Breaking it Down: Competitive Costs of Cost Disclosures

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Abstract

Does decomposing cost of goods sold entail significant competitive costs? We examine this question using a relaxation of disaggregated manufacturing cost disclosure requirements in Korea. Our survey evidence indicates managers perceive these disclosures to provide a competitive edge to competitors. Using archival data, we find firms with distinctive cost structures and high market shares are less willing to disclose, consistent with a desire to protect cost-leadership advantages embedded in production and sourcing. Firms experience higher gross profits and lower liquidity after withholding manufacturing cost details, suggesting these disclosure decisions involve trading off competitive costs (and not managers' self-interests) against capital market benefits. At the aggregate level, industries with more nondisclosing firms subsequently experience greater profitability dispersion, suggesting uncertainty about competitors' cost of goods sold helps drive the widely studied performance dispersion observed within industries.

JEL Classification: D40, D80, L15, M40

Key Words: Competition, Disaggregated cost disclosure, Manufacturing cost structure, Profitability dispersion, Proprietary cost, Voluntary disclosure

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1. Introduction

Cost minimization is an essential part of profit maximization. If cost minimization is subject to frictions, then information about competitors' costs may play a key role in shaping competitive outcomes. Although cost disclosures may thus help determine competition, the empirical accounting is largely silent on the impact of disclosure about a firm's cost of goods sold (COGS).[1] The omission is notable because COGS is typically the largest expense on manufacturers' and retailers' income statements, disclosed information about it has important implications for firm performance and industry competition, and it is closely tied to firms' production and activities (e.g., Baron and Myerson 1982; Cohen 2010; Mussa and Rosen 1978; Shapiro 1986). We therefore investigate how competitive costs, managers' self-interests, and capital market benefits influence voluntary disaggregation decisions about COGS, and the economic consequences of these decisions at the firm and industry levels.[2]

We examine Schedule of Manufacturing Costs (henceforth SoMC) disclosures, which were mandatory for Korean public firms before 2004, and voluntary thereafter. This setting has appealing characteristics for examining cost disclosures. First, a firm's SoMC details its cost structure with considerably more granularity than 10-K cost disclosures do. As such, SoMCs are informative about firms' production and sourcing activities in ways not applicable to other settings. For example, we are able to produce a novel proprietary cost measure intimately tied to the SoMC: cost structure distinctiveness, which measures how much a firm's cost structure deviates from its

[1] While researchers have examined voluntary disclosures that incorporate cost information (e.g., Dedman and Lennox 2009), these disclosures also include revenue information, making it difficult to discern which type of information drives the results.

[2] We view competitive costs to be a subset of proprietary costs. Competitive costs of disclosure derive from intensified competition from industry peers. Proprietary costs of disclosure encompass these, as well as loss of bargaining power within the supply chain.

industry's norm in terms of portions of spending on labor, materials and overhead. Second, our setting features a change in disclosure regime, allowing us to form inferences about the economic consequences of voluntary disclosure decisions.[3] Finally, we observe public SoMC disclosures for a selected set of private firms, helping us to separate the roles of competitive costs and capital market benefits of disclosure more cleanly than is possible in settings with only public firm disclosures (e.g., Berger 2011; Dedman and Lennox 2009).

Our conversations with operational-level managers in Korea help illustrate how a firm might use its competitors' SoMC disclosures. These managers use disclosed information to determine where competitors' cost-leadership advantages lie, and which of their firms' own cost-leadership advantages are under threat. For instance, a Korean firm learning its raw material costs are high relative to its competitors' may attempt to find alternative vendors from low cost countries or to increase vertical integration of its supply chain. Learning of higher relative labor costs suggests a need to improve employee productivity, move production offshore, or outsource activities. Disaggregation of competitors' COGS can help firms identify which of their raw material, labor and overhead costs might be wasteful. Potential entrants can also use incumbents' SoMCs to understand feasible cost structures for entry.

We propose and examine two hypotheses about firms' propensity to disaggregate COGS and disclose the SoMC under the voluntary disclosure regime**.** First, distinctive cost structure firms are more likely to withhold their SoMCs, reducing the ability of competitors to appropriate any cost-leadership advantages these firms' distinctive cost structures reflect. Second, high-

[3] Further, the switch was from mandatory to voluntary disclosure, and thus firms' internal information environments likely remained the same. When moving from a voluntary to mandatory disclosure regime, however, there is not only a disclosure effect, but also an internal information environment effect as firms implement the requisite reporting infrastructure to comply with the mandate.

market share firms are more likely to withhold the SoMC, reducing the ability of competitors to uncover any competitive advantages that drive higher market share.

We find that one standard deviation increases in cost structure distinctiveness and market share reduce SoMC disclosure propensity by 6.3% and 4.7%, respectively. Importantly, we find cost structure distinctiveness and market share also reduce SoMC disclosure propensity for private firms, providing reassurance that our results are not driven purely by capital market benefits (e.g., Ball and Shivakumar 2005; Burgstahler, Hail and Leuz 2006).

Having established competitive cost motivations for non-disclosure, we then examine firm-level economic consequences of the choice to withhold the SoMC and not disaggregate COGS. We find gross profits increase by 6.3% and stock liquidity decreases by 8.5% for public firms withholding the SoMC, relative to those outcomes for public firms disclosing the SoMC, consistent with a tradeoff between competitive costs and capital market benefits of disclosure.[4] The relative increase in gross profits for non-disclosers is inconsistent with a managerial private benefit motivation for withholding the SoMC.

To further check the plausibility of the economic consequence results above, and of our cost structure distinctiveness measure, we survey managers of public firms in Korea. The results, based on 32 respondents, indicate that annual reports are the most important information source for competitor analysis by managers. Managers view peer firms' cost structures as influential in production and sourcing decisions, and the majority of managers agree that their SoMC provides valuable, actionable information for competitor analysis, cannot be reproduced from other information sources, and gives competitors a significant advantage when disclosed.

[4] The percentage increase in gross profits is relative to the mean of gross profits in Panel B of Table 2. The percentage decrease in liquidity comes directly from Table 6 because illiquidity is measured as a logarithm.

Having documented firm-level determinants and economic consequences of SoMC disclosure, we turn our attention to the industry-level impact of these decisions given that competition is an industry-level outcome shaped by firm-level decisions. If firms withholding the SoMC can better shield new and existing cost-leadership advantages in production activities from appropriation by competitors, we expect to see industry profitability dispersion grow as more firms in an industry begin withholding the SoMC. Consistent with this hypothesis, a one standard deviation increase in the percentage of an industry's firms withholding the SoMC is associated with a 5.9% increase in that industry's subsequent gross profit dispersion.[5] This result has ties to the industrial organization literature attempting to explain the widespread, persistent productivity and profitability differences observed across firms within the same industries (e.g., Bartelsman, Haltiwanger and Scarpetta 2013; Breuer 2018; Syverson 2011). Specifically, it suggests uncertainty about competitors' COGS helps drive these differences in manufacturing industries.

Our study provides three contributions. First, we provide evidence that disclosures about firms' cost structures entail significant competitive costs, consistent with these disclosures being informative about firms' production and sourcing activities. Despite the theoretical importance of cost information in shaping competition (e.g., Baron and Myerson 1982; Cohen 2010; Mussa and Rosen 1978; Shapiro 1986), the empirical literature examining competitive costs of disclosure has largely focused on disclosures about summary financial performance and product markets (see Section 3.2.2.1 of Beyer, Cohen, Lys and Walther (2010) for a review).[6] Moreover, examining a

[5] The standard deviation of the percentage of firms withholding the SoMC in an industry in 2004 is 16.7%. The absolute increase in profitability dispersion due to a one standard deviation increase in the percentage of firms withholding the SoMC in an industry is 0.6%=16.7%*0.0371. 5.9% is relative to the mean of profitability dispersion, 10.5%.

[6] A mere sampling includes Ali, Klasa and Yeung (2014), Bens, Berger and Monahan (2011), Berger and Hann (2007), Bernard (2016), Bhojraj, Blacconiere and D'Souza (2004), Botosan and Harris (2000), Dedman and Lennox (2009), Ellis and Fee (2012), Guo, Lev and Zhou (2004), Harris (1998), Huang and Li (2014), Jin (2005), Li (2010), Li, Lin and Zhang (2018), Meek, Roberts and Gray (1995), Scott (1994), and Verrechia and Weber (2006).

disclosure regime change lets us highlight competitive costs of disclosing cost information from both a determinants of disclosure and an economic consequences perspective. Bernard (2016) and Guo, Lev and Zhou (2004) also examine competitive costs from these dual perspectives, albeit in highly specialized settings of product market predation and biotechnology IPOs. Our setting examines manufacturing industry competition, which is important both within and across most developed economies, yet the setting also has features that let us perform the difficult task of distinguishing competitive concerns, capital market benefits, and managerial private benefit motivations in making cost disclosure choices (Berger 2011; Dedman and Lennox 2009).

Second, we add to the literature exploring disaggregation of financial statement information by examining outcomes surrounding decomposition of COGS. IFRS and US GAAP provide little specific guidance about the granularity of financial statement line items. There is also a broader debate by standard setters about disaggregation in financial reporting, as evidenced by the Financial Accounting Standards Board's focus on disaggregation in its long-running Financial Performance Reporting Project. The handful of studies in this area examine disaggregation at the firm or operating segment level, with less regard given to the specific information unlocked by disaggregation (e.g., Berger and Hann 2007; Bens, Berger and Monahan 2011; Chen, Miao and Shevlin 2015; Hoitash and Hoitash 2018). In contrast, we focus on the disaggregation of a single, major line item: COGS. This focus lets us exploit the information made available by disaggregation and construct a measure capturing a new dimension of firm differentiation: cost structure distinctiveness. The literature has typically examined firm differentiation in terms of product markets and geography.

Lastly, by analyzing industry-level profitability dispersion, our study links to the industrial organization literature exploring the ubiquitous productivity and profitability dispersion

phenomenon (e.g., Bartelsman, Haltiwanger and Scarpetta 2013; Breuer 2018; Griffith, Haskel and Neely 2006; Syverson 2004; Syverson 2011). This literature shows that the gap in performance between top and bottom performers in narrowly defined (e.g., 4-digit SIC code) industries is much larger than traditional views of economic competition predict. Thus, firms may face large frictions in attempting to emulate their more successful peers within most industries.

Management practices, product market competition and information technology are examples of factors explaining part of this dispersion, though the majority of it remains unexplained. Recent studies suggest financial reporting and attestation also affect this dispersion by improving the allocation of resources in capital markets and improving internal decision making (e.g., Barrios, Lisowsky and Minnis 2019; Choi 2018; Hann, Kim, Wang and Zheng 2018). We provide evidence that withholding disaggregated COGS information from competitors helps firms maintain competitive advantages in production and sourcing activities, contributing to profitability dispersion within industries. In other words, higher quality financial disclosure is associated with lower within-industry profitability dispersion. This is in keeping with Breuer (2018), who documents that mandatory reporting reduces profitability dispersion, but does not increase economic growth—he suggests reporting regulation facilitates dissemination of proprietary information, which stifles ex-ante incentives to innovate.

Before proceeding, a note on generalizability beyond Korea is in order. We note that the manufacturing sector plays an important role in most advanced economies.[7] Moreover, competitive concerns related to cost structures are widely discussed by firm executives, politicians and policy-makers in the world's leading economies and their multinational organizations (such

[7] In 2004, manufacturing contributed 28.5%, 13.5%, and 17.7% (unweighted average) to value added in Korea, the US and OECD countries. Source: https://data.oecd.org/natincome/value-added-by-activity.htm.

as the OECD).[8] Finally, productivity and profitability dispersion are phenomena observed globally, giving our industry-level results and their implications the same broad applicability as our firm-level findings.

The next section presents the institutional background. Section 3 describes the hypothesis development, Section 4 the data and research design, and Section 5 our empirical results. Section 6 concludes.

2. Institutional Background

2.1. The Schedule of Manufacturing Costs

Until 2003, the Korean Financial Supervisory Commission (KFSC) required Korean pubic firms to disclose a Schedule of Manufacturing Costs (SoMC) along with their annual reports.[9] The SoMC decomposes manufacturing costs into specific components grouped under Raw Material Costs, Labor Costs, and Overhead Costs. Appendix B contrasts the SoMC of Hyundai Motor Company (a Korean firm) with the 10-K automotive cost of sales discussion of General Motors (a US company)—Hyundai's SoMC provides far more detail about its production process and specific costs than General Motors' 10-K discussion does.

