Trade-offs in Firm Culture? Nope, You Can Have It All[*]

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Abstract

A firm can exhibit many "good" cultural values, for example collaboration, integrity, or ambition. Influential theories of corporate culture claim that firms must choose which cultural values to foster because of inherent trade-offs between them. This paper tests this proposition using a new survey of managers (370 firms, averaging 27 respondents each). We find no evidence of trade-offs. To the contrary, *we find that firms that score higher on one cultural value also tend to score higher on others*. Our findings suggest that any inherent trade-offs are outweighed by the ability of good management practices to help a firm excel across many cultural values.

Keywords: Corporate Culture; Organizational Culture; Strategy Implementation; Management Practices; Survey Design

INTRODUCTION

In September 2016, Wells Fargo agreed to pay the largest penalty ever assessed by the Consumer Financial Protection Board 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, leading to fines, potential lawsuits and criminal charges, and heavy reputational damage. Reflecting on this failure in a report put together by their independent board directors, Wells Fargo concluded that "The root cause of sales practice failures was the distortion of the Community Bank's sales culture…" (Independent Directors of the Board of Wells Fargo & Company, 2017). The report goes on to detail how managers set ambitious sales targets for bankers and held them strictly accountable for achieving these goals, even if they were deemed unrealistic by the employees.

This Wells Fargo example highlights a prominent view in the firm culture literature, that building a firm culture implies trade-offs in values – in this case, that fostering greater ambition came at the cost of integrity. This is merely one example of the conflicts that can arise between values. Groysberg and his colleagues, for example, argue that an organizational culture that emphasizes caring for employees conflicts with the drive to deliver results (Groysberg et al., 2018). Goffee and Jones (1996) contend that a corporate culture that values friendliness can blunt the candor required for honest feedback and difficult decisions.

Despite the clear potential for such conflicts, this paper argues (and presents evidence) that competition between values explains little of the observable differences in culture between firms. Instead, we argue that differences in firm culture are better explained by how effectively firms build the cultural values that are important to them. This distinction can be thought of as analogous to firm productivity in the context of Porter's Productivity Frontier (Porter, 1996). The view that culture requires trade-offs is analogous to Porter's view that firms will be on the frontier and need to make trade-offs to differentiate. But, just as Bloom and Van Reenan's work on productivity has shown that many firms are inside the productivity frontier (Bloom and Van Reenen, 2007; Bloom *et al*., 2017), this paper shows that many firms are inside the 'cultural frontier'. In both cases, the important implication being that improved management practices allow firms to improve their

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performance without tradeoffs. This paper shows that empirical differences in firm cultures are well explained by differences in firm cultural execution, but not by competing values.

Our findings are important because, as the Wells Fargo example illustrated, corporate culture, by shaping employees' behavior, can have a material influence on firm performance. For Wells Fargo, their cultural failure led to the company dropping off Fortune magazine's annual list of the world's most admired companies, after ranking 25th in 2016 (Colvin, 2017). A separate Harris survey of corporate reputations saw Wells Fargo experienced the largest single-year drop in Harris Poll history, landing at second to last place (Harris Poll, 2017).

The link between culture and important firm outcomes is widely understood among executives. A recent survey of 1,348 North American CEOs and CFOs found that 92% believed that improving corporate culture would increase their firm's value (Graham *et al*., 2017). Empirical research provides correlational support for these assessments. Companies that made the list of Best 100 Companies to Work For (which is based largely on surveys of corporate culture) delivered 20% higher returns to shareholders over a five-year period compared to similar firms (Edmans, 2012). A separate study used GlassDoor's "Best Places to Work" (another ranking based on corporate culture) to construct portfolios of stocks of companies with strong cultures (Chamberlain, 2015). The resulting portfolios earned an average annualized return of 18–23% back-tested between 2009 and 2014, versus 14% for the S&P 500 Index.[1]

The assumption of trade-offs among values is built into one of the most influential models of corporate culture – the Competing Values Framework (Quinn and Rohrbaugh, 1983) – which is a widely used tool to assess corporate culture. A survey to measure these competing values has administered to over 10,000 organizations (Cameron *et al*., 2006) and the framework was used to structure a recent meta-analysis of the corporate culture literature as a whole (Hartnell *et al*., 2011). Other models also implicitly represent corporate culture in a way that implies trade-offs among conflicting values (Goffee and Jones, 1996; Groysberg *et al*.,

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[1] The Best Places to Work portfolios also had higher volatility than the S&P 500 Index. The standard deviation of annualized return at the portfolio level ranged between 0.19 and 0.22 for the Glassdoor portfolios versus 0.10 for the S&P 500. The Best Places to Work portfolios also consisted of significantly fewer stocks—between 30 and 40—that contributed to their volatility.

2018), The core assumption of all these model is that, when it comes to values, firms can't have it all. The theory of trade-offs among competing values sounds plausible, but is it true?

In this paper, we propose an alternative view, where firms strive to cultivate *cultural effectiveness,* moving them towards the *cultural frontier.* We define these two terms to parallel Porter's concepts of *operational effectiveness* and the *productivity frontier*.

In his summary of strategic theory, Michael Porter introduced the construct of the "productivity frontier" (Porter, 1996). Porter argued that firms could be conceptualized as bundles of hundreds or thousands of activities, such as processes to serve customers, develop new products, or manufacture goods. Taken together, these activities increased customers' willingness to pay for a good or service but also added costs. Porter defined the productivity frontier as the "sum of all existing best practices at any given time." Firms that are on the frontier face hard trade-offs. An automaker at the frontier, for example, might find that the only way to cut costs would be to eliminate activities that added value for customers. Firms within the frontier, however, could take actions that would move them towards the frontier, improving "operational effectiveness". Porter gives the example of U.S. automakers in the 1980s which learned, after studying Toyota's production techniques, that implementing lean manufacturing processes would cut costs and improve quality at the same time.

Insert Figure 1 Here

We posit a model analogous to Porter's, where instead of improving operational effectiveness to get to the productivity frontier, firms strive to improve their cultural effectiveness to get to the cultural frontier (the sum of all existing best culture-improving practices at any given time). Figure 1 shows this schematically. Firms, in this view, only face trade-offs between cultural values when they are at the frontier. Most firms, however, will not be on the frontier, and thus there will be scope to improve cultural effectiveness by moving up and/or right in the figure, that is, moving towards the frontier to build a better corporate culture.

Corporate culture, as we use the term, refers to a bundle of cultural values that are deeply held, widely shared throughout the firm, and shape behavior over time (O'Reilly and Chatman, 1996). Managers and employees can take a large number of actions to build and reinforce the desired culture. Common levers to

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influence culture include hiring, promoting, and firing employees based on congruence between their personal values and firm culture; symbolic actions that reinforce specific cultural traits; training; and incorporating cultural considerations into strategic decisions such as which companies to acquire. At any point in time, the cultural frontier is the set of activities that is both achievable and best promotes the desired bundle of values.

Assuming a frontier exists, an important empirical question arises: how easy is it to reach the frontier? Porter argues that firms will quickly adopt best practices and thus rapidly approach the productivity frontier. As a result, he argues, firms cannot sustain an advantage based on adopting known best practices. Recent empirical work by Nicholas Bloom and John Van Reenen, however, calls into question both the rapid adoption of practices and firms' inability to sustain competitive advantage (Bloom and Van Reenen, 2007; Bloom *et al.*, 2017). Bloom, Van Reenen and their co-authors measure a subset of structured management practices including target setting, incentives, and performance monitoring that are widely-believed to improve performance in manufacturing settings. Through careful interviews, they assess whether individual plants have adopted these management practices. They find wide variance in the use of sixteen structured management practices across US manufacturing plants (Bloom *et al.*, 2017). In one study, one out of every four factories had failed to adopt half of known best practices (Bloom *et al.*, 2017). Thus, their findings reveal that many companies had not adopted well-established practices.

