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The effects of financial reporting and disclosure on corporate investment: A review☆

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ABSTRACT

A fundamental question in accounting is whether and to what extent financial reporting facilitates the allocation of capital to the right investment projects. Over the last two decades, a large and growing body of literature has contributed to our understanding of whether and why financial reporting affects investment decision-making. We review the empirical literature on this topic, provide a framework to organize this literature, and highlight opportunities for future research.

1. Introduction

We review the empirical literature investigating the influence of financial reporting and disclosure on corporate investment decisions. A fundamental question in accounting is whether and to what extent financial reporting facilitates the allocation of capital to the right investment projects. In a frictionless world, such as that modeled by Modigliani and Miller (1958), every project with a positive net present value (NPV) is funded as it arises, and negative NPV projects are not funded. In practice, a variety of frictions prevent this perfect outcome, with perhaps the most widely-discussed one being frictions arising from information asymmetries (Hubbard, 1998; Stein, 2003). Over the last two decades, a large and growing body of literature has contributed to our understanding of whether and why financial reporting affects investment. Such research efforts have also uncovered unforeseen and perhaps unintended consequences of financial reporting. Our objective in this review is to synthesize this growing stream of empirical archival research in a unified framework and to highlight opportunities for future research.[1]

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[1] We refer readers interested in the theoretical literature to a recent review by Kanodia and Sapra (2016). Related, Leuz and Wysocki (2016) review some of this literature in the context of disclosure and regulation.

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Much of the early literature on the "economic consequences" of financial reporting suggests that financial reporting affects stock prices and contracts (e.g., Ball and Brown, 1968; Beaver, 1968; Watts and Zimmerman, 1986), with implications for firm value. Initial efforts to establish a link between financial accounting and firm value focus on testing whether financial reporting transparency lowers the cost of capital (Healy and Palepu, 2001; Verrecchia, 2001; Beyer et al., 2010) and/or improves contracting efficiency (Bushman and Smith, 2001; Lambert, 2001; Armstrong et al., 2010).[2] While this prior work has examined the role of accounting in reducing information asymmetry and in designing efficient contracts, it has not examined the direct effect of accounting on the firm's investment decisions. Thus, an unanswered question from this stream of work is whether financial reporting affects managers' investment decisions, and consequently firm value. Capturing this sentiment, Bushman and Smith (2001) state "accounting information potentially enhances the investment decisions and productivity of firms … we suggest future research that directly examines the effects of financial accounting information on economic performance."

Most of the literature inspired by Bushman and Smith's (2001) call for research focuses on corporate investment decisions such as capital expenditures, mergers and acquisitions (M&A), and research and development (R&D). The focus on investment reflects the notion that investment decisions are a primary means through which firms create value for their investors and stakeholders. In fact, in the frictionless Modigliani-Miller world, investment is the only factor affecting firm value. Guided by the progress in the literature, we restrict the scope of our review to studies examining corporate investment and, for the most part, refrain from discussing the evidence relating financial reporting to other drivers of firm value such as financing decisions (e.g., capital issuance, payout policy).[3] For the purposes of our discussion, a firm is considered to be investing efficiently if it invests in every project with a positive NPV as such projects become available (i.e., in a timely manner) and does not invest in projects with negative NPV (e.g., Jorgenson, 1963; Hayashi, 1982).

Several attributes of the accounting system are purported to influence investment decisions and they can be broadly classified into two non-mutually exclusive groups: (i) attributes capturing the amount and precision of the information disclosed, and (ii) attributes capturing the nature and extent of disclosure related to a transaction or economic event. Examples of financial reporting attributes related to the precision of accounting information include earnings quality proxies, changes in accounting standards, voluntary disclosures, etc. Examples of attributes related to the nature and extent of disclosure include the frequency of financial reporting, which economic transactions are measured and which are not measured, how they are measured and aggregated, etc. (Kanodia and Sapra, 2016).[4]

Why might financial reporting affect investment choices and hence investment efficiency? As we describe in Fig. 1, we organize the literature into two broad categories. The first category (discussed in Section 2) involves the role of financial reporting in a world with *agency* frictions arising from information asymmetry. The key feature in Section 2 is that accounting information either helps reduce information asymmetry and consequently improves investment efficiency, or provides agents with an incentive to undertake potentially inefficient investment to meet financial reporting benchmarks. The second category (discussed in Section 3) abstracts from agency issues and information asymmetry among agents, and instead focuses on *learning* effects arising from the presence of uncertainty about investment opportunities. The key feature in Section 3 is that accounting information (reported by the firm or disclosed by peer firms) affects managers' information set and thereby alters their investment choices.[5,6]

Within an agency framework, accounting information can affect investment decisions by influencing information asymmetry between managers and shareholders (and between other stakeholders of a firm, for example, shareholders and debtholders) in two ways. First, financial reporting can improve investment decisions by reducing information asymmetry between managers and investors, as well as among investors, which can affect adverse selection costs and consequently the cost of raising external capital. Second, accounting information can affect investment decisions by altering moral hazard costs arising from agency conflicts among various stakeholders in the firm. A notable observation that emerges from our review is that financial reporting can simultaneously improve investment efficiency by reducing moral hazard costs and reduce investment efficiency by providing managers incentives to make myopic investment decisions.

Within the learning channel, our review highlights two ways through which managers (and shareholders) can learn new information about their investment opportunity set. First, accounting information disclosed by *peer* firms can help reduce uncertainty about growth opportunities available to related firms, particularly when a firm is affected by common demand

[2] See also Core (2001), Dye (2001), Magee (2001), Sloan (2001), and Brickley and Zimmerman (2010) for discussions of these literatures.

[3] To narrow the scope, our review also focuses only on non-financial institutions. The financial sector regulation introduces a variety of different incentive issues that diverge from the framework of our review. We refer the reader interested in the financial sector to reviews by Beatty and Liao (2014) and Acharya and Ryan (2016).

[4] Of course, these two attributes are related. For instance, to the extent that increasing reporting frequency improves reporting quality, it will also have a precision effect. This distinction will become clearer when we discuss myopic incentives arising from reporting benchmarks.

[5] Our framework overlaps with the framework in Bushman and Smith (2001, p. 294). We organize our review along Fig. 1 to better approximate the progress in the field since their paper and to better frame our discussion of the literature moving forward.

[6] A related stream of literature suggests that stock prices aggregate information from many traders and greater stock price informativeness informs managers about investment decisions (e.g., Chen et al., 2007). We do not review the evidence in that literature as it does not concern the role of financial reporting and disclosure, but we refer readers to Bond et al. (2012) for a review of the literature. That said, one study in this line of research that fits into the scope of our review is Jayaraman and Wu (2018), who provide evidence that improvements in mandatory disclosure discourage informed trading, which lowers stock price informativeness and the extent to which managers learn from price. Other related papers include Zuo (2016) and Zhu (2018).

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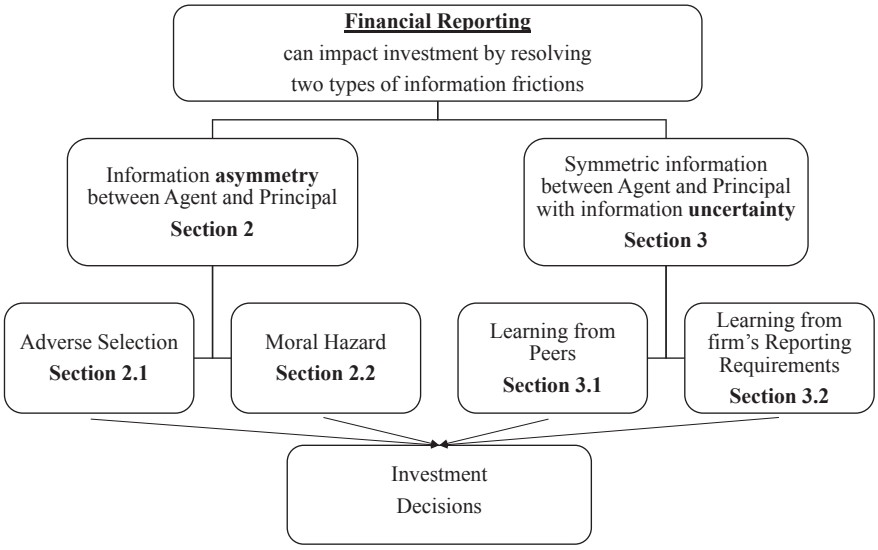

Fig. 1. Framework for the effect of financial reporting on investment decisions.

and supply conditions with the disclosing peer firms.[7] Second, in the presence of information acquisition and processing costs, disclosure requirements and financial reporting regulation (e.g., internal control testing) can induce firms to collect and process additional information that affect managers' information sets and thus their investment decisions.

Much of the literature we review can be characterized as relying on one or more of the four channels in Fig. 1. However, our review also identifies two streams of literature that have received considerable attention in economics and finance, but have not received as much attention in accounting. In particular, accounting information can influence investment decisions when managers or stakeholders have behavioral biases, and when firms are connected through networks created by the use of common agents (auditors, board members, etc.). We discuss these streams of work in Section 4.

In the remainder of this section, we highlight six insights that emerge from our review (we provide ideas to address the issues in the later sections). First, the literature documenting that financial reporting can *improve* investment efficiency has evolved somewhat independently from the literature showing that financial reporting can induce myopia and *reduce* investment efficiency (e.g., when a firm cuts R&D to meet financial reporting goals). As a result, although the evidence in these literatures is closely related, they do not provide a cohesive picture of the economic consequences of financial reporting that incorporates both its positive and negative effects on investment decisions. More research is necessary to reconcile these two streams of the literature.

Second, in addition to having both beneficial and distortionary investment effects at the *firm*-level, financial reporting also generates significant externalities. As a result, it is difficult to estimate the aggregate effect of financial reporting on investment decisions that accounts for (i) the firm-specific positive and negative effects (as discussed in the first point above) as well as (ii) the positive and negative spillover effects on non-disclosing firms. As an illustration, consider the case of increased reporting frequency. On the one hand, Fu et al. (2012) document that an increase in reporting frequency can be beneficial for a firm because it reduces the firm's cost of capital. On the other hand, Kraft et al. (2018) find that increases in reporting frequency can be detrimental to shareholders of the firm because it leads managers to reduce investment by exacerbating myopic incentives. Further, Kajüter et al. (2018) find that increases in reporting frequency is net costly for small firms (due to compliance costs), but that increased reporting frequency by larger firms has spillover benefits for smaller firms exempt from the reporting requirements. Collectively, these studies provide important evidence on several pieces of a large and multi-dimensional issue that involves both firm-level effects and spillover effects on peer firms. All these different pieces of evidence are relevant for the question of whether an increase in reporting frequency is desirable from a regulator's perspective, and for discerning the net impact of financial reporting on aggregate investment. A concerted effort by researchers to estimate and discuss the economic magnitudes of the effects of financial reporting on investment will help answer these questions.

Third, there is an opportunity to enhance our understanding of the sources of variation in financial reporting quality aimed at influencing investment decisions in the presence of agency frictions. In adverse selection settings, managers and (current) shareholders typically have aligned interests, and an increase in reporting quality is a natural outcome as long as the expected benefits of increasing transparency exceed the expected costs. In contrast, in situations involving moral hazard, managers and shareholders typically have incentives that are not perfectly aligned, and joint control over reporting and investment choices

[7] As we discuss in Section 2, information disclosed by peer firms can also reduce adverse selection and moral hazard costs for related firms. However, when reviewing the literature on the learning channel we focus on non-agency issues.

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poses a more complicated problem. Managers can conceivably exploit their discretion to issue low-quality reports as well as engage in inefficient investments as mutually reinforcing strategies that allow them to pursue their own private interests as opposed to shareholders'. In this context, it is crucial to understand when managers have the incentive and the opportunity to engage in such behavior. Further, mechanisms such as regulation, governance and litigation that discipline managers' reporting choices are likely to have significant spillover effects on investment decisions. Understanding how managers exercise their joint control over reporting and investment, and how they can commit to higher reporting quality in a way that facilitates more efficient investments remains a fertile area of research.

Fourth, while our framework identifies separate channels through which financial reporting may affect investment, the findings in most studies are consistent with multiple mechanisms. For example, an observed increase in investment after an increase in financial reporting transparency may be the result of the increased transparency reducing adverse selection costs, and hence the cost of capital, thus expanding the firm's investment opportunities. However, such a finding is also consistent with the increase in transparency allowing shareholders to incentivize managers to undertake new investment projects, that is, a mitigation of moral hazard. Studies identifying and isolating specific mechanisms through which accounting information affects investment decisions will help further our understanding of when and how accounting information might be most valuable. In addition, such studies will also help us compare the role of accounting with other “curative mechanisms” that help resolve agency frictions.

Fifth, most of the literature concentrates on the classic agency frictions arising from manager-shareholder conflicts. However, there exist several related topics that have received less attention and present an opportunity for future research. For example, financial reporting information can improve investment efficiency by reducing conflicts of interests between shareholders and debtholders, by alleviating agency issues within multi-segment organizations, as well as conflicts of interest between shareholders and a broader stakeholder group that includes customers, employees, etc. Similarly, there exists relatively less research on the “learning” channel in which financial reporting information improves the manager's information set about future investment opportunities (see also a discussion of our review by Ferracuti and Stubben (2019)). There is also little evidence on whether information processing frictions (e.g., limited attention or bounded rationality) as well as behavioral biases (e.g., loss aversion, fixation on salient metrics, miscalibration) lead to an association between financial reporting and investment choices. In addition, recent technological advances and the availability of big data and sophisticated data analytic tools can influence internal and external reporting decisions which can ultimately influence investment via agency costs, managerial learning or behavioral biases, and thus offer promising opportunities for both empirical and analytical research. As such, several research opportunities remain and we highlight them throughout the review.

