

***The Information Asymmetry Effects and A Conceptual
Framework of Enhanced Mandatory Disclosures***

by

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A Conceptual Framework of Enhanced Mandatory Disclosures**

Koç University
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This is to certify that I have examined this copy of a master thesis by

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and have found that it is complete and satisfactory in all respects, and
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ABSTRACT

The Information Asymmetry Effects and A Conceptual Framework of Enhanced Mandatory Disclosures

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I study the information asymmetry effects of enhanced mandatory disclosure by incorporating the inherent differences between institutional and individual investors into an information model. In the model, I characterize the information asymmetry to originate from the fact that some investors possess private information ex-ante mandatory public disclosure. I show that enhanced mandatory disclosure does not always result in leveled informational playing field and reduced information asymmetry. Specifically, I show how the relative characteristics of mandatory disclosure and ex-ante private information systems (complementary versus substitute nature of the information signals they generate), affect the extent of ex-post information asymmetry between individual and institutional investors.

Drawing on the findings and predictions of the model, I present a conceptual framework of classifying accounting standards and disclosure requirements in a spectrum from ‘substitute’ to ‘complementary’ based on their objectives and information properties at the time of pronouncement and on the nature of their relationship with the ex-ante private information. Finally, I discuss the empirical implications of such classification scheme, which is based on the model’s findings.

ÖZETÇE

Geliştirilmiş Zorunlu Mali Açıklamaların Bilgi Asimetrisi Etkileri ve Kavramsal Çerçevesi

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İşletme Yönetimi İşletme Teorisi Yüksek Lisansı

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Kurumsal ve bireysel yatırımcılar arasındaki doğal farklılıkları bir bilgi modeline dahil ederek, zorunlu mali bilgilendirme yükümlülüğünün artırılmasının bilgi asimetrisi üzerindeki etkilerini inceledim. Modelde, bilgi asimetrisini, bazı yatırımcıların kamuya zorunlu mali açıklama öncesinde özel bilgilere sahip olmasından kaynaklandığı biçimde tanımladım. Geliştirilmiş zorunlu mali açıklamaların her zaman eşit bilgi ortamı ve bilgi asimetrisinin azalmasıyla sonuçlanmadığını gösterdim. Özellikle, zorunlu mali açıklamalar ile açıklama öncesi özel bilgi sistemlerinin göreceli özelliklerinin (ürettikleri bilgi sinyallerinin tamamlayıcı veya ikame edici niteliği bakımından), bireysel ve kurumsal yatırımcılar arasında sonradan ortaya çıkan bilgi asimetrisinin boyutunu nasıl etkilediğini ortaya koydum.

Modelin bulguları ve öngörülerinden yola çıkarak, muhasebe standartlarını ve mali açıklama gerekliliklerini, ilan edildikleri andaki amaçları ve bilgi özellikleri ile önceden özel bilgilerle olan ilişkilerinin niteliğine göre “ikame ediciden” “tamamlayıcıya” uzanan bir yelpazede sınıflandıran kavramsal bir çerçeve sundum. Son olarak, modelin bulgularına dayanan bu sınıflandırma şemasının ampirik sonuçlarını tartıştım.

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ABBREVIATIONS

ASC	Accounting Standards Codification
FASB	Financial Accounting Standards Board
SEC	Securities and Exchange Commission
SFAS	Statement of Financial Accounting Standards



Chapter 1

INTRODUCTION

Reducing information asymmetries and increasing market liquidity is one, albeit an important, objective in securities and accounting regulation. Consistent with these objectives, securities and disclosure regulators have shown concerns with the extent and quality of information to which individual¹ investors have access and utilize in their investment decisions. Regulatory institutions' history and culture are filled with references that reflect an advocacy of both promoting individual investors' confidence to give depth and liquidity to the capital markets and leveling the informational playing field between the privileged and the ordinary (Seligman 2003, Langevoort 2009).

Especially after the financial collapse of 2007, the public has lost faith in a system where it seems to favor a few. This has fueled the demands in the investment community for more stringent securities and disclosure requirements. Such developments spurred regulators to be even more receptive to investors' needs to restore confidence and stability in financial markets.

Since 2008, the FASB has moved towards a direction which highlights usefulness of economic decisions as the primary objective of financial reporting and forecasting future cash flows, preferably as directly as possible, as the principal need of users (FASB 157: Fair Value Measurements, FASB Conceptual Framework 2010). Such efforts indicate regulatory bodies' interest in providing decision useful information and encouraging individual investors to make their own informed investment decisions.

¹ In accounting, finance and law literatures retail or non-professional investor terms are used interchangeably with the 'individual' investor term I describe here.