Although Korean public firms must report information about manufacturing costs in other parts of their annual reports, evidence suggests these sources compose an imperfect substitute for

[8] E.g., The US Department of Justice and Federal Trade Commission's Antitrust Guidelines for Collaborations Among Competitors states "Other things being equal, the sharing of information relating to price, output, costs, or strategic planning is more likely to raise competitive concern than the sharing of information relating to less competitively sensitive variables."

[9] Formed in 1998, the KFSC was responsible for promulgating financial regulation, and for oversight of financial institutions. In 1999, the Korean Financial Supervisory Service (KFSS) was established and placed under the KFSC's oversight. The KFSS was the integrated regulator of four domains previously regulated by different bodies: banking, insurance, securities, and other financial sectors. One of the KFSS's responsibilities was overseeing firms' compliance with the KFSC's SoMC disclosure requirements. The KFSC became the Korean Financial *Services* Commission in 2008 after the *Supervisory* Commission merged with a portion of the Ministry of Finance and Economy. The merger expanded the scope of the Services Commission relative to the Supervisory Commission.

SoMC information because they are more aggregated and less complete. For instance, major purchases of raw materials must be separately reported, but firms are able to exert significant discretion over what is considered major and over the extent of aggregation. For tax purposes, firms must report total salaries, retirement allowances, employee benefits, rent, and taxes and dues included in manufacturing costs. These items are collectively narrower in scope than the SoMC, however, making the SoMC incrementally informative.

To provide evidence on the potential for disclosure of manufacturing cost reports to create competitive costs, we surveyed managers working for public Korean firms.[10] The results, based on 32 responses, indicate that annual reports are the most important information source for competitor analysis, and that understanding peer firms' cost structures is important for production and sourcing decisions. The majority of managers agree their SoMCs would provide valuable information for competitor analysis beyond other information sources, and would provide competitors a significant competitive advantage if disclosed.

2.2. Disclosure Regulation Surrounding the Schedule of Manufacturing Costs

In 2004, the KFSC made disclosure of the Schedule of Manufacturing Costs, along with ten other Schedules, voluntary for public firms. The impetus for this change was the planned expansion in scope of securities class action lawsuits to cover accounting fraud in annual and quarterly reports from 2005 onwards. The KFSC argued that the SoMC contains proprietary information and mandating its disclosure would place an excessive legal burden on public firms

[10] We emailed a survey invitation to 410 managers through the Korea Investor Relations Service, LinkedIn, and additional contacts. We note two caveats. First, the response rate of 8% is lower than the 38% mean participation rate of surveys in the management accounting literature (Hiebl and Richter 2018), but comparable to Tomy (2019), who surveys bankers about the link between competitive actions and disclosure choices. The email delivery medium might be one factor contributing to the low participation rate. Second, we administered this survey in 2018—even though we ask questions about a disclosure rule change in 2004, survey respondents can use their current knowledge to answer those questions. Appendix C provides the survey questionnaire and summarizes the results.

following the expansion in scope of securities class action lawsuits. At the end of 2004, the KFSC announced and enacted three major changes in disclosure regulation: eliminating some mandatory disclosure items, such as the SoMC; allowing the use of IFRS or US GAAP; and simplifying other elements of the disclosure process. Table 1 chronicles this regulatory process.[11]

[Table 1 about here.]

For private firms, although those considered large (i.e., with assets exceeding seven billion won) have always been required to disclose audited financial statements, the SoMC has always been a voluntary disclosure item.[12]

As noted above, the relaxation of mandatory SoMC disclosure coincided with similar relaxations for other schedules, covering receivables, payables, inventories, deposits, securities, borrowings, bonds, depreciations, and corporate taxes (Hwang and Hong 2004; Kim and Jung 2011). Although these other schedules relate to important accounts, we believe the Schedule of Manufacturing Costs' reporting requirement change was the most important among the suite of disclosure changes because the vast majority of press coverage and discourse among practitioners focused on the SoMC. Consistent with the lower importance of the other schedules, their presence in our data set is substantially more incomplete than for the SoMC, even in years where disclosure was mandatory.

A handful of papers investigate aspects of the SoMC disclosure rule change. Kim, Jung, Choi and Lee (2016) study determinants of firms' disclosure choices including leverage, size, Herfindahl Index, and labor productivity, but do not investigate cost structure distinctiveness,

[11] In addition to the KFSC, the Korean Accounting Standards Board (KASB) also oversaw the SoMC. Until 2006, the KASB had required public and large private firms to prepare the SoMC, but not necessarily disclose it. In 2006, the KASB withdrew this preparation requirement citing proprietary costs. We focus on the change in SoMC disclosure requirements promulgated by the KFSC because these were widely viewed as being more substantial.
[12] Seven billion won reflects the 2004 threshold.

customer concentration, market share, or firms' subsequent performance. Bae, Han, Choi, Noh, Shin and Li (2013) find capital market benefits of disclosing the SoMC, largely focusing on the cost of capital. Oh, Park and Jeon (2017) show that the switch to voluntary disclosure impaired analysts' earnings forecast accuracy. These findings reinforce that SoMC information cannot be completely reconstructed from alternative sources.

3. Hypothesis Development

Our broad thesis is that disaggregation of COGS entails significant competitive costs. Verrecchia (1983) demonstrates that any general voluntary disclosure cost leads to a partial disclosure equilibrium. One important potential disclosure cost is deterioration in competitive position from revealing proprietary information, that is, competitive costs. We build on the industrial organization literature to motivate our specific hypotheses.

3.1. Distinctive Cost Structure Firms

Firms might gain a competitive edge in their industry by implementing cost-leadership innovations in production and sourcing activities (e.g., Dasgupta and Stiglitz 1980). Firms might also discover alternative ways to produce the same product, helping them adjust to input market shocks. Disclosing the Schedule of Manufacturing Costs (SoMC) might facilitate discovery and appropriation of these innovations by a firm's competitors (Cohen 2010). Potential entrants can also use incumbents' SoMCs to determine the type of cost structures necessary to compete in a market, resulting in better informed entry decisions.

Hypothesis 1: *Firms with more distinctive cost structures are more likely to withhold the Statement of Manufacturing Costs.*

3.2. High Market Share Firms

High market share firms are plausibly those with the most to lose should they cede their competitive position. Nickell, Wadhwani and Wall (1992) demonstrate that these firms experience higher productivity growth, potentially due to cost-competitiveness and technological advances. High market share firms will be less willing to disclose their SoMCs if competitors can then discover the sources of their higher productivity.

Hypothesis 2: Firms with higher market share are more likely to withhold the Statement of Manufacturing Costs.

The nulls for Hypotheses 1 and 2 follow from standard assumptions of cost-minimization and full, common knowledge about potential cost structures. Absent these assumptions, a potential countervailing force to proprietary cost motivations for withholding the SoMC is coordination benefits of disclosure. Pooling cost information can help industries allocate production towards more efficient firms, and can be mutually desirable for competitors, customers, and suppliers if it helps them adjust to cost shocks (Armantier and Richard 2003; Li 2002; Ha and Tong 2008; Shapiro 1986; Vives 1984; Vives 2008). To the extent firms perceive benefits from sharing cost information with competitors, customers and suppliers, they will tend to disclose the SoMC. If coordination benefits correlate with cost structure distinctiveness and market share, however, these benefits might obscure competitive costs' impact on SoMC disclosure choices. Because coordination among competitors represents an industry-level disclosure incentive, examining Hypotheses 1 and 2 across- and within-industries can inform us about such obscuring. The idea is

that across-industry variation in SoMC disclosure choices captures competitive costs and coordination benefits, while within-industry variation largely captures competitive costs.[13]

3.3. Tradeoff between Competitive Costs and Capital Market Benefits

Profit maximizing firms should trade off proprietary costs and capital market benefits when making voluntary disclosure choices (Boone, Floros and Johnson 2016; Clinch and Verrecchia 1997; Darrough and Stoughton 1990; Leuz 2004; Verrecchia 1983). We expect gross profits to increase for firms that begin withholding the SoMC, relative to firms that continue disclosing, because they no longer incur competitive costs of SoMC disclosure. Withholding the SoMC and not disaggregatings COGS makes it harder for rivals to learn about existing cost-leadership advantages. Withholding might also spur additional investments in cost reduction that are now better protected from appropriation by competitors.

We focus on reduced information asymmetry as the capital market benefit of SoMC disclosure. Although firms can use ex-post discretion to disclose good news, we view the main decision firms face in our setting as an ex-ante one: whether to adopt a policy of SoMC disclosure or not. This ex-ante view suggests liquidity as a suitable measure of capital market benefits (Leuz and Verrecchia 2000). In the same way withholding the SoMC can preserve information asymmetry between the firm and its competitors, it can also heighten information asymmetry between informed and uninformed investors about cost components that were previously disclosed (Badertscher, Shroff and White 2013).

[13] In addition, antitrust laws limit information sharing between competitors (Vives 2008) and such laws are in place and enforced in Korea. Furthermore, if there are significant frictions in customer-supplier negotiation, supply-chain coordination might not be feasible.

Hypothesis 3-1: *Gross profits increase for firms withholding the Schedule of Manufacturing Costs relative to the gross profits for firms that continue disclosing the Schedule.*

Hypothesis 3-2: *Liquidity decreases for firms withholding the Schedule of Manufacturing Costs.*

Hypothesis 3-1 makes a claim about relative gross profits because we do not view SoMC disclosing firms as providing a counterfactual for SoMC withholding firms had mandatory disclosure continued. Ideally (and impossibly), we would observe the outcomes for non-disclosing firms in a world where the SoMC disclosure mandate was not relaxed. This differs from observing the outcomes for firms that continued disclosing in our setting because these firms are affected by non-disclosure of their competitors' SoMCs. In contrast, Hypothesis 3-2 makes a claim about the level of liquidity because we view a firm's liquidity as being much less impacted by its competitors' SoMC disclosure decisions. Thus, we consider disclosing firms as providing a counterfactual for withholding firms had mandatory disclosure continued.

Managers may trade off not only competitive costs, but also their own private benefits against capital market benefits of disclosure. Withholding the SoMC might make it harder for the firm's monitors to evaluate a poorly performing manager (Berger and Hann 2007). If private benefits motivate firms' SoMC disclosure choices, we expect gross profits to decline for withholding firms. This is because a manager's private benefits typically come at the expense of the firm (Hope and Thomas 2008). Thus, the direction of a firm's gross profit trend after withholding the SoMC can help discriminate between the competitive cost and private benefit motivations for withholding the SoMC. That said, we expect competitive costs to dominate managerial self-interest motivations as a driver of SoMC disclosure choice because the SoMC is

more informative about factory level outcomes rather than corporate level outcomes. Even if firms withhold the SoMC, shareholders have a range of information sources to help assess whether a manager is appropriating firm wealth.

3.4. Effect of Manufacturing Cost Disclosures on Performance Dispersion

Absent frictions in input and output markets, competition should largely eliminate the significant and pervasive productivity and profitability dispersion across firms that is routinely observed by academics (see Syverson (2011) for a review). In this vein, we posit that if information barriers about costs can help firms establish and protect competitive advantages as discussed above, then industries containing more firms withholding the SoMC will exhibit greater dispersion in firm performance.

Hypothesis 4: *An industry's gross profit dispersion increases as the proportion of its firms withholding the SoMC increases.*

4. Data and Research Design

4.1. Data and Sample Selection

The financial and market data come largely from Kisvalue, a leading credit-rating agency and data repository for Korean firms' public disclosures. Kisvalue also provides information voluntarily reported by subscribing firms, which can be privately owned. Kisvalue's data are accessible to any of its subscribers, including academics.[14] IBES provides our analyst data.

Panel A of Table 2 summarizes our sample selection procedure. The base sample comprises firms listed on the Korea Stock Exchange (KSE) and KOSDAQ that disclosed the

[14] We note voluntarily reported data might be less reliable than publicly disclosed data. However, as Gigler (1994) notes, the trade-off between capital market benefits and proprietary costs of disclosure can make voluntary disclosures credible.