Last, a criticism of this literature is that investment efficiency is not observable and researchers often use many imperfect proxies, each with its own limitations. Specifically, a large literature in economics and finance discusses the significant inferential challenges that arise due to measurement error in proxies for growth opportunities, conflicting evidence regarding the validity of proxies for financing constraint, and misspecification in the empirical investment model based on *q* theory.[8] In addition, as discussed in Dechow et al. (2010), financial reporting quality is also an elusive construct without a one-size-fits-all proxy that conforms to all research questions. This issue is further complicated in our setting because the “true” financial performance of a firm is integrally linked to its investment opportunities, which makes it challenging for reporting quality proxies to separate out the *measurement* of performance from the true *underlying* performance of a firm. For example, firms may disclose more information in footnotes because they are more transparent (a financial reporting decision) or because they engage in more transactions (an economic/investment decision). Researchers have attempted to address these measurement issues by selecting proxies for financial reporting quality tailored to suit a research question, and by relying on multiple proxies for efficient investment. However, more needs to be done to address the measurement challenges in the literature.

2. Agency issues arising from information asymmetry

In this section, we review the literature on the effect of financial reporting on investment decisions in the presence of agency frictions. The common theme underlying the studies discussed in this section is that information asymmetry between various parties to the firm gives rise to investment distortions relative to first best. In such a setting, financial reporting can improve investment efficiency by reducing information asymmetry (and consequently agency costs). Alternatively, financial reporting can exacerbate investment distortions if managers attempt to exploit their information advantage to meet financial reporting goals. As we discuss below, crucial factors in this literature include who exercises primary control over financial reporting (e.g., managers, shareholders, regulators), whether managers can credibly commit to transparency, and whether regulated increases in transparency necessarily reduce agency costs.

We divide the discussion of the literature into two subsections: Section 2.1 reviews the evidence on adverse selection issues and Section 2.2 reviews the evidence on moral hazard issues. At the risk of oversimplifying, one can think of the former as the consequence of having information asymmetry about firm value *before* the firm raises external capital for investment, and the latter as the consequence of having information asymmetry regarding managers' actions *after* the firm raises capital.

[8] See, e.g., Kaplan and Zingales (1997), Erickson and Whited (2000), Gomes (2001), Hennessy (2004), Farre-Mensa and Ljungqvist (2016), Peters and Taylor (2017), and Bartlett and Partnoy (2018), among others.

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This distinction notwithstanding, the separation is intended for tractability and pedagogical purposes. In fact, one of the insights from our review is that these channels are hard to separate empirically, and that the evidence is often consistent with both channels.

2.1. The adverse selection channel

2.1.1. Conceptual underpinnings

One of the primary mechanisms through which financial reporting is hypothesized to facilitate investment decisions is through a reduction in adverse selection costs resulting from information asymmetry between managers and capital providers. Accounting information can reduce adverse selection problems between the firm and new investors (shareholders, creditors, etc.) if, for example, financial reports better describe the value of assets in place or of existing investment opportunities. In this case, to the extent that the information asymmetry between managers and investors is reduced, investors would be more forthcoming with capital, which would then enable financially constrained firms to tap into new investment opportunities (Myers and Majluf, 1984).[9]

In addition, accounting information can also mitigate adverse selection among investors, thereby improving liquidity in observable security prices (Verrecchia, 2001). Consistent with this argument, empirical studies document a positive relation between financial reporting quality and stock price liquidity (e.g., Healy et al., 1999; Leuz and Verrecchia, 2000). Further, to the extent that information asymmetry between managers and investors or information asymmetry among investors is non-diversifiable, then it would also affect the rate of return expected by investors, further facilitating access to capital.[10] The implications are that, by reducing information asymmetry, financial reporting transparency improves firms' access to external capital and allows financially constrained firms to increase investment efficiency by tapping into new investment opportunities.

2.1.2. Empirical evidence and open issues

Early studies in this literature investigate the relation between accounting information and investment decisions by acknowledging multiple potential channels such as the reduction in adverse selection costs (as well as moral hazard costs which we discuss in Section 2.2), without explicitly testing the specific intermediate channel. For example, using both country-level and firm-level measures of financial reporting quality and investment-cash flow sensitivity as a proxy for investment efficiency, Biddle and Hilary (2006) document a positive association between accounting information and investment efficiency. They interpret their findings as financial reporting quality improving investment efficiency by (potentially) reducing adverse selection as well as moral hazard costs. Biddle et al. (2009) extend the findings in Biddle and Hilary (2006) by showing that the relation between proxies for accounting quality and the level of investment is positive among financially constrained firms but negative among cash-rich firms. To the extent that financially constrained firms are more likely to under-invest because of adverse selection costs, and cash-rich firms are more prone to over-invest due to moral hazard frictions, their results suggest that higher reporting quality reduces both adverse selection and moral hazard costs associated with under- and over-investment.

Chen et al. (2011) study whether reporting quality improves investment efficiency among private firms. Private firms are unique because (among other things) the moral hazard conflict between managers and shareholders is not as acute relative to public firms because such firms are often owner-managed (especially small private firms). In addition, because private firms rely on bank financing, Chen et al. (2011) argue that even information asymmetry between managers and suppliers of capital is not as pronounced. Nonetheless, the authors find evidence of a positive association between reporting quality and investment efficiency for private firms. Based on cross-sectional analyses the authors conclude that their findings are partially driven by the demand for earnings information in bank lending.

Evidence in prior studies suggests that financial reporting can ease financing frictions and allow firms to improve investment efficiency by tapping into new investment opportunities. The key challenge in this literature, however, is to deal with endogeneity, which arises in several forms. For example, it is possible that an omitted correlated factor such as managerial ability influences both reporting quality and investment efficiency (e.g., skilled managers can both invest more efficiently and produce higher quality financial reports). Related, to the extent that financial reporting and investment are controlled by the manager, it is possible that the manager choses to simultaneously improve reporting (say by increasing disclosure in the MD&A) in periods of increasing growth opportunities; thus, changes in growth opportunities could be a correlated omitted variable in regressions of investment efficiency on reporting quality.

While dealing with endogeneity remains a challenge, some studies have made progress in this regard by exploiting within-firm (as opposed to cross-sectional) variation in reporting quality and by identifying settings with (arguably) exogenous changes in adverse selection and reporting quality. For instance, Cheng et al. (2013) use the remediation of internal control weaknesses as a proxy for time-series variation in financial reporting quality. They show that (i) firms substantially

[9] See also Stiglitz and Weiss (1981) for a similar discussion in the context of rationing by creditors.

[10] The literature on the relation between financial reporting quality and expected return is large and beyond the scope of this review. Some channels debated in the literature include a reduction in estimation risk (Easley and O'Hara, 2004; Lambert et al., 2007, 2012; Hughes et al., 2007) and improved risk sharing (Merton, 1987; Diamond and Verrecchia, 1991).

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under- and/or over-invest prior to the disclosure of internal control weaknesses, but (ii) these investment distortions are reduced subsequent to the remediation of internal control deficiencies.[11] More recently, Dou et al. (2018) exploit the adoption of SFAS 123R as an exogenous mandatory change in the information available to shareholders about employee stock options (ESOs). They report that financially constrained firms with the most unreliable estimates of ESO costs before the new rule experience an increase in investment after the introduction of the new regime. Naranjo et al. (2019) use the adoption of IFRS as a shock to a firm's information asymmetry and find that firms increase financing and investment after the new regime. While these studies are still susceptible to endogeneity threats arising from changes in omitted variables (e.g., changes in growth opportunities) around the remediation of internal control weakness and the introduction of SFAS 123R and IFRS, they mitigate concerns that their results are driven by unobservable factors such as managerial ability that are unlikely to change within short intervals.

Other studies attempt to address endogeneity by identifying settings with exogenous variation in adverse selection costs as well as financial reporting quality. Balakrishnan et al. (2014) exploit time-series variation in financing constraints due to macroeconomic fluctuations in the value of a firm's collateralizable assets as a proxy for exogenous variation in adverse selection costs. The underlying presumption is that lenders are less worried about adverse selection when the firm has collateralizable assets, but would be more information sensitive if the borrower lacks collateralizable assets. Balakrishnan et al. (2014) document that (i) financial reporting quality moderates the sensitivity of investment to fluctuations in collateral value and (ii) firms respond to an increase in adverse selection costs by increasing disclosure.[12]

Balakrishnan et al. (2016) investigate the influence of financial reporting on investment in a period with substantially reduced capital supply, the 2007–2008 financial crisis. They find that firms with more conservative accounting practices prior to the crisis experienced a lower decline in investments during the crisis. Further, the effect is stronger among firms more dependent on external financing and with higher information asymmetry between the firm and capital suppliers. Overall, the authors interpret the evidence as highlighting the ability of financial reporting to reduce information asymmetry frictions and to mitigate capital rationing during periods of reduced capital supply. More recently, Kim (2018) uses the collapse of the junk bond market in the early 1990s as a proxy for an exogenous shock to external financing. Kim (2018) finds that following this shock, speculative grade firms recognizing losses in a timely manner experience a smaller reduction in investment.

Shroff (2019) exploits a setting in which firms experience an exogenous increase in perceived auditor quality resulting from staggered increases in auditor regulatory oversight. Specifically, he exploits the fact that the Public Company Accounting Oversight Board (PCAOB) inspects the audit work of non-U.S. auditors if the auditor has a client that is registered with the SEC (e.g., a cross-listed firm trading in U.S. exchanges). Using staggered auditor inspections as well as variation in the content of their inspection reports, Shroff (2019) finds that non-SEC registered firms audited by a PCAOB-inspected auditor increase capital expenditures following the disclosure of their auditors' inspection reports. The primary benefit of his design is that it exploits changes in perceived financial reporting quality driven by spillover effects that arise from a regulation unrelated to the focal firm.

Overall, the literature has made significant progress in documenting the effect of financial reporting on investment decisions via the reduction of adverse selection costs. This literature builds on prior studies providing evidence that financial reporting quality can ease financing costs by lowering the adverse selection component of the cost of capital, and significantly extends it by showing the implications for firms' investment choices.

Before we conclude this section, we discuss a few unanswered questions. First, the findings in this literature suggest that financially constrained firms can benefit from higher reporting quality by lowering financing costs and increasing access to financing (i.e., reducing the capital rationing problem). A natural follow-up question then is what prevents firms from voluntarily increasing reporting quality? The typical answer to this question is that the evidence does not take into account all possible costs associated with higher reporting quality (e.g., proprietary costs of disclosure). More relevant to our survey, section 2.2 notes that in the presence of moral hazard frictions the manager might derive private benefits from low reporting quality or opacity. For example, prior research (e.g., Berger and Hann, 2007; Hope and Thomas, 2008) finds that multisegment firms hide the performance of underperforming segments due to unresolved agency problems (e.g., empire building incentives). One challenge for this literature, however, is that it is hard to calibrate the potential costs of increasing reporting quality against the estimated economic benefits of increased investment, because of the difficulty in precisely estimating their economic magnitudes. An opportunity remains in the literature to improve estimates of the economic benefits (and costs) of financial reporting on investment which can help researchers understand the trade-offs associated with changing reporting quality.

Relatedly, it is plausible that managers opt to not incur the costs of increasing financial reporting quality because they can address adverse selection costs via contracting arrangements. For example, Beatty et al. (2010) argue that one mechanism

[11] Feng et al. (2015) and Harp and Barnes (2018) also study the effect of material weaknesses on inventory and investment decisions. Since their focus is on how internal control weaknesses can affect the quality of managers' internal information sets (as opposed to agency-based explanations), we discuss these papers in Section 3.2.

[12] Two related studies are Ramalingegowda et al. (2013) and Armstrong et al. (2019) who exploit the role of financial reporting in the sensitivity of investment to dividends and to monetary policy, respectively. In these papers, the sensitivity of investment to a variable of interest (say dividend or monetary policy changes) arises from information asymmetry between managers and investors. These studies then show that investment is less sensitive to dividend/monetary policy decisions for firms with higher financial reporting quality, suggesting that accounting transparency reduces information asymmetry frictions.

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through which firms mitigate adverse selection costs is by leasing assets. Specifically, they predict and find that financially constrained firms with low financial reporting quality are more likely to use leased assets as a substitute for buying the asset by raising additional external capital. Traditional investment measures such as capital expenditures tend to omit off-balance-sheet leased assets. As a result, an interesting implication of Beatty et al. (2010) is that constrained firms can mitigate the financing consequences of having low reporting quality by engaging in alternative financing contracts. This poses a more general question of whether firms can successfully minimize the costs of having low reporting quality with contracting solutions. If true, then the net cost of poor reporting quality may be lower than what studies examining financial reporting's influence on investment decisions conclude.

Second, what can financially constrained firms with low reporting quality do when faced with high adverse selection costs? The evidence in Balakrishnan et al. (2014) suggests that firms respond to an increase in adverse selection costs by increasing disclosure. But if firms voluntarily increase reporting quality and disclosure, how do they make them credible? The issue of credibility in voluntary disclosure has been discussed in other contexts (see, e.g., Rogers and Stocken, 2005) but direct evidence of credibility mechanisms with implications for investment is sparse in the literature. As an illustration, Kausar et al. (2016) exploit a setting in the U.K. in which a regulatory change exempts a sample of private firms from a mandatory audit requirement. They find that firms continuing to provide audited financials even after the regulatory exemption are able to raise more capital and increase investment relative to control firms, and that this effect is concentrated among financially constrained firms. The evidence in Kausar et al. (2016) suggests that the information contained in a firm's choice to engage an auditor serves as a signal about the firm's growth opportunities, which helps alleviate adverse selection frictions.[13,14]

Last, while most of the literature focuses on the investment consequences of accounting information directly provided by the firm, other sources of information can also lead to a reduction in adverse selection costs and, consequently, improve investment efficiency. For instance, accounting information disclosed by peer firms can inform shareholders (and other stakeholders) of economically related firms about their growth opportunities, operations, and overall performance, which can reduce adverse selection costs (Dye, 1990; Admati and Pfleiderer, 2000). However, we are unaware of any empirical study that isolates this mechanism.[15]

To summarize, our review of the literature on the effect of financial reporting quality on investment via the reduction of adverse selection costs highlights four suggestions for future work: (i) improvement in identification with a focus on the economic magnitude of benefits from reducing adverse selection costs, (ii) measurement of the costs of improving financial reporting quality as well as identification of other contracting arrangements that firms can use to substitute for low financial reporting quality, (iii) identification of the mechanisms firms use to provide credible disclosures about future growth opportunities, and (iv) identification of other sources of (accounting) information that can influence firms' adverse selection costs and investment decisions.