These authors also provide compelling evidence that the adoption of management practices improves productivity. They find that one-third of the differences in firm level productivity is explained by differences in the plant's use of management practices (Van Reenan, 2018), and present causal evidence that interventions to adopt best-practices improve productivity (Bloom et al., 2011). Their research demonstrates that many plants lie inside the productivity frontier, and that adopting good management practices can move them towards it.

We postulate that firms will find it even more difficult to approach the cultural frontier than to reach the productivity frontier. The quality of a firm's culture is more difficult to measure than outcomes associated with productivity, such as defect rates, waste, or product quality. The mechanisms to reinforce desired cultural norms, moreover, are less well understood and codified than structured practices such as Six Sigma or agile

software development that improve productivity. As a result, we argue that the vast majority of firms will fall well short of the cultural frontier and thus will not face the trade-offs in cultural norms found at the frontier. Based on this argument, we hypothesize that we should observe little to no evidence of negative trade-offs between cultural norms we measure empirically.

This paper analyzes the results of a novel survey administered to 9,930 managers across 370 firms. We find no evidence of trade-offs across the cultural values we measure with the survey. To the contrary, we find significant positive correlations across the cultural norms we measure. Moreover, we find that the positive correlations between cultural norms decrease as firms approach the cultural frontier. Thus, this paper concludes that, contrary to theory and conventional wisdom, trade-offs between cultural values are relatively rare. Most firms are inside the cultural frontier, and thus their managers can take actions that strengthen more than one cultural value at a time. In short, when it comes to improving corporate culture, most firms can "have it all."

Finally, to help understand why firms perform well across multiple cultural values, we connect our cultural findings with firm performance on structured management practices. Just as Bloom *et al*. found that good adoption of management practices is correlated with productivity, we find that good adoption of management practices is correlated with excellent performance on cultural values. Taken collectively, these results support a view where corporate culture and management practices mutually reinforce one another. Managers, as a result, can use structured management practices, like those studied by Bloom and Van Reenen, to shape their firm's culture.

DEFINING AND MEASURING CORPORATE CULTURE

The principle source of data for this paper is an online survey (hereafter referred to as the Strategy Execution Survey or survey) originally developed by the first author and Rebecca Homkes, and subsequently developed and refined by the first author. 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,

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and key values and norms that supported strategy implementation (Sull *et al.*, 2015). Figure 2, Panel (a), shows the number of firms that took the Strategy Execution Survey by year.

Insert Figure 2 Here

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).

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 are the recurrent practices that embody these values and translate them into action on a day-to-day basis. A company might value collaboration, for instance, which would be supported by 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). Formal management practices and informal norms of behavior both interact with culture, and the Strategy Execution Survey measures both. 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.

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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 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 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.

Selecting which values to measure

An analysis of the websites of companies in the S&P 500 Index identified more than 50 distinct values those companies used to describe their corporate culture (Guisa *et al.*, 2015). 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), 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 four values: accountability, ambition, autonomy, and transparency. In total, we analyze nine values in this paper.

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) and bias. We address a panoply of these concerns in Appendix B, but highlight a few key ones here to show how our survey design minimizes them.

If survey questions are interpreted differently by respondents, it can lead to large and statistically significant measurement errors (Fowler, 1992). This can be particularly challenging for cultural values, where concepts such as "integrity" or "collaboration," can easily mean different things to different respondents. To address this, the survey focused on how cultural norms manifest in observable behaviors that are easier to agree on. The questions were also refined using open-ended interviews to ensure common understanding and the survey avoided Likert scales, which themselves can introduce measurement error (Krosnick *et al.*, 2014).

The avoidance of Likert scales also helps with non-differentiation, where respondents will tend to fill in the same answer, even for different questions, if presented on the same scale (Krosnick, 1991). 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).

Measurement error can also be an issue if only a single respondent is used to gather data on each company. Bloom et al. (2017) and Bloom and Van Reenen (2010) find that 45 to 49% of the variation in factory-level usage in management practices arises from divergent answers by separate managers *at the same plant!* 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.

Our large number of respondents per company also help us with common method bias, as does our variation in question types. Common method bias arises when all the variables of interest are measured using a single instrument, which can lead to spurious correlations if, for example, a recently promoted manager was favorably disposed to her company, and rated the company higher 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), enduring tendency towards positive or negative disposition (Watson and Clark, 1984), transient mood states, or other biases. Previous findings indicate that common

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method bias can account for one-quarter or more of the variance explained by correlations coming from a single questionnaire (Cote and Buckley, 1987). A number of our design choices reduce our exposure to this risk. Our large number of respondents per firm helps a lot. For example, imagine that individuals were enormously swayed in their answers by day-to-day vicissitudes of 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 variation[2] (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 test for this, we empirically test for common method bias using a marker variable approach (Craighead et al., 2011; Lindel and Whitney, 2001; Malhotra et al., 2006). These allow us to bound the variance coming from common method bias to no more than one-fifth (full details in Appendix B).

Thus, by construction, our survey is able to address many of the most problematic potential sources of bias and measurement error, and thus we conclude that it provides a strong measure of actual firm culture.

1.1 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 the tenure of our respondents, with more than half having 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

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[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.

existed for 41 years, is publicly held[3], and has nearly 10,000 employees.

Insert Table 1 and Table 2 Here

ANALYSIS PLAN

The goal of our analysis is to understand whether the competing value theory or our cultural effectiveness theory better explain observable patterns in firm culture. The key distinction between these theories is what they imply about correlation patterns between values. In particular, the competing value framework implies a negative correlation because of the trade-offs, whereas our cultural effectiveness theory does not require any correlation, although it opens the possibility for a positive correlation if being good at implementation applies broadly across cultural values. This section develops these lines of argumentation explicitly, discusses the data that we use for testing, and shows why analysis of the correlation matrices best distinguishes them.

If theories such as the Competing Values Framework are correct, firms make choices about which cultural values to strengthen and then must pay a price as the competing values suffer. For example, if integrity and accountability are particularly important for an auditing firm, we would expect it to emphasize these in selecting employees and then to build a culture that embeds these values in work practices and norms at the expense of other values, such as innovation or agility. Thus, the traditional model of firm culture implies that we should observe *negative* correlations across cultural characteristics.

An alternative view is that firms lie within the cultural frontier, and leaders can take actions to move towards the cultural frontier without making tradeoffs across values. Managers could, for example, make improvements that advance a particular cultural value without affecting others, or even improve multiple values simultaneously. For these firms within the cultural frontier, steps to improve cultural effectiveness could dominate trade-offs between values. Thus, if most firms are within the frontier, we should observe a *neutral* or *positive* correlation in the performance on cultural values across firms. We can make the stronger assertion that the correlation is strictly positive if we assume that some aspect of cultural effectiveness, say

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[3] 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.

better management practices, make some firms better across a range of characteristics.

Thus, empirically, we should see very different correlation matrices based on whether the competing values framework or the cultural effectiveness framework is right. In particular, consider four values: A, B, C, and D. Assume that in a competing values framework each value competes with the others. Then we should expect a correlation matrix, like Figure 3(a), that is dominated by negative correlations in the off-diagonal positions, reflecting the trade-off in values. If, instead, firms can move towards the frontier in multiple dimensions, and or the values naturally complement each other (say via shared management practices), then we should expect a correlation matrix like Figure 3(b) where the off-diagonals show positive correlations. As these illustrative examples show, the correlation of the off-diagonal entries provides a strong test of the Competing Values Framework and thus will be central to our analysis.

