firms and discretionary accruals present a negative relationship, while mature firms present a null relationship with discretionary accruals, regardless of the Model's Version.

Following the results within Table 6 it becomes valid to interpret that discretionary accruals play a proportionally more substantial role within startup firms than within mature firms. Moreover, debt taken into account as liabilities seems to account for added volatility within firms across the two age spectrums considered.

3.4.3 - Analyzing information quality

Through calculating the residuals' standard deviation, an information quality measure for each firm is obtained. At this point, panel data is converted into cross-sectional data, which means that this indicator will only vary by firm and no longer by year.

In order to confront mature and startup firms under both Versions, the average value for residuals' standard deviation (the information quality measure) is presented in Table 7 (refer to Appendix II).

The estimated Versions of the Dechow-Dichev Model present similar results relatively to both startups and mature firms, with the latter providing for a significantly larger coefficient than the former, which may indicate the prevalence of higher levels of manipulations, and thus a lower level of information quality prevailing within mature firms.

Calculating the residuals' (or discretionary accruals') standard deviation allows for the computation of a manipulation indicator for each firm. The larger the values assumed by this indicator, the lesser the information quality provided by a firm.

In order to obtain a stronger perspective of both types of firms' information quality and how they might affect them, the information quality measure is regressed, through residuals' standard deviation, along with variables year of establishment (the year in which a firm is created), employees (number of employees within a firm), cash (level of cash held by a firm), loans (bank loans), current liabilities (liabilities due within a year) and non-current liabilities (liabilities due in over an year, within the long run), being achieved results presented within Table 8 (refer to Appendix II).

Focusing, firstly, on the year when firms were established, it becomes perceivable that it presents negative impact within information quality when it comes to

startup firms, and a small negative impact on mature firms, being the said impact more pronounced under Version 1 for startup firms.

Moreover, the number of employees seems to affect positively both startups and mature firms, with a more evident impact on startup firms under Version 1 and a more evident impact on mature firms under Version 2.

The level of cash a firm has available, provides for a similar positive impact on startup firms and mature firms, although more pronounce within the former, across both Versions of the Model.

Debt taken into account as loans provides for a similar negative impact on information quality across both Versions for both mature and startup firms. Said impact is more pronounced in a negative manner relatively to startup firms under Version 2.

Debt taken into account as liabilities impacts firms' information quality positively, although more pronouncedly in the short run, as current liabilities present a stronger positive impact on both mature firms and startup firms across both Versions, than non-current liabilities do under the same terms.

Taking into account the analysis exposed within the present section and sections prior, the initial perception that discretionary accruals increasingly prevail within startup firms in higher proportion than within mature firms, becomes dismissible as the created measure for information quality shows that its higher levels are present within mature firms rather than startup firms, thus entailing that the latter seem to present higher levels of information quality and, thus, lower levels of earnings management.

Also, by regressing the information quality measure along with variables as the year of establishment of a firm, its number of employees, its level of cash available and its debt forms, it becomes apparent that all variables, although affecting mature and startup firms in the same direction, have a more pronounced effect on the latter, specially, and more pronouncedly, in regard to the effect of the year of establishment of a firm in its information quality within startups.

However, our main hypothesis is rejected, since, although initial evidence may point for higher levels of discretionary accruals within startup firms, information quality seems to prevail in substantially higher terms within mature firms.

3.4.4 – Model's adjustment quality and limitations

The Model's adjustment quality is translated by R^2's value, which is always placed between zero and one, since the sum of the errors' squares cannot exceed the total sum of squares. For interpretation purposes, R^2's value, as presented in Table 5 (refer to Appendix II) is multiplied by 100 in order to be analyzed as a percentage.

Under Version 1, the analysis to R^2 determines that 92% of startup firms' total current accruals' variability around the sample's mean as being explained by it. For the same Version, it can also be concluded that 91% of mature firms' total current accruals' variability around the sample's mean is explained. Under Version 2, 96% of startups and mature firms' total current accruals' variability around the sample's mean is explained by the Dechow-Dichev Model.

Hereupon, Versions 1 and 2 of the Dechow-Dichev Model present an acceptable adjustment quality, since they explain more than 80% of total current accruals' variability around the sample's mean, being 80% the percentage widely regarded as benchmark for suitable or unsuitable Models.

In regard to the information quality measure's regression (refer to Table 8 in Appendix II), R^2 presents, within startup firms, a value of 23% and 22% under Versions 1 and 2, respectively. This entails the percentage of startup firms' information quality variability around the sample's mean that is explained by it. Concerning mature firms, this percentage presents itself with values of 37% and 36% under Versions 1 and 2, respectively.