2.2. The moral hazard channel

2.2.1. Manager-shareholder conflicts

2.2.1.1. Conceptual underpinnings. In this section, we discuss the literature on how accounting information can influence investment decisions by mitigating or exacerbating moral hazard costs. Moral hazard arises when managers derive utility from actions that do not coincide with shareholder interests (Berle and Means, 1932; Jensen and Meckling, 1976). While moral hazard costs are most commonly studied in the context of manager-shareholder conflicts, they can conceptually involve other parties as well, such as debtholders, regulators and consumers (which we review in Section 2.2.2).

A well-known manifestation of moral hazard is managers' incentive to over-invest, often referred to as empire building. Empire building occurs when managers increase the size of the firm, through acquisitions or other expansion projects, with the objective of acquiring more power, potentially higher compensation, and greater perquisite consumption. In such a situation, Jensen (1986, 1993) hypothesizes that managers of firms with available free cash flows will be more likely to undertake investment projects that increase the size of the firm, even though these investments are negative-NPV from the perspective of shareholders.[16]

An alternative manifestation of moral hazard involves managerial effort-aversion, or managers' preference for a “quiet life” (Bertrand and Mullainathan, 2003). Bertrand and Mullainathan (2003) find that managers protected from takeover threats (by state-level adoption of anti-takeover laws) become less likely to liquidate old plants and invest in new plants, with an

[13] A large body of research reviewed by DeFond and Zhang (2014) discusses the role of audits in resolving agency frictions. In this review, we restrict the discussion of the auditing literature to those papers that examine firms' investment decisions.

[14] Relatedly, other studies provide evidence that the relation between reporting quality and investment is a function of the bank's ability to resolve information frictions (Biddle and Hilary, 2006; Beatty et al., 2010).

[15] Shroff et al. (2017) provide evidence that a firm's disclosure affects peer firms' cost of capital but do not examine investment decisions.

[16] See, e.g., Harford (1999), Richardson (2006), and Hanlon et al. (2015) for empirical evidence.

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attendant decline in firm productivity and profitability. They interpret this evidence as managers avoiding actions that increase firm value but require effort.[17] Another version of moral hazard arises from managers' risk-aversion. Managers are over-exposed to the idiosyncratic risk of the firms they are employed by, and are less diversified relative to outside shareholders. This can lead to a lower managerial appetite for risk than is optimal from the viewpoint of shareholders. For example, Amihud and Lev (1981) propose a model in which risk-averse managers reduce their employment risk via diversifying acquisitions. Similarly, the manager might forego positive-NPV projects they consider too risky for their personal welfare (Gormley and Matsa, 2016).

The moral hazard scenarios discussed above illustrate how managers' specific incentives may lead them to invest in a manner that does not align with shareholders' preferences. By increasing transparency, financial reporting can facilitate better monitoring of managers' investment decisions, for example, via contracts that rely on accounting information to incentivize managers to make more efficient investments. Thus, financial reporting can play a positive role in mitigating moral hazard and in improving investment efficiency in these settings.

In contrast to the above scenarios in which financial reporting can be beneficial, myopia represents a moral hazard setting in which financial reporting can play a distortionary role. Managerial myopia refers to managers' focus on achieving short-term goals through actions that are potentially detrimental for long-term value. Studies such as Rogerson (1997), Reichelstein (1997, 2000), Lambert (2001), and Stein (1988, 1989) propose similar reasons for why managers may be myopic in their investment decisions. Collectively, they argue that the heightened probability of events such as corporate reorganizations, takeovers, and dismissal in the event of poor performance can make managers more focused on reporting higher performance in the short-term (where performance is measured using earnings). Additionally, managers may need to sell stock in the near term to meet personal demands for liquidity or access the stock market to issue new shares for the firm. Thus, managers have incentives to undertake investments that either help them extract greater compensation because of its direct link with compensation or to boost stock prices in the nearer term.

Watts and Zimmerman (1986) point out that the importance of financial statements in assessing the firm's financial health, forecasting future cash flows, evaluating managerial performance, and setting compensation contracts provides managers with incentives to manipulate reported numbers, if necessary, through managers' investment decisions. This can give rise to a direct link between financial reporting and myopia. A link between reporting and myopia can also arise from stock-price-based incentives. Stein (1989) describes a scenario in which managerial myopia motivated by financial reporting is sustained even in fully efficient markets because of the unobservability of managerial actions and managers' private information advantage over shareholders.[18] In his model, investors rely on earnings to make rational forecasts of future earnings, and hence of firm value. This provides managers incentives to manipulate shareholders' signals by inflating current earnings to raise forecasted values (and by implication, stock prices). In equilibrium, the market is not fooled – it correctly conjectures that a certain amount of earnings inflation will occur and incorporates that into its predictions. This in turn provides ex-post incentives for managers to behave myopically (Stein, 1989).[19] In a more recent study, Gigler et al. (2014) extend the Stein (1989) model to show that increased reporting frequency can exacerbate myopia.

Finally, it is important to note that managers' shorter horizons relative to shareholders make them less sensitive to the likelihood of settling up over the long-term when the future consequences of their actions are revealed.[20] Lambert (2001) argues that the myopia problem is exacerbated because in addition to shorter horizons relative to shareholders, managers also enjoy an information advantage with respect to the intertemporal patterns in investments' payoffs. Thus managers have the ability to manipulate any long-term performance metric used to judge managerial investment decisions, and avoid the ex-post settling up costs of misleading shareholders in response to their shorter horizons.

Existing empirical evidence on the influence of financial reporting on investment via moral hazard frictions has primarily focused on two forms of agency conflicts: empire building and managerial myopia. Accordingly, our review focuses on these two scenarios, but also acknowledges moral hazard costs arising from managers' effort-aversion (i.e., the incentive to “lead a

[17] While the issue of managerial effort-aversion is widely discussed in the agency literature (see Hölmstrom, 1979; Harris and Raviv, 1979; Grossman and Hart, 1983), the specific evidence in Bertrand and Mullainathan (2003) has been recently questioned in the literature. Karpoff and Wittry (2018) show that Bertrand and Mullainathan's (2003) results, which rely on the adoption of state-level anti-takeover provisions as an exogenous source of variation in governance, are sensitive to controlling for the institutional and legal features of the firm (e.g., the existence of firm-level anti-takeover defenses, the legal regime where the firm is located).

[18] Stein's (1989) model is based on a conflict between short-term and long-term shareholders, and thus it is set up as an adverse selection problem. However, it also encompasses moral hazard, since the key factor generating managerial myopia in the model is the unobservability of managers' actions.

[19] One caveat to the discussion of myopia in this section is that myopia induced by reporting objectives may not necessarily be driven by the unobservability of managerial action or the frictions of information asymmetry. Lys and Vincent (1995) document AT&T managers' keen interest in using the pooling treatment for their 1991 acquisition of NCR. Shareholders consistently signaled their disapproval and reacted negatively to any news indicating the acquisition would progress, but this did not deter managers from pursuing it. By the authors' estimates, the AT&T stock lost between $3.9 billion and $6.5 billion in value during the process.

[20] Rogerson (1997) and Reichelstein (1997, 2000) generally conclude that as long as investment costs are deducted intertemporally from income at the same rate as that at which those investments generate benefits inclusive of a cost-of-capital charge, the investment incentive problem can be solved by tying managerial compensation to the firm's residual income. Lambert (2001) describes these results as “too good to be true” and suggests they may in part be the result of the common assumption that there is zero information asymmetry between managers and shareholders about the time patterns in the investments' cash flows.

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quiet life") and risk-aversion (relative to shareholders' risk preferences), because these may offer alternative explanations for results attributed to empire building.

2.2.1.2. Empirical evidence on empire building. As discussed in Section 2.1, initial studies such as Biddle and Hilary (2006) and Biddle et al. (2009) provide evidence consistent with financial reporting improving investment efficiency by reducing potentially both adverse selection and moral hazard frictions. Within moral hazard settings in which financial reporting plays a positive role in investment decisions, a majority of existing studies have been interested in testing whether accounting information reduces managers' incentives and ability to engage in empire building behavior.

Hope and Thomas (2008) use the passage of SFAS 131 as an event that causes a decline in transparency about foreign operations (i.e., their proxy for lower reporting quality), and study the extent to which the decrease in transparency post-SFAS 131 increases the likelihood that managers engage in empire building.[21] Consistent with this hypothesis, Hope and Thomas (2008) find that after the adoption of SFAS 131, firms experience higher sales growth, but lower profits and firm values. Further, the results are concentrated in foreign investments, where the new regime most significantly impacts shareholders' ability to monitor the manager's investment decisions. Overall, the evidence is consistent with managers being more likely to engage in empire building when financial reporting quality decreases.

A possible alternative explanation to empire building for the findings in Hope and Thomas (2008) (that they acknowledge) relies on managerial risk-aversion. Managers who feel overexposed to firm risk may over-invest in projects that make the firm more diversified. Lower reporting quality can facilitate managers' ability (via lower monitoring) to pursue expansion projects motivated by their desire to reduce firm risk, such as diversifying acquisitions. Opportunities exist to better distinguish financial reporting's influence on empire building from that on risk-aversion, for example, by examining not just the level of investment but its riskiness.[22]

A related literature exploits the timely recognition of losses as an attribute of the financial reporting system that moderates managers' desire to engage in empire building behavior. Ball (2001) introduces the idea that a financial reporting system that is timely in recognizing losses potentially incentivizes managers to expedite the termination of loss-making projects, even when such projects generate private benefits for managers. The reason is that timely losses on unprofitable projects attract the attention of boards and investors. Managers are thus motivated to abandon such projects more quickly, to avoid the scrutiny and to minimize damage to their human capital and compensation. In addition, timely loss recognition can also disincentivize managers from investing in negative NPV projects for the sake of empire building to the extent that managers anticipate that such investment will generate losses and consequently lower compensation and human capital in the future (Ball, 2001; LaFond and Roychowdhury, 2008).

Francis and Martin (2010) empirically investigate the influence of timely loss recognition on investment choice in the context of acquisitions. They document an association between timely loss recognition, measured using the Basu (1997) piecewise linear model, and the acquirer's stock market reaction to the acquisition announcement. In additional tests, they find that for acquirers with timelier loss recognition, divestitures following acquisitions are less frequent suggesting better ex-ante decisions. Further, when divestitures occur, they happen more quickly, indicative of an earlier termination of projects that are ex-post negative NPV. Relatedly, in a cross-country study, Bushman et al. (2011) find that timely loss recognition accentuates the sensitivity of investment to growth opportunities when investment opportunities are declining, but not when they are increasing. That is, conservatism does not influence managers' investment decisions in periods of increasing growth opportunities, but incentivizes managers to liquidate poorly performing projects when investment opportunities are declining. Their evidence, along with that in Francis and Martin (2010), suggests that timely loss recognition discourages managers from empire building.

A concern with this literature is that the evidence is consistent with alternative interpretations. For instance, the results in Francis and Martin (2010) and Bushman et al. (2011) may not just reflect timely loss recognition's ability to constrain empire building, but also to address managerial effort-aversion. Specifically, it is possible that timely recognition forces managers who may otherwise be predisposed towards a quiet life to actively terminate loss-making projects, instead of passively allowing their continuation. In addition, Lawrence et al. (2018) argue that Basu's (1997) measure of timely loss recognition can mechanically reflect managers' abandonment of underperforming operations (Hayn, 1995). Thus, the association between timely loss recognition and investment could possibly be a manifestation of managers abandoning loss-making projects without necessarily involving any agency issues, which in turn mechanically leads to earlier recognition of losses. The possible simultaneity of loss recognition in earnings and the strategic and operating decisions that managers take in response to adverse economic situations make it difficult to favor any one of the two as the driving force for the other.

[21] Underlying the analysis in Hope and Thomas (2008) is the idea that following SFAS 131, managers withheld information on segments with lower profitability due to agency incentives (Berger and Hann, 2007).

[22] Direct evidence of financial reporting on managerial risk-taking and investment riskiness is limited. Hayes et al. (2012) find that subsequent to a mandated accounting rule change – the adoption of FAS 123R requiring the expensing of option compensation – firms substantially reduce the use of stock options, but do not appear to reduce risky investments. Other studies have examined the impact on risk-taking of regulation encompassing but not limited to financial reporting, in particular the Sarbanes-Oxley Act (SOX). Bargeron et al. (2010) report that risk-taking (proxied for by capital and R&D expenditures, cash retention, and return volatility) reduces post-SOX, while Albuquerque and Zhu (2018) find no evidence of reduced risk-taking using the staggered adoption of Section 404 of SOX. In the context of tax reporting, Ljungqvist et al. (2017), Lester and Langenmayr (2018), Yost (2018) study the influence of tax rates on risk-taking investments. Overall, the influence of financial reporting on corporate risk-taking behavior remains unresolved.

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As another example of multiple possible explanations for the negative relation between financial reporting quality and over-investment, consider McNichols and Stubben (2008). The authors find that firms experiencing SEC investigations, class action litigation and restatements exhibit significant evidence of over-investment in fixed assets during the misreporting period. One interpretation of this result is that managers find it easier to engage in empire building when poorer reporting quality makes it more difficult for shareholders to monitor managerial actions. As we discuss in Section 3 below, however, the authors' preferred explanation for this relation is that firm managers who have the decision rights on investments believe the firm's own misreported growth trend and (over-) invest accordingly.

