

The Close Relationship Between Management Practices and Corporate Culture

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Abstract

A growing body of literature finds that a healthy corporate culture is associated with superior financial performance. A separate stream of research has found that a firm's adoption of management "best practices" is correlated with higher efficiency and productivity. To date, the cultural and management practices literatures have proceeded in parallel, with few studies considering the relationship between an organization's processes and its culture. This paper uses data from a carefully-designed survey of 370 organizations and nearly ten thousand managers to simultaneously measure corporate culture and management practices. Our key finding is that the quality of a company's management practices and health of its corporate culture are highly correlated. This implies that studies which measure either culture or processes in isolation are likely to overstate their impact on performance. We also provide suggestive evidence that management practices may *cause* changes in corporate culture, or at least that this effect is stronger than the reverse.

1 INTRODUCTION

The recent history of Wells Fargo illustrates the close relationship between management practices and firm culture. In September 2016, Wells Fargo agreed to pay the largest fine ever assessed by the Consumer Financial Protection Board as penance for opening more than 2 million credit card and deposit accounts without customer authorization – an average of 2,000 fake accounts every business day between 2011 and 2015 (McLean, 2017). The fraud proved costly for Wells Fargo. In the year after the fraud was discovered, Wells Fargo saw its reputation experience the largest single-year drop in the history of the Harris Poll of corporate reputations (Harris Poll, 2017). When the Federal Reserve banned Wells Fargo from increasing its assets in 2018, the bank lost nearly \$30 billion dollars in market capitalization in a single day (Glazer, 2018). The economic value destroyed by Wells Fargo's fraudulent behavior is not an anomaly—publicly-traded firms caught committing fraud typically lose between 25-40% of their enterprise value (Dyck, Morse, and Zingales, 2017).

Wells Fargo independent board directors commissioned a study of the bank's fraudulent behavior that concluded that "The root cause of sales practice failures was the distortion of the Community Bank's *sales culture and performance management system*" (Independent Directors of the Board of Wells Fargo & Company, 2017, emphasis added). The report goes on to describe the bank's process of setting ambitious sales targets for bankers and holding them strictly accountable for achieving these goals, even if they were deemed unrealistic by the employees. It also details how the corporate culture tolerated unethical behavior to achieve these objectives, for example employees opening unauthorized accounts to hit their targets.

The independent director's report on Wells Fargo highlights the impact that a dysfunctional corporate culture can have on employees' behavior and, as a result, firm performance. A growing body of research supports the link between corporate culture and performance (O'Reilly et al., 2014; Symitsi et al., 2018; Green et al., 2019; Huang et al., 2015). Guiso and his co-authors found that companies with low-integrity cultures underperform on return on sales and Tobin's q, as compared to those that score higher on

integrity and ethics (Guiso, Sapienza, and Zingales, 2015). Other research has found that corporate culture can predict the probability of a firm committing financial fraud (Ji et al., 2017; Huang et al., 2017). Conversely, firms with healthy corporate cultures can outperform their competitors. For example, companies that made the list of Best 100 Companies to Work For (which is based largely on a survey of corporate culture) delivered 20% higher returns to shareholders over a five-year period than did similar firms (Edmans, 2011). Recent studies have explored potential mechanisms linking corporate culture to financial performance, and found that corporate culture can predict innovative activity (Corritore et al., 2019; Nguyen, 2019) and customer satisfaction (Wolter et al., forthcoming).

The director's report also emphasizes how Wells Fargo's management practices, specifically goal setting and compensation, induced employee behavior and firm performance, a finding that is consistent with a separate stream of literature. Recent empirical work by Nicholas Bloom, John Van Reenen, Raffaella Sadun and their co-authors analyzed the role of management practices in predicting firm-level performance (Bloom and Van Reenen, 2007; Bloom *et al.*, 2017). These authors developed the World Management Survey to measure some structured management practices that are widely-believed to influence performance in manufacturing settings. These structured management practices included target setting and incentives, the practices highlighted in the Wells Fargo directors' report. Through careful interviews, the World Management Survey assesses whether individual operating units (such as factories in manufacturing industries) have adopted management practices. They find wide variance in the adoption of formal processes. In a study of sixteen structured management practices across US manufacturing plants, for example, they find that one out of every four factories had failed to adopt half of systems that were considered to be best practices (Bloom *et al.*, 2017). Across a broader sample, they found that one-third of the differences in firm level productivity were explained by differences in the use of management practices (Van Reenan, 2018). These authors have also presented causal evidence that interventions to adopt best-practices improve productivity (Bloom et al., 2013).

To date, the academic research on management practices and corporate culture have proceeded in streams that were largely independently of one another, although there has been some research exploring

the conceptual distinctions between management practice and culture (Graham et al., 2017) and the relationship between national culture and management practices (Newman and Nollen, 1996; Chiang and Birtch, 2007). But qualitative research suggests that corporate culture and management practices may be deeply intertwined. Studies of the NUMMI joint venture between Toyota and General Motors, for instance, provide evidence that the adoption of the Toyota Production System dramatically changed the culture of the Fremont plant (Krafcik, 1986; Adler, 1993). The causality could also run the other way, with an organization's culture influencing the likelihood that it will adopt management practices (Liu et al., 2010).

This paper analyzes the results of the Strategy Execution Survey, a novel survey administered to 9,930 managers across 370 firms to explore the relationship between management practices and corporate culture. We find that the presence of management practices is highly correlated with measures of cultural values. Taken collectively, these results support a view where corporate culture and management practices mutually reinforce one another. It further suggests that findings of good corporate culture improving performance implicitly include the benefits of management practices in their estimates, and similarly that findings of good management practices improving performance incorporate the benefits of good corporate culture.

2 MANAGEMENT PRACTICES AND CORPORATE CULTURE

2.1 Defining Management Practices

A recent body of research has explored the role of structured management practices in factories, schools, hospitals, and retail outlets (Bloom, *et al.*, 2014). While these authors do not explicitly define “management practice,” the outlines of a definition are clear from their examples and measurement methodology (Bloom and Van Reenen, 2010b). Management practices are standardized processes to get work done that are generally codified into a standard operating procedure or documented in a process manual. Because they are standardized and codified, managers (or researchers) can assess adherence to

the process. A recent study, for example, demonstrated wide variance in the use of sixteen structured management practices across US manufacturing plants (Bloom *et al.*, 2017). Only 18% of the factories adopted twelve or more of the practices they measured, and 27% of factories had adopted fewer than half the processes. Standardization and codification also facilitate the transfer of management practices across units within an organization or across organizations. Examples of management practices that meet the criteria of standardization and codification include target setting, incentives, and performance monitoring (Bloom and Van Reenen, 2007; 2010; Bloom *et al.*, 2017)

2.2 Defining culture

The term culture, used to describe distinctive values or behaviors of a social group, first appeared in an English dictionary in 1921 (Kroeber and Kluckhohn, 1952:149). In the three decades that followed, anthropologists, sociologists, and historians generated more than 150 different definitions of culture. Since then, articles about culture have continued to proliferate. A recent meta-analysis identified 4,637 articles about corporate culture written between 1980 and 2008 (Hartnell *et al.*, 2011). This vast literature on corporate culture has produced an array of definitions, including culture as narrative, values, cognitive frames, rituals, practices, among others (Giorgi *et al.*, 2015).

2.2.1 Corporate culture as norms and values

In this paper, we adopt the definition of culture as “a set of norms and values that are widely shared and deeply held throughout the organization.” (O’Reilly and Chatman, 1996). Values refer to ideals, such as collaboration or innovation, that employees aspire to, while norms clarify expected behaviors that embody these values and translate them into action on a day-to-day basis. The general value of collaboration, for instance, might be embodied in norms of delivering on promises to colleagues in other units or anticipating and avoiding conflicts with other teams. These norms are informal patterns of behavior, distinct from codified management practices such as target setting, operational processes, or incentives (Bloom and Van Reenen, 2007; Graham *et al.*, 2017). In defining culture, we focus on values

and norms for three reasons: leaders describe their firm's culture in these terms, values and norms represent a clear causal linkage between corporate culture and firm performance, and this definition is widespread in empirical work on corporate culture.

Executives typically describe their culture in terms of values and norms. A survey of Chief Executive Officers and Chief Financial Officers of 1,348 North American firms found that 90% of them described their culture in terms of values, with most listing specific values that their company emphasized (Graham *et al.*, 2017). A separate study found that 85% of companies in the Standard & Poor's 500 (S&P 500) Index had a page on their corporate website describing their corporate culture in terms of values (Guiso *et al.*, 2015).

Operationalizing corporate culture as a set of values and norms that shape employees' behavior provides a clear causal pathway linking culture to corporate performance. Many of the actions that have the greatest impact on a firm's performance, such as solving an unexpected problem for a customer, helping a colleague in another team, or experimenting with a risky technological solution, will be difficult to specify in advance, observe at the time, and evaluate after the fact (Gibbons and Henderson, 2013). Cultural values and norms can shape employees' behaviors and increase the odds they act in a way consistent with the company's strategy and goals. Cultural values and norms serve as an informal mechanism of control that induce employees to "do the right thing" even when their actions are difficult to observe (Kreps, 1990; O'Reilly and Chatman, 1996). Firms with strong and widely understood values will attract employees who share those values, further reinforcing the firm culture. To the extent that values and norms are widely shared throughout a firm, they also shape employees' expectations of what their colleagues will do in a given situation, which makes it easier to coordinate activities across different parts of the firm.

Finally, the theory of culture as a bundle of values and norms that are deeply held and widely shared has informed much of the empirical literature on corporate culture and firm-level performance. Surveys based on the Competing Values Framework, a widely-used taxonomy for classifying corporate cultures by their constituent values, for instance, have been used to measure culture in over 10,000 firms (Cameron *et*

al., 2006). Recent empirical work in financial economics has also adopted the values-based view of culture (Edmans, 2012; Guiso *et al.*, 2015; Graham *et al.*, 2017; Zingales, 2015). Widespread usage of the values-based view of corporate culture allows us to build on existing empirical literature on corporate culture.

2.2.2 *Selecting which cultural values to measure*

An analysis of the websites of more than 600 large corporations identified more than 60 distinct values those companies used to describe their corporate culture (Sull *et al.*, 2019a). To select which values to measure with this survey, we started with the six values that comprise the principal components of culture identified by Charles O'Reilly and Jennifer Chatman (O'Reilly *et al.*, 1991; O'Reilly *et al.*, 2014). The Strategy Execution Survey was part of a broader research project on how firms implement their strategies (Sull *et al.*, 2015; Sull *et al.*, 2018), so we focused specifically on those values that executives cited as important for translating their strategy into action throughout the firm. We conducted open-ended interviews of executives and middle managers about the key factors (including management practices, firm structure, and cultural values and norms) that they viewed as most critical to effective implementation of their strategic priorities. We used data from these interviews to create a set of cultural values that executives viewed as most important for strategy execution.