Insert Figure 3 Here

Survey Data: Coding responses

As discussed in sections Defining culture and Measuring culture, 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 as 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.

We also map survey questions to the cultural values they were intended to measure. We map to the following cultural values: integrity, ambition, innovation, autonomy, accountability, agility, collaboration, performance and transparency. We also map questions to structured management practices such as resource allocation, goal setting, and operational processes. We provide full details of all the mappings in 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.

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.

Correlation between values

We calculate correlation between values at the firm-culture level. First, we calculate each firm's average response for each culture value (aggregating individual responses to the firm level). We then calculate the correlation between each pair of values at the firm level.

It is possible that even if the above analyses yielded positive correlations between values, that this could be driven entirely by a subset of firms that scored poorly on several values. While this itself would be interesting, it would not address a key managerial concern: is it possible to build systematically better firm cultures. To check this, we perform a variant on our analysis, that replaces a percentile score for a firm's cultural value with a dichotomous (0/1) variable that is 1 if the firm is in the top 25% of firms for that value and 0 otherwise. This allows us to ask the more-targeted question: do the choices and investment needed to

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get a firm into the top quartile of a cultural value induce trade-offs that make the firm less likely to have other cultural values in the top quartile? To explore this effect, and whether it changes as firms approach the cultural frontier, we consider a variety of cut-offs (other than 25%) for this threshold.

RESULTS

For our analysis, we consider each cultural value in terms of its average strength and the variation across firms and individuals. We then look for correlations in the patterns of cultural values and run simulations to provide context for these correlations. Throughout our analysis we find no evidence of trade-offs in cultural values, but instead find pervasive evidence that firms can "have it all".

Strength of cultural values

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 autonomy and accountability, and lowest on collaboration, ambition and innovation. Interestingly, innovation is not only the lowest cultural value on average, it also has the second highest standard deviation.

Correlations across cultural values

Recall, from Analysis Plan section, that the key empirical distinction between a trade-off and cultural effectiveness view of firm culture is the correlation of cultural values across firms. The trade-off view implies negative correlations, whereas the cultural effectiveness view implies positive ones.

Figure 5 shows the correlation between cultural values at the firm level. For example, the 0.62 value at the intersection of Collaboration and Agility reveals that across the firms in our sample there is a 62% 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.

Insert Figure 5 Here

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The most striking finding in Figure 5, and the main finding of this paper, is that virtually all the pairwise correlations between cultural values are positive. Of the 36 off-diagonal correlations that we report, they have an average correlation of 0.29, and 35 are positively correlated. In other words, firms that rate well in one cultural value tend to rate highly in others as well. This finding is alternatively articulated as an absence of negative correlations. Only 1 correlation is (barely) negative: integrity-transparency, and only 2 more have correlations less than 0.1: accountability-ambition (0.06) and autonomy-ambition (0.01). This is not at all what one would expect to see if firms were arrayed along the cultural frontier and had to make difficult trade-offs between cultural values. For example, we began the paper with a motivation about the trade-offs one might expect between ambition and integrity. If that was indeed a central trade-off that firms were making, then that pairwise correlation should be negative. But it isn't, it is 0.2. Indeed, *we observe no systematic trade-offs in our results*.

Thus, our main result shows the opposite of what would be expected if firms were making hard cultural value trade-offs. This suggests two possible explanations. One is that, even in principle, there aren't trade-offs between cultural values. We find this explanation implausible given the host of well-articulated theories about why such trade-offs should exist (Quinn and Rohrbaugh, 1983; Goffee and Jones, 1996). A more plausible explanation is that trade-offs do exist for firms at the cultural frontier, but that most firms fall within the frontier and thus don't face such trade-offs. We discuss this in more depth in our discussion section.

What is driving these results?

Having observed correlations in cultural values, we now turn to understanding what is generating them. In particular, we consider what this means for managers striving to build the best corporate cultures.

In looking at the best performers, we consider a key managerial concern about whether it is possible to build firms that are systematically better across many aspects of culture. To address this, we modify the dependent variable from our previous correlation table from the percentile of the distribution to a dichotomous one which is 1 if that firm is in the top quartile of a cultural value and 0 otherwise. Figure 6 shows the results.

Insert Figure 6 Here

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There are two key facts to note from Figure 6. First, the correlations remain overwhelmingly positive, confirming that firms can indeed excel systematically across many areas of culture. Second, while the correlations in Figure 6 are positive, they are smaller than those observed in Figure 5. (showing an average correlation of 0.20 instead of 0.29). This diminishment in correlations is consistent with our argument that trade-offs are not required when firms are inside the cultural frontier, but become so as they approach the frontier. We can see this trend explicitly in Figure 7, which repeats the above analysis, but considers a variety of definitions for being a "top" performer. These range from a lax definition (just being above the median), to a stringent one (being in the top 5%). Rather than showing the full heatmap for each of these, we report only the average correlation for the non-diagonal entries.

Insert Figure 7 Here

Figure 7 reveals that our finding from Figure 6 (that correlations were weaker at the 75th percentile than overall) is part of a larger trend: firms find it more difficult to excel across multiple values as they move closer to the cultural frontier. That is, if a firm scores in the top 30% (i.e. cut-off of 70%) for one value, then it is likely to be able to score highly on other cultural values as well. But, if a firm scores in the top 5% (i.e. cut-off of 95%) on one value, it is still somewhat more likely to score highly on other values, but not nearly as much. Importantly, this finding is not a mechanical consequence of the calculation itself. If values were independent, this analysis would show correlations of ~0% across all cut-off levels.

This finding is consistent with two aspects of our theory, so either or both could explain it. First, it is consistent with our theory of the cultural frontier. If trade-offs are required at the cultural frontier, but not inside it, then we would expect firms that approach the frontier to transition from positive correlation to no correlation and then to negative correlation. We observe a move from positive towards no correlation, consistent with this. A second potential explanation for this finding is that firms develop *cultural effectiveness* – that is, they adopt good management practices that improve many cultural values. In simulations of this type of model (similar in spirit to those reported below), we also find a drop-off in correlations at high thresholds.[4]

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[4] For our cultural effectiveness simulations we considered each firm to have culture scores for each value of $Y_i = \alpha + (1 - \alpha) * W_i$, where α is Cultural Effectiveness, which contributes across all values, and W_i is idiosyncratic performance

Thus, while we cannot determine which of these effects would be more likely to cause our empirical finding, both are consistent with it (as well as with our theoretical model).

SIMULATION

Setup

In both the traditional trade-off-based view of firm culture and our cultural effectiveness view, performance on one cultural value of a firm should be, to some extent, predictive of other values.[5] That is, firm cultural values should exhibit statistical dependencies. We explore this dependence explicitly by simulating the distributions of firm values based on potential dependencies between then.

For example, if cultural values are independent, then they could be well-simulated by a generative model where the probabilities of getting better or worse scores across cultural values are not affected by the draws of other values. Mathematically:

$$p(Y_1, \dots, Y_N) = p(Y_1)\, p(Y_2|Y_1) \dots p(Y_N|Y_1, \dots, Y_{N-1}) = \; p(Y_1)\, p(Y_2) \dots p(Y_N)$$

where each Y_i represents a cultural value and $p(Y_1, \dots, Y_N)$ represents the probability of a firm having a particular set of value scores. Because of the statistical independence, this joint probability is just the product of the independent values for each value, $p(Y_i)$.