Overall, the literature has provided reasonably consistent evidence of a negative relation between reporting quality and over-investment. Future work can advance this literature by better identifying, isolating and distinguishing the alternative channels responsible for this relation. An identification of specific channels would help understand whether financial reporting leads to reduced over-investment because it constrains empire building or mitigates managers' effort-aversion and risk-aversion. Furthermore, opportunities exist to distinguish between specific aspects and types of reporting and disclosure choices. For example, are forward-looking versus backward-looking disclosures more relevant for constraining moral hazard? Even for a specific disclosure or reporting choice, there may be inherent trade-offs with respect to investment efficiency (Leuz, 2001; Roychowdhury, 2010). As an illustration, if conservative reporting makes managers less likely to over-invest (Ball, 2001; Francis and Martin, 2010), does it also heighten under-investment in risky projects? These issues remain underexplored in the literature.

2.2.1.3. Empirical evidence on myopia. There is a long-standing and extensive literature on earnings management to accomplish reporting objectives (see Schipper (1989), Healy and Wahlen (1999), and Fields et al. (2001) for reviews). Over the last twenty years, studies have focused more directly on how managers use investment decisions to meet/beat earnings benchmarks, or more broadly speaking, achieve a desired financial report objective.[23] These actions often have been referred to in the literature as "real earnings management."

A significant number of studies focus on research and development (R&D) expenditures. Due to the GAAP requirement that R&D outlays be expensed in the period that they are incurred, managers can increase current earnings by reducing R&D, but such reductions are potentially detrimental to long-term competitiveness. Early evidence links the passage of SFAS 2 requiring the mandatory expensing of R&D rather than capitalization-and-amortization to a decline in R&D expenditures among small high-technology firms (Horwitz and Kolodny, 1980).[24]

Bushee (1998) examines R&D expenditures in a sample of firms whose earnings before R&D and taxes is "marginally lower" in the current year than in the previous one. Bushee (1998) documents that the probability of an R&D cut is unusually high for these firms, and interprets this finding as evidence of managers' willingness to sacrifice the long-term benefits of R&D for the sake of avoiding earnings declines. Consistent with this argument, Bens et al. (2002) find that firm-years characterized by employee stock option exercises report unusually low R&D (and capital expenditures), and unusually high stock repurchases. They interpret their evidence as indicating that managers worried about earnings per share (EPS) dilution from stock options exercises divert resources from value-increasing investments to stock repurchases in an attempt to boost EPS.

Roychowdhury (2006) finds a similar decline in R&D expenditures in firms trying to avoid reporting losses. The study further points out that the scope of investment actions managers can engage in to meet their reporting objectives extends beyond R&D reductions. Specifically, firms trying to avoid losses also exhibit evidence of aggressive attempts to reduce selling, general and administrative expenditures (SG&A), to accelerate sales and to overproduce.[25] Another example of a study examining potentially myopic behavior induced by financial reporting objectives is Dierynck et al. (2012). They find that managers in firms trying to avoid losses (which they identify as firms reporting small profits) are more willing to incur the costs of terminating employees to reduce labor costs, even though such terminations are potentially damaging to the firm's reputation in the labor market. The managerial decisions these studies investigate correspond well with Stein's (2003) conjecture that instances of myopia could involve under-investments in hard-to-measure assets, such as maintenance, customer loyalty, employee training, etc.

[23] See Burgstahler and Dichev (1997) for one example of a paper providing evidence that managers are keen to meet certain earnings benchmarks such as zero earnings and previous year's earnings through accrual management or altering the operating/investing decisions. In anonymous surveys, managers themselves often point to the need to meet earnings targets at regular quarterly intervals as one of the primary motivators of myopic behavior (Bruns and Merchant, 1990; Graham et al., 2005, 2011).

[24] Horwitz and Kolodny (1980) attribute the R&D decline to the contractual effects associated with the expensing treatment for R&D, for example, lower earnings-based compensation for managers and higher probability of debt covenant violation. To the extent that managers were seriously concerned about debt covenant violations and the consequent transfer of control to debtholders, the R&D reductions may not necessarily have been myopic from shareholders' point of view. Dukes et al. (1980) and Elliott et al. (1984) also examine the consequences of SFAS 2, but find more mixed evidence of changes in R&D expenditures.

[25] SG&A often includes discretionary expenditures such as maintenance costs, advertising costs, etc. Acceleration of sales involves offering price discounts and other lenient sales terms to push inventory to customers, a practice sometimes referred to as channel-stuffing. Overproduction refers to the production of inventory in excess of anticipated needs inclusive of sales and target end-of-period inventory to take advantage of absorption costing and report lower cost of goods sold by "inventorying" the fixed costs of production. Similar to R&D cuts, actions such as SG&A cuts, sales acceleration through aggressive price discounts and overproduction can have negative future consequences, for example, safety issues in the future because of cuts to maintenance expenditures (Caskey and Ozel, 2017), permanently reduced margins and inventory obsolescence risk respectively.

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Two factors readily emerge in the literature as responsible for inducing managerial myopia: shareholder characteristics and managerial horizons. With respect to shareholder characteristics, the literature has focused on shareholders' sophistication and their investment horizons. Bushee (1998), Roychowdhury (2006) and Zang (2012) find that real earnings management is lower in the presence of sophisticated investors such as financial institutions. They interpret these findings in a moral hazard context – managers' ability to undertake real earnings management for private gains is lower because of sophisticated institutions' ability to detect such actions and unravel their impact on earnings.

Shareholders' horizons are also key because shorter horizons can lead shareholders to continuously emphasize meeting/beating short-term earnings targets. Bushee (1998) partitions institutional investors into dedicated versus transient investors and shows that R&D reductions are more (less) pronounced in the presence of transient (dedicated) investors. This leads Bushee (1998) to infer that shorter horizons of transient investors incentivize them to seek short-term returns, in turn causing managers to focus on meeting or beating current earnings targets through myopic R&D reductions. Agarwal et al. (2017) analyze a regulation which forced mutual fund managers to issue "more frequent and reliable" information. The study finds that following the regulation, mutual funds' investee firms exhibit myopic behavior, through a reduction in innovative activities. The authors interpret the evidence as more frequent and transparent disclosures increasing the pressure on mutual funds to report continually increasing short-term performance, which they transmit to their investee firms. Investee firms accordingly refrain from risky investments that potentially generate benefits only in the longer run.

In addition to shareholder characteristics, another important factor influencing myopic investment decisions is managerial horizon. Dechow and Sloan (1991) focus on firms that have significant ongoing R&D programs, and find that firms with CEOs in their final years in office report unusually low R&D. The paper further reports that the tendency to cut R&D in their final years is mitigated when CEOs own stock in their firms. The authors interpret their results as evidence of CEOs with shorter horizons reducing R&D to increase short-term earnings.

Edmans et al. (2016) examine whether managers have greater incentives to behave myopically when their compensation has more short-term implications. Specifically, firms in which managers have vesting equity exhibit a reduction in investment growth, particularly in the growth rates of R&D and capital expenditures. Their subsequent empirical analysis reveals that investment cuts in response to equity vesting are less drastic in firms where the costs to the CEO from being myopic are potentially higher, for example in firms with blockholders and younger CEOs. Chen et al. (2015) investigate a second manifestation of this phenomenon: they distinguish between CEOs with long-term employment contracts and/or severance contracts and those without, reasoning that the former have a longer-term perspective on firm value. They find that in the presence of long-term compensation contracts, real earnings management is significantly lower. Further, this negative relation is more pronounced when CEOs face greater pressure to deliver short-term earnings, which the authors measure using the presence of transient investors.

Both shareholder and managerial horizons are also relevant when firms issue new equity. At the time of seasoned equity offerings (SEOs), both managers and (existing) shareholders have incentives to maximize the stock price, which would increase resources available to the firm. Further, SEOs also provide managers and existing shareholders with an opportunity to at least partially liquidate their stockholdings at the expense of new shareholders buying the stock. Collectively these factors provide a greater impetus for corporate myopia at the time of SEOs as Stein (2003) conjectures. Consistent with this notion, Cohen and Zarowin (2010) find that firms issuing SEOs exhibit evidence of real earnings management, which in turn is associated with lower post-SEO return on assets (ROA). Kothari et al. (2016) focus on unusually low R&D at the time of SEOs and report similar evidence. Importantly, they also find that earnings overstatement through aggressive R&D cuts is associated with negative post-SEO equity returns, implying overvaluation at the time of the SEO, and thus a transfer of wealth from new investors to existing investors.[26]

Related to Cohen and Zarowin's (2010) and Kothari et al.'s (2016) evidence on a negative relation between real earnings management and lower future performance, Vorst (2016) examines the relation between current R&D cuts, future R&D expenditures and firm performance. Vorst (2016) distinguishes between R&D expenditure cuts that reverse within a year versus those that do not. He argues that reversing R&D cuts are more likely to be symptomatic of managers' desire to achieve immediate earnings targets, with the reversals representing managers' attempts to "catch up" with R&D expenditures necessary to maintain competitiveness. In contrast, permanent R&D cuts are more likely to be in response to a decline in investment opportunities. He finds that reversing R&D cuts are associated with more negative future operating performance relative to the non-reversing ones. The results suggest that despite managers' attempts to "catch up" in future years, myopic R&D cuts are responsible for a decline in future performance.

While most of the literature on myopia focuses on under-investment, some studies also explicitly examine whether the desire to inflate short-term earnings leads managers to over-invest. Kedia and Philippon (2009) study firms forced by the SEC to restate previous fraudulently overstated earnings. They find that, relative to industry peers, overstating firms make excessive capital investments and over-hire during the earnings manipulation period. The authors propose that over-

[26] This setting is also unique because it is characterized by both an adverse selection problem and a moral hazard problem between future shareholders and current managers. Consistent with moral hazard, real earnings management around equity offerings involves "hidden action" that is managerial investment decisions, but the actions of managers are presumably motivated by the desire to increase stock price to maximize issue proceeds, which has the flavor of "hidden information" that characterizes adverse selection. We retain the discussion in the moral hazard section of our review because this section is more devoted to covering the literature on managerial myopia.

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investment reinforces misreported financial statements and managers use the two strategies in conjunction to mislead shareholders by pooling with firms that have better investment productivity. In a similar vein, Chuk (2013) examines the consequences of SFAS 132R's requirement that firms disclose the composition of pension assets. The study finds that the disclosure prompted managers who were using upward-biased expected rates of return (ERRs) to shift asset allocations into higher-risk securities. The findings suggest that in order to justify higher ERRs, which in turn led to higher reported earnings, managers were willing to over-invest in higher-risk securities, at least relative to pre-SFAS132R levels.[27]

Even though the literature on myopic investment decisions motivated by reporting goals has developed almost independently of the investment efficiency literature, they are connected by the common thread of accounting's influence on investments. The literature on financial reporting and myopia has yielded two important insights. First, reporting goals may induce managers to alter not only their long-term investment decisions such as R&D expenditures, but also their short-term investment decisions such as inventory production. Second, although a predominant form of corporate myopia involves under-investment (for example R&D reductions), myopia can also manifest as over-investment (for example, overproduction of inventory or over-investment to justify aggressive reporting choices). Collectively, this stream of literature suggests that proper firm governance and steering managers' incentives towards increasing long-term value requires a more nuanced understanding of the complex role of financial reporting in investment decisions.

It is also important to recognize that a key issue in research investigating corporate myopia is measurement. As Stein (1989) points out "short-termism models can be difficult to test directly. This is because their central prediction is that there will be under-investment in *those types of activities that are not directly observable by the market* … to the extent that an econometrician's information set is no better than that of investors, this makes it difficult to actually document the under-investment behavior explicitly." Early studies simply investigated changes in investment, for example Bushee's (1998) examination of R&D cuts. Roychowdhury (2006) introduced models for estimating "normal" production levels R&D and SG&A, with the residuals from these models yielding estimates of real earnings management. There have been some methodological improvements in the models over the past few years. For example, Stubben (2010) develops a model of revenue management that incorporates firm-specific credit policies, although his model does not distinguish accrual manipulations from operational choices. Kothari et al. (2016) introduce the estimation of these models with firm and year-fixed effects, which extracts systematic firm-specific errors. Further, the measurement in Kothari et al. (2016) relies on both ex-ante and ex-post data, that is data prior to and past the hypothesized year of real earnings management, which incorporates the opacity of these actions at the time they are undertaken. But measures of real earnings management relying on the benefit of hindsight may not be well-suited to every research setting.

One lingering issue is that a firm's investments and operations are determined endogenously with its economic environment, which implies that models of normal investments and operations could yield residuals that are susceptible to systematic firm-specific measurement errors. To refine the specification of these measures of investment and operational decisions that deviate from the norm, studies have typically used them in conjunction with specific reporting goals (such as earnings thresholds) and specific incentives to accomplish these goals. Continuous improvements and refinements to the measurement of myopia are necessary and welcome.

2.2.2. Other agency conflicts

While most studies in this literature have focused on manager-shareholder conflicts, some studies have focused on other agency conflicts between other principal and agent combinations such as: (a) conflicts between shareholders and debtholders, (b) conflicts that arise within multi-segment organizations and (c) conflicts between managers and broader stakeholder groups such as regulators and consumers.

2.2.2.1. Shareholder-debtholder conflicts. Prior research points out that debt and equity holders have different investment preferences following from their different payoff structures, which creates conflicts of interest (Fama and Miller, 1972; Jensen and Meckling, 1976; Myers, 1977; Smith and Warner, 1979). For example, Jensen and Meckling (1976) and Eisdorfer (2008), among others, argue that shareholders and debtholders have conflicting appetites for risk-taking when a firm is close to financial distress, leading to agency issues such as asset substitution.

