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Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

Tez Onay Belgesi

İŞLETME Anabilim Dalı MUHASEBE FİNANSMAN(İNG) Bilim Dalı Doktora öğrencisi BANU DİNCER nın THE IMPACT OF ADOPTION OF IAS /IFRS ON INFORMATION ASYMMETRY IN ISTANBUL STOCK EXCHANGE adlı tez çalışması ,Enstitümüz Yönetim Kurulunun 26.03.2009 tarih ve 2009-6/36 sayılı kararıyla oluşturulan jüri tarafından oybirliği/~~oyçokluğu~~ ile Doktora Tezi olarak kabul edilmiştir.

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GENERAL KNOWLEDGE

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ABSTRACT

THE IMPACT OF ADOPTION OF IAS/IFRS ON INFORMATION ASYMMETRY IN ISTANBUL STOCK EXCHANGE

This dissertation investigated whether the mandatory adoption of IFRSs (International Financial Reporting Standards) had a positive impact on information asymmetry in ISE (Istanbul Stock Exchange). Using the bid-ask spread, trading volume and price volatility models, we investigated the effects by descriptive analysis at first, and then we continued our analysis using the OLS regression and the two-stage least squares regression method. Both the findings of regression analyses confirmed significant reductions in bid-ask spread subsequent to the adoption of the new accounting standards. The purpose of this study is to extend the spread decomposition literature into the order-driven environment. The dissertation, first research in Turkey to examine the impact of the mandatory adoption of IFRSs on information asymmetry in ISE, contributes to the literature by providing evidence on the economic link between increased accounting disclosure and information asymmetry in an emerging market. It also demonstrates that the accounting regulations permanently reduce long-run information asymmetry risk in capital markets.

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ÖZET

İSTANBUL MENKUL KIYMETLER BORSASI'NDA UMS/UFRS UYGULAMASININ BİLGİ ASİMETRİSİNE OLAN ETKİSİ

Bu çalışma IMKB (İstanbul Menkul Kıymetler Borsası)'de UFRS (Uluslararası Finansal Raporlama Standartları)'nin zorunlu olarak uygulanmasının bilgi asimetrisi üzerinde pozitif bir etkisi olup olmadığını incelemiştir. Alım-satım arası fark, işlem hacmi ve fiyat oynaklığı modellerini kullanarak, ilk olarak tanımlayıcı analizlerle etkiler incelenmiş daha sonra analizlere, EKK (Sıradan En Küçük Kareler) ve 2EKK (İki Aşamalı En Küçük Kareler) regresyon yöntemleriyle devam edilmiştir. Her iki regresyon yönteminin sonuçları yeni muhasebe standartlarının uygulanmasıyla, alım-satım arası fark açısından istatistiki olarak anlamlı azalma olduğunu doğrulamıştır. IMKB gibi emir güdümlü bir piyasada UFRS'nin zorunlu uygulanmasının bilgi asimetrisine olan etkisini Türkiye'de ilk kez araştıran bu çalışma, gelişmekte olan bir piyasada artan finansal açıklamalar ve bilgi asimetrisi arasındaki ekonomik ilişkiyi ortaya koyarak literatüre katkıda bulunmaktadır. Aynı zamanda sermaye piyasalarındaki muhasebe düzenlemelerinin uzun vadede bilgi asimetrisi riskini azalttığını göstermektdir.

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ABBREVIATIONS

CMB: Capital Markets Board

CoA: Chart of Accounts

CML: Capital Markets Law

EU: European Union

FASB: Financial Accounting Standards Board

GAAP: General Accounting Accepted Principles

IAS: International Accounting Standards

IASB: International Accounting Standards Board

IASC: International Accounting Standards Committee

Ibid.: Ibidem

IFRSs: International Financial Accounting Standards

IFRIC: International Financial Reporting Interpretations Committee

IOSCO: International Organization of Securities Commissions

IPO: Initial Public Offering

ISE: Istanbul Stock Exchange

HKSE: Hong Kong Stock Exchange

NASDAQ: National Association of Securities Dealers Automated Quotations

NYSE: New York Stock Exchange

MoU: Memorandum of Understanding

OECD: Organization for Economic Co-Operation and Development

Op.Cit.: Opus Citatus/ Opere Citato

OLS: Ordinary Least Squares

ROE: Return on Equity

SAC: Standard Advisory Council

SEC: Securities and Exchange Commission

TASB: Turkish Accounting Standards Board

UK: United Kingdom

UN: United Nations

US: United States

2 SLS: Two-Stage Least Squares

1. INTRODUCTION

The literature of accounting disclosure has developed an economic link between financial reporting and the firm's cost of capital through the reduction in information asymmetry. These studies have used bid-ask spread as a proxy for the level of information asymmetry in U.S. markets. This dissertation investigates the economic link between bid-ask spread and increased accounting disclosure due to the adoption of new accounting standards (IFRSs) in Turkey.

The bid-ask spread, which is the difference between the bid price and the ask price for a firm's stock, is comprised of three components in quote-driven markets (*):

- adverse selection costs,
- order processing costs and
- inventory holding costs[1].

For an order-driven market, such as Istanbul Stock Exchange (ISE), adverse selection costs and order processing costs are valid components while inventory holding costs are ignorable because there are no market makers who are required to hold inventory to meet immediacy[2]. The adverse selection component of the bid-ask spread is directly related to the perceived level of information asymmetry in the market.[3]. Because the adoption of accounting standards can increase disclosure and reduce the information asymmetry risk, we investigate if there would be a significant reduction in the adverse selection component of the bid-ask spread and hence a significant reduction in the size of the bid-ask spread in the stocks of companies listed in Istanbul Stock Exchange.

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*The types of markets are explained in section 3.6. of this thesis.

[1] L. Glosten, L. Harris., "Estimating the components of the bid-ask spread", **Journal of Financial Economics**, 21, 1988, p. 126.

[2] P. Brockman, D. Y. Chung, "Bid-ask spread components in an order-driven environment", **The Journal of Financial Research**, 12, 1999, p. 237.

[3] Carolyn M. Callahan, Charles M.C. Lee, Teri Lombardi Yohn. "Accounting information and bid-ask spread", **Accounting Horizons,** Vol.11, No.4, December 1997, p. 59.

To realize this, we first determine the components of bid-ask spread and their significance in ISE. Secondly, to confirm our hypotheses and to study the bid-ask spread and its relationship with other market microstructure variables (trading volume, price volatility), we also test our hypotheses using the trading volume and price volatility model. Finally, we examined the changes in bid-ask spreads in a long term basis using a graphical presentation.

Our dissertation aims to investigate the impact of increased mandatory accounting disclosure and shed light on his capital market effects in a dynamic and growing emerging market such as ISE in which adoption to IFRS is mandatory since 01 January 2005([*]). Therefore, the findings of the study will have implications for policy-makers in emerging markets, as well as for the regulators and researchers. In addition, the evidence from an order-driven market will also extent the literature since similar studies are relatively insufficient then those in quote-driven markets such as NASDAQ and the London Stock Exchange.

Our work is organized as follows. Chapter Two describes the development of accounting environment, international accounting harmonization and IASB's role.

An overview of prior research on the information asymmetry bid-ask spread and IFRS adoption is presented in Chapter Three.

Chapter Four develops the hypotheses and discusses the research design.

Chapter Five presents the empirical results.

Conclusion chapter, chapter six summarizes the results and addresses the implications.

[*] Capital Market Board has adopted IFRS by Communiqué Serial: XI, No. 25 on *Accounting Standards in Capital Markets* issued on 15 November 2003, which is mandatory for all listed companies and intermediary institutions (brokerage firms) from the beginning of 2005.

2. ACCOUNTING ENVIRONMENT, INTERNATIONAL ACCOUNTING HARMONIZATION / CONVERGENCE and IASB'S ROLE

In this chapter of our work, we will first examine the differences in accounting environment according to different factors then we will focus on accounting practices to see the need for an international harmonization. A historical overview of this harmonization process and its economic consequences are presented in the final part of this chapter.

2.1. Accounting Environment and Differences in Domestic GAAP's

In the ongoing debate on international accounting harmonization, several reasons for international differences in accounting and accounting systems have been suggested[4]. *"Just as nations have different histories, values, and political systems, they also have different patterns of financial accounting development"*[5].

According to Roberts et al. there are not two countries, which have the same accounting practices[6]. The following graphic gives an overview on variables, which can cause differences in accounting practices:

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[4] A. D'Arcy , "The degree of determination of national accounting systems – an empirical investigation", **Schmalenbach Business Review**, Vol.52, 2000, pp. 45-60
R. Ball, R., S Kothari and A Robin, "The effect of international factors on properties of accounting earnings", **Journal of Accounting and Economics**, Vol.29, 2000, pp. 1-40
T. S. Doupnik and Salter, S.B. "External environment and accounting practice: A preliminary test of a general model of international accounting development". **International Journal of Accounting Education and Research,** Vol.30, No.2**,** 1995, pp. 189–207.
A. Alford, J. Jones, R. Leftwich and M. Zemijewski, "The relative informativeness of accounting disclosures in different countries". **Journal of Accounting Research, International Accounting Supplement** 3, 1993, pp. 183–215
S. Gray, "Towards a theory of cultural influence on the development of accounting systems internationally". **Abacus** 24, 1, 1988, pp. 1–10.

[5] Christopher Nobes; G Mueller, H Gernon; G Meek, **Accounting an International Perspective**, Richard D. Irwin, Inc; Chicago, 4th edition, 1997, p.2

[6] C Roberts, P Weetman, P Gordon **International Financial Accounting – a comparative approach**, Financial Times Pitman Publishing, London, 1988, p.34.

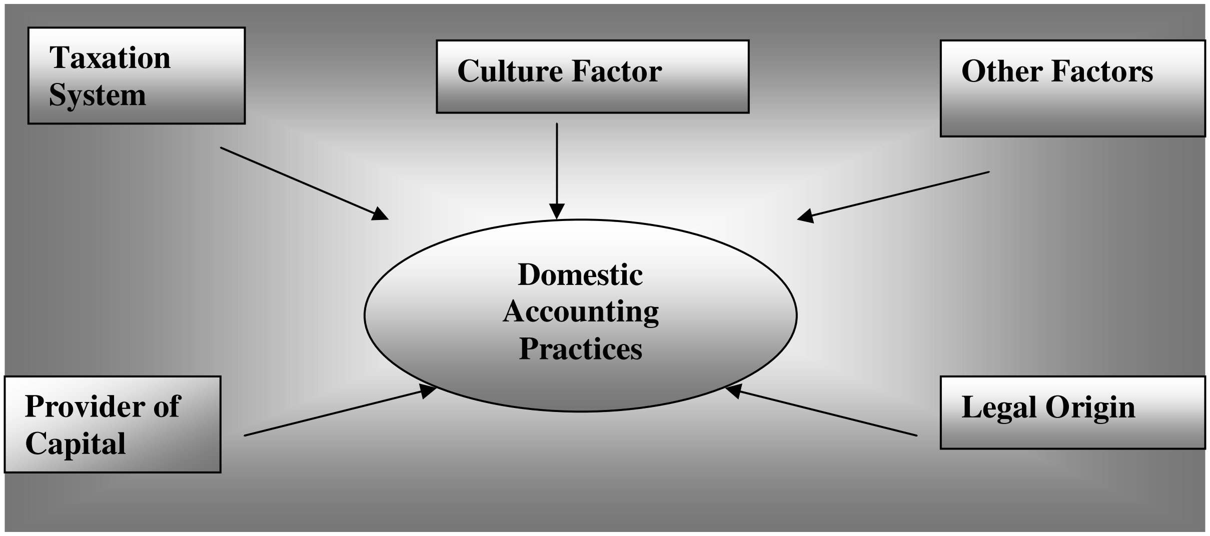

Figure 1: Factors of Differences in Accounting Practices
Source: C Roberts, P Weetman, P Gordon **International Financial Accounting – a comparative approach**, Financial Times Pitman Publishing, London, 1988, p.34.

2.1.1. Legal Origin

There is abundant literature examining the links between international accounting differences and legal system. As early as 1967, Seidler studied this relation. He indicated that the fundamental similarity in the results of the legalistic approach to the determination of accounting principles in civil law countries, such as Turkey and Italy, can be contrasted with the patterns found in common law countries such as England and the United States.[7] According to the study conducted by Salter and Doupnik[8] in 1995, the accounting world can be divided into "*those countries which have a 'legalistic' orientation toward accounting and those with a 'nonlegalistic' orientation*". In common law countries, accounting does not depend upon law. Accountants (professional organizations) arrange accounting rules. Hence, it is the private sector, which determines accounting and not the

[7] Lee J. Seidler, "International Accounting- The Ultimate Theory Course", **The Accounting Review**, Vol.42, No.4, October 1967, pp.775-781. (p.776)
[8] T. S. Doupnik and Salter, op. cit., p.192.

law. The task of the legal system is to give an answer to a specific case rather than to formulate general rules for the future[9] .

The legalistic approach can be found in countries, which use the so called code (or codified) law. In contrary to the common law, the codified law system needs to develop rules in detail for the accounting and financial reporting[10]. This means that *"Accounting rules are incorporated into national law and tend to be highly prescriptive and procedural"*[11]. A codified law country, such as Germany, is rooted in a system based on collective planning in the public sector. In codified law countries governments or quasi-governmental standard-setting bodies establish the accounting standards[12]. In these countries the role of law is to describe behavior, which is considered to be acceptable in the society. Nobes and Parker give an overview on legal systems, shown in the table below [13]

Table 1: Classification of Countries Legal Systems

Common Law	Codified Law
England and Wales	France
Ireland	Italy
United States	Germany
Canada	Spain
Australia	Netherlands
New Zealand	Portugal
	Japan (commercial law)

Source: Christopher Nobes, Robert B.Parker, **Comparative International Accounting,** Sixth Edition, Essex: Pearson Education Limited, England, 2000, p.19.

[9] Frederick Choi, Caro A. Frost, Gary K Meek, **International Accounting**, 4th edition, Prentice Hall, New Jersey, 2002.
[10] Christopher Nobes, **Accounting Harmonisation in Europe: Process, progress and prospects**, FT Business Information Ltd, London, 1994 ,p. 54.
[11] F.Choi et al., op. cit., p.43.
[12] R. Ball et al., op. cit., p.20.
[13] Christopher Nobes, Robert B.Parker, **Comparative International Accounting,** Sixth Edition, Essex: Pearson Education Limited, England, 2000, p.19.

2.1.2. Provider of Capital

Shareholders, banks and government are three main sources for external capital.[14] It varies from country to country, which of these three provides most of the financial capital to companies. In countries like Germany and Italy banks provide companies with capital. In countries like England and the United States shareholders provide companies with capital. The government is the provider of capital in countries like France and Sweden[15]. Information disclosure will be more important in countries where the shareholder ownerhip is more developed (e.g. in U.K. and U.S.) than in countries, where capital is raised from banks or governments.[16] Financial statements in the US and UK are "*oriented toward providing individual investors with the information they need to make decisions about purchasing or selling corporate stocks and bonds*" [17]. The accounting practices in countries with banks as main capital providers have an interest to protect bank's investment. This led to more conservative methods, which are characterized by overvaluation of liabilities and underestimation of assets. In countries where capital is provided by the government, accounting practices are oriented towards needs of governmental planners. As capital markets have become increasingly globalized there has been a perceived need for more relevant and reliable accounting information in the international arena. As a result, securities exchanges have begun to require multi-national companies to prepare their financial statements in accordance with a recognized set of accounting standards. In the case of shareholder ownership, (e.g. in the U.K. and the U.S.), information disclosure will be more important than in countries, where capital is raised from banks or governments.

2.1.3. Taxation

In countries like the U.S., U.K. and Netherlands there is no interplay between tax and accounting law. The main focus is how to conduce the information function. Questions

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[14] Charles Hill, **Competing in the Global Marketplace**; 3rd edition, Boston: Irwin McGraw Hill, Boston, 1999, p.22.
[15] C. Hill, op. cit., p.515.
[16] Lee Radebaugh, Sidney Gray, **International Accounting and Multinational Enterprises**, 4th edition, New York: John Wiley and Sons, 1997, p.67.
[17] C. Hill, op. cit., p.593

about taxation are not considered in those countries[18]. However, in nations as France and Germany, tax and accounting systems are ruled equal. There is the principle of decisiveness in continental European countries. This means that the profit of the balance sheet is at the same time the foundation to snap income taxes.

2.1.4. Culture Factor

Domestic GAAP's are widely influenced by national culture. The impact of culture was the subject of research by various authors who used the cultural frameworks of Hofstede[19] and Gray[20] to analyze differences between countries. Cultural variables also interested Violet[21] who attributed the relative lack of success of the IASC to cultural factors. Belkaoui[22] viewed language as a variable and studied the impact of language on accounting practices. Jaggi[23], Ndubizu[24], and Nair and Frank[25] also analyzed the impact of culture on accounting practices in various ways, including both empirical and descriptive methods.

Hofstede's research was aimed at detecting the structural elements of culture within 50 countries and three regions. His aim was to define characteristics of national culture with help of the four following dimensions:

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[18] Bernard Colasse, **Comptabilité Générale (PCG 1999, IAS et Enron)**, 8th edition, Paris: Economica, France, 1999.
[19] Geert Hofstede, **Culture Consequences: International Differences in Work-related Values**, Sage Publications, London, 1980, p.6.
[20] S. Gray, op. cit., p. 11.
[21] William J. Violet,." The development of International Accounting Standards: An anthropological perspective", **The International Journal of Accounting**, Volume 18, No.2, 1983, pp. 1–12.
[22] Ahmed Belkaoui, " Economic, political and civil indicators and reporting and disclosure adequacy: empirical investigation", **Journal of Accounting and Public Policy**, Volume 2, No.3, 1983, pp.207-219
[23] Bikki L.Jaggi, "The Impact of the Cultural Environment on Financial Disclosure." **International Journal of Accounting,** Volume 10, No.2, 1975, pp.75-84.
[24] G. A Ndubizu, "Accounting standards and economic development: The third world perspective", **The International Journal of Accounting**, Spring, 1984, pp. 181–198.
[25] R.D.Nair, Werner G. Frank, "The impact of disclosure and measurement practices in international accounting classifications", **The Accounting Review**, Volume 55, No.3, 1980, pp. 426–450.

• Large versus small power distance,

• Strong versus weak uncertainty avoidance,

• Individualism versus collectivism and

• Masculinity versus femininity.

The importance of Hofstede's dimensions of national culture in the International Accounting field is that national culture influences the behavior of accountants and therefore the nature of accounting practices. On the basis of Hofstede's study, Gray subsequently proposed direct associations between these four cultural values and the values of accounting subcultures. He found that the most relevant values in the exercise of authority in accounting systems are those of *professionalism* and *uniformity*. They are also the most relevant values pertaining to compliance with accounting standards. Gray's study further revealed that *conservatism* is the accounting value which exerts the greatest influence over valuation practices, while *secrecy* is the accounting value that exerts the greatest influence in determining the amount of information that firms are willing to disclose to third parties in financial statements[26].

2.1.5. Other Factors

Political and economic factors have another important role in shaping Domestic GAAP's. The impact of economic factors on accounting differences was investigated by several authors. Perera[27] affirmed that international harmonization of accounting practices depended on the level of regulation within an economy as well as on macro-economic factors. Chow and Wong-Boren[28] studied micro-economic factors that impacted on accounting choices and the financial reporting practices of companies. In some researches a classification scheme for countries according to economic factors in the environment is

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[26] S. Gray, op. cit., p.12.
[27] Hector M.B. Perera, "Towards a framework to analyze the impact of culture on accounting", **International Journal of Accounting**, Vol.24, 1989, pp.42–56
[28] Chee W. Chow, Adrian Wong-Boren, "Voluntary financial disclosure by Mexican corporations", **Accounting Review**, Volume 62, No. 3, 1987, pp.533-541.

proposed[29]. They analyzed a number of economic factors influencing the accounting practices of diverse countries and developed a classification scheme to differentiate countries according to these economic factors. Hill indicates that Accounting in developed countries might be more complex and sophisticated than in less developed countries and add that developed nations might have larger and more complex organizations with more educated workforce. He thinks that they have a need for more advanced Accounting Practices[30].

According to Luther[31] , political factors were the primary reason for differences in accounting practices among countries. Ahadiat and Stewart[32] looked at the relationships between the SEC, the European Union and the IASC. The influence of American institutions such as the SEC and the FASB on international accounting standards-setting is remarquable in most of these studies. We should also add that the American and British Accounting Practices had enormous influence on other countries such as their colonies.

2.2. Classification of Accounting Practices

In this section, we aim to present classifications of Accounting Practices and to give an overview about the international diversity of them. We will examine the evolution of the factors throughout the time.

2.2.1. Nobes Classification of Accounting Practices (1980)

Nobes classes into a hierarchy of three levels the measurement practices of fourteen western countries.

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[29] DaCosta, R. C., J. C. Bourgeois, W. M. Lawson, "Linkage in the international business community: Accounting evidence", **The International Journal of Accounting**, Fall,1980, pp.47–67.
[30] C. Hill, op. cit., p.532.
[31] Robert Luther, "The development of accounting regulation in the extractive industries, an international review", **The International Journal of Accounting**, Volume 31, No.1, 1996, pp. 67–93.
[32] N. Ahadiat, B. R. Stewart, "International geographic segment reporting standards, a case for the harmonization of accounting and reporting practices" ,**The International Journal of Accounting**, Volume 27, 1992, pp.45–56.

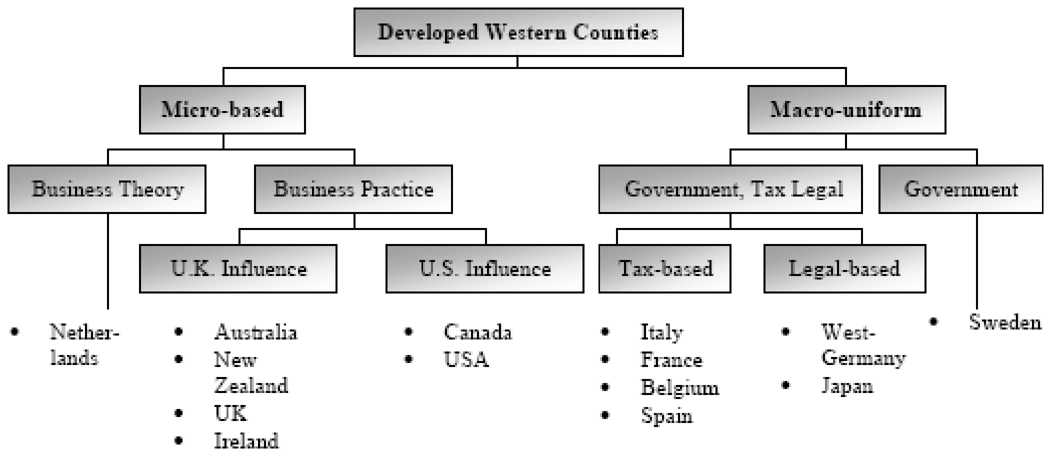

Figure 2: Nobes classification of Accounting Practices in 1980
Source: Lee Radebaugh, Sidney Gray, International Accounting and Multinational Enterprises, 4th edition, New York: John Wiley and Sons, 1997, p.70.

The micro-based and the macro-uniform orientation constitute the first level of the classification. While the macro-uniform orientation corresponds with the code law, the micro-based corresponds with the common law. This indicates the high importance of the legal system as a dominant factor in shaping accounting practices.[33] Radebaugh and Daniels argue that macro-uniform countries are determined by more governmental influence than the micro-based ones[34]. On the second level Nobes differentiates between business theories under the micro-based classification. Under the macro-based one he considers influence factors as the government/tax/legal orientation, in contrast to the government/economic one. The last step dedicates the U.K. and U.S. influence under the business practices orientation. At the end, he differs between tax-based and law-based systems under the government/tax/legal orientation.

2.2.2. Nobes Classification of Accounting Practices (1998)

Nobes new classification of Accounting Practices commits *"that the type of finance is now more important than the legal system in classifying financial reporting*

[33] F. Choi et al., op. cit., p.48.
[34] John Daniels, Lee H. Radebough, **International Business, Environment and Operations**, 9th edition, London: Prentice Hall, London,.2001

systems" [35], he emphasizes that "*many companies modified their financial reporting to suit the information needs of international capital investors. In particular, companies from code law countries began to adopt shareholder oriented reporting found in common law countries"*. Therefore, he saw a need to focus his classification on financial reporting of companies instead of countries. His new classification divides between strong equity and weak equity reporting. The strong equity is meant a shareholder-oriented reporting. Additionally, his classification divides outsider from insider financiers. *"Outsiders are not members of the board of directors and do not have privileged relationship with the company (e.g., such as that enjoyed by a company's banker who is also a major shareholder"* [36] But also the standards of the IASB (IFRS) belong to this class of more focus for shareholder orientation.

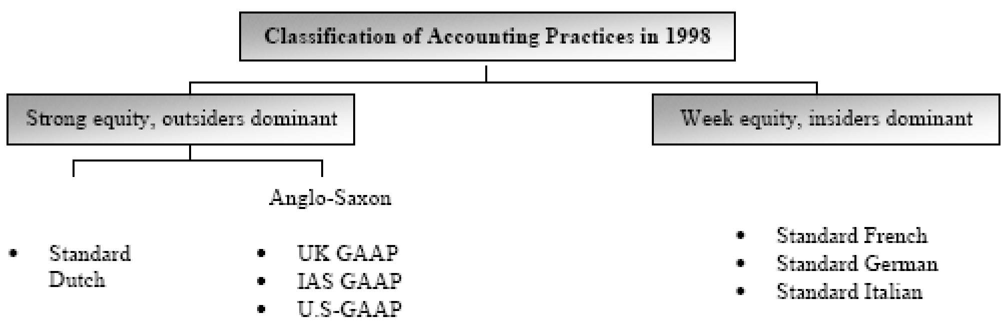

Figure 3: **Nobes classification in 1998**
Source: Frederick Choi, Caro A. Frost, Gary K Meek, **International Accounting**, 4th edition, Prentice Hall, New Jersey, 2002, p.53.

Following from the graphic above the Accounting Practice are divided into two systems, which stand at the extremes. These two practices are the Anglo-American Model and the Continental- European Model.

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[35] F. Choi et al., op. cit., p.53.
[36] C. Nobes, op. cit., p.166.

2.2.2.1. Anglo–American Model

The financial statement shall be used in order to give information about the future development of the company. In Anglo-American countries by more focus on the addressee in order to mobilize capital, extensive disclosure and an attenuation of the prudence principle in favor of the accrual accounting are characteristic for Accounting Practices of those countries because of the bigger influence of capital markets. The standards of the IASB, countries as the UK, many members of the British Commonwealth, the US, the U.K., Australia, New Zealand, Canada, the Netherlands, Mexico, Pakistan or Kenya belong to this model.

2.2.2.2. Continental-European Model

Countries as Germany, France, Spain, Italy, Japan, Turkey, Switzerland and Egypt belong to the Continental-European Model. In contrast to the Anglo- American-Model, countries of this cluster rely on banks as capital providers and have therefore a close relationship with them[37]. In Continental- European Model, the task of financial statements is not in first line to provide information (to capital providers) but to please government imposed requirements[38]. Accounting Practices can be characterized as legalistic and as highly conservative. According to that model the security of creditor is more important, and the prudence principle can be called as the dominating accounting principle. Another factor in order to classify Accounting Practices is culture.