We can generalize this data generating process by adding back dependence that parameterizes the correlation between factors and includes a draw, W_i, which is independent of the other values.

$$Y_i \sim f(Y_1, Y_2, \dots Y_{i-1}, W_i)$$

We make the additional assumptions that correlation effects are additive, pairwise, and symmetric to get:

$$Y_i = \; f(Y_1) + f(Y_2) + \dots + f(Y_{i-1}) + f(W_i)$$

We can then re-cast this as a weighted average[6], where each other cultural value contributes a percentage

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on that value. Both are drawn from uniform distributions. This model also predicts a drop-off in correlations at low thresholds, which we also see in our data.

[5] Although these two theories would, of course, predict in opposite directions.

[6] Notice: because γ can be negative, this can produce results outside our desired range of 0 to 1. In such circumstances, we rescale to return it to this range.

of its own value, γ, to the others:

$$Y_i = \gamma Y_1 + \gamma Y_2 + \cdots + \gamma Y_{i-1} + (1 - (i-1)\gamma)(W_i)$$

But each Y_j is itself also a weighted average, i.e.

$$\gamma Y_{i-1} = \gamma(\gamma Y_1 + \gamma Y_2 + \cdots + W_{i-1}) = \gamma^2 Y_1 + \gamma^2 Y_2 + \cdots + \gamma W_{i-1})$$

This recurrence creates an infinite series, which we can rewrite as a function of the independent parts of each component:

$$Y_i = \alpha * W_1 + \alpha * W_2 + \cdots + \alpha * W_{i-1} + \left(1 - \sum_{i-1} \alpha\right) W_i$$

That is, each cultural value is a linear sum of impacts from other cultural values, plus an independent portion. The influence of the other cultural values is parameterized by α.

To generate a distribution under this null, we replicate this simulation 10,000 times. By varying α across simulations, we develop a series of distributions reflecting different levels of correlations. We use standard grid search with a least squares target function to generate our estimate for $\hat{\alpha}$.

Our estimator, α, has a straight-forward interpretation: it is the extent to which being better in one dimension of culture makes you better in all others. $1 - \sum_{i-1} \alpha$ is also informative. It is the share of a cultural value that is independent (i.e. not due to dependencies on other values).

Results

Using the simulation setup described above we can seek to better understand the empirical findings discussed earlier. Figure 8, Panel (a), shows the empirical results we see in our data (solid line) as compared to the distribution one would expect if cultural values had no correlation (dashed line). The lighter zone around the simulation shows two standard deviations in the distribution of simulation outcomes, showing that the distributions are statistically significantly different almost everywhere.

Insert Figure 8 Here

Figure 8, Panel (a), shows that the true distribution of firm cultural values has a much greater variance than one would expect by chance if such values were assigned randomly and had no influence on each other.

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The thicker tails of the distribution are particularly interesting, suggesting that there are many more firms that are systematically poor at culture (left tail) and many more that are systematically good at culture (right tail) than one would expect if the strength of different values were uncorrelated with one another.

By varying the level of pairwise influence of one cultural values on another, i.e. α in the generative model, we can infer the level of influence that would be needed to produce a distribution similar to that observed in our empirical data.

Figure 8, Panel (b), shows that simulations with positive correlations between cultural values do a much better job of approximating our empirical results. Using numerical optimization[7] we find that the optimal α is 6.7%. Recall, from our generative model, that this reflects how much each value affects each of the others. Thus, the interpretation from our generative model is not just that values aren't independent, but that they influence each other strongly. We can even be more quantitative about the size of these interdependencies. Since each value is affected by all of the other eight other values in our model, it gets a collective contribution $8 * 6.7\%$[8], or 54%, of its value from them. Put another way, only 46% of the score on one value in attributable to progress on just that value, 54% is attributable to interdependencies.

DISCUSSION

Competing values, but only at the frontier

This paper tests the widespread view that firms must make trade-offs between competing values, where increased emphasis on one value, such as collaboration, comes at the expense of another. Looking across more than 370 firms and almost 10,000 respondents, we find no evidence to support this view. Instead we find that firms that excel in one dimension of culture are systematically more likely to do well on other values as well. Looking across pairwise correlations between the nine cultural norms, we find that nearly all are positive and

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[7] Calculated by minimizing sum of squared difference for 10 bins between real value and the simulation (10,000 times for each value). Tested for using a grid search, with spacing of 0.001.

[8] We saw in Figure 5 that the average pairwise correlation of values was 29%, much higher than the 6.7% reported here. This suggests that much of the pairwise correlations come from broader correlations across many cultural values (and which would then be multiply counted in the heatmap but not the generative model). This is precisely what we would expect if managerial practices came in bundles and could improve performance across multiple cultural values.

that they average 29%.

Our findings are consistent with a recent meta-analysis (Hartnell *et al*., 2011) that looked at the correlation between the Competing Values Framework's cultural archetypes (clan, adhocracy, hierarchy, and market), and found that all six pairwise comparisons among these cultural archetypes were positively correlated, with an average correlation coefficient of 0.54. They also find positive correlations where the Competing Values Framework predicts negative ones, although they caution that they are unable to address common method bias issues.

While our findings show no trade-offs between cultural values, they do not refute that such trade-offs could exist. Rather, our findings suggest that they cultural trade-offs are most likely to hold at the cultural frontier, where managers have exhausted all the actions that do not require trade-offs. We interpret our results as evidence that the firms in our study fall well within the cultural frontier, and can therefore improve multiple dimensions of culture at the same time. This aligns well with other survey data on corporate culture. In a survey of CEOs and CFOs across more than 1,300 firms, only 15% of executives reported that their culture was where it should be (Graham *et al*., 2017).[9]

Our findings that the average correlation between a "top" firm across multiple cultural norms falls as our definition of "top" becomes stricter, is consistent with a story where firms within the frontier can improve on multiple cultural dimensions at the same time, but as they approach the frontier they find it harder to make improvements in one value without diminishing another. Values may, indeed, compete with one another, but only for the small minority of firms at or near the cultural frontier.

Culture norms correlate with structured management practices

Our research complements the work of Nicholas Bloom and John Van Reenen on structured management practices including target setting, incentives, and performance monitoring (Bloom and Van Reenen, 2007;

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[9] Firms that took the Strategy Execution Survey could be arguably more or less likely to be inside the cultural frontier. They could be more likely if they participated because their firm's ability to execute its strategy needed improvement. They could be less likely if their participation is a signal that the firm works harder at improving their culture.

2010; Bloom *et al.*, 2017). In a recent study, Bloom, Van Reenen and their co-authors demonstrate 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. This same study documents that the use of more practices is associated with higher performance across multiple measures including profitability, revenue growth, productivity, and patenting activity.

Our survey includes 19 questions measuring structured management practices. Our survey overlaps with two of the practices Bloom and Van Reenen measured – i.e., target setting (which we label goals) and incentives. The Strategy Execution Survey also attempts to measure a firm's ability to implement its strategy across multiple units rather than measure efficiency within a single facility. As a result, the survey measures practices that promote firm-level implementation such as structured processes to communicate strategy (six questions) and processes to allocate capital and human resources across units (five questions). We create a composite metric – called "Management Practices" – which equally weights 19 questions measuring formal management processes to promote strategy implementation.

The Management Practices measure is positively correlated with all nine cultural norms, and has an average correlation coefficient of 41% across all of them (see Figure 9). When we compare how closely management practices relate to cultural norms, we find that the Management Practices metric is more highly correlated with the cultural norms than any of the values (except Collaboration) are with one another (Figure 10). Several of the structured practices included in the Management Practices metric are explicitly designed to foster specific values. Six of the nineteen practices measured (e.g., goal setting, performance pay) are designed to foster performance, four practices (e.g., formal processes to coordinate across units) should foster collaboration, three of the practices (e.g., resource allocation) should promote agility, and the other six management practices are not linked to any specific value. The relatively higher correlation between our Management Practices measure and the values of collaboration, performance, and agility support a relationship between a firm's values and its structured practices designed to reinforce them. It is interesting to note that the bundle of Management Practices is also correlated with seemingly unrelated values, such as

integrity and transparency.