Kravet (2014) tests whether debtholders' demand for accounting conservatism, measured as the timelier recognition of losses relative to gains in earnings, induces managers to reduce investment in risky projects. Since some positive NPV projects carry the possibility of bad outcomes and timely loss recognition accelerates the recognition of these losses (relative to gains), managers may be predisposed towards discarding high-risk projects if these projects carry a higher chance of triggering covenant violations. In support of this hypothesis, Kravet (2014) reports that firms that are timelier in recognizing losses relative to gains are also less likely to engage in risky acquisitions, and that the findings are driven by firms with accounting-based debt covenants. These results provide support for the argument in Roychowdhury (2010) that conservative reporting can lead to less risky investments, but Kravet (2014) views the lower risk-taking as at least a partial mitigation of the asset substitution problem. At the same time, the evidence in Kravet (2014) raises the question of why shareholders agree with lower risk-taking if that implies forgoing projects with positive NPV. Garcia-Lara et al. (2016) propose an explanation: since

[27] In Chuk (2013), the motivation for managers to overstate earnings remains unspecified and unexamined.

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timely loss recognition mitigates managers' asset substitution incentives, it facilitates better and cheaper access to debt capital, which increases the set of profitable investment projects.

In contrast to *attenuating* shareholder-debtholder conflicts, financial reporting can in certain cases *accentuate* these conflicts when managers engage in investment decisions to meet or beat certain thresholds set by debtholders. Franz et al. (2014) find greater evidence of real earnings management in firms that are closer to debt covenant violations.[28] Further, the evidence of real earnings management in such firms is stronger when the firms also have poorer credit ratings. The authors interpret the results as evidence of managers acting in the interest of shareholders to achieve reporting outcomes that would avoid a transfer of control to debtholders. In related work, Shroff (2017) finds that when cumulative adjustments reported on the income statement in response to accounting rule changes are more negative, managers react by reducing R&D expenditures and capital investments. Shroff (2017) further documents that this positive relation between investments (in particular, R&D) and cumulative adjustments is more pronounced in firms with debt contracts that do not incorporate the impact of accounting rule changes on covenant computation. The results thus provide support for the hypothesis that managers alter their investment decisions to avoid the impact of accounting rule changes on existing debt contracts.

2.2.2.2. Conflicts within multi-segment firms. In addition to shareholder-debtholder conflicts, a few studies have also examined the effect of financial reporting on investments within multi-segment firms. Stein (2003) discusses the literature on agency incentives arising inside multi-segment firms and notes that conflicts can arise when a (benevolent) CEO faces moral hazard costs when monitoring divisional managers with misaligned incentives. The presence of moral hazard can result in inefficient capital allocation across divisions, and it seems natural that accounting information can play a role in mitigating such conflicts.

Cho (2015) uses the adoption of SFAS 131 as a shock to segment information to test whether accounting information can influence capital allocation in multi-segment firms. He finds that internal capital allocation among multi-segment firms improves following the increase in segment disclosure. One insight from Cho (2015) is that SFAS 131 potentially improved the information set of top managers in the corporate headquarters, enabling them to better monitor divisional managers.[29] Such "learning" evidence is still nascent in the literature and we revisit this discussion in Section 3.

Multi-segment firms have also served as a setting to test whether the disclosures of peer firms are informative about common economic factors, and thus instrumental in reducing moral hazard costs within conglomerates (Hölmstrom, 1982). In an examination of multinational companies (MNCs), Shroff et al. (2014) argue that disclosures by peer firms in the countries where an MNC's subsidiaries are located leads to a more transparent information environment at the location of the subsidiary. This, in turn, reduces information asymmetry between MNC parents and their foreign subsidiaries. Greater transparency at the location of the foreign subsidiary allows parent firms to more effectively monitor their foreign subsidiaries. Consistent with their argument, they find that the investment decisions of foreign subsidiaries are more responsive to local growth opportunities (their proxy for investment efficiency) when they operate in more transparent information environments.

2.2.2.3. Conflicts between managers and broader stakeholder groups. A stream of research considers agency conflicts between the firm and a broader stakeholder group extending beyond investors. Over the past decade, policymakers across the world are requiring firms to disclose non-financial information about social issues such as employee safety, corruption, environmental issues, etc., in their financial statements. A unique aspect of such disclosures is that they are typically not directly related to investor protection objectives, which is a primary goal of disclosure regulation. Broadly speaking, such disclosures can arm the media and activist groups with information to exert public pressure on firms to engage in behaviors considered socially desirable; public pressure is then presumed to incentivize firms to be better corporate citizens (e.g., by paying more taxes). As a result, disclosure about non-financial issues can influence firms to change their decision-making processes in a manner that reduces political and social costs to the firm and its investors. For example, Dyreng et al. (2016) find that forcing firms to disclose the location of their subsidiaries disincentivizes firms from locating subsidiaries in tax havens. Christensen et al. (2017) show that requiring mine owners to disclose information about their mine-safety performance in their 10-K filings incentivizes mine owners to increase investments in mine safety. Although the precise mechanism is not explicitly tested, the typical argument is that paying lower taxes or not adequately investing in employees generates backlash from stakeholders, which manifests as lower demand for the firm's products, a smaller pool of employees that are willing to work for the firm, fewer suppliers willing to sell to the firm, etc.[30]

On the one hand, the evidence in the studies discussed above suggests that disclosures related to social activities have a negative effect on firms' cash flow (e.g., via additional tax payments, increased safety cost), which can be detrimental to

[28] Real earnings management is measured as in Roychowdhury (2006) and Zang (2012), using unusually high production costs which capture both sales acceleration and overproduction, and abnormal discretionary expenses inclusive of SG&A and R&D.

[29] An important distinction between Hope and Thomas (2008) and Cho (2015) is that Hope and Thomas use the fact that firms stop reporting geographical segments as a decrease in transparency about *foreign* operations. In contrast, Cho (2015) uses the increase in the use of operating segments as an improvement in the internal information set.

[30] Hoopes et al. (2018) provide preliminary evidence consistent with consumer backlash against firms perceived as paying less than their fair share of taxes.

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shareholder value. On the other hand, investing in social causes can help firms enhance reputation, which can result in increased demand for their products, access to a larger pool of employees with different social values, etc., which increases shareholder value. Additional research examining whether mandatory disclosure related to social issues accomplishes desired social goals or leads to shifts in who engages in the "socially undesirable" behavior is warranted to understand the effectiveness of a disclosure-based approach to modify social behavior. For example, Rauter (2017) finds that a law requiring European firms engaged in extraction activities (e.g., of oil, gas, and minerals) to provide detailed disclosures on monetary payments to foreign host governments led to an increase in such payments. Rauter (2017) infers that the disclosure law impeded extraction companies' attempts to exploit the host nation by bribing government officials in charge of approving the projects to secure lower extractive payments. Interestingly, the paper also documents a decline in the extraction companies' investments in the host countries, possibly an unintended consequence of the now-reduced profitability of extraction projects.

Overall, it appears that most of the literature has concentrated on classic agency frictions arising from manager-shareholder conflicts, whereas other agency conflicts have received less attention and present an opportunity for future research.

2.2.3. What drives the variation in financial reporting quality?

As with adverse selection, an important consideration is the extent of joint control that managers exert over both the financial reporting process and investment decisions in the presence of moral hazard. Indeed, the possible scenarios with moral hazard problems between managers and shareholders are even more complicated than with adverse selection. In a typical corporation, the management team is hired to run the firm, with considerable discretion over operating and investment decisions, as well as discretion over financial reporting and disclosures. As a result, in the absence of perfect alignment of incentives between managers and shareholders, what exactly is the nature of the relation between financial reporting transparency and moral hazard? In other words, while it seems intuitive that higher-quality reporting constrains managers' propensity towards empire building, risk-aversion and effort-aversion, a question that arises is: why would managers make reporting choices that constrain their own ability to capture private rents? In fact, the findings in McNichols and Stubben (2008) and Kedia and Philippon (2009) highlight the possibility that managers make aggressive reporting choices while over-investing at the same time, with the two potentially undesirable effects reinforcing each other.

One source of variation in financial reporting quality is variation in underlying firm characteristics (growth options, business model complexity, product mix complexity, etc.). Information reporting and processing costs can simply be higher for some firms than for others due to underlying characteristics, implying that the equilibrium level of reporting quality varies across firms. The problem with this approach, however, is that it may confound inferences about the causal effect of reporting quality on investment via lower/higher moral hazard costs.

Recognizing this challenge, researchers have sought out settings with exogenous variation in reporting quality due to changes in mandated disclosures. These exogenous sources of variation allow for a "cleaner" interpretation of the impact of reporting quality on investment decisions. For instance, Hope and Thomas (2008) study managers' empire building incentives around a change in transparency due to mandated changes in segment disclosures. Similarly, Chuk (2013) examines managers' incentives to over-invest in risky securities in response to the mandate in SFAS 132R to disclose the composition of pension assets.

Interestingly, some studies have found that mandated increases in transparency can yield both positive and negative outcomes. Specifically, recent studies exploiting mandated increases in the frequency of reporting financial statements have found that the extent to which such an increase improves or reduces investment efficiency depends on the dominant friction at the time of the change. For instance, Ernstberger et al. (2017) find that when the EU changed in 2004 from semiannual reporting to quarterly reporting of interim management statements (which tend to be primarily narrative disclosures), European firms exhibited sharply increased evidence of REM. Related, Kraft et al. (2018) find that firms listed on U.S. stock exchanges exhibit investment declines after the exchanges imposed increasingly higher-frequency financial reporting requirements over the period 1950 to 1970. These declines in investments are associated with future declines in efficiency (measured via asset turnover) and profitability, implying that the declines are myopic. Further, Fu et al. (2019) examine the effect of changes in reporting frequency on innovation outputs (rather than capital expenditures) for firms that increase their reporting frequency as well as peer firms whose reporting frequency remains unchanged. They find that increases in reporting frequency lead the disclosing firms to reduce innovation output and simultaneously lead the non-disclosing peer firms increase innovation, suggesting a spillover effect from firms increase reporting frequency to those not increasing reporting frequency. [31,32]

[31] As motivation for these studies, survey evidence suggests that managers themselves often point to the need to meet earnings targets at regular quarterly intervals as one of the primary motivators of myopic behavior (Bruns and Merchant, 1990; Graham et al., 2005, 2011, 2014, 2017).

[32] As another example, studies have also exploited unintended effects of increased transparency when managers under pressure to report higher-quality accruals resort to real earnings management to achieve reporting objectives. Cohen et al. (2008) find that following the more stringent reporting regulations introduced by the Sarbanes-Oxley Act of 2002, U.S. firms exhibit a decline in discretionary accruals, consistent with higher-quality accounting. However, firms also exhibit an increase in REM, suggesting that managers shifted from relying on accruals to relying on investment and operational decisions to meet their reporting goals (see also Zang, 2012 for related evidence based on higher auditor scrutiny).

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In contrast, Nallareddy et al. (2017) and Kajüter et al. (2018) find no evidence that increases in reporting frequency lead to myopic investment decisions in the U.K. and in Singapore, respectively. Indeed, Fu et al. (2012) document that an increase in reporting frequency can be beneficial for a firm because it reduces the firm's cost of capital. Consistent with this theme, Balakrishnan and Ertan (2018) find that increases in reporting frequency serve a disciplinary role in the banking industry. Overall, whether changes in reporting frequency decrease managers' investment horizon and induces myopia, or whether it increases transparency and serves a disciplinary role on investment decisions remains an open question. Similarly, the effect of reporting frequency on aggregate investment (which encompasses the spillover effects of changes in reporting frequency) is also an open question.

A separate view is that variation in reporting quality is imposed on managers from external sources such as the board of directors, activist shareholders or outside mechanisms. While there is an extensive literature on the relation between contracting/governance and reporting (see, e.g., Bushman and Smith (2001) and Armstrong et al. (2010)), the evidence in this literature has not focused on investment outcomes. Thus, there is little understanding in the literature about the specific channels inducing variation in financial reporting to incentivize managers in the presence of moral hazard to undertake the right investment projects.

As an example, consider Francis and Martin (2010), who hypothesize that firms with more conservative reporting practices undertake more profitable acquisitions and are quicker to divest acquired entities that perform poorly. Roychowdhury (2010) raises the following conceptual question with the Francis and Martin (2010) hypothesis: what prevents managers from using less conservative practices to avoid recognizing losses and thus delaying divestments when acquisitions perform poorly? In other words, how do managers commit to using a certain level of reporting quality when moral hazard exists with respect to both their accounting choices and investment decisions? Roychowdhury (2010) conjectures that governance mechanisms like “independent boards, directors with financial expertise, auditors”, etc. help to ensure a commitment to better accounting practices that facilitate more efficient investments. Despite almost a decade since the publication of these studies, these questions remain unanswered in the literature.

In lieu of exogenous variation in financial reporting quality, researchers can seek exogenous variations in forces that shape (i) the managers' incentive to increase/decrease reporting quality or (ii) shareholders' ability to monitor managers' actions. For example, Huang et al. (2019) point to class-action litigation as an ex-post settling up mechanism that allows shareholders to discipline managers ex-ante. Focusing on an exogenous shock to litigation risk, Huang et al. (2019) study the resulting impact on REM. Specifically, they argue that when managers pursue myopic actions, their decisions regarding product pricing, inventory, and expense cuts are often questioned by investors and financial analysts. In the face of such scrutiny, managers are under pressure to misrepresent the true intent and impact of their actions.[33] Thus, if managers' ability to issue misleading disclosures is constrained because of higher litigation risk, so is their flexibility to withstand scrutiny on myopic investment decisions motivated by meeting/beating earnings targets. Consistent with this argument, Huang et al. (2019) document evidence indicating that a *decline* in litigation risk is associated with an increase in REM, and this increase is concentrated among firms that also issue misleading disclosures.