[37] G.Mueller, Gernon, H.; Meek, G., **Accounting – an International Perspective**; 2nd edition. Homewood: Richard D. Irwin, Inc, 1991, p.10
[38]B. Epstein, A. Mirza, **IAS, Interpretation and Application**, New York: John Wiley & Sons, 2001, p.3

2.2.3. Gray´s cultural classification of Accounting Practices

Gray discovered the following pairs of accounting values, which can be used in order to describe a nation's Accounting Practices and how to distinguish them from each other[39].

• *Professionalism versus statutory control*

A high level of professionalism describes a system of self-regulation and a lower degree denotes high level of government regulation. This dimension is concerned with attitudes towards regulations, in particular how accounting control is done[40].

• *Uniformity versus flexibility*

Uniformity versus flexibility describes the attitudes towards regulations; in particular how accounting control is done.

• *Conservatism versus optimism*

While conservatism aims at a more cautious approach to value assets and recognize income, optimism is a more risk taking and liberal approach to measurement[41].

• *Secrecy versus transparency*

Secrecy is consistent with a restricted information disclosure *"on a need-to-know basis"*[42]. Transparency is characterized by a willingness to disclose much more open to the public.

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[39] S. Gray, op. cit., p.3
[40] C. Roberts, P. Weetman, P. Gordon, **International Financial Accounting – a comparative approach**, Financial Times Pitman Publishing, London, 1998.
[41] F. Choi et al., op. cit., p.45.
[42] Ibid., p.46.

2.3. Harmonization and Convergence Processes and The IFRSs Background

Harmonization and *standardization are two notions distinguished by many authors.* Harmonization is defined as reconciliation of various points of view that permits different standards in different countries, standardization requires uniform standards in all participating countries[43].

On the other hand, *convergence* means the formation of high quality and the best accounting standards by the two standards setting bodies and refers to the process of narrowing differences between IFRSs and the accounting standards of countries that retain their own standards.[44] After the highest quality standards are determined standard setting bodies change the standards accordingly. If there is no high quality standard among the existing, a new standard is formed.

2.3.1. International Accounting Standard Board

2.3.1.1. Objective

International Accounting Standards is one of the most popular global accounting standards in all around the world. According to the IASB website in September of 2007, *nearly 100 countries currently require or permit the use of, or have a policy of convergence with, IFRSs.* The motivation for the creation of the IASC was the need for a common international language of accounting to serve capital markets which had become increasingly international, a trend which has continued since. A common set of accounting standards increases the comparability of companies based in different countries but traded in the same market. An additional benefit for trans-national companies and their auditors is that the preparation of group accounts, consolidating the accounts of companies based in different countries is made easier and more informative. Finally, there was a benefit to

[43] Leandro Canibano, Mora Araceli , "Evaluating The Statistical Signifiance of De Facto Accounting Harmonization: a Study of European Global Players", **European Accounting Review**, Vol:9, No:3, 2000, pp.349-369.
[44] PriceWaterHouseCoopers, http://www.pwc.com/extweb/pwcpublications.nsf/docid/fc800243be0e3882852570500000c756/$File/viewpoint_convergence.pdf, **Convergence of IFRS and US GAAP** (30.10.2007)

those countries that did not have an established set of national accounting standards. The adoption of international standards in such countries provided a ready-made set of standards which would meet the needs of domestic companies (or at least the larger ones) and have credibility in international capital markets. Actually, almost 100 countries now require or allow IFRSs[45], all listed companies in EU member countries are required to report consolidated financial statements complying with IFRSs, effective in 2005, International Organization of Securities Commissions (IOSCO), the international organization of national securities regulators, has recommended that its members permit foreign issuers to use IFRSs for cross-border securities offerings and listings, which are some indicators IASB success.

The first IAS was published in 1975 by the IASC, which was formed in 1973. Since then, the process for setting international accounting standards has undergone substantial evolution, culminating in the 2001 restructuring of the IASC into the IASB. In recognition of the quality of the core set of IAS, in 2000 the International Organization of Securities Commissions recommended that the world's securities regulators permit foreign issuers to use IAS for cross border offerings[46]. In April 2005, IOSCO announced that it had distributed a consultation paper to its members outlining principles to be adopted and options available in its approaches to encouraging cooperation and consultation among members in the regulatory interpretation and enforcement of IFRSs[47].

As of 2005, almost all publicly listed companies in Europe and many other countries are required to prepare financial statements in accordance with International Financial Reporting Standards (IFRSs). In addition, the Financial Accounting Standards Board has embarked on a comprehensive project aimed at convergence between IFRSs and US standards. Between 1973 and 2000, international standards were issued by the IASB's predecessor organization, the International Accounting Standards Committee (IASC), a

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[45] Deloitte & Touche, Use of IFRS's by Jurisdiction, http://www.iasplus.com/country/useias.htm, (10.10.2007)

[46] International Organization of Securities Commissions, IASC Standards – Assessment Report, May 2000, http://www.iasplus.com/iosco/ioscores0005.pdf, (04.10.2007)

[47] International Organization of Securities Commissions, Final Communiqué of its XXXth Annual Conference, 7 April 2005, http://www.iasplus.com/resource/0504ioscocommunique.pdf, (04.10.2007)

body established in 1973 by the professional accountancy bodies in Australia, Canada, France, Germany, Japan, Mexico, Netherlands, United Kingdom and Ireland, and the United States. During that period, the IASC's rules were described as "International Accounting Standards" (IAS). Since April 2001, this rule-making function has been taken over by a newly-reconstituted IASB. The IASB describes its rules under the new label "International Financial Reporting Standards" (IFRSs), though it continues to recognize (accept as legitimate) the prior rules (IAS) issued by the old standard-setter (IASC). The IASB is better-funded, better-staffed and more independent than its predecessor, the IASC. Nevertheless, there has been substantial continuity across time in its viewpoint and in its accounting standards.

2.3.1.2. Structure

The IOSCO endorsement of the IASC's standards, in 2000, not only marked the culmination of nearly three decades of work by the IASC but it also indicated a significant change in future expectations of international standards. The Board of the IASC therefore decided to re-constitute his structure and become a smaller committee (the IASB) with mostly full-time members and with a much larger technical staff. The new framework is described by Figure 5. A governing body, the Board of Trustees, raises the funds from a wide variety of sources (including corporates, audit firms and market regulators) and appoints the members of the standard-setting body (IASB), Trustees, the Advisory Council (SAC) and the Interpretations Committee (IFRIC).

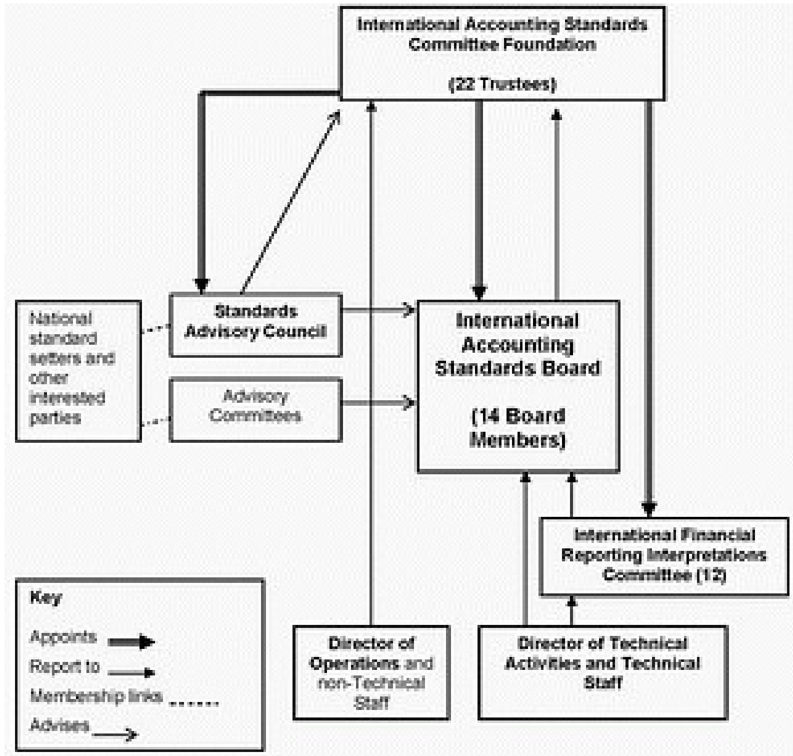

Figure 4: IASB Structure

Source: Due Process Handbook for IASB ,http://www.iasb.org/NR/rdonlyres/7D97095E-96FD-4F1F-B7F2-366527CB4FA7/0/DueProcessHandbook.pdf, (04.10.2007)

The standard-setting board (IASB) consists of 14 members. The 14 members are (with two exceptions) full-time and are selected for their skills and knowledge, not as representatives of any group or constituency. Their tasks are to draw up Exposure Drafts, to permit publications of the International Financial Reporting Interpretations Committee, to announce new and to revise old accounting standards. Their work shall be done independently and in the public interest. The IASB aims at adjusting national Accounting Standards. Therefore, national standard-setters are represented through a liaison person in the board. Seven members of the Board are contact persons to national standard-setters. The Trustees consist of 22 members, six from North America; six form Europe, six from the Asia/Oceania region and four Trustees from any area, subject to establishing overall geographical balance. They are mainly responsible to appoint members of the IASB, the Standard Advisory Council and the International Financial Reporting Interpretations

Committee. The Council consists of thirty or more members, having a diversity of geographical and professional backgrounds, appointed for renewable terms of three years. The Standards Advisory Council meets the IASB three times a year and has approximately 49 members, who are nominated for three years. The aim of the Standard Advisory Council is to choose important projects, to advice the Board and the Trustees and to inform about the views of the member organizations. The International Financial Reporting Interpretations Committee (IFRIC) has 12 members. They are responsible to give interpretations to application questions of the International Accounting Standards.[48].An interpretation of an IFRS must be approved by the IASB before it can be adopted.

The standards are characterized through their principle-based set of standards. The standard-setting consists of six stages[49]

Stage 1: Setting the agenda

Stage 2: Project planning

Stage 3: Development and publication of a discussion paper

Stage 4: Development and publication of an exposure draft

Stage 5: Development and publication of an IFRS

Stage 6: Procedures after an IFRS is issued

First of all, all issues related to the new problem (standard) are considered. When the issues to be considered are decided, IASB establish a working group and plan the project. There will be an exchange of ideas with the national standard-setters. Afterwards the Board consults the Standards Advisory Council, whether it should deal with that

[48] Due Process Handbook for the International Financial Reporting Interpretations Committee, http://www.iasb.org/NR/rdonlyres/24B1613A-FBD2-43EA-87EF-72E0F526D35C/0/DueProcessHandbook_January2007.pdf, (04.10.2007)

[49] Due Process Handbook for IASB ,http://www.iasb.org/NR/rdonlyres/7D97095E-96FD-4F1F-B7F2-366527CB4FA7/0/DueProcessHandbook.pdf, (04.10.2007)

problem and develop a new standard and a discussion paper will be prepared and will be shown to the public for commendation. After that phase the Board will develop an Exposure Draft, which will also include dissenting opinions of Board members. Afterwards the Exposure Draft is presented to the public again. If comments have been disused, there will be public hearings and field tests of the new standard. If the Exposure Draft is approved by of the 14 Board members, a new IFRS will be published.

2.3.2. Historical Overview of Accounting Standards

In the literature it is often written about three development stages of harmonization, especially when the work of IASB is considered.[50] We have decided to follow these three stages in the structure of this part. However, we added a pre-stage, in order to find out the roots of harmonization, and a stage beginning 1998 and onwards. This overview gives the reader an impression of the organizations (actors) involved in the process.

2.3.2.1. The Founding of IASC (1973 –1989)

The period, between 1973-1989, is also called the first stage of development of the International Accounting Standards Committee. In 1973 the IASC was formed. During that time the IASC established most of its standards. These were standards on major Accounting topics as for example accounting for inventory. During the time of 1973 and 1987 it was the main focus of the IASC to achieve compatibility between the IAS and the existing standards in the member states of the IASC[51].

Not only private bodies (like IASC) also certain international public bodies (like OECD, UN and the African Accounting Council) were interested in the development of the accounting area. In 1976 the Organization for Economic Co-operation and Development issued a declaration which was a guideline on disclosure of financial information.[52] The

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[50] B. Epstein and Mirza, op. cit., p.66.
[51] IASB, http://www.iasb.org/About+Us/About+the+Foundation/History.htm, (04.10.2007)
[52] F. Choi et al., op. cit., p.113.

UN founded the Intergovernmental Working group of Experts on International Standards of Accounting and Reporting (ISAR).[53]

1970's and the 1980's the European Union put a lot of efforts in the development of closer agreements of the company laws in Europe.[54]The council of ministers, as the legislative body of the European Union, have issued 12 directives concerning company.[55] In 1984 the London Stock Exchange professed that listed companies, not incorporated in the U.K. or Ireland, have to use accounts in accordance with IAS.[56]

2.3.2.2. The Changing Look of IASC (1987 – 1992)

1987 - 1993 is the period of the second stage of IASC development. This period starts with the membership of the International Organization of Securities Commissions in the Consultative Group of IASC in 1987. One year later the FASB joined the Consultative Group of the IASC as well. One very important member of the IOSCO is the U.S. Securities and Exchange Commission. Furthermore the IAS framework for the preparation and presentation of financial statements was established in 1989. This period is further characterized by the *"Comparability/Improvements Project"* of IASC[57]. The objective of this project can be described as to narrow the range of alternative accounting treatments, which could be used in the same situation.[58] Furthermore 10 standards have been revised during that period. In 1990, European Commission joins the Consultative Group and takes a seat at the IASC Board table as an observer. Bank regulators and asset valuers also join the Consultative Group.

2.3.2.3. The Fortification of IASC Standards (1993 -1998)

In 1993, IASC and IOSCO agree on a list of core standards, and Comparability and Improvements project completed with approval of ten revised IAS. In 1994, IOSCO

[53] C. Nobes and Parker, op. cit., p. 89.
[54] C.Roberts et al, pp.55-56.
[55] C. Nobes, op. cit., p.177.
[56] F. Choi et al., op. cit., p.20.
[57] IASB, http://www.iasb.org/About+Us/About+the+Foundation/History.htm, (04.10.2007)
[58] B. Epstein, Mirza, op. cit., p.20.

accepts 14 IAS and identifies some specific issues to be addressed in the remaining core standards. In 1995 IOSCO recommends the IAS to its members for cross-border capital raising and listing purposes in all global markets, the IASC had to develop a comprehensive set of core standards in accordance with of IOSCO. European Commission supports the IASC/IOSCO agreement and concludes that IAS should be followed by EU multinationals[59]. Choi argues *"The EU has concluded that IASC Standards are the preferred option as new standards are developed in EU countries".*[60] The European Commission stated its policy in 1995 as *"Rather than amend existing directives, the proposal is to improve the present situation by associating the EU with the efforts undertaken by IASC and IOSCO towards a broader international harmonization of Accounting Standards".*[61]

In 1996 the SEC manifested that it *"supports the IASC´s objective to develop, as expeditiously as possible, Accounting Standards that could be used for preparing financial statements that could be used in cross-border offerings".*[62] IOSCO joins Board as an observer.

Furthermore the IASC undertook initiatives to find a new strategic alignment and organizational structure in 1998. Number of countries with was IASC members passes 100.

[59] IASB, http://www.iasb.org/About+Us/About+the+Foundation/History.htm, (04.10.2007)
[60] F. Choi et al., op. cit., p.736.
[61] B. Epstein and Mirza, op. cit., p.21.
[62] F. Choi et al., op. cit., p. 696.

2.3.2.4. Towards a World Standard Setter Through Convergence between IFRSs and US GAAP

The IASC was restructured into the IASB (International Accounting Standards Board) at the start of 2001[63]. As mentioned earlier, the collaboration between IASB and FASB was initiated back to 1987. To achieve convergence in accounting the FASB and the IASB decided to pursue an ever closer cooperation. In September 2002 the FASB and IASB agreed within the scope of the *Norwalk-Agreement* to abolish the existing differences between IFRSs and US GAAP by 2005. With the agreement called Norwalk Agreement, the Organizations reached a settlement on developing high quality and compatible accounting standards to be used both by the national and international markets. It is the most important step taken in the field of convergence of the standards. One of the key initiatives was the short term convergence project. The short term convergence project covered areas where the boards expected that a solution could best be found by selecting between existing IFRSs and US GAAP. Further differences were to be addressed by coordination of the boards' working programs which would take the form of joint projects (IASB Press Release 29 October 2002). Within these joint projects the standard setters agreed to conduct their business simultaneously and in a coordinated manner. On 28 February 2006 the boards published "A Roadmap for Convergence between IFRSs and US GAAP 2006-2008", the Memorandum of Understanding (MoU) between IASB and FASB (IASB News Release, 27 February 2006). This paper reaffirms the boards' objective of developing high quality common accounting standards for use in global capital markets. The MoU elaborates the objectives and principles set out in the Norwalk Agreement. The boards concluded the second phase of the business combinations project by issuing SFAS 141 (revised in December 2007) and IFRS 3 (revised in January 2008). Business Combinations for which the acquisition date is on or after the beginning of the first annual reporting period beginning on or after 1 July 2009 (IASB) respectively 15 December 2008 (FASB) shall prospectively apply the new standards. The International Accounting

[63] IASB, http://www.iasb.org/About+Us/About+the+Foundation/History.htm, (04.10.2007)

Standards Board and the Financial Accounting Standards Board have published an update of their 2006 memorandum of understanding (MoU). The boards are issuing this update to report the progress they have made since 2006 and to set the goal of completing their major joint projects by 2011.[64]

Apart from the above activities, in 2000, the International Organization of Securities Commissioners (IOSCO) recommended to member countries that IASB standards be used in the firms listed accounting. In March 2002 the European Commission took a further proposed a regulation, which requires that all enterprises listed on a regulated market in the European Union would have to prepare their consolidated accounts in accordance with IFRSs by 2005. The regulation will require the use of IFRSs by the 01.01.2005 after a formal EU endorsement.

2.4. Economic Consequences of Introducing IFRSs

2.4.1. Higher Disclosure Quality

The importance of IFRSs is clearly documented in the most recent "GAAP convergence" survey in 2002 revealing that 95 percent of the 59 surveyed countries either have adopted intend to adopt, or intend to converge with IFRSs for publicly traded companies. A survey of implementation of IFRSs conducted by the accounting firm Mazars and involving 550 listed companies in 12 European countries, including Turkey, released in July 2005 shows that 87 per cent of the respondents consider themselves well prepared for the adoption of IFRS; 74 per cent have already prepared their opening balance sheets; and 66 per cent have assessed the impact of the restatements on their 2004 financial statements. With respect to the cost of conversion to IFRSs, only 45 per cent of the respondents

[64] FASB, http://www.fasb.org/intl/convergence_iasb.shtml, (25.01.2009)

considered it high, while 55 per cent believed that the benefits of conversion justified the costs.[65]

IFRSs promise more accurate, comprehensive and timely financial statement information, relative to the national standards they replace for public financial reporting in most of the countries adopting them, Continental Europe included. To the extent that financial statement information is not known from other sources, this should lead to more-informed valuation in the equity markets, and hence lower risk to investors. Small investors are less likely than investment professionals to be able to anticipate financial statement information from other sources. Improving financial reporting quality allows them to compete better with professionals, and hence reduces the risk they are trading with a better-informed professional (known as "adverse selection")[66] Thus, improvements in financial reporting and disclosure resulting from application of IFRSs would lower information asymmetry and information risk.[67] The advantages to investors arise from improving the usefulness of financial statement information in contracting between firms and a variety of parties, notably lenders and managers.[68]. Increased transparency causes managers to act more in the interests of shareholders. IFRSs offer several additional, indirect advantages to investors. Because higher information quality should reduce both the risk to all investors from owning shares and the risk to less-informed investors due to adverse selection, in theory it should lead to a reduction in firms' costs of equity capital. This would increase share prices, and would make new investments by firms more attractive, other things equal.

2.4.2. Lower Cost of Capital

Decreasing cost of capital as an underlying rationale has often been expressed by the IASB, regulators around the globe adopting IFRSs, and has also been put forward to

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[65] Mazars, IFRS 2005 European Survey, , http://www.mazars.com/pdf/Enquete_IFRS_2005_UK.pdf, (20.09.2007), p.8

[66] [66] C. Leuz, and R. Verrecchia, "The Economic Consequences of Increased Disclosure", **Journal of Accounting Research** 38 (Supplement), 2000, pp.91-95

[67] Lawrence R. Glosten. and Paul R. Milgrom, 1985. "Bid, ask and transaction prices in a specialist market with heterogeneously informed traders", **Journal of Financial Economics,** Vol. 14, (1985), pp.71-100.

[68] L. Watts Ross and Jerold Zimmerman, 1978, "Towards a Positive Theory of the Determination of Accounting Standards," **The Accounting Review**, Vol. 53, pp. 112-134

reason the EU's decision[69]. For example, Fritz Bolkestein, the European Commissioner for Internal Markets, assessed that IFRSs are "vital because a single set of accounting standards will help reduce the cost of capital". Arthur Levitt, the former SEC Chairman, once summarized "The truth is; high quality standards lower the cost of capital". The motivation and claim that international reporting standards are expected to lower the adopter's cost of capital nowadays are commonly found in the media and applied business journals and is frequently referred to by the involved parties in Europe, particularly in countries where companies have already adopted international reporting.

Application of a single set of standards would result in lower costs of comparing performance of firms from different countries. By eliminating many international differences in accounting standards, and standardizing reporting formats, IFRSs eliminate many of the adjustments analysts historically have made in order to make companies' financials more comparable internationally. IFRSs adoption therefore could reduce the cost to investors of processing financial information. The gain would be greatest for institutions that create large, standardized-format financial databases. A bonus is that reducing the cost of processing financial information most likely increases the efficiency with which the stock market incorporates it in prices. Most investors can be expected to gain from increased market efficiency. Reducing international differences in accounting standards assists to some degree in removing barriers to cross-border acquisitions and divestitures, which in theory will reward investors with increased takeover premiums[70].

The nature of economic benefits and costs of adopting IFRSs within and across countries remains a subject of discussion. However, a benefit versus cost analysis is key when assessing the quality of accounting standards and when rationalizing IFRSs in favor of local standards customized according to the needs of a particular financial system.[71]

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[69]International Accounting Standards Committee Foundation, Annual Report 2002, http://www.iasb.org/NR/rdonlyres/E66DC405-5681-48E5-ACD6-4D525B26054B/0/AnnualReport2002.pdf, (05.10.2007)
[70]M. Bradley, A. Desai, E. H. Kim, "Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms", **Journal of Financial Economics**, Vol.21, 1988, p. 8
[71] American Accounting Association's Financial Accounting Standards Committee (AAA), "Criteria for Assessing the Quality of an Accounting Standard", **Accounting Horizons**, Vol. 12, No. 2, 1998, pp. 161-162

While the direct cost of adopting IFRSs in the firm's accounting systems have been estimated by adopting firms and/or their consultants in applied business journals, the total economic costs and particularly benefits are even more difficult to quantify. The increased transparency and quality as compared to most local reporting requirements as well as the perceived increased comparability of financial reports under IFRSs across countries and markets should make it less difficult and costly for investors to compare the opportunities and risk involved in investments in global markets. While these are not ends in themselves, transparency and comparability should ultimately result in lower rates of return investors require for providing funds and thus in lower cost of capital for adopting firms.

The benefit of international accounting standards, set in this manner, is that their objectivity and transparency should give investors greater confidence in accounting information, reducing the perceived risks of investment and lowering the cost of capital. Cross-border investment, in particular, should be encouraged by removing the barriers to communication that are created by having different national languages of accounting. These benefits are obviously consistent with the European Commission's ambition to create a single market within the EU. They are also consistent with the ambition that the EU capital markets should play an important future role in the global capital market. A primary goal of the IASB is to develop, "in the public interest, a single set of high quality, understandable and enforceable global accounting standards that require transparent and comparable information in general purpose financial statements." In other words, the major expectations of the adoption of an international accounting system like IFRSs is to provide a higher quality and transparency of financial reporting based on IFRSs than on the domestic accounting standards with lower information asymmetry and information risk, and therefore lower costs of capital and efficient capital markets.

3. INFORMATION ASYMMETRY, BID-ASK SPREAD AND IFRSs ADOPTION

For firms in many countries, the adoption of IFRSs represents a significant change in the structure of their financial reporting system. Consequently, the change to IFRSs ordinarily results in financial reports that contain greater transparency relative to domestic GAAP reports. Financial reports prepared under IFRSs are more suited to the needs of capital market participants because these numbers and notes are generated using a set of accounting method choices that are more detailed than are those under domestic GAAP[72] .

A voluntary or mandatory switch from domestic to internationally recognized accounting standards is a commitment to increase levels of disclosure that is likely to reduce the possibility of information asymmetry between the firm and its shareholders or among potential buyers and sellers of firm's shares. The bid-ask spread is a measuring of the liquidity degree of firms' securities which was proposed by Demsetz[73]. The bid-ask spread addresses the adverse selection problem that arises from transacting in firm shares in the presence of asymmetrically informed investors. Less information asymmetry implies less adverse selection, which implies in turn a smaller bid-ask spread.

In this section we outline the information asymmetry and bid-ask spread theories in more detail. We review the literature on the defined subject area and we point out the relationship between bid-ask spread, market liquidity in stock markets and give brief details about the Turkish Stock Market and accounting regulations.

3.1. Information Asymmetry

It is empirically clear that people possess different information. The information they possess affects their behavior in many situations. The concept of information asymmetry was able to explain many common phenomena that could not be

[72] H. Ashbaugh, P. Olsson, "An exploratory study of the valuation properties of cross-listed firms. IAS and U.S. GAAP earnings and book values", **The Accounting Review**, Vol. 77, No. 1, 2002, pp. 107-127.
[73] H. Demsetz, "The Cost of Transacting", **Quarterly Journal of Economics**, 1968, pp. 33-53.

otherwise explained when it was first introduced in the early 1970s. Since then it has become a valuable tool in the field of economics and it is used to explain a diverse set of phenomena.

Information asymmetry, in business life, is a condition whereby managers (insiders) possess greater (private) information about the firm and its operations than do those outside the firm (e.g., investors, creditors, market makers, analysts). Because the domestic GAAP reporting systems of some countries (e.g., France, Sweden, Switzerland) are not historically tailored to capital market participants, the informational division between management and these participants is likely important. Information asymmetry is a problem for a firm to the extent that it creates perceived "information risk"[74]. Information risk is yet another form of risk for which market participants likely demand compensation, thus increasing a firm's cost of capital[75]. Accordingly, a reduction in information asymmetry lowers information risk, which in turn may lower a firm's cost of capital. Information asymmetry and associated information risk is therefore, one component of the overall cost of capital.

3.2. The Origin of Information Asymmetry

Information asymmetry is based on the intuition provided by Akerlof[76] (1970), according to whom information asymmetry generates costs by introducing adverse selection into transactions. For more than two decades, the theory of markets with asymmetric information has been a vital and lively field of economic research. The foundations for this theory were established in the 1970s by **George Akerlof**, **Michael Spence** and **Joseph Stiglitz**. They received the Bank of Sweden Prize in Economic Sciences in Memory of Alfred Nobel, 2001, "for their analyses of markets with information asymmetry". However, its significance was established well before the year 2001 when the original authors of the theory, George Akerlof, Michael Spence and Joseph Stiglitz received the Nobel Prize in Economic Sciences.