However, it should be noted in this respect, that a low R^2 doesn't turn this regression into an inadequate one, thus remaining the likelihood of it constituting an acceptable assessment of the underlying *ceteris paribus* relationship.

Following the specification of the Dechow-Dichev Model's' adjustment quality perceived, it is important to address limitations prevailing. Firstly, data gathered from SABI database might contain inaccurate representations of the firms' financial data, as mistakes can be made upon entering data, thus negatively influencing the findings.

Additionally, the chosen Model falls into the category of earnings management Models under efficient in isolating the proxy for accruals-based earnings management, which consists in discretionary accruals. In fact, it has been

previously demonstrated by authors as Guay et al (1996) as well as Dechow et al (1998) that estimates of discretionary accruals often include considerable amounts of non-discretionary accruals. Such limitation has been counteracted throughout this dissertation through the use of a large sample across six years, minimizing the influence of a low level of power regarding the reliability of the findings. More so, Models are not able to evidence causality, as managers are not interviewed in order to state if any findings constitute a reality or are caused by unconsidered factors.

Conclusion

Thru regressing the Dechow-Dichev Model, how each factor contributes to the prevalence of discretionary accruals within firms' results becomes perceivable.

Cash flow from operations deriving from the following and prior years affects positively all firms, presenting a more pronounced effect when considering debt as loans, while cash flow from operations from the current year provides for a negative effect across firms, increasingly evident when debt is taken into account as liabilities. Change in revenue appears to have a more pronounced role within mature firms rather than within startups, as does property, plant and equipment.

Through estimating the Dechow-Dichev Model's residuals, equivalent to discretionary accruals, results point to the prevalence of a negative relationship between startups and discretionary accruals and a null relationship between the latter and mature firms. This result places emphasis on startups and accruals-based earnings management, appearing that mature firms' total accruals are fully explained by the Model's variables.

Despite this, through analyzing the developed information quality measure's average, regardless of how debt is taken into account, mature firms appear to present lower levels of information quality. Additionally, it is perceived that the year in which a firm is established relates negatively across startups and mature firms, although affecting startups supplementary. Adding up, loans affect all firms negatively, while liabilities seem to slightly affect all firms positively, as does the number of employees.

Regarding the question exposed within this dissertation's introduction, it becomes possible to state that accruals-based earnings management does appear to differ whether startup firms or mature firms are considered, with higher levels of discretionary accruals prevailing within startups, although mature firms ultimately seem to provide for lower levels of information quality, being these findings congruent with the notion that mature firms rely on a much larger pool of resources and are able to manage their accounts more effectively if they choose to do so.

Our hypothesis (refer to section 3.1) is, thus, rejected, since, although discretionary accruals do seem to prevail within startup firms over mature firms, information quality does not present itself weaker within startups, rather than within mature firms. However, although a firm's year of establishment influences negatively both startup firms and mature firms, the effect prevails in a proportionally larger scale within startups.

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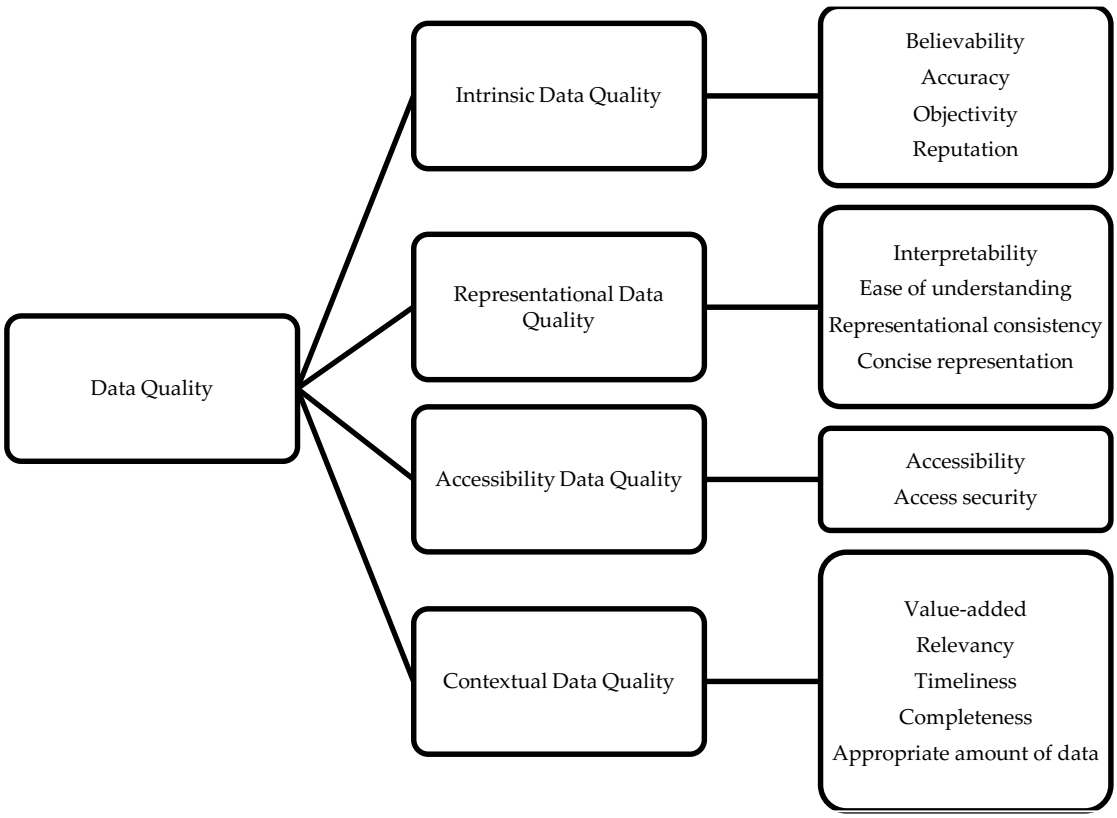
Appendix I: Figures