Schedule of Manufacturing Costs (SoMC) in 2003, that have the requisite financial information from 2003 to 2005, and that do not produce observations in the top or bottom 1% in terms of independent variables with denominators (such as gross profit and leverage). We then winsorize the top and bottom 1% of observations in terms of profitability and cost-component variables for tests spanning multiple years. In Table 4, we bolster our sample with private firms having audited financial statements that also meet these criteria. While this limits our inferences to private firms that chose to report the SoMC to Kisvalue in 2003, it also allows us to construct an empirical measure of cost structure distinctiveness for private firms. In Table 6, which examines the economic consequences of SoMC disclosure, sample firms must have the requisite financial information from 2001 to 2007.

[Table 2 about here.]

4.2. Empirical Measures of Competitive Position

We examine two key measures of a firm's competitive position as it pertains to the SoMC: its cost structure distinctiveness and market share. Cost structure distinctiveness is the distance of a firm's proportions of manufacturing costs driven by raw material (RMC), labor (LC), and overhead costs (OC) from its industry's average of these proportions.

$$Cost\ Structure\ Distinctivness_{\mathrm{i}} = \left(\frac{RMC_i}{MC_i} - \frac{\overline{RMC}}{\overline{MC}_k}\right)^2 + \left(\frac{LC_i}{MC_i} - \frac{\overline{LC}}{\overline{MC}_k}\right)^2 + \left(\frac{OC_i}{MC_i} - \frac{\overline{OC}}{\overline{MC}_k}\right)^2, \quad (1)$$

where firm i is in industry k and an overbar indicates an industry average. Firms are assigned to industries by their 3-digit Korean Standard Industrial Classification (KSIC) codes. Given that private firms voluntarily disclose the SoMC, we exclude them when computing the industry averages to avoid biasing these averages towards disclosing firms' characteristics. Cost

structure distinctiveness is similar in spirit to other multidimensional firm distance measures, such as a technological and geographic distance (e.g., Jaffe 1988; Netz and Taylor 2002).

We compute market share by dividing a firm's sales by its industry's sales, which comprises public firms' and large private firms' sales.

$$Market\ Share_{i,k} = \frac{Sales_{i,k}}{\sum_{i \in k} Sales_{i,k}} \quad (2)$$

4.3. Effects of Competitive Position on Manufacturing Cost Disclosure Decisions

We explore the determinants of firms' SoMC disclosure decisions using the following linear probability model:

$$NDMC_i = \alpha + \beta_1 \cdot Cost\ Stucuture\ Distinctiveness_i + \beta_2 \cdot Market\ Share_i + \gamma \cdot Control\ Variables_i + \varepsilon_i, \quad (3)$$

$NDMC$ equals 1 if a firm stops disclosing the schedule of manufacturing costs in 2004, and 0 otherwise, with β_1, and β_2 providing inferences about Hypotheses 1 and 2.

A commonly cited concern when interpreting models such as Model (3) is that the choice to withhold information might be driven by lower capital market benefits rather than by higher competitive costs. Our setting, however, allows us to estimate Model (3) separately for public firms and a set of audited private firms that previously voluntarily disclosed the SoMC to Kisvalue in 2003. The literature has argued that capital market benefits play a relatively insignificant role in influencing private firms' disclosure decisions, and thus if β_1 and β_2 are significantly positive for private firms, this will provide assurance that our public firm results are not purely driven by variation in capital market benefits (Ball and Shivakumar 2005; Burgstahler et al. 2006).[15]

[15] Private firms might, however, still derive capital market benefits from disclosure because of venture capitalists.

We include a measure of customer concentration to control for proprietary costs related to supply chain concerns—we consider these costs distinct from competitive costs.[16] Customers and suppliers often negotiate to determine prices and divide economic surplus. Under standard models, manufacturers obtain informational rents by not disclosing their private cost structures (e.g., Baron and Myerson 1982; Mussa and Rosen 1978). We include the Herfindahl Index, PPE entry barriers, related party sales, and the industry proportion of private firms to control for other dimensions of competition that might be correlated both with voluntary disclosure decisions, and with cost structure distinctiveness and market share (Bens et al. 2011; Harris 1998). We do not have directional expectations about these controls' coefficient estimates because they depend on the nature of competition. We include size, leverage, market-to-book, sales growth, gross profits, analyst following, diversification, foreign sales, and membership in high litigation-risk industries to control for other supply and demand drivers for voluntary disclosure. These drivers include the need to secure external financing for growth opportunities, financial schedule preparation costs, investors' informational demands, the presence of agency conflicts that can be mitigated by disclosure, and litigation risk (Berger and Hann 2007; Choi 2014; Frankel, Kothari and Weber 2006; Meek et al. 1995). Appendix A contains variable definitions.

4.4. Tradeoff between Costs and Benefits of Disclosure

We explore the economic consequences of withholding the SoMC and not disaggregating COGS by estimating the following difference-in-differences model for the years 2002 to 2007:

[16] With hand-collected data, we compute customer concentration by dividing a firm's sales to its three largest customers (by sales) by its total sales. Public firms were required to disclose statements of accounts receivable from major customers until 2004, when along with the SoMC such disclosures became voluntary. These statements typically report beginning balances, increases from new credit sales, decreases from customer payments, and ending balances for accounts receivable for each major customer; we use the increases from new credit sales as our measure of sales to a customer. Firms exercise considerable discretion over how they define major customers, and customer concentration is zero if they report no major customers. In such cases, it is unclear whether firms have no major customers, or are withholding information about major customers.

$$Gross\ Profit_{i,t}\ or\ Illiquidity_{i,t} = \gamma_i + \lambda_t + \beta_1 \cdot NDMC_{i,t-1} + \omega \cdot Control\ Variables_{i,t-1} + \varepsilon_{i,t}, \quad (4)$$

where $NDMC_{i,\,t-1}$ indicates if firm i withholds the SoMC in year $t-1$, γ_i are firm fixed effects, and λ_t are year or year-quarter fixed effects. To interpret β_1 as reflective of competitive costs or capital market benefits of SoMC disclosure, we need to mitigate the likelihood that differing characteristics, for instance sales growth, between SoMC disclosing and non-disclosing firms drive differential patterns in these outcomes.

To alleviate these concerns, we propensity score match our set of SoMC withholding firms to a set of observably similar SoMC disclosing firms. We one-to-one match firms that stopped disclosing the SoMC in 2004 to firms that continued disclosing the SoMC in 2004, based on propensity scores, with replacement and within industry. We require matched firms to have propensity scores less than 0.25 standard deviations apart (Imbens 2004).

A residual concern is unobservable reverse causality; that is, firms might anticipate future gross profits, and withhold the SoMC if its disclosure imperils a portion of these profits. Though still consistent with the competitive cost hypothesis, this would overstate the extent of competitive costs. We acknowledge that propensity score matching on observables does not address unobservable anticipation of gross profits.

We include size, leverage, investment, sales growth, and a negative earnings indicator to control for other drivers of realized and expected gross profits separate from voluntary disclosure (e.g., Fama and French 1995; Hayashi 1982; Piotroski 2000). In the illiquidity regression tests, we include size, return volatility, and trading volume to control for other determinants of illiquidity (Chae 2005, Leuz and Verrecchia 2000).

4.5. Effect of Manufacturing Cost Disclosures on Profitability Dispersion

We test whether industries containing more firms withholding the SoMC exhibit greater dispersion in firm performance by estimating the following industry-year level model for the years 2002 to 2007:

$$Gross\ Profit\ Disperison_{i,t} = \gamma_i + \lambda_t + \beta_1 \cdot Ind\ NDMC_{i,t-1} + \omega \cdot Control\ Variables_{i,t-1} + \varepsilon_{i,t}, \quad (5)$$

where *Ind NDMC* is the proportion of an industry's firms withholding the SoMC.

We choose gross profit dispersion as our measure of performance dispersion as a natural extension of our firm level tests based on gross profits. We include the following control variables: the Herfindahl Index to capture non-information-based drivers of competition that might reduce performance dispersion (e.g., Javorcik 2004; Syverson 2011); industry intangible assets to capture performance dispersion driven by uncertain processes such as R&D (e.g., Doraszelski and Jaumandreu 2013); industry leverage to capture financial friction-based entry barriers that allows incumbents' performance to become disperse (e.g., Midrigan and Xu 2013); and average firm size and profitability to capture any mechanical relation between scale and dispersion in an industry's profitability.

5. Empirical Results

5.1. Descriptive Statistics

Panel B of Table 2 reports descriptive statistics. Public firms withholding the Schedule of Manufacturing Costs (SoMC) have more distinctive cost structures and higher market shares than disclosing public firms. Relative to SoMC disclosers, SoMC withholders are also more likely to operate in lower PPE entry barrier and lower litigation risk industries, have a lower proportion of domestic sales, have more gross profits, be larger, be less leveraged, have a higher market-to-book ratio, and have analyst coverage.

Panel C of Table 2 reports the correlation matrix, which shows a number of significant correlations between our competitive position, industry competition, and other control variables. While we do our best to isolate the effects of cost structure distinctiveness and market share on the decision to disclose the SoMC, the reader should bear in mind these correlations when considering our evidence.

5.2. Competitive Positions, Competitive Costs, and Manufacturing Cost Disclosure

Table 3 provides our main findings. Regarding Hypothesis 1, distinctive cost structure firms are more likely to withhold the SoMC and not disaggregate COGS, consistent with cost structure distinctiveness capturing cost-leadership advantages. Column 1 shows a one standard deviation increase in cost structure distinctiveness increases the propensity to withhold the SoMC by 6.3%.[17]

[Table 3 about here.]

Consistent with Hypothesis 2, high market share firms are more likely to withhold the SoMC, consistent with both a desire to protect competitive advantages driving their higher productivity, and with larger potential losses from competitive costs. Column 2 shows a one standard deviation increase in market share increases the propensity to withhold the SoMC by 4.7%.

In Column 3, the coefficient estimates on distinctive cost structure and market share remain very similar to those from Columns 1 and 2 when both variables are included together in the estimation, suggesting these variables capture distinct aspects of competitive cost motivations for SoMC nondisclosure. Columns 1 to 3 comingle across-industry and within-industry variation in

[17] To calculate this number, we multiply the standard deviation of cost structure distinctiveness, 0.1351 in Panel B of Table 2, by the coefficient of interest, 0.4653, in Column 1 of Table 3. We calculate the economic effect of market share in the next paragraph in the same way.

our variables, and thus industry-level coordination benefits of disclosure might drive part of the observed relations. Column 4 includes industry fixed effects to alleviate this concern, and by isolating within-industry variation in our variables, suggests competitive costs of disclosure significantly affect SoMC disclosure choice.

Given the advent of securities class action lawsuits to Korea in 2005, a potential alternative explanation for these results is litigation risk; for example, if cost structure distinctiveness captures operational volatility, disclosure of the SoMC might magnify expected losses from litigation (e.g., Kim and Skinner 2012; Lowry and Shu 2002). We note, however, that only five securities class action lawsuits occurred in Korea from 2005 to 2012, suggesting litigation risk is unlikely large enough to generate our findings (Choi 2014). In addition, our results in Section 5.4 about gross profits are unlikely to be driven by litigation risk.

5.3. Competitive Costs and Private Firms' Manufacturing Cost Disclosure

As discussed in Section 4.3, we examine private firms' SoMC disclosure choices to address the concern that distinctive cost structure firms withhold the SoMC because of lower capital market benefits of disclosure, rather than higher competitive costs of disclosure.

Column 1 of Table 4 reveals that private firms having distinctive cost structures also tend to withhold the SoMC. Considering arguments in the literature that private firms derive little capital market benefit from disclosure, this result reduces the concern that cost structure distinctiveness and market share predict SoMC disclosure choices largely because these variables capture capital market benefits (e.g., Ball and Shivakumar 2005; Burgstahler et al. 2006). In addition, private firms are not subject to class action lawsuits in Korea, helping to rule out a litigation risk explanation for the empirical results in Table 3 (Byun 2014). Although Column 2 shows that industry fixed effects weaken the results for private firms, the positive, insignificant

coefficient on distinctive cost structure and positive, weakly significant coefficient on market share are consistent with competitive cost motivations for withholding the SoMC.

[Table 4 about here.]