The six values identified by O'Reilly and Chatman are collaboration, integrity, results-orientation, adaptability, detail-orientation, and customer-orientation. Based on the interviews, we adopted three of these values, collaboration, results-orientation (which we call “performance”), and integrity, without modification, and dropped two values (detail-orientation and customer-orientation) that did not emerge as important factors for strategy execution in our interviews. We split adaptability into innovation and agility to distinguish between novelty and speed in responding to market shifts. Based on the interview data, we added two values: accountability and ambition that managers viewed as critical to executing strategy. In total, we analyze seven values in this paper.

2.3 Does better culture lead to better management practices or vice-versa?

We find it plausible that management practices and culture mutually reinforce each other, with causality running in both directions. This view is supported by a large body of ethnographic and case-based research. A study of 3M's adoption of the Six Sigma methodology, for example, found that these practices created enduring changes in corporate culture among employees who adopted Six Sigma (Canato *et al.*, 2013). Conversely, a series of ethnographic studies have shown that firm values and norms shape the use of formal management practices including coordination tools (Orlikowski, 2000), strategy formulation (Jarzabkowski and Wilson, 2002), and operational processes associated with new technology (Barley, 1986).

A third possibility for causality is that management practices and culture are both shaped by other factors. For example, a 'high quality' firm (say, due to having smart employees) could lead to better management practice, better corporate culture, and better performance.

Our observational data, a cross-sectional survey, does not allow us to distinguish between the alternative causal pathways through causal statistical analysis. We can, however, use theory to guide interpret the correlations that we observe in ways that lend weight to particular causal interpretations.

2.4 Measuring culture & management practices

The Strategy Execution Survey was originally developed by Donald Sull and Rebecca Homkes, and subsequently developed and refined by Donald Sull. Between 2012 and 2017, the Strategy Execution Survey has been administered to 9,930 managers in 370 firms. The survey was designed to measure a firm's ability to execute its strategy and included questions on management practices, how well the strategy was understood throughout the firm, and key values and norms that supported strategy implementation (Sull *et al.*, 2015). Figure 1, Panel (a), shows the number of firms that took the Strategy Execution Survey by year.

Insert Figure 1 Here

Surveys are frequently used to measure corporate culture (Cameron *et al.*, 2006; Hartnell *et al.*, 2011; Graham *et al.*, 2017) as well as management practices (Bloom and Van Reenen, 2010b). Despite their ubiquity, surveys are susceptible to measurement error (Fowler, 2014) and bias. In Online Appendix B we discuss in-depth our approach for addressing these, but highlight a few key points here.

If survey questions are interpreted differently by different respondents, it can lead to large and statistically significant measurement errors (Fowler, 1992). This can be particularly challenging for cultural values, where abstract concepts such as “integrity” or “collaboration” can be interpreted differently by respondents. To address this, our survey focused on how cultural values manifest in observable norms of behavior that are easier to observe and assess. The questions were also refined using open-ended interviews to ensure common understanding of items.

Another source of measurement error is an insufficient number of respondents. Much of the management practice research, for example, has relied on a single respondent per operating unit. When these authors interviewed more than one respondent, however, they found that 45 to 49% of the variation in factory-level usage in management practices arose from divergent answers by separate managers *within the same plant* (Bloom *et al.*, 2017; Bloom and Van Reenen, 2010). To minimize this source of measurement error, we administer surveys to multiple employees per firm. The median number of respondents was 23 (8% of the unit’s employees), and the average was 27.

Common method bias is another important source of measurement error in surveys. It arises when the outcome and explanatory variables are measured using a single instrument. Gathering data with the same survey can lead to spurious correlations if, for example, a recently promoted manager was favorably disposed to her company, and rated the company highly across the board. A respondent’s tendency to answer all items the same way could result from the desire to appear consistent in the answers that they give (Salancik and Pfeffer, 1977; Johns, 1994), an enduring tendency towards positive or negative disposition (Watson and Clark, 1984), a halo effect (Rosenzweig, 2007), transient mood states, or from other biases. Previous findings indicate that common method bias can account for one-quarter or more of the variance explained by correlations observed in data gathered from a single questionnaire (Cote and

Buckley, 1987). Reliance on Likert scale questions exacerbates the common method bias, because respondents are more likely to provide consistent answers even for different items, if questions are presented on the same scale (Krosnick, 1991; Krosnick *et al.*, 2014).

To minimize the risk that respondents would shift to autopilot in responding to questions, we varied the format of questions, including free text responses, numeric range (e.g., number of objectives responsible for achieving), frequency (e.g., how frequently colleagues deliver on their commitments), randomized list of multiple answers with no obviously correct answer (e.g., factors that most influence promotion decisions), percent of total (e.g., percent of bonus linked to individual, team, and corporate performance), and hypothetical questions (Kang *et al.*, 2011).

Having multiple respondents per firm helps mitigate the potential impact of the common method bias in the Strategy Execution Survey. For example, imagine that individuals were swayed in their answers by the day-to-day vicissitudes of their lives, to such a large extent that 50% of all the variation in their answers came from having a good or bad day, rather than underlying characteristics of the company's culture or efficacy of its management practices. This would be a large problem for a survey with only one respondent per firm, but for a survey with 27 respondents per firm (our average) the expected misallocation component would fall to just 3.7% of the variation¹ (because of the central limit theorem). Thus, even large idiosyncratic fluctuations would produce only small amounts of common method bias because of our sample sizes.

Large sample sizes help less if biases are systematic – for example, if high growth and profitability of a firm create a “halo effect” whereby employees assume their organization excels on every dimension because it is performing well in the market (Rozenszweig, 2007). To check for this, we use a marker variable approach (Craighead *et al.*, 2011; Lindel and Whitney, 2001; Malhotra *et al.*, 2006). This allows us to bound the variance coming from common method bias to no more than one-fifth (full details in

¹ As with most estimates, the expected variance falls as sample size grows. In this case, the expected variation from the idiosyncratic part is $\frac{50\%}{27-1} = 1.9\%$, and therefore the share of all variation would fall to $\frac{1.9\%}{50\%+1.9\%} = 3.7\%$. The specificity of this result implicitly assumes that the distribution of the initial fluctuations was Gaussian, although the overall implication does not.

Online Appendix B). By construction, the Execution Survey is designed to address many of the most problematic sources of bias and measurement error and provide more reliable measures of firm culture and management practices.

Another important issue in survey design is construct validity – that the questions are measuring what they are intended to (Fowler, 1992; Fowler, 2014). To ensure construct validity in measuring management practices, we followed the methodology used in the World Management Survey (WMS) as described by Bloom and Van Reenen (2010b). Rebecca Homkes, who was one of the co-developers of the original version of the Strategy Execution Survey, was the global coordinator for the WMS for seven years, and helped ensure our methodology was consistent with the Bloom and Van Reenen approach. For the questions about culture and management practices not measured in the WMS (e.g., resource allocation, communicating strategy) we initially interviewed managers and asked them how they would measure constructs such as collaboration or integrity. We piloted candidate questions, and discussed with managers to see if the questions were unambiguous and also whether they were good measures of the underlying construct.

2.5 Sample description

Table 1 shows summary statistics for our individual respondents. Panel (a) shows their current role, revealing our focus on upper and middle level managers. Panel (b) shows respondent tenure. More than half the respondents had been with their employer for 5 or more years. Table 2 shows summary statistics for the firms in our survey. The median firm has 23 respondents, has existed for 41 years, is publicly held², and has nearly 10,000 employees.

Insert Table 1 and Table 2 Here

² While our data includes some not-for-profits, educational institutions, and government agencies, 85% of our sample consists of for-profit companies, hence we use the term “firm” to refer to them collectively.

3 ANALYSIS PLAN

3.1 Empirical Strategy

The goal of our analysis is to understand the relationship between management practices and firm culture, in particular whether they are strongly and systematically correlated. If true, this is important because, as we noted in the introduction, research on corporate culture and management practices have evolved largely independent of one another. But if management practices and firm culture are positively correlated, then each of these literatures are implicitly reporting the effect of both and thus are not separate findings at all. Said in econometric parlance: when performance is regressed against either firm culture or management practices, the other is an omitted variable that upward biases the estimated effect of the included variable.

The importance of this question, however, goes beyond just getting unbiased estimates for performance regressions. It also speaks to which aspects of firm culture are most related to good management practices. As discussed in section 2.3, the causal relationship between culture and management practices could be that:

1. Using better management practices leads firms to develop better cultures (labeled “A” in Figure 2)
2. Having better cultural values leads firms to develop better management practices (“B”)
3. Having some third cause, say being a ‘better quality firm’, leads to firms having better culture as well as better management practices (“C”)

Insert Figure 2 Here

Because our analysis is cross-sectional and we do not have any random variation, we cannot distinguish between these causal hypotheses econometrically. We can, nevertheless, consider causality by relying on theory and looking at whether the empirical correlations in our data are consistent with those theories. If we see that they are not, then either the direction of causation doesn’t exist or our understanding of how it applies is wrong. In practice, we expect to find some evidence for all the

propositions, since all are plausible. And thus, our focus is on which mechanism is most important.

Based on theory we make the following predictions for the correlation patterns that we should observe under each of the potential causal pathways.

If better management practices generate better firm culture, then we would expect management practices to be highly correlated to those cultural values. If the effect of management practices on culture is sufficiently strong, this should also induce a positive correlation amongst cultural values because any natural negative correlation between cultural values would be outweighed by the positive correlation induced by the collective impact of better management practices. Since the correlations between cultural values are secondarily induced, we would expect them to be weaker than the primary effects: correlation between management practices and aspects of culture. Empirically, this should manifest as shown schematically in Figure 3(c), where cultural values (here labeled C_1 , C_2 , C_3) and management practices (MP) are positively correlated, and cultural values are also positively correlated, although more weakly.

Insert Figure 3 Here

If the causality runs in the opposite direction, with better firm culture generating better management practices, we would expect that a cultural value that is closely related to management practices would be correlated. For example, the cultural value of accountability might lead to better management practices for recognizing and rewarding employees who achieved their goals. But causality running from firm culture to management practices, could also mean *negative* correlations between management practices and other aspects of culture. This is because, according to the Competing Values Framework (Quinn & Rohrbaugh, 1983), excelling in one area of firm culture requires trade-offs in others. That is, cultural values should be negatively correlated with one another. And thus, if one cultural value is high, it might induce a positive correlation with a related management practice and a negative correlation with other cultural values. All else equal, this should show up as a negative correlation between management practices and some cultural values and positive correlations with others. This is shown schematically in Figure 3(b), where C_1 is assumed to be the cultural value closely related to management practices and thus it shows a positive correlation. However, if the Competing Values Framework is right, then this

means that the firm may be trading-off between C1 and other cultural values (here C2 and C3), and thus those would (all else equal) have negative correlations with management practices.

A third hypothesis would be that common causes, say being a “better quality firm,” generates both better firm cultures as well as better management practices. This should generate positive correlations between aspects of culture and management practices. If this effect is strong, it could also overwhelm any trade-offs between aspects of culture, leading to positive correlations between those as well. Collectively, these would produce a correlation structure like Figure 3(c).