The preceding discussion highlights the importance of recognizing the situations in which managers are likely to pursue opportunistic reporting practices and inefficient investments, versus when they are likely to commit to higher-quality reporting and better investment decisions. Governance and managerial incentives are likely to play a key role in distinguishing between these situations, as multiple studies including Bushee (1998), Zang (2012) and Huang et al. (2019) argue. But more research is necessary to understand the joint determination of reporting practices and investment decisions.

3. Learning issues arising from information uncertainty

This section discusses the theoretical arguments and empirical evidence examining whether and why financial accounting disclosures affect investment when the stakeholders of a firm are symmetrically informed and agency frictions are absent. We step back into a Modigliani and Miller (1958) world and discuss evidence showing that financial accounting disclosures can affect investment decisions even in a frictionless world as long as managers and investors are not fully informed regarding all current and future investment opportunities. The underlying premise is that managers face uncertainty because the payoffs from investments are uncertain and depend on macro-, industry-, and firm-level factors. If the accounting disclosures made by a firm or its peers change the degree of uncertainty regarding investment payoffs, such disclosures can help managers learn new information relevant for their investment decisions. In Section 3.1, we discuss the evidence on whether peer-firms' disclosures affect the investment decisions of related firms by reducing uncertainty. Section 3.2 reviews the evidence showing that a firm's own disclosure requirements can provide managers with new information that facilitates their decision-making.

[33] Court cases reveal that managers who had to settle 10b-5 securities litigation attributed channel-stuffing and/or overproduction to anticipated surges in demand, and myopic and ultimately harmful reductions in discretionary expenses to the pursuit of cost efficiencies (see Huang et al., 2019).

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3.1. Learning from peer disclosures

3.1.1. Conceptual underpinnings

Firms within a peer group (e.g., industry, geographic region, supply chain, etc.) are affected by similar economic conditions related to demand, supply, labor availability, and input costs, among other things. If peer-firm disclosures inform managers of other firms about these economic conditions, then peer-firm disclosures can help managers make more informed investment decisions. For example, firms are required to disclose information about their sales, cost of sales, inventories, etc. in their quarterly financial reports, and prior research finds that such information is valuable for forecasting future demand and costs (e.g., Lundholm and Sloan, 2013; Curtis et al., 2014). Similarly, firms voluntarily disclose estimates of future earnings, sales, and capital expenditures, which can help managers of peer firms develop more precise estimates of aggregate demand and supply conditions (e.g., Bonsall IV et al., 2013). Such peer-firm disclosures can improve the manager's investment decisions by helping them identify new investment opportunities. In addition, peer-disclosures can reduce uncertainty about expected future cash flows from an investment project and thereby lower investment adjustment costs such as the option value of waiting to invest at a future date (Dixit and Pindyck, 1994) and the time taken to raise additional capital, hire/train new employees, and build/install new capacity.[34] By lowering adjustment costs, peer-firm disclosures allow managers to respond faster to investment opportunities and make better investment decisions (Bond and Van Reenen, 2007; Bloom et al., 2007).

However, since managers have incentives to misreport performance metrics to meet financial reporting objectives (as discussed in section 2.2), peer-firm disclosures can mislead managers/investors of other firms and result in firms making ex-post inefficient investment decisions (Durnev and Mangen, 2009).[35] Thus, the peer-firm disclosures can result in positive externalities for related firms when disclosures are truthful but can also generate negative externalities when peer firms misreport performance.

We highlight that the information a firm learns from peer-firm disclosures can be proprietary or non-proprietary in nature, and this distinction has important implications for disclosure regulation and aggregate investment activity.[36] Changes in a firm's investment decisions that result from learning proprietary information disclosed by its peers is more likely to involve a wealth transfer from the disclosing peer firm to the non-disclosing firms. By contrast, improvements in investment decision-making that result from disclosures of non-proprietary information by peer firms are potentially Pareto improvements as they do not necessarily put the disclosing peer firms at a competitive disadvantage. As we discuss below, understanding the net effect of peer disclosures on both the disclosing and non-disclosing firms is crucial to assess the merits of disclosure regulation.

3.1.2. Empirical evidence

Several studies provide evidence consistent with the idea that firms rely on peer-firm disclosures for making investment decisions. Badertscher et al. (2013) argue that the composition of public versus private firms in an industry has a significant effect on transparency in the industry because public firms are subject to significant disclosure requirements while most private firms (in the U.S.) are subject to almost no disclosure requirements. They argue that as a larger fraction of the firms in an industry publicly disclose information about corporate performance, a more complete perspective of the current economic environment and future outlook for the industry emerges. They show the private (and public) firms operating in industries with greater public firm presence are more responsive to their investment opportunities, which is their proxy for investment efficiency. To tease out the role of peer information in informing managers about growth opportunities from its role in reducing agency frictions, Badertscher et al. (2013) focus on small private firms, where there are few manager-shareholder conflicts. As a result, they interpret their results as evidence that peer-firm disclosures improve investment efficiency by reducing overall industry uncertainty.

An implication of managers relying on their peers' disclosures to evaluate investment opportunities is that this reliance can lead to costly decision-making errors when peer firms misstate their financial statements or perpetrate fraud (to the extent managers do not back out such accounting irregularities by peer firms). For example, if a firm inflates its growth and peer firms rely on the misreported growth for decision-making, such reliance could lead peer-firms to invest in (ex-post) negative NPV projects.[37] Consistent with this idea, Durnev and Mangen (2009) argue that announcements of accounting restatements by one firm lead the restating firm's peers to revise their prior beliefs about the uncertain payoffs of their

[34] Adjustment costs are costs that prevent or delay firms from investing in (divesting) positive (negative) NPV projects and are one of the most important determinants of investment activity at the micro- and macro-levels (Hamermesh and Pfann, 1996; Cooper and Haltiwanger, 2006).

[35] The notion of "inefficient" investment in a world without agency frictions is different from the notion of inefficient investment in the context of the literature discussed in the previous sections. Specifically, in section 3, managers knowingly choose to engage in value destroying investments to consume private benefits (e.g., shirking, empire building, etc.). However, absent agency frictions, managers are acting in the best interest of their firm and the inefficiencies arise ex-post as new information is revealed.

[36] Peer groups include a firm's competitors as well as firms providing complementary product/service offerings. For example, firms manufacturing computer hardware and computer software are economically related peers whose products are complementary to each other.

[37] An interesting but unresolved question is whether firms misreport their financial statements in part to mislead their peers into making suboptimal investment decisions or whether the misreporting decisions are primarily driven by capital market and compensation incentives, with the cost to peers being incidental. Regardless, peer firms' reliance on misreported financial statements can increase the aggregate cost of misreporting.

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investment projects. As a result, they predict and find that restatement announcement returns of a firm are predictive of the subsequent investment decisions of its peers.

In a related study, Beatty et al. (2013) examine a firm's investment behavior in periods when one of its peers perpetrates fraud by overstating earnings rather than the period following the detection of fraud, as examined in Durnev and Mangen (2009). Specifically, Beatty et al. (2013) argue that the fraudulently overstated earnings of an (industry-leader) peer firm causes managers of other economically-related firms to believe that future industry prospects are rosier than they truly are, which leads these firms to over-invest. Consistent with this argument, Beatty et al. (2013) find that firms increase investment in periods when a peer firm overstates its earnings and that the magnitude of a peer firm's overstatement is predictive of the magnitude of over-investment by economically related firms. Li (2016) extends the evidence in Beatty et al. (2013) by showing that financial misreporting by peer firms distorts not only other firms' capital expenditure decisions but also their R&D and advertising decisions.[38]

A related idea proposed by Raman and Shahrur (2008) is that firms manage their earnings opportunistically to influence suppliers and customers to make larger relationship-specific investments. Specifically, transactions between customers and suppliers often require specialized investments that have lower value outside the relationship (Williamson, 1979). The value of relationship-specific investments depends in part on the firm's expectation about the future prospects of the customer/supplier because (i) the size of future transactions is likely correlated with the customer's/supplier's future prospects and (ii) the period over which relationship-specific investments generate value depends on the customer's/supplier's survival. Thus, firms seeking relationship-specific investments from their customer/supplier have incentives to manage earnings to increase their customers/suppliers willingness to make such investments. Raman and Shahrur (2008) provide evidence consistent with the above hypothesis by showing that customers and suppliers invest more in R&D (their proxy for relationship-specific investments) when firms report higher discretionary accruals.

Collectively, the inference from the above studies is that firms rely on the financial statements of their peers, which leads them to make better (worse) investment decisions when the reported information is accurate (inaccurate). While the literature has made progress documenting benefits and costs of peer-firm disclosures to other firms in the economy, there is relatively little known about whether the documented benefits/costs to peer firms outweigh the benefits/costs of such disclosures to the disclosing firms. For example, the evidence in Badertscher et al. (2013) suggests that private firms benefit from the reporting of public firms but does not speak to whether the documented benefit to private firms come at the expense of the disclosing public firms. Research that furthers our understanding of economic consequences of disclosure to both the disclosing firm and its peers is important to (i) design effective disclosure regulation (as we discuss in detail later) and (ii) understand firms' discretionary disclosure choices.

Two studies that identify potential wealth transfers between disclosing and peer firms are McNichols and Stubben (2015) and Breuer (2018). McNichols and Stubben (2015) examine the role of peer disclosures in an M&A setting. They argue that greater transparency by a target firm allows the acquiring firm to develop more precise estimates of target value as well as the expected gains from the acquisition. Consequently, acquirers make more profitable acquisitions (at the target's expense) when their targets have higher disclosure quality. Breuer (2018) takes a step towards quantifying the net effect of disclosure that accounts for the costs and benefits of disclosure for both peer firms and disclosing firms by examining how disclosure affects aggregate industry-level resource allocation. The evidence in Breuer (2018) suggests that greater public disclosure requirements have a nuanced effect on resource allocation within the economy, such that it (i) increases competition by easing entry and exit of firms in the economy, (ii) decreases product market concentration, and (iii) decreases the reliance on relational contracting, among other things. However, Breuer (2018) finds no evidence that greater public disclosure requirements increase resource allocation efficiency or aggregate output. More research along the lines of McNichols and Stubben (2015) and Breuer (2018) is needed to obtain a complete picture of the overall consequences of disclosures for firms and their peers.

3.1.3. Open issues

Next, we highlight three ways in which future work can advance our understanding of the economic implications of peer-firm disclosures: (i) address some of the conceptual challenges in the literature, (ii) address some of the empirical challenges in the literature, and (iii) build on the insights learned from prior studies and highlight the policy implications of peer disclosures.

3.1.3.1. Conceptual challenges. A natural question that arises from the evidence in some of the papers discussed in the previous subsection is why firms are misled by the earnings management or misreporting behavior of their peers. Large equity market reactions to the public revelations of accounting irregularities (e.g., GAO, 2002; Karpoff et al., 2017) suggests that investors do not fully see through these irregularities as they occur. In economies such as the U.S. where financial reporting enforcement is strong, it is reasonable for peer firms to believe that the average firm's financial statements comply with GAAP. Thus, egregious forms of misreporting that fall outside the purview of GAAP (e.g., misreporting by Enron, WorldCom, etc.) are more likely to deceive peer firms until the fraud is detected and publicly reported. However, it is less clear why customers/suppliers

[38] Sidak (2003) provides evidence based on a case study of WorldCom that its false financial statements and internet traffic reports led to significant over-investment by its competitors in the telecom industry.

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do not anticipate some amount of *within*-GAAP earnings management (as implied in Raman and Shahrur, 2008) and back out such earnings management in equilibrium.

Section 2.2 discusses some circumstances in which firms manage earnings and investors do not undo the manipulation, but it is unclear whether those arguments apply to the peer setting given that managers of peer-firms are arguably more informed about industry conditions than arm's length investors. Theory suggests that firms within a peer group have an information advantage relative to arm's length investors because of the frequency and nature of their interactions with other firms in the peer group (e.g., Smith, 1987; Biais and Gollier, 1997). To the extent managers are well informed about industry prospects, they are less likely to be misled by the misreporting activities of their peers.[39] Future work should consider when firms are more likely to be misled by the misreporting activities of their peers.

3.1.3.2. Empirical challenges. As Leuz and Wysocki (2016) discuss, empirically identifying and estimating the economic magnitude of peer effects in a plausibly causal manner is particularly challenging because of the reflection problem, as described by Manski (1993). This problem refers to a specific form of endogeneity that arises when trying to infer whether the characteristics of a group (e.g., industry membership and industry-level accounting information) influence the actions of the individuals that comprise the group (e.g., investment decisions by firms in the industry). Typically, associations between firms' disclosure choices and the investment decisions of their peers can be attributed to two alternative explanations. First (and most important), the selection of firms into a peer group could be due to latent factors (e.g., growth opportunities) that are common to firms in a peer group. As a result, a latent factor, such as a group-level growth opportunity shock, could affect the disclosure and investment decisions of both the disclosing firm as well as its peers. In essence, the correlation between firms' disclosure decisions and the investment behavior of their peers could reflect an omitted variable endogeneity bias. Second, firms' disclosure/investment decisions could be partly driven by a response to the decisions of their peers, creating a simultaneity issue. In other words, the firms in a peer group simultaneously *influence* and *respond to* the strategic decisions of each other. Thus, it is hard to empirically distinguish between (i) the effect of a firm's decision on that of its peers and (ii) the effect of its peers' decision on its own decision, since these decisions can be simultaneously determined.

The empirical challenges in peer-effect studies are such that Angrist (2014) paints a bleak view of this literature. A large part of his criticism applies to mechanical effects that arise when one studies the effect of group averages on the outcomes of individuals comprising the group (e.g., the effect of industry-average disclosure on the disclosure decisions of individual firms comprising the industry). However, several of his criticisms can be extended, and applied, to the studies discussed above. It is important for future studies to discuss and mitigate concerns related to the reflection issue when conducting studies of peer effects.