Figure 1: 'Conceptual framework of data quality'



*Source: Wang, R. Y. and D. M. Strong (1996)

Appendix II: Tables

Table 1: Observations' exclusion process

Observations (number of firms)	
Original Sample	2.439.909
Absent Data	1.008.869
Unavailable Data After Creating Variables	727.517
Outliers (1st and 99th percentiles)	90.624
Final Sample	**612.899**

Table 2: Matrix for Version 1's Pearson Correlation test

Variables	$TCA1$	$resid$	$CFO1_{n-1}$	$CFO1_{n}$	$CFO1_{n+1}$	$CRev$	PPE	age
Total Current Accruals	1,00	0,01** (0,00)	0,06** (0,00)	-0,93** (0,00)	0,08** (0,00)	0,01** (0,01)	-0,03** (0,00)	0,00** (0,50)
Residuals	0,01** (0,00)	1,00	0,10 (0,00)	0,14 (0,00)	0,04 (0,00)	-0,01 (0,00)	0,46 (0,00)	0,05 (0,00)
Cash Flow from Operations from the previous year	0,06** (0,00)	0,10 (0,00)	1,00	-0,04 (0,00)	-0,82 (0,00)	0,00 (0,00)	0,03 (0,00)	0,00 (0,19)
Cash Flow from Operations from the previous year	-0,93** (0,00)	0,14 (0,00)	-0,04 (0,00)	1,00	-0,06 (0,00)	0,06 (0,00)	0,17 (0,00)	0,01 (0,00)
Cash Flow from Operations from the previous year	0,08** (0,00)	0,04 (0,00)	-0,82 (0,00)	-0,06 (0,00)	1,00	0,01 (0,00)	0,01 (0,00)	0,00 (0,82)
Change in Revenue	0,01** (0,01)	-0,01 (0,00)	0,00 (0,00)	0,06 (0,00)	0,01 (0,00)	1,00	0,01 (0,00)	-0,03 (0,00)
Property, Plant and Equipment	-0,03** (0,00)	0,46 (0,00)	0,03 (0,00)	0,17 (0,00)	0,01 (0,00)	0,01 (0,00)	1,00	0,04 0,00
Age	0,00** (0,50)	0,05 (0,00)	0,00 (0,19)	0,01 (0,00)	0,00 (0,82)	-0,03 (0,00)	0,04 0,00	1,00