Critics of enhanced mandatory disclosure requirements, on the other hand, argue that regulations are responsive mostly to individual investor needs and are unnecessary in markets dominated by institutional investors (Langevoort 2009, Zingales 2009). The investment trends in U.S. capital markets over the last 60 years back their argument. In 1950, individual investors owned over 90% of the stock of U.S. corporations (Bogle 2005). According to Securities Industry and Financial Markets Association (SIFMA) 2019 Fact Book, individual investors owned 37.6% of the market value of outstanding equity securities in 2018 and represent a very small percentage of U.S. trading volume.

The opponents of stringent securities and accounting regulations refer to the institutionalization and internationalization of issuers and investors as the new dynamics and question the current status of the regulatory environment for a marketplace which is strikingly different from the one existing at the time of the SEC's establishment². For example, Langevoort (2009) argues that the disclosure requirements in issuer securities markets are heavily individual investor driven, reflecting the 1930s investing climate, and unnecessarily costly for the issuers.

Furthermore, Langevoort (2009) argues that directing individual investments towards institutional portfolios would lead to "efficiency conditions [that are] much better." His assertion is consistent with the view that individual investors are "noise traders"³ that distort

² Zingales (2009) states: "The backbone of U.S. securities law was introduced in the 1930s to restore the public's trust in the securities market, which had been undermined by the excesses of the 1920s and the crash of 1929 and the early 1930s. The intellectual foundation of this legislation was the protection of small investors against the abuses perpetrated by knowledgeable insiders in the issuance and the trading of securities. Seventy-five years later, we face a similar problem of trying to restore trust in the securities market but starting from very different initial conditions.

The fundamental trust problem we are facing today is the result of frauds and mistakes committed by managers who are accountable to no one. The 2007 to 2008 financial crisis is perceived as a manifestation of excessive risk taking by managers who were enriching themselves via short-term bonuses while destroying the long-term value of their companies (ACCA [2008])."

³ Noise traders are investors that do not trade on fundamental company information, but rather on rumors, fads, and other types of information deemed to be unreliable.

share prices and harm market functioning. His line of reasoning is also in parallel with numerous studies' findings that individuals' response to information is limited or naive, concluding that individual investors do not effectively utilize all available information (Malmendier and Shanthikumar 2007; Hirshleifer et al. 2008).

To overcome such alleged regulatory inefficiencies in traditional markets, these critics call for deregulation of financial disclosures in public markets. Zingales (2009) proposes a less regulated public disclosure regime which would lead to more information asymmetry between institutional and individual investors. Increased information asymmetry, he argues, would then deter rational individual investors from investing on their own and cause them to participate in equity markets through institutional investor channels. In such a case, unlike the average undiversified individual investor, well-diversified institutions would require less firm-specific accounting information and a decrease in mandatory disclosures would not harm their returns as much.

Langevoort (2009) and Zingales (2009) also argue that with higher institutional holding percentages, more empowered institutional investors would not need the protection of the securities rules and regulations as currently conceived. Langevoort (2009) asserts that even if there is some slippage and investor losses ensue, institutions, as diversified investors, will not suffer substantial harm.

Overall, Langevoort (2009) and Zingales (2009) conclude that more institutions oriented, and less regulated markets would be more effective at inducing individual investors' capital market participation and increasing liquidity. Such policies would, in turn, provide a natural mechanism for the provision of capital for private innovation and assist allocative efficiency. These two opposite policy views discussed above, in fact, share a fundamental similarity in

their line of reasoning. Both assume more (less) disclosure of mandatory financial information leads to less (more) information asymmetry between individual and institutional investors.

However, it is unclear whether imposing more (less) disclosure of accounting information would always result in less (more) information asymmetry among investors. Moreover, the empirical evidence on the information asymmetry consequences of major regulatory changes is mixed (Healy and Palepu 2001, Beyer et al. 2010, Leuz and Wysocki 2016).

Securities and accounting regulators' agenda for enhanced mandatory disclosures aims at reducing information asymmetries among investors, which would consequently encourage individual investors to participate in capital markets and to make their own informed investment decisions. On the other hand, proponents of fewer disclosure requirements suggest more information asymmetry between institutional and individual investors, which would channel individual investments towards institutional portfolios rather than shying them away from capital markets.

However, both policy views' assertions are quite contradictory to the historical evidence on the evolution of US capital markets. Along with more stringent legal and disclosure regulations, the last thirty years have brought a rapid shift toward institutionalization in the financial markets in the United States (a shift toward investment by mutual funds, pension funds, insurance companies, bank trust departments, and the like). This trend obviously contrasts with the deregulation advocates' view, which suggests fewer, as opposed to more, disclosure regulations would bring about more institutional holdings or institutionalization.

There are newer forms of institutional ownership, hedge funds and private equity firms that had a relatively small presence before the 1980s but now invest trillions of dollars collectively. In 1950, individual investors owned over 90% of the stock of U.S. corporations (Bogle 2005).