While endogeneity concerns are not unique to studies of peer effects, what makes them especially challenging is that the independent variable of interest is typically a "group" characteristic such as industry-level transparency that is (i) common to all firms in the group and (ii) slow-moving or persistent in nature. As a result, it is hard to identify suitable counterfactuals for such group-level characteristics, forcing studies to rely on cross-sectional variation in the independent variable of interest. At the risk of being overly general in our prescription, we propose two ideas to better address concerns related to the reflection problem. First, the use of falsification tests, showing when peer effects are not present (but potential confounding effects likely to be present) could be an effective way to mitigate some of the concerns raised by Angrist (2014). Second, in instances where theory predicts that peer effects should vary over time (e.g., as agents learn or form more precise expectations of firm behavior), explicitly testing whether within-firm changes in the magnitude of peer effects follows a pattern consistent with theory could be an effective way to mitigate concerns about the reflection problem (see e.g., Shroff et al., 2017).

3.1.3.3. Policy implications of peer disclosures. Evidence examining externalities of accounting information is important (in part) because it is one of the primary justifications for disclosure regulation. When choosing the optimal disclosure level, firms are expected to evaluate the costs and benefits of their disclosures to themselves. For example, firms trade-off the capital market benefits of disclosure against its proprietary costs when choosing optimal disclosure amounts (Verrecchia, 2001). However, firms are unlikely to internalize the costs and benefits of their disclosure to peer firms (when such costs/benefits are unrelated to the disclosing firm). For instance, if disclosure imposes a proprietary cost on the firm or constrains the manager's ability to divert resources for private benefit, then the firm will not disclose such information even if there are significant spillover benefits to other firms that *outweigh the costs to the disclosing firm*. In such a scenario, greater disclosure could be socially beneficial but is not achieved without regulation.

Our review of the literature reveals that prior research generally does not distinguish between peer effects that arise from the disclosure of proprietary versus non-proprietary information.[40] It is plausible that some disclosures such as quarterly earnings forecasts benefit peer firms without putting the disclosing firm at a competitive disadvantage (e.g., Lang and Sul, 2014; Park et al., 2019). By contrast, other disclosures (e.g., the disclosure of material contracts) could benefit peer firms at

[39] In fact, as discussed in section 2.2., peer-firm disclosures can help discipline misreporting activities of related firms by providing additional context to investors, boards of directors, analysts, regulators, and other market participants to evaluate industry conditions (e.g., Shroff et al., 2014).

[40] However, we note that a few studies provide evidence that accounting information affects peer-firm investment at a broad level without testing the specific mechanism for why such peer effects manifest. For example, Chen et al. (2013) provide evidence that mandatory IFRS adoption increases the transparency and comparability of disclosures made by peers operating in foreign countries.

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the expense of the disclosing firm. Future research that partitions disclosures of firms into those that reveal proprietary information versus those that do not and examine peer-firms' responses to these different types of disclosure can yield interesting insights.

Although not focused on investment decisions, Bernard (2016) is an example of a study that provides preliminary evidence on firms exploiting peer firms' proprietary disclosures. Bernard (2016) exploits an enforcement change in Germany that forced small private firms to publicly disclose their financial statements. He finds that upon disclosing their financial statements, these firms' competitors were able to evaluate the degree to which the disclosing firms are financially constrained and used the disclosing firms' financial vulnerability to steal market share away.[41] Shroff (2016) discusses the investment implications of the findings in Bernard (2016) and offers suggestions for future research. When we consider that a large literature argues that a firm's disclosure decisions are affected by proprietary cost concerns (e.g., Beyer et al., 2010), the lack of evidence showing that competitors indeed incorporate peer firms' proprietary disclosures into their decision-making is somewhat surprising.

Second, there is little research examining whether/how firms alter their investment decisions in response to a requirement to disclose proprietary information (e.g., due to a change in disclosure regulation). To the extent disclosure requirements force firms to reveal proprietary information, it is plausible that such requirements change the cost-benefit calculus related to subsequent investments *for the disclosing firm*, and result in changes in their investment behavior. Recently, Kim (2019) and Valentine (2019) provide evidence along these lines by examining whether a change in disclosure regulation that required firms/inventors to disclose additional information related to their patent applications led firms to change their investments in innovation. Both studies find that the new disclosure rule reduces firms' incentives to innovate, presumably because the increased disclosure requirements convey proprietary information to peers and reduces the expected gains from investing in innovation.[42]

We note that there is little evidence examining the implications of proprietary disclosures on (i) the disclosing firm's investment decisions and (ii) peer firms' investment decisions. Overall, we call for research that examines and quantifies the benefit of disclosure to peer firms and calibrates these benefits against the cost of disclosure to disclosing firms. Calibrating the economic magnitudes of any positive spillover effects to peer firms against the various costs of disclosure to the disclosing firm is particularly important if research is to inform policy and affect regulation.

Third, if a firm's disclosures affect the information set of its peers' stakeholders, then it is plausible that firms take advantage of the implications of their disclosures for peer firms and use this channel to gain a strategic advantage over their competitors. For example, Aobdia and Cheng (2018) suggest that firms strategically disclose good news when their peers are renegotiating contracts with labor unions. Since labor unions use peer-firm disclosures to evaluate their own firm's prospects, the good news disclosed by a peer firm *during contract renegotiations* can help unions negotiate better contract terms with their employer, putting the unionized firm at a competitive disadvantage. Similarly, Kim et al. (2019) finds that acquirers in M&A transactions disclose information to lower the target's stock price (via information transfers) in periods when M&A negotiations are taking place. Like Aobdia and Cheng (2018), their evidence is consistent with spillover effects influencing firms to change the timing and content of their disclosures. To the extent that firms internalize the externalities of their disclosures on peers (as suggested in the above studies), understanding their implications for investment decisions at the disclosing firm and the peer firm is a promising avenue for future research.

Finally, we highlight that most private firms in the U.S. and Canada, regardless of their size and economic importance, have no public disclosure requirement. However, several countries (e.g., the U.K., Australia, India, most E.U. member countries) require privately owned firms to disclose at least some basic financial information once they meet a size threshold. Whether the positive externalities of corporate disclosures exceed the firm-specific costs of disclosure (or vice versa) can be useful to evaluate and compare the mandatory disclosure systems adopted by countries such as the U.S. and Canada (where a large fraction of the corporate world has few disclosure requirements) with that adopted in much of Europe (where disclosure requirements are more closely related to a firm's size and economic footprint).[43] An interesting avenue for future research is to examine the consequences of these mandatory disclosure approaches for aggregate investment and overall economic growth.

Similarly, in circumstances where some firms' disclosures are regulated while the disclosures of others are not, regulatory requirements can be an advantage or disadvantage to the unregulated firms compared to regulated firms. On the one hand, disclosure regulation could impose significant compliance costs on the regulated firms and force them to reveal proprietary information, which could benefit unregulated firms at the expense of regulated firms. On the other hand, disclosure regulation could help regulated firms gain greater access to external capital and crowd out unregulated firms from the capital markets. Research on spillover effects of disclosure can further our understanding of the economy-wide effect of disclosure

[41] When financially unconstrained competitors are informed about the financial constraints of their rivals, the unconstrained firms can temporarily lower prices (and engage in other forms of non-price competition) to push financially constrained competitors out of business – a competitive strategy known as predation (see Bolton and Scharfstein, 1990).

[42] These studies also find that the disclosures of one firm are beneficial to others. Kim (2019) provides preliminary evidence suggesting that the benefits to peer firms exceed the costs to the disclosing firm.

[43] Hope and Vyas (2017) and Minnis and Shroff (2017) review the literature on private firm financial reporting and provide additional suggestions for future research as it relates to the disclosures of private firms.

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regulation by examining its implications for not only the directly regulated firms (and spillovers from one regulated firm to another), but also by examining the consequences of disclosure regulation for unregulated firms.

3.2. Learning from a firm's own disclosure requirements

3.2.1. Conceptual underpinnings

Much of the literature focuses on evidence showing that financial reporting affects investment decisions by mitigating agency frictions. However, financial reporting can have significant effects on investment decision-making even in the absence of agency frictions. Over the past few decades, traditional economic models of firm behavior have begun to incorporate the idea that economic agents, including managers, can have limited attention and incur information acquisition and processing costs (see Conlisk (1980) and Sims (2003) for reviews of the literature). In fact, research in psychology dating back to Simon (1955), suggests that managers, like all other economic agents, face information processing constraints that affect their decision-making. As a result, it is plausible that managers do not incorporate *all* decision-relevant information accessible to them within their firms because such information is costly to collect and/or process.

A recent stream of research incorporates theories of limited attention and processing costs into their hypothesis development and predicts that preparing financial statements and complying with financial reporting requirements can affect managers' information sets. Specifically, the idea is that information acquisition and processing costs affect the extent to which managers' investment decisions incorporate information accessible within their firm that is not yet collected or processed. When changes in disclosure regulation or a firm's stakeholder base (e.g., becoming a government supplier) prompt firms to collect and process additional information, the additional information collected/processed can affect managers' information sets and thus their investment decisions, even in the absence of agency considerations.

A primary (but not the only) mechanism through which managers are purported to learn new information from complying with financial reporting regulation is that firms use many of the same rules to measure performance for internal decision-making as that required for external reporting (Kaplan, 1984). Thus, compliance with new financial accounting rules leads to changes in managerial accounting systems, which is the premier source of information for managers' capital budgeting decisions.[44] In his textbook, Zimmerman (2013) provides some justification for why managerial and financial accounting systems are closely aligned in many firms. Specifically, he argues that using different approaches to measure firm performance for internal decision-making and external reporting creates confusion from having to reconcile the numbers from different accounting systems (for internal and external reporting), implicitly relying on the notion that information processing is costly (see also Dichev et al. (2013) for survey evidence consistent with Zimmerman's conjecture). The link between managerial and financial accounting is likely an important reason why changes in financial reporting regulation affects managerial information sets and their subsequent decisions.

3.2.2. Empirical evidence and open issues

McNichols and Stubben (2008) are perhaps the first to suggest that managers might "believe" their own misreported financial statements, which then leads to suboptimal investment decisions.[45] They show that firms over-invest in periods when they overstate their earnings and interpret their evidence as consistent with managers relying on the misreported growth trends while making their investment decisions. This may occur because the individuals within the firm responsible for making investment decisions are different from those responsible for the firm's financial reporting choices. However, as the authors recognize, the evidence in McNichols and Stubben (2008) is also consistent with (i) poor quality accounting increasing moral hazard costs and (ii) firms choosing to support their overstated earnings by investing too much (Kedia and Philippon, 2009). The authors are agnostic about the specific mechanism that leads to a relation between accounting misstatements and investment efficiency.

More recently, Shroff (2017) argues that compliance with new accounting rules can, at times, force managers to collect and/or process additional information that is relevant for their investment choices. To test this prediction, Shroff (2017) uses cross-sectional variation in the characteristics of several changes in GAAP and classifies them as more or less likely to provide managers with additional decision-relevant information upon compliance.[46] He finds that changes in GAAP that are more likely to require firms to collect new information as part of the compliance process have a significant effect on firms' in-

[44] A primary purpose of managerial accounting systems is to provide managers with information to facilitate capital budgeting decisions. Thus, it is perhaps obvious that managerial accounting systems affect investment decision-making. The focus of our review is on the effect of *financial* reporting and disclosure on corporate investment and thus we do not review evidence examining the effect of managerial accounting on investment. See Ittner and Larcker (2001) and Zimmerman (2001) for reviews of the managerial accounting literature.

[45] The conceptual discussion above accommodates both a rational explanation for why managers learn from complying with financial reporting requirements as well as a behavioral one. McNichols and Stubben (2008) allude to a behavioral argument for why financial reporting affects managers' information sets and their decision-making.

[46] For example, Shroff (2017) argues that changes in GAAP requiring firms to *recognize* accounting amounts previously *disclosed* in financial statements are less likely to provide managers with new information than changes in GAAP that fundamentally change the measurement of an economic transaction.

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vestment decisions even in the absence of a contracting motive. By contrast, changes in GAAP that are less likely to require firms to collect new information affect investment decisions only in the presence of a contracting motive.[47] Bae et al. (2017) extend the evidence in Shroff (2017) by documenting that more knowledgeable auditors help increase their client firms' investment efficiency, presumably by improving the quality of information reported to managers within their firms. In a similar vein, Heitzman and Huang (2019) find evidence consistent with managers placing greater emphasis on information within their firms for investment decision-making when internal information quality is high; in contrast, managers rely more on the information embedded in their stock price for investment decision-making when the quality of information available within the firm is poor.

A related stream of research uses the requirement under SOX that firms assess the effectiveness of their internal controls to identify changes in the quality of managers' internal information sets. The premise underlying this line of research is that internal controls over financial reporting (ICFR) encompass processes and procedures set by managers to maintain records that accurately reflect a firm's transactions. If a firm's ICFR are ineffective, managers are supplied with lower quality information, which they use as inputs into decision-making, leading to inefficient decisions. Consistent with this idea, Cheng et al. (2013) and Harp and Barnes (2018) find that firms with material weaknesses in their ICFR have lower investment efficiency in terms of capital expenditure and M&A decisions, respectively.[48] Feng et al. (2015) find that firms with inventory-related material weaknesses have lower inventory turnover and higher inventory impairments. The above studies also document an improvement in investment and inventory management efficiency following the remediation of ICFR material weaknesses.

Since managers' information sets are unobservable to the researcher, an important limitation of the above studies is they cannot identify whether managers do indeed learn new information from their own firms' financial reports. Further, since changes in managers' information sets are likely to be correlated with changes in investors' information sets, the above studies struggle to differentiate between two competing explanations for much of the evidence. On the one hand, changes in financial reporting could change the information available to managers and thus lead to changes in their investment decisions. On the other hand, changes in financial reporting could change the information available to investors/stakeholders, which can lower agency costs and thus affect investment.[49] We expect that advances in this area of research would require a mix of approaches such as combining survey data with archival data (e.g., Graham et al., 2017; Cheng et al., 2018) or field experiments to provide further support of the managerial learning hypothesis.