The high correlation between management practices and cultural norms supports a large body of ethnographic and case-based research that finds practices and culture mutually influence one another. 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).

Our findings suggest a tight linkage between a firm's culture and its management practices. Our observational data does not allow us to disentangle the direction of causality between cultural values and structured practices. Interpreting our results against the backdrop of previous findings from careful ethnographic studies, however, we believe that causality probably runs both ways. Implementing structured management practices, such as those measured by Bloom and van Reenen, is likely to reinforce desired cultural values. Conversely, a firm's culture will influence how it puts structured processes and management techniques into practice. If our hypothesis is correct, it suggests that one of the mechanisms underpinning Bloom and Van Reenan's striking findings could be the transformation of firm norms and values. Nine out of every ten senior executives believe that strengthening their corporate culture would improve firm performance (Graham *et al*., 2017), and our findings also suggest practical advice to them. The tight linkage between practices and values suggests that a potential way for managers to improve their corporate culture is by implementing structured management practices.

CONCLUSION

Our findings have important implications for both managers and academics. For managers, they imply that most firms are well within the cultural frontier, and thus they can focus on initiatives that help them "have it all", and that good managerial practices are likely to underpin that pursuit. For academics, our findings

suggest that there is considerable room for research in how to bring underperforming firms to the frontier of cultural values.

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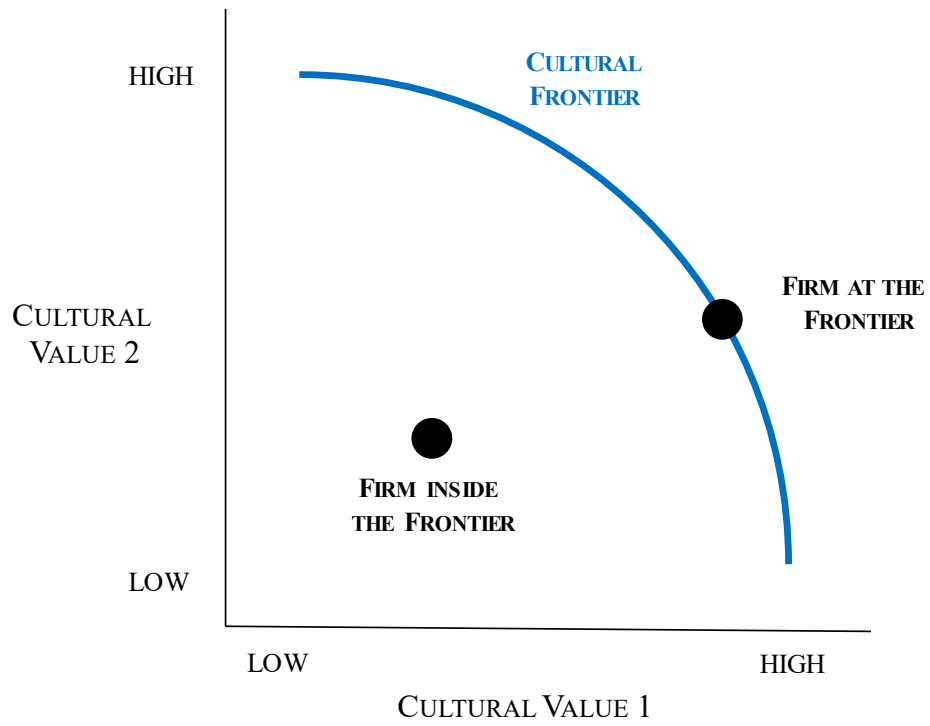Zingales L (2015) The 'cultural revolution' in finance. *Journal of Financial Economics* 117(1): 1-4.
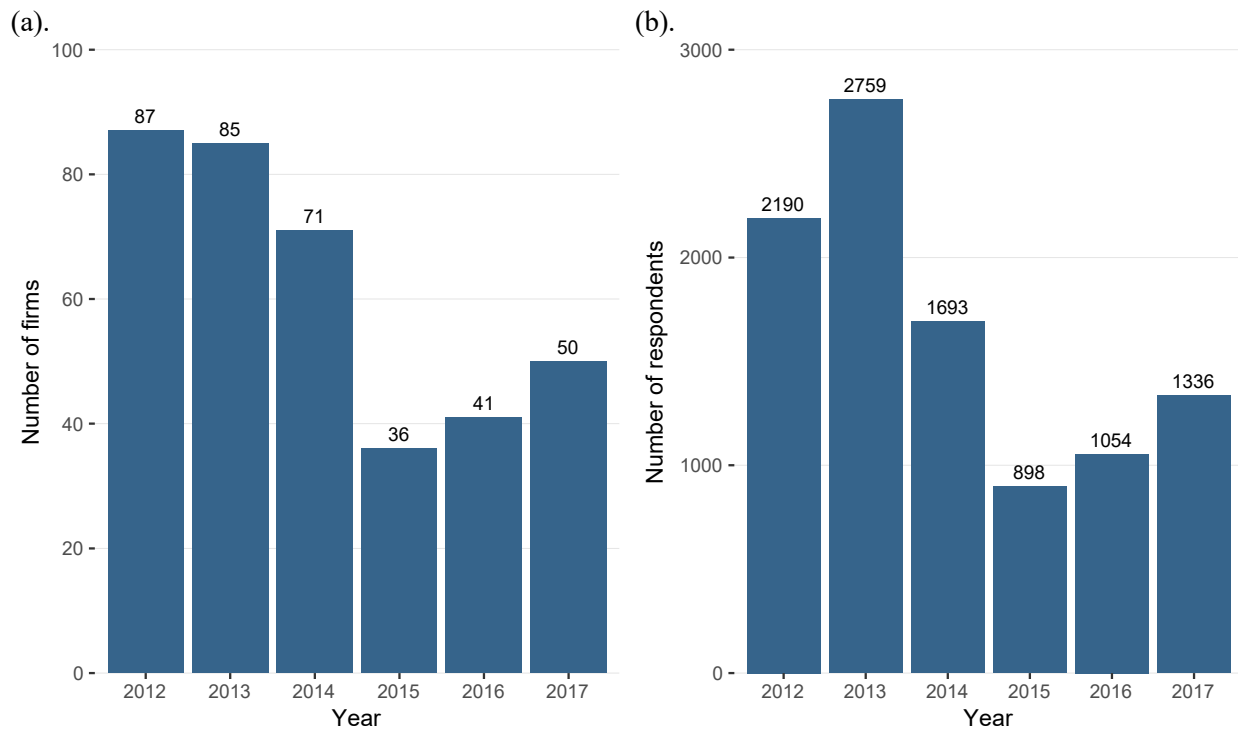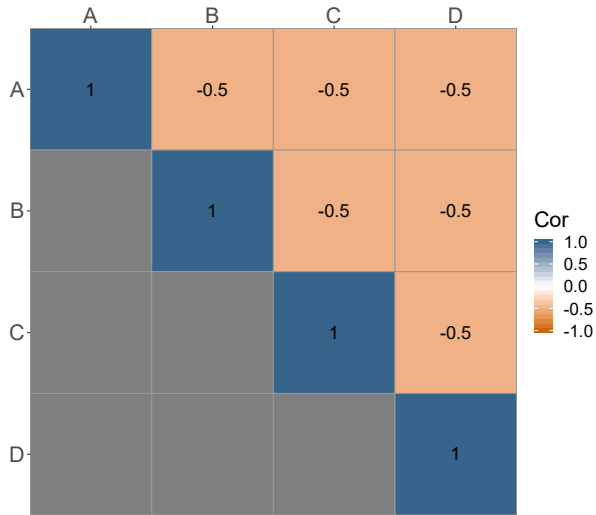
Figure 1. The Cultural Frontier