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[74]Carolyn M. Callahan, Charles M.C. Lee, Teri Lombardi Yohn. "Accounting information and bid-ask spread", **Accounting Horizons,** Vol.11, No.4, December 1997, pp 50-60.
[75]David Easley, Soeren Hvidkjaer, Maureen O'Hara," Is Information Risk a Determinant of Asset Returns", **Journal of Finance**, Vol. 57, No. 5, 2002, pp. 2185-2221.
[76] George Akerlof, "The Market for "Lemons": Quality Uncertainty and the Market Mechanism", **The Quarterly Journal of Economics**,Vol. 84, No.3, 1970, pp. 488-500

3.2.1. Information asymmetry, Adverse Selection, Counteracting Institutions

The key issue in the economics of information asymmetry was first introduced in George A. Akerlof's 1970 article titled "*The Market for "Lemons": Quality Uncertainty and the Market Mechanism*". In this article, Akerlof studied information asymmetry with the example case of automobile market, and developed the market for lemons. This is one of the most frequently cited articles in the last half of the 20th century. The 'lemons' in question are used cars. Akerlof began by noting that the owner of a car knows more about it than any potential buyer[77]. Therefore, the used car market inevitably involves information asymmetry. His basic argument is that in many markets the buyer uses some market statistic to measure the value of a class of goods. Thus the buyer sees the average of the whole market while the seller has more intimate knowledge of a specific item. Akerlof argued that this *information asymmetry* gives the seller an incentive to sell goods of less than the average market quality. The average quality of goods in the market will then decrease as will the market size. Akerlof begins by assuming a model of the automobiles market where there are four kinds of cars; new cars and old cars, which both can be good or bad (the bad cars are commonly known as "lemons"). When buying a car there is a probability q that it is a good car and a probability $1-q$ that it will be a lemon. This is true for both new and old cars. After owning the car for some time the owner acquires more information about the condition of the car and can assign a new probability to the event of the car being a lemon.

As this probability can be assumed to be more accurate than the initial q, an information asymmetry between the owner and potential buyers has developed. The price of good cars and lemons stay the same as the potential buyers cannot realize the difference. Akerlof further argues that the price of a new car must be higher than an old car, because otherwise it would be possible to sell a lemon with the price of a new car and buy a new car with the lower probability q of it being a lemon. It must thus be that the owner of a car that is good and old is locked in his position. He cannot get the real valuation of his car from the market, because his car is better than the market average.

[77] George Akerlof, op. cit., pp. 488-500.

He also cannot change to a new car because he cannot receive the price of a new car for his old car. This leads to the conclusion that most cars that are traded are lemons. The process of the worse individuals (cars) starting to dominate the market is called *adverse selection*[78].

Akerlof claims that he first became interested in the used car market from his interest in macro fluctuations, and from the fact that the new car market exhibits large fluctuations that contribute significantly to macro fluctuations.[79] But he soon realized that applications of his discovery went well beyond both the used car market and basic macroeconomics. Akerlof showed that awareness of their relative ignorance would lead potential buyers to assume that any used car would have a high probability of being low quality, a 'lemon.' This would cause them to bid down the price of used cars in general, and this would drive most high quality used cars out of the market. Indeed, in his original theoretical model, Akerlof showed that, in principle, *only* lemons would be offered for sale. However, Akerlof observed that, in the real world, some people would be forced by circumstance to offer a high quality car for sale, using the example of someone transferred abroad. The inefficiency arising from information asymmetry would essentially be borne by these individuals, who would be unable to receive a sufficient price for their car because it was likely to be viewed as just another lemon. Although there are markets where repeat sales and reputation may resolve the problem, Akerlof observed that in many markets these problems are not easily resolved, including in insurance, labor, and credit. His finding of lemons driving out good cars from the market is known as *adverse selection*.

Akerlof then continues with a utility theoretic approach to calculating the size of the automobile market under information asymmetry. The result is that in the end no goods are traded at any price. He then modifies the model to reflect symmetric information and shows that transactions will now take place and that there is gain of utility to all parties over the information asymmetry situation.

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[78] George Akerlof, op. cit., pp. 488-500.

[79] George Akerlof, "Behavioral Macroeconomics and Macroeconomic Behavior", **American Economic Review**, American Economic Association, June 2002, Vol. 92, No.3, pp. 411-433

3.2.2. Signaling, Signaling Equilibrium

Michael Spence continues the ideas of George A. Akerlof in his 1973 article "*Job Market Signaling"*[80]. He divided markets into two classes: **those where there are few players in the market and they can establish a reputation as signalers and those where the players in the market are numerous and change frequently**. Spence concentrated on the latter market where signals need to be interpreted without prior knowledge of the individual signaler. He used job market as an example in the article. Spence identified the possibility of an infinite set of signaling equilibria, with each equilibrium associated with the level of education (or amount of the signal), which was based on the conditional probabilities believed in by the employers. Potential employees were sorted as being either above or below this level and, in theory, people will either invest in the signal up to that level and no further or will not invest in the signal at all.

Spence models hiring employees as investment decisions made under uncertainty. The employer is not sure of the productive capabilities of an individual before hiring her. Even after hiring the productive capabilities are not immediately clear as some job specific training and learning has to take place[81]. Spence reasons that because the capabilities of an individual are not known and hiring is an investment decision, it is an investment decision under uncertainty. Spence parallels such an investment decision with a lottery. The employer perceives a certain chance of winning in the lottery and a certain chance of losing. This chance of winning is determined by his prior experience in the job market and the *signals* a job applicant transmits and the *indices* she has. In Spence's terminology indices are immutable characteristics of an individual, like race or sex, whereas signals are the characteristics of an individual that the individual can manipulate. Spence uses education as the example signal in his model of the job market[82].

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[80] A. M. Spence, "Job market signaling", **The Quarterly Journal of Economics,** 87(3), 1973, p. 357.
[81] A. M. Spence, "Competitive and optimal responses to signals: an analysis of efficiency and distribution", **Journal of Economic Theory**, 7, 1974, p. 297.
A. M. Spence, "Competition in salaries, credentials, and signaling prerequisites for jobs", **Quarterly Journal of Economics,** 90, 1976, pp. 55.
[82] Ibid., p. 56.

Using previous experience from the job market the employer can assign conditional probabilities to levels of productivity given a set of signals and indices. After hiring new employees and observing their behavior the employer adjusts his view of the probabilities. Potential employees in this model, on the other hand, confront offered wage schedules based on their signals and indices. As they cannot change their indices, the model becomes from their viewpoint one of optimizing their wages reduced by their *signaling costs*. Signaling costs are the total costs of changing a signal, including money, time and psychic costs. Spence sets a critical assumption for the validity of the model that costs of signaling should be negatively correlated with productive capability. In the job market example this means that getting a qualification or a degree should be easier for more productive people.

In this model the job market works in iterations. First the applicants decide on their signaling based on maximization of the offered wages net of signaling costs, then the employer hires the applicants, observes their productive capabilities and adjusts his conditional probabilistic beliefs. Lastly the employer presents a new set of offered wages as a function of signals and indices and then the iteration starts again.

A *signaling equilibrium* is generated when the employers' beliefs are confirmed by the signaling they generate through the offered wage schedule. Signaling equilibrium is a stable state where the sellers (potential employees) in the market differentiate themselves from each other by signaling and thus reduce the information asymmetry between themselves and the buyer (employer). So, where in the asymmetric model without signaling the market size reduced to zero, signaling enable equilibrium to be generated with a market size of greater than zero[83].

Spence goes on to study the use of indices in place of signals. He studies sex as the differentiating index. The conclusion is that two groups with the same distributions of productivity, men and women, may after some time end up in different equilibrium. Based on the employees hired and their capabilities the model develops into one of the equilibria. This equilibrium may be different for the initially equals groups and can encourage different approach to acquiring education or to other signals. This leads to

[83] A. M. Spence, op. cit., 1976, p. 58.

what Spence refers to as a lower level equilibrium trap. This equilibrium, once acquired persists due to endogenous factors of the model and the equilibrium state. For example, the level of compensation for the lowest level jobs may be sufficiently high compared to education costs that most of individuals in a group prefer the lower level jobs.

The idea of signaling was also presented by George A. Akerlof, but when Spence's article was published the term signaling became prevalently used in the literature.

3.2.3. Screening

Rothschild and Stiglitz[84] (1976) extend the analysis by introducing the concept of *screening*. They apply this to insurance markets which, as noted above, are rife with information asymmetry problems leading to both adverse selection and moral hazard. The screening mechanism is aimed to offer a variety of contracts that encourage agents to reveal accurate information about their riskiness through a process of self-selection. Thus, lower risk agents will tend to select contracts that charge lower premiums but higher deductibles. However, there is an inherent conflict between the two functions of transmitting information and redistributing risk.

Stiglitz (1975) applies this argument to the education example studied by Spence and comes up with results that are partly similar and partly dissimilar. He also identifies multiple equilibriums and notes various costs of screening. However, he argues that the optimal solution would be a full screening that properly identifies each agent's true capabilities. However, this outcome is not sustainable as market equilibrium. In Spence's article the employees in the market select the signals they want to transmit in order to choose a suitable wage schedule. Stiglitz in his 1975 article "*The Theory of 'Screening,' Education, and the Distribution of Income*" explore whether this could be used by the seller (employer) to screen the applicants (potential employees) into categories that reflect their productivity or some other capability.[85]

[84] Michael Rothschild, Joseph Stiglitz; "Equilibrium in competitive insurance markets: An essay on the economics of imperfect information", **The Quarterly Journal of Economics,** 90(4), 1976, pp.633.
[85] J. Stiglitz, "The Theory of "Screening," Education, and the Distribution of Income", **American Economic Review**, American Economic Association, Vol. 65, No.3, June 1975, pp. 283-300

Stiglitz states that there are many important differences in the qualities of goods, individuals, brands and other items. He defines *screening* as identifying these qualities. Devices that perform screening activities are called *screening devices*. Stiglitz develops the theory of screening using a simple model. Each individual has one characteristic, which directly tells her productivity. In a non-screening situation each worker will receive a wage proportional to the mean productivity of workers. If those workers with higher screens can be identified, they will receive higher wages. These individuals thus have an economic incentive to be identified. For simplicity, the model further assumes that there are only two kinds of individuals, with productivities of (high) and (low).

Stiglitz then introduces a screening process, which costs per individual to perform, and is able to perfectly tell the two kinds of individuals apart. Stiglitz argues that there are two possible equilibrium for this model (i) non-screening equilibrium and (ii) full-screening equilibrium. In the non-screening equilibrium all workers receive the mean productivity wages and as the cost of screening is more than the gain available, workers do not have an incentive for screening. Individuals do not benefit from the screening and thus will not pay for it. In the full-screening equilibrium all workers receive wages of the lower productivity group if not screened into category; workers now clearly have an incentive for screening and will pay the cost of the screening process.

From this model Stiglitz makes some important observations. For example, the presence of the lower productivity individuals lowers the income of the higher productivity individuals, and on the other hand, the presence of the higher productivity individuals may increase the income of the lower productivity individuals. Furthermore, the social and private returns of screening– by education, for example–differ. Screening involves costs, but only serves to redistribute the income in the population, so the social return is negative. The individual, on the other hand, may increase her own income, so the private return is positive to the high productivity individual screened.

Stiglitz continues to argue why having screening processes may still be better for the whole population than having no screening processes even though the social return of such an institution is negative. For example, he proposes that matching individuals to suitable groups and jobs happens only under a screening process and results in social returns. In the rest of the article, Stiglitz, discusses the education system as a screening device in more detail.

3.3. Information Asymmetry and Financial Disclosure

3.3.1. Information Asymmetry and Information Quality

The mandatory introduction of IFRSs in Europe may reduce not only costs of capital for adopting firms but also trading costs. Both effects can significantly lower overall costs of raising capital and improve capital market accessibility. Although direct and indirect trading costs have decreased in the last decades, they can still affect significantly timing of initial issuing and investment decisions of institutional investors. High-quality financial disclosure under IFRSs can further reduce trading costs, namely information search costs and adverse selection costs. Financial statements prepared according to IFRS are intended to provide transparent, comparable information to capital market participants and other external users making a variety of economic decisions. Nobes[86] is among a group of academics who have expressed the urgent need for a single global financial reporting mechanism. Nobes's opinion is consistent with the view that the reduction of financial reporting diversity will allow investors to compare firms more easily. Gernon and Meek[87] present not only Nobes's perspective, but also the contradictory view that the results from making business decisions—as reflected in financial statements—should not be disassociated with the accounting standards under which the original business decisions were made. Mueller and Walker[88] illustrate this "same context" view by asserting that managers make business decisions with at least some understanding as to how these decisions will eventually, based on a particular set of accounting principles, be reported in financial statements.

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[86] C. Nobes, "Large Firms Assessment of Differences between Domestic GAAPs and IAS. GAAP 2000—A Survey of Accounting Rules in 53 Countries". 2000, International Forum on Accountancy Development website: (http://www.ifad.net/content/ie/ie_f_gaap_frameset.htm)

[87] H. Gernon, and G. Meek., **Accounting: An International Perspective** (Third Edition), Irwin/McGraw-Hill, New York, NY, 2001, p.95.

[88] Mueller and Walker, "The Coming of Age of Transnational Financial Reporting", **Journal of Accountancy,** July, 1976, p.71.

An inverse relationship between disclosure quality and cost of equity capital is provided by both economic theory and anecdotal evidence. However, empirical work in this area suffers from a significant methodological drawback; cost of capital cannot be observed directly and information quality is subjectively measured. Certain variables represent good proxies for these constructs and information risk (information asymmetry), as one of the theorized components of cost of capital, is also not directly observable.

Private information represents information about firm value that has not (yet) been incorporated into the firm's stock price. Information asymmetry in the stock market occurs when one or more investors possess private information about the firm's value while other investors are uninformed. This dichotomy of information among investors is consistent with Admati and Pfleiderer[89], Diamond and Verrecchia[90], Glosten and Milgrom[91], and Kyle[92] among others.

Grossman[93], Milgrom [94], and Verrecchia[95] provide early discussions of possible motives behind providing greater public information. There are also some more recent discussions of how the dissemination of information impacts a firm's cost of capital and/or information asymmetry (Leuz[96], Heflin et al[97] Bailey et al.[98]; Leuz and Verrecchia[99], Botosan[100], Lang and Lundholm[101]). The consensus among these authors is that information asymmetries are costly to firms and therefore increasing the quantity

[89] A. Admati, and P. Pfleiderer, "A theory of Intraday Patterns: Volume and Price Variability", **Review of Financial Studies**, 1988, p.11.
[90] D. Diamond, and R. Verrecchia, "Disclosure, liquidity and the cost of equity capital", **Journal of Finance,** (September 1991): p. 1331.
[91] L. Glosten, and P. Milgrom., p. 81.
[92] A. Kyle, **Continuous Auctions and Insider Trade**, 1985, Econometrica.
[93] S. Grossman, "The Role of Warranties and Private Disclosure About Product Quality", **Journal of Law and Economics** 24 (3), 1981, pp. 461-483.
[94] P. Milgrom, "Good News and Bad News: Representation Theorems and Applications", **Bell Journal of Economics** 12 (Autumn), 1981, pp.380-391.
[95] R. Verrecchia, "Discretionary Disclosure", **Journal of Accounting and Economics** 5 (December), 1983, pp. 179-194.
[96] C. Leuz, "IAS versus U.S. GAAP: A (New) Market Based Comparison", **Journal of Accounting Research** 41 (June), 2003, pp. 445-472.
[97] F. Heflin, K. Shaw and J. Wild.. **Disclosure Quality and Market Liquidity**, 2001, Working Paper (Purdue University, University of Maryland, University of Wisconsin at Madison)
[98] W. Bailey, G. A. Karolyi, and C. Salva., **The Economic Consequences of Increased Disclosure: Evidence from International Cross-Listings**, 2000, Working Paper (Cornell University).
[99] C. Leuz, and R. Verrecchia, op.cit. pp.91-124
[100] C. Botosan, "Disclosure Level and the Cost of Equity Capital", **The Accounting Review** 72, July 1997, 323-349.
[101] M. Lang, and R. Lundholm., "Corporate Disclosure Policy and Analyst Behavior", **The Accounting Review** 71, October 1996, pp. 467-492.

and quality of financial information reduces these asymmetries. For instance, Leuz [102] not only summarizes the literature detailing why information asymmetry is costly to firms, but he also argues that the proxies for information asymmetry should reflect the level and the precision of financial disclosure.

Botosan[103] provides what may be the best known empirical assessment dealing with the quantifiable benefits of greater disclosure. She uses a version of the residual income model to implicitly measure a firm's cost of equity capital and finds that those firms (particularly the smaller firms) with higher-quality disclosures benefit from relatively lower costs of capital. Like many of the investigations involving the benefits of increased disclosure quality, Botosan's study employs only U.S. listed firms.

Sengupta[104] and Botosan and Plumlee[105] also provide evidence that greater levels of disclosure are associated with lower costs of capital for U.S. firms. Finally, Francis et al.[106] is one international study that documents a lower cost of capital for firms having higher average levels of accounting disclosure.

Higher disclosure quality reduces the incentives to search for private information by reducing the expected benefits from obtaining private information and thus information risk. Diamond[107], Verrecchia[108] examine settings where public and private information are substitutes for each other. Higher disclosure quality also reduces information asymmetry by altering the trading behavior of uninformed investors. Merton[109] and Fishman and Hagerty[110] analyze settings in which firms' more informative disclosures reduce the costs associated with processing and assimilating public information. As a result, greater disclosure induces more investing by

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[102] C. Leuz, op. cit., 2003, pp. 445-472.
[103] C. Botosan, op. cit., pp. 323-349.
[104] P. Sengupta, "Corporate Disclosure Quality and the Cost of Debt", **The Accounting Review** 73 (October), 1998, pp. 459-474.
[105] C. Botosan, and M. Plumlee. (2002). A Re-Examination of Disclosure Level and the Expected Cost of Equity Capital. **Journal of Accounting Research** 40: 21-40.
[106] J. Francis, I. Khurana, and R. Pereira. (2003). Global Evidence on Incentives for Voluntary Accounting Disclosures and the Effect on Cost of Capital. Working Paper (University of Missouri-Columbia).
[107] D. Diamond, "Optimal release of information by firms" **The Journal of Finance** 40, 1985, pp. 1071-1094.
[108] R. Verrecchia, "The use of mathematical model in financial accounting", **Journal of Accounting Research** 20 (Supplement), 1982, 1-42.
[109] R. Merton, R. "Presidential Address: A Simple Model of Capital Market Equilibrium with Incomplete Information", **The Journal of Finance,** 1987, pp. 483-510.
[110] M. Fishman, K. Hagerty, 1989, Disclosure decisions by firms and the competition for price efficiency, **Journal of Finance** 44, 633-646.

uninformed liquidity traders. Diamond and Verrecchia[111] find that the amount of uninformed trading by large investors can increase as the firm discloses more information. Consistent with this assumption, accounting regulators and practitioners argue that more and better disclosure by firms makes the capital markets more attractive to uninformed investors. However, previous research indicates that increases in uninformed trading are associated with more informed trading. Kyle[112] demonstrates that if investors are risk neutral and are not capital constrained, then the amount of informed trading varies proportionately with the expected amount of uninformed, liquidity-based trading. Informed traders act strategically to maximize their trading profits by taking advantage of the "noise" provided by the trading activity of uninformed investors. The end result is that the relative amount of informed trading remains unchanged when the expected amount of uninformed trading changes. In practice, however, it is likely that informed traders are risk averse and/or capital constrained, and thus, there is a less than fully proportional change in the amount of informed trading. Accordingly, we expect that higher disclosure quality is associated with relatively less informed trading and, therefore, less information asymmetry.

3.3.2. Public Disclosure and Information Asymmetry

Since Demsetz[113], the spreads have been of great interest to the finance and economic researchers. However, the economic link between the public disclosure and information asymmetry became the subject of accounting studies only very recently. We will try to investigate this link by taking a look at some of these theoretical studies on the effect of public disclosure on the information asymmetry.

Many theoretical models on bid-ask spread and information flow usually suggest that the public disclosure should decrease the information asymmetry. Verrecchia[114] argues that a firm's commitment to more disclosure leads to less information asymmetry. Diamond[115]

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[111] D. Diamond, and R. Verrecchia, (1991), "Disclosure, liquidity and the cost of equity capital", **Journal of Finance**, (September) 1991, pp. 1325-1360.
[112] A. Kyle, op. cit., p. 1330.
[113] H. Demsetz, op. cit., p.36.
[114] R. E. Verrecchia, op. cit., 1982, p.3.
[115] D. Diamond, op. cit., 1985, p. 1087.

provides a theory of a firm's voluntary disclosure and confirms the conclusion of Verrecchia[116] . The increase in shareholder's welfare is related to the savings in information cost under the disclosure policy, and the relevant risk sharing. In contrast to Verrecchia and Diamond, Lundholm[117] argues that the increase in the information precision due to public disclosure concentrates the allocation of private information to informed traders, and increases the information asymmetry between the informed and uninformed traders.

Demski and Feltham[118] study how the information content of the public report (earnings report) affects the information acquisition behavior of traders, and therefore the price reaction to the public disclosure. They show that the magnitude of price changes at the announcement dates depends on the precision of public report in reflecting future value of a firm. Kim and Verrecchia[119] show that when certain traders have superior information processing capability, the earnings announcement could lead to more information asymmetry at the announcement time than in a non-announcement period. They also show that the trading volume increases because more traders are informed due to the public announcement. Thus, they present a model where more information asymmetry, less market liquidity and more trading volume coexist.

We see that many studies suggest different empirical predictions from theoretical models under different assumptions on the impact of earnings announcement on information asymmetry; we can briefly examine these studies at the table 2 below.

Table 2: Summary of studies on the Impact of Earnings Announcement on Information Asymmetry

Study	Description
Verecchia[120] (1982)	Shows that earnings announcements reduce private information search.
Diamond[121] (1985)	Shows that earnings announcements make trader's belief more homogeneous and reduce informed traders' speculations.

[116] R. E. Verrecchia, op. cit., 1982, p.4.
[117] R. Lundholm, "Public signals and the equilibrium allocation of private information", **Journal of Accounting Research,** 29 (3), 1991, pp. 322-349.
[118] J. Demski, and G. Feltham. Market response to financial reports. *Journal of Accounting and Economics* 17, 1994, pp. 3-40.
[119] O. Kim, and R. Verrecchia, Market liquidity and volume around earnings announcements. **Journal of Accounting and Economics,** 17, 1994, p. 51.
[120] R. E. Verrecchia, op. cit., 1982, p.6.

Lundholm(1991)[122]	Shows that earnings announcements may increase the degree of information asymmetry between the informed and uninformed traders due to the concentration in the private information allocation.
Kim and Verrechia[123] (1994)	Show that earnings announcements increase information asymmetry on the day of release when investors have different ability to process the information.
Demski and Feltham[124] (1994)	Show that the anticipation of earnings announcements may increase the private information search.
McNichols and Trueman[125] (1994)	Show that short-term investors may increase their private information search prior to earnings announcements.
Verrecchia[126](2001)	Discusses disclosure models from various perspectives, such as individual traders, managers and social welfare.

In summary, Verrecchia[127] provides an overview of the disclosure models in accounting; he determines three categories of disclosure models.

- The "association based disclosure" models investigate the relationships between the disclosure and market equilibrium prices and trading volume, assuming the disclosure arrangements are fixed or exogenous.

- The "discretionary-based disclosure" models examine the managers' incentives in voluntarily disclosing corporate information to the public assuming the disclosure arrangements are endogenous.

- The "efficiency-based disclosure" models examine whether efficient disclosure arrangements exist in the absence of prior knowledge of the information.

According to these models, he shows that; public disclosure affects the behavior of traders under diverse market scenarios; the disclosure cost and uncertainty affects

[121] D. Diamond, op.cit, 1985, p. 1086.
[122] R. Lundholm, *op.cit.*, pp. 339-340.
[123] O. Kim, and R. Verrecchia, op.cit., pp. 54-62
[124] J. Demski, and G. Feltham., op.cit,p.14.
[125] M. McNichols, and B. Trueman. “Public disclosure, private information collection, and short-term trading”, **Journal of Accounting and Economics,** 17, 1994, pp. 69-94.
[126] R. E. Verrecchia., “Essays on disclosure”, **Journal of Accounting and Economics***,* 32, 2001, p.102-111.
[127] Ibid., p. 114.

manager's decision to voluntarily disclose corporate information; public disclosure affects the efficiency either in the social welfare context or in a single-firm. He concludes that information asymmetry reduction plays a key role in linking the disclosure to the efficiency incentives.

3.3.3. The Transitory Effect of Public Disclosure on Information Asymmetry

Studies in the literature focusing on the *transitory effect* of information asymmetry work on the information asymmetry risk facing traders[128] and examine their transitory behaviors within a short window of a disclosure event or management action.[129]

Morse and Ushman[130] examine the changes in spreads of 25 OTC stocks around the quarterly earnings announcement during 1973-1976 to see the impact of earnings announcement on the information flow. They find significant changes in trading volume and price level, but no significant change in dollar spreads for a period of -20 to day +20 or -10 to +10 day. Venkatesh and Chiang[131] examine whether the spreads are larger when earnings and dividends are simultaneously or separately announced. Their analysis show a significant increase in spreads only before the second announcements, but not before joint announcement or first announcement. Thus, they conclude that when the second announcement is separated from the first by more than ten days, the traders will suspect an abnormal announcement and widen the spreads.

Lee et al.[132] using intraday data of 230 NYSE in 1988 consistent with Demski and Feltham[133] find that spreads increase, and trading volume and quote depths decrease on the day of and the two days prior to earnings announcements. The results also show that the changes in spreads around the announcement are associated with trading volume.

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[128] C. Callahan et al., op.cit., pp 53.
[129] R. E. Verrecchia, op. cit., 2001, pp. 111-120.
[130] D. Morse, and N. Ushman. "The effects of information announcements on the market microstructure" **The Accounting Review,** 58 (2), 1983, pp.247-258.
[131] P. Venkatesh, and R. Chiang. "Information asymmetry and the dealer's bid-ask spread: A case study of earnings and dividend announcements". **The Journal of Finance,** 41, 1986, pp. 1089-1102.
[132] C. B. Lee, B. Mucklow, and M. Ready. "Spreads, Depths and the Impact of Earnings Information: An Intraday Analysis". **Review of Financial Studies,** 1993, pp. 345-375.
[133] J. Demski, and G. Feltham., op. cit., p. 22.

Using the transaction data of 90 NYSE firms during 1988, Brooks[134] investigates the changes in spreads and in adverse selection component of spreads around earnings and dividend announcements. He finds that the spreads and the adverse selection cost increase on the day prior to and the day of earnings announcements, which does not happen for dividend announcements. Consistent with these results, Krinsky and Lee[135] report an increase in adverse selection cost of spreads on the day prior to, the day of, and the day subsequent to quarterly earnings announcements.