5.4. Tradeoff between Competitive Costs and Capital Market Benefits

As discussed in Section 4.4, a concern when examining the economic consequences of withholding the SoMC is that despite linear controls, differing characteristics between SoMC disclosing and non-disclosing firms might drive differential patterns in gross profits and liquidity. We address this issue by propensity score matching the SoMC withholding firms to a set of SoMC disclosing firms. Table 5 assesses the covariate balance achieved by the matching procedure, and shows that the two sets of matched firms have similar characteristics.

[Table 5 about here.]

Figure 1 illustrates that gross profit increases and liquidity decreases for firms that stop disclosing the SoMC in 2004 compared to matched firms that continue disclosing in 2004.

[Figure 1 about here.]

Table 6 corroborates Figure 1. Columns 2 and 4 show gross profit increases 6.3% and liquidity decreases 8.5% for firms withholding the SoMC, relative to firms disclosing the SoMC.[18,19] These changes are economically significant—the mean gross profit for sample firms is roughly 20% and the two-way equity trading cost in Korea is 4% (Domowitz, Glen and Madhavan 2001).

[18] Untabulated analyses using the unmatched sample provide similar inferences in terms of economic and statistical significance, suggesting that observable differences between disclosing and non-disclosing firms are captured reasonably by linear controls. We again acknowledge, however, that propensity score matching does not address disclosure choices driven by unobservable anticipation of future profitability.

[19] Our test likely violates the Stable Unit Treatment Value Assumption (SUTVA) because firms that withhold their SoMC might adversely affect the gross profits of SoMC disclosing firms by creating a more opaque industry information environment. We note, however, that this adverse effect should also spill over to other SoMC withholding firms in the same industry, reducing the impact of the SUTVA violation.

[Table 6 about here.]

Our main takeaway from Table 6 is that its results are consistent with the hypothesis that managers trade off competitive costs, rather than their own private benefits, against capital market benefits of SoMC disclosure. By not disaggregating COGS, firms protect proprietary information about cost-leadership advantages from their competitors. The resulting public information reduction about costs, however, might worsen information asymmetry between informed and uninformed investors, reducing liquidity and increasing the cost of capital (Amihud 2002).

5.5. Effect of Manufacturing Cost Disclosures on Profitability Dispersion

Column 2 of Table 7 shows that a one standard deviation increase in the percentage of firms withholding the SoMC in an industry is associated with an increase in that industry's subsequent gross profit dispersion of 5.9% of mean profitability dispersion. This is consistent with the notion that non-disclosure allows firms to build and maintain cost-leadership advantages in production and sourcing activities, separating themselves from competitors. The broader implication is that information barriers between competitors can explain a portion of the persistent productivity and profitability dispersion documented in prior literature.

[Table 7 about here.]

Comparing the coefficient on Ind NDMC across Columns 1 and 2 shows that relation between profitability dispersion and the proportion of withholding firms is robust to the inclusion of control variables argued to drive performance dispersion.[20]

[20] In an untabulated analysis without industry and year fixed effects, and consistent with our expectations, Herfindahl Index, Industry Intangible Assets, and Industry Gross Profit are significantly positively related to Gross Profit Dispersion (as too is Industry NDMC). This is consistent with these controls being slow-moving variables and Industry NDMC being a fast-moving variable.

Borrowing the argument discussed in Section 4.4, an alternative view is that firms which unobservably anticipate their future gross profits changing also withhold their SoMCs to protect the competitive advantages driving these changes. This view is consistent with the competitive cost hypothesis, but could imply an overstatement of SoMC disclosure's impact on profitability dispersion.

5.6. Robustness Tests

5.6.1. Competitive Positions, Competitive Costs, and Manufacturing-Cost Disclosure with Different Specifications

Columns 1 to 6 of Table 8 show that our disclosure determinants results are robust to the following model specification variations: 1) constructing market share, the Herfindahl Index, and PPE entry barriers using only public firms—competition might be largely confined to public firms; 2) measuring cost structure distinctiveness as the sum of absolute, rather than squared, differences from industry averages; 3) measuring customer concentration using a firm's sales to its top customer rather than its top three customers; 4) the inclusion of bank fixed effects to control for the specific capital market benefit of relationship lending (Roberts and Sufi, 2009)—relationship banks might influence firms' disclosure decisions, and while we find these fixed effects are jointly significant, their inclusion does not affect our main inferences; 5) using 4-digit rather than 3-digit KSIC codes to define industries; and 6) the addition of a Chaebol firm indicator.[21]

[Table 8 about here.]

[21] Chaebol firms are large, family run conglomerates producing diverse products, and thus their firm-level SoMCs are likely less actionable by competitors. In addition, Chaebol are known to squeeze out small and medium size rivals. These features suggest Chaebol face lower competitive costs of SoMC disclosure. On the other hand, Chaebol have substantial internal capital markets, suggesting they derive lower capital market benefits from disclosure (Campbell and Keys 2002). We find that Chaebol firms tend to withhold the SoMC.

5.6.2. Disclosure Dynamics

Figure 2 illustrates that the proportion of public firms that elected to withhold their SoMC increased continually by year after 2003, approaching 80% in 2013. By far, the largest increase occurred in 2004, the first year of the voluntary disclosure regime. Gassen and Muhn (2018) similarly document a slow uptake of non-disclosure in a field experiment, with their evidence suggesting that informational constraints (i.e., lack of awareness of disclosure mandate relaxations) can explain the drift in their very small firm setting. The firms in our setting are much larger, however, so information constraints seem less likely to bind. An alternative explanation for the drift in our setting is that firms' mandated disclosures had set disclosure expectation precedents for investors, which some firms were initially reluctant to stray from.

[Figure 2 about here.]

To assess whether our results are influenced by these disclosure dynamics, we re-estimate Model (3) using firms' SoMC disclosure decisions in 2005 and 2006. Columns 7 and 8 of Table 8 (analogous to Column 3 in Table 3) reveal that firms' cost structure distinctiveness in 2003 is positively associated with withholding the SoMC in 2005 and 2006, but the coefficient is statistically significant only in 2005. We expect this relation to become weaker over time if cost structures are not completely static—indeed, the autocorrelation of 0.88 is high, but below one. Market share in 2003 is positively associated with withholding the SoMC in 2005 and 2006.

5.6.3. Informativeness of Manufacturing Cost Reports

To illustrate a potential mechanism for how manufacturing cost disclosures might provide capital market benefits, we examine the usefulness of disaggregating COGS for predicting future earnings. Table 9 shows the SoMC components—raw materials, labor, and overhead—have differential relations with future earnings. Aggregating these items into a single COGS figure

would preclude one from exploiting these differential relations when predicting future earnings. F-tests of equality of these coefficient estimates are rejected in three out of six specifications.

[Table 9 about here.]

6. Conclusion

Accounting research has shown that firms consider competitive costs when making voluntary disclosure choices, largely in the contexts of withholding product market and overall financial performance information. A focus on cost disclosures is notably absent in the literature despite the key role cost minimization plays in profit maximization, and the theorized importance of cost information in competitive dynamics.

Examining Korea's relaxation of mandatory disclosure of disaggregated manufacturing cost information, we find that firms with distinctive cost structures and high market shares are more likely to withhold this information. Gross profits increase and liquidity decreases for firms that become non-disclosers relative to continuing disclosers. At the aggregate level, firms' decisions to withhold manufacturing cost information are associated with profitability dispersion within industries. Broadly speaking, these results suggest that withholding cost information from competitors allows firms to create and maintain cost-leadership advantages in production and input sourcing activities. We reinforce these empirical results and interpretations with survey evidence indicating that managers view manufacturing cost disclosures from their own firm as providing rivals with valuable competitive information.

We caveat our findings by noting that the disclosure variation we observe is driven by firm choices. Though we take numerous steps to address alternative explanations, we cannot rule out the possibility that non-disclosing and disclosing firms are unobservably different in a way

correlated with both our competitive position variables and our outcomes of interest. Thus, we see promise for future studies that can leverage different research settings and empirical designs to examine the determinants and economic consequences of cost disclosures. Future research could also examine the specific production and input sourcing innovations firms make once cost disclosures are withheld, though this would likely require additional data in order for researchers to see through the veil raised by non-disclosure.

References

Ali, A., S. Klasa, and E. Yeung. 2014. Industry concentration and corporate disclosure policy. *Journal of Accounting and Economics* 58 (2–3): 240–264.

Amihud, Y. 2002. Illiquidity and stock returns: cross-section and time-series effects. *Journal of Financial Markets* 5: 31–56.

Armantier, O., and O. Richard. 2003. Exchanges of cost information in the airline industry. *The RAND Journal of Economics* 34 (3): 461–477.

Badertscher, B., N. Shroff, and H. D. White. 2013. Externalities of public firm presence: Evidence from private firms' investment decisions. *Journal of Financial Economics* 109 (3): 682–706.

Bae, B.-H., E.-J. Han, C.-H. Choi, Y.-S. Noh, J.-H. Shin, and L. Li. 2013. The effect of voluntary disclosure of the schedule of manufacturing cost on cost of debt. *Journal of Korean Association of Tax and Accounting* 37: 25–43.

Ball, R., and L. Shivakumar. 2005. Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics* 39 (1): 83–128.

Baron, D. P., and R. B. Myerson. 1982. Regulating a monopolist with unknown costs. *Econometrica* 50 (4): 911–930.

Barrios, J., P. Lisowsky, and M. Minnis. 2019. Measurement matters: Financial reporting and productivity. *Working Paper*.

Bartelsman, E., J. Haltiwanger, and S. Scarpetta. 2013. Cross-country differences in productivity: The role of allocation and selection. *The American Economic Review* 103 (1): 305–344.

Bens, D. A., P. G. Berger, and S. J. Monahan. 2011. Discretionary disclosure in financial reporting: An examination comparing internal firm data to externally reported segment data. *The Accounting Review* 86 (2): 417–449.

Berger, P. G. 2011. Challenges and opportunities in disclosure research-A discussion of "the financial reporting environment: Review of the recent literature." *Journal of Accounting and Economics* 51 (1–2): 204–218.

Berger, P. G., and R. N. Hann. 2007. Segment profitability and the proprietary and agency costs of disclosure. *The Accounting Review* 82 (4): 869–906.

Bernard, D. 2016. Is the risk of product market predation a cost of disclosure? *Journal of Accounting and Economics* 62 (2–3): 305–325.

Beyer, A., D. A. Cohen, T. Z. Lys, and B. R. Walther. 2010. The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics* 50 (2–3): 296–343.

Bhojraj, S., W. G. Blacconiere, and J. D. D'Souza. 2004. Voluntary disclosure in a multi-audience setting: An empirical investigation. *The Accounting Review* 79 (4): 921–947.

Boone, A. L., I. V. Floros, and S. A. Johnson. 2016. Redacting proprietary information at the initial public offering. *Journal of Financial Economics* 120 (1): 102–123.

Botosan, C. A., and M. S. Harris. 2006. Motivations for a change in disclosure frequency and its consequences: An examination of voluntary quarterly segment disclosures. *Journal of Accounting Research* 38 (2): 329–353.

Breuer, M. 2018. How does financial-reporting regulation affect market-wide resource allocation? *Working Paper*.

Burgstahler, D. C., L. Hail, and C. Leuz. 2006. The importance of reporting incentives: earnings management in European private and public firms. *The Accounting Review* 81 (5): 983–1016.

Byun, H. 2014. Suggestion for class action lawsuit reform. *Korean Law Newspaper*.

Campbell II, T. L., and P. Y. Keys. 2002. Corporate governance in South Korea: The chaebol experience. *Journal of Corporate Finance* 8 (4): 373–391.