The key distinction between these causal interpretations is what they imply about correlation patterns. If management practices drive firm culture, or other effects commonly influence both, then we should see positive correlations as in Figure 3(c). Since these are the same pattern, we cannot distinguish between them based only on the correlational structure. In contrast, if cultural values drive management practices (and the Competing Values Framework is correct), then we should observe a mix of positive and negative correlations, as in Figure 3(b).

If we observe virtually all negative correlations, as in Figure 3(a), this would reflect a trade-off between cultural values and management practices, and would be inconsistent with any of our theories of a positive causal relationship between cultural values and management practices.

3.2 Survey Data: Coding responses

As discussed earlier, a strength of our survey is that it forces managers to choose between realistic options – which engages respondents more than, for example, a series of similar Likert scale question. Phrasing the choices this way does, however, require us to convert the responses back to numerical values for our statistical analyses. We present an example here to provide a sense of the analysis. Consider question #63:

Question #63

How well do department function or business unit leaders typically resolve conflicts amongst different parts of the business?

- (a) These issues often go unresolved.
- (b) Leaders resolve issues, but often with a delay.

- (c) Leaders don't anticipate problems, but resolve them promptly and effectively when they arise.
- (d) Leaders anticipate and avoid potential conflicts

For this question, it is clear that Option (d) is the best answer, Option (a) the worst, and Options (b) and (c) between them. But the relative ranking between (b) and (c) is unclear. To code this question, we provide ordinal rankings, with ties for instances of ambiguity. Thus, in this case, the best answer gets a "3", the worst a "1", and the others a "2". For many of our questions, ties are not needed.

These mappings are, of course, not perfect. Firstly, they are ordinal and thus may not reflect differences in cardinality in the minds of survey-takers. Secondly, we may map two concepts to the same ordinal value, even though respondents viewed them as ordered. In either case, the ambiguities in mapping could lead to measurement error. Importantly, this will bias correlations towards zero, working against our finding any effects, and thus if we nevertheless find non-zero results, then this measurement error will not call them into question.

We also map survey questions to the cultural values they were intended to measure, which include: integrity, ambition, innovation, accountability, agility, collaboration, and performance. Some questions map to management practices, for example those covering resource allocation, goal setting, and operational processes. We provide full details of all the mappings in Online Appendix A, but also continue the above example here for expositional purposes. We map Question #63 to "collaboration", as it reflects management's role in smoothing the conflicts that inhibit teamwork across the different parts of an organization.

3.3 Survey Data: Aggregating across questions

Because multiple questions map to each cultural value, we aggregate them to calculate a composite score. To make such composites comparable, we rescale each question to 0 to 10. Continuing our example with Question #63, the response mapping is: 1→0, 2→5, and 3→10. This rescaling is particularly useful in that it allows us to aggregate responses across questions with differing numbers of answers. After transforming questions in this way, we take simple averages across questions to aggregate.

4 RESULTS

4.1 Strength of cultural values and management practices

Figure 4 shows the aggregated survey responses for each cultural value across firms, including both the mean and one standard deviation in each direction

Insert Figure 4 Here

Across our sample we see that, on average, firms score highest on the cultural value of Accountability, and lowest on Integrity. They also generally score low on management practices, consistent with previous findings of sparse adoption of individual practices (Bloom *et al.*, 2017).

4.2 Overall correlations between cultural values and management practices

We begin our analysis by analyzing cultural values at an aggregate level, averaging the score over all cultural values at the firm level and comparing that average to the firm's score for Management Practices. Figure 5 graphically shows such relationship between average culture score and Management Practice score. Each point represents a firm. We find a positive and strong correlation between corporate culture and Management Practices (correlation coefficient: 0.66). These correlations are also true at the level of individual cultural values, as shown in Figure 6.

Insert Figure 5 and Figure 6 here

Formal regression models confirm this relationship. Table 3, Model 1, shows the estimated coefficient when (average) corporate culture is regressed on Management Practices. It shows that a one-point increase in overall firm culture rating corresponds to a 0.720 increase in management practices score (highly statistically significant), and that 42% of the variance in management practices can be explained this way. Models 2-8 show that each culture value is independently correlated with management practices (range from 0.124 to 0.617), and Model 9 shows that, even when all combined into one regression, each cultural value except ambition is positively and statistically significantly related to higher Management

Practices scores. Moreover, Model 9 explains more than 60% of the variance in Management Practices scores.

Insert Table 3 Here

Collectively, Models 1-9 provide strong evidence that management practices and cultural values are closely related and manifest in correlated patterns within firms.

We can also examine whether this effect is true in each sector of the economy. We find that the strong correlation between cultural values and industry is true across virtually all sectors in our data, although it is somewhat weaker in consumer discretionary and information technology, as shown in Figure 7.

Insert Figure 7 here

Thus, we find strong evidence that management practices and cultural values are highly correlated, confirming our most important hypothesis. This also affirms the broad conclusion that regressions in the literature that look just at the effect of either management practices or cultural values on performance are biased because they ignore other factor (and hence overstate effect sizes).

4.3 Detailed correlations between cultural values and management practices

Recall, from Analysis Plan section, that theory can guide us to which causal interpretations are plausible. In particular, there are empirical distinctions between various causal interpretations that manifest in the correlation patterns of how firm cultural values correlate amongst themselves and with management practices. Figure 8 shows these correlation at the firm level.

Insert Figure 8 here

Figure 8 shows the overall correlations between cultural values and management practices. For example, the 0.57 value at the intersection of Collaboration and Agility reveals that across the firms in our sample there is a 57% correlation between the scores that firms get on these two measures. That is, firms that are better at one of these values, are very often better at the other as well. Management practices are most highly correlated with Collaboration and then Agility and Performance. Innovation and

Accountability are modestly correlated with Management Practices. On the other hand, Integrity and Ambition are more weakly (but still positively) linked to Management Practices.

The most striking finding in Figure 8 is that virtually all the pairwise correlations are positive. Of the 28 off-diagonal correlations that we report, they have an average correlation of 0.35, and 27 are positively correlated. In other words, firms that rate well in one cultural value tend to rate highly in others as well. Moreover, firms that rate well on management practices also rate well on cultural values. This picture is inconsistent with the view of cultural values (that require trade-offs) driving management practices. It is, however, consistent with both a view that management practices drive cultural improvement and the view that a common cause is affecting both.

Figure 9 investigates this more deeply by considering a subset of management practices that have a clearer relationship with particular cultural values. In particular, the Strategy Execution Survey contains five questions designed specifically to look at how remuneration is structured and whether it incentivizes specific behaviors (a key management practice).

Insert Figure 9 Here

Overall, we find that the average correlation between cultural values ratings and financial rewards ratings is 0.39 when the two measuring the same value (diagonals) and 0.26 when incentives and cultural questions measure different values (off-diagonals), suggesting that there is some specificity in the relationship between management practices and cultural values. Our interpretation is that this makes the causal interpretation of management practices being the driver more plausible, but is not definitive.

Further suggestive evidence that the causation runs from management practices to cultural values, and not from a common cause, comes from considering the correlations of each cultural value or management practice, with all the others. Figure 10 shows this. Notice, that it is not that good performance across measures are equally (or normally) distributed, as one might expect if being a ‘good firm’ had an overall positive effect across measures. Instead, it is management practices in particular that are correlated with better cultural values scores. This result is particularly striking since, as we showed in Figure 4, average management practice scores are relatively low. If management practices are indeed

causing improvements in cultural values, then this means that there is a potential for even greater improvements if better management practices are adopted.

Insert Figure 10 Here

5 DISCUSSION

Our key finding is the strong positive correlation between the firm management practices and cultural values measured in our study. Aggregating cultural values into a single measure reveals a correlation of 66%, whereas each individual cultural values has an average correlation of 47%. Perhaps most telling, when we regress management practices on cultural values, more than 60% of the variance is explained. Thus, the relationship between the cultural values and management practices is not only statistically strong, but highly explanatory.

But which management practices are linked with specific cultural norms? The bundle of management practices we measured, following Bloom and van Reenen's research, focused primarily on performance monitoring (5 items in our survey), recognizing and rewarding performance (4 items), and target setting (12 items). This specific bundle of practices was most highly correlated with the values of accountability, agility, collaboration, and performance (Figure 8 and Table 3). These practices were less highly correlated, in contrast, with the values of innovation, integrity, and ambition.

A deeply practical question for managers is whether specific processes can be used as a tool to reinforce desired cultural norms. Companies including Danaher (Anand *et al.*, 2015) and AB InBev (Sull *et al.*, 2019b) implement standardized processes with the explicit objective of instilling desired cultural norms in acquired companies. AB InBev, for example, implements zero-based budgeting in all its acquired companies to inculcate a sense of frugality and ownership, where employees spend the company's money as if it were their own. Our findings suggest that the approach of implementing specific management practices might, in fact, be effective in reinforcing desired norms.

Can the same management practice can be used to reinforce different values? The execution survey asked a series of questions about the extent to which a company's incentives recognized and rewarded

distinct values. The horizontal axis of Figure 9 plots employees assessment of how well their company's incentives reward specific values, while the vertical axis plots the company's score on those values measured using different questions. If incentives were uniformly effective in reinforcing specific values, we would expect to see the highest correlations along the downward sloping diagonal. This is not the pattern of correlations we observe. Overall, the correlations on the diagonal are larger, but whereas rewarding integrity is highly correlated with corporate integrity (measured by other survey questions), incentivizing ambition does not appear to induce higher levels of ambition.

A crucial assumption in the last two questions is the direction of causality. It is plausible that companies which place a high value on accountability and performance (cultural values), for example, are more likely to adopt practices like pay-for-performance (a management practice). But it is also plausible that the adoption of a management practice like objectives and key results (OKR), might instill and reinforce a norm of achieving one's objectives where such discipline had not existed in the past. It is also possible, of course, that a third variable—an effective top leadership team for example—might push for the adoption of best practices and independently cultivate desired cultural norms. A cross-sectional design like ours cannot establish the causal relationship between cultural norms and management practices using typical causal statistical setups. We can, however, use theory to interrogate our results to ask which are consistent with different models of causality. We find that overall correlation patterns between cultural values, and between cultural values and management practices are *inconsistent* with a view that the dominant effect is that corporate culture causes changes to management practices (because we do not observe the negative correlations implied by the competing values hypothesis). In contrast, the correlation pattern is consistent with management practices causes changes to corporate culture, as well as with a third factor influencing both. That said, the management practices metric is more highly correlated with the cultural norms than any of these values is with the others. We also observe (limited) evidence that particular management practices are more closely correlated with related cultural values than more distant one. Neither of these findings is dispositive, but both are most parsimoniously explained by management practices being the causal driver.

6 CONCLUSION

Our research introduces a new survey, the Strategy Execution Survey, which provides data on management practices and cultural values across 370 organizations and nearly 10,000 managers.