According to Securities Industry and Financial Markets Association (SIFMA) 2019 Fact Book, individual investors owned 37.6% of the market value of outstanding equity securities in 2018. This striking decline in direct individual ownership ratio, on the other hand, is inconsistent with the SEC and the FASB's efforts over the last thirty years to remediate information asymmetries among outside investors and to encourage individual investors make better informed investment decisions on their own via enhanced mandatory disclosures.

Yet, this dramatic decrease in individual investor ownership ratio over the last sixty years does not mean individual and household investment has declined in absolute numbers. In fact, from 1965 to 2018, the value of equity securities owned directly by households increased from approximately \$616 billion to \$16.1 trillion. More disclosure regulations over this time span implies that the SEC and the FASB have been fairly successful at spurring individual investors to participate in capital markets. However, advocates of less disclosure regulation are silent on this fact and do not address the issue of how individual investors' capital market participation would be affected when there is less mandatory public information is available and, potentially, all outside investors are relatively less informed.

In light of the above discussion, first, I study the information asymmetry effects of enhanced mandatory disclosures by incorporating the inherent differences between institutional and individual investors into an information model. Institutional and individual investors, as the main users of financial information, have inevitable differences in terms of obtaining and processing information (El-Gazzar 1998, Hirshleifer and Teoh 2003, Malmendier and Shanthikumar 2007, Hirshleifer et al. 2008). These informational inequities may emerge from money, time, social network, education and/or professional expertise related factors.

In the model, I characterize the information asymmetry to originate from the fact that some investors possess private information ex-ante mandatory public disclosure in a setting where

I also assume all investors to be equally sophisticated at information processing (Refer to Chapter 4 for more discussion on differential information processing). I show that enhanced mandatory disclosure does not always result in leveled informational playing field and reduced information asymmetry. Specifically, I show how the relative characteristics of mandatory disclosure and ex-ante private information systems (complementary versus substitute nature of the information signals they generate), affect the extent of ex-post information asymmetry between individual and institutional investors. Furthermore, I explain and predict under which conditions enhanced mandatory disclosure would result in lower information asymmetry and/or even informational playing field.

Drawing on the findings and predictions of the model, I present a conceptual framework of classifying accounting standards and disclosure requirements in a spectrum from ‘substitute’ to ‘complementary’ based on their objectives and information properties at the time of pronouncement and on the nature of their relationship with the ex-ante private information. Finally, I discuss the empirical implications of such classification scheme, which is based on the model’s findings.

I expect the contribution of this study along the following lines. First, it challenges the assumption of imposing more (less) disclosure of accounting information would always result in less (more) information asymmetry among investors. Through a formal analysis, it shows how the relative information characteristics of mandatory (regulatory) disclosures and ex-ante private information systems determine ex-post information asymmetries. Second, by putting forward a novel approach to classify and distinguish disclosure regulations based on their information characteristics, this study presents a conceptual framework to study the financial consequences of disclosure regulations. And finally, this study has the potential to contribute to the policy debate on the issue of desirability of disclosure regulations.

The remainder of the thesis is organized as follows. Chapter 2 covers the fundamentals of how to model information. Chapter 3 develops an information model of the effects of mandatory disclosure on information asymmetry. Chapter 4 extends the analysis by incorporating differential information processing abilities among investors. Chapter 5 presents a conceptual framework of classifying accounting standards based on the model's findings and discusses its empirical implications. Chapter 6 concludes the thesis by summarizing its main findings and discussing its potential contributions.



Chapter 2

MODELING INFORMATION

To model uncertainty and information, I use state representation following Savage (1972) and Christensen and Demski (2003). A state is a description of the world containing all the conceivable relevant aspects of an uncertain outcome which decision maker's action choice will affect. In other words, a state variable carries all important uncertainty regarding the realizations of the variable in question. By the nature of uncertainty, the true state to be realized is unknown and this notion is captured by assigning probabilities to the possible states.

In this representation, information can be defined as something that refines our knowledge of the state. In other words, information reduces the number of uncertain outcomes that will follow any action choice by revealing something about states that are certain not to occur. This enables the decision maker to revise the probabilities on the set of states and make informed decisions.

Following Christensen and Demski (2003), let $Z = \{z_1, z_2, z_3, \dots, z_m\}$ be a collection of sets.

This collection of sets, Z , forms a partition of $S = \{s_1, s_2, s_3, \dots, s_n\}$ if

1. $z_i \subseteq S, \forall z_i \in Z$
2. $z_1 \cup z_2 \cup z_3 \cup \dots \cup z_m = S$
3. $z_i \cap z_j = \emptyset, \forall z_i, z_j \in Z \text{ and } i \neq j$

From a modeling perspective, this relies on an information source being a partition of the set of possible states, a collection of mutually disjoint subsets of the set of possible states whose

union is the set of possible states. The information source then reveals which partition element contains the true state. Each possible information signal is a subset of the set of states, S .