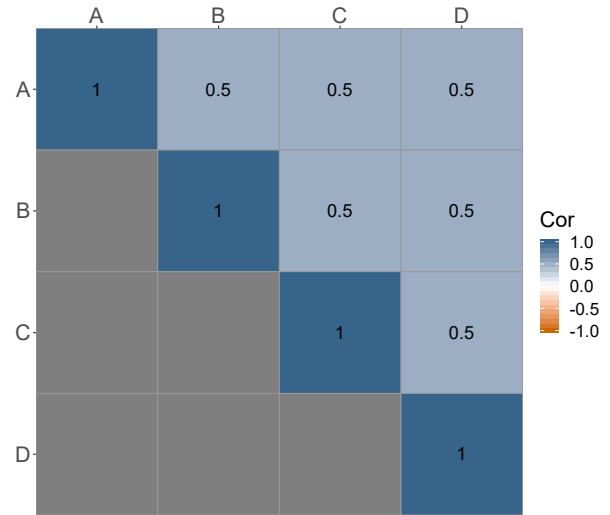**Figure 2.** (a). Firms in surveys, (b). Respondents in surveys

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(a). (b).

Figure 3. Illustrative Correlation Heatmaps. Figure (a) shows what we would expect if there are tradeoffs between cultural values (such as in the competing value framework). Figure (b) shows what we would expect if firms do not face such tradeoffs (such as in our cultural effectiveness framework)
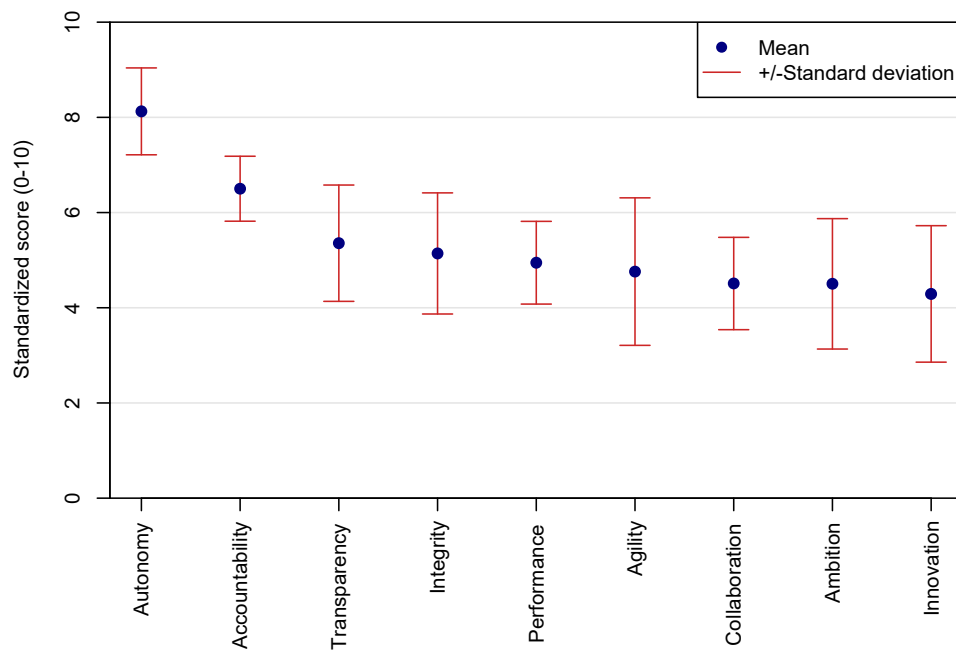

Figure 4. Cultural Values (Firm-level Analysis)

28

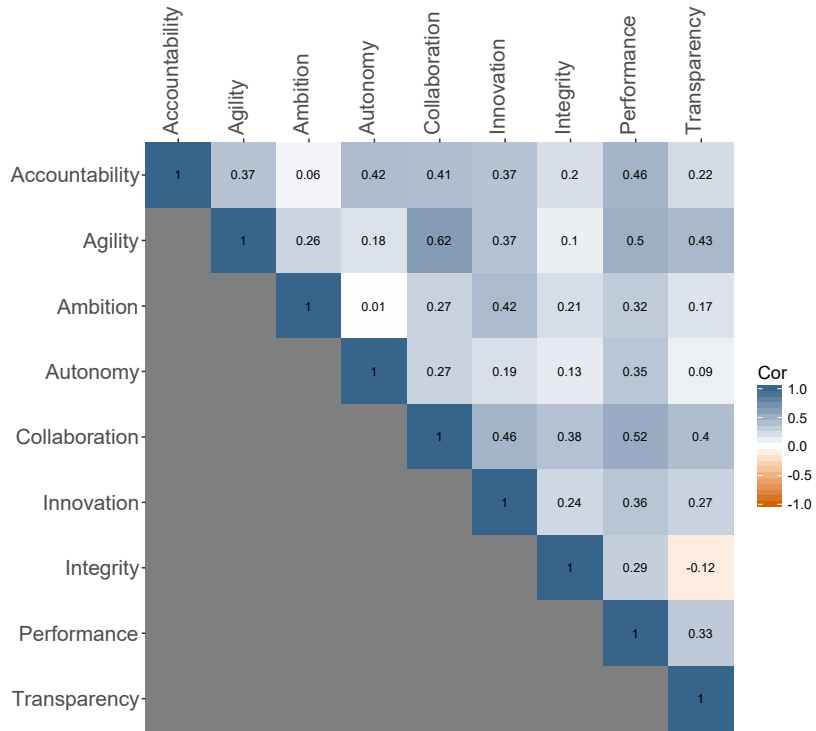**Figure 5.** Heatmap of Correlations between Cultural Values
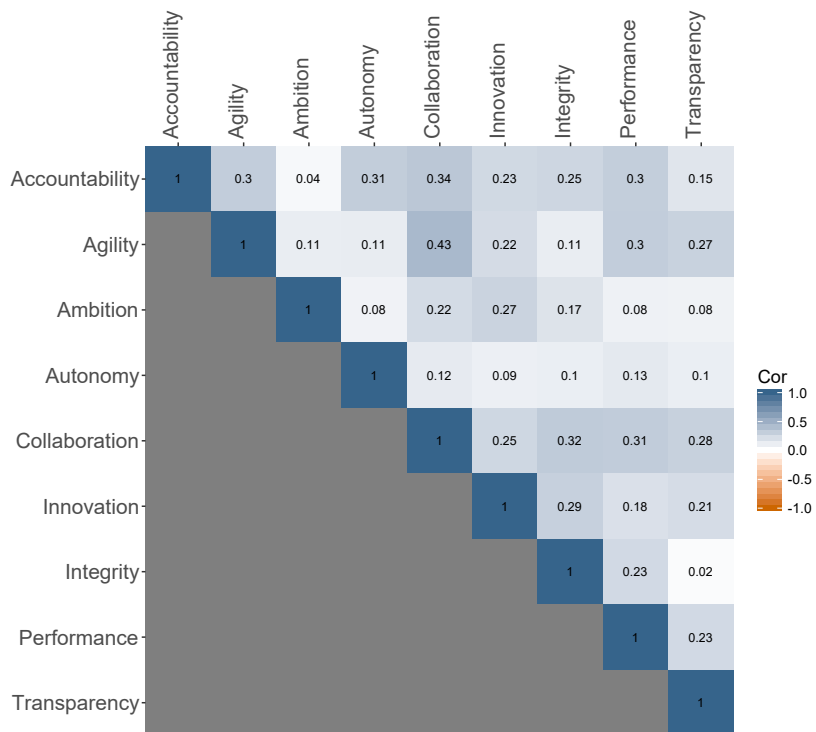
Figure 6. Heatmap of whether Firms are in the Top Quartile of Cultural Values