Analysis of this survey provides strong evidence of the close relationship between management practices and corporate culture: firms that score higher on one tend to score higher on the other. This correlation with management practices is true whether one looks at an aggregate cultural score or looks at individual cultural values. It is true across industries, and it is true if one controls for ratings on other cultural values. As one would expect, this correlation is highest between cultural values and the management practices that most closely reflect them (e.g. rewarding behaviors financially), although it is also true more broadly.

Documenting this close relationship is important for the academic literature because it unites two research streams that have developed largely independently, the relationship between cultural values and firm performance, and the relationship between management practices and firm performance. Our results suggest that these may not be independent findings at all, but different manifestations of coherent behavior by firms in both these areas. For theory, this means that both culture and management practices need to be considered together when deriving implications. For empirics, this means that econometric estimates of the impact of either management practices or culture alone are econometrically likely to be confounded, with omitted variable bias making the reported estimates too high.

Our findings are also important for practitioners, since they provide suggestive (but not definitive) evidence that improving management practices causes improvements in firm culture. If correct, this provides a tangible pathway for managers seeking to improve corporate culture.

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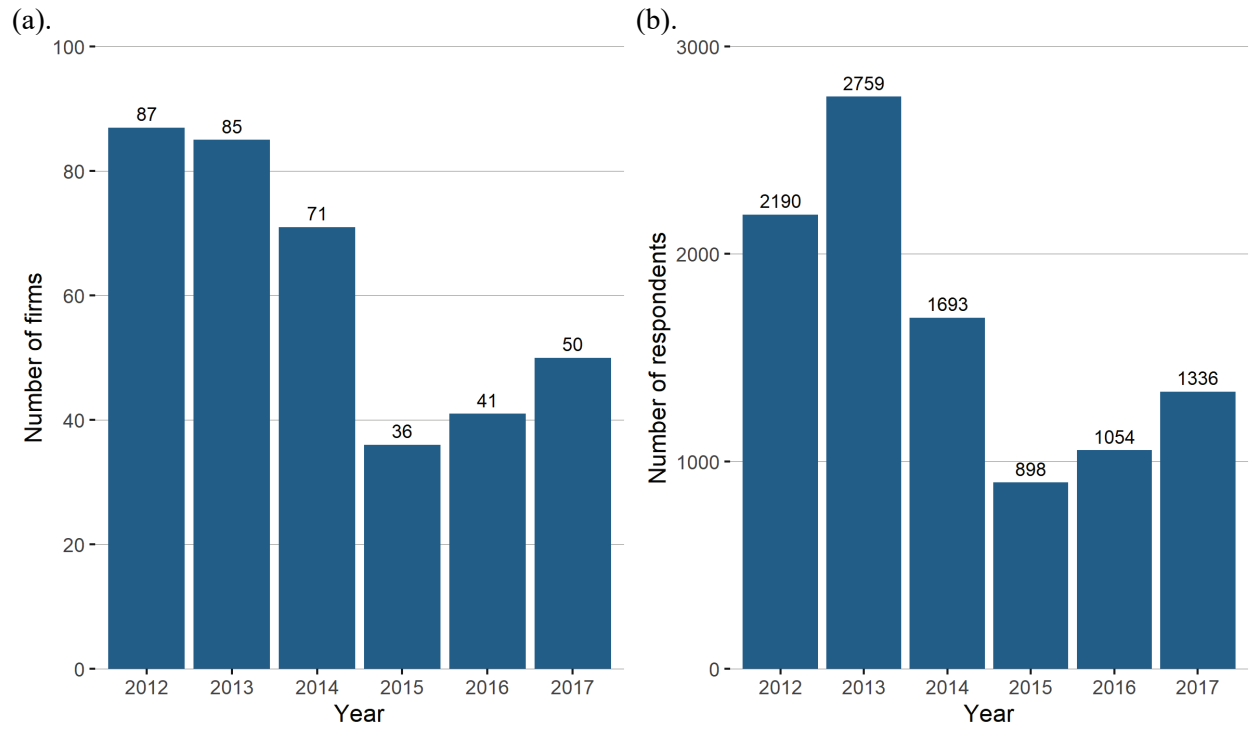


Figure 1. (a). Firms in surveys, (b). Respondents in surveys

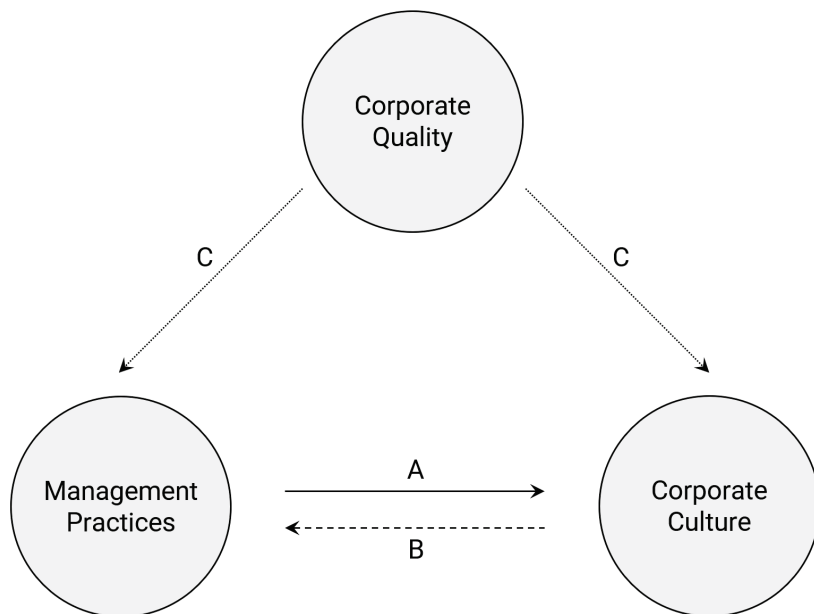
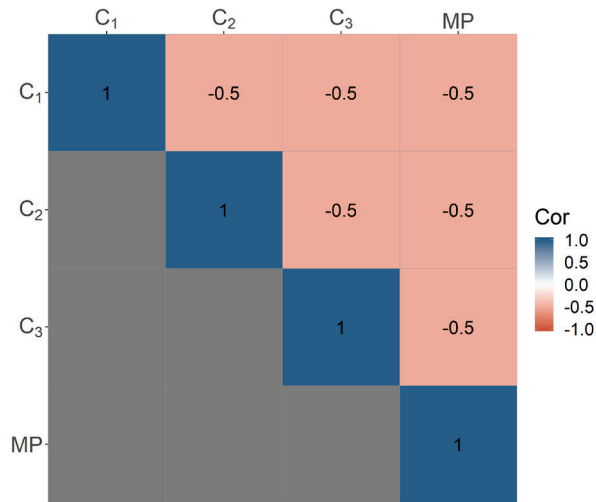
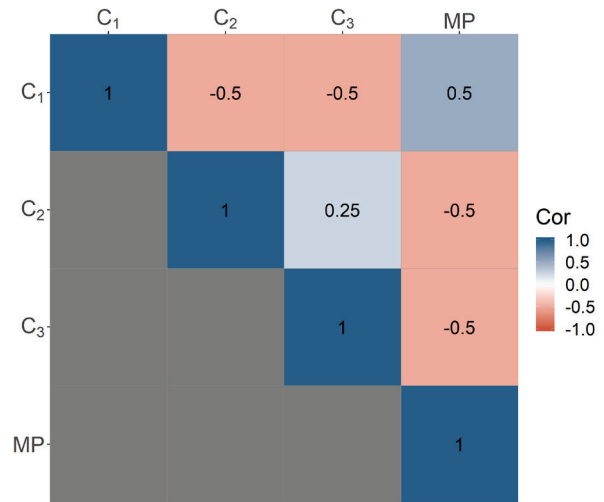


Figure 2 Causal relationships between culture and management practices

(a).



(b).



(c).



Figure 3 Illustrative heatmaps showing correlations amongst cultural values (C₁, C₂, and C₃) and management practices (MP). Figure (a) shows negative correlations, Figure (b) a mix of positive and negative correlations, and Figure (c) positive correlations.

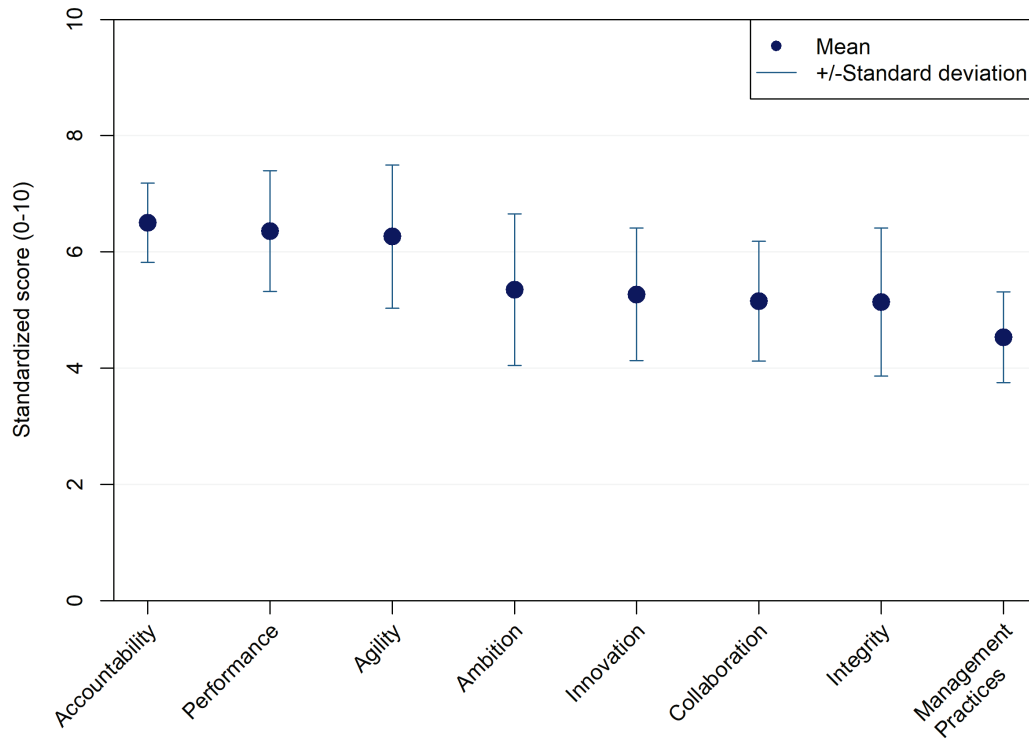


Figure 4. Cultural Values (Firm-level Analysis)