Table 3: Matrix for Version 2's Pearson Correlation test

Variables	$TCA2$	$resid$	$CFO2_{n-1}$	$CFO2_n$	$CFO2_{n+1}$	$CRev$	PPE	age
Total Current Accruals	1,00	-0,01** (0,00)	0,05** (0,00)	-0,97** (0,00)	0,07** (0,00)	0,02** (0,00)	0,00** (0,00)	0,00** (0,71)
Residuals	-0,01** (0,00)	1,00	0,04 (0,00)	0,10 (0,00)	0,05 (0,00)	0,00 (0,00)	0,45 (0,00)	0,05 (0,18)
Cash Flow from Operations from the previous year	0,05** (0,00)	0,04 (0,00)	1,00	-0,04 (0,00)	-0,62 (0,00)	0,00 (0,42)	0,00 (0,34)	0,00 (0,40)
Cash Flow from Operations from the previous year	-0,97** (0,00)	0,10 (0,00)	-0,04 (0,00)	1,00	-0,06 (0,00)	0,03 (0,00)	0,10 (0,00)	0,01 (0,00)
Cash Flow from Operations from the previous year	0,07** (0,00)	0,05 (0,00)	-0,62 (0,00)	-0,06 (0,00)	1,00	0,01 (0,01)	0,02 (0,00)	0,00 (0,89)
Change in Revenue	0,02** (0,00)	0,00 (0,00)	0,00 (0,42)	0,03 (0,00)	0,01 (0,01)	1,00	0,01 (0,00)	-0,03 (0,00)
Property, Plant and Equipment	0,00** (0,00)	0,45 (0,00)	0,00 (0,34)	0,10 (0,00)	0,02 (0,00)	0,01 (0,00)	1,00	0,04 (0,00)
Age	0,00** (0,71)	0,05 (0,18)	0,00 (0,40)	0,01 (0,00)	0,00 (0,89)	-0,03 (0,00)	0,04 (0,00)	1,00

Table 4: Summary statistics

	Variables	Mean	Standard Deviation	Minimum	1%	5%	25%	Median	75%	95%	99%	Maximum
Version 1 (if Debt = Loans)	*Total Current Accruals*	(0,11)	267,54	(3.020,95)	(919,78)	(303,59)	(39,94)	0,04	40,19	305,93	912,52	2.941,18
	Cash Flow from Operations	32,71	285,38	(2.599,64)	(825,78)	(258,16)	(27,51)	10,44	67,07	403,16	1.108,56	4.038,93
	Change in Debt	0,37	144,53	(1.414,79)	(514,79)	(125,95)	(0,01)	0,00	0,09	128,02	518,90	1.431,87
	Total Accruals	(24,59)	273,09	(3.511,43)	(1.031,22)	(364,39)	(58,09)	(8,11)	26,37	260,39	833,25	2.554,17
Version 2 (if Debt = Liabilities)	*Total Current Accruals*	(0,42)	417,14	(4.712,95)	(1.459,98)	(460,08)	(55,61)	0,00	55,66	461,06	1.441,30	4.576,21
	Cash Flow from Operations	33,03	428,57	(4.293,01)	(1.349,62)	(408,63)	(40,85)	10,25	82,78	556,52	1.616,72	5.804,09
	Change in Debt	0,05	212,55	(2.107,96)	(757,72)	(200,33)	(8,18)	0,00	8,50	203,22	747,70	2.129,58
	Total Accruals	(24,91)	420,85	(5.303,33)	(1.565,03)	(519,32)	(73,37)	(7,66)	41,05	413,07	1.354,87	4.322,24
Common Variables	*Change in Revenue*	(8,33)	272,17	(2.415,81)	(966,64)	(306,69)	(39,90)	(3,91)	24,75	271,44	959,91	2.498,24
	Property, Plant and Equipment	226,60	685,70	0,00	0,15	0,85	10,45	41,40	159,01	1.006,54	3.057,98	17.024,45
	Change in Current Assets	1,13	305,86	(3.347,78)	(1.040,66)	(326,92)	(38,16)	0,18	39,34	334,59	1.046,22	3.379,77
	Change in Current Liabilities	1,42	295,09	(3.176,64)	(1.000,03)	(333,57)	(38,04)	0,10	39,45	339,10	1.024,34	3.270,92
	Change in Cash	0.19	87,87	(713,95)	(310,25)	(102,71)	(13,12)	0,00	13,29	103,30	313,00	718,97
	Depreciation	24,48	54,18	0,00	0,08	0,35	2,95	8,76	22,62	97,43	270,51	889,91
	Net Income	8,12	74.32	(571,60)	(199,96)	(58,58)	(5,01)	2,89	13,85	89,98	284,72	1.055,30

*Statistics were computed using 612.899 observations and are presented with two decimal places, with Variables being segregated into those common to both Versions of the Dechow-Dichev Model and those specific to each.