29
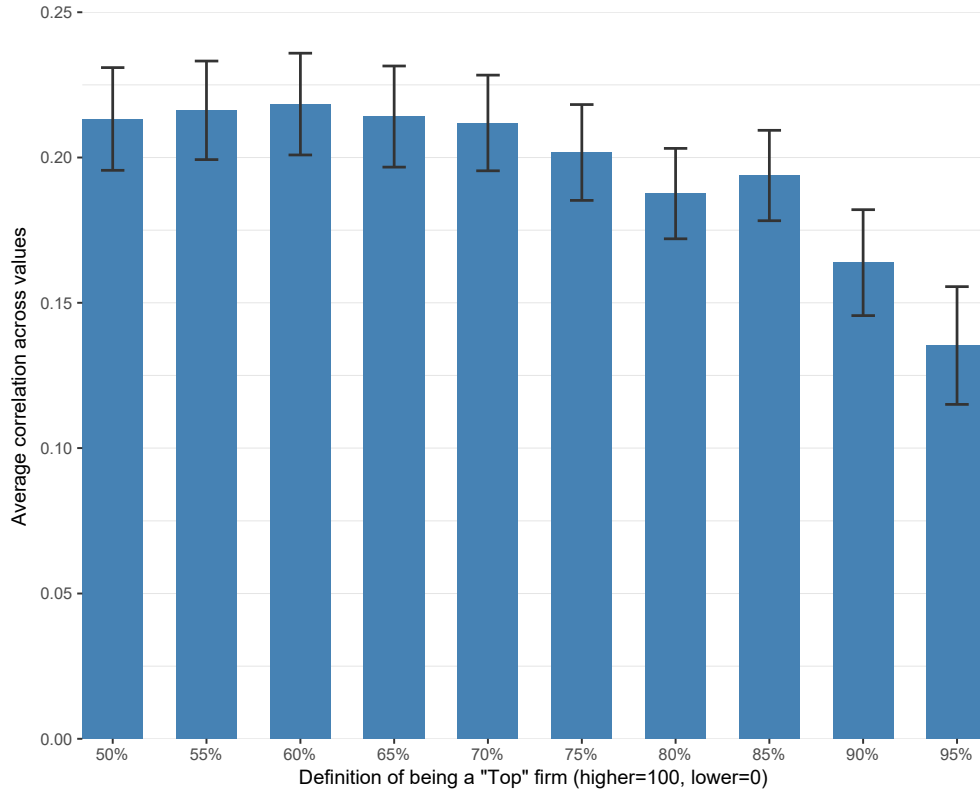
Figure 7. Average Correlations of Cultural Values across Firms
(with various cutoffs for being a "Top" firm)

Figure 8. Empirical Results vs. Simulation Results (a) As compared to no-correlation baseline, (b) As compared to positive correlation levels

30

Figure 9. Correlation between Management Practices and each Cultural Value

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

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Table 1. Summary Statistics: Individual

Panel A. Current Role

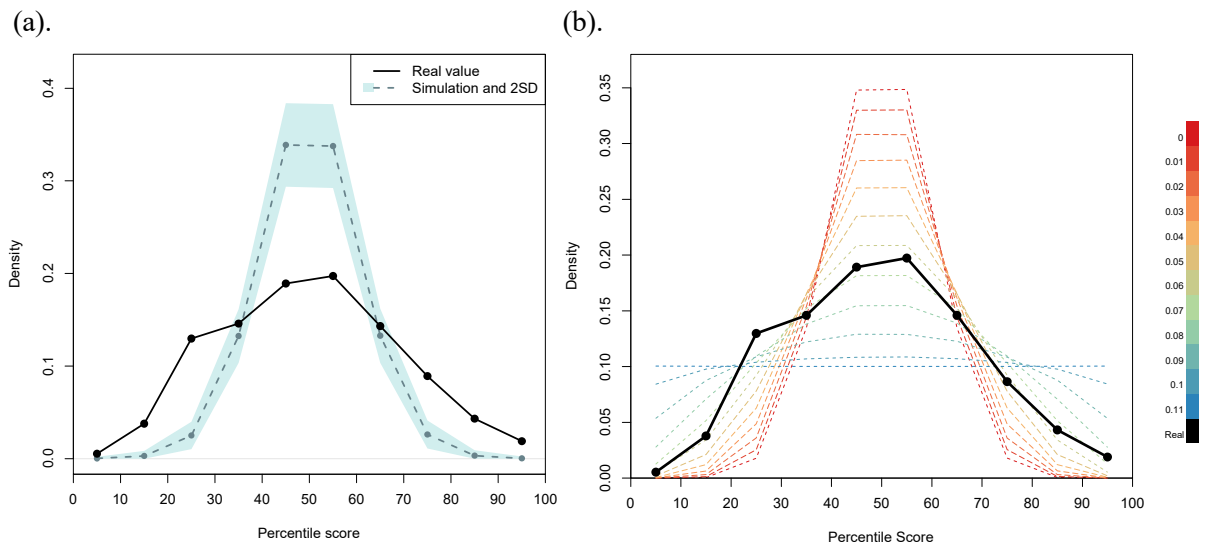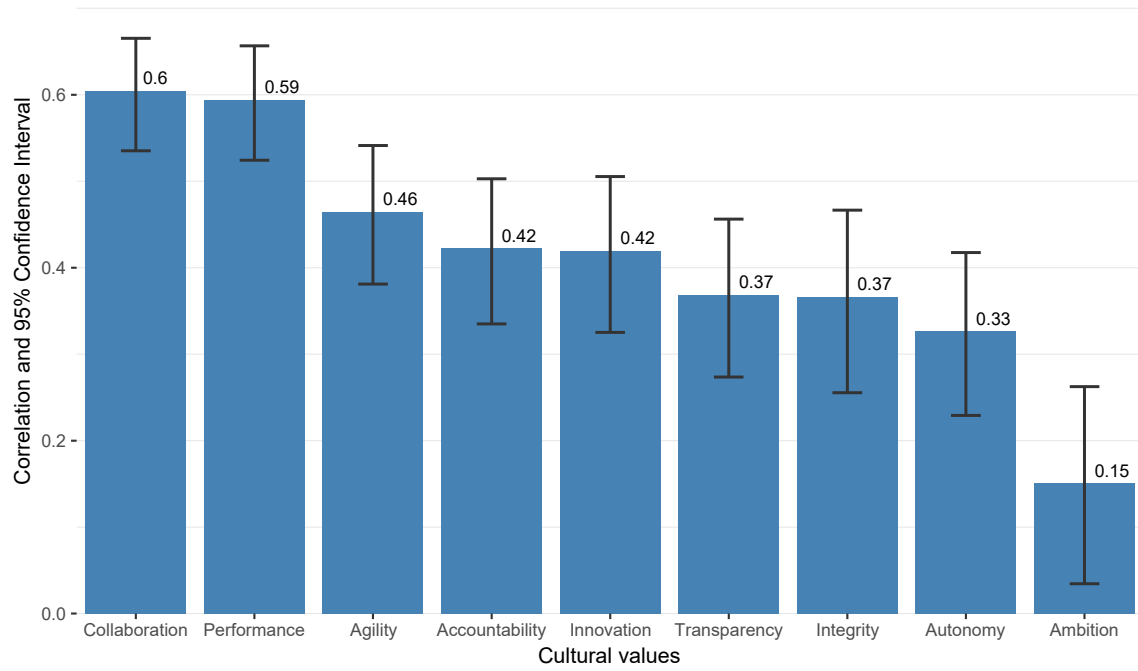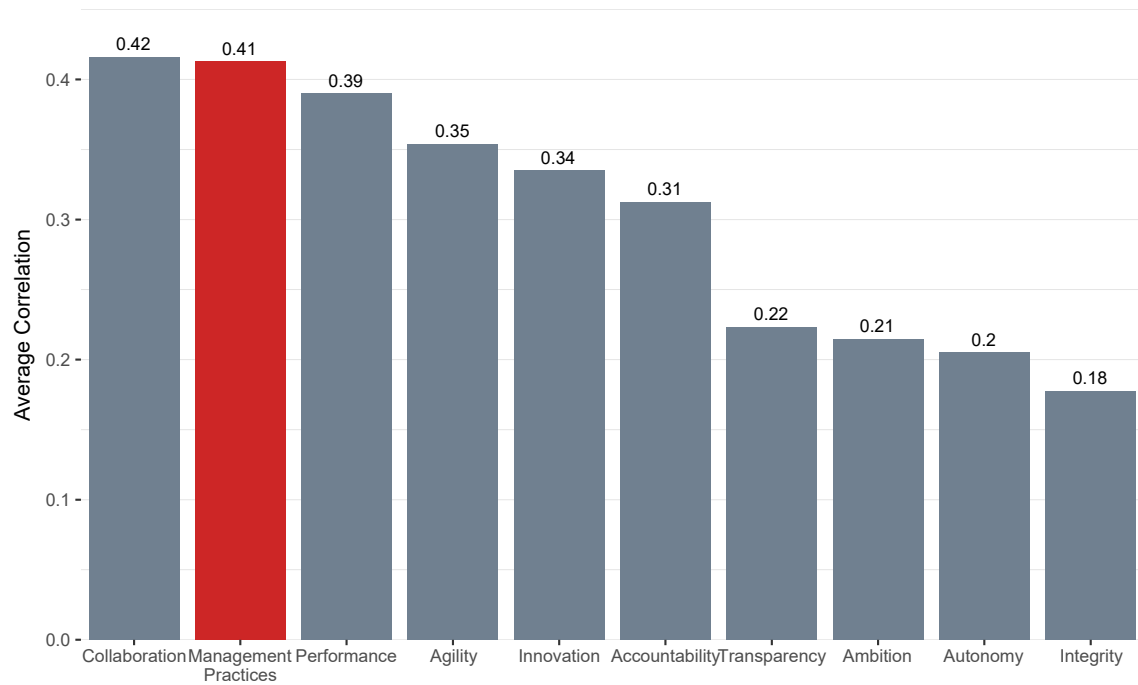| Answers	Count	%
1. Member of the executive team responsibility for running the entire company or business unit	1,298	13
2. Report directly to a member of the top executive team of the company or business unit	3,246	33
3. Vice President Director or Manager who does not report to a top executive of the 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

