

Revisiting the World Management Survey in Strategy: applications to theory and replication

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Abstract

The academic field of strategy has a strong history of developing theories and frameworks to explain real-world phenomena, but a relatively younger empirical literature testing these theories. Partly due to the nature of questions in strategic management, scholars have often relied on collecting their own data or using specialized, and often expensive, proprietary data. This limits the possibility of replication exercises, which are a key step to refining and reinforcing the theories that are most supported in practice. To support this effort, we revisit the World Management Survey (WMS): a cross-country, cross-industry survey dataset with over 20,000 observations at the establishment-level that is collected through a rigorous and well-documented process and made free and accessible to researchers. While it is well-cited in the strategy literature, we propose it is underused and better exposure to this data's offerings has the potential to add significant value to the field.

1 Introduction

“We do not want for theories, but we do want for theories that have been adequately tested against empirical data”

(Schendel & Hofer 1979): 394.

The academic field of strategy has a strong history of developing theories and frameworks to explain real-world phenomena, but a relatively younger empirical literature testing these theories. Even more nascent is the practice of testing and refining theories with publicly available and replicable code and datasets. Despite the latter being “critical for building a cumulative body of research knowledge” (Bettis, Helfat & Shaver 2016, Hambrick 2004), replications in strategic management have been understandably challenging given the dearth of publicly available data. As the concepts of interest are not always covered in the variable set of widely available, large databases, strategic management scholars frequently have to collect their own data (Helfat 2007) or purchase highly specialized (and expensive) proprietary datasets that often cannot be shared publicly.

In this paper, we revisit the latest, large-sample version of the World Management Survey (WMS) and propose that it is well placed to contribute to a new generation of replicable work across many topics in strategic management. The inherently market- and firm-specific nature of strategic management decisions makes firm-level datasets that provide these specific contextual elements important for advancing research. We argue that complementing these data with the WMS can further develop our understanding and scholarship. Specifically, we propose that the WMS dataset can serve twin goals for the strategy community: first, its free accessibility facilitates replicable scholarship and lowers barriers for all researchers, especially those without substantial institutional resources such as early career faculty and graduate students. Second, its breadth can be useful for exploring a number of open questions in our field. In particular, this dataset (a) has now grown to a useful scale, (b) is free and easily accessible, and can include firm identifiers,¹ (c) allows for linkages to many other datasets commonly used in strategy research (including, for example, Orbis Bureau van Dijk, Compustat and Harte Hanks/Aberdeen), and (d) has many additional variables beyond management practices, such as ownership and hierarchy measures, collected over time.

By highlighting what the WMS covers, as well as what is not included in the WMS, our contribution is to provide researchers with an introduction to using the WMS as an additional tool in their toolbox as we jointly build this cumulative body of knowledge in strategic management. In particular, we hope that this paper will equip strategy scholars with sufficient understanding of the WMS to consider novel, creative uses of this dataset that go beyond its current applications focusing on firm characteristics and behavior from an economics lens. The expanded scale of the

¹Access to the anonymized dataset is immediate via a simple registration form on the website, and access to the identified data requires only a short application form available on www.worldmanagementsurvey.org.

data, especially matched with financial data sources, allows for a focus on examining the behavior of the best-performing firms, for example, which is often the focus of strategy scholars. While existing work has largely focused on operations and structured management, strategy scholars are well poised to extend the work using the WMS into strategy topics. For example, in strategic complementarities, [Hong et al. \(2019\)](#) use a Statistics Canada dataset with some similar measures to the WMS and find complementarities between pay structure practices and centralization of decision-making.² While the WMS does not have employee-level data, it is feasible to match it with administrative datasets that do; as [Cornwell et al. \(2021\)](#) did. They use a matched WMS-RAIS (Brazilian employer-employee administrative data) to document the patterns of hiring, firing and pay dispersion relative to structured management practices in Brazilian firms but do not discuss complementarities, leaving space for future work in this area.³