Table 5: Estimated Discretionary and Non-Discretionary Accruals (compounding Total Current Accruals)

Variables	Version 1 ($Debt = Loans$)		Version 2 ($Debt = Liabilities$)	
	Startup Firms	Mature Firms	Startups Firms	Mature Firms
Cash Flow from Operations from the previous year	0,09 (0,01)	0,04 (0,02)	0,04 (0,01)	0,00 (0,00)
Cash Flow from Operations from the current year	-0,85 (0,01)	-0,87 (0,01)	-0,92 (0,01)	-0,95 (0,00)
Cash Flow from Operations from the following year	0,09 (0,01)	0,04 (0,02)	0,05 (0,00)	0,01 (0,00)
Change in Revenue	0,05 (0,00)	0,06 (0,00)	0,06 (0,00)	0,07 (0,00)
Property, Plant and Equipment	0,02 (0,00)	0,04 (0,00)	0,03 (0,00)	0,05 (0,00)
Constant	9,33 (0,55)	16,72 (0,98)	11,23 (0,52)	19,39 (0,27)
R^2	0,92	0,91	0,96	0,96
Observations	24.820,00	588.079,00	24.820,00	588.079,00

*Both Versions for the Dechow-Dichev Model were estimated with robust standard errors, ensuring homoskedestacity in all regressions. The number of observations is drastically reduced when the distinction between startup firms and mature firms is considered.

Table 6: Estimated Discretionary Accruals

Variable	Version 1 ($Debt = Loans$)		Version 2 ($Debt = Liabilities$)	
	Startup Firms	Mature Firms	Startup Firms	Mature Firms
DA ($Residuals$)	-8,55 (0,35)	0,00 (0,11)	-9,74 (0,38)	0,00 (0,11)
$Observations$	24.820,00	588.079,00	24.820,00	588.079,00

Table 7: Average standard deviation for residuals for Startups and Established Firms (Information Quality measure)

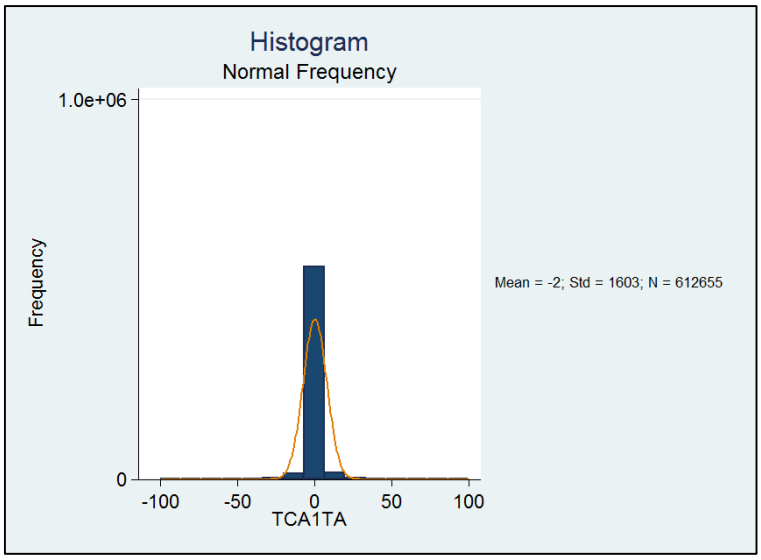
Variable	Version 1 ($Debt = Loans$)		Version 2 ($Debt = Liabilities$)	
	Startup Firms	Mature Firms	Startup Firms	Mature Firms
Standard Deviation for residuals	19,52 (34,10)	30,94 (49,09)	19,52 (34,37)	30,71 (48,58)

Table 8: Estimated Residuals' Standard Deviation (Information Quality Measure)

Variables	Version 1 ($if\ Debt = Loans$)		Version 2 ($if\ Debt = Liabilities$)	
	Startup Firms	**Mature Firms**	**Startup Firms**	**Mature Firms**
Year of Establishment	-1,61	-0,12	-1,06	-0,11
	(0,82)	(0,01)	(0,84)	(0,01)
Employees	0,09	0,07	0,11	0,15
	(0,08)	(0,02)	(0,08)	(0,03)
Cash	0,06	0,04	0,07	0,04
	(0,02)	(0,00)	(0,02)	(0,00)
Loans	-0,01	-0,01	-0,02	-0,01
	(0,01)	(0,00)	(0,01)	(0,00)
Current Liabilities	0,04	0,04	0,04	0,03
	(0,00)	(0,00)	(0,00)	(0,00)
Non-Current Liabilities	0,02	0,02	0,02	0,02
	(0,00)	(0,00)	(0,00)	(0,00)
Constant	3.242,98	250,82	2.139,05	246,59
	(1.648,08)	(24,28)	(1.695,22)	(25,71)
R^2	0,23	0,37	0,22	0,36