Chae, J. 2005. Trading volume, information asymmetry, and timing information. *The Journal of Finance* 60 (1): 413–442.
Chen, S., B. Miao, and T. Shevlin. 2015. A new measure of disclosure quality: The level of disaggregation of accounting data in annual reports. *Journal of Accounting Research* 53 (5): 1017–1054.
Choi, J. H. 2018. Accrual accounting and resource allocation: A general equilibrium analysis. *Working Paper*.
Choi, J.-S. 2014. Proposal for the invigoration of securities class action system. *Korean Law Review* 53: 311–333.
Clinch, G., R. E. Verrecchia. 1997. Competitive Disadvantage and Discretionary Disclosure in Industries. *Australian Journal of Management* 22 (2): 125-137.
Cohen, W. M. 2010. Fifty years of empirical studies of innovative activity and performance. In *Handbook of The Economics of Innovation*, 1:129–213. Elsevier B.V.
Darrough, M. N., and N. M. Stoughton. 1990. Financial disclosure policy in an entry game. *Journal of Accounting and Economics* 12 (1–3): 219–243.
Dasgupta, P., and J. Stiglitz. 1980. Uncertainty, industrial structure, and the speed of R&D. *The Bell Journal of Economics* 11 (1): 1–28.
Dedman, E., and C. Lennox. 2009. Perceived competition, profitability and the withholding of information about sales and the cost of sales. *Journal of Accounting and Economics* 48 (2–3): 210–230.
Domowitz, I., J. Glen, and A. Madhavan. 2001. Liquidity, volatility and equity trading costs across countries and over time. *International Finance* 4 (2): 221–255.
Doraszelski, U., and J. Jaumandreu. 2013. R&D and productivity: Estimating endogenous productivity. *The Review of Economic Studies* 80 (4): 1338–1383.
Ellis, J. A., C. E. Fee, and S. E. Thomas. 2012. Proprietary costs and the disclosure of information about customers. *Journal of Accounting Research* 50 (3): 685–727.
Fama, E. F., and K. R. French. 1995. Size and book-to-market factors in earnings and returns. *The Journal of Finance* 50 (1): 131–155.
Frankel, R., S. P. Kothari, and J. Weber. 2006. Determinants of the informativeness of analyst research. *Journal of Accounting and Economics* 41 (1–2): 29–54.
Gassen, J., and M. Muhn. 2018. Financial transparency of private firms: Evidence from a randomized field experiment. *Working Paper*.
Gigler, F. 1994. Self-enforcing voluntary disclosures. *Journal of Accounting Research* 32 (2): 224–240.
Griffith, R., J. Haskel, and A. Neely. 2006. Why is productivity so dispersed? *Oxford Review of Economic Policy* 22 (4): 513–525.
Guo, R.-J., B. Lev, and N. Zhou. 2004. Competitive costs of disclosure by biotech IPOs. *Journal of Accounting Research* 42 (2): 319–355.
Ha, A. Y., and S. Tong. 2008. Contracting and information sharing under supply chain competition. *Management Science* 54 (4): 701–715.
Hann, R. N., H. Kim, W. Wang, and Y. Zheng. 2018. Information frictions and productivity dispersion: The role of financial reporting quality. *Working Paper*.
Harris, M. S. 1998. The association between competition and managers' business segment reporting decisions. *Journal of Accounting Research* 36 (1): 111–128.
Hayashi, F. 1982. Tobin's marginal q and average q: A neoclassical interpretation. *Econometrica* 50 (1): 213–224.

Hiebl, M. R. W., and J. F. Richter. 2018. Response rates in management accounting survey research. *Journal of Management Accounting Research* 30 (2): 59–79.
Hoitash, R., and U. Hoitash. 2018. Measuring accounting reporting complexity with XBRL. *The Accounting Review* 93 (1): 259–287.
Hope, O.-K., and W. B. Thomas. 2008. Managerial empire building and firm disclosure. *Journal of Accounting Research* 46 (3): 591–626.
Huang, Y., and N. Li. 2014. Market competition and voluntary disclosure: The role of industry life cycle. *Working Paper*.
Hwang, I., and J. Hong. 2004. Eleven proprietary statements won't need to be disclosed from next year. *Maeil Business Newspaper*.
Imbens, G. W. 2004. Nonparametric estimation of average treatment effects under exogeneity: A review. *The Review of Economics and Statistics* 86 (1): 4–29.
Jaffe, A. B. 1988. Demand and supply influences in R&D intensity and productivity growth. *The Review of Economics and Statistics* 70 (3): 431–437.
Javorcik, B. S. 2004. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *The American Economic Review*.
Jin, G. Z. 2005. Competition and disclosure incentives: an empirical study of HMOs. *The RAND Journal of Economics* 36 (1): 93–112.
Kim, I., and D. J. Skinner. 2012. Measuring securities litigation risk. *Journal of Accounting and Economics* 53 (1–2): 290–310.
Kim, M.-O., and H.-R. Jung. 2011. Voluntary disclosure of the schedule of manufacturing cost. *Journal of Taxation and Accounting*.
Kim, M., H. Jung, Y. Choi, and H. Lee. 2016. A study on the determinants of voluntary disclosure of the schedule of manufacturing costs. *Korean Accounting Journal* 25 (1): 1–33.
Leuz, C. 2004. Proprietary versus nonproprietary disclosures: Evidence from Germany. In *The Economics and Politics of Accounting: International Perspectives on Trends, Policy, and Practice*, edited by D. Pfaff and A. Hopwood, 164–197. Oxford University Press.
Leuz, C., and R. E. Verrecchia. 2000. The economic consequences of increased disclosure. *Journal of Accounting Research* 38: 91–124.
Li, L. 2002. Information sharing in a supply chain with horizontal competition. *Management Science* 48 (9): 1196–1212.
Li, X. 2010. The impacts of product market competition on the quantity and quality of voluntary disclosures. *Review of Accounting Studies* 15 (3): 663–711.
Li, Y., Y. Lin, and L. Zhang. 2018. Trade secrets law and corporate disclosure: Causal evidence on the proprietary cost hypothesis. *Journal of Accounting Research* 56 (1): 265–308.
Lowry, M., and S. Shu. 2002. Litigation risk and IPO underpricing. *Journal of Financial Economics* 65 (3): 309–335.
Meek, G. K., C. B. Roberts, and S. J. Gray. 1995. Factors influencing voluntary annual report disclosures by U.S., U.K. and continental European multinational corporations. *Journal of International Business Studies* 26 (3): 555–572.
Midrigan, V., and D. Y. Xu. 2014. Finance and misallocation: evidence from plant-level data. *The American Economic Review* 104 (2): 422–458.
Mussa, M., and S. Rosen. 1978. Monopoly and product quality. *Journal of Economic Theory* 18 (2): 301–317.
Netz, J. S., and B. A. Taylor. 2002. Maximum or minimum differentiation? Location patterns of retail outlets. *The Review of Economics and Statistics*.

Nickell, S., S. Wadhwani, and M. Wall. 1992. Productivity growth in U.K. companies, 1975-1986. *European Economic Review* 36 (5): 1055–1085.

Oh, H., S. Park, and H. Jeon. 2017. Effects of voluntary disclosure of the schedule of manufacturing cost on analysts' earnings forecasts: Evidence from Korea. *The Journal of Applied Business Research* 33 (3): 623–636.

Piotroski, J. D. 2000. Value investing: The use of historical financial statement information to separate winners from losers. *Journal of Accounting Research* 38 (2000): 1–41.

Roberts, M. R., and A. Sufi. 2009. Financial contracting: A survey of empirical research and future directions. *Annual Review of Financial Economics* 1: 1–20.

Scott, T. W. 1994. Incentives and disincentives for financial disclosure: Voluntary disclosure of defined benefit pension plan information by Canadian firms. *The Accounting Review* 69 (1): 26–43.

Shapiro, C. 1986. Exchange of cost information in oligopoly. *The Review of Economic Studies* 53 (3): 433–446.

Syverson, C. 2011. What determines productivity? *Journal of Economic Literature* 49 (2): 326–365.

Syverson, C. 2004. Product substitutability and productivity dispersion. *The Review of Economics and Statistics* 86 (2): 534–550.

Tomy, R. E. 2019. Threat of entry and the use of discretion in banks' financial reporting. *Journal of Accounting and Economics* 67 (1): 1–35.

Verrecchia, R. E. 1983. Discretionary disclosure. *Journal of Accounting and Economics* 5: 179–194.

Verrecchia, R. E., and J. Weber. 2006. Redacted disclosure. *Journal of Accounting Research* 44 (4): 791–814.

Vives, X. 1984. Duopoly information equilibrium: Cournot and Bertrand. *Journal of Economic Theory* 34 (1): 71–94.

Vives, X. 2008. Information sharing among firms. In *New Palgrave Dictionary of Economics*, edited by S. Durlauf and L. Blume. 2nd ed.

A Variable Description

Firm-Level Variables	Description
NDMC	1 for years in which manufacturing cost information is not disclosed, 0 otherwise
Cost Structure Distinctiveness	The sum of squared differences (distance) between the proportions of a firm's manufacturing costs driven by raw material, labor, and overhead costs, and the industry averages of these proportions (computed from public firms only) $\left(\frac{RMC_i}{MC_i} - \frac{\overline{RMC}}{MC_k}\right)^2 + \left(\frac{LC_i}{MC_i} - \frac{\overline{LC}}{MC_k}\right)^2 + \left(\frac{OC_i}{MC_i} - \frac{\overline{OC}}{MC_k}\right)^2$, where RMC, LC, OC and MC are raw material, labor, overhead, and total manufacturing costs, respectively
Market Share	Sales divided by industry total sales
Analyst Following	1 if analysts follow the firm, 0 otherwise
Chaebol	1 if a firm belongs to one of the 10 largest conglomerates by assets in Korea in 2004, 0 otherwise
Customer Concentration	Sales to the three largest customers (by sales) divided by total sales
Foreign Sales	Foreign sales divided by total sales
Gross Profit	Gross profit divided by sales
Illiquidity	$Illiquidity_{I,t} = log\left(\frac{1}{n_{I,t}}\sum_{d\in t}\frac{\lvert Ret_{d,I,t}\rvert}{Vol_{d,I,t}}\right)$
Intangible Asset	Intangible assets divided by total assets
Investment	Total assets divided by lagged total assets minus 1
Large Shareholders' Ownership	Proportion of shares held by large shareholders with more than 5% ownership, or significant influence over the firm's decisions
Leverage	Book value of debt divided by book value of equity
Market to Book	Market capitalization divided by book value of common equity
Market Capitalization	Stock price multiplied by shares outstanding (billion won)
Negative Earnings	1 if lagged earnings are negative, and 0 otherwise
Net Income	Net income divided by sales
Operating Income	Operating income divided by sales
Product Concentration	Main product's sales divided by total sales
Raw Material, Labor and Other Costs, etc.	Raw material costs, labor costs, overhead costs, other COGS, SG&A, and non-operating expenses divided by sales
Related Party Sales	Sales to related parties divided by total sales
Return Volatility	Sample standard deviation of returns
Sales Growth	Sales divided by lagged sales minus 1
Size	Log market capitalization or log total assets
Turnover	Average trading volume divided by shares outstanding

Industry-Level Variables	Description
Gross Profit Dispersion	The standard deviation of gross profit divided by sales
Herfindahl Index	The sum of the squares of each firm's market share $\sum_{i \in k} (\frac{Sales_{i,k}}{\sum_{i \in k} Sales_{i,k}})^2$
Litigation Risk	1 if one of the five Korean securities class action lawsuits held during 2005 to 2012 involved the industry, 0 otherwise
PPE Entry Barriers	Firms' average PPE divided total assets
Proportion of Private Firms	The number of audited private firms divided by the number of audited private firms and public firms

B Examples of Manufacturing Cost Disclosures

B.1 Korean Example: Hyundai Motor Company

Income statement excerpts:

(unit: million won)	2003	2002	2001
Sales	24,967,265	24,565,847	22,505,093
Domestic Sales	10,646,265	12,383,414	12,104,963
Foreign Sales	14,321,000	12,182,433	10,400,130
Cost of goods sold	18,248,594	18,626,256	17,079,037
Beginning inventory	330,195	276,717	596,217
Purchases for the period	391,976	736,077	2,103,283
Cost of products manufactured for the period	18,633,283	18,276,719	14,924,252
Sub-total	19,355,454	19,289,513	17,623,752
Transfer to other accounts	347,647	261,783	188,107
Duty refunds	104,140	71,279	79,891
Closing inventory	655,073	330,195	276,717
Gross profit	6,718,671	5,939,591	5,426,056

Schedule of manufacturing costs (from annual report):