Yohn[136] finds an increase in spreads in the four days prior to announcement, consistent with the theory on traders' private information inquiry[137] argued in Demski and Feltham. He also finds that the spread around earnings announcement is related to traders' expected profits from private information.

Senteney[138] further investigates the impact of the nature and the timing of unexpected earnings on the spreads' reaction to trading volume. The results reveal that unexpected trading volume induces smaller unexpected spreads for firms with positive earnings surprise and firms announcing earnings later than expected. Maddala and Nimalendran[139] study the daily spreads around earnings announcements made by 330 NASDAQ firms from 1984 to 1990. They find that unobservable earnings surprise is significantly related to the increase in spreads prior to the announcement, and the increase in trading volume after the announcement. Affleck-Graves et al.[140] also argue that earnings predictability affects spreads in that the noisy earnings increase information asymmetry between informed and uninformed traders. They find an increase in the adverse selection component of spreads and also in trading volume on the day of and the day prior to the announcements by firms with low predictability of earnings, but not by firms with high predictability of earnings.

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[134] R. Brooks, "Bid-ask spread components around anticipated announcements", **The Journal of Financial Research,** 17, 1994, pp. 375-386.
[135] I. Krinsky and J. Lee. "Earnings Announcements and the Components of the Bid- Ask Spread", **The Journal of Finance,** 51, September, 1996, pp. 1523-1535.
[136] T. Yohn, "Information asymmetry around earnings announcements". **Review of Quantitative Finance and Accounting,** 2, 1998 pp. 165-182.
[137] J. Demski, and G. Feltham., op. cit., p. 29.
[138] D. Senteney, "Characteristics of earnings news and operational efficiency in the NASDAQ securities market", **Review of Financial Economics**, 1, Fall 1991, pp. 49-61.
[139] G. Maddala, and M. Nimalendran., "An unobserved component panel data model to study the effect of earnings surprises on stock prices, trading volumes and spreads", **Journal of Economics,** 68, July 1995, pp. 229-242.
[140] J. Affleck-Graves, C. M. Callahan, and N. Chipalkatti. "Earnings predictability, information asymmetry and market liquidity", **Journal of Accounting Research**, 40, 3, 2002, pp. 561-564.

In sum, studies usually report a temporary increase in spreads around earnings announcements[141]. In addition, they suggest the association between the changes in spreads around earnings announcements and the content of earnings announcements, such as the magnitude of earning surprise[142], the nature and timing of earnings surprise[143], and earnings predictability[144].

Managers also convey information to the market and affect the information asymmetry. Their signals are expected to convey information to investors, reduce the information asymmetry, and make firm's shares more valuable. The impact of these signals has been a topic of interest to many studies on information asymmetry. Coller and Yohn[145] examine the impact of management earnings forecasts, their study's results revealed that forecast firms have higher spreads than non-forecasters before the announcement, consistent with the notion that managers use forecasts to reduce the information asymmetry and increase the liquidity of firm's shares. They also find the spreads of forecasters increase gradually in the twelve-month and nine-day window, consistent with the existence of informed trading. As expected, the spreads in the nine days after the announcement is smaller than those in the nine days before, suggesting the manager's success in reducing the information asymmetry. Similarly, Jennings[146] studied the data of 153 firms on the day of takeover announcements and he found no evidence that spreads increase before the announcement, he also added that spreads and quote sizes increase immediately after the announcement but they quickly return to normal.

Concerning the dividend announcements and stock splits similar to Brooks[147], find no impact of dividend announcement on price level or relative spreads. However, they found that stock splits lead to higher prices and smaller relative spreads. Based on a sample of 906 firms for 1986-1990, their analysis showed a significant increase in price and a significant decrease in relative spreads over a week period. They conclude that split

[141] T. Yohn, op. cit., p. 171.
C. B. Lee et al., op. cit., p.357.
[142] T. Yohn, op. cit., p. 172.
[143] D. Senteney, op. cit., p.53.
[144] J. Affleck-Graves et al., op. cit., p. 577.
[145] M. Coller and T. Yohn, "Management Forecasts and Information Asymmetry: An Examination of Bid-Ask Spreads", **Journal of Accounting Research**, Vol. 35, 1997, p. 188.
[146] R. Jennings "Intraday changes in target firm's share price and bid-ask quotes around takeover announcements" **The Journal of Financial Research**, 17, 1994, pp. 255-270.
[147] R. Brooks, op. cit., pp. 375-378.

announcements increase informed trading because lower share prices attract, after the split, more traders and increase the concentration level of private information.

Table 3 summarizes these empirical evidences on the transitory impact of public disclosure and some management actions. In sum, their findings show that earnings announcement, as well as management actions, conveys information to the market and creates, at least, a transitory change in the information asymmetry level in the market as reflected in bid-ask spreads.

3.3.4. The Permanent Effect of Accounting Disclosure on Information Asymmetry

The permanent impact of the accounting disclosure on information asymmetry risk of the market is also investigated in many studies. These studies are classified into mandated disclosure and voluntary disclosure literature.

Concerning the mandated accounting disclosure, Swaminathan[148] (1991) examines the economic benefits of the segment data disclosure imposed by the SEC in 1970. In his work, the sample is composed of a control group of 101 firms that voluntarily disclosed their segment data prior to 1970, and an experimental group of 160 firms who disclosed segment data for the first time in 1970. Using price variability and divergence of analysts' earnings forecast as proxy for information asymmetry, he compares the price variability around 1969 and 1970 annual report release dates and the average divergence of analysts' earnings forecasts between 1970 and 1971. The results show that only the firms in the experimental group have a significant increase in price variability and a significant decrease in divergence of beliefs of investors reflected in analysts' earnings forecast. Conducting a regression of average percentage changes in the information asymmetry proxies, he finds that these changes are proportional to the number of segments reported by these firms. However, his study does not investigate whether the impact of mandated accounting disclosure is permanent.

[148] S. Swaminathan, “The impact of SEC mandated segment data on price variability and divergence of beliefs”, **The Accounting Review**, 66, 1, 1991, p.30.

Table 3: Summary of Empirical Studies on the Transitory Impact of Public Disclosure and Management Action on Information Asymmetry

Panel A Empirical Studies of Earnings Announcement and Information Asymmetry

Study	Findings
Morse and Ushman[149] (1983)	Find no significant changes in spread around earnings announcements; find changes in spreads on days of large absolute price changes.
Venkatesh and Chiang[150] (1986)	Find no significant increase in spreads in anticipating earnings announcements.
Senteney[151] (1991)	Finds greater spread reaction to trading volume around earnings announcements when earnings are positive and when earnings are reported later than expected.
Lee et al.[152] (1994)	Find an increase in spreads the day prior to, the day and the day after earnings announcements.
Brooks[153] (1994)	Finds significant changes in spread components around earnings announcements.
Maddala and Nimalendran[154] (1995)	Find significant changes in spreads with earnings surprises; also find significant effects on price and trading volume.
Krinsky and Lee[155] (1996)	Find significant increase in the adverse selection component but significant decrease in the inventory holding and order processing components surrounding earnings announcements.
Yohn[156] (1998)	Finds a relationship between the spreads and the expected trading profits from private information prior to earnings announcements; also finds an increase in spreads in the four days prior to earnings announcements.
Affleck-Graves et al.[157] (2002)	Find an inverse relationship between the increase in spreads and the earnings' predictability around earnings announcements.

Table 3. (continued)

[149] D. Morse, and N. Ushman, op. cit., pp. 247-258.
[150] P. Venkatesh, and R. Chiang, op. cit.,, pp. 1094-1097.
[151] D. Senteney, op. cit., p.58.
[152] C. B. Lee et al., op. cit., p. 360-361.
[153] R. Brooks, op. cit., p. 382.
[154] G. Maddala, and M. Nimalendran, op. cit., p. 240.
[155] I. Krinsky and J. Lee, op. cit., pp. 1530-1531.
[156] T. Yohn, op. cit., p. 175.
[157] J. Affleck-Graves et al., op. cit., pp. 561-583.

Panel B. Empirical Studies of Other Public Announcement and Information Asymmetry

Study	Findings
Jennings[158] (1994)	Finds that prior to merger announcement, there are no effects on spreads except when trading is suspended and that at merge announcement spreads increase immediately but quickly return to normal.
Coller and Yohn[159] (1997)	Find an increase in spreads over twelve months prior to management forecast; no changes in spreads immediately prior to the management forecast, an increase in spreads the day of and day after the management forecast; larger spreads in pre-forecast period than in post-forecast period in both twelve-month window and nine-day window.
Desai et al.[160] (1998)	Find an increase in price volatility and an increase in adverse selection component of the spread after stock splits. Total volatility are increased with the number of trades, while adverse selection costs decrease with the number of trades.

Greenstein and Sami[161] extend Swaminathan's[162] work to investigate the permanent impact on information asymmetry of the 1970 SEC mandated disclosure of segment data. They examine interventions in the time-series data of relative spreads and a cross-sectional model of intervention magnitudes on the number of segments and firm sizes. Their findings show that firms initially implementing SEC disclosure requirement of segment data experienced a more permanent decrease in their spreads, and the magnitude of this decrease in spreads is positively associated with the number of segments. However, they find no evidence on the negative relation between the decrease in relative spreads and firm size. They attribute this to the correlation between the number of segments and firm size.

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[158] R. Jennings "Intraday changes in target firm's share price and bid-ask quotes around takeover announcements" **The Journal of Financial Research**, 17, 1994, pp. 255-270.
[159] M. Coller and T. Yohn, op. cit., pp. 181-191.
[160] A. S. Desai, M. Nimalendran, and S. Venkataraman., "Changes in trading activity following stock splits ad their effect on volatility and the adverse-information component of the bid-ask spread", **The Journal of Financial Research**, 21, 1998, p. 170.
[161] M. M. Greenstein, H. Sami., "The impact of the SEC's segment disclosure requirement on bid-ask spread", **The Accounting Review**, 69, 1, 1994, p. 185.
[162] S. Swaminathan, op. cit., p. 30.

Hagerman and Healy[163] find a decrease in spreads subsequent to the 1964 SEC insider trading disclosure regulations on the OTC firms. They study the spreads for a control group of 42 OTC national banks (not subject to this regulation) and an experimental group of 100 randomly selected OTC industrial companies (subject to the regulation) on three trading dates (that is, the first Monday in May, the second Monday in February and the fourth Monday in October) during each year of 1962-1966. Comparing the annual sample mean spreads in the years before 1965 with those in 1965 and 1966, they observe a decline in spreads for both the control group and experimental group. However, they find no significant difference in spreads between the two groups either before or after the regulation. Thus, they could not show a link between the changes in disclosure regulation and spreads.

Boone[164] investigates the market effects experienced by firms initially implementing the 1978 SEC disclosure regulations on reserve-based present value information. The author examines the spreads for an industry control group of 7 firms, a market control group of 1706 firms, and an experimental group of 51 firms during 1978-1980. His cross-sectional model of spreads includes trading volume and price variability. The results show a more significant reduction in the spreads of experimental firms for at least twelve months subsequent to the initial mandated disclosure of reserve-based accounting data.

The economic link between accounting disclosure and information asymmetry also finds evidence in voluntary disclosure studies using analysts' disclosure ratings. Welker[165] conducts one of the first studies on the effect of the disclosure level and the spreads. He examines the relationship between disclosure ratings and spreads. The results indicate that relative spreads of firms in the top third disclosure rankings are 50% higher than those in the bottom third rankings. Controlling for the return volatility, trading volume and price, the results show a significantly negative relationship between

[163] R. L. Hagerman, J. P. Healy., “The impact of SEC-required disclosure and insider-trading regulations on the bid-ask spreads in the over-the-counter market”, **Journal of Accounting and Public Policy** 12 (Fall), 1992, p. 238.
[164] J. P. Boone, “Oil and gas reserve value disclosure and bid-ask spreads”, **Journal of Accounting and Public Policy**, 17 (Spring), 1998, p. 65.
[165] M. Welker, M., “Disclosure policy, information asymmetry, and liquidity in equity markets”, **Contemporary Accounting Research** ,11, 1995, pp. 801–827.

disclosure rankings and spreads. This is consistent with the suggestion that high-ranking disclosure lowers information asymmetry.

Healy et al.[166] investigate the economic benefit of firms increasing their voluntary disclosure during 1980-1990. They examine the impacts of the increases in firm's disclosure ratings on spreads, stock returns and institutional ownership. They find that the increase in disclosure ratings is associated with increase in stock returns, institutional ownership and decrease in spreads. Therefore, they conclude that a firm's increased voluntary disclosure encourages investors to value more on the firm's stocks, lower the information asymmetry, and attract more investments from institutions. Consistently, Heflin et al.[167] estimate effective spreads and the adverse selection component and examine the effects of disclosure quality on these estimates. They find that high quality disclosure are associated with lower spreads and lower adverse selection components, consistent with the hypothesis that higher quality disclosure increases market liquidity. Overall, these findings provide evidence for the theoretical models in Verrecchia[168] and Diamond[169], which indicate that increased disclosure could decrease the information asymmetry on the market. These studies are more concerned with the long-run information asymmetry risk confronting the accounting regulators; therefore, they are of great interest to accounting researchers.

3.4. Information Asymmetry, Bid-Ask Spread and Financial Markets

We will first try to investigate the theories of bid-ask spread and the empirical studies on the determinants and components of bid-ask spread. Studies on the determinants reveal the association between bid-ask spread and other microstructure factors, while studies on the components yield the significant component due to information asymmetry. Then, we will discuss the theoretical and empirical studies on the information asymmetry and finally, we will take a look at recent studies on order-driven markets to justify the application of the findings from quote-driven markets to order-driven markets.

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[166] P. M. Healy, A. P. Hutton, and K. G. Palepu., "Stock performance and intermediation changes surrounding sustained increases in disclosure", **Contemporary Accounting Research**, 16, 3, 1999, pp. 491-492.
[167] F. Heflin et al.,op. cit., p.12
[168] Verecchia, op. cit., 2001, p.12
[169] D. Diamond, op. cit., p. 1082.

3.4.1. Bid-ask Spread

The bid-ask spread is an important component of all transaction costs[170]. Generally, theories of bid-ask spread are developed in the framework of a quote-driven market. In such a market, the bid-ask spread represents the difference between the lowest available price at which a dealer is willing to sell and the highest available price at which a dealer is willing to buy[171]. Thus, the dealer sets up the bid-ask spread, and then stands ready to trade at the bid and ask prices. That is, the dealer is usually charged based on the number of shares and the share price, which is the largest element of total transaction cost feeing traders. Price impact costs are costs facing large traders due to the changes in the price of a share, which results from executing a transaction. It represents the extent to which large orders, which give rise to temporary illiquidity, cause the price to move away from the equilibrium[172].

Thus, it is clear that, there are a number of factors affecting the size of bid-ask spreads, such as the trading activity, price volatility, the informed trading and the competition on the market[173]. Theoretically, the spreads decrease with trading activity. The dealers can obtain economies of scale from higher trading activity, and thus lower the relative (percentage) spreads through allocating fixed transaction costs among greater trading volume. Moreover, the dealers can face a higher risk from holding an inventory if the price of security is volatile. To reduce this risk, they have to widen their spreads. When the dealers suspect that other traders in the markets have private information on the future price of the stock, they also widen the spreads to protect themselves from loss of trading with these informed traders. Finally, the competition on the market can reduce the spread, because the active stocks attract more dealers or market makers, which, in turn, leads to higher trading activity and lower spreads.

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170 R. W. Kolb, R. J. Rodriguez., **Financial Markets**. Cambridge, MA: Blackwell Publishers, 1996, pp. 55-57.
171 Jay Coughenour, Kuldeep Shastri, Symposium on Market Microstructure: A Review of the Empirical Evidence, Financial Review, vol. 4 no. 4, 1999, pp.1-27.
172 M. Aitken and A. Frino., "The determinants of market bid-ask spreads on the Australian Stock Exchange: Cross-sectional analysis", **Accounting and Finance**, 36,1, 1996, pp. 51-52.
173 R. W. Kolb, R. J. Rodriguez., op. cit., pp. 55-57.

Many studies have decomposed the spreads into the relevant components[174]. Coughenour and Shastri[175] provide a review of empirical research with the estimation of the components of spread. Callahan et al.[176] provide a summary of research on determinants of spread and those on the relationship between accounting information and bid-ask spread. The spread is typically divided into three components:

- Order-processing cost,
- Inventory holding cost
- Adverse selection cost

The order-processing costs are the costs of filling an order, including exchange fees, clearing fees, bookkeeping cost and brokerage firm back-office costs. In other words, these costs are due to the paperwork necessary to realize the transaction[177]. Because the order processing costs are commonly fixed, and these costs are spread over a greater amount of trading volume for an active stock or a higher priced stock, the research models considering order processing cost suggest an inverse relationship between (relative) spreads and trading volume and an inverse relationship between (relative) spreads and price level.

The inventory holding costs are the dealer's costs of holding the necessary inventory level to meet the demand of investors. Since the dealer is required to hold inventory at any time, filling an order from an investor can cause the dealer's inventory level to move away from the initial optimal level. This can stimulate the dealer to change the bid-ask spread so as to attract stock to restore the desired inventory level. Thus, this inventory holding cost compensates a dealer for sacrificing the diversification of his/her portfolios to meet the investor's demand on trades[178], or for bearing the risk of

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[174] L. Glosten, L. Harris., “Estimating the components of the bid-ask spread”, **Journal of Financial Economics**, 21, 1988, p. 126.
H. R. Stoll, “Inferring the components of the bid-ask spread: Theory and empirical Tests”, **The Journal of Finance**, 44, 1989, p. 121.
[175] J. Coughenour, Kuldeep Shastri, op. cit., p.10.
[176] C. Callahan et al. op. cit., p 57.
[177] R. W. Kolb, R. J. Rodriguez., op. cit., pp. 55-57.
[178] Ibid, p.56

holding an inventory that is not optimal[179]. In general, the inventory holding cost emphasizes the discrepancy between the dealer's objective of maximizing his profit and his duty of holding sub-optimal portfolios to provide liquidity in the market[180]. In particular, the dealer sets a bid-ask spread so that the utility gained from the compensation can offset the utility lost from holding sub-optimal portfolios[181]. Because price volatility poses a greater risk for the dealer in holding an inventory, the research models considering inventory-holding cost suggest a positive relationship between bid-ask spreads and price volatility.

Finally, the adverse selection cost, also called the information asymmetry cost or the adverse information cost, represents a fee charged by dealers for bearing the risk of trading with informed traders and has been of great interest to accounting researchers[182]. The research models considering adverse selection component assume that dealers face two kinds of traders - liquidity traders and informed traders[183]. The dealer expects to gain from trades with liquidity traders and lose from trades with informed traders since informed traders only trade when they benefit from it. Thus, to optimize the profit, the dealer sets the bid-ask spread to maximize the difference between the gains from trades with liquidity traders and the losses from trades with informed traders[184]. In particular, when the dealer perceives a greater information asymmetry risk, he tends to increase the adverse selection component of bid-ask spread[185]. Because informed traders tend to trade at large amounts, order size conveys information to the market. The adverse selection cost models suggest that trading volume should be divided into trading frequency and order size, and that bid-ask spreads are positively related to order size (depth) and negatively related to trading frequency. In this dissertation, we will only focus on the effects of increased accounting disclosure on the stock market rather than the temporary effect faced by dealers. Therefore, we will only study the general relationship between the trading volume and bid-ask spread. Due to the difficulty in getting intraday trading

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[179] H. R. Stoll, *op. cit.*, 1989, p. 121.
[180] T. Ho, H. R. Stoll., "Optimal dealer pricing under transactions and return uncertainty", **Journal of Financial Economics**, 9, 1981, p. 56.
[181] J. Coughenour, Kuldeep Shastri, op. cit., p.12.
[182] C. Callahan et al., op. cit., p 58.
[183] T. Copeland, D. Galai. "Information effects on the bid-ask spread", **The Journal of Finance**, 38, 1983, p. 1460.
L. Glosten, Milgrom, P., op. cit., pp. 82-84.
[184] J. Coughenour Jay, Kuldeep Shastri, op. cit., p.14.
[185] C. Callahan et al., op. cit., p 59.

data, we will not try to decompose the trading volume and test the relationship between bid-ask spread and order size, and that between spread and trading frequency.

3.4.2. Factors Affecting Bid-ask Spread

The variation of equilibrium prices in the market, in particular the bid-ask spread, had been largely ignored by researchers until Demsetz[186], who first illustrated that this variation of equilibrium price is inversely related to the trading activity for a certain stock. In a relatively active market, the trader who stands ready for incoming orders can preempt limit orders through offering relatively high bid prices and relatively low ask prices. Therefore, in an active market the trader can quickly restore the desired inventory levels, lowering inventory holding cost. Using the number of trades as proxy of temporary trading activity and the number of shareholders as long-run trading activity, Demsetz[187] finds a significant inverse relationship between the spreads and both measures of trading activity and a significantly positive relationship between the spreads and price levels.

Tinic[188] argues that aside from the trading characteristics, the institutional ownership and the risk of positioning (holding inventory for immediacy) also affect the inventory cost regarding an individual share. He further proposes that trading cost incurred to a specialist firm is associated with its purchasing capability, the composition and risk of its portfolio and the market structure. Including all these variables into his analysis, he finds that spreads decrease with trading volume but increase with price level. In addition, spreads increase with the number of shares carried in a specialist firm, and decrease with the number of institutional investors. Although price volatility, is not found to directly affect the spread, it is significantly associated with the number of trades and price, implying an indirect affect on the spread.

[186] H. Demsetz, op. cit., p.40.
[187] H. Demsetz, op. cit., p.41.
[188] S. M. Tinic, “The economics of liquidity services”, **Quarterly Journal of Economics**, 86, February, 1972, pp. 81-82.

Benston and Hagerman[189] consider the inherent risk of a security in their study and they report an inverse relationship between spreads and trading activity, measured by the number of shareholders. In addition, they also find that spreads increase with the adverse selection cost, suggesting that the market makers widen their spreads to cover their adverse selection cost.

In 1975 Barnea and Logue[190], summarize the literature into three theories on dealer behavior

- The "liquidity theory", which considers spreads as charges for providing liquidity and emphasizes the trading activity and institutional ownership[191].

- The "adversary theory" (adverse selection cost theory) which relates spreads to information asymmetry risk[192].

- The "dynamic price/inventory adjustment theory" which argues that dealers could change the spreads or the level of bid and ask prices to restore the desired inventory.

Barnea and Logue,[193] they find that spreads increase with risk and decrease with activity. Thus both the "liquidity theory" and the "adversary theory" are supported. They could not test the third theory due to the unavailability of data on market makers' positions.

Branch and Freed[194] consider the impact of competition on the spreads, along with the role of trading volume, risk of security, and market imperfection in determining the spreads. They find results similar to those of Demsetz[195] and they also find that the relative spreads

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[189] G. Benston, R. Hagerman., "Determinants of bid-ask spreads in the over-the-counter market", **Journal of Financial Economics**, 2, 1974, pp. 355-359.
[190] A. Barnea, D. Logue., "The effect of risk on the market maker's spread", **Financial Analysts Journal**, November/December, 1975, p. 47.
[191] H. Demsetz, op. cit., p. 44.
S. M. Tinic, op. cit., pp. 81-82.
[192] W. Bagehot, (pseudonym used by Jack Treynor), "The only game in town", **Financial Analysts Journal**, 8, 1971, pp. 31–53.
[193] A. Barnea, D. Logue, op. cit., p. 47.
[194] B. Branch, Freed, W. "Bid-ask spreads on the AMEX and the Big Board", **Journal of Finance**, 32, 1977, pp.159-163.
[195] H. Demsetz, op. cit., p.46.

are positively related to the risk of a security (measured by price volatility), but negatively related to competition (measured by the number of exchanges).

Hamilton[196] investigates the transaction cost of NYSE stocks, he examines 191 NYSE stocks and 209 non-listed stocks, consistent with other studies, and he finds that spreads decrease with trading activity and competition and increase with price. In a later article, Hamilton studies the impact of introducing NASDAQ on the spreads his findings on these factors are similar to those of Branch and Freed[197] but he also finds that spreads in the multi-dealer environment became smaller when the automated price quotation system was introduced.

Stoll[198] analyzes the dealers' transaction cost on NASDAQ, and finds significant inverse relationship between relative spreads and trading activity as earlier studies. Using share turnover as a measure of the level of informed trading, he also reports proportional spreads increase with share turnover. This suggests the existence of adverse selection element of spreads. Furthermore, his results indicate that spreads are inversely related to the price and number of dealers, and positively related to return volatility, which supports the inventory cost model.

Subsequent to Benston and Hagerman[199] who suggest the existence of adverse selection component, the adverse selection cost has become of major interest to theoretical and empirical research.

Chiang and Venkatesh[200] investigate the market perception of information asymmetry through three measures: insider ownership, institutional ownership, and firm size. They argue that insiders have access to private information, and institutions have access to spread information acquisition cost over larger blocks of shares. Hence, both of them could create an information asymmetry problem. In addition, small firms tend to have a smaller number of insiders and higher concentration of inside information and higher information

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[196] J. Hamilton, "Market place organization and marketability: NASDAQ, the stock exchange, and the national market system", **The Journal of Finance** 33, 1978, p. 497.
[197] B. Branch, Freed, W., op. cit., p:160.
[198] H. R. Stoll, "The pricing of security dealer services: An empirical study of NASDAQ stocks", **The Journal of Finance** 33, 1978, pp. 1155.
[199] G. Benston, R. Hagerman., op. cit., pp. 355-359.
[200] R. Chiang, P. Venkatesh., "Insider holdings and perceptions of information asymmetry: A note", **The Journal of Finance**, 43, 1988, p. 1044.

asymmetry. Their results support the hypothesized impact of insider ownership and firm size on dealer's adverse selection cost. However, they find no evidence for the impact of institutional ownership on adverse selection cost.

Laux[201] extends the literature on factors affecting the spreads by examining trade-size and the characteristics of trade size (such as mean, variation and percentage change in mean and variation) by controlling institutional ownership, trading volume, price level and price volatility. He finds significant results for all the traditional variables (except the institutional ownership), consistent with other studies. Also, he finds the distribution of trade size is significantly related to the percentage spreads.

These empirical findings on the factors of spreads are summarized in Table 4. In sum, these studies generally support the theoretical relationships; particularly we see that spreads are positively associated with price[202], price variance[203] and percentage of inside shares[204], while negatively associated with trading volume[205], firm size[206] and the number of market makers[207]. These findings from quote-driven markets are further confirmed by empirical evidence from order-driven markets. Aitken and Frino[208] report that trading volume, price volatility and price level are also major factors of relative spreads in order driven markets. In examining the effect on information asymmetry of greater accounting disclosure under the IAS and U.S. GAAP than German GAAP, Leuz and Verrecchia[209] document that aside from the disclosure policy, the relative spreads are negatively related to trading volume, firm size and percentage of publicly-held shares while positively related to price volatility.