When the first wave of the World Management Survey (WMS) dataset was collected in 2007 ([Bloom & Van Reenen 2007](#)), the core insights were not new to the management and strategy community.⁴ A rich literature on the importance of organizational structures for firm performance already existed, and, while the methodology was novel and the data held promise, the early scale was rather limited. The early version of the WMS data, with its random sample of firms, had limited coverage of the top-performing firms, reducing its relevance to strategy scholars where there is an emphasis on how *the best firms* create and sustain value ([Porter 1996](#)). Almost twenty years later, however, the project has grown to include over 35 countries, four sectors and over 20,000 observations including over 3,000 establishments with repeated observations across time. While the project is not without influence in the field — it has been cited over 100 times in influential strategy and management journals since 2008 — it has only been *used* by a small fraction of strategy researchers. This paper outlines the key features of the dataset with special emphasis on those that are likely to be most useful for the strategy community.

As an exhaustive exploration of all potential topics is untenable, we start with sketching out two examples of replication-extension exercises that could be feasible with the WMS data, and end with briefly outlining a set of topics where the data could be useful. In particular, we focus on strategic human resource management (SHRM) as a recent Academy of Management Perspectives symposium urged scholars to rethink their approach to advances in the discipline ([Kehoe 2021](#)). We summarize the key characteristics of the data, along with a transparent discussion of the survey method features and limitations. We hope this will promote easier replication and, especially, extensions of current work. This is increasingly relevant: the *Strategic Management Journal* has

²In this paper, we use complementarities to refer to the interdependence between different elements that can create superior performance ([Milgrom & Roberts 1995](#)), depending on the fit between elements and between elements and the environment. We discuss this further in Section 4.1.

³Another example in strategy execution, [Bilicka & Scur \(2022\)](#) use WMS data for multinationals and found that the execution of strategic decisions on tax planning hinges on the level of structured practices of their subsidiaries.

⁴The primary intended audience at that time was, however, economists who had not yet engaged with a measure of management practices. To that end, the new data did kick-start interest and focus on management and organizational practices in economics, as evidenced by the dataset being cited 56 times and used 10 times in publications across the top 5 economics journals since 2009. See Table A1 for a summary.

encouraged submissions of replication articles (see Bettis, Ethiraj, Gambardella, Helfat & Mitchell (2016)) and the Academy of Management launched the *Academy of Management Discoveries* with one of the key goals to encourage replication (see Miller & Bamberger (2016)). Since many graduate programs use replication as a research methods exercise, being able to do so with compelling data and publish the outcome of this work would promote both objectives outlined in this section.⁵ Bergh et al. (2017) find that 70% of articles they attempted to replicate did not disclose enough data to allow for reproduction of findings; and even among those that did, one-third to one-half of the reproductions found inconsistent results (Bergh et al. 2017, Goldfarb & King 2016, Delios et al. 2022). Replication is a crucial complement to important quantitative and qualitative work, building a widely-accepted body of knowledge (Hambrick 2004). A key tenet in strategic management is that managers choose strategies based on their firm’s context (Wolffolds & Siegel 2019, Shaver 2020). Being able to show that the results hold in a similar context or perhaps change in a different context through a replication/extension exercise (Bettis, Helfat & Shaver 2016, Köhler & Cortina 2021, Tsang & Kwan 1999), is then essential to consistently establish the conditions under which a strategic choice may be optimal.

2 Data

In this section we briefly describe the methodology and outline the key groups of variables within the data that can be instructive in exploring open questions in strategy research. As there are a number of survey papers already outlining the details of the WMS, we will focus on the core elements of the method and direct interested readers to more thorough descriptions of the history and prior applications in economics in Bloom & Van Reenen (2007) and Scur et al. (2021).⁶

2.1 Data access and identifiers

Public anonymized data. The 2007-2014 anonymized dataset with a basic set of variables is available to registered users via the project’s main website: www.worldmanagementsurvey.org.⁷ Registration is free and takes seconds to complete, and the data is authorized for general research use with attribution.

Data with firm identifiers. Researchers who wish to request additional variables or firm identifiers can do so via a data request form on the website, and receive the data after the request is approved and the researcher signs a data confidentiality agreement in line with the project’s

⁵These journals promoting replication, as well as those listed in Table A1 that have published papers using the WMS, are some of the potential outlets for the type of work using this data that we describe in this paper.