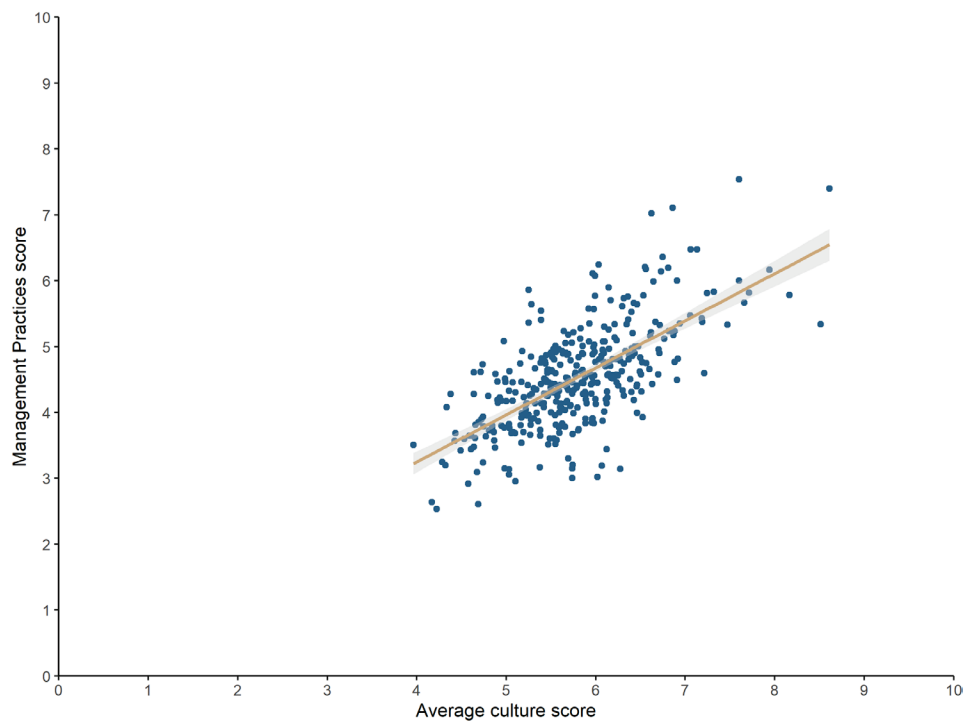


Figure 5 Firm level scatterplot between Management Practices and average culture score

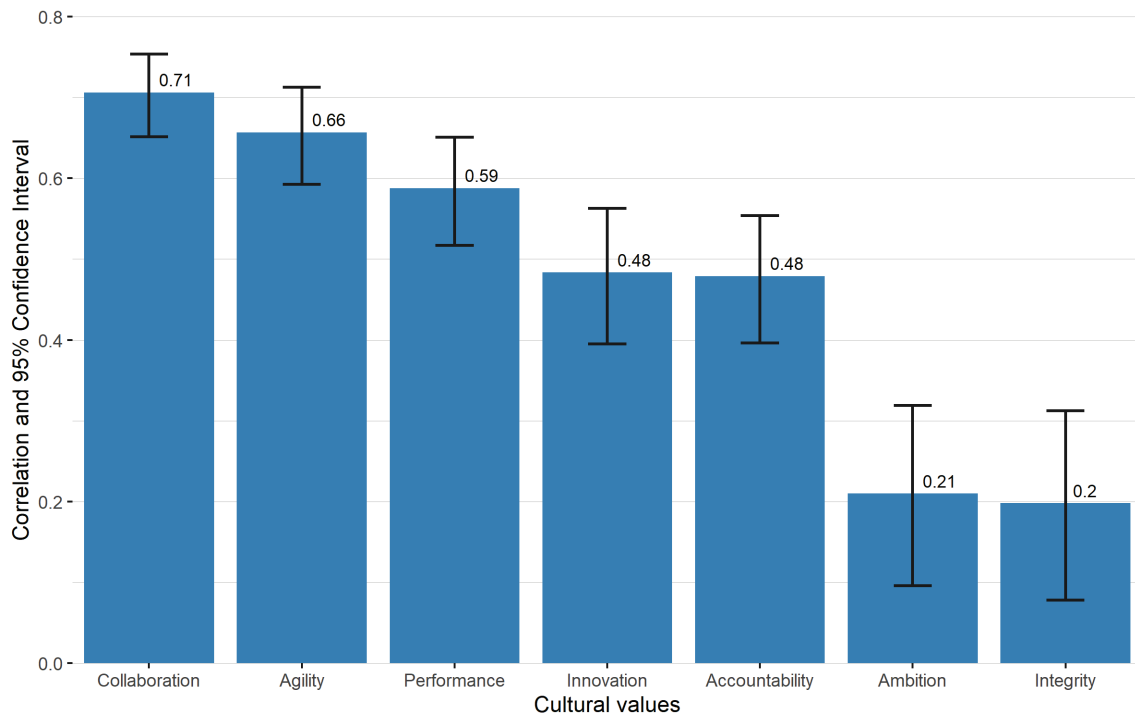


Figure 6. Correlation between Management Practices and each Cultural Value

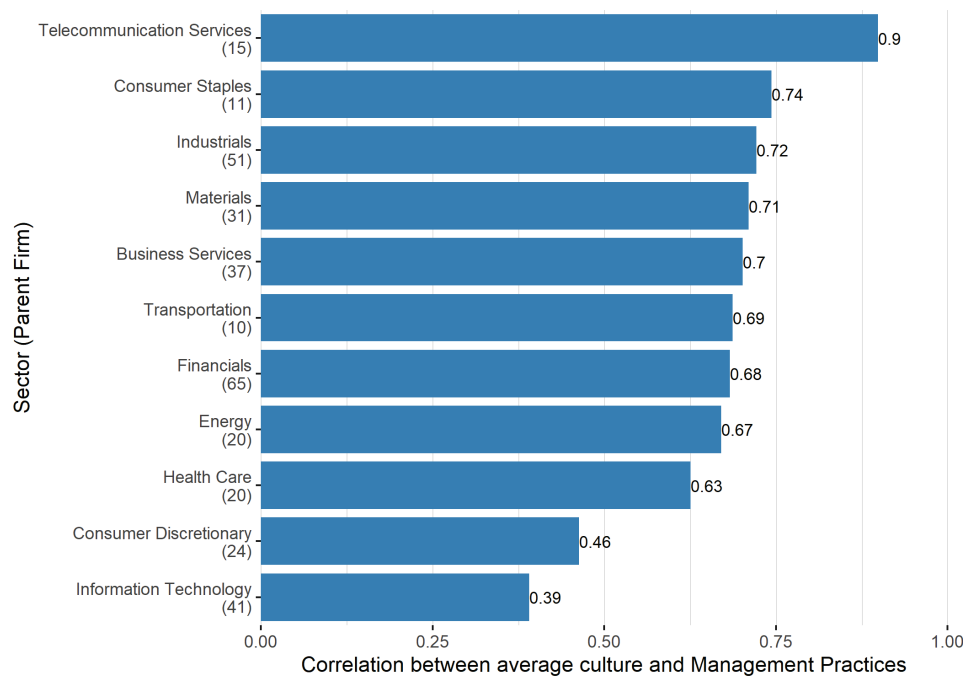


Figure 7 Correlation between average culture and Management Practices score by sector

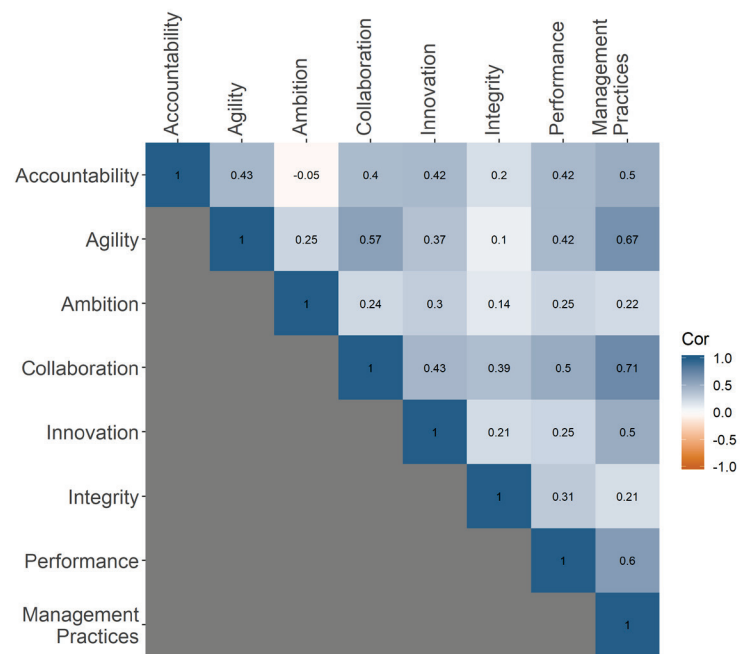


Figure 8. Heatmap of Firm-level Correlations between Cultural Values and Management Practices

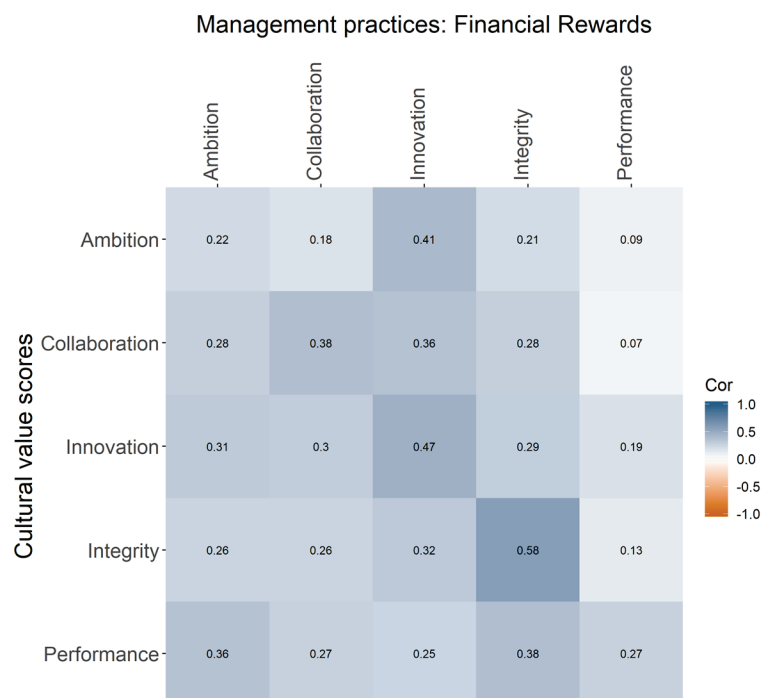


Figure 9 Heatmap of Correlations between financial rewards and the corresponding cultural values