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[201] P. Laux, "Trade Sizes and Theories of the Bid-Ask Spread", **Journal of Financial Research**, 16, 1993, pp. 237-249.
[202] H. Demsetz, op. cit., p. 48.
S. M. Tinic, op. cit., pp. 81-82.
[203] A. Barnea, D. Logue, op. cit., p. 47.
H. R. Stoll, op. cit., 1978, p. 1155.
J. Hamilton, op. cit., p. 497.
[204] R. Chiang, P. Venkatesh., op. cit., p. 1044.
[205] H. Demsetz, op. cit., p. 49.
S. M. Tinic, op. cit., pp. 81-82.
H. R. Stoll, op. cit., 1978, p. 1155.
[206] R. Chiang, P. Venkatesh., op. cit., p. 1044.
[207] G. Benston, R. Hagerman., op. cit., pp. 355-359.
H. R. Stoll, op. cit., 1978, p. 1155.
[208] M. Aitken, A. Frino., op. cit., pp. 51-52.
[209] C. Leuz, R. E. Verrecchia. op. cit., 2000, p. 111.

Table 4: Summary of Studies on the Factors affecting Bid-ask Spread

Study	Findings
Demsetz (1968)	Spreads are positively associated with price, while negatively associated with trading activity (number of trades and number of shareholders).
Tinic (1972)	Spreads are positively associated with price and number of specialty shares in a specialist firm, while negatively associated with number of trades, institutional ownership.
Benston and Hagerman (1974)	Spreads are positively associated with price and adverse selection cost (unsystematic risk), while negatively associated with number of shareholders and number of competing dealers.
Barnea and Logue (1975)	Spreads are positively associated with price variance, while negatively associated with trading volume.
Branch and Freed (1977)	Relative spreads are positively associated with price variance, while negatively associated with trading volume and competition (number of markets).
Hamilton (1978)	Spreads are positively associated with price and price variance, while negatively associated with number of trades, institutional ownership and dealer competition.
Stoll (1978)	Relative spreads are positively associated with price variance, while negatively associated with price, trading volume, and dealer competition.
Chiang and Venkatesh (1988)	Spreads are positively associated with insider ownership, while negatively associated with firm size.
Laux (1993)	Spreads are positively associated with characteristics of trade size: Spreads of low trading volume, low capitalization, low price are dominated by the order costs, while spreads of high trading volume, high capitalization, high price are dominated by the inventory cost
Brennan and Subrahmanyam[210] (1995)	The adverse selection cost is lower for firms with more analysts following them.
Aitken and Frino (1996)	Relative spreads increase with price volatility and decrease with price level and trading volume on the Australian Stock Exchange.

[210] M. Brennan and A. Subrahmanyam, 'Investment Analysis and Price Formation in Securities Markets', **Journal of Financial Economics**, Vol. 38, No. 3, 1995, pp. 361-381.

3.4.3. Bid-ask Spread: The Components

According to the differences in sample period, stocks, exchange structure, and empirical models the components of bid-ask spread vary across different studies. Moreover, the estimation models also vary across different studies based on different assumptions. For instance, Roll[211], Stoll[212] and George et al.[213] infer the bid-ask spreads from the series covariance of time-series of transaction prices, while Glosten and Harris[214], and Huang and Stoll[215] infer the components from trade size and whether the trade is initiated by a buyer or seller. However, Huang and Stoll, show that these models are basically identical, and they only differ in assumptions about the components and the probability of price reversal.

Roll[216] constructs a model on effective spreads using time series of transaction prices, assuming that the market is informatively efficient and the probability distribution of observed prices is stationary. We must add at this point that finance literature on bid-ask spreads distinguishes the quoted (observed) spreads from effective (realized) spreads. According to Stoll[217], the former is defined as the difference between the ask price and the bid price quoted by a dealer at a point of time. The later is defined as "the average difference between the price at which a dealer sells at one point in time and the price at which a dealer buys at an earlier point of time". The theories of spreads are about the quoted spreads. Generally, effective spreads are smaller than quoted spreads, because most trades are actually executed within the quoted spreads[218]. Using daily and weekly transaction returns for a large cross-section of NYSE/AMEX stocks during 1963-1982, Roll finds that the effective spreads decrease with firm size, consistent with earlier studies. Although Roll[219] does not try to directly decompose the spreads, his model initiates a number of studies to estimate effective spread and its components.

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211 R. Roll, "A simple implicit measure of the effective bid-ask spread in an efficient market", **The Journal of Finance**, 39, 1984, p. 1130.
212 H. R: Stoll, op. cit., 1989, p. 121.
213 T. J. George, G. Kaul, and M. Nimalendran., "Estimation of the bid-ask spread and its components: A new approach", **Review of Financial Studies**, 4, 1991, pp. 634-635.
214 L. Glosten, L. Harris., op. cit., p. 126.
215 R. Huang, and H. Stoll, 'The Components of the Bid-ask Spread: A General Approach', **Review of Financial Studies**, Vol. 10, 1997, pp. 995-1034.
216 R. Roll, op. cit., p. 1130.
217 H. R. Stoll, op. cit., 1989, p. 124.
218 F. Heflin et al., op. cit., p.14
219 R. Roll, op. cit., p. 1130.

Glosten and Harris[220] try in their study to decompose the spreads using a 20-stock specification sample and a 250-stock validation sample from NYSE during December 1981 to January 1983, they estimate the transitory component (inventory holding cost, clearing cost and monopoly profits) and permanent component of spreads (adverse selection cost) and they conclude that information asymmetry is a significant component of stock spreads.

Stoll[221] establishes a model for time-series behavior of spreads and explicitly specifies the relationship between the quoted spreads and the effective spreads through the magnitude and possibility of price reversal. He estimates the components for three monthly samples of NASDAQ stocks in October, November and December 1984. His results show that the adverse selection component accounts for 43% of spreads, and order processing component accounts for 47%. The remaining 10% is the inventory holding cost. However, George et al.[222] according to their model, report that the adverse selection component varies from 8% to 13% of the spread for a sample of NASDAQ stocks with small trades during 1983-1987.

Wei[223] examines the intraday variations in the components of spreads and trading activity. Wei (1992) estimates the average adverse selection and transitory component (order processing and inventory costs) at 81% and 19%, respectively, for both the high-activity group and the low-activity group. However, using the Glosten and Harris[224] model, Wei finds that the average adverse selection component is 21% (transitory component as 78%) for the high-activity group, and 58% (transitory component as 42%) for low-activity group. These estimates are consistent with the notion that information asymmetry is lower for active stocks. Because the two models generate different estimates, the relevant intraday patterns of adverse selection component estimated are not consistent. Additionally, Wei finds a declining pattern of trading activity and price variability for the high-activity group but not for the low-activity one.

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[220] L. Glosten, L. Harris., op. cit., p. 126.
[221] H. R. Stoll, op. cit., 1989, p. 127.
[222] T. J. George, G. Kaul, and M. Nimalendran., op. cit., 1991, pp. 634-635.
[223] P. H. Wei, “Intraday variations in trading activity, price variability, and the bid-ask spread”, **Journal of Financial Research,** 15, 3, Fall, 265–276.
[224] L. Glosten, L. Harris., op. cit., p. 131.

Affleck-Graves et al.[225] estimate the components of spreads of NYSE/AMEX and NASDAQ stocks traded on March and April 1985 isolating firm-specific differences from market structural differences, by forming matched samples of 339 stocks in March 1985 and 399 stocks in April 1985 based on price, price volatility, trading volume, and stock capitalization. Under the Stoll[226] model, they estimate the adverse selection, order processing, and inventory components for their NYSE/AMEX stocks at 59%, 12% and 29% respectively, and those for NASDAQ stocks at 35%, 41% and 24% respectively. However, under the George et al.[227] model, the adverse selection and order processing components for their NYSE/AMEX stocks are 26% and 74% respectively, and those for NASDAQ stocks are at 7% and 93% respectively. They conclude that the adverse selection problem is less severe in a multi-dealer market. Porter and Weaver[228] also investigate the difference in the components of spread between NYSE, AMEX and NASDAQ stocks. Their results suggest lower adverse selection component for multi-dealer markets, consistent with Affleck-Graves et al.[229].

Lin et al.[230] estimate the adverse selection component at 35% for their total sample, and report an increasing adverse selection component with trading volume. The average order processing component is about 33%, with an inverse relation with trading volume. These percentages are relatively lower than reported in Stoll[231] for a large cross-section of NYSE stocks.

Madhavan et al.[232] develop a model similar to Glosten and Harris[233] to investigate the intraday pattern of spreads and its components. Based on transaction data for 274 NYSE stocks in 1990 over five intraday intervals, they report a declining pattern for both the spreads and the adverse selection component, the latter ranging from 51%

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225 J. Affleck-Graves, Hedge, S. P., and R.E. Miller, "Trading mechanisms and the components of the bid-ask spread" **Journal of Finance,** 49, 1994, pp.1471-1488.
226 H. R. Stoll, op. cit.,1989, p. 130.
227 T. J. George, G. Kaul, and M. Nimalendran., op. cit., 1991, p. 634-635.
228 David C. Porter, Daniel G. Weaver, Estimating Bid-ask spread components: Specialist versus multiple market maker systems, **Review of Quantitative Finance and Accounting**, 6, 1996, pp. 167-180.
229 J. Affleck-Graves, J., Hedge, S. P., and R.E. Miller, op. cit., pp.1471-1488.
230 J. C. Lin, G. Sanger and G. Booth, 'Trade Size and Components of the Bid-Ask Spread', **Review of Financial Studies**, Vol. 8, 1995, pp. 1153-83.
231 H. R. Stoll, op. cit, 1989, pp. 131.
232 A. Madhavan, Richardson, M., and M. Roomans, "Do security prices change? A transaction-level analysis of NYSE stocks" **Review of Financial Studies** 10, 1997, 1035-1064.
233 L. Glosten, L. Harris., op. cit, pp. 133.

to 36% over the intraday intervals. In addition, they provide evidence on the intraday pattern of the price volatility, effective spreads, returns, and quote correlations.

According to their three-way decomposition model, Huang and Stoll[234] estimate the average adverse selection, order processing and inventory holding component at 9.6%, 62.7% and 28.7%, respectively, for the 20 largest and most active NYSE stocks during 1992. The adverse selection component is much lower than reported in prior studies on NYSE stocks, such as Glosten and Harris[235], Stoll[236], Affleck-Graves et al.[237]. This could be explained by the use of largest and most active stocks because the information asymmetry is negatively related to the firm size and trading activity as in Demsetz[238]; Chiang and Venkatesh[239].

These studies on the components of spreads are summarized in Table 5. Generally, these findings indicate that the adverse selection component is a significant proportion of the spread. This is also confirmed by studies on order-driven markets.

Table 5: Summary of Studies on the Components of Bid-ask Spread

Study	Model	Sample	Findings
Roll (1984)	Roll (1984)	NYSE/AMEX Stocks (1962-1983)	Develops a model to estimate the effective bid-ask spread from a series of closing transaction prices, and finds that spreads are negatively related to firm size.
Glosten and Harris (1988)	Glosten and Harris (1988)	NYSE stocks (12/81-01/83)	With price discreteness ignored, the adverse selection component accounts for 20% of the spread. With price discreteness, the adverse selection component accounts for 35% (inventory holding cost is assumed as 0).

[234] R. Huang and H. Stoll, op. cit, pp. 995-1034.
[235] L. Glosten, L. Harris., op. cit, p. 135.
[236] H. R. Stoll, op. cit, 1989, p. 132.
[237] J. Affleck-Graves, Hedge, S. P., and R.E. Miller, *op. cit.* , pp. 1477.
[238] H. Demsetz, p. 50.
[239] R. Chiang, P. Venkatesh., pp. 1044.

Stoll (1989)	Stoll(1989)	NASDAQ stocks (10/84-12/84)	The adverse selection component accounts for 43% of the spread; while order processing costs are 47% (inventory holding cost is 10%).
George et al. (1991)	George et al. (1991)	NASDAQ stocks (1983-1987)	The adverse selection component accounts for 8%-13% of the spread; while order processing costs are 87-92% (inventory holding cost is assumed as 0).
Wei[240] (1992)	Glosten and Harris (1988), Stoll (1989)	NYSE stocks (09/87-10/87)	Under the Stoll (1989) model, the adverse selection component accounts for 81% of the spread, while order processing and inventory costs are 19%. Under the Glosten and Harris (1988) model, the adverse selection component accounts for 21% of the spread, while order processing and inventory costs are 79%.
Affleck -Graves et al.[241](1994)	Stoll (1989) George et al. (1991)	NASDAQ NYSE/AMEX (03/85-04/85)	Under the Stoll (1989) model, the adverse selection, order processing and inventory costs for NYSE/AMEX stocks are 59%, 12% and 29%, respectively, and those for NASDAQ stocks are 35%, 41% and 24%. Under the George et al. (1991) model, the adverse selection and order processing costs for NYSE/AMEX stocks are 26% and 74%, respectively, and those for NASDAQ stocks are 7% and 93%, respectively.
Lin et al.[242] (1995)	Lin et al. (1995)	NYSE stocks (1988)	The average adverse selection component accounts for 35% of the spread, while order processing costs are 33%.

[240] P. H. Wei, op. cit , pp. 272-273.
[241] J. Affleck-Graves, Hedge, S. P., and R.E. Miller, op. cit,1994, p. 1477.
[242] J. C. Lin, G. Sanger and G. Booth, op. cit, p. 1174.

Porter and Weaver[243] (1996)	George et al. (1991)	NASDAQ NYSE/AMEX (1990)	The adverse selection component for NYSE, AMEX and NASDAQ ranges from -5% to 55%, 17% to 46%, and -2% to 24%.
Huang and Stoll[244] (1997)	Huang and Stoll (1997)	NYSE stocks (1992)	The adverse selection component accounts for as low as 9.6% of spread for the 20 largest and most active NYSE stocks.
Madhavan et al.[245] (1997)	Madhavan etal. (1997)	NYSE (1990)	The average adverse selection cost accounts for 40%, ranging from 36%-51%.
Brockman and Chung[246] (1999)	Lin et al. (1995)	Hong Kong Stock Exchange	The adverse selection component accounts for 33% of the spread, while the order-processing component accounts for 45%. (Inventory holding cost is assumed as 0).

3.4.4. Bid-Ask Spread and Researches on Order-Driven Markets

All the theories based on quote-driven markets that we've reviewed are also applicable to order-driven markets, since the bid-ask spread is a natural property of an order-driven market[247]. Moreover, the equilibrium in an order-driven market is no less robust than that of a quote-driven market[248].

Accordingly, Glosten[249] shows that the existence of adverse selection costs generates positive bid-ask spreads in an order-driven market. Handa et al.[250] also show that placing a limit order in an order-driven market involves the information asymmetry cost. Brockman and Chung[251] examine the components of the bid-ask spread on Hong Kong Stock Exchange (HKSE) an order driven market and they decompose the spreads

[243] D. C. Porter, Daniel G. Weaver, op. cit, pp. 167-180.
[244] R. Huang, H. Stoll, op. cit, pp. 995-1034.
[245] A. Madhavan, M. Richardson and M. Roomans, op. cit, pp. 1035-1064.
[246] P. Brockman, D. Y. Chung, "Bid-ask spread components in an order-driven environment", **The Journal of Financial Research**, 12, 1999, p. 237.
[247] P. Handa, R. Schwartz, and A. Tiwari, "The ecology of an order-driven market", **Journal of Portfolio Management**, 1998, pp. 47-55.
[248] A. Madhavan, M. Richardson and M. Roomans, op. cit, p. 1059.
[249] L. R. Glosten, "Equilibrium in an electronic open limit order book", **Journal of Finance** 49, 1994, pp. 1127-1161.
[250] P. Handa, R. Schwartz, and A. Tiwari, op. cit, pp.49-51.
[251] P. Brockman, D. Y. Chung, op. cit, p. 237.

into adverse selection and order processing costs for each of 345 sample firms. Their results indicate that the adverse selection costs are significant components of spreads (with a median of 33%), which decrease with trading volume. Their findings are generally consistent with the literature on quote-driven markets.

Table 6: Summary of Empirical Studies on the Permanent Impact of Accounting Disclosure on Information Asymmetry

Study	Findings
Swaminathan[252] (1991)	The release of SEC mandated segment data results in a significant increase in price variability and decrease in the divergence of belief (measured with analyst earnings forecast) around annual report releases for firms reporting these data the first time. These impacts are prepositional to the number of segments.
Hagerman and Healy[253] (1992)	Find a decrease in spreads subsequent to the SEC insider-trading regulations, which may also attribute to changes in pricing system for the OTC securities.
Greenstein and Sami[254] (1994)	The SEC mandated segment disclosures have permanent impact on the bid-ask spread. The relative bid-ask spread decreased more significantly in the period subsequent to the annual report release for firms reporting segment data for the first time than for either firms previously reporting this information or single-segment firms. The impacts are proportional to the number of segments.
Welker[255] (1995)	Higher relative spreads are associated with firms with lower disclosure rankings.
Boone[256](1998)	Disclosure of the discounted present value of oil and gas reverses is associated with a decline in spreads.
Healy et al.[257] (1999)	Increases in analyst disclosure ratings are positively associated with firm's stock returns, growth in institutional ownership, more analyst coverage and negatively associated with spreads.
Leuz and Verrecchia[258] (2000)	Firms committing to either the IAS or U.S. GAAP have lower percentage bid-ask spread and higher share turnover than firms using German GAAP. Also find that these firms experience higher price volatility, which is driven by less frequently traded stocks.

252 S. Swaminathan, op. cit, p. 32.
253 R. L. Hagerman, J. P. Healy, op. cit , p. 238.
254 M. M. Greenstein, H. Sami., op. cit, p. 185.
255 M. Welker, op. cit , pp.813-822.
256 J. P. Boone, op. cit, p. 65.
257 P. M. Healy, A. P. Hutton, and K. G. Palepu., op. cit., p. 491-492.
258 C. Leuz, R. E. Verrecchia op. cit., p. 111.

Leuz[259] (2001)	Finds no significant difference in the bid-ask spread between German firms using IAS and those using the U.S. GAAP.
Heflin et al.[260] (2001)	Find that firms with higher analyst disclosure ratings have lower effective spreads, lower adverse-selection component of spread.

Brockman and Chung[261] investigate whether the trading behaviors of informed and uninformed traders and the related impacts on the market liquidity are similar. Their results suggest that limit order traders on the HKSE behave in the same manner as dealers on quote-driven markets, such as widening spreads and reducing depth for stocks with higher risk of informed trading. Consistently, Joo et al.[262] examine the trading data of fifty shares on Singapore Stock Exchange during October and November of 1994. They find that the estimated effective spreads are not significantly different from the observed spreads, which implies that in trading systems without market makers, the Roll[263] model performs as well as in trading systems dominated by market makers.

Aitken and Frino[264] investigate if the order-driven markets have different factors, using a multivariate regression model of relative bid-ask spread on number of trades, price level, and price volatility, they find that these three factors are the fundamental factors of bid-ask spread in the order driven markets as in the quote driven markets. This result is consistent with the findings of Benston and Hagerman[265], Stoll[266], and Chiang and Venkatesh[267].

Leuz and Verrecchia[268] studied whether increased accounting disclosure could reduce information asymmetry in the order-driven markets as in the quote-driven markets. They investigated if switching from national GAAP to an international reporting regime (IAS or U.S. GAAP), experienced lower information asymmetry and

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259 C. Leuz, op. cit., pp.87-88.
260 F. Heflin et al., op. cit., p.13
261 P. Brockman, D. Y. Chung, op. cit., p. 133.
262 T. H. Joo, B. K. C. Hing, L. A. Meng, "Estimation of the bid-ask spread: Evidence from the stock exchange of Singapore" **International Journal of Management**, 15,3, 1998, p. 364-370.
263 R. Roll, op. cit., p.1130.
264 M. Aitken , A. Frino., op. cit., p. 51-52.
265 G. Benston, R. Hagerman., op. cit., pp. 355-359.
266 H. R. Stoll, op. cit., 1978, p.1155.
267 R. Chiang, P. Venkatesh., op. cit., p. 1044.
268 C. Leuz, R. E. Verrecchia, op. cit., p. 111.

hence lower cost of capital than non-switching firms. They showed that switching firms had lower bid-ask spreads and higher trading volume compared to non-switching firms, suggesting firms' committing to increased accounting disclosure could reduce information asymmetry in an order-driven market. So, we see that, the findings of these studies confirm the results from quote-driven markets.

The existence of adverse-selection component[269], informed trading[270], validity of effective spread model[271], the factors affecting bid-ask spread[272], and reduction in information asymmetry through increased accounting disclosure[273] are all confirmed in the order driven markets. Accordingly, in our research, we will investigate these factors, the components of bid-ask spread in an order-driven market, as well as the impact of increased accounting disclosure regulations on the bid-ask spread.

3.5. IFRSs Adoption and Its Relationship throughout the Bid-Ask Spread and Information Asymmetry

In this section, we review prior and concurrent evidence on the capital-market effects of IFRSs adoption. We focus primarily on studies examining the introduction of mandatory IFRSs reporting. Studies examining voluntary adoptions do not speak directly to the costs and benefits of an IFRSs reporting requirement. Overall, evidence on the consequences of mandatory IFRSs reporting is still in its infancy. Studies in the first category try to infer whether the adoption of IFRSs in the EU has net benefits (or costs) to firms from their stock market reactions to key events that made IFRSs reporting more or less likely.

3.5.1. Evidence from Voluntary IFRSs Adoption

When we examine the literature related to IFRSs adoption, we distinguish that there is a large and increasing number of studies analyzing the accounting effects and

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[269] P. Brockman, D. Y. Chung, op. cit., p. 237.
[270] P. Brockman, D. Y. Chung., op. cit., p.133.
[271] T. H. Joo, B. K. C. Hing, L. A. Meng, op. cit., pp. 364-370.
[272] M. Aitken, A. Frino., op. cit., pp. 51-52.
[273] C. Leuz, R. E. Verrecchia, op. cit., p. 111.

consequences of IFRSs. We analyzed prior studies we realized that we can subdivide the literature review into three broad categories:

- Studies examining IFRS and other local GAAP according to their quality of financial statements

- Studies examining the effects of IFRS adoption on capital markets, liquidity and cost of capital

- Studies that examine other effects of IFRS adoption.

3.5.1.1. IFRSs and local GAAPs and, The Quality of Financial Statements

Harris and Muller[274], Ashbaugh and Olsson[275], Eccher and Healy[276], Hung and Subramanyam[277] analyze the value relevance of IAS accounting numbers relative to local GAAP and/or U.S. GAAP numbers and generally find mixed evidence. Barth et al.[278] examine whether application of International Accounting Standards is associated with higher accounting quality and compute the combined effects of features of the financial reporting system, including standards, their interpretation, enforcement, and litigation for firms using IAS and compare them to those for firms using local GAAP and U.S. GAAP, respectively. The evidence suggests that IAS reports are of higher quality than local GAAP reports but of lower quality than U.S. GAAP numbers. Goncharov and Zimmermann[279] find little evidence that IFRSs adopters do not curb the level of earnings management relative to German GAAP, whereas the evidence in

[274] M. S. Harris and K.A. Muller III, "The market valuation of IAS versus US-GAAP accounting measures using Form 20-F reconciliations", **Journal of Accounting & Economics,** 26, 1999, pp. 285–312.
[275] H. Ashbaugh, P. Olsson, *An exploratory study of the valuation properties of cross-listed firms. IAS and U.S. GAAP earnings and book values*, **Accounting Review**, 2002, pp. 107-127.
[276] E. A. Eccher and P.M. Healy, "The Role of International Accounting Standards in Transitional Economies: A Study of the People's Republic of China", 2000, Working paper, MIT and Harvard Business School.
[277] M. Hung and K.R. Subramanyam, "Financial Statement Effects of Adopting International Accounting Standards: The Case of Germany", **Review of Accounting Studies,** 12,3, 2007, pp. 43-56.
[278] M. Barth, W. Landsman, M. Lang, and C. Williams, "Accounting Quality: International Accounting Standards and US GAAP", 2006, Working paper, Stanford University and University of North Carolina.
[279] I. Goncharov and J. Zimmermann, "Do Accounting Standards Influence the Level of Earnings Management? Evidence from Germany", 2006, Working paper, University of Amsterdam and University of Bremen.

Gassen and Sellhorn[280] suggests that IFRSs numbers are of higher quality. Daske and Gebhardt[281] find that IFRSs reporting is associated with higher perceived quality .

A related set of studies examines the compliance of firmes with IFRSs. Cairns[282] examines firms' adoption approaches such as full adoption, dual reporting and their compliance with IFRSs as well as Street and Bryant[283], Gebhardt and Heilmann[284] use disclosure checklists to determine the level of compliance of IFRSs firms relative to other sets of firms. All these studies document substantial non-compliance with IFRSs, but they are based on fairly small samples and do not examine the capital-market effects of non-compliance. Using a larger sample of non-U.S. firms around the world, Bradshaw and Miller[285] also find non-compliance among firms that have voluntarily adopted U.S. GAAP.

3.5.1.2. Capital Market Effects of IFRSs Adoption

Leuz and Verrecchia[286] investigate the changes in liquidity experienced by firms that switch from German accounting standards to US GAAP or IAS. They explain that German accounting standards have been criticized for allowing too much discretion to managers since they do not contain the detailed disclosure requirements demanded by the US GAAP. They argue that by adopting the US accounting standards, firms commit to disclosing much more information to the investors than that is disclosed under German GAAP. In a cross-sectional analysis*, they demonstrate that firms that are committed to either IAS or US GAAP have lower bid-ask spread and greater liquidity in the market as compared to the firms using German GAAP. Additionally, they find that firms that switch from German GAAP to IAS or US GAAP experience a decline in spreads accompanied by an increase in share volume around the time of the switch.*

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[280] J. Gassen and T. Sellhorn, "Applying IFRS in Germany - Determinants and Consequences", **BFuP** 58, 2006, pp.365–386.
[281] H. Daske and G. Gebhardt, "International Financial Reporting Standards and Experts' Perceptions of Disclosure Quality", **Abacus** 42, 2006, pp.461–498.
[282] D. Cairns, **International Accounting Standards Survey**, LLP Professional Publishing, UK, 1999.
[283] D. L. Street, S. Bryant, 2000, Disclosure Level and Compliance with IASs: A Comparison of Companies With and Without U.S. Listings and Filings, **International Journal of Accounting**, 35, pp.305–329.
[284] G. Gebhardt and A.A. Heilmann, "Enforcement of German and International Accounting Standards in Germany: The Case of Cash Flow Statements", in A. Hopwood, C. Leuz and D. Pfaff (eds.), **The Economics and Politics of Accounting**, 2004, pp.218–238.
[285] M. T. Bradshaw and G.S. Miller, "Will Harmonizing Accounting Standards Really Harmonize Accounting? Evidence from Non-U.S. Firms Adopting US GAAP", 2005, Working paper, Harvard University.
[286] C. Leuz, R. E. Verrecchia. op. cit., p. 111.

Gassen and Sellhorn[287] analyze voluntary IFRSs adoptions between 1998 and 2004 and find an increase in market liquidity using bid-ask spreads and the frequency of zero returns. In contrast, Dumontier and Maghraoui[288] find that market liquidity increases only for larger firms in the sample using IFRSs adoptions from 2000 to 2005 and 1999 to 2002, respectively.

There are also a few recent studies analyzing the cost of capital effects of IFRSs reporting. They produce mixed evidence. Using implied cost of capital estimates, Cuijpers and Buijink[289] do not find significant differences across local GAAP and IFRSs firms in the EU. Daske[290] presents evidence that German IFRSs firms have a higher cost of equity capital than German GAAP firms.