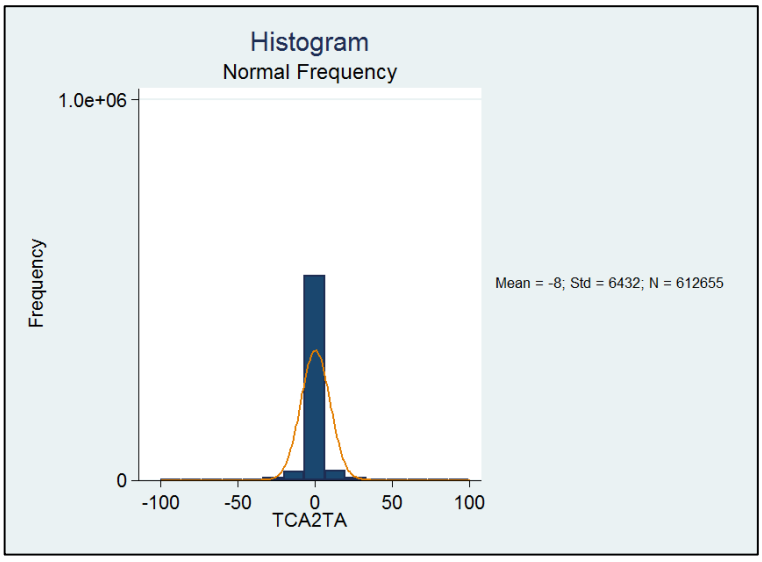
Appendix III: Graphics

Graphic 1: Histogram for normal frequency for the ratio Total Current Accruals over Total Assets under Version 1



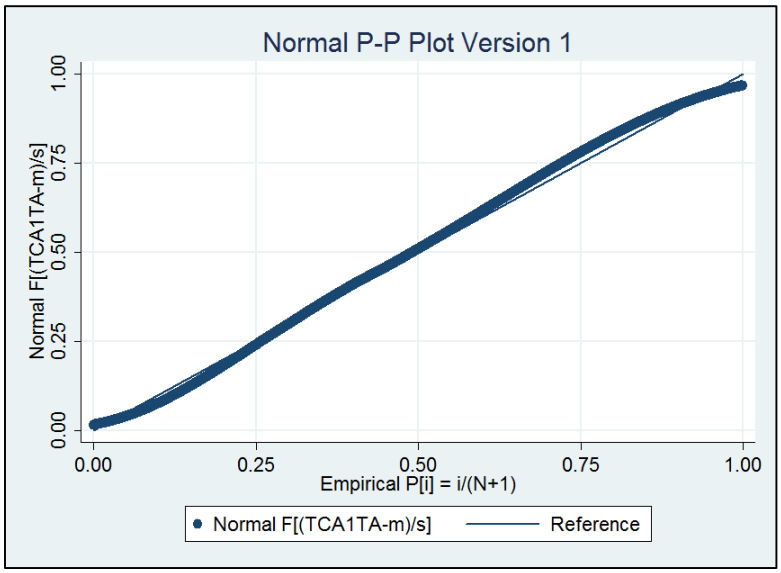
*Source: Obtained through statistical software Stata, as estimated by the author.

Graphic 2: Histogram for normal frequency for the ratio Total Current Accruals over Total Assets under Version 2



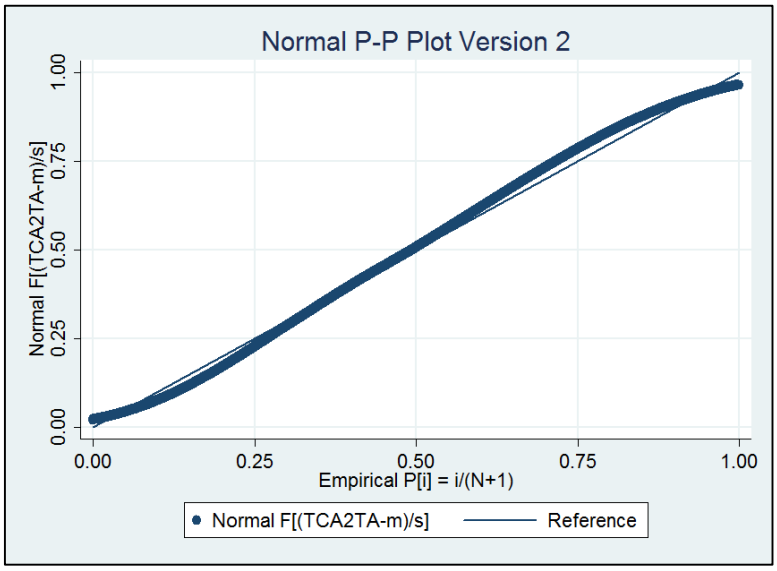
*Source: Obtained through statistical software Stata, as estimated by the author.