Now let us consider the set $\{Z\}$ consisting of all possible partitions $Z = \{z\}$, $Z' = \{z'\}$, of a fundamental set of states, $S = \{s\}$. Each partition Z is called a set of (mutually exclusive and exhaustive) state descriptions. A binary relation " $\leq$ " is defined on $\{Z\}$ as follows:

DEFINITION 1. $Z \leq Z'$ (Z is **finer** than Z' ; or, Z' is coarser than Z ; or, equivalently, Z is a **sub-partition** of Z') if, for every z in Z , there is a z' in Z' with $z \subseteq z'$.

The relation " $\leq$ " induces a strict partial ordering on $\{Z\}$ and, from an information perspective, enables us to rank information sources. In other words, if Z is a sub-partition of Z' , as an information source Z provides at least as much (PRECISE) information as Z' . Information sources that have a strict partial ordering relation with each other are called **substitute** information sources.

However, this sub-partition device or " $\leq$ " relation does not allow a complete ranking of information sources. Because not every possible partition of a fundamental set of states, S , is a sub-partition of the other. In such case, neither of the two partitions or information sources is superior to another and each source reveals some information the other does not. I define such information sources as complements to each other as they provide more detailed, superior information (a finer sub-partition of the state space, S) when combined.

DEFINITION 2. Let the set $\{Z\}$ consist of all possible partitions $Z = \{z\}$, $Z' = \{z'\}$ of a fundamental set of states, $S = \{s\}$. Each partition Z is called a set of (mutually exclusive and exhaustive) state descriptions.

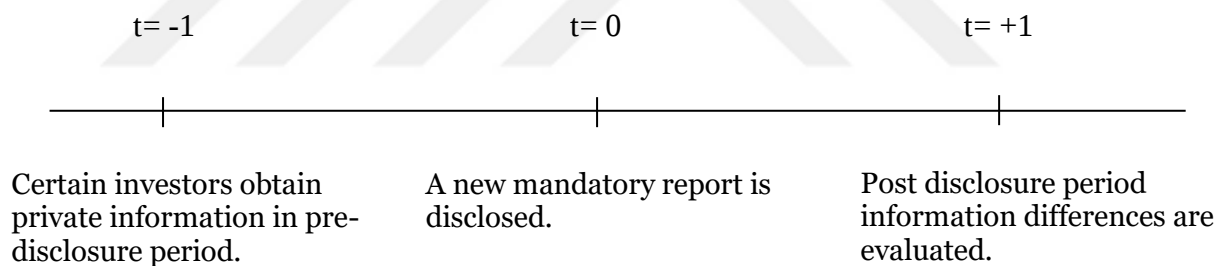
If, for at least one z in Z , there is a z' in Z' with $z \not\subseteq z'$ and for at least one z' in Z' , there is a z in Z with $z' \not\subseteq z$; then Z and Z' are called **complementary** information sources.



Chapter 3

**A MODEL: THE EFFECTS OF MANDATORY DISCLOSURE
ON INFORMATION ASYMMETRY**

Consider an informational playing field where certain investors are more informed than the others about the intrinsic value of a public company through their access to private information. To reduce information asymmetry between these ex-ante privately informed investors and the uninformed ones, a regulatory body mandates enhanced disclosure of value-relevant financial information on this company. The timeline of events is summarized below.



I assume the value of the firm to be invested in is a random variable with no specific distribution characteristic specified but each possible state in the state space, S , represents (an event that would lead to) a different potential realization value with a positive probability. I define information asymmetry as follows:

$$\text{Information Asymmetry} = \frac{(\text{Number of States for Public Information})}{(\text{Number of States for Private Information})}$$

The number of states in each partition represents the extent of the uncertainty in each information signal (OR inverse of the precision of each information signal). 'Pre-Info Asym'

and ''Post-Info Asym'' represent information asymmetry measures at time $t = -1$ and $t = +1$, respectively.

In this setting, to analyze the information asymmetry effects of an enhanced mandatory disclosure, two potential cases need to be reckoned. First, ex-ante private information and mandatory public disclosure are complementary information sources. The results of this analysis will be covered in proposition 1 and remark 1. In the second case, each information source is a sub-partition of the other, as will be presented through propositions 2 and 3 (Refer to Appendix A for proofs).

PROPOSITION 1 If ex-ante private information and mandatory public disclosure are complementary information sources, the ex-post informational playing field will never be leveled. The resulting information asymmetry between ex-ante informed and uninformed investors might increase, decrease or remain unchanged depending on the information content of the signals provided by these sources. To be specific, the less commonality the information content of these signals share, the more precise would be the resulting post-private information and the higher would be the resulting information asymmetry.

REMARK 1 Assume certain investors are more informed than the others about the intrinsic value of a public company through their access to private information. If a new public disclosure, the information content of which is in complementary nature to that of ex-ante private information, is imposed; the resulting informational playing field will not be even (leveled).