(unit: million won)	2003	2002	2001
I. Raw material cost	14,830,070	14,075,671	11,797,809
1. Beginning raw material	165,925	194,945	156,806
2. Purchases of raw material	16,778,484	15,801,250	13,379,338
3. Other purchases	82,053	63,605	59,979
4. Closing raw material	268,187	165,925	197,363
5. Transfer to other accounts	1,928,205	1,818,203	1,600,951
II. Labor cost	1,706,184	1,720,974	1,366,183
1. Salary	701,307	647,239	551,395
2. Wage	213,687	190,760	170,470
3. Miscellaneous pay	0	0	0
4. Retirement allowance	200,532	299,647	113,543
5. Bonus	550,571	549,045	498,963

6. Allowance	40,087	34,280	31,811
III. Overhead cost	2,079,794	2,465,752	1,692,443
1. Employee benefits	221,031	200,275	172,842
2. Utilities	0	0	148,192
3. Taxes and dues	14,083	13,751	12,635
4. Insurance	3,396	3,050	2,767
5. Entertainment	840	874	894
6. Travel	9,124	9,720	7,252
7. Car	5,530	5,147	5,636
8. Commission	25,305	22,127	21,203
9. In-house outsourcing	288,409	212,885	157,001
10. Transportation	3,962	7,334	5,849
11. Communication	2,471	2,322	2,441
12. Office supply	1,473	1,568	1,595
13. Book	835	835	737
14. Consumables	24,908	24,765	25,059
15. Maintenance	101,057	116,348	70,011
16. Training	9,300	6,596	3,417
17. Test	2,932	2,544	2,237
18. Lease	0	0	185
19. Development	194,609	272,976	0
20. Loyalty	12,580	15,880	17,827
21. Depreciation	621,896	612,160	577,278
22. Litigation	88	36	29
23. Rent	870	846	695
24. Consumable metallic pattern	13,389	12,737	14,267
25. Manufacturing support	174,926	110,338	89,248
26. Amortization	177,414	653,786	353,147
27. Water, lighting, and heating	165,979	156,839	0
28. Other transportation	3,387	0	0
IV. Manufacturing cost for the period	18,616,048	18,262,398	14,856,434
V. Beginning work-in-progress	98,222	125,739	151,711
VI. Transfer from other accounts	151,401	13,195	41,847
VII. Sub-total	18,865,671	18,374,941	15,049,992
VIII. Closing work-in-progress	232,388	98,222	125,740
IX. Cost of products manufactured for the period	18,633,283	18,276,719	14,924,252

B.2 US Example: General Motors Company

Income statement excerpts:

	Years Ended December 31,		
	2013	2012	2011
Net sales and revenue			
Automotive	$ 152,092	$ 150,295	$ 148,866
GM Financial	3,335	1,961	1,410
Total	155,427	152,256	150,276
Costs and expenses			
Automotive cost of sales	134,925	140,236	130,386
GM Financial operating and other expenses	2,448	1,207	785
Automotive selling, general and administrative expense	12,382	14,031	12,163
Goodwill impairment charges (Note 10)	541	27,145	1,286
Total costs and expenses	150,296	182,619	144,620
Operating income (loss)	5,131	(30,363)	5,656
Automotive interest expense	334	489	540
Interest income and other non-operating income, net (Note 20)	1,063	845	851
Gain (loss) on extinguishment of debt (Note 14)	(212)	(250)	18
Equity income and gain on investments (Note 8)	1,810	1,562	3,192
Income (loss) before income taxes	7,458	(28,695)	9,177
Income tax expense (benefit) (Note 18)	2,127	(34,831)	(110)
Net income	5,331	6,136	9,287
Net (income) loss attributable to noncontrolling interests	15	52	(97)
Net income attributable to stockholders	$ 5,346	$ 6,188	$ 9,190
Net income attributable to common stockholders	$ 3,770	$ 4,859	$ 7,585

Management's discussion on the automotive cost of sales in 2013 (from the 10-K):

Automotive Cost of Sales

	Years Ended December 31,		Year Ended 2013 vs. 2012 Change		Variance Due To			
	2013	2012	Favorable/ (Unfavorable)	%	Volume	Mix	Other	Total
	(Dollars in millions)				(Dollars in billions)			
Automotive cost of sales	$ 134,925	$ 140,236	$ 5,311	3.8%	$ 0.3	$ (2.3)	$ 7.3	$ 5.3
Automotive gross margin	$ 17,167	$ 10,059	$ 7,108	70.7%				

	Years Ended December 31,		Year Ended 2012 vs. 2011 Change		Variance Due To			
	2012	2011	Favorable/ (Unfavorable)	%	Volume	Mix	Other	Total
	(Dollars in millions)				(Dollars in billions)			
Automotive cost of sales	$ 140,236	$ 130,386	$ (9,850)	(7.6)%	$ (0.9)	$ (3.8)	$ (5.2)	$ (9.9)
Automotive gross margin	$ 10,059	$ 18,480	$ (8,421)	(45.6)%				

The most significant element of our Automotive cost of sales is material cost which makes up approximately two-thirds of the total amount excluding adjustments. The remaining portion includes labor costs, depreciation and amortization, engineering, and policy, product warranty and recall campaigns.

In the year ended December 31, 2013 Automotive cost of sales decreased due primarily to: (1) Other of $7.3 billion due to decreased impairment charges of $2.8 billion for long-lived assets and intangible assets; decreased pension settlement losses of $2.5 billion; the favorable effect of $1.3 billion resulting from the reversal of the Korea wage litigation accrual in 2013 compared to accruals related to the litigation in 2012; favorable net foreign currency effect of $0.9 billion due primarily to the weakening of the Brazilian Real against the U.S. Dollar; and reduction in unfavorable warranty and policy adjustments of $0.7 billion; partially offset by increased material and freight costs of $0.4 billion; increased costs of $0.2 billion related to parts and accessories sales; and net increased manufacturing expenses of $0.1 billion due primarily to new launch costs offset by reduced depreciation and amortization; (2) decreased costs related to decreased wholesale volumes; partially offset by (3) unfavorable vehicle mix due primarily to GMNA of $1.3 billion, GMSA of $0.4 billion and GMIO of $0.4 billion.

In the year ended December 31, 2012 Automotive cost of sales increased due primarily to: (1) Other of $5.2 billion due primarily to increased employee costs of $4.1 billion including increased pension settlement losses and decreased net pension and other postretirement benefits (OPEB) income and separation costs; impairment charges of $3.7 billion for long-lived assets and intangible assets; increased manufacturing expense of $1.4 billion due to new launches; increased policy and product warranty expense of $0.2 billion; partially offset by favorable net foreign currency effect of $3.3 billion due primarily to the weakening of the Brazilian Real, Euro, Korean Won, Argentinian Peso and South African Zar against the U.S. Dollar; decreased engineering expense of $0.5 billion; decreased costs of $0.3 billion related to powertrain and parts sales; and decreased costs of $0.1 billion due to the deconsolidation of VMM in June 2011; (2) unfavorable vehicle mix due primarily to GMNA of $1.3 billion, GMSA of $1.2 billion and GME of $0.8 billion; and (3) increased costs related to increased wholesale volumes due primarily to GMNA of $2.7 billion; partially offset by a decrease in GME of $1.9 billion.

C Survey

C.1 Summary of Survey Responses

1. How would you characterize the size of your firm?

	Large (>=10T KRW)	Medium (>=500B KRW,<10T KRW)	Small (<500B KRW)
N(responses)	13	2	17

What is your position in the firm?

	Planning manager	Sales manager	Production manager	Purchasing manager
N(responses)	9	1	0	0

	Human resource manager	Investor Relations / Accounting / Financial manager	Other
N(responses)	1	20	1

2. Please indicate the area in which your firm operates.

	Manufacturing	Finance	Service	Other
N(responses)	23	6	2	1

3. To the best of your knowledge, what is the market share of your firm in the *main* market in which it operates?

	Below 5%	5% – 10%	10% – 20%	20% – 30%	Above 30%
N(responses)	8	4	5	6	9

4. How would you describe the level of competition your firm faces?

Very intensive	Intensive	Mild	Very mild
12	15	4	1

5. How often do you conduct competitor analysis?

	Once a month	Once a quarter	Twice a year	Once a year	Never
N(responses)	5	14	1	8	4

6. In your opinion, how important is competitor analysis for the following business activities? (5: Very important-1: Unimportant)

	Strategy	Marketing / Distribution / Pricing	Production
Mean(responses)	4.28	4.19	3.45
Std(responses)	0.77	0.97	0.77

	Procurement	Human resource	Investment / Financing
Mean(responses)	3.16	2.83	3.41
Std(responses)	0.90	0.75	1.04

7. What information sources do you use to analyse competitors' **sales** (e.g. prices, volumes, and distribution channels)? (3: Important-1: Unimportant)

	Annual reports	Media / Government / Analysts / Homepage	Commercial data providers or consulting companies	
Mean(responses)	2.66	2.44	2.13	
Std(responses)	0.48	0.62	0.79	
	Market surveys	Industry association	Private channels	Other
Mean(responses)	1.47	2.16	2.41	1.45
Std(responses)	0.62	0.72	0.61	0.69

8. What information sources do you use to analyse competitors' **production** (e.g. capacity, costs, raw materials, and employees)? (3: Important-1: Unimportant)

	Annual reports	Media / Government / Analysts / Homepage	Commercial data providers or consulting companies	
Mean(responses)	2.56	2.22	1.97	
Std(responses)	0.56	0.61	0.78	
	Market surveys	Industry association	Private channels	Other
Mean(responses)	1.53	2.00	2.31	1.55
Std(responses)	0.57	0.67	0.64	0.52

9. To your knowledge, how similar is your firm's manufacturing cost structure (or just cost structure) to the manufacturing cost structure (or just cost structure) of other firms in the industry?

	Very different	Different	Similar	Very similar
N(responses)	0	4	24	4

10. Do you agree with the following statement?
Knowledge of a firm's manufacturing cost structure (or just cost structure) would give its competitors a significant advantage.

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
%(responses)	15.6%	56.3%	12.5%	12.5%	3.1%

11. Do you agree with the following statement?
Knowledge of a firm's manufacturing cost structure (or just cost structure) would give its customers and suppliers more bargaining power in dealings with the firm.

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
%(responses)	12.5%	56.3%	18.8%	9.4%	3.1%

12. Until 2004, firms were required to disclose information about manufacturing costs in their annual reports. If this information were still included in the annual report, would it be useful for competitor analysis?

	Percent responses
(1) Yes, it would.	87.5%
(2) No, it wouldn't because we are able to obtain the information from other sources.	9.4%
(3) No, it wouldn't because the information is not useful.	3.1%

13. If you picked (1) or (2) in the previous question, please answer the following question. In your opinion, how useful are manufacturing cost reports in the following activities? (5: Very important-1: Unimportant)

	Strategy	Marketing / Distribution / Pricing	Production
Mean(responses)	4.03	4.03	4.06
Std(responses)	0.98	1.20	0.96
	Procurement	Human resource	Investment / Financing
Mean(responses)	3.71	2.57	3.48
Std(responses)	1.24	1.19	1.06

14. Do you agree with the following statement?
Companies are unwilling to disclose information about manufacturing costs in their annual reports because competitors are able to use it to their advantage.

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
%(responses)	18.8%	53.1%	12.5%	12.5%	3.1%

C.2 Survey Questionnaire

Survey

You are invited to participate in the *Competitor Analysis Survey*. The goal of the survey is to understand how companies conduct competitor analysis. We would like this survey to be answered by two groups in your company:

1) Planning Department
2) Investor Relations Department (including Accounting Department)

If your team does not conduct competitor analysis or makes public disclosures, please forward this survey to the appropriate team(s) in your company.

You will receive a summary of the survey results, which could potentially inform you about other companies' competitor analysis practices, their usage of different information sources for competitor analysis, and their disclosure policies.

Please note the following.

1. The survey will take approximately 10 minutes to complete.
2. Survey responses will be kept confidential and on an encrypted computer. The data will be analysed at an aggregate level to protect your privacy. If you choose to provide your contact details, please be assured that your privacy will be maintained at all times.

If you have any questions about this survey, please contact:

General information

Please provide some general information about your company and yourself.

1. How would you characterize the size of your firm?

Large (>=10T KRW)	Medium (>=500B KRW,<10T KRW)	Small (<500B KRW)

What is your position in the firm?