Graphic 3: Normal Probability-Probability plot for the ratio Total Current Accruals over Total Assets under Version 1



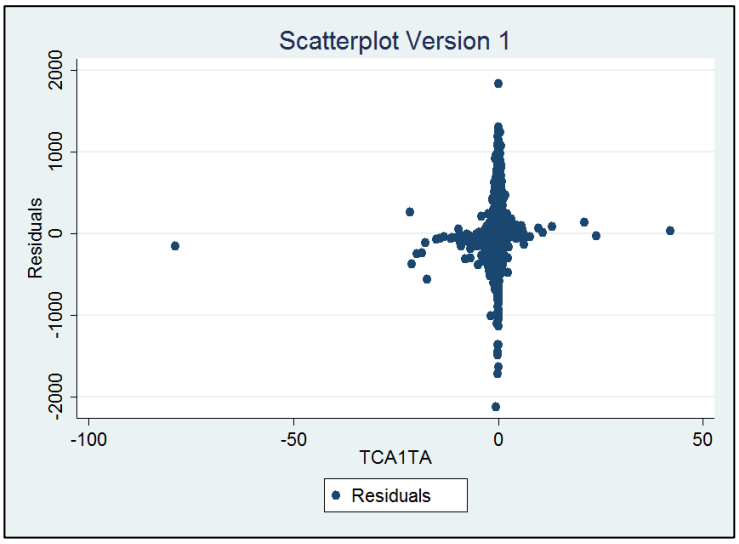
*Source: Obtained through statistical software Stata, as estimated by the author.

Graphic 4: Normal Probability-Probability plot for the ratio Total Current Accruals over Total Assets under Version 2



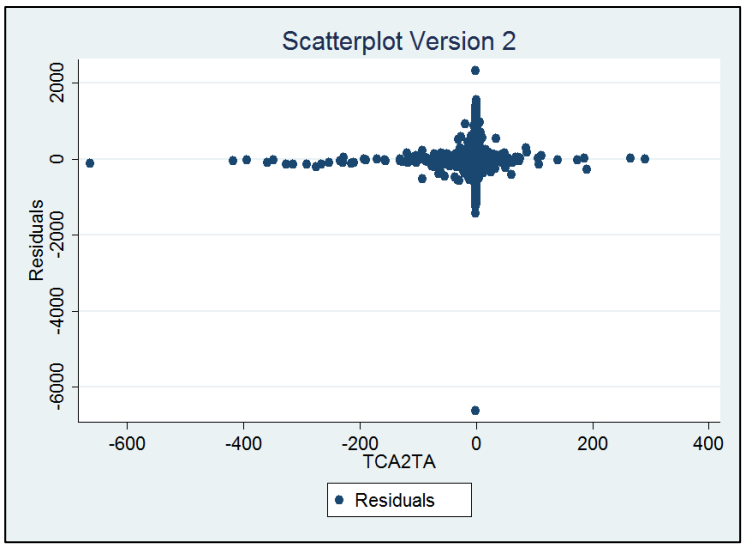
*Source: Obtained through statistical software Stata, as estimated by the author.

Graphic 5: Scatter plot for the ratio Total Current Accruals over Total Assets and Residuals under Version 1