The above analysis captures to a certain extent the private event-period information formation. Kim and Verrecchia (1997) define private event-period information as new information arising from an interaction between information contained in the public announcement and

private information gathered elsewhere that becomes useful only in conjunction with the announcement itself. In this context, the ex-ante private information could be firm-specific knowledge about events affecting future performance such as planned capital expenditures or an important customer's non-renewal of a contract, which can be combined with publicly reported earnings to produce "uniquely privately inferred information" about future earnings.

PROPOSITION 2 If, as an information source, mandatory public disclosure is a sub-partition (superior& perfect substitute) of ex-ante private information; the resulting informational playing field will be even (leveled) in the post public disclosure period.

The information content or partition structure of the post-private information will be just the same as that of post-public information, which means all investors end up having same information. In fact, this result is a direct consequence of the fact that mandatory public disclosure, as a superior information source, perfectly substitutes for the ex-ante private information and eliminates the pre-disclosure period information differences.

PROPOSITION 3 If, as an information source, mandatory public disclosure is a sub-partition of ex-ante private information; the information asymmetry between informed and uninformed investors will decrease in the post disclosure period. However, the resulting informational playing field will not be even (leveled).

Since by definition 1, pre-private information is superior to the mandatory public disclosure, ex-ante uninformed investors will never end up having the same information as the privately informed ones, which will be manifested in the information contents of the post-public and post-private information signals. As a sub-partition of pre-private information source, mandatory public disclosure does not bring any new information to the ex-ante informed investors. Yet it makes ex-ante uninformed investors somewhat more informed, which reduces the information gap between these two classes of investors.

Chapter 4

DIFFERENCES IN PROCESSING DISCLOSURES

For the sake of completeness in the analysis, in this section, I assume the information asymmetry to stem from differential processing abilities among investors, without any investor possessing ex-ante private information.

Investors might differ in their ability to process financial disclosures or in their access to processed information due to cognitive, money, time, social network, education and professional expertise related reasons. In such cases, the analysis lends itself to a straightforward conclusion. Namely, sophisticated users of accounting disclosures, even without any prior private information, can effectively process public disclosures into new idiosyncratic information relative to common information. Such generation of private information due to the triggering effect of enhanced public disclosures would likely put unsophisticated investors at a greater disadvantage and result in greater information asymmetry.

For example, in the context of SFAS No. 131, *Disclosures about Segments of an Enterprise and Related Information*' (FASB 1997), more disaggregated operating segments disclosures would help a sophisticated investor (OR a financial analyst) who understands when and how specific accruals will reverse and affect future earnings to predict future earnings with greater precision. Consistent with this argument, empirical studies find that implementation of SFAS 131 results in greater precision in analysts' forecasts (Berger and Hann 2003) and greater ability of investors to predict earnings (Ettredge et al. 2005).

On the other hand, if estimated future cash flow type - already processed and ready to be incorporated into economic decisions- public disclosures are generated then we can expect to see a less uneven informational playing field.

From this perspective, fair value disclosures represent more direct and value relevant, naturally processed (either by an active market as in mark-to-market or by company executives as in mark-to-model) information which facilitates less sophisticated users' economic decisions. Setting aside the reliability concerns over the fair value disclosures, this type of expanded mandatory disclosures would predictably reduce the information asymmetries among investors with differential processing abilities.

Chapter 5

A CONCEPTUAL FRAMEWORK OF CLASSIFYING DISCLOSURE REGULATIONS AND ITS EMPIRICAL IMPLICATIONS

In this section, drawing on the model's findings and contrasting implications of complementary vs. substitute information systems, I present a conceptual framework of classifying disclosure regulations based on their information properties and objectives at the time of pronouncement by a regulatory body. The purpose of such framework is to identify the nature of the relation between accounting and disclosure regulations and the pre-disclosure period private information in terms of their information structures. If the analysis suggests that the nature of the relation between these information sources is more complementary than substitute, by referring to propositions 1-3, we can predict to observe an uneven playing field, relatively higher information asymmetries among outside investors and an increase in the percentage of institutional holdings in the post-regulation period. On the contrary, if substitution effects are more pronounced then we expect to find relatively lower information asymmetry and lower institutional holding percentages in the post-disclosure period.

To exemplify such classification, let us consider the type of disclosure requirements which originate, to primarily mitigate the informational inequities among outside investors (*Extrinsic information asymmetry*). For example, the issuance of FASB ASC Topic 718, 'Share Based Payment' (2011) requires companies to expense the estimated fair value of employee stock options and similar awards. The expense valuation methods required by the FASB are based upon option pricing models that are fairly complicated and, naturally, demand incorporation of further information, such as assumptions and estimates for the valuation

model variables (i.e., expected life, volatility, interest rate, and dividend). Furthermore, for such types of disclosures the accounting regulatory bodies demand guidance from companies. The guidance, which is another form of mandatory disclosure, requires disclosures of the nature of any estimates or assumptions that could materially impact the financial condition or operating performance of an entity. Also, the critical accounting estimates should present management's analyses of the uncertainties involved in applying a principle.