Planning manager	Sales manager	Production manager	Purchasing manager
Human resource manager	Investor Relations / Accounting / Financial manager		Other, please specify

2. Please indicate the area in which your firm operates.

Manufacturing	Finance	Service	Other

Competitive environment

3. To the best of your knowledge, what is the market share of your firm in the *main* market in which it operates?

Below 5%	5% – 10%	10% – 20%	20% – 30%	Above 30%

4. How would you describe the level of competition your firm faces?

Very mild	Mild	Intensive	Very intensive

5. How often do you conduct competitor analysis?

Never	Once a year	Twice a year	Once a quarter	More than once a month

6. In your opinion, how important is competitor analysis for the following business activities? (Please answer for each activity.)

	Not applicable	*Unimportant*		*Neither important nor unimportant*		*Very important*
Strategy						
Marketing /Distribution/Pricing						
Production						
Procurement						
Human resource						
Investment/Financing						

7. What information sources do you use to analyse competitors' **sales** (e.g. prices, volumes, and distribution channels)? Please indicate all numeric options that apply. 1= Unimportant; 2 = Neither Important nor unimportant; 3 = Important)

Annual reports	Media / Government / Analysts / Homepage	Commercial data providers or consulting companies	
Market surveys	Industry association	Private channels	Other

8. What information sources do you use to analyse competitors' **production** (e.g. capacity, costs, raw materials, and employees)? Please select all options that apply.

Annual reports	Media / Government / Analysts / Homepage	Commercial data providers or consulting companies	
Market surveys	Industry association	Private channels	Other

<u>Manufacturing costs and cost structure</u>

9. To your knowledge, how similar is your firm's manufacturing cost structure (or just cost structure) to the manufacturing cost structure (or just cost structure) of other firms in the industry?

Very different	Different	Similar	Very similar

10. Do you agree with the following statement? *Knowledge of a firm's manufacturing cost structure (or just cost structure) would give its competitors a significant advantage.*

Strongly disagree	Disagree	No opinion	Agree	Strongly agree

11. Do you agree with the following statement?
Knowledge of a firm's manufacturing cost structure (or just cost structure) would give its customers and suppliers more bargaining power in dealings with the firm.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree

12. Until 2004, firms were required to disclose information about manufacturing costs in their annual reports. If this information were still included in the annual report, would it be useful for competitor analysis? *Please pick the answer that best reflects your opinion.*

1) Yes, it would.
2) No, it wouldn't because we are able to obtain the information from other sources.
3) No, it wouldn't because the information is not useful.

If you picked (1) or (2) in the previous question, please answer the following question. In your opinion, how useful are manufacturing cost reports in the following activities? (Please answer for each activity.)

	Not applicable	*Unimportant*		*Neither important nor unimportant*		*Very important*
Strategy						
Marketing /Distribution/Pricing						
Production						
Procurement						
Human resource						
Investment/Financing						

13. Do you agree with the following statement?
    Companies are unwilling to disclose information about manufacturing costs in their annual reports because competitors are able to use it to their advantage.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree

14. *Optional* – please describe a specific example of competitor analysis for business activities.

15. *Optional* – please provide your contact details.

Figure 1 Trends of Gross Profit and Illiquidity

This figure plots the average gross profit and illiquidity, by year, for two matched sets of Korean listed firms that disclosed the Schedule of Manufacturing Costs (SoMC) in 2003: those that disclosed the SoMC in 2004, and those that withheld the SoMC in the same year. Disclosing firms are one-to-one matched with non-disclosing firms with replacement and within industry. Appendix A contains variable definitions.

Figure 2 Proportion of Non-disclosing Firms over Time

This figure plots the proportion of non-disclosing firms, by year, for Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003.

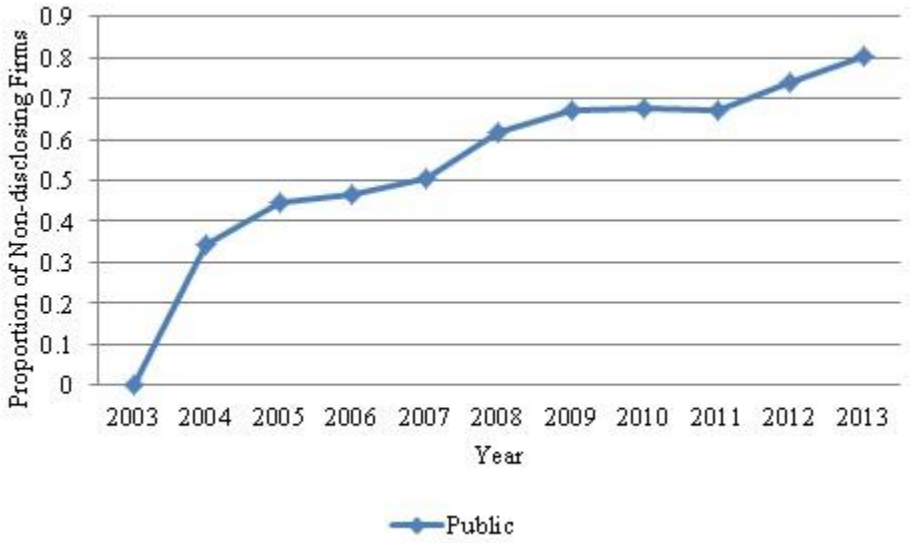

Table 1 Timeline for New Manufacturing Cost Disclosure Regulation

This table chronicles the relaxation of the Schedule of Manufacturing Costs disclosure requirements:

Date	Description
January 2004	The Korean Financial Supervisory Service (KFSS) launched a task force to resolve any issues that could arise because of the planned 2005 expansion in scope of securities class action lawsuits to cover accounting fraud in annual and quarterly reports.
March 2004	The task force suggested possible supplementary changes in financial regulations. One suggestion was to allow public firms to voluntarily disclose details of manufacturing costs. The rationale was that proprietary costs of disclosure can be large, and excessively detailed information about manufacturing costs can trigger excessive securities class action lawsuits.
April 2004	The KFSS adopted the task force's suggestions, and began to delineate a set of items that would move from being mandatorily to voluntarily disclosed.
November 2004	The KFSS drafted new disclosure regulations that exempted the Schedule of Manufacturing Costs and other sensitive information from mandatory disclosure.
December 2004	The Korean Financial Supervisory Commission (KFSC) adopted and announced the public draft of new disclosure regulations.

Table 2 Data Description

Panel A – Sample Selection

This panel describes the sample selection.

Data Requirement	Number of Firms	Used in Table
Listed firms on the KSE and KOSDAQ in 2003 that…	1,563	
…disclosed the Schedule of Manufacturing Costs in 2003,	1,330	
…had the requisite financial and market data from 2003 to 2005,	1,203	
…did not have extreme values because of denominators,	1,109	3, 4, 5, 10
…had the requisite financial and market data from 2001 to 2007,	900	9
…and were selected by propensity score matching	422	7, 8

Panel B – Descriptive Statistics

This panel reports descriptive statistics for Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003 (the fourth row of Panel A above). Appendix A contains variable definitions.

Variables	All (N=1,109)		NDMC=0 (N=729)		NDMC=1 (N=380)	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Distinctive Cost Structure	0.0797	0.1351	0.0611	0.1045	0.1154	0.1744
Market Share	0.0169	0.0553	0.0126	0.0361	0.0252	0.0795
Herfindahl Index	0.0800	0.0722	0.0789	0.0675	0.0820	0.0805
Entry Barrier	0.3156	0.1148	0.3208	0.1123	0.3058	0.1190
Proportion of Private Firms	0.7924	0.0990	0.7983	0.0965	0.7810	0.1028
Customer Concentration	0.3034	0.3283	0.3137	0.3464	0.2837	0.2899
Related Party Sales	0.0680	0.1536	0.0692	0.1563	0.0658	0.1483
Foreign Sales	0.2806	0.3121	0.3007	0.3099	0.2419	0.3130
Gross Profit	0.1974	0.1466	0.1822	0.1280	0.2267	0.1734
Product Concentration	0.6300	0.2262	0.6254	0.2265	0.6389	0.2256
Size	24.07	1.53	24.02	1.40	24.18	1.77
Market Capitalization	258.36	2,232.60	125.85	540.96	512.58	3,729.80
Sales Growth	0.1720	0.3569	0.1762	0.3402	0.1641	0.3872
Leverage	0.4368	0.1957	0.4579	0.1882	0.3965	0.2035
Market to Book	0.8512	0.7998	0.7710	0.7345	1.0051	0.8931
Analyst Following	0.0622	0.2417	0.0494	0.2168	0.0868	0.2820
Litigation Risk	0.2489	0.4326	0.2949	0.4563	0.1605	0.3676
Large Shareholders' Ownership	0.3378	0.1763	0.3370	0.1731	0.3394	0.1825

Table 2 cont.

Panel C - Correlation Matrix

This panel reports the correlation matrix for Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003 (the fourth row of Panel A above) Appendix A contains variable definitions. p-values are in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) NDMC	1.00																	
(2) Distinctive Cost Structure	0.19	1.00																
	(0.00)																	
(3) Market Share	0.11	-0.01	1.00															
	(0.00)	(0.78)																
(4) Herfindahl Index	0.02	0.02	0.35	1.00														
	(0.50)	(0.42)	(0.00)															
(5) Entry Barrier	-0.06	-0.11	0.14	0.14	1.00													
	(0.04)	(0.00)	(0.00)	(0.00)														
(6) Proportion of Private Firms	-0.08	0.01	-0.06	-0.37	0.11													
	(0.01)	(0.72)	(0.04)	(0.00)	(0.00)	1.00												
(7) Customer Concentration	-0.04	0.08	-0.12	0.13	-0.04	0.04	1.00											
	(0.15)	(0.01)	(0.00)	(0.00)	(0.13)	(0.16)												
(8) Related Party Sales	-0.01	-0.04	-0.01	0.07	0.03	0.01	0.08	1.00										
	(0.73)	(0.14)	(0.82)	(0.03)	(0.38)	(0.68)	(0.00)											
(9) Foreign Sales	-0.09	-0.10	0.05	0.29	0.09	-0.08	0.14	0.13	1.00									
	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)										
(10) Gross Profit	0.14	0.07	0.04	-0.14	-0.09	-0.21	-0.14	-0.12	-0.22	1.00								
	(0.00)	(0.03)	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)									
(11) Product Concentration	0.03	0.06	0.01	0.08	0.09	0.05	-0.01	-0.04	0.10	-0.02	1.00							
	(0.34)	(0.06)	(0.76)	(0.01)	(0.00)	(0.12)	(0.85)	(0.22)	(0.00)	(0.52)								
(12) Size	0.05	-0.07	0.49	0.11	0.09	-0.02	-0.13	0.03	0.13	0.13	-0.06	1.00						
	(0.10)	(0.03)	(0.00)	(0.00)	(0.00)	(0.46)	(0.00)	(0.38)	(0.00)	(0.00)	(0.05)							
(13) Sales Growth	-0.02	-0.01	0.00	0.08	-0.05	-0.01	0.06	0.01	0.03	0.00	0.01	0.09	1.00					
	(0.59)	(0.68)	(0.92)	(0.01)	(0.11)	(0.73)	(0.04)	(0.72)	(0.26)	(0.91)	(0.75)	(0.00)						
(14) Leverage	-0.15	-0.07	0.07	0.05	0.01	0.07	0.00	-0.03	0.04	-0.24	-0.02	-0.10	0.06	1.00				
	(0.00)	(0.03)	(0.03)	(0.09)	(0.63)	(0.01)	(0.88)	(0.30)	(0.14)	(0.00)	(0.54)	(0.00)	(0.05)					
(15) Market to Book	0.14	0.17	0.06	0.09	-0.09	-0.11	0.06	-0.05	0.02	0.12	-0.01	0.25	0.11	0.12	1.00			
	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.05)	(0.08)	(0.56)	(0.00)	(0.65)	(0.00)	(0.00)	(0.00)				
(16) Analyst Following	0.07	0.00	0.42	0.18	0.05	-0.06	-0.11	-0.01	0.10	0.11	-0.01	0.59	0.02	-0.03	0.18	1.00		
	(0.01)	(0.89)	(0.00)	(0.00)	(0.10)	(0.03)	(0.00)	(0.84)	(0.00)	(0.00)	(0.86)	(0.00)	(0.42)	(0.37)	(0.00)			
(17) Litigation Risk	-0.15	-0.06	-0.11	0.34	-0.25	-0.10	0.18	0.06	0.21	-0.13	-0.05	0.02	0.15	0.05	0.07	0.01	1.00	
	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.08)	(0.53)	(0.00)	(0.07)	(0.02)	(0.81)		
(18) Large Shareholders' Ownership	0.01	-0.05	-0.07	-0.02	0.09	0.01	-0.01	0.07	-0.06	0.03	0.01	-0.03	-0.03	-0.13	-0.13	-0.11	-0.08	1.00
	(0.83)	(0.13)	(0.01)	(0.50)	(0.00)	(0.69)	(0.81)	(0.01)	(0.04)	(0.32)	(0.79)	(0.40)	(0.34)	(0.00)	(0.00)	(0.00)	(0.01)	

Table 3 Effects of Competitive Position on Manufacturing Cost Disclosure

This table relates public firms' competitive positions to their disclosure policies in 2004. NDMC is 1 if a firm did not disclose its Schedule of Manufacturing Costs in 2004. The sample comprises Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003. Appendix A contains variable definitions.