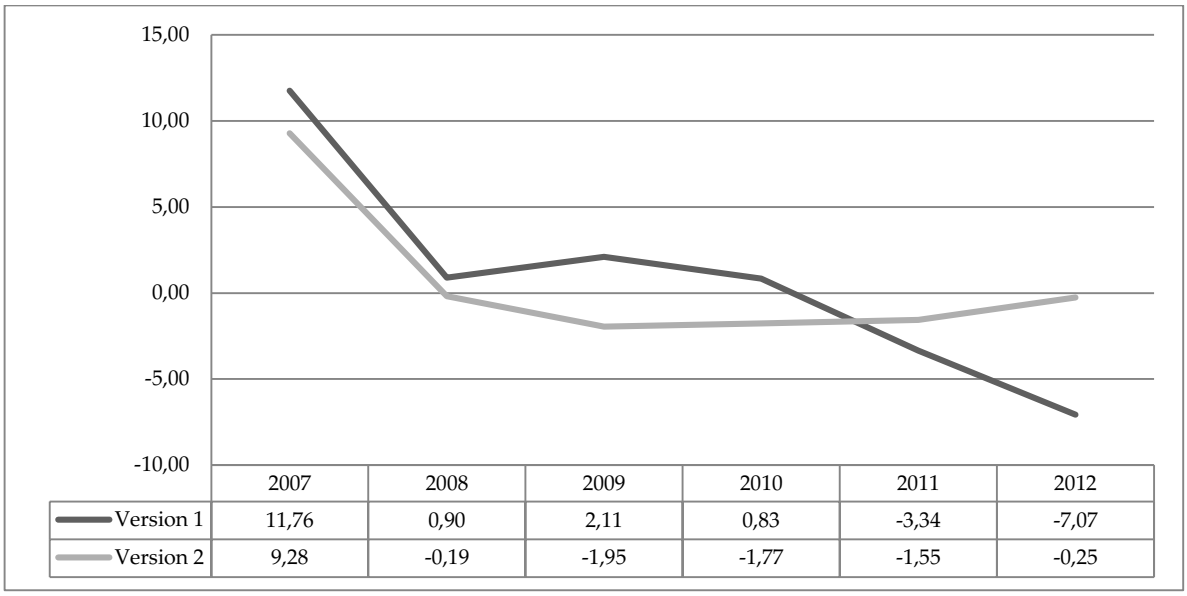
*Source: Obtained through statistical software Stata, as estimated by the author.

Graphic 6: Scatter plot for the ratio Total Current Accruals over Total Assets and Residuals under Version 2



*Source: Obtained through statistical software Stata, as estimated by the author.

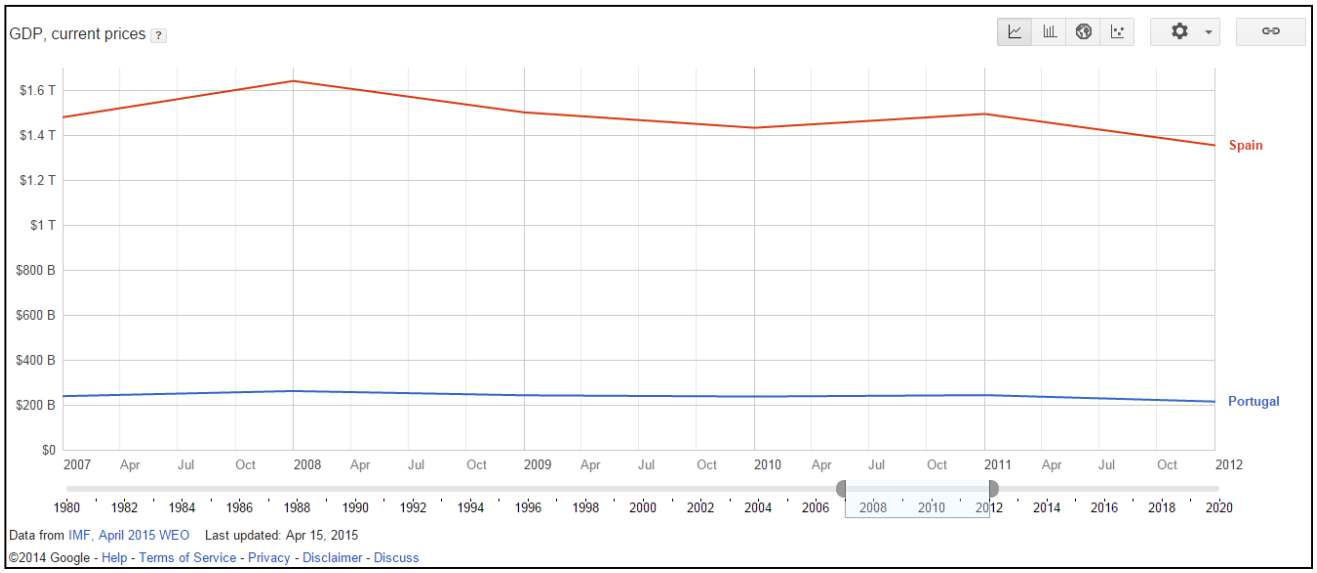
Graphic 7: Average Discretionary Accruals per Year



	2007	2008	2009	2010	2011	2012
Version 1	11,76	0,90	2,11	0,83	-3,34	-7,07
Version 2	9,28	-0,19	-1,95	-1,77	-1,55	-0,25

*Source: Author's calculations.

Graphic 8: Spain and Portugal's Gross Domestic Product (GDP) evolution from 2007 to 2012



*Source: Google's Public Data Explorer in September 2015, using International Monetary Fund's data from April 2015.