Cuijpers and Buijink[291] use a European sample to test the affect of changing from local-GAAP to either IFRSs or US-GAAP. They examine information asymmetry proxied by analyst following, forecast dispersion and stock return volatility and the implied cost of capital estimated using the method suggested by Easton[292]. They document a positive effect of adopting IFRSs or US-GAAP on analyst following, but fail to find support for a lower implied cost of equity. They also examine recent and early adopters of IFRSs or U.S. GAAP. They suggest that analysts need time to understand financial statements under the new standards. These results suggest that realization of the benefit of switching to non-local GAAP may take time. Contrary to this conclusion Daske[293] finds no evidence of a reduced cost of capital when using both the residual income valuation model. In contrast, Daske[294] fails to find a decrease in the cost of equity, measured from several stock valuation models for German firms

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287 J. Gassen and T. Sellhorn, op. cit., pp. 365–386.

288 P. Dumontier and R. Maghraoui. “Does the adoption of IAS-IFRS reduce information asymmetry systematically?” Proceedings of the 30th Annual Congress of the European Accounting Association, Lisbon, Portugal, April 25-27, 2007.

289 R. Cuijpers and W. Buijink, “Voluntary adoption of non-local GAAP in the European Union: a study of determinants and consequences”, **European Accounting Review,** 14, 2005, 487–524.

290 H. Daske, “Economic Benefits of Adopting IFRS or US-GAAP – Have the Expected Costs of Equity Capital really decreased?”, **Journal of Business Finance & Accounting**, 33, 2006, 329–373.

291 R: Cuijpers and W. Buijink,, op. cit., pp. 512-520.

292 P. Easton, “PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital”, **The Accounting Review**, 79, 2004, pp. 79–95.

293 H. Daske, , op. cit., pp. 329–373.

294 Ibid., p.340

adopting IFRSs or U.S. GAAP. Leuz[295] examines bid-ask spreads and stock turnover ratios for U.S. GAAP and IAS firms in Germany's New Market, where U.S. GAAP and IAS are the only allowed financial reporting standards. Consistent with Leuz and Verrecchia[296], he does not find any statistical differences in bid-ask spreads and turnover ratios across the two standards. In more recent studies Daske et al.[297] examine the economic consequences of voluntary IFRSs adoptions around the world and document that the average effects on the cost of capital and the market liquidity are generally modest. They point out the heterogeneity in the consequences and recognize that firms have considerable discretion in how they adopt IFRSs. Some firms may simply adopt a label, while others view the decision as a serious commitment to transparency. They classify firms into "label" and "serious" adopters and analyze whether capital markets respond to differences in adoption quality, using proxies for market liquidity and the cost of capital. Consistent with their predictions, they find that "serious" adopters experience significantly stronger effects on the cost of capital and market liquidity than label adopters.

3.5.1.3. Other Effects Of IFRSs Adoptions

These studies focus on the behavior of financial statement users. Covrig et al.[298] document that foreign mutual fund ownership is significantly higher for IFRSs adopters compared to local GAAP firms. La Porta et al.[299] provide the first investigation of the legal system's effect on a country's financial system. They find that common law countries have better accounting systems and better protection of investors than code law countries.

There is an increasing literature suggesting that voluntary IFRSs reporting is associated with substantial capital market benefits, but the results are often mixed.

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[295] C. Leuz, , op. cit., pp. 445-472.
[296] C. Leuz, R. E. Verrecchia,, op. cit., p. 111
[297] H. Daske, L. Hail, C. Leuz, and R. S. Verdi, "Adopting a Label: Heterogeneity in the Economic Consequences of IFRS Adoptions", 2007, Working paper, University of Pennsylvania and University of Chicago.
[298] V. M. Covrig, M.L. DeFond and M. Hung, "Home Bias, Foreign Mutual Fund Holdings, and the Voluntary Adoption of International Accounting Standards", **Journal of Accounting Research,** 45, 2007, pp. 41–70.
[299] R. La Porta, F. Lopez-de-Silanes, A. Shleifer and R. Vishny, "Law and Finance", **Journal of Political Economy,** 106, 1998, pp. 1113-1155.

3.5.2. Evidence from Mandatory IFRSs Reporting

Arguments suggesting that the adoption of mandatory IFRSs reporting yields significant capital market benefits often start from the premise that IFRSs reporting increases transparency and improves the quality of financial reporting (e.g., EC Regulation No. 1606/2002), citing that IFRSs are more capital-market oriented and more comprehensive, especially with respect to disclosures, than most local GAAP. To the extent that the premise is correct, prior analytical and empirical studies suggest that the introduction of mandatory IFRS reporting should be associated with an increase in market liquidity as well as a decline in firms' cost of capital. That is, higher quality financial reporting and better disclosure should reduce adverse selection problems in share markets and lower estimation risk[300]. Voluntary adoption differs from mandatory adoption both because of the elimination of self selection issues in the latter and because the choice to voluntarily adopt is a signal that include information in itself[301].

In this section according to the related literature we can subdivide into three categories:

- Studies examining the stock market reactions and mandatory IFRSs reporting

- Studies using local capital-market settings to compare the consequences of mandatory IFRS/US GAAP reporting and

- Studies analyzing the effects of mandatory adoption of IFRSs for fiscal year 2005.

3.5.2.1. Stock Market Reactions and Mandatory IFRSs Reporting

Concerning the studies about stock market reactions, Comprix, Muller and Stanford[302] examine the market reaction to mandatory compliance with IFRSs rather than voluntary adoption. They examine abnormal returns in the EU around dates of increased likelihood of mandatory IFRSs. They connect the abnormal returns to a

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[300] R. E. Verrecchia, op. cit., 2001, pp. 91–180.
[301] R. A. Dye, "Strategic accounting choice and the effects of alternative financial reporting requirements". **Journal of Accounting Research**, vol. 23, no. 2. 1985, pp. 3-9.
[302] J. Comprix, K. Muller, and M. Stanford. "Economic Consequences of Mandatory Adoption of IAS in the European Union". 2003, Working paper, Pennsylvania State University.

number of company and country characteristics. They find that companies that are a) audited by a big 5 auditor, b) located in countries that will experience the greatest increase in quality of financial information as a consequence of IFRSs, and c) are subject to the highest level of legal enforcement experience significant positive returns on some of the event dates they examine. However, they find a weakly significant, but negative market reaction to the four event dates.

Armstrong et al.[303] examine the reactions to 16 events between 2002 and 2005 associated with the adoption of IFRSs in the EU and find a positive (negative) reaction to events that increase (decrease) the likelihood of IFRSs adoption. The results show that the reaction was more positive for firms with lower quality pre-adoption information environments, with higher pre-adoption information asymmetry, and firms that are domiciled in common law countries.

Christensen et al.[304] studies the market reactions of U.K. firms to announcements of mandatory IFRS reporting in the EU and point out that the average U.K. market reaction is small. Using the degree of similarity with German voluntary IFRSs and U.S. GAAP adopters as a proxy for a U.K. firm's willingness to adopt IFRSs, they find that this proxy is positively (negatively) related to the stock price reaction to news events increasing (decreasing) the likelihood of mandatory IFRSs reporting. They find a similar association for changes in the implied cost of equity capital. The heterogeneity in the results across firms is consistent with the reporting incentives view.

Studies in the second category analyze the effects of mandated IFRSs using the first set of annual reports released under the new reporting regime. They are closest in spirit to our firm-year analyses, but limited to particular countries and fragmented in terms of the research methods. First, Platikanova[305] studies various measures of liquidity and information asymmetry in four European countries. She finds

[303] C. S. Armstrong, M. E. Barth, A. D. Jagolinzer, E. J. Riedl, "Market Reaction to Events Surrounding the Adoption of IFRS in Europe", 2003, Harvard Business School Working Paper,

[304] H. B. Christensen, E. Lee, and M. Walker, "Do IFRS/UK-GAAP reconciliations convey new information?", 2007, Working paper, Manchester Business School.

[305] P. Platikanova, "Market Liquidity Effects of the IFRS Introduction in Europe", 2007, Working paper, University Pompeu Fabra.

heterogeneous liquidity changes for these countries and documents that the liquidity differences across countries become smaller after the adoption of IFRSs.

Christensen et al.[306] analyze the market reactions of U.K. firms to announcements of mandatory IFRSs reporting in the EU and find that the average U.K. market reaction is small. The authors use the degree of similarity with German voluntary IFRSs and U.S. GAAP adopters as a proxy for a U.K. firm's willingness to adopt IFRSs, and find that this proxy is positively (negatively) related to the stock price reaction to news events increasing (decreasing) the likelihood of mandatory IFRSs reporting. They also find a similar association for changes in the implied cost of equity capital.

3.5.2.2. Local Capital Markets and the Consequences of Mandatory IFRSs and US-GAAP Adoption

Leuz[307] is the first study to analyze the economic consequences of IFRSs reporting. In his study he analyzes firms in German's Former New Market and points out that differences in bid-ask spreads, turnover and IPO under pricing are statistically and economically insignificant across IFRSs and US GAAP firms. Even if they use different accounting standards, the both sets of firms are characterized by similar information asymmetries. While this study illustrates relatively clean comparison across IFRSs and US GAAP firms, it cannot provide if mandatory reporting has any effects on information asymmetry or market liquidity.

Hughes and Sander[308] based their study on 40 cross-listed firms from EU and worked on the issue of convergence. They use a comparability index and conclude that IFRSs has not resulted in convergence with US-GAAP.

Platikanova[309] studies various measures of liquidity and information asymmetry in four European countries and finds that the liquidity differences across countries become smaller after the adoption of IFRSs.

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[306] H. B. Christensen, E. Lee, and M. Walker, op. cit., pp.14-16.
[307] C. Leuz, op. cit.,pp. 445-472.
[308] S. B. Hughes and J. F. Sander, "Are IFRS and US GAAP Converging? Preliminary Evidence from Three European Union Countries", 2007, Working paper, University of Vermont.

Giner and Iniguez[310] compare the earnings quality of 119 firms that are cross-listed in the US and have to report under IFRSs in the EU using various proxies suggested by Leuz[311]. Hence, the result do not illustrate clear differences in earnings quality across IFRSs and US GAAP firms.

3.5.2.3. Other Effects of Mandatory IFRS Adoption

Demaria and Dufour[312] examine the transitional effects and changes in accounting numbers and observe firm's accounting choices in an explanatory backround. Abellan and Aledo[313] analyze Spanish firms and the systematic effects of IFRSs adoption on accounting ROE (Return on Equity). Aubert and Dumontier[314] observe if financial analysts are able to anticipate the impact of IFRS reporting on firms'earnings. Morais and Curto[315] point out that the mandatory IFRS reporting increases the value relevance of EU firms. Lin and Paananen[316] observe the development of value relevance of IFRSs over time and that the relation between earnings, book value of equity and market prices has increased.

Lang et al.[317] and Leuz[318], show that firms' reporting practices are influenced by home-country institutions are consistent with these results.

Finally, the studies on mandatory IFRSs reporting are in period of infancy as most of them use financial data from 2005. This means that there is still no clear evidence from stock market reactions toward IFRSs reporting.

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[309] P. Platikanova, op. cit., pp. 12-18.

[310] B. Giner, R. Iniguez, "Earnings quality of ifrs vs usgaap: do both accounting models produce equivalent quality measures?", **European Accounting Association Annual Congress**, Lisbon, April 2007.

[311] C. Leuz, op. cit., pp. 445-472.

[312] S. Demaria and D. Dufour, "First Time Adoption of IFRS, Fair Value Option, Conservatism: Evidence from French Listed Companies", 2007, **EAA Annual Congress**, Lisbon 2007.

[313] D. Abellán and J. Aledo, "Impact of IFRS on Accounting Returns and Accounting-Based Residual Income Model: Does it Work?", **EAA Annual Congress**, Lisbon 2007.

[314] F. Aubert and P. Dumontier, "Analyzing Analysts' Expertise: Did Analyst Fully Anticipate the Impact of IFRS Adoption on Earnings?" **EAA Annual Congress**, Lisbon 2007.

[315] A. Morais and J. D. Curto, "IASB Standards Adoption: Value Relevance and the Influence of Country-Specific Factors", **EAA Annual Congress**, Lisbon 2007.

[316] H. Lin and M. Paananen, "The Development of Value Relevance of IAS and IFRS over Time: The Case of Germany", 2007, Working paper, University of Hertfordshire.

[317] M. Lang, Smith Raedy, J. and W. Wilson, "Earnings Management and Cross Listing: Are Reconciled Earnings Comparable to US Earnings?", **Journal of Accounting & Economics,** 42, 2006, p. 271.

[318] C. Leuz, "Cross Listing, Bonding and Firms' Reporting Incentives: A Discussion of Lang, Raedy and Wilson", **Journal of Accounting & Economics**, 42, 2006, pp. 285–299.

3.6. The Institutional Features of the Istanbul Stock Exchange

In literature, researchers make a distinction between quote-driven and order-driven markets. In quote-driven markets such as NASDAQ in the U.S. designated market makers provide liquidity to the market by competing to quote the most attractive bid and ask prices. Investors submit their market orders that are subsequently matched against the market makers' bid and ask prices. In order-driven markets such as the Frankfurt Stock Exchange, the Singapore Stock Exchange and the Istanbul Stock Exchange, public limit orders supply liquidity to the market and provide the bid and ask prices, which are entered into, displayed, and matched through an automatic trading system[319]. Between them are hybrid quote-driven markets such as the New York Stock Exchange (NYSE), where the public limit orders also compete with the bid and ask prices quoted by designated specialists[320]. A pure order-driven market where orders are accumulated and matched against each other via the automated central limit order book at frequent call intervals (less than one minute between calls), there is no official market maker providing bid and ask quotations. On-line market report on the latest transaction prices, market bid and ask quotes and volumes for each stock is available to all investors. The markets bid and ask quotations are the best prices in the limit order book provided by various traders. In quote-driven markets, designated market makers supply liquidity to the market by continuously quoting the bid and ask prices that they are willing to trade at. In order driven systems, public limit orders provide liquidity to the market and establish the bid-ask spread[321].

3.6.1. Istanbul Stock Exhange

Inaugurated in the beginning of 1986, the Istanbul Stock Exchange (ISE) is the sole securities market of Turkey established to provide trading in equities, right coupons, Government bonds, Treasury bills, revenue sharing certificates bonds issued by the Privatization Administration and corporate bonds and to carry out repo

[319] R. A. Schwartz, B. W. Weber., "Next-generation securities market system: An experimental investigation of quote-driven and order-driven trading", **Journal of Management Information Systems**, 14, 2, 1997, p. 72.
R. Bildik, "Intra-Day Seasonalities on Stock Returns: Evidence from the Turkish Stock Market", **Emerging Markets Review**, Vol. 2, No. 4, December 2001, p. 1.
P. Handa, R. Schwartz, and A. Tiwari, op. cit., pp.49-51.
[320] P. Brockman, D. Y. Chung., op. cit., p. 240.
[321] Ibid., p. 241.

transactions. The Istanbul Stock Exchange is in the supervision of the Capital Markets Board (the regulatory and supervisory authority for the Turkish capital markets) which has the role of ensuring the proper operation of both the Istanbul Stock Exchange and its members and protecting the interests of both the public and the investing community. ISE consists of five types of markets: National Market, Second National Market, New Economy Market, Watch List Companies Market and Wholesale Market. The main segment is the National Market where all companies fulfilling listing requirements are traded. Transactions and listing requirements in ISE are supervised by the Capital market Board and the Surveillance Department.

The ISE is an order-driven, multiple-price, continuous auction market with no market makers or specialists. ISE is a pure order-driven market that uses a fully automated trading which is an order matching system based around the concept of “priority” trading, where orders are ranked in priority of price, then in time within price. Market liquidity is provided by the limit orders of traders - there are no market makers. The Istanbul Stock Exchange (ISE) members can execute purchase and sale orders for shares through the fully computerized trading system were completed in mid-November 1994. Buy and sell orders (either market or limit) that are entered into the system via trading terminals in members’ offices are immediately displayed to all operators in the network. Orders that can be matched, either fully or partially and the type of order placed is confidential and is not shown to other brokers. Prices are determined on a “multiple price-continuous auction” method. The buyers and sellers enter the orders into the computer system through their workstations located at the ISE building and also in their head offices, thus, the computerized system automatically matches buy and sell orders on a price and time priority basis.

The system enables the ISE members to trade in stocks and rights coupons. The stock trading activities are carried out in two separate sessions, first session is between 09.30 a.m.-12.00 a.m and the second session is between 14.00 p.m.-17.00 p.m. from Monday to Friday. Only electronic order submission is allowed in the first 15 (10) minutes of the morning (afternoon) session. Orders can be submitted both electronically and non-electronically (via brokers on the floor) afterwards.

Order involving a price limit is also limited by a maximum lot quantity and the maximum trading limit for an order is YTL 1.5 million (approximately $1.1 million) per order. Members can enter market and special orders with various validity periods of up to one trading day and unmatched orders without a specific validity period are canceled at the end of the trading session. Settlement of securities traded occurs 2 days later and is realized by the ISE Settlement and Custody Bank Inc. (Takasbank), which is the sole and exclusive central depository in Turkey.

The Base Price is determined by rounding the previous session's weighted average price to the nearest price tick. Price margins are generally limited to 10 % above or below the base price. However, in the rights issue market, the margin is 25 %. Upper limits are rounded upwards and lower limits downwards with the appropriate price tick. The best bid, offer and closing prices of stocks, indices and number of stocks are shown on screens and text light in the trading floors.

The companies traded on the ISE are obliged to submit to the ISE their financial statements on a quarterly basis according to the standards required by the Capital Markets Board. The six-month and annual financial results have to be independently audited. In addition to reporting all corporate actions to the ISE, the traded companies are also required to comply with the disclosure requirements.

Like a typical order-driven market, all bid and ask prices on the ISE are provided by public limit orders that are entered into, displayed, and matched through an automatic computerized trading system. The order information, including both the bid (ask) prices and the number of shares to be purchased (sold), is entered into the automatic trading system. Then on the basis of price and time priority rule, the system displays all the bid prices from the highest to the lowest and all the ask prices from the lowest to the highest. The buyer (seller) who demands liquidity is willing to submit a bid (ask) price to match the lowest (highest) displayed ask (bid) price, and thus an order is executed. These bid (ask) prices and trading information are instantaneously displayed to all actual and potential traders via floor-based or remote trading terminals to members and real time data vendors to non-members.

Therefore, as in quote-driven markets, the bid-ask spread is also a natural property of an order-driven market and consists of substantial adverse selection costs[322]. However, the traders, rather than market makers or specialists, directly provide the bid and ask prices to a limit order book. The above market features create a trading system different from previously researched markets such as NYSE, and NASDAQ. Thus, it remains an empirical question whether the findings on the quote-driven markets or hybrid quote-driven markets could apply to order-driven markets.

3.6.2. The Accounting Disclosure Regulation in Turkey

The first step of the analysis of Turkish accounting environment can be started by the Commercial Code of the country. Our Commercial Law is based essentially on French Commercial Code (1850) at the beginning and based on German and Italian Commercial Codes in the later decades, 1926 and 1956. Since the Commercial Law only prescribes the minimum book-keeping requirements, Tax Procedural Law (TPL) provides more detailed rules for practical accounting applications for all companies except financial institutions such as banks, insurance companies and companies listed in Istanbul Stock Exchange (ISE) since they have their own regulations.

Under the TPL, the Ministry of Finance (MOF) issued Accounting System Application General Communiqué Order No.1 in 1992 (became effective in 1994) and introduced a Uniform Chart of Accounts (CoA). This Communiqué prescribes the basic accounting concepts (social responsibility, business entity, going concern, periodicity, monitory unit, cost, objectivity, consistency, full disclosure, prudence, materiality, and substance over form), detailed principles for the preparation of financial statements, a chart of accounts and formats for financial statements (balance sheet, income statement, funds flow statement, profit distribution table, cost of sales statement, statement of changes in shareholders' equity). Even the aim of this Communiqué is defined as: "…to provide a true and fair accounting of operations and results of enterprises and companies owned by legal and real entities that keep accounting records on a balance sheet basis; to secure a fair reflection of the information presented to the interested

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[322] L. R. Glosten, op. cit., pp. 1151-1161.
P. Handa, R. Schwartz, and A. Tiwari, op. cit., p..54.

parties through financial statements; by maintaining the consistency and comparability of that information and to facilitate the audit of these firms", the main purpose is to provide information to tax authorities. Since the 1992 Communiqué, the major regulation of tax authorities can be seen as the 2003 Law No: 5024 (and 5228) which is also known "inflation adjustment" law. The Law 5024 is far from general "inflation accounting knowledge" and the results of adjusted statements are not clear since the first adjusted statements are still not prepared.

Under the Capital Markets Law (CML), the Capital Markets Board (CMB) regulates all corporations whose shares are traded on the ISE, brokerage companies operating in the market, mutual funds, and investment funds. In January 1989 the CMB issued a Communiqué governing financial reporting by the capital market companies. This Communiqué strongly emphasizes that the financial statements should contain useful information to the users for their economic decisions. Financial statements prepared according to CMB regulations must be published and audited. The auditors should be approved by CMB. Until 2001 financial reporting requirements of capital market companies are mostly based on 1989 Communiqué. Following the full membership application of EU by Turkey in the year 1987, our country has been influenced by the EU Regulations and by the International Accounting / Financial Reporting Standards following the recent acceleration of globalization as it is the case almost for all of the countriesIn 2001 CMB issued two important communiqués to provide a higher degree of harmonization with international applications. These are known as Communiqué for inflation accounting and communiqué for consolidation of financial statements and both of them are effective for financial statements for the financial years ending after 1 January 2003. Finally, in November 2003 the CMB issued another Communiqué which is on IFRSs identical standards. This Communiqué is become effective in the first interim (quarterly) financial statements starting from 1 January 2005.

Turkish Accounting Standards Board (TASB) is another important organization in Turkey. TASB is a public corporation with administrative and financial autonomy that has been established through an Article inserted into the Law on Capital

Markets through the Law 4487 announced on the Official Gazette dated 15/12/1999 and numbered 23910. TASB has adopted the resolution to exactly implement the sets of IFRSs. Within the framework of the copyright agreement entered into with IASB, TASB publishes the Turkish translations of international accounting/financial reporting standards on the Official Gazette as Turkish Accounting Standards.

Some of the Turkish firms were choosing the voluntary reporting in compliance with IFRSs before the entry into force of the CM Board's Communiqué by reason of securing funds from foreign money and capital markets, taking part in international trade or fulfilling the requests of foreign partners. But, the partnerships, stock brokers, portfolio management firms, and other firms under the consolidation, the capital market instruments issued by which are accepted for trading on stock exchange, are now obligatorily held liable to perform reporting in compliance with IFRSs.

According to the amendments added to CML in 1999, Turkish Accounting Standards Board (TASB), the official representative of International Accounting Standards Board (IASB) in Turkey, established as an autonomous body in 2002 to prepare and issue Turkish Accounting Standards (direct translations of IFRSs).

4. HYPOTHESES DEVELOPMENT AND RESEARCH DESIGN

4.1 Introduction

In this section, we will present the hypothesis on the relationships between bid-ask spreads and other market factors in ISE. Then, we will discuss the hypothesis on the impact of increased accounting disclosure on bid-ask spreads.

4.2. Hypotheses

4.2.1. Bid-ask Spread and Trading Volume

As mentioned in the previous chapters, the literature has documented a negative relationship between trading activity and spread[323]. With a higher trading volume, it is easier for the dealer to reverse his/her position from a buyer to a seller[324]. As a result, the holding period of the dealer is shorter. Thus, higher trading volumes are associated with shorter inventory holding periods and lower inventory holding cost components. Similar evidence is offered in other researches[325].

Although the inventory holding cost is considered as ignorable in an order-driven market because there are no market makers, some researchers[326] theoretically extend the negative relationship between the spread and the trading activity to an order-driven market. They suggest that limit orders have lower probability of execution for stocks with a lower transaction rate. Therefore, market participants are less likely to submit limit orders, which reduces the downward pressure on spreads. This inverse relationship between

[323] H. Demsetz, op. cit., p. 52.
S. M. Tinic, op. cit.,p. 81-82.
G. Benston, R. Hagerman., op. cit., pp. 355-359.
H. R: Stoll, op. cit., 1978, p. 1155.
T. Copeland, D. Galai., op. cit., p. 1460.
[324] P. Venkatesh, R. Chiang., op. cit., pp. 1092-1093.
[325] M. Coller, T. Yohn., op. cit., p. 187.
D. Easley, N. Keifer, M. O' Hara, and J. Paperman, "Liquidity, information, and infrequently traded stocks", **The Journal of Finance**, 51, 1996, pp. 1410-1415.
C. Leuz, op. cit., p.74.
[326] P. Brockman, D. Y. Chung., op. cit., p. 237.
[326] Ibid., p. 133.
K. J. Cohen, S. F. Maier, R. A. Schwartz, and D. K. Whitcomb. "Transaction costs, order placement strategy, and existence of the bid-ask spread", **Journal of Political Economy**, 89, 1981, pp. 297.

spreads and trading activity is supported by empirical studies in order-driven markets[327]. This implies that high trading activities can speed up the dissipation of private information from informed traders to liquidity traders and lower the information asymmetry in the market. Therefore, we conclude our first hypothesis as follows:

Hypothesis 1: The bid-ask spread in ISE is negatively related to the trading volume.

4.2.2. Bid-ask Spread and Price Volatility.

Following most of the studies[328] on information asymmetry, we add the price volatility in our study.

Earlier studies showed positive relationship between price variance and spreads[329]. As argued in Venkatesh and Chiang [330] and Kolb and Rodriguez[331], the more the price fluctuates, the higher the risk of security and the higher the spread. Hence, there is a positive relationship between the price volatility and the spreads.

Aitken and Frino[332] propose that in periods of high price volatility, informed traders have an opportunity to gain in trading with less informed traders. Consequently, the liquidity traders tend to demand a higher return in order to compensate them for the risk of loss in trading with informed traders. So, the traders set wider spreads to acquire higher returns.

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[327] C. Leuz, R. E. Verrecchia, op. cit., p. 111.
M. Aitken, A. Frino, op. cit., p. 55.
[328] P.Venkatesh, R. Chiang., op. cit.,p. 1097.
D. Easley et al., op. cit., p. 1417.
M. Aitken, A. Frino, op. cit., p. 53.
C. Leuz, R. E. Verrecchia., op. cit., p. 114.
C. Leuz, op. cit., pp. 87-88.
[329] H. R. Stoll, op. cit., 1978, p. 1155.
J. Hamilton, op. cit., p. 498.
T. Ho., H. R. Stoll., op. cit., p. 56.
[330] P. Venkatesh, R. Chiang., op. cit., p.1099.
[331] R. W. Kolb, R. J. Rodriguez., op. cit., pp. 55-57.
[332] M. Aitken, A. Frino, op. cit., p. 54.

Accordingly, the spreads in the market increase with price volatility and our second hypothesis is formulated as follows:

Hypothesis 2 : The bid-ask spread in ISE is positively related to the price volatility.

4.2.3. Bid-ask Spread and Market Value (Firm Size)

It should also be emphasized that large companies generally have lower spreads, as their high trading activities give informed traders less time to gain from informed trading with liquidity traders[333]. It should also be noted that these stocks are followed by more analysts and media coverage, which, leads to lower level of concentration of private information[334]. This inverse relationship between the firm size and spreads has been documented in previous research using U.S. data[335].