Question Number	Question Text (Multiple choice options not shown)	Firms	Respondents
Accountability			
62	When dealing with leaders in other departments functions and business units, my supervisor typically:	347	8,936
85	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "Top executives"	346	8,599
86	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "My supervisor"	346	8,685
87	When it comes to honoring their commitments, I can rely on the following to do what they say they will: "My direct reports"	345	8,361
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"	370	9,333
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"	283	7,004
Agility			
17	How does your company exit from declining businesses or unsuccessful initiatives?	370	8,219
26.1	When it comes to hard decisions such as firing people, exiting businesses, or killing initiatives, our top management team:	346	8,214
60	How does your team typically respond when market circumstances change?	347	8,993
Ambition			
66.1	Imagine you were giving advice to a newly hired manager. What suggestion would you give about making performance commitments?	283	7,530
78	How consistently does your company financially reward the following behaviors? "Pursuing ambitious targets"	208	4,999
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"	208	4,459
Autonomy			
36.1	Which best describes how your individual objectives for this year were set?	208	5,131
45	In terms of the day-to-day management of my work, my supervisor:	347	9,105
Collaboration			
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?	346	7,929
63	How well do department function or business unit leaders typically resolve conflicts with other units?	370	9,520
64	Imagine a manager achieves his or her objectives but fails to collaborate with colleagues in other units. What would typically happen?	346	8,087
75	How consistently does your company financially reward the following behaviors? "Cooperating across units"	322	8,127

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"	208	4,465
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?	208	5,005
97	Management teams evolve over time. At present, how well does your top executive team work together?	346	7,968

Innovation

68	Imagine you pursued a risky opportunity that supported your company's strategy. What are the most likely consequences for your career?	323	7,203
77	How consistently does your company financially reward the following behaviors? "Innovating"	208	4,998
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"	208	4,487

Integrity

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?	260	6,146
79	How consistently does your company financially reward the following behaviors? "Acting with integrity"	208	4,992
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"	208	4,975

Performance

39	My supervisor provides performance feedback that is:	368	9,402
43	To what extent does your supervisor hold everyone on the team accountable for results?	370	9,603
65	How does your company typically deal with underperforming employees?	358	9,244
69	How well does your company's compensation system reward performance against objectives?	346	8,867
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)	307	6,642
76	How consistently does your company financially reward the following behaviors? "Achieving individual objectives"	322	8,156
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"	208	4,624

Transparency

| 41 | For my colleagues in other departments functions and business unit, I know or can easily find out: (Please check all that apply) | 346 | 7,900 |
| 46 | When working with colleagues in other units, how well do they seem to understand your performance objectives? | 346 | 8,512 |

Management Practices

4	How involved have you been in your company's process to develop its strategy?	347	9,306
7	How do top leaders communicate your company's strategy and key priorities throughout the organization?	323	8,507
12	How confident are you that your company's strategic priorities have the financial and human resources they need to succeed?	283	7,599
13	How useful are company-wide updates on performance against corporate priorities?	290	7,830
18	How well do your company's information and data gathering systems help you identify what is working and not working in the market?	257	6,083
29	How does your supervisor explain why current priorities matter?	370	9,649
33	How often does your supervisor discuss how your work supports current company-wide priorities?	347	9,052
34	Which of the following best describes how your unit set its budget for this year?	231	5,636
40	Do you have the resources you need to achieve your performance objectives?	347	9,096
47	How would you describe your company's formal systems or processes? E.g. cross-functional teams, information systems, or internal service agreements to coordinate activities across units.	323	8,396
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"	208	4,485
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"	208	4,767
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"	208	4,858
53	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? "Coordinating activities across units"	208	4,801
55	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? "Adapting when circumstances change"	208	4,639
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)	312	7,922
153	Does your organization have a clearly stated list of organization-wide priorities? If so, how many objectives are on that list?	114	2,914
154	How well do these priorities support your organizations strategy?	114	2,840
216.2	In total, how many individual objectives are you being held accountable for this year?	347	9,306

APPENDIX B. Measuring Culture

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).

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 B1 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.

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 B1. Example of questions assessing collaboration

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

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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%).

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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. Figure 2, Panel (b), shows the number of respondents who answered the survey by year.

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 bias[10]

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 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

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[10] Portions of the sample description section are repeated here, for clarity.

Electronic copy available at: https://ssrn.com/abstract=3228167

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 variation[11] (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 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,

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[11] 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.

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.

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