Within the context of FASB ASC Topic 718, any ex-ante private information that would give advantage to certain investors in terms of making more informed estimates and assumptions would be substituted even subsumed, by the public disclosure and provide, relatively, a more leveled playing field.

Similarly, the Regulation Fair Disclosure (Reg FD) regulation enacted by the SEC explicitly prohibits disclosure of material nonpublic information to select market participants (SEC 2000). What prompted policymakers to issue such restrictions is the concerns of market participants that selective earnings guidance creates an uneven playing field and damage investor confidence (Levitt 1998b). Companies which choose to replace private disclosure to analysts with public disclosure in the post-Reg FD period provide a setting to test the empirical predictions of the model. To be specific, public disclosures display a substitute characteristic to the pre-Reg FD selective earnings guidance, which leads us to hypothesize to observe a decrease in information asymmetry levels and institutional holding percentages in the post-Reg FD period.

On the other hand, if the regulation aims at reducing the information asymmetry between firm insiders and outside investors (*Intrinsic information asymmetry*), we are more likely to observe a 'complementary' effect.

For example, the '*management approach*' in SFAS No. 131, Disclosures about Segments of an Enterprise and Related Information' (FASB, 1997) requires that disaggregated information be presented based on how management internally evaluates the operating performance of its business units. Besides providing more disaggregated information, this standard allows users to assess the performance of individual operating segments in the same way that management does. (Herrmann and Thomas, 2000; Berger and Hann, 2003). Within this setting ex-ante private information about certain operating segment-specific knowledge (such as future consumption patterns of a product policy, details of a prospective industry regulation in a country or a potential competitor threat in a specific consumer category) potentially becomes even more useful through the disclosure of disaggregated operating segments information. Since mandated disclosures under SFAS 131 stimulate the generation of new idiosyncratic information by the privately informed investors, we can expect to observe greater information asymmetry and higher percentage of institutional holdings post-regulation.

Also as established in the literature, trading volume reactions are the outcome of a lack of consensus regarding a firm's stock price. Empirical evidence suggests that a significant portion of the trading around earnings announcements stems from differential interpretations of the announcement (Bamber et al., 2011). In other words, trading volume reactions reflect the disagreement across investors, including disagreement arising from information asymmetry. Therefore, we can expect to observe higher trading volume reactions to public disclosures that increase information asymmetry. Referring to our model's findings and predictions, more 'complementary' disclosure regulations stimulate the generation of new idiosyncratic information by the privately informed investors, which suggests post-information asymmetry and disagreements. Hence, we can predict that a more 'complementary' disclosure regulation is associated with a greater increase in trading volume in the post-regulation event-period.

As discussed above I expect the disclosure regulations that target informational inequities among outside investors (*extrinsic information asymmetry*) to be in more **substitute** relation with ex-ante private information. Also, I show in section 3 that a mandatory disclosure the information content of which is in substitute nature to that of ex-ante private information resolves more information asymmetry than a complementary one.

A firm's information environment can be defined as the extent of public information available about the firm that reduces incentives to acquire private information. Public information generated by the firm through voluntary disclosures, or by intermediaries such as news media or financial analysts determines the strength of a firm-level information environment. In that regard, in weaker information environments we expect to observe higher information asymmetry levels in the pre-disclosure period for two reasons. First, there is less public information generated and available about the intrinsic value of the firm. Second, a weaker information environment increases the net benefits of and the incentives for private information acquisition (Verrecchia, 1982; Diamond, 1985; Kim and Verrecchia, 1991), leading to more private information in the pre-disclosure period.

Therefore, in the particular context of 'extrinsic-substitute' disclosure regulations - for any given level of information precision- we can expect to see more extrinsic information asymmetry is resolved (higher decrease in information asymmetry) via disclosure regulation in weaker information environments due to the fact that pre-disclosure extrinsic information asymmetry is higher.

Similar reasoning can be applied to the disclosure regulations that aim to mitigate the information asymmetry between firm insiders and outside investors (*intrinsic information*

asymmetry). These types of disclosure regulations improve the monitoring role by outside parties and lead to better managerial incentive alignment with outside shareholders. These effects potentially feed back into managerial decision making and have real effects. (Kanodia and Sapra, 2016). Real effects represent situations in which the disclosing manager changes her decisions in the real economy in anticipation of public disclosure (e.g., investment, consumption or resource allocation decisions). In that regard, more effective disclosure regulations can be expected to bring about better incentive alignment between firm insiders and outsiders and improved managerial performance. There are studies in literature linking better reporting quality to higher investment efficiency (Biddle et al., 2009; Chen et al., 2011), and better internal capital allocation (Cho, 2015).