Stocks of large companies traded at higher frequencies accelerate the dissipation of private information to liquidity traders and consequently, large companies have lower level of information asymmetry than small companies. According to this negative relationship between the firm size and spreads, we have the following hypothesis:

Hypothesis 3 : The bid-ask spread in ISE is negatively related to the market value.

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[333] M. M. Greenstein, H. Sami., op. cit.,p. 185.
[334] R. Chiang, P. Venkatesh., op. cit., p. 1044.
[335] R. Roll, op. cit., p. 1130.
Y. Amihud, H. Mendelson., "Asset pricing and the bid-ask spread", **Journal of Financial Economics**, 17, 1986, p. 228.

4.2.4. The Increased Accounting Disclosure and Information Asymmetry

The implementation of new accounting standards should guide the disclosure of detailed financial information to the capital markets and enhance the quality of accounting disclosure[336]. The adoption of new standards can be considered as a systematic and significant increase in the level of disclosure. Moreover, a change in the information asymmetry (adverse selection) cost which is a significant component of spreads should have a direct impact on the size of spreads[337].

Therefore, as the standards make more previously undisclosed information available to the public and improve the quality of information, the information asymmetry should significantly decrease and accordingly the bid-ask spreads should experience significant decreases subsequent to the implementation of these standards. So, we have the following hypothesis:

Hypothesis 4: The bid-ask spread in ISE decreases after the adoption of IFRSs.

4.3. Research Design

We examined the impact of the implementation of IFRSs that became effective in 1 January 2005. Generally, the implementation of accounting standards can affect the accounting disclosure from the following year on but there are some exceptions. We took in consideration 2 years before and 2 years after the moment that the accounting standards issued and implemented at the end of 2004 fiscal year. This influenced the annual reports for the 2005 and for the following years.

In order to examine the market consequences of increased mandatory accounting disclosure, we have used as a sample in our study the firms included in ISE 100 index. We then excluded from our database the firms which have already adopted

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[336] K. C. Liu, W. G Zhang., **Current Accounting Issues in China: an Analytical Approach**, Prentice Hall, NJ, 1996, pp.44-46.
M. DeFond, T. J. Wong, and S. Li., "The impact of improved auditor independence on audit market concentration in China", **Journal of Accounting and Economics**, 28, 1999, pp. 275-278.
[337] M. M. Greenstein, H. Sami., op. cit., p. 187.

voluntarily the new standards. Then, our sample selection resulted in 53 firm observations for 5 years from 2003 to 2007. We examined the consequences of mandatory accounting disclosure and studied the impact of these new accounting standards in the market structure using the observations from the pre-adoption and post-adoption periods.

4.3.1. The Adverse-selection Component of Bid-ask Spread and The estimation of Bid-ask Spread

In order to start testing the hypotheses, we have to estimate the components of bid-ask spread and study whether the adverse selection component is significant in ISE. The literature[338] shows that the adverse selection component is one of the major elements of bid-ask spread. So, to extract the adverse selection component, we used the method, used by George et al.[339] and Desai et al.[340], which is one of the most used methods in the literature. This method uses the difference between transaction returns and returns based on bid prices to estimate the components of bid-ask spread. George et al. show that with this method, the daily and weekly data provide similar estimates of adverse-selection component. In addition, the inventory holding cost is assumed to be zero in his work, which is supported by many empirical studies[341]. Accordingly, under the assumption of zero inventory-holding cost, the theoretical relationship between the observed spreads and the difference between transaction returns and returns based on bid prices is as follows:

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[338] H. R. Stoll, op. cit., 1989, p.133.
T. J. George, G. Kaul, and M. Nimalendran., op. cit., pp. 634-635.
P. Brockman, D. Y. Chung., op. cit., p. 239.
[339] T. J. George et al., op. cit., p. 636.
[340] A. S. Desai et al., op. cit.,p. 170.
[341] H. R. Stoll, op. cit., 1989, p.133.
A. Madhavan, A., S. Smidt., "A Bayesian model of intraday specialist pricing", **Journal of Financial Economics**, 30, 1991, p. 211.

$$Cov(RD_{it} - RD_{i,t-1}) = -\pi_i^2(S_i^2/4)$$

Where $Cov(RD_{it} - RD_{i,t-1})$ = serial covariance of RD_{it}, the difference between the transaction returns based on the closing transaction prices and the returns calculated based on the closing bid-prices of firm i at time t;

π_i = the fraction of the spread due to order-processing costs;

S_i = the observed bid-ask spread.

Then, the order-processing component is estimated by using the model used by George et al[342].

$$\mathbf{S_{ei} = \alpha + \beta\, S_i + \varepsilon}$$

Where S_{ei} = the estimated bid-ask spread, calculated on the basis of theoretical model $Cov(RD_{it} - RD_{i,t-1})$

$Cov(RD_{it} - RD_{i,t-1})$ = serial covariance of RD_{it}, the difference between the transaction returns based on the closing transaction prices and the returns calculated based on the closing bid-prices of firm i at time t

S_i = the observed bid-ask spread

β = the measure of the order-processing fraction of bid-ask spread

(The return based on bid prices is calculated as $(B_{it} - B_{i,,\, t-1}) / B_{ii,\, t-1}$ where B_{it} is the closing bid price of firm i at time t)

According to Roll[343], smaller firms have larger relative spreads so we separated our sample into three groups based on firm's market value as in George et al.[344] .

[342] T. J. George et al. 1991, pp. 641.
[343] R. Roll, op. cit., p. 1132.
[344] T. J. George et al., op. cit., p. 643.

4.3.2. Analysis of Factors affecting Bid-ask Spread and Models

As outlined in the previous discussion, the increased regulation on accounting disclosure should decrease the information asymmetry component in the stock market. However, some researchers[345] point out that previous study suffered from the fact that the information asymmetry component is not directly observable. In order to address this problem, we used the bid-ask spread as a proxy for information asymmetry because recent studies commonly treat this as an explicit measure[346.] In addition, we investigated trading volume and price volatility, alternative proxies for the information asymmetry in the literature[347] .

In the following section, we studied the effect of adopting the new accounting standards on bid-ask spread, trading volume, and price volatility. First, descriptive statistics are presented and examined. Then, we continued by performing univariate analysis to compare the differences in means and medians of these variables for pre-adoption and post-adoption periods. After interpreting the results, we estimated a set of OLS and simultaneous equation regression models to investigate the impact of increased accounting disclosure on bid-ask spread, trading volume and price volatility.

4.3.2.1. Bid-ask Spread Model

According to hypotheses and the review of literature, we added to the empirical model the period dummy as an indicator of increased accounting disclosure, trading volume (VOL) and price volatility (VAR) as market microstructure factors and market value, firm size (MV) as a firm characteristic factor. Hence, the bid-ask spread model is specified as:

$$S_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VOL_i + \alpha_4 VAR_i + e_i$$

[345] C. Callahan et al., op. cit., pp. 52-53.
C. Leuz, R. E. Verrecchia., op. cit., p. 116.
J. E. Core, "A review of the empirical disclosure literature: discussion", **Journal of Accounting and Economics**, 31, 2001, pp. 447.
[346] R. L. Hagerman, J. P. Healy., op. cit., p. 238.
M. M. Greenstein, H. Sami., op. cit., p. 191
M. Coller, T. Yohn, op. cit., p.188.
J. P. Boone, op. cit., p. 65.
[347] P. M. Healy, A. P. Hutton, and K. G. Palepu., op. cit., pp. 491-492.
S. Swaminathan, op. cit., p. 34.

Where S = average weekly relative bid-ask spread in the pre-adoption period or post-adoption period

PERIOD = 1 if the observation is from post-adoption period and 0 otherwise

MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period

VOL = average weekly share turnover in the pre-adoption period or post-adoption period. Share turnover is defined as the dollar amount of trading volume divided by the market value of the firm

VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period

Dependent Variable: We used the average weekly relative spread as the major measure of information asymmetry, which is calculated as the difference between the ask and bid prices divided by their average. This measure is widely used in the finance and accounting literature.

Independent Variables: Previous research has used a variety of measures for trading activity, including the number of trades[348], the number of shareholders[349], the number of shares traded[350], the dollar amount of trading volume[351], and the share turnover - the dollar amount of trading volume scaled by the firm's market value of equity[352]. Generally, these studies provide evidence of a negative relationship between the trading activity and spreads, indicating that all of the above measures suffice as

[348] H. Demsetz, op. cit., p. 51.
M. Aitken, A. Frino, op. cit., p. 59.
M. Coller, T. Yohn, op. cit., pp. 188-189.
[349] H. Demsetz, op. cit., p. 52.
G.Benston, R. Hagerman, op. cit., pp. 359-364.
[350] S. M. Tinic, op. cit., p. 84.
P. Venkatesh, R. Chiang., op. cit., p. 1100.
M. M. Greenstein, H. Sami., op. cit., p. 193.
[351] A. Barnea, D. Logue., op. cit., p. 47.
H. R. Stoll, op. cit., 1978, p. 1155.
[352] C. Leuz, R. E. Verrecchia., op. cit., p. 120.
C. Leuz, op.cit., p.82.

proxy for trading activity[353]. Similar to recent work[354], we used the average weekly share turnover as a measure of trading activity. As the number of shares traded usually suffers from the problem of excessive volatility while the share turnover does not[355] and using the share turnover facilitates the estimation of the hypothesized relationship between the firm size and the spread[356].

We used the average standard deviation of weekly return as a measure of the price variability. Various measures of price variability are also employed in the literature, such as the percentage price change[357], the standard deviation of stock prices[358], the standard deviation or variance of stock returns[359] and the percentage change in standardized abnormal return[360]. Because the standard deviation of return is the most commonly used proxy for the price volatility, and the major purpose of the study is to document the permanent changes in the market structure, we used standard deviation of weekly returns as used in Greenstein and Sami[361].

Following earlier studies[362], the size of a firm is measured by the average weekly market value of the firm's equity. Although total of assets is an alternative proxy of a firm's size, the market value is more commonly used in literature. Hence, we used the average weekly market value of the firm's equity as a proxy of firm size.

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353 M. Aitken, A. Frino, op. cit., p. 60.
354 C. Leuz, R. E. Verrecchia., op. cit., p. 121.
C. Leuz, op. cit., pp.83-84.
355 M. Aitken, A. Frino, op. cit., p. 61.
356 C. Leuz, R. E. Verrecchia., op. cit., p. 122.
357 P. Venkatesh, R. Chiang., op. cit., p.1100.
358 S. M. Tinic, op. cit., p. 86.
359 R. Chiang, P. Venkatesh., op. cit., p. 1045.
M. M. Greenstein, H. Sami., op. cit., p. 194.
M. Coller, T. Yohn, op. cit., pp. 189.
C. Leuz, R. E. Verrecchia., op. cit., p. 122.
C. Leuz, op. cit., p.83.
360 S. Swaminathan, op. cit., p. 32.
361 M. M. Greenstein, H. Sami., op. cit., p. 194.
362 R. Chiang, P. Venkatesh, op. cit., pp. 1045-1046.
M. M. Greenstein, H. Sami., op. cit., p. 195.

Like many studies on the impact of increased disclosure[363], a dummy variable PERIOD is also used to identify the effect on market. This dichotomous variable takes the value of "1" during the post-adoption period and "0" otherwise for the analysis.

Expected sign of Variables in Bid-ask Spread Model

The literature documents that bid-ask spread is negatively related to the trading volume and market value, and positively related to the price volatility. Therefore, we expect negative signs for VOL and MV, and positive one for VAR. As mentioned before, companies would experience significant reductions in the bid-ask spread subsequent to the adoption of IFRSs, hence the sign of PERIOD is expected to be negative in the bid-ask spread model.

In our work, in addition to the bid-ask spread model, we will also use the trading volume and the price volatility model in order to check and confirm the possible effects of increased disclosure and provide additional evidence on the impact of increased accounting disclosure.

4.3.2.2. Trading Volume Model

The increased accounting disclosure has an impact on trading activity as well[364]. To explore the relationship between increased disclosure and trading volume, we examined the determinants of trading volume to test its simultaneous variation due to increased disclosure. The study of the trading volume model will help to:

- test the impact of increased accounting disclosure on this factor
- control for the effect of simultaneous variation in trading volume on the coefficients in bid-ask spread model
- provide additional evidence on the impact of increased accounting

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[363] J. P. Healy et al., op. cit., p. 494.
J. P. Boone, op. cit., pp. 66-67.
K. Raman, N. Tripathy., "The effect of supplemental reverse-based accounting data on the market microstructure", **Journal of Accounting and Public Policy**, 12, Summer, 1993, pp. 114-115.
R. L. Hagerman, J. P. Healy., op. cit., p. 239.
[364] C. Leuz, R. E. Verrecchia., op. cit., p. 122.

disclosure.

According to the trading volume literature, trading volume is driven by information asymmetry and the divergence of traders' beliefs[365]. Typically, the market comprises of rebalancing trades (non-event related trades as the investors' trade the market portfolios of stocks back and forth) and abnormal trades (e.g. informed trading and liquidity trading). The former is related to the market-wide information, while the latter is associated with information on individual firm. Hence a theoretical function between the disclosure regulation and trading volume

The literature shows that in most trading volume models the common variables are market value of the firm (firm size) and the price volatility of the stock and the index of the stock. The index variable is generally a dichotomous variable showing if the stock is included in a specific index but as all the stocks we use in our analysis are making part of the ISE100 index, we will not use this variable in our trading volume model. The firm size (MV) contributes to the (abnormal) trading volume[366]. Besides, trading volume is associated with the price volatility[367].

Accordingly, we examine the following trading volume model:

$$VOL_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VAR_i + e_i$$

Where VOL = average weekly share turnover in the pre-adoption period or post-adoption period

PERIOD = 1 if the observation is from post-adoption period and 0 otherwise

[365] J. M. Karpoff, "The relation between price changes and trading volume: a survey", **Journal of Financial and Quantitative Analysis**, 22, 1987, p. 111.
[366] P. Tkac, "A trading volume benchmark: Theory and evidence", **Journal of Financial and Quantitative Analysis**, 34, 1, 1999, pp. 90.
H. Bessembinder, K. Chan, and P. Seguin., "An empirical examination of information, differences of opinion, and trading activity", **Journal of Financial Economics,** 40, 1, p. 109.
C. Leuz, R. E. Verrecchia., op. cit., p. 123.
[367] J. M. Karpoff, op. cit., pp. 112-113.

MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period

VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period

Expected Sign of Variables in Trading Volume Model

The literature documents that price volatility is positively related to trading volume[368]. Thus a positive sign is expected for VAR.

The sign for MV could be ambiguous. On one hand, larger firms experience trading related to market information (vs. individual firm's information), hence they may be expected to have higher trading volume than smaller firms. On the other hand, larger firms, have more analyst and media following them, following and media following and thus are subject to more news, which reduce the amount of private information that can be profitably traded on (the informed trading).

Finally, the sign of PERIOD in the trading volume model could be ambiguous because the public disclosure can simultaneously impact the information asymmetry and divergence of traders' beliefs (or information precision). On one hand, trading volume can increase subsequent to public disclosure because information asymmetry is reduced[369], hence a positive sign for PERIOD. On the other hand, trading volume may decrease when beliefs of traders are less heterogeneous[370], hence a negative sign for the coefficient of PERIOD.

George et al[371] show that the increase or decrease in trading volume with an increase in divergence in beliefs depends on whether liquidity (uninformed) trading decreases in transaction cost at an increasing or decreasing rate. In a relevant study[372], the

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368 C. Leuz, R. E. Verrecchia, op. cit, p. 123.
369 B. Lev, "Toward a theory of equitable and efficient accounting policy", **The Accounting Review**, 63, 1, 1988, pp. 6-8.
370 O. Kim, R. E. Verrecchia, "Trading volume and price reactions to public announcements" **Journal of Accounting Research**, 29,2, 1991, p. 305.
371 T. J. George, G. Kaul, and M. Nimalendran, *Trading,* op. cit., 1994, p.1493.
372 M. Harris, A. Raviv., "Differences of opinion make a horse race", **Review of Financial Studies**, 6, 1991, pp. 478.

researchers show that even if all traders are evenly informed, differences in opinion between traders is a major determinant of trading volume.

Therefore, we do not assign a specific direction to the coefficient of PERIOD in the trading volume model.

4.3.2.3. Price Volatility Model

The accounting disclosure literature documents the impact of increased accounting disclosure on price volatility[373]. To explore the relationship between increased disclosure and price volatility, we investigated the determinants of price volatility and its simultaneous variation due to increased disclosure as well. The theoretical model can be derived from the same simple theoretical model of disclosure suggested in a recent work[374].

The empirical studies indicate that price volatility is associated with disclosure level[375]. In addition, empirical studies show that price volatility is positively associated with firm's systematic risk, but negatively associated with firm size[376]. Accordingly, we examine the following price volatility model:

$$VAR_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 BETA_i + e_i$$

Where VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period

PERIOD = 1 if the observation is from post-adoption period and 0 otherwise

MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period

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373 P. M. Healy, A. P. Hutton, and K. G. Palepu., op. cit., p. 496.
S. Swaminathan, op. cit., p. 33.
374 R. E. Verrecchia, op. cit., 2001, p. 101.
375 S. Swaminathan, op. cit., p. 35.
C. Leuz, R. E. Verrecchia., op. cit., p. 123.
M. H. Lang, R. J. Lundholm., "Cross-sectional determinants of analyst ratings of corporate disclosures", **Journal of Accounting Research**, 31, 2, 1993 , p. 248.
376 C. Leuz, R. E. Verrecchia., op. cit., p.. 123.

BETA = systematic risk of firm i, estimated with weekly returns in the pre-adoption period or post-adoption period.

Expected Sign of Variables in Price Volatility Model

As price volatility decreases with firm size and increases with beta, the sign of MV in the *price volatility model* is expected to be negative while the sign of BETA to be positive[377].

The literature indicates that the precision of information due to public disclosure increases price volatility, suggesting a positive relationship between price volatility and the disclosure level[378]. Meanwhile, lower price volatility may also suggest lower information asymmetry in that smooth price reflects less informed trading[379]. Therefore, the literature provides mixed results on the direction of relationship between price volatility and disclosure level, indicating that the sign of PERIOD can be ambiguous as in the trading volume model.

4.4. Estimation Method

The bid-ask spread model, is the major model to investigate our Hypotheses, the trading volume model and the price volatility model are used primarily to test the impact of increased accounting disclosure on these two major microstructure factors and control for simultaneous variations in these factors. Moreover, both trading volume and price volatility have been used as various proxies for information asymmetry in the literature[380], examining these factors could provide empirical evidence on the relative

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[377] S. Swaminathan, op. cit., p. 36.
P. M. Healy, A. P. Hutton, and K. G. Palepu., op. cit., p. 498.
M. H. Lang, R. J. Lundholm., "Voluntary disclosure and equity offerings reducing information asymmetry or hyping the stock?" **Contemporary Accounting Research** 17, 4, 2000, p. 626.
C. Leuz, R. E. Verrecchia., op. cit., p. 123.
[378] R. W. Holthausen, R. E. Verrecchia., "The effect of informedness and concensus on prices and volume behavior" **The Accounting Review** 65, 1990, p. 194.
S. Swaminathan, op. cit., p. 37.
[379] M. H. Lang, R. J. Lundholm, *Cross-sectional determinants of analyst ratings of corporate disclosures*, pp.249.
[380] S. Swaminathan, pp. 37.
P. M. Healy, A. P. Hutton, and K. G. Palepu., pp. 500.
M. H. Lang, R. J. Lundholm, op. cit., 2000, p.249.
C. Leuz, R. E. Verrecchia, op. cit., p. 123.

strength of the spread proxy. Because models might be dependent on one another, aside from the OLS estimation, we used simultaneous regression method to estimate these models as well.

We also studied whether the changes subsequent to the adoption of new accounting standards are permanent. In particular, we used a graphical method showing the trend in bid-ask spread to see if the effects are permanent.

5. EMPIRICAL TESTS

In this section, we studied changes in our proxies around the change in regulations concerning firm's reporting strategy and then we tested our hypotheses. We started by the adverse selection component of bid-ask spread. Then, we studied the effect of increased disclosure using our bid-ask spread, trading volume and price volatility models. We investigated the effects by descriptive and univariate analysis at first, then we continued our analysis using the OLS regression and the 2 stage least squares regression method regression and finally we graphically represented the pattern followed by the bid-ask spread.

5.1. The Adverse-selection Component of Bid-ask Spread

In order to estimate the adverse selection component and test our hypotheses, we used the period from January 2003 to December 2007. We divided this sample period into two sub-periods based on disclosure date, (pre-adoption and post-adoption period) and sorted firms into groups based on firm's average market value (small, middle and large sized firms). We used the weekly data (a total of 261 weeks) to estimate the effective bid-ask spread and its components but we didn't take into account 6 months prior and after the year 2005 as it is the adoption year so we had in our analysis a total of 208 weeks. The weekly trading returns for each security and those based on the bid-prices are, respectively, calculated from the prices of the last transaction and the last bid of each week (from Wednesday to Wednesday).

Table 7 reports average weekly estimates of the bid-ask spread for the firms in our sample using the George et al.[381] method. We presented average estimates for each group and for all the firms in the sample. These 53 firms are in ISE 100 Index and they adopted the new standards in 1/1/2005 according to ISE data. The second column shows the average sample size (firm year observations) over the entire period for each group. Column 3 reports the average market values of the firm (in millions of USD) in the

[381] T. J. George et al., p. 649.

sample. We also added the XU100 index average market value as supplementary information.

Groups are based on firm's average market value, with small (large) group including firms ranked in the lower (upper) 25%. The market value is obtained from ISE, which is calculated using the closing price, total outstanding shares and the currency data (Central Bank of the Republic of Turkey, dollar exchange rate/buying price) of each Wednesday . The observed bid-ask spread, S, is calculated using the last bid price and the last ask price. The estimated bid-ask spread, is calculated under the George et al. (1991) model.

We also reported the average observed spreads for each group and all firms in the sample. These numbers are calculated using the last bid price and the last ask price of each Wednesday. The observed spread is reported in the relative (percentage) terms, and is calculated as the difference between bid and ask prices divided by their average.

Table 7: Weekly Estimates of the Bid-ask Spread Sorted by Market Value

Group	Sample size	Average market value (in mill. USD)	Observed spread %(S)	Estimated spread%(S,.)
Small	13	943,24	0.318	0.186
Middle	27	9.858,65	0.284	0.183
Large	13	31.551,77	0.271	0.145
All	53	12.992,81	0.290	0.174
XU100	100	102.611,45		

The numbers for the observed spread vary across groups with different values ranging from 0.318 to 0.271 with the average market value ranging from 943 to 31.551. This is consistent with earlier findings on the negative relationship between firm size and bid-ask spread. This finding is also consistent with our third hypothesis and it confirms that there is a negative relationship between the bid-ask spread and the firm size.

Accordingly, we can affirm that:

H3: The Bid-ask spread in ISE is negatively related to the firm size

According to Table 7, we also see that the average estimated spreads vary across groups with different market values, ranging from 0.186 to 0.145. The average estimated spread for all firms is 0.174, while the average observed spread for all firms is 0.290.

Table 8 reports the estimates of bid-ask spread components for all the sample firms and firms in each group. The components are cross-sectionally estimated for firms within each group in each period. The reported estimates of spread are average of the sub-period estimates.

The behavior of the estimates of beta in Table 8 has some important implications. First, the estimates of beta, which measure the order processing cost component of the bid-ask spread, vary with the market value. For instance, the estimates of Beta, order processing component, accounts for 48% of the observed (relative) spreads for the smallest market value group, while it accounts for 73% of the observed (relative) spread for the largest market value. Second, the magnitude of the estimate of beta for all the firms is much less than 1, indicating that the observed spread contains a substantial adverse-selection cost. The adverse selection component accounts for 37% of the observed spreads for all firms in the sample, with a range of 52% to 27% across different groups. That suggests that the component due to the information asymmetry in ISE is much larger than reported in George et al.[382] for NASDAQ stocks.

[382] T. J. George et al., op. cit., 1991, p. 652.

Table 8: Weekly Estimates of the Bid-ask Spread and its Components for the Firms Sorted by Market Value

Group	Sample size	Observed spread %(S)	Estimated spread%(S_e)	Order Processing Beta ß	Adj.R Square	Adverse Selection (1-ß)
Small	13	0.318	0.186	0.484***	0.022	0.516***
Middle	27	0.284	0.183	0.668***	0.021	0.332***
Large	13	0.271	0.145	0.728***	0.034	0.272***
All	53	0.290	0.174	0.630***	0.024	0.370***

The regression parameters, the order processing component, are estimated cross-sectionally for all firms within a particular group.
***The adverse selection (1-B) column reports the percentage of adverse selection component in the total observed spread significant at 0.01,0.05,0.10 respectively.

Note that all the estimates of beta turn out to be significant as expected. T-tests indicate that the average adverse selection component is significant for all-firm sample and each group. Overall, the results show that the adverse selection cost comprises a significant component of the bid-ask spread in the ISE; and, it is a significant portion (about 37 percent) of the total spread.

Therefore, it is reasonable to conclude that the information asymmetry exists in ISE.

5.2. The Analysis of Factors Affecting Bid-ask Spread

In this section, we study the effect of increased accounting disclosure due to the 2005 implementation of IFRSs on the bid-ask spread, trading volume and price volatility across firms.

Table 9 presents the descriptive statistics for the variables used in the cross-sectional analysis. The descriptive statistics in Table 9 show that the average (median) relative spread for the period before the implementation of new standards is 0.243 (0.230), while for the periods subsequent to the consecutive adoption of standards it is 0.173 (0.158). The t-test suggests that the consecutive reductions in the mean (median) of spread are significant. This indicates that subsequent to annual report disclosure, the companies had significantly lower bid-ask spreads than the pre-adoption periods.

Table 9: Descriptive Statistics for Regression Variables Including Differences in Means and Medians between Pre-adoption and Post-adoption Periods

Variables	Sample	Number (weeks)	Mean	Median	StdDev.
S	All	208	0.208	0.193	0.077
	Period = 0	104	0.243	0.230	0.074
	Period = 1	104	0.173***	0.158***	0.063
VOL	All	208	1.962	1.835	0.853
	Period = 0	104	1.740	1.617	0.692
	Period = 1	104	2.190***	2.093***	0.939
VAR	All	208	2.461	2.452	0.658
	Period = 0	104	2.901	2.855	0.387
	Period = 1	104	2.032***	1.988***	0.580
MV	All	208	3842.8	2748.3	3823.0
	Period = 0	104	3136.4	2196.3	3245.1
	Period = 1	104	4533.7***	3336.1***	2206.4
BETA	All	208	0.938	1.052	2.477
	Period = 0	104	0.985	0.979	0.311
	Period = 1	104	0.892	1.101	0.473

Definitions of Variables:

S = average weekly relative bid-ask spread (in percentage) in the pre-adoption period or post-adoption period.
PERIOD = 1 if the observation is from post-adoption period and 0 otherwise
MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period (in mill. USD)
VOL = average weekly share turnover in the pre-adoption period or post-adoption period
VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period
BETA = systematic risk of firm i, estimated with weekly returns in the pre-adoption period or post-adoption period.
***, **, * significant at 0.01,0.05,0.10 respectively.