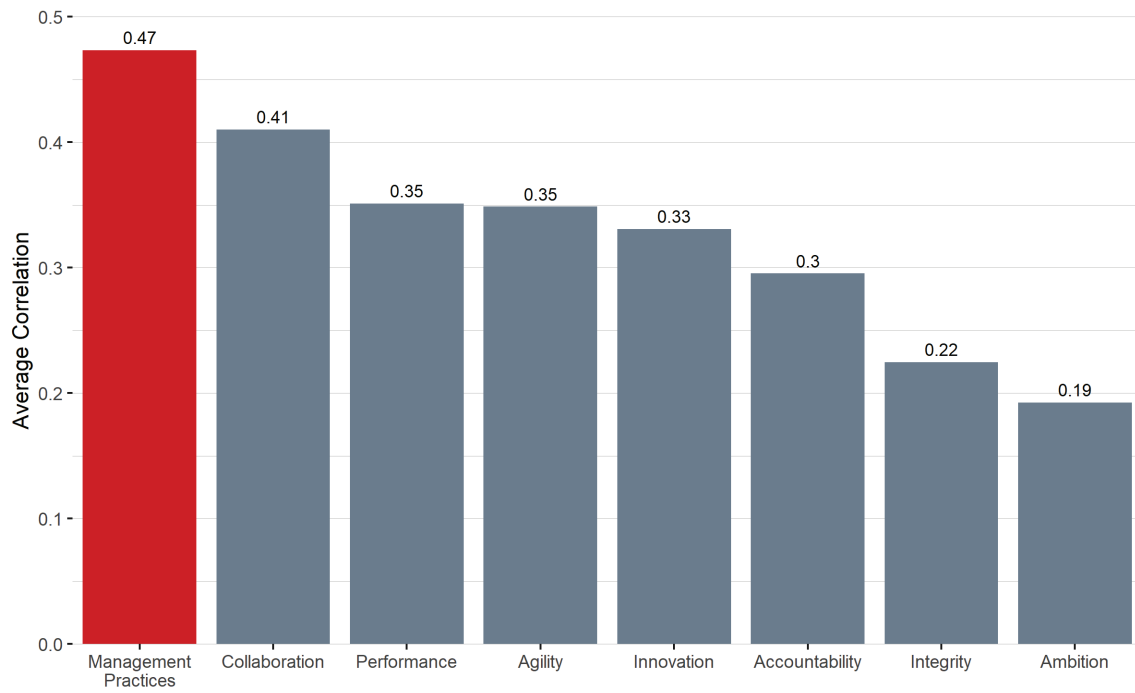


Figure 10. Average Correlation to all (other) Cultural Values

Table 1 Summary Statistics: Individual**Panel A. Current Role**

Answers	Count	%
1. Member of the executive team responsibility for running the entire company or business unit	1,298	13
2. Report directly to a member of the top executive team of the company or business unit	3,246	33
3. Vice President Director or Manager who does not report to a top executive of the company or business unit	2,429	25
4. Front line supervisor or team leader	1,567	16
5. Individual contributor	951	10
6. Other	406	4

Question: Which best describes your current role? (N=9,897)

Panel B. Length of Current Employment and Position

Answers	Length of Current Employment		Length of Current Position	
	Count	%	Count	%
1. Less than one year	211	7	604	21
2. 1-3 years	547	19	1,141	40
3. 3-5 years	388	14	560	20
4. 5-7 years	392	14	315	11
5. 8-10 years	292	10	127	4
6. More than 10 years	1,030	36	122	4

Questions: How long have you been with the company? (N=2,860); How long have you been in your current position? (N=2,869)

Table 2. Summary Statistics: Firm**Panel A.**

	Mean	S.D.	Min	Median	Max
Respondent per Firm (N=370)	27	25	2	23	310
Age – Parent company (N=277)	61.8	62.4	3	41	~650

Panel B.

Parent Type (N=290)	%	Parent Employment (N=289)	%	Parent Headquarters (N=242)	%
Public company	51.4	<200	12.5	USA	27.3
Privately held	33.4	200-500	14.2	UK	8.7
Government agency	7.2	500-1,000	4.8	Germany	6.6
Not for profit	4.5	1,000-5,000	17.0	Switzerland	4.1
Education	2.1	5,000-10,000	7.6	Saudi Arabia	3.7
Partnership	1.3	10,000+	43.9	Others	49.6

Table 3 Regression result for corporate culture and Management Practices

	<i>Dependent variable: Management Practices score</i>								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Culture score (average)	0.720*** (0.044)								
Accountability		0.617*** (0.051)							0.185*** (0.056)
Agility			0.361*** (0.027)						0.120*** (0.032)
Ambition				0.044 (0.034)					-0.057** (0.026)
Collaboration					0.443*** (0.032)				0.216*** (0.041)
Innovation						0.297*** (0.030)			0.057* (0.033)
Integrity							0.124*** (0.033)		0.056** (0.024)
Performance								0.393*** (0.033)	0.151*** (0.036)
Constant	0.290 (0.255)	0.520 (0.331)	2.311*** (0.170)	4.243*** (0.186)	2.243*** (0.166)	2.953*** (0.163)	3.904*** (0.178)	2.024*** (0.215)	0.209 (0.329)
Observations	370	370	347	283	370	323	260	368	258
R ²	0.424	0.287	0.348	0.006	0.346	0.231	0.051	0.275	0.601
Adjusted R ²	0.422	0.285	0.346	0.002	0.344	0.228	0.047	0.273	0.590
Residual Std. Error	0.604 (df=368)	0.655 (df=368)	0.609 (df=345)	0.729 (df=281)	0.627 (df=368)	0.681 (df=258)	0.681 (df=258)	0.662 (df=366)	0.458 (df=250)

* <0.1; ** <0.05; *** <0.01.

ONLINE APPENDICES

The Close Relationship Between Management Practices and Corporate Culture

Donald Sull Hyo Kang Neil C. Thompson

A CULTURE VALUES AND QUESTIONS

Question Number	Question Text	Firms	Respondents
<i>Accountability (Cronbach's Alpha=0.80)</i>			
62	When dealing with leaders in other departments functions and business units, my supervisor typically: <ul style="list-style-type: none"> 1. Often over commits our team and fails to secure the resources we need 2. Makes realistic commitments but sometimes fails to secure the resources we need 3. Makes realistic commitments for our team and secures the resources we need 	376	10,093
85	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "Top executives" <ul style="list-style-type: none"> 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time 	349	8,703
86	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "My supervisor" <ul style="list-style-type: none"> 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time 	374	9,287
87	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "My direct reports" <ul style="list-style-type: none"> 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time 	348	8,464
88	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "Colleagues in other functions, departments, and business units" <ul style="list-style-type: none"> 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time 	399	10,118
89	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "Key partners outside our company" <ul style="list-style-type: none"> 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time 	284	7,009
<i>Agility</i>			
60	How does your team typically respond when market circumstances change? <ul style="list-style-type: none"> 1. We struggle to adapt to changing circumstances 2. We adjust our activities but are often too slow to adapt 3. We quickly adjust activities and coordinate with other units and key business partners 	376	10,093
<i>Ambition (Cronbach's Alpha=0.05)</i>			

66.1	Imagine you were giving advice to a newly hired manager. What suggestion would you give about making performance commitments? 1. Make ambitious commitments even if you are not sure how you will achieve them 2. Make conservative commitments that you are sure you can achieve (✓) 3. When possible try not to commit to concrete targets or objectives 4. Don't know	285	7,794
83	How consistently does your company recognize and reward the following behaviors with nonfinancial measures such as promotions, public recognitions or awards, or praise from executives? "Pursuing ambitious targets" 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time	210	5,310
<i>Collaboration (Cronbach's Alpha=0.82)</i>			
10	From your perspective, how closely do members of the top executive team agree on key priorities for the company over the next few years? 1. They appear to disagree on key priorities 2. There is some overlap of their views on companywide priorities 3. Top team members agree on most priorities 4. Top executives agree completely on key priorities	349	9,269
63	How well do department function or business unit leaders typically resolve conflicts with other units? 1. These issues often go unresolved 2. Leaders resolve issues but often with a delay 3. Leaders don't anticipate problems but resolve them promptly and effectively when they arise 4. Leaders anticipate and avoid potential conflicts	399	10,674
64	Imagine a manager achieves his or her objectives but fails to collaborate with colleagues in other units. What would typically happen? 1. That behavior would be tolerated 2. It would be addressed but after an extended delay 3. It would be addressed promptly	349	9,269
80	How consistently does your company recognize and reward the following behaviors with nonfinancial measures such as promotions, public recognitions or awards, or praise from executives? "Cooperating across units" 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time	210	5,310
90	Imagine that circumstances changed for colleagues in another unit, and they can no longer deliver what they promised you. How do they typically deal with these changes? 1. They often fail to communicate these changes 2. They let us know but often with a significant delay 3. They inform us promptly but do not always help us resolve the problem 4. They let us know promptly and help us find a solution	210	5,310
97	Management teams evolve over time. At present, how well does your top executive team work together? 1. There seem to be factions within the team 2. They work as a cohesive team 3. Don't know	349	9,269

Innovation (Cronbach's Alpha=0.53)

68	Imagine you pursued a risky opportunity that supported your company's strategy. What are the most likely consequences for your career? 1. I would be rewarded for success, but would be penalized for failure 2. I would be rewarded for success, but little risk if I failed 3. I would be rewarded for success, and not penalized should I fail	326	8,688
82	How consistently does your company recognize and reward the following behaviors with nonfinancial measures such as promotions, public recognitions or awards, or praise from executives? "Innovating" 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time	210	5,310

Integrity (Cronbach's Alpha=0.64)

44	Imagine a manager achieves his objectives by compromising long-term performance or nonfinancial factors such as safety quality or environmental standards. What would typically happen? 1. This behavior would be tolerated 2. It would be addressed but after a delay 3. This behavior would be addressed promptly 4. Don't know	262	7,213
79	How consistently does your company financially reward the following behaviors? "Acting with integrity" 1. Rarely 2. Some of the time 3. Most of the time 4. All of the time	210	5,310
84	How consistently does your company recognize and reward the following behaviors with nonfinancial measures such as promotions, public recognitions or awards, or praise from executives? "Acting with integrity" 1. Don't Know 2. Rarely 3. Some of the time 4. All/most of the time	210	5,310

Performance (Cronbach's Alpha=0.42)

39	My supervisor provides performance feedback that is: 1. Rare and not particularly helpful 2. Frequent enough but not consistently useful 3. Frequent and helpful to me	397	10,326
81	How consistently does your company recognize and reward the following behaviors with nonfinancial measures such as promotions, public recognitions or awards, or praise from executives? "Achieving individual objectives" 1. Rarely/Never 2. Some of the time 3. All/most of the time	210	5,310

Management Practices (Cronbach's Alpha=0.86)