In weaker firm-level information environments, we expect to observe higher levels of intrinsic information asymmetries in the pre-disclosure period simply because there is less public information available regarding the performance indicators of managers. Therefore, in the particular context of ‘intrinsic- complementary’ disclosure regulations, I predict more intrinsic information asymmetry will be resolved in weaker information environments in the post-regulation period. That is to say, new mandatory public disclosure will have relatively more weight in monitoring managerial behavior and incentive alignment and resolve more intrinsic information asymmetry, leading to a more improved managerial performance in weaker information environments.

Chapter 6

CONCLUSION

I study the information asymmetry effects of enhanced mandatory disclosure by incorporating the inherent differences between institutional and individual investors into an information model. In the model, I characterize the information asymmetry to originate from the fact that some investors possess private information ex-ante mandatory public disclosure. I show that enhanced mandatory disclosure does not always result in leveled informational playing field and reduced information asymmetry. Specifically, I show how the relative characteristics of mandatory disclosure and ex-ante private information systems (complementary versus substitute nature of the information signals they generate), affect the extent of ex-post information asymmetry between individual and institutional investors.

Drawing on the findings and predictions of the model, I present a conceptual framework of classifying accounting standards and disclosure requirements in a spectrum from ‘substitute’ to ‘complementary’ based on their objectives and information properties at the time of pronouncement and on the nature of their relationship with the ex-ante private information. Finally, I discuss the empirical implications of such classification scheme, which is based on the model’s findings.

I expect the contribution of this study along the following lines. First, it challenges the assumption of imposing more (less) disclosure of accounting information would always result in less (more) information asymmetry among investors. Through a formal analysis, it shows how the relative information characteristics of mandatory (regulatory) disclosures and ex-ante private information systems determine ex-post information asymmetries. Second, by putting

forward a novel approach to classify and distinguish disclosure regulations based on their information characteristics, this study presents a conceptual framework to study the major capital market consequences of disclosure regulations. And finally, this study has the potential to contribute to the policy debate on the issue of desirability of disclosure regulations.



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Appendix A

A.1 Proof of Proposition 1

A.1.1 Proposition 1

If ex-ante private information and mandatory public disclosure are complementary information sources, the ex-post informational playing field will never be leveled. The resulting information asymmetry between ex-ante informed and uninformed investors might increase, decrease or remain unchanged depending on the information content of the signals provided by these sources. To be specific, the less commonality the information content of these signals share, the more precise would be the resulting post-private information and the higher would be the resulting information asymmetry.

A.1.2 Proof of Proposition 1

We can analyze the resulting effect of an interaction between two complementary information sources in two possible scenarios.

Case 1- The Precision of Mandatory Public Information Signal is Greater⁴ than the Precision of Private Information Signal ex-ante Mandatory Public Disclosure:

Total state spaces: $s_1, s_2, \dots, s_{12}$.

Public information ex-ante mandatory public disclosure (Pre-public information):

$s_1, s_2, \dots, s_{12}$.

Private information ex-ante mandatory public disclosure (Pre-private information):

$(s_1, s_5, s_6, s_{10}, s_{11}, s_{12}), (s_2, s_3, s_4, s_7, s_8, s_9)$.

Mandatory public disclosure (Post-public information): $(s_1, s_2, s_3, s_4), (s_5, s_6, s_7, s_8), (s_9, s_{10}, s_{11}, s_{12})$.

⁴ The analysis and the results do not change if the precision of the signals generated by these two information systems are the same.

Private information ex-post mandatory public disclosure (Post-private information:

Pre-Private information combined with public disclosure):

$(s_1), (s_9), (s_5, s_6), (s_7, s_8), (s_2, s_3, s_4), (s_{10}, s_{11}, s_{12})$.

RESULTS:

Pre-Info Asym = (of states for Pre-Public Info) / (# of states for Pre-Private Info) = $12/6 = 2$.

If the post-private information is (s_1) or (s_9) , the information asymmetry increases through mandatory public disclosure as shown below:

Post-Info Asym₁ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $4/1 = 4$.

If the post-private information is (s_5, s_6) or (s_7, s_8) , the information asymmetry does not change through mandatory public disclosure as shown below:

Post-Info Asym₂ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $4/2 = 2$.

If the post-private information is (s_2, s_3, s_4) or (s_{10}, s_{11}, s_{12}) , the information asymmetry decreases through mandatory public disclosure as shown below:

Post-Info Asym₃ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $4/3 = 1.33$

Case 2- The Precision of Mandatory Public Information Signal is Less than the Precision of Private Information Signal ex-ante Mandatory Public Disclosure:

Total state spaces: $s_1, s_2, \dots, s_{12}$.

Public information ex-ante mandatory public disclosure (Pre-public information):

$s_1, s_2, \dots, s_{12}$.