	(1)	(2)	(3)	(4)
VARIABLES	NDMC	NDMC	NDMC	NDMC
Distinctive Cost Structure	0.4653***		0.4641***	0.2918***
	(0.1310)		(0.1291)	(0.0954)
Market Share		0.8437*	0.8377**	1.6712***
		(0.4277)	(0.3957)	(0.4172)
Herfindahl Index	0.6004	0.4331	0.3215	
	(0.3672)	(0.4688)	(0.4427)	
Entry Barrier	-0.3484*	-0.4073**	-0.3372*	
	(0.1894)	(0.1986)	(0.1877)	
Proportion of Private Firms	-0.1199	-0.1043	-0.1584	
	(0.2974)	(0.3427)	(0.3131)	
Customer Concentration	-0.0407	-0.0211	-0.0339	-0.0252
	(0.0466)	(0.0474)	(0.0444)	(0.0401)
Related Party Sales	0.0625	0.0579	0.0655	0.0476
	(0.1234)	(0.1194)	(0.1224)	(0.1201)
Foreign Sales	-0.0735	-0.0795	-0.0621	-0.0974**
	(0.0450)	(0.0500)	(0.0470)	(0.0378)
Gross Profit	0.1737	0.1754	0.1612	0.1863
	(0.1179)	(0.1150)	(0.1164)	(0.1455)
Product Concentration	0.0393	0.0540	0.0401	0.0532
	(0.0658)	(0.0711)	(0.0656)	(0.0669)
Size	-0.0035	-0.0213*	-0.0161	-0.0211*
	(0.0110)	(0.0122)	(0.0111)	(0.0112)
Sales Growth	-0.0036	-0.0021	0.0009	0.0362
	(0.0337)	(0.0339)	(0.0332)	(0.0361)
Leverage	-0.3151***	-0.3730***	-0.3422***	-0.3100***
	(0.0699)	(0.0700)	(0.0706)	(0.0768)
Market to Book	0.0708***	0.0918***	0.0765***	0.0642***
	(0.0208)	(0.0236)	(0.0214)	(0.0186)
Analyst Following	0.0760	0.0647	0.0548	0.0419
	(0.0566)	(0.0587)	(0.0571)	(0.0574)
Litigation Risk	-0.1889***	-0.1813***	-0.1636***	
	(0.0429)	(0.0526)	(0.0477)	
Large Shareholders' Ownership	0.0119	0.0169	0.0288	0.1065
	(0.0824)	(0.0874)	(0.0845)	(0.0835)
Observations	1,109	1,109	1,109	1,109
R-squared	0.1117	0.1014	0.1171	0.2126
Industry FE	NO	NO	NO	Yes

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 Effects of Competitive Position on Manufacturing Cost Disclosure—Private Firms

This table relates private firms' competitive positions to their disclosure policies in 2004. NDMC is 1 if a firm did not disclose its Schedule of Manufacturing Costs in 2004. The sample comprises Korean audited private firms that disclosed the Schedule of Manufacturing Costs in 2003. Appendix A contains variable definitions.

	(1)	(2)
VARIABLES	NDMC	NDMC
Distinctive Cost Structure	0.1293**	0.0658
	(0.0509)	(0.0414)
Market Share	1.7471***	1.0343*
	(0.3565)	(0.5565)
Herfindahl Index	-0.4328**	
	(0.1837)	
Entry Barrier	0.1414	
	(0.0860)	
Proportion of Private Firms	-0.1062	
	(0.1348)	
Gross Profit	0.0397	-0.0461
	(0.0602)	(0.0545)
Total Asset	0.0060	0.0062
	(0.0112)	(0.0094)
Sales Growth	-0.0481***	-0.0398***
	(0.0098)	(0.0077)
Leverage	-0.0473	-0.0466*
	(0.0288)	(0.0278)
Observations	3,192	3,192
R-squared	0.0273	0.0720
Industry FE	No	Yes

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 Covariate Balance Tests for Propensity Score Matching

This table reports covariate balance tests for the matched sample. Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003 are partitioned into two sets: those that disclosed the Schedule of Manufacturing Costs in 2004, and those that did not. Disclosing firms are one-to-one matched with non-disclosing firms with replacement and within industry. Appendix A contains variable definitions.

Variables	NDMC=1	NDMC=0	Difference	t-statistic
Distinctive Cost Structure	0.0589	0.0697	-0.0108	-1.19
Market Share	0.0114	0.0097	0.0017	0.57
Customer Concentration	0.2609	0.2568	0.0041	0.15
Related Party Sales	0.0664	0.0580	0.0083	0.65
Foreign Sales	0.2697	0.2807	-0.0110	-0.35
Gross Profit	0.2080	0.2058	0.0022	0.15
Product Concentration	0.6245	0.6369	-0.0124	-0.55
Size	24.1980	24.0330	0.1650	1.11
Sales Growth	0.1728	0.1651	0.0077	0.21
Leverage	0.4036	0.3974	0.0062	0.34
Market to Book	0.8297	0.7153	0.1144	1.65
Analyst Following	0.0758	0.0711	0.0047	0.19
Large Shareholders' Ownership	0.3408	0.3448	-0.0041	-0.23

Table 6 Effects of Disclosure Decisions on Gross Profit and Illiquidity

This table relates the matched sample firms' disclosure policies in 2004 to their subsequent gross profit and illiquidity. Korean listed firms that disclosed the Schedule of Manufacturing Costs (SoMC) in 2003 are partitioned into two sets: those that disclosed the SoMC in 2004, and those that did not. Disclosing firms are one-to-one matched with non-disclosing firms with replacement and within industry. The sample spans 2002 to 2007. Appendix A contains variable definitions.

	(1)	(2)	(3)	(4)
VARIABLES	Gross Profit	Gross Profit	Illiquidity	Illiquidity
NDMC	0.0118**	0.0125**	0.1903	0.0847*
	(0.0051)	(0.0050)	(0.1303)	(0.0466)
Size		0.0005		-1.0138***
		(0.0050)		(0.0233)
Investment		0.0069		
		(0.0047)		
Leverage		-0.0002		
		(0.0185)		
Sales Growth		0.0048**		
		(0.0023)		
Negative Earnings		-0.0097		
		(0.0066)		
Return Volatility				0.6286***
				(0.0696)
Turnover				-0.9177***
				(0.0354)
Observations	2,532	2,532	10,128	10,128
R-squared	0.8266	0.8281	0.7570	0.8797
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	No	No
Year-Quarter FE	No	No	Yes	Yes

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 Manufacturing Cost Disclosure and Profitability Dispersion

This table relates the proportion of an industry's firms withholding the Schedule of Manufacturing Costs to dispersion in that industry's firms' subsequent gross profits. The sample comprises Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003 and spans 2002 to 2007. Each industry is required to have at least 10 firms. Appendix A contains variable definitions—the "Ind" prefix denotes an industry level average of the variable that follows.

	(1)	(2)
VARIABLES	Gross Profit Dispersion	Gross Profit Dispersion
Ind NDMC	0.0416**	0.0371**
	(0.0154)	(0.0176)
Herfindahl Index		0.0283
		(0.2658)
Ind Intangible Asset		-0.2030
		(0.2703)
Ind Size		-0.0031
		(0.0111)
Ind Gross Profit		0.0504
		(0.1391)
Ind Leverage		-0.0071
		(0.0932)
Observations	132	132
R-squared	0.9130	0.9150
Industry FE	Yes	Yes
Year FE	Yes	Yes

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8 Robustness Tests for Determinants of Disclosure Decisions

This table relates public firms' competitive positions to their disclosure policies in 2004 using different constructions of key variables than those used in Table 3. The dependent variables in Columns 1 to 6 are 1 if firms stop disclosing the Schedule of Manufacturing Costs (SoMC) in 2004. The dependent variables in Columns 7 and 8 are 1 if firms did not disclose the SoMC in 2005 and 2006, respectively. The sample comprises Korean listed firms that disclosed the SoMC in 2003. Appendix A contains variable definitions.

VARIABLES	(1) Public	(2) Cost	(3) Customer	(4) Bank	(5) Chaebol	(6) Industry	(7) 2005NDMC	(8) 2006NDMC
Distinctive Cost Structure	0.4214***	0.2351***	0.4619***	0.4364***	0.4493***	0.4681***	0.2699**	0.1621
	(0.1257)	(0.0644)	(0.1307)	(0.1335)	(0.1267)	(0.1235)	(0.1283)	(0.1302)
Market Share	0.3630**	0.8471**	0.8445**	0.8137*	0.6655*	0.5062***	0.9047**	0.9513***
	(0.1645)	(0.3853)	(0.3957)	(0.4058)	(0.3526)	(0.1743)	(0.3734)	(0.3497)
Observations	1,109	1,109	1,109	1,104	1,109	1,109	1,109	1,109
R-squared	0.1245	0.1171	0.1169	0.1499	0.1271	0.1194	0.1288	0.1345
Bank FE	NO	NO	NO	Yes	NO	NO	NO	NO

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 Informativeness of Manufacturing Cost Reports about Subsequent Profitability

This table relates various components of firms' manufacturing costs with various measures of their subsequent year's profitability. The sample comprises Korean listed firms that disclosed the Schedule of Manufacturing Costs in 2003 and spans 1995 to 2003. The last three rows report p-values from F-tests of the equality between the Raw Material, Labor, and Overhead's coefficient estimates. Appendix A contains variable definitions.

VARIABLES	(1) Gross Profit	(2) Gross Profit	(3) Operating Income	(4) Operating Income	(5) Net Income	(6) Net Income
Raw Material	-0.7935***	-0.7164***	-0.5637***	-0.5451***	-0.6097***	-0.6245***
	(0.0566)	(0.0483)	(0.0380)	(0.0348)	(0.0453)	(0.0445)
Labor	-0.8248***	-0.6895***	-0.6655***	-0.5311***	-0.6325***	-0.5402***
	(0.0730)	(0.0588)	(0.0660)	(0.0706)	(0.0793)	(0.0883)
Overhead	-0.7900***	-0.6787***	-0.5691***	-0.5148***	-0.6450***	-0.6302***
	(0.0633)	(0.0547)	(0.0411)	(0.0389)	(0.0520)	(0.0551)
Other COGS	-0.7943***	-0.7043***	-0.5940***	-0.5262***	-0.6456***	-0.6116***
	(0.0578)	(0.0467)	(0.0394)	(0.0321)	(0.0521)	(0.0486)
SG&A			-0.5741***	-0.5407***	-0.7817***	-0.7697***
			(0.0353)	(0.0327)	(0.0593)	(0.0511)
Non-operating Expense					-0.1551***	-0.1241***
					(0.0392)	(0.0382)
Observations	6,038	6,038	6,038	6,038	6,038	6,038
R-squared	0.6995	0.7357	0.3511	0.3986	0.2041	0.2467
Industry FE	No	Yes	No	Yes	No	Yes
Year FE	No	Yes	No	Yes	No	Yes
RMC=LC	0.6136	0.4896	0.0583*	0.8043	0.7234	0.3159
RMC=OC	0.8358	0.0366**	0.6623	0.2281	0.0786*	0.8914
LC=OC	0.6152	0.8193	0.0763*	0.8071	0.8494	0.3328

Robust standard errors clustered by industry in parentheses
*** p<0.01, ** p<0.05, * p<0.1