7	How do top leaders communicate your company's strategy and key priorities throughout the organization? 1. Top leaders rarely communicate our company's strategy 2. The message is clear but changes frequently 3. Their message is clear and consistent over time	326	8,688
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12	How confident are you that your company's strategic priorities have the financial and human resources they need to succeed? 1. Many of our priorities lack the resources necessary to succeed 2. Some of our major priorities lack the required resources 3. Most of our strategic priorities have sufficient resources 4. All of our priorities have the funds people and management support needed to succeed	285	7,794
13	How useful are company-wide updates on performance against corporate priorities? 1. We do not receive regular updates on company progress against priorities 2. A good update on progress against priorities but could be more frequent 3. Frequent enough and clarify performance against companywide priorities	292	7,991
14	How does your company shift funds across departments functions and business units to support strategic priorities? 1. We struggle to shift funds 2. We move funds effectively but not quickly enough 3. We quickly and effectively reallocate funds 4. Don't know	399	10,674
15	How does your company reallocate staff across units? 1. We shift people without disrupting other parts of the company (✓) 2. We shift people but this often disrupts other parts of the organization 3. We rarely shift people across units 4. Don't know	315	8,572
17	How does your company exit from declining businesses or unsuccessful initiatives? 1. We struggle to exit from declining businesses or unsuccessful initiatives 2. We generally exit from declining businesses or unsuccessful initiatives but not quickly enough 3. We quickly and decisively exit from declining businesses or unsuccessful initiatives	400	10,746
18	How well do your company's information and data gathering systems help you identify what is working and not working in the market? 1. The information is neither frequent nor useful enough 2. I receive useful information but it is not timely enough 3. I have all the data I need and it is updated on a timely basis	258	7,130
26.1	When it comes to hard decisions such as firing people exiting businesses or killing initiatives our top management team: 1. Often seems unaware of things that are not going well 2. Struggles to make the hard decisions 3. Makes the hard decisions but only after a significant delay 4. Makes the hard decisions (✓)	349	9,269
29	How does your supervisor explain why current priorities matter? 1. My supervisor struggles to explain why our current priorities are important 2. My supervisor typically explains why our priorities matter in terms of our unit or team 3. My supervisor consistently explains why our priorities matter for the company as a whole and also for our unit or team	399	10,674

33	How often does your supervisor discuss how your work supports current company-wide priorities? 1. Once a week (✓) 2. Once a month (✓) 3. A few times a year 4. Once a year 5. Rarely or never	376	10,093
34	Which of the following best describes how your unit set its budget for this year? 1. We started with last year's budget and adjusted it incrementally 2. We started with last year's budget, but we made major changes 3. We start anew each year and justify expenses against our annual objectives (✓) 4. Our company does not have a formal budgeting process 5. Don't know	233	5,891
36.1	Which best describes how your individual objectives for this year were set: 1. My supervisor set my individual objectives 2. I set my individual objectives and my supervisor approved them	238	6,123
40	Do you have the resources you need to achieve your performance objectives? 1. I lack both the people and the funds needed to achieve my objectives 2. I have the necessary funds but not the people with the required skills 3. I have the funds and the people with the appropriate skills needed to achieve my objectives	376	10,093
41	For my colleagues in other departments functions and business unit I know or can easily find out. Please check all that apply: 1. Their responsibilities 2. Their current objectives (✓) 3. Their performance against objectives (✓) 4. Their unit or team's objectives 5. None of the above	348	7,931
43	To what extent does your supervisor hold everyone on the team accountable for results? 1. My supervisor struggles to hold people accountable for results 2. My supervisor holds some team members accountable for results but not everyone 3. My supervisor consistently holds all team members accountable for results	399	10,674
46	When working with colleagues in other units how well do they seem to understand your performance objectives: 1. Few of my colleagues seem to understand my objectives 2. Some of my colleagues understand my objectives but others do not 3. Most of my colleagues seem to understand my objectives	349	9,269
49	Structured processes can improve an organizations ability to get things done, but too much structure can hinder action. How would you assess your organizations processes for the below in terms of the level of structure? "Allocating funds" 1. Not enough structure / Too much structure 2. Right amount of structure	210	5,310
50	Structured processes can improve an organizations ability to get things done, but too much structure can hinder action. How would you assess your organizations processes for the below in terms of the level of structure? "Allocating people across priorities or projects" 1. Not enough structure / Too much structure	210	5,310

	2. Right amount of structure		
51	Structured processes can improve an organizations ability to get things done, but too much structure can hinder action. How would you assess your organizations processes for the below in terms of the level of structure? “Setting and managing performance objectives” 1. Not enough structure / Too much structure 2. Right amount of structure	210	5,310
65	How does your company typically deal with underperforming employees? 1. There are few consequences for poor performance 2. Poor performance is addressed but with a delay 3. Poor performance is addressed as soon as the weakness is identified	388	10,354
69	How well does your company’s compensation system reward performance against objectives? 1. Financial incentives are large enough to matter and tightly linked to performance (√) 2. Financial incentives are significant but not clearly linked to performance 3. Financial incentives are tightly linked to performance but not large enough to matter 4. Our company does not use financial incentives to reward performance	349	9,269
70	The last time you received an annual bonus what percentage out of 100 of it came from the following? (Please enter 100 in “I do not receive a bonus” if you do not receive a bonus) 1. Companywide performance 2. Performance of your team or unit 3. Your individual performance (√) 4. I do not receive a bonus	313	8,156
73	Which factors most influence promotion decisions in your company? Please pick up to three. 1. Technical expertise 2. Length of time with the organization 3. Past performance (√) 4. Collaborating with colleagues in other units 5. Ability to adapt when circumstances change 6. Acting with integrity 7. Political connections 8. Loyalty to the company 9. Pursuing ambitious targets (√) 10. Innovating 11. Informal networks who you know 12. Putting corporate values into practice 13. Potential to perform in the future	398	10,171
76	How consistently does your company financially reward the following behaviors: “Achieving individual objectives.” 1. All Most of the time (√) 2. Some of the time 3. Rarely Never 4. Don’t know	325	8,651
78	How consistently does your company financially reward the following behaviors: “Pursuing ambitious targets.” 1. All Most of the time (√) 2. Some of the time 3. Rarely Never	210	5,310

	4. Don't know		
154	How well do these priorities support your organizations strategy?	115	2,990
	1. Few of these priorities support our strategy		
	2. Some of these priorities support our strategy		
	3. Most seem to support the strategy		
	4. All of these priorities clearly support our strategy		
166.1	How often do you create new performance objectives for yourself and your team?	23	581
	1. We do not formally set objectives		
	2. Once a year		
	3. A few times per year		
	4. Once a quarter		
	5. More than four times per year		
216.2	In total, how many individual objectives are you being held accountable for this year?	259	7,264
	1. 0-2		
	2. 3-5 (√)		
	3. 6-8		
	4. 9-11		
	5. 12 or more		

B MEASURING CULTURE

B.1 Measuring culture

Surveys are frequently used to measure corporate culture (Cameron *et al.*, 2006; Hartnell *et al.*, 2011; Graham *et al.*, 2017), but they are susceptible to measurement error (Fowler, 2014). In this section we identify several potential sources of measurement error, and describe how we address them via survey design, analysis design, and testing.

Minimize ambiguity

To provide accurate measurements, survey questions should be interpreted the same way by all respondents and researchers. Ambiguous survey questions result in large and statistically significant measurement errors (Fowler, 1992). Cultural values, such as “integrity” or “collaboration,” are abstract concepts that will mean different things to different respondents. To minimize ambiguity in questions, the survey focused questions on the cultural norms that manifest in observable behavior.

In 2011 and 2012, we conducted open-ended interviews with executives about how our chosen values manifest themselves as concrete norms of behavior. In describing specific behaviors related to collaboration, for example, several respondents focused on how the company dealt with managers who achieve their targets but fail to cooperate with colleagues in other units. Examples from these interviews were then translated into survey questions, which were included in a survey generation, and evaluated for how well they were understood by respondents, especially by non-native English speakers and front-line supervisors. Based on respondents’ feedback, each question was kept as is, modified to make the wording more clear, or dropped from the Strategy Execution Survey.

As a result of this process of testing and refinement, the questions included in the survey varied over time. As a result, the sample sizes for varies by question (See Appendix for an overview). All questions that we analyze were answered by at least 110 firms, and on average 288 firms answered the questions included in our analysis. We also refined the wording of questions based on feedback from respondents.

Where such changes were minor, we consolidated the questions and treated similar phrasings of answers as identical. When the wording changes were significant, we treated them as separate questions.

The Execution Survey also minimizes ambiguity by avoiding questions that measure a respondent's level of agreement with a statement. Although they are ubiquitous in surveys, five- or seven-point Likert scales measuring agreement with a statement introduce significant measurement error (Krosnick *et al.*, 2014). Agree/disagree rating scales can be applied to any statement, including ambiguous items susceptible to a wide range of interpretations. A widely-used employee engagement survey, for example, asks respondents to rate their level of agreement (on a five-point scale) with the statement "There is good cooperation and collaboration between my division/function and other divisions/functions." Respondents may have very different interpretations of what constitutes "good cooperation and collaboration," and these divergent interpretations introduce measurement error into the survey.

Instead of agree/disagree questions, the Strategy Execution Survey relies primarily on "item specific" questions where the answer alternatives are clearly specified and unique to the question being posed (Saris *et al.*, 2010). One question to measure the value of collaboration, for example, asks "Imagine a manager achieves his or her objectives but fails to collaborate with colleagues in other units or teams. What would typically happen?" and includes question-specific answer options such as "This behavior would be addressed promptly" and "This behavior would be addressed with a delay." (See Figure B1 for all answers to this question).

Imagine a manager achieves his or her objectives but fails to collaborate with colleagues in other units or teams. What would typically happen?

- ☐ This behavior would be addressed promptly
- ☐ It would be addressed, but after a delay
- ☐ It might be addressed
- ☐ This behavior would be tolerated
- ☐ Don't know

Imagine that circumstances changed for colleagues in another unit or team, and they can no longer deliver what they promised you. How do they typically deal with these changes?

- ☐ They let us know promptly and help us find a solution
- ☐ They inform us promptly, but do not always help us resolve the problem
- ☐ They let us know, but often with a significant delay
- ☐ They often fail to communicate these changes

Management teams evolve over time. At present, how well does your top executive team appear to work together?

- ☐ They consistently work as a cohesive team
- ☐ They work well together on most issues
- ☐ There seem to be factions within the team
- ☐ Team members typically focus on their own agendas
- ☐ Don't know

Figure B.1 Example of questions assessing collaboration

No single behavioral norm will provide a perfect measure for abstract values like collaboration or innovation. To address this challenge, the survey triangulates on cultural values by using multiple questions to measure each underlying value. For the cultural values we measured, collaboration is measured by seven questions; performance by seven; accountability by six; agility, ambition, integrity, and innovation by three; autonomy and transparency by two (See Figure B.1 for examples of three of the ten questions measuring collaboration). The survey also includes 19 questions measuring management practices, and three questions measuring how well the strategy is understood throughout the firm.

Account for variance in culture across units

Some of the most influential research on culture assumes that values are strongly held throughout the organization (Kotter and Heskett, 1992; Burt *et al.*, 1994; Sorenson, 2002). These studies, however, are based on a handful of responses from the senior-most executives at large companies, who were asked to assess cultural strength for their company and for competitors (Kotter and Heskett, 1992). There are good reasons, however, to believe that values and norms will vary in strength across units within a firm.

Ethnographic and anthropological research has found that different parts of a complex organization have different subcultures (Schein, 1996) and survey-based studies confirm the presence of subcultures

(Hofstede, 1998).