Choi (2018) develops a model that incorporates the idea that implementing an accrual accounting system supplies managers with incremental information relative to one provided by a cash-basis accounting system, and the incremental information is useful for making investment decisions. He shows that an accrual accounting system improves managers' estimates of the firm's future productivity. Further, improvements in managers' estimates of future productivity lead to better resource allocation within the economy such that capital and labor flow to the most productive firms. Overall, Choi (2018) finds that an accrual accounting system helps improve the quality of information managers use to make decisions, which leads to increases in aggregate productivity and aggregate output.[50]

An important question that arises from the evidence in the above studies is whether regulation requiring managers to collect/process additional information increases or decreases firm value. Obviously, it must be too costly for managers to process *every* piece of information relevant for decision making. Thus, it would be informative to know what kinds of information managers collect absent regulation and whether managers collect and process the optimal amount of information.

Regulation that forces managers to collect/process additional information might help with decision-making on the margin but may or may be not optimal to collect in the absence of regulation. On the one hand, managers might rationally choose to *not* collect/process certain information even if it is useful for decision-making because the cost of processing such information exceeds the value of doing so (e.g., Sims, 2003). On the other hand, managers may not fully appreciate the value of information not collected until regulation forces them to do so (e.g., Simon, 1973; Camerer and Malmendier, 2007). Since knowing what information to collect/process requires managers to incur processing cost and effort, it is plausible that managers do not internalize the value of some information until regulation forces them to collect it.[51] More research is needed to better understand the implications of information processing costs on the relation between accounting and investment. Perhaps, technological improvements related to processing big data or providing real-time validated information (e.g., distributed Ledger Technology such as Blockchain) can increase or decrease the relation between financial accounting and investment by providing managers alternative sources of more precise information.

An observation that emerges from our review is that prior studies generally suggest that the reason why managers learn new information from financial reporting is due to the link between managerial and financial accounting systems. Dichev

[47] Related to Shroff (2017), Cheng et al. (2018) and Samuels (2018) provide evidence that compliance with new financial reporting requirements can lead to improvements in managers' voluntary disclosure decisions (e.g., greater management forecast accuracy) as a result of improvements in managers' internal information environments.

[48] Cheng et al. (2013) interpret the association between ICFR weaknesses and investment using an agency framework rather than a managerial learning/information processing cost framework.

[49] Realistically, changes in financial reporting rules are likely to affect the information sets of both managers and investors/stakeholders simultaneously.

[50] The evidence in the above studies is related to that in Soll (2014), who provides a historical account of the role double-entry accounting played in contributing to the rise and fall of nations in the 17th and 18th centuries.

[51] In other words, to the extent it is difficult to accurately estimate the value of information *prior to* its acquisition, it is plausible that managers do not collect/process certain decision-relevant information even when the benefits of processing such information exceed its processing cost (ex-post).

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et al. (2013), Goodman et al. (2014) and Ittner and Michels (2017) provide preliminary evidence on the link between managerial and financial accounting. Yet, this conjecture is not explicitly tested in prior research (most likely due to the unavailability of publicly available data on managerial accounting systems). Whether the link between financial and managerial accounting is truly the causal mechanism tying accounting rule changes to investment remains to be seen. More broadly, the notion that financial reporting systems shape the structure of management accounting systems is likely to lead to additional testable predictions concerning their joint influence on managers' real actions. Hemmer and Labro (2008) provide some theoretical guidance on the implications of the link between managerial and financial accounting systems.

In sum, existing studies provide evidence that complying with financial reporting requirements can affect managers' investment decisions. However, the idea that managers can learn new information from the financial reporting process is still in its infancy and much is yet to be learned. The existing evidence is largely cross-sectional in nature, leaving room for alternative interpretations. In addition, the precise mechanisms that drive the extant evidence are unclear. Thus, more research is needed to examine whether the financial reporting system indeed informs and improves managers' investment decisions.

4. Related topics

This section discusses two research topics that abstract away from both information asymmetry and uncertainty as the sources of friction that generate a relation between financial reporting and investment.

4.1. Other behavioral biases

In addition to limited attention, other behavioral biases can also lead to a relation between financial reporting and investment. Over the past three decades, economists have made substantial progress in incorporating preferences and judgement errors (e.g., loss aversion, limited attention, salience, etc.) into the standard economic model. By doing so, research in behavioral economics and finance offers new predictions and evidence related to how managers make corporate finance decisions (see Mullainathan and Thaler (2001), Camerer and Malmendier (2007), and Baker and Wurgler (2013) for reviews of this literature). The previous section touches upon the idea that managers can have cognitive limitations, which can induce behavioral biases into their decision-making. However, we are aware of only a few studies that explicitly examine the implications of managers' and investors' behavioral biases in the context of the relation between accounting and investment.[52]

Jackson et al. (2009) argue that the method of depreciation accounting used by firms affects their capital investment decisions when managers exhibit loss-aversion. Specifically, they observe that straight-line depreciation results in recording financial statement losses more often than accelerated depreciation when assets are sold, and hypothesize that loss-averse managers are less likely to replace assets when they use straight-line depreciation than when they use accelerated depreciation. Consistent with their hypothesis, Jackson et al. (2009) find a negative association between the use of straight-line depreciation and capital investment.

Pinnuck and Lillis (2007) argue that managerial loss-aversion increases agency costs for profit-making firms but not for loss-making firms. Specifically, they hypothesize and find that managers of firms reporting a financial statement loss are more likely to exercise the abandonment option and discard unproductive assets since exercising the abandonment option only affects the magnitude of the reported loss but does not change the fact they report a loss. By contrast, managers of firms reporting a financial statement profit are less likely to exercise the abandonment option because doing so could cause them to report a loss instead of a profit.

Graham et al. (2017) provide evidence consistent with managers having a salience bias that leads them to use readily available metrics reported in financial statements for decision-making.[53] Using a survey instrument, Graham et al. (2017) find that managers often use the GAAP effective tax rate (ETR) rather than the marginal tax rate (MTR) as the tax rate input for evaluating investment decisions. Graham et al. (2017) combine their survey data with archival data to provide evidence that using the GAAP ETR for decision-making leads managers to make value-decreasing investment (and capital structure) decisions.

The idea that financial statement numbers affect investment decision-making even when financial statements do a poor job capturing the underlying economics of a transaction likely extrapolates to other cases besides taxes and depreciation (e.g., accounting for stock option, pension, and leases, conservative accounting such as lower of cost or market, etc.). As a result, an important avenue for future research is to better understand *when* managers are more susceptible to making decision-errors by using GAAP numbers for internal decision making.[54] In general, decision-making errors are more likely to persist in equilibrium (and thus detected with empirical tests) when (i) the decision in question is infrequent and lacks clear feedback,

[52] We note that there are some experimental studies that test behavioral theories linking accounting to investment. To limit the scope of this review, we do not discuss research from the experimental area. However, we refer interested readers to Libby and Emett (2014) and Libby et al. (2015), who review many of the experimental studies testing behavioral theories that link financial reporting to investment.

[53] Salience can be thought of as a byproduct of having cognitive constraints. Specifically, if managers are constrained in their ability to process information, they are more likely to rely on heuristics that impose lower information processing costs. The use of such heuristics could be rational or the result of a behavioral bias.

[54] As discussed earlier, compliance with GAAP can also change managers' information sets and improve decision-making.

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(ii) the manager does not specialize in the decision, and (iii) managers are protected from market pressure and competition (see Camerer and Malmendier, 2007). Along these lines, Graham et al. (2017) provide preliminary evidence that managers are less likely to make decision-errors due to taxes when there is more competition and when managers have a degree in accounting or have more years of education.

Overall, there is much to be learned from advancements in both theoretical and empirical research in accounting that incorporates the effects of behavioral biases into decision-making by all economic agents interacting with firms. Broadly speaking, economic agents can have several behavioral biases such as overconfidence, limited attention, loss aversion, miscalibration, and attribution, among others (see Camerer and Malmendier, 2007; Baker and Wurgler, 2013). Further, these behavioral biases could occur at the manager-level, investor/stakeholder-level, regulator-level or some combination of these. We believe that several testable predictions will emerge as we incorporate the idea that different subsets of economic agent(s) can have behavioral biases, which affect their decision-making. For example, if investors are rational but managers are loss averse, managers might under-invest in R&D given that U.S. GAAP requires firms to immediately expense R&D costs, and information asymmetry related to the payoffs of R&D investments prevents investors from designing a contracting solution to this problem. Alternatively, it is plausible that investors have limited attention and tend to fixate on earnings (e.g., Sloan, 1996). A consequence of investors fixating on earnings is that managers are then incentivized to make investment decisions that maximize earnings rather than cash flows (as discussed in section 3). As a point of caution, we believe that advancements in our understanding of how behavioral biases affect the relation between accounting and investment would require a fair bit of innovation and creativity with respect to separating and identifying behavioral explanations from rational ones.

4.2. Network effects

A recent stream of research examines whether the use of common agents (e.g., auditors, board members, shareholders, etc.) affects firms' decision-making. The premise underlying such studies is that shared agents (i) have conflicts of interest and/or (ii) act as a conduit for information, which subsequently affects the decisions managers make. For example, Cai et al. (2016) find that M&A transactions in which the acquirer and target share a common auditor are more value enhancing (proxied by M&A announcement returns) than those without common auditors. They argue that common auditors facilitate the flow of information during M&A deals by acting as information intermediaries for merging firms. Dhaliwal et al. (2016) present similar findings as Cai et al. (2016) but suggest that much of the value generated by common auditors is captured by the acquiring firms' investors because the auditor's interests are more aligned with those of the acquirer (i.e., since the acquirer is the surviving firm). As such, research examining whether common agents affect the relation between accounting and investment is an interesting area for future research. In the past two decades, there has been a steady increase of concentration in audit markets, labor market for directors, stock ownership, etc, thereby increasing the likelihood that two firms have a common agent.[55] Thus, understanding the economic consequences of having a common agent is an important area of inquiry.

5. Conclusion

Over the last two decades, a large and growing body of literature has contributed to our understanding of whether and why financial reporting affects investment decision-making. In this review, we provide a framework that organizes the literature into the different channels that connect financial reporting to investment choices. We articulate two broad scenarios in which financial reporting “matters” for investment choices: (i) the presence of information asymmetry that gives rise to agency frictions such as adverse selection and moral hazard costs, and (ii) the presence of uncertainty about growth opportunities. The framework we provide is by no means complete or perfect, and the channels we highlight are not mutually exclusive or exhaustive. However, our classification scheme allows us to categorize most of the literature in a manageable and accessible manner. Additionally, it is easy to see how most studies that do not fit the framework can still be interpreted in its context, with some modifications.

With respect to adverse selection, earlier studies concentrate on establishing a relation between reporting quality and investment efficiency in settings where adverse selection is likely to play a crucial role. The two-fold effort in more recent studies has been to demonstrate that reporting quality influences investment efficiency by facilitating access to external capital, and to provide better identification. Nonetheless, there is a need to better estimate the magnitude of the increases in investment efficiency attributable to financial reporting, as well as to understand alternative forces and channels available to firms to overcome the purported costs (in terms of foregone investment efficiency) of having low reporting quality.

Studies examining financial reporting in the context of moral hazard have collectively generated interesting insights along several dimensions, in particular empire building and corporate myopia. On the other hand, the literature relating financial reporting to managerial effort-aversion and risk-aversion still appears nascent. A key feature of this stream of literature is the possibility that reporting can either mitigate or accentuate moral hazard and consequently, either improve or hinder

[55] In fact, a rapidly growing body of research finds that when a firm's investors simultaneously own significant stakes in its competitors, managers are incentivized to reduce investment, increase disclosure and become less competitive (e.g., He and Huang, 2017; Azar et al., 2018; Park et al., 2019).

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investment efficiency. Specifically, studies have found in certain settings that higher reporting quality increases shareholders' ability to monitor managers and thus reduce managerial incentives to over-invest. At the same time, the reliance on accounting information in contracts and for valuation create financial reporting benchmarks that managers are incentivized to meet or exceed, in part by distorting their investment behavior. In addition, a key issue in the context of moral hazard is that managers not only exert control over their investment decisions, but they also have scope for discretion in their reporting choices, inclusive of the specific reporting objectives they decide to pursue (for example, short-term earnings or long-term growth). The interaction between mandatory reporting requirements, managers' discretionary disclosure choices and their investment decisions is thus a fertile ground for future research to understand the circumstances under which the impact on investment efficiency is beneficial or distortionary.

Stepping away from agency frictions, a stream of literature examines how accounting information affects investment decisions when there is uncertainty about future investment opportunities. Two distinct scenarios are possible. First, accounting information disclosed by *peer* firms can reduce managers' (and shareholders') uncertainty about growth opportunities for their own firms, thereby improving investment efficiency. At the same time, to the extent there firms misreport their financial statements, firms might invest in negative NPV projects by relying on the disclosures of peer firms. Second, the presentation and preparation of financial reports for their own firms can enhance managers' information sets, which then affects the quality of their investment decisions. Despite the intuitive conceptual appeal, relatively few studies provide evidence on this "learning" channel and a number of issues remain to be explored in greater depth. For example, when does the knowledge that managers extract from their peer firms' disclosures represent wealth transfers from their peers in the form of proprietary costs, as opposed to increases in the collective knowledge about investment opportunities? Similarly, what is the type of information about future investment opportunities that firms' financial statements reveal to their own managers? The link between financial and managerial reporting may be key to answering this last question.

In summary, our goal is to provide a description of what we have learned with respect to the relation between financial reporting and investment decisions, and the challenges and open questions that remain. The framework we provide can help researchers to understand how individual studies fit into existing literature and identify new research questions that can further the literature. We look forward to future research on this topic.

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