As to the trading volume, the results show that firms on average experienced a significant increase in trading share turnover subsequent to the adoption of the new standards. The t-test indicates that this change in means of share turnover is significant. This result is in the same direction with the expectations.

Price volatility shows a different pattern than the change in trading volume. According to the table, we see that the average volatility in the stock prices significantly decreased subsequent to the adoption new accounting standards. The t-test further indicates that this change in the means is significant. Again, the result is as expected, the price volatility is decreased with the adoption of new standards that could be explained by the basics of the beliefs among traders.

Table 9 also provides some descriptive statistics for other variables on firm characteristics used in this study. It shows that during the sample period the companies also experienced significant changes in firm size (MV). As the trading activity increases following the adoption of new standards, the firms' market value is also increasing. Because the increased accounting disclosure is a structural change that attracts more investors, decreases risks and it has a positive impact on market value.

Table 10 reports the Pearson correlation coefficients for the major variables. PERIOD is highly correlated with VAR, with r equal to .66. Also, PERIOD is highly correlated with trading volume, with r equal to .74. The signs are consistent with the univariate tests in Table 9. VAR and VOL are highly correlated, with r equal to .77. These correlations are not surprising since in each case one can expect that the increased accounting disclosure has an impact on the trading activity. Since these are the major predicative variables in the cross-sectional analysis, no attempt is made to exclude either of the correlated variables from the major model. However, we also checked for the multicollinearity of data according to these correlations between these variables and the variance inflation factors for the OLS models showed no variable with a factor in excess, indicating that, collinearity is not a problem for the analysis.

Table 10 : Pearson Correlation Coefficients

Variables for paired-yearly cross-sectional test

Variables	PERIOD	S	VOL	VAR	MV	BETA
PERIOD	1.0000					
S	-0.3102 <.0001	1.0000				
VOL	0.7412 <.0001	-0.4218 <0001	1.0000			
VAR	-0.6610 <.0001	-0.2715 <.0001	-0.7701 <.0001	1.0000		
MV	0.1829 <.0001	-0.2540 <.0001	0.2318 <.0001	0.1259 <.0001	1.0000	
BETA	-0.0310 0.2022	0.0217 <0001	-0.0723 0.0012	0.0412 0.0090	-0.0271 0.0002	1.0000

Definitions of Variables:

S = average weekly relative bid-ask spread (in percentage) in the pre-adoption period or post-adoption period
PERIOD = 1 if the observation is from post-adoption period and 0 otherwise
MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period
VOL = average weekly share turnover in the pre-adoption period or post-adoption period
VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period
BETA = systematic risk of firm i, estimated with weekly returns in the pre-adoption period or post-adoption period.

5.3. Models and Results

5.3.1. Bid-ask Spread Model

In this section, we analyzed the bid-ask spread model, the trading volume model and the price volatility model using the OLS regression and the simultaneous equation method regression. These regression analyses showed us the direction of relations between our variables. Especially, the bid-ask spread model helped us confirming or rejecting our hypotheses and the other models helped clarify the relationships and the results.

Table 11 reports the regression results on the incremental effect of the implementation of new accounting standards. Table 11 shows the results from the ordinary least square estimation. The F-statistic indicates that the bid-ask spread model has significant explanatory power. All variables have the expected signs and are statistically significant. The period variable has a P value that makes it statistically insignificant but it's still negative. This might be caused by the simultaneous effects of increased accounting disclosure on trading volume and price volatility. Consistent with previous research, the bid-ask spread is positively associated with price volatility and negatively associated with trading volume (share turnover) and market value[383]. Although these preliminary results are in line with our first and second hypotheses, we continue our analysis with the simultaneous equation method and then conclude with our hypotheses.

As mentioned earlier in the table 10, although trading volume and price volatility are highly correlated (r = .77), we do not exclude either of these test variables from the model. Moreover, we have to add that, the results reported are qualitatively unchanged for other variables with either one excluded.

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[383] R. Chiang and P. Venkatesh, op. cit., p. 1047.
L. Glosten, L. Harris., op. cit., p. 137.

Table 11: The Incremental Effects of the Implementation of IFRSs on Information Asymmetry, OLS Method.

Regression results under the OLS method

Bid-ask spread model: $S_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VOL_i + \alpha_4 VAR_i + e_i$

Variables	Expected Sign	Coefficient	Std. Dev.	t-stat.	p-value
Constant		0.495***	0.049	10.58	<.0001
PERIOD	-	-0.016	0.012	-1.28	0.1010
VAR	+	0.061***	0.014	4.49	<.0001
VOL	-	-0.035***	0.004	-8.92	<.0001
MV	-	-0.039***	0.005	-7.90	<.0001
R-Square		0.367		**F-Value**	62.40
Adj. R-Square		0.361		**Pr>F**	<.0001

Trading volume model: $VOL_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VAR_i + e_i$

Variables	Expected Sign	Coefficient	Std. Dev.	t-stat.	p-value
Constant		-5.590***	0.465	-12.21	<.0001
PERIOD	+/-	0.505***	0.133	3.80	0.0002
VAR	+	2.645***	0.095	27.75	<.0001
MV	+/-	0.066	0.060	1.11	0.2691
R-Square		0.820		**F-Value**	490.82
Adj. R-Square		0.816		**Pr>F**	<.0001

Price volatility model: $VAR_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 BETA_i + e_i$

Variables	Expected Sign	Coefficient	Std. Dev.	t-stat.	p-value
Constant		2.505***	0.199	12.59	<.0001
PERIOD	+/-	1.076***	0.038	28.14	<.0001
MV	-	-0.048***	0.024	-1.99	0.0234
BETA	+	0.290***	0.109	2.67	0.0039
R-Square		0.609		**F-Value**	210.22
Adj. R-Square		0.606		**Pr>F**	<.0001

Table 12 reports the results under the simultaneous equations method. In general, the model is highly significant and explains more than 43% of the variation in the bid-ask spread. The coefficient of PERIOD is negative as expected and highly significant. It suggests that the companies experienced a substantial decrease in the bid-ask spread. All other coefficients have the expected signs and are highly significant, except that trading volume is positively associated with bid-ask spread. **These results show us that our hypotheses H2, H3 and H4 are confirmed.**

Taken with the previous regression OLS result, the unexpected sign of trading volume might be attributed to the positive relationship between trading volume and price volatility and stocks with small trades in the sample. Since for the less frequently traded stocks the reporting change may actually increase volatility and bid-ask spreads. Further test shows that only the small trade group has a significant and positive coefficient for the trading volume (p =.00653) but the large trade group does not have such a coefficient (p = .2993).

Table 12: The Incremental Effects of the Implementation of IFRSs on Information Asymmetry, 2SLS Method.

Regression results under the 2SLS method

Bid-ask spread model: $S_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VOL_i + \alpha_4 VAR_i + e_i$

Variables	**Expected Sign**	**Coefficient**	**Std. Dev.**	**t-stat.**	**p-value**
Constant		-0.139	0.283	-0.49	0.6336
PERIOD	**-**	-0.579***	1.670	-3.46	0.0003
VAR	**+**	0.210***	0.094	2.23	0.0131
VOL	**-**	0.086***	0.038	2.27	0.0118
MV	**-**	-0.024***	0.010	-2.46	0.0062
R-Square		**0.431**			

Trading volume model: $VOL_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 VAR_i + e_i$

Variables	Expected Sign	Coefficient	Std. Dev.	t-stat.	p-value
Constant		8.916	5.899	1.51	0.1313
PERIOD	+/-	6.066***	2.302	2.63	0.0087
VAR	+	2.540	2.158	-1.18	0.1200
MV	+/-	-0.189	0.152	-1.25	0.2133
R-Square		**0.431**			

Price volatility model $VAR_i = \alpha_0 + \alpha_1 PERIOD + \alpha_2 MV_i + \alpha_3 BETA_i + e_i$

Variables	Expected Sign	Coefficient	Std. Dev.	t-stat.	p-value
Constant		3.385***	0.184	11.24	<.0001
PERIOD	+/-	0.608***	0.023	18.96	0.0032
MV	-	-0.232***	0.031	-1.19	0.0080
BETA	+	-0.015***	0.096	2.19	0.0014
R-Square		**0.431**			

Definitions of Variables:

S = average weekly relative bid-ask spread (in percentage) in the pre-adoption period or post-adoption period.
PERIOD = 1 if the observation is from post-adoption period and 0 otherwise
MV = average weekly market value of the firm's equity in the pre-adoption period or post-adoption period
VOL = average weekly share turnover in the pre-adoption period or post-adoption period
VAR = average standard deviation of weekly returns in the pre-adoption period or post-adoption period
BETA = systematic risk of firm L estimated with weekly returns in the pre-adoption period or post-adoption period.
***, **, * significant at 0.01, 0.05, 0.10, respectively.

Overall, the analysis of bid-ask spread suggests that companies experienced significant reductions in information asymmetry, measured by bid-ask spread, subsequent to implementation of IFRSs.

The analysis confirms H4 and indicates that bid-ask spread decreases subsequent to implementation of new standards.

When controlling for the trading volume, price volatility and market value (firm size), the OLS regression results indicate that these relations remain significant. After controlling for the simultaneous effects of increased disclosure on trading volume and price volatility, the reductions in bid-ask spread remain significant subsequent to the implementation of IFRSs.

Furthermore, the OLS regression results also indicate that bid-ask spread is negatively related to market value (firm size) and positively related to the price volatility. So, the results of both regression methods are in line with H2 and H3 and confirm that:

H2 : The bid-ask spread in ISE is positively related to the price volatility.

H3 : The bid-ask spread in ISE is negatively related to the firm size.

However, the relationships among bid-ask spread, and trading volume is ambiguous. Controlling for the simultaneous effects on trading volume, the simultaneous equation results show an unexpected positive relationship between bid-ask spread and trading volume and it remains significant in the analyses. This unexpected result might be caused by the positive relationship of trading volume and price volatility or the firms with smaller and less frequently trades. Finally, although the results of this 2SLS method regression are not supporting our hypothesis H1, as the results of preliminary tests and other models results that we'll explain in the next section are in conformity. **We also accept the H1.The bid-ask spread in ISE is negatively related to the trading volume.**

5.3.2. Trading Volume Model

Table 11 reports the ordinary least square results on changes in trading volume regarding the implementation of new standards. The model is highly significant and explains 82% of the variation in share turnover. The PERIOD dummy is significantly positive, suggesting that a market with heavier trading were achieved subsequent to the new standards. This finding is also supporting H1 and shows us that t**he bid-ask spread is negatively related to the trading volume.**

This step of our analysis gives us complementary results. Consistent with the literature[384], **price volatility is positively related to the trading volume**. Other variable, the market value, has the expected sign but is insignificant. Table 12 reports the results under the simultaneous equations method. The coefficient for PERIOD remains highly significant. On average, the share turnover increases by 6.066. All other coefficients have expected sign but insignificant.

Overall, the analysis of trading volume suggests that companies experienced significant change in trading volume, subsequent to the adoption of new accounting standards and the direction of the change is positive suggesting that the new standards had a positive impact on the trading volume. Consistent with the literature, the results showed that price volatility is also positively related to the trading volume as the disclosure of public information increases the trading activities for the uninformed traders. We can argue that this increase in the trading activities of the uninformed traders is more powerful than the possible decrease in the trading activity of informed traders suggested by Leuz and Verrecchia[385].

The simultaneous equation results indicate that after controlling for the simultaneous effects of increased disclosure on trading volume and price volatility, the results remain the same, but the relationship with the market value becomes insignificantly negative, this change might be caused by the fact that the emerging markets are dominated with smaller firms with less

[384] C. Leuz, R. E. Verrecchia., op. cit., p. 124.
[385] Ibid.

frequent trades which can experience abnormal price changes due to their systematic beta and trading volume. Previous studies find that for less frequently traded stocks, the adoption may actually increase the volatility and decrease market value for these smaller stocks[386]. In the simultaneous equation method this effect may have affected the results.

5.3.3. Price Volatility Model

The price volatility model is highly significant and explains 61% of the variations in the price volatility. But, the model doesn't confirm our result concerning H2 as the PERIOD dummy has a positive coefficient.

We can explain this result with the findings of previous research on the effects of information precision. It is argued that price variability increases as the precision of information increases, because each trader interprets the signal differently due to differences in their ability to process information, and hence, a public information signal is likely to have idiosyncratic noise terms[387]. Another possible explanation, as suggested before, might be that the emerging markets are dominated with smaller firms with less frequent trades. Previous studies find that for less frequently traded stocks, the adoption of new standards may actually increase the volatility[388]. We can also argue that the period dummy indicates that, taken with the results on the bid-ask spread and trading volume in the same period, the disclosure of cash flow statements and events occurring after balance sheet date might motivate traders to seek private information, which, in turn, might increase the information asymmetry. It also might be the effect of information precision. Some researchers indicate that price variability increased with the precision of information because

[386] C. Leuz, R. E. Verrecchia., op. cit., p. 124.
S. Swaminathan, op. cit., pp.38-39.
[387] R. W. Holthausen, R. E.Verrecchia, op. cit., p.196.
[388] C. Leuz, R. E. Verrecchia., op. cit., p. 124.
S. Swaminathan, op. cit., p. 40.

of an increase in the divergence of traders' beliefs[389] (the difference in traders' ability in interpreting information).

Market value (firm size) has the expected sign and is significant; that confirms our hypothesis H3, but the systematic risk, Beta, has an unexpected sign in the simultaneous equation method indicating that in this period some firms experienced abnormal changes in their systematic beta.

Overall, the analysis of price volatility suggests that the companies experienced significant changes in price volatility, subsequent to the adoption of new accounting standards. However, the directions of change in price volatility and in beta are mixed; this shows once again the ambiguous relationship between price volatility and the divergence in the beliefs of traders (the effects of increased precision of information). The analysis indicates that price volatility increased then the multivariate analysis indicate that these changes remain significant and the unexpected sign for Beta indicates that in this period some firms might experience abnormal changes in their systematic risk, which requires further study in the future.

5.4. Graphical Presentation of Increased Accounting Disclosure on Information Asymmetry

We also plotted over time the means of weekly relative spread for all firms in the sample including the year 2005 from year 2003 to 2008 in figure 5 in order to visualize the effect of the adoption of new standards on bid-ask spreads of the firms in our sample. The figure shows that on average the relative spread is declining over time. We also plotted over time the medians of relative spread for all firms in the sample in Figure 6. Similar to Figure 5, this figure also shows a decreasing pattern over time.

389 R. W. Holthausen, R. E.Verrecchia, op. cit., p.200.

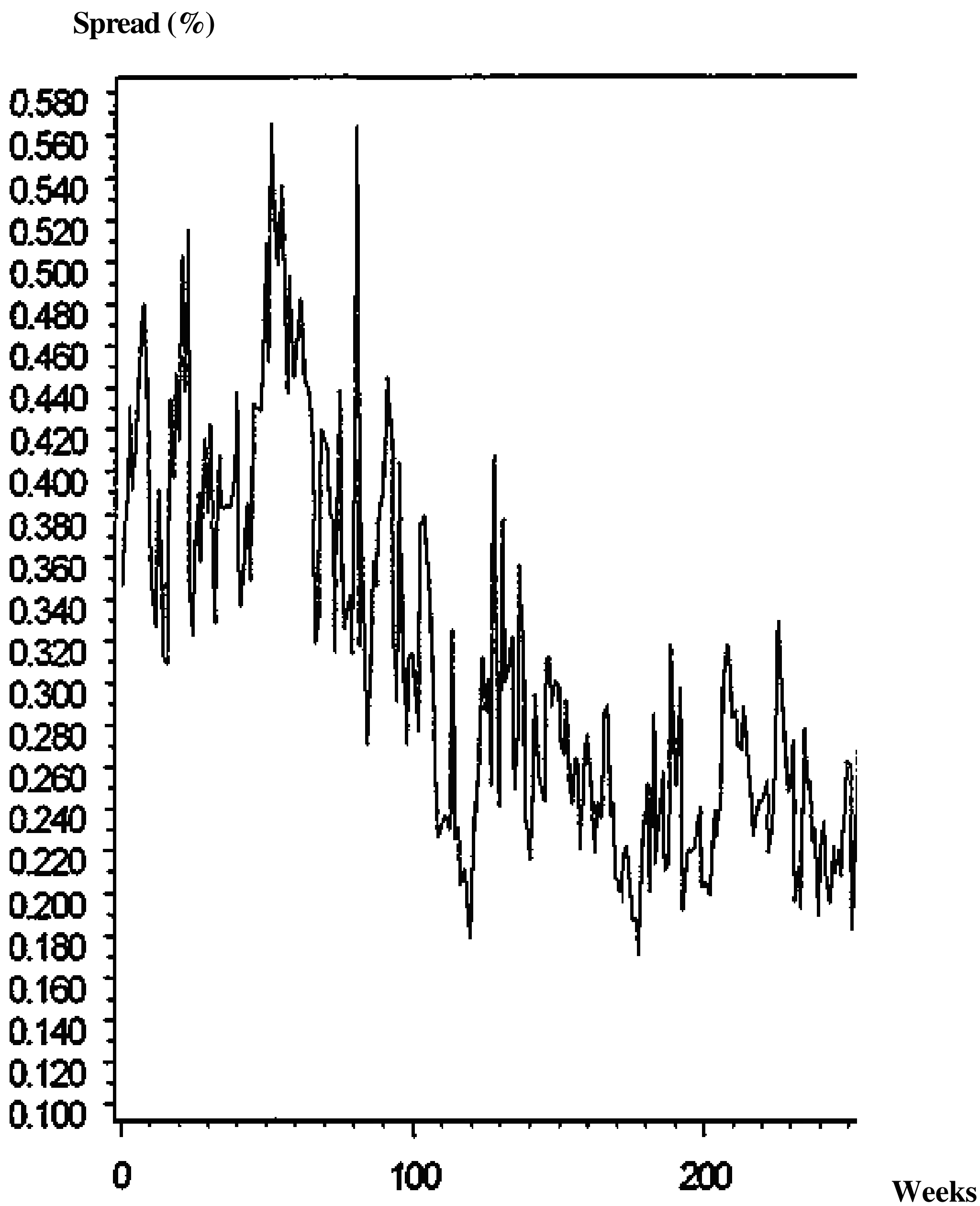

Figure 5: Average Weekly Relative Bid-ask Spread of the Companies

In general, the results from the figures and the general pattern shown in these figures suggest that there were permanent reductions in bid-ask spread subsequent to the adoption of new accounting standards.

However, although the analysis and the figures are in the same declining pattern, these results might be limited as we could take in our analysis a limited number of companies listed in ISE 100 index as the other firms had already voluntarily adopted new standards or disclosed information prior to the adoption. This requires further study, in the future, on the disclosure behavior of the companies in emerging markets.

Figure 6 showing the median weekly relative Bid-ask spread of the companies is also showing a decline starting from the 70th week; towards the beginning of the year 2005.

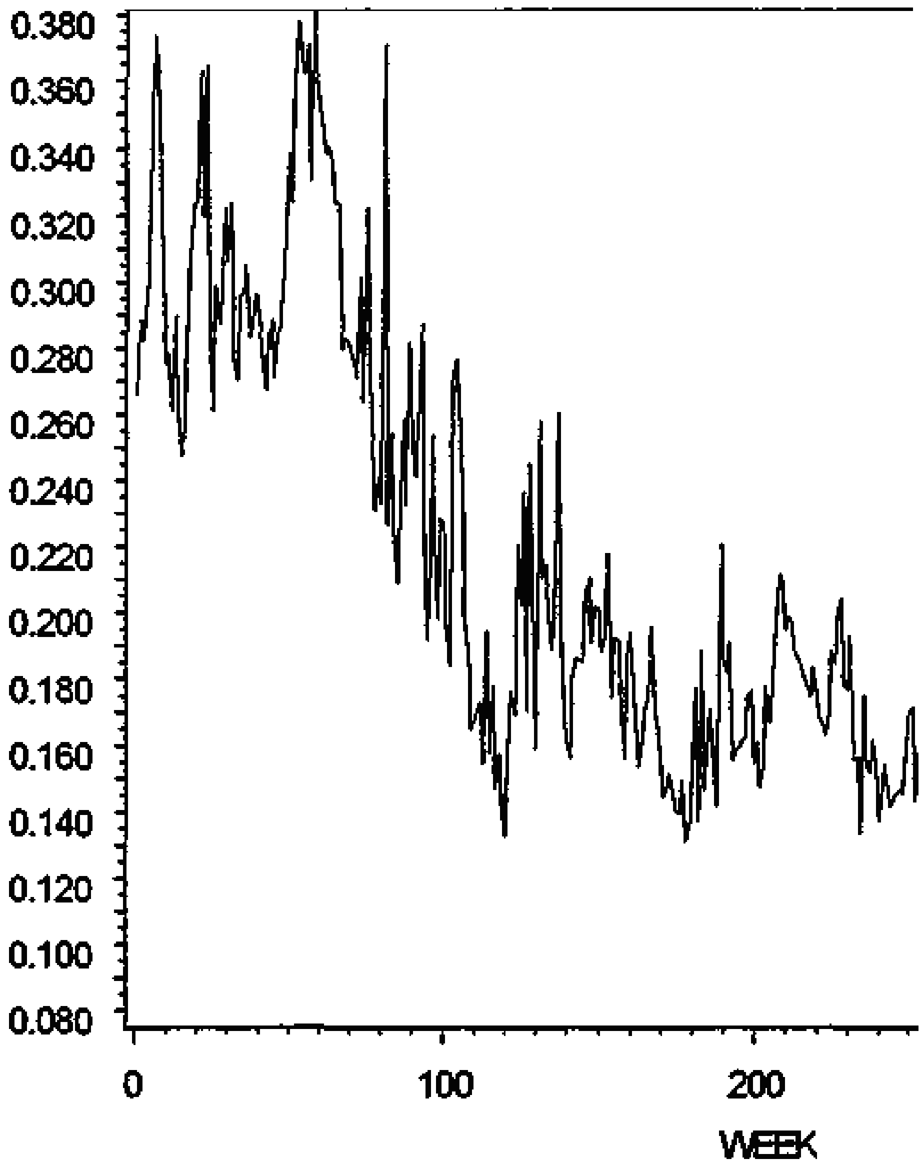

Figure 6: Median Weekly Relative Bid-ask Spread of the Companies

The figures also show that there were permanent reductions in bid-ask spread subsequent to the adoption as the average and median weekly relative spreads don't show any incline or bounce to their levels before 2005.

6. CONCLUSION

The recent move towards IFRSs adoption in over 100 countries is one of the most significant regulatory changes in accounting history. The effects of this change are widely studied in the literature in many aspects. This dissertation contributes to this discussion by pointing out early evidence on the capital market effects and economic consequences of introducing mandatory IFRSs reporting in ISE.

Prior analytical and empirical studies suggest that the adoption of mandatory IFRS reporting yield significant capital-market benefits which start from the premise that IFRS reporting increases transparency and improves the quality of financial reporting. A similar argument in favor of positive market effects is that IFRSs increase market liquidity, since provide better disclosure. Thus, several researches[390] suggest that information asymmetry is indeed associated with firms' disclosure and accounting policies and they point out that higher quality financial reporting and better disclosure should reduce adverse selection problems in capital markets and lower estimation risk. IFRSs introduction can reduce information asymmetry costs, if investors consider the new accounting regime more informative and thus adjust bid-ask spreads accordingly. In numerous empirical studies the bid-ask spread, the share price turnover and the price volatility are commonly used proxies of information asymmetry.

In the line of this argument, we studied empirically whether the mandatory adoption of IFRSs has a positive impact on information asymmetry in ISE. Our empirical study focuses, first of all, on the decomposition of bid-ask spreads components. The adverse selection cost and the order-processing cost constitute the main components of the bid-ask spread in ISE, which is a perfect example of an order-driven market. The adverse selection component of bid-ask spread reflects how investors perceive information asymmetry problems on capital market. Following George, Kaul and Nimalendran serial covariance model, we decomposed the spreads into two components and provided evidence

[390] Leuz and Verrecchia, op.cit.,pp. 91-95
Healy, Hutton, Palepu, op.cit., pp. 485-490

on the existence of the adverse selection cost in ISE (about 37%). The bid-ask spread is commonly used to measure information asymmetry explicitly. Trading volume and price volatility are also used to measure liquidity and information asymmetry, though not explicitly and less precisely. Findings of previous studies suggest that relative spreads are negatively associated with trading volume, positively associated with price volatility. Market value (firm size) is included in the analysis because prior research documents a significant association between market value and proxies for information asymmetry and disclosure level suggesting that market value could be a correlated omitted variable if excluded form the analysis.[391] According to descriptive statistics, the results of *t tests* demonstrated that the difference in means of bid-ask spread, trading volume, share price volatility and market value (firm size) over time (pre-adoption and post-adoption period of IFRS) is statistically significant. Following the models used by Leuz and Verrecchia[392], we adopted the bid-ask spread model, trading volume model and price volatility model and we conducted a cross-sectional analysis. Both the findings of OLS and 2 SLS regression analyses confirmed significant reductions in bid-ask spread subsequent to the adoption of the new accounting standards.

The purpose of this study is to extend the spread decomposition literature into the order-driven environment. Also the dissertation contributes to the literature by providing evidence on the economic link between increased accounting disclosure and information asymmetry in emerging markets. This dissertation demonstrates that the accounting regulations could permanently reduce long-run information asymmetry risk in capital markets. Previous studies focus on the microstructure of quote-driven markets such as NASDAQ (or hybrid quote-driven markets such as NYSE). However, little was known about the empirical features of order-driven markets until recently[393]. This dissertation is the first research in Turkey to examine the impact of the mandatory adoption of IFRSs on information asymmetry in ISE. The

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[391] Botosan, op.cit. pp. 323-330
[392] Leuz and Verrecchia, op.cit., pp. 100-117
[393] M. Aitken, A. Frino,op. cit.., pp. 51-63.
P. Brockman, D. Y. Chung., op. cit.,1999, p. 241.

findings of this dissertation imply that the results from quote-driven markets can also be applicable to order-driven markets.

Due to difficulties concerning data collection, we used weekly data in our study. This research can be extended using daily or intraday data and the results can remain the same or take another dimension about the information asymmetry in ISE. Another suggestion for further study is to highlight the relation between the information asymmetry and the several sectors in ISE. It is also possible to analyze the effects of the information asymmetry and increased accounting disclosure on the cost of capital or earnings management.

In this study, we analyzed the role of the mandatory adoption of IFRSs which is one of the disclosure regulation aiming to decrease the information asymmetry, to make financial markets more transparent and to protect investors. However, there is little evidence on the outcomes of changes to mandated financial reporting rules, especially in Turkey. Accordingly, the future researches can analyze the information asymmetry and the role played by other regulatory measures. For example, the interaction between the information asymmetry and corporate governance or auditor quality can be examined. In this sense, the agency theory, managers decisions and the information asymmetry can be another issue to investigate.

Our final suggestion calls for future research to understand the relation between legal origin (common-law versus code-law based accounting regimes) and information asymmetry costs. In the literature, it is suggested that legal institutions affect capital market structure and stock liquidity and it is plausible that trading costs after IFRSs introduction change differently in common-law and code-law countries. It is possible to create two legal origin groups (with the insertion of Turkey in code-law countries) and exhibit if the effect of IFRSs introduction on adverse selection (trading) costs is larger for stocks from countries with civil law than those with common law.

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