Empirical research offers evidence for variation across parts of a firm in terms of performance and the usage of management practices. Economists have documented large variation in productivity of similar units within the same firm (Chew *et al.*, 1990; Freeman and Shaw, 2009). Recent research suggests that much of the divergence in unit-level performance is attributable to variance in the usage of management practices within the same firm. A survey of 30,000 factories across 10,000 US firms found that differential usage of management tools across factories within the same firm accounted for 40% of the total variation in performance across plants (Bloom *et al.*, 2017). Given this level of variance in explicit practices (e.g., monitoring, target setting, incentives), it would not be at all surprising to find large variation in implicit norms across different parts of a firm.

To control for potential variance in norms across units, we administered most of our surveys to smaller subunits within larger firms. 78% of all surveys were administered to a specific business unit, function, or geographic segment of a larger firm, while the remaining 22% were administered to the company as a whole. Surveying at the unit level is similar to the approach followed by Bloom *et al.* (2017), who reported a median establishment size of 80 employees (average 167 employees) in their study of factory-level adoption of management practices.

Measurement error resulting from a single respondent

Even when asked the same question about the same aspect of the company, respondents will answer differently. Divergent answers from separate managers in the same plant accounted for 45 to 49% of the variation in factory-level usage in management practices (Bloom *et al.*, 2017; Bloom and Van Reenen, 2010). To minimize this source of measurement error, we administer surveys to multiple employees per firm. The median number of respondents was 23 (8% of the unit's employees), and the average was 27.

Middle managers play a particularly important role in transmitting and reinforcing cultural norms throughout the firm by their behaviors and the initiatives they choose to support (Huy, 2002; Rouleau, 2005; Wooldridge *et al.*, 2008). Middle managers are also well positioned to assess how well their firm

recognizes and rewards values such as collaboration across units, innovation, and ambition, that might be less apparent to front-line employees or individual contributors. This survey targets managers including the executives responsible for running the company, business unit, function, or department (13% of all respondents), their direct reports (33%), other middle managers (25%), and front-line supervisors or team leaders (16%).

The survey takes on average 31 minutes to complete, which means that the typical survey required over ten hours of collective effort from a firm's respondents to complete. We took several steps to secure participation. First, the survey was a required part of an executive education course on strategy execution offered at the London Business School and MIT Sloan School of Management. As a pre-requisite for attending the course, each participant had to send the survey to at least 20 managers responsible for executing strategy in their firm.

The typical participant in the executive education programs had at least 200 direct and indirect reports, and was sufficiently senior to sponsor the survey. To increase their incentives to promote the survey, we provided each company with a 78-page customized report that consolidated their responses to all questions, and compared their results to all firms that had completed the survey. The report provided an overview of how the firm performed on factors driving execution (e.g., collaboration, agility) broken down by management practices (e.g., incentives, goal-setting) and cultural norms.

We tracked survey completion percentages, and sent follow-up emails to firms with low participation rates showing how their firm's completion rate compared to other companies participating in the same executive education course. At least 42% of potential respondents who received the survey opened it.

Even with executive sponsorship, individual respondents may not complete a survey if they view it as too long or uninteresting. In our beta versions of the survey (not included in the results reported in this paper) we sought extensive feedback from respondents on all questions. We asked respondents to grade each question on how clear and engaging it was. We learned that participants were most likely to answer questions that they believed mattered to the firm's performance, that they could answer, and that they had not been asked before. We used these criteria to formulate the questions used in the final version of the

survey. On average, 89% of respondents who began the survey completed it, even though the survey took half an hour to fill out.

Avoiding non-differentiation

When respondents are asked to rate multiple items using the same scale, they are much more likely to fill in the same answer for different questions to economize on cognitive effort and time (Krosnick, 1991). Faced with multiple questions using the same five-point Likert scale, for instance, many respondents will choose a single point on the scale and apply it across diverse items. The “acquiescence bias” is another source of non-differentiation among survey items. Over 100 studies have documented the acquiescence response bias, whereby survey respondents tend to agree with almost any statement, regardless of its content (Saris *et al.*, 2010). Respondents’ tendency to satisfice when responding to questions using the same scale diminishes differentiation in their answers across different questions, and introduces significant measurement error (Visser *et al.*, 2000).

To minimize the risk that respondents would shift to autopilot in responding to questions, we avoided agree/disagree Likert scales altogether. We also varied the format of questions, including free text responses, numeric range (e.g., number of objectives responsible for achieving), frequency (e.g., how frequently colleagues deliver on their commitments), randomized list of multiple answers with no obviously correct answer (e.g., factors that most influence promotion decisions), percent of total (e.g., percent of bonus linked to individual, team, and corporate performance), and hypothetical questions (Kang *et al.*, 2011).

Common method bias¹

Our study relies on the same survey to measure all variables, and may be susceptible to common method bias, or spurious correlations that arise from the use of a single instrument rather than actual relationships between the underlying variables of interest. For example, a recently promoted manager might be

¹ Portions of the sample description section are repeated here, for clarity.

favorably disposed to her company, and rate the company higher across the board on all items. A respondent's tendency to answer all items the same way could result from the desire to appear consistent in the answers that they give (Salancik and Pfeffer, 1977; Johns, 1994), enduring tendency towards positive or negative disposition (Watson and Clark, 1984), transient mood states, or other biases.

Social scientists have compared research relying on a single questionnaire to multi-method designs to estimate the amount of variance attributable to using a single measurement tool (Cote and Buckley, 1987). According to these studies, common method bias can account for one-quarter or more of the variance explained by correlations coming from a single instrument. Recent reviews of the empirical evidence, however, challenge the assumption that using a single survey necessarily inflates correlations of all measured variables across the board (Crampton and Wagner, 1994; Lindell and Whitney, 2001; Spector and Brannick, 2009; Spector, 2006). Instead they find that specific biases (e.g., respondents' tendency to agree with default responses or present themselves in a socially acceptable light) or research design choices (e.g., question sequence or choice of rating scale) affect correlations among some items, but not others.

We address common method bias in two ways. First, we make survey design and analysis choices to mitigate the potential for common method bias. Second, we test for common method bias using a marker variable and questions where the best answer is not obvious to respondents to estimate the impact of a common method bias, if it exists. We find little evidence of potential common method bias, consistent with our design choices.

Survey design and analysis choices that mitigate the risk of common method bias: Some survey design choices create biases that artificially inflate correlations between variables. Ambiguous survey questions or the use of a common rating scale, for example, can lead to non-differentiation in answers. We mitigate these risks through the survey design choices discussed above, including testing and refining of questions to ensure different respondents understood them in the same way; using item specific questions rather than Likert scales; varying question format; separating questions asking about the same variable; and the inclusion of questions with no obvious right answer.

The second important design choice that we make comes from having multiple respondents per firm, but analyzing our results at the firm level (discussed in more detail in the Analysis Plan section). This means that any idiosyncratic bias that comes from a respondent having a positive or negative outlook is quickly averaged out by other respondents. Because of our large number of respondents per firm, this helps us substantially. For example, imagine that individuals were enormously swayed in their answers by day-to-day fluctuations in their lives, such that the expected impact was that 50% of all the variation in their answers came from that, rather than real characteristics of the company's culture. This would be a large problem for a survey with only single respondents per firm, but for a survey with 27 respondents per firm (our average) the expected misallocation component would fall to just 3.7% of the variation² (because of the central limit theorem). Thus, even large idiosyncratic fluctuations would produce only small amounts of common method bias because of our sample sizes.

If such biases are systematic, then our challenge is greater. High growth and profitability, for example, might create a “halo effect” whereby employees assume their organization excels on every dimension because it is performing well in the market (Rozenszweig, 2007). If this were the case, then scores would be high across respondents, which would influence firm-level values. Although our survey design helps mitigate these concerns, we cannot rule them out. Thus we test for common method bias empirically.

Empirically testing for common method bias: The use of a marker variable is a widely-used method to estimate the impact of common method bias on survey results (Craighead *et al.*, 2011; Lindel and Whitney, 2001; Malhotra *et al.*, 2006). In this approach, a survey includes one or more questions that resemble other items in the survey, but is theoretically uncorrelated with them. The ideal marker item should resemble the form of other questions, address the same unit of analysis, but be conceptually distinct from all or most of the other variables being measured. If, for whatever reason, respondents have

² The expected variation from the idiosyncratic part is $\frac{50\%}{27-1} = 1.9\%$, and therefore the share of all variation would fall to $\frac{1.9\%}{50\%+1.9\%} = 3.7\%$. The specificity of this result implicitly assumes that the distribution of the initial fluctuations was Gaussian, although the overall implication does not.

a general tendency to answer consistently well (or poorly), they should rate the marker variable well (or poorly) too. Thus, correlations between the marker variable and theoretically independent variables can shed light on the presence and magnitude of common method bias.

The marker variable in the Strategy Execution Survey asked respondents “What would happen if a key partner such as suppliers of critical components, distributors, or alliance partners acted in a way inconsistent with your organization’s values” and answer options included “This behavior would be addressed promptly,” “It would be addressed but after a delay,” “It might be addressed,” “This behavior would be tolerated, and “Don’t know.” This question followed the precise form of three other questions that asked how promptly and consistently specific behaviors, such as poor performance or failure to collaborate across units, are addressed. Like other questions in the survey, the first response reflected well on the respondent’s firm, while other options painted a less positive picture.

Despite the marker item’s similarity in terms of focus on the firm, question structure, and answers that reflected well or poorly on their firm, it differed on two key theoretical dimensions from the other questions included in the survey. First, strategy implementation largely takes place within a firm, and all other questions in the execution survey questions focus on intra-firm behaviors and norms. Second, this question was the only one in the survey that referred to general “values.” All other items avoided the term “values” (as well as “culture” or “norms”), and instead specified concrete, observable behaviors. The correlation coefficient between the marker question, which we included in 126 surveys, and all other variables in those surveys was (0.02).

A second test of the magnitude of common error bias is the introduction of variables where the “best” answer is not obvious to the respondent. If the underlying correlation among variables is real (and not a result of common method bias) then the correlations between variables where the “best” response isn’t obvious should be nearly as high as those questions where the best answer is clear to respondents. In contrast, if common method bias is a serious problem, questions with a clear best answer will be largely uncorrelated with items where the best answer is not obvious.

The Strategy Execution Survey includes seven questions designed to make sure the best and worst

answers are not obvious to respondents. The average correlation coefficient of questions with no obvious right answer with all other questions is 11.3%, versus an average correlation coefficient of 14.3% for all questions with one another. The small difference between these, 3 percentage points, suggests that if there is a common method bias, it might explain as much as one-fifth $\left(\frac{3.0}{14.3}\right)$ of the pairwise correlations we observe. Even if we assume this (and thus scale down the magnitude of our findings), our conclusions would not change.

Thus, because of our survey design and analysis choices, and because of empirical tests on a marker question and questions with no obvious best answers, we conclude that common method bias is not driving our results.