Private information ex-ante mandatory public disclosure (Pre-private information):

$(s_1, s_2, s_3, s_4), (s_5, s_6, s_7, s_8), (s_9, s_{10}, s_{11}, s_{12})$.

Mandatory public disclosure (Post-public information): $(s_1, s_5, s_6, s_{10}, s_{11}, s_{12}), (s_2, s_3, s_4, s_7, s_8, s_9)$.

Private information ex-post mandatory public disclosure (Post-private information): $(s_1), (s_9),$

$(s_5, s_6), (s_7, s_8), (s_2, s_3, s_4), (s_{10}, s_{11}, s_{12})$.

RESULTS:

Pre-Info. Asym = (of states for Pre-Public Info.)/(# of states for Pre-Private Info.) = $12/4 = 3$.

If the post-private information is (s_1) or (s_9) , the information asymmetry increases through mandatory public disclosure as shown below:

Post-Info Asym₁ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $6/1 = 6$.

If the post-private information is (s_5, s_6) or (s_7, s_8) , the information asymmetry does not change through mandatory public disclosure as shown below:

Post-Info Asym₂ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $6/2 = 3$.

If the post-private information is (s_2, s_3, s_4) or (s_{10}, s_{11}, s_{12}) , the information asymmetry decreases through mandatory public disclosure as shown below:

Post-Info Asym₃ = (of states for Post- Public Info)/(# of states for Post-Private Info) = $6/3 = 2$.

Remark 1 Assume certain investors are more informed than the others about the intrinsic value of a public company through their access to private information. If a new public disclosure, the information content of which is in complementary nature to that of ex-ante private information, is imposed; the resulting informational playing field will not be even (leveled).

Proof of Remark 1

A leveled informational playing field would imply a post-information asymmetry measure which is equal to 1. However, as can be seen in proof of Proposition 1, the post-information asymmetry measure is greater than 1 under every possible scenario implying a continuing informational advantage of ex-ante privately informed investors.

A.2 Proof of Proposition 2

A.2.1 Proposition 2

If, as an information source, mandatory public disclosure is a sub-partition (superior& perfect substitute) of ex-ante private information; the resulting informational playing field will be even (leveled) in the post public disclosure period.

A.2.2 Proof of Proposition 2

Total state spaces: $s_1, s_2, \dots, s_{12}$.

Public information ex-ante mandatory public disclosure (Pre-public information): $s_1, s_2, \dots, s_{12}$.

Private information ex-ante mandatory public disclosure (Pre-private information):
 $(s_1, s_2, s_3, s_4, s_5, s_6), (s_7, s_8, s_9, s_{10}, s_{11}, s_{12})$.

Mandatory public disclosure (Post-public information): $(s_1, s_2, s_3), (s_4, s_5, s_6), (s_7, s_8, s_9),$
 (s_{10}, s_{11}, s_{12}) .

Private information ex-post mandatory public disclosure (Post-private information): $(s_1, s_2, s_3),$
 $(s_4, s_5, s_6), (s_7, s_8, s_9), (s_{10}, s_{11}, s_{12})$.

Pre-Info Asym = $12/6 = 2$.

Post-Info Asym = $4/4 = 1$.

A.3 Proof of Proposition 3

A.3.1 Proposition 3

If, as an information source, mandatory public disclosure is a sub-partition of ex-ante private information; the information asymmetry between informed and uninformed investors will decrease in the post disclosure period. However, the resulting informational playing field will not be even (leveled).

A.3.2 Proof of Proposition 3

Total state spaces: $s_1, s_2, \dots, s_{12}$.

Public information ex-ante mandatory public disclosure (Pre-public information): $s_1, s_2, \dots, s_{12}$.

Private information ex-ante mandatory public disclosure (Pre-private information):

$(s_1, s_2, s_3), (s_4, s_5, s_6), (s_7, s_8, s_9), (s_{10}, s_{11}, s_{12})$.

Mandatory public disclosure (Post-public information):

$(s_1, s_2, s_3, s_4, s_5, s_6), (s_7, s_8, s_9, s_{10}, s_{11}, s_{12})$.

Private information ex-post mandatory public disclosure (Post-private information):

$(s_1, s_2, s_3), (s_4, s_5, s_6), (s_7, s_8, s_9), (s_{10}, s_{11}, s_{12})$.

As a sub-partition of pre-private information source, mandatory public disclosure does not bring any new information to the ex-ante informed investors. Yet it makes ex-ante uninformed investors somewhat more informed, which reduces the information gap between these two classes of investors. The resulting lower information asymmetry can be seen in the pre versus post information asymmetry measures below.

Pre-Info Asym = (of states for Pre-Public Info) / (# of states for Pre-Private Info) = $12/3 = 4$.

Post-Info Asym = (of states for Post- Public Info)/(# of states for Post-Private Info) = $6/3 = 2$.