⁶These papers, paired with the WMS website and availability of the data in established dataverses (e.g. the Harvard dataverse <https://doi.org/10.7910/DVN/OY6CBK>) reinforce the WMS’ usefulness for replication work.

⁷The latest wave (2022) is expected to become available within 2-3 years of the data being collected.

Institutional Review Board ethics requirements.⁸ Requests are reviewed monthly by the WMS core research team primarily to verify credentials and confirm the purpose of use is strictly academic, with nearly all academic projects being quickly approved. Upon publication, the team provides a letter confirming the data use is authorized and authors are welcome to list their papers on the WMS website.

Matching with financial and accounting datasets. Firm identifiers match their original sampling frame IDs; for example, the primary firm ID in the WMS is from Bureau van Dijk (Orbis) and the primary ID for US public firms is Compustat’s GVKEY. Researchers can request the firm’s tax ID when applying for data access, and if matching issues arise the WMS team works with researchers to make sure they are able to obtain the largest match. While firm names cannot be shared, the team can help procuring the correct ID to match to other firm-specific databases. With firm IDs, researchers can link the management data to common financial database sources including those with private and public firms such as Orbis, Dun & Bradstreet and Prowess, as well as those focused on public firms such as Compustat, ExecuComp, Capital IQ, Zephyr and Bloomberg. Across these databases, researchers can find data from balance sheets, ownership trees and ownership shares, board members’ information and mergers and acquisitions records.⁹

2.2 Data structure

2.2.1 Summary of WMS methodology

The goal of the WMS project has been to measure a well-known and important factor in production systems: management structures. While research papers and popular articles have long attested to the important role of managers and management practices, in the early 2000s there was not a publicly available dataset that systematically measured a set of key practices across countries and industries. The goal of the WMS project was to systematically measure these relatively less straightforward practices in a comparable and consistent way. Almost 20 years later, it is clear that it is possible and useful to do this, especially in understanding differences across more “average” enterprises that would not be featured in case studies but make up the vast majority of firms in economies across the world.

The WMS data is collected via phone surveys, where trained interviewers cold-call the senior-most manager at an establishment (manufacturing plant, retail outlet, school or hospital department) and persuade them to engage in a 1-hour phone interview about the day-to-day practices at their establishment.¹⁰ Respondents are not offered cash incentives, but do get offered a project summary

⁸These requirements include committing not to divulge firm names or identifiers, not to publish any identifying information of firms in the sample, and not contacting any firms in the sample suggesting an affiliation with the WMS.

⁹Please note that the share of WMS data that is matched to financial data depends on researchers’ access to the various financial databases.

¹⁰Across the sectors, the WMS collects comparable data on management structures. Surveys primarily differ across

report at the end of the project. The interview is semi-structured, in that the interviewers know what type of information they are looking for and follow a set of primary questions to extract the appropriate answers. They may go “off-script” with additional questions as they are trained to ask as many follow up questions as necessary to get the relevant information. Questions are open-ended and conversational, so it is not clear to the responding manager what the “right” answer is. Interviewers often ask for examples to back up claims managers make, avoiding biases that could come from misrepresentations or misunderstandings. The advantage of this type of method is that it avoids the manager simply giving the answer she thinks the interviewer wants to hear, and the data collected reflects practices at the firm rather than the manager’s subjective perceptions.

The interview is the primary point of data collection, and there are a number of steps included in the process to ensure high quality data that reflects the practices in use, rather than subjective perceptions of the manager. First, the data is collected in a *double blind* protocol, where the interviewer knows only the name of the establishment (and nothing of their performance), and the manager does not know they are being scored. Second, managers are asked a series of questions that aim to extract information on a set of topics, and the trained interviewers assign scores based on this information (avoiding self-responder bias). In particular, interviewers are trained to ask for multiple examples to cross check manager claims, and they take into account not just the stated response but the entirety of the conversation. Third, interviewers all receive identical training, in English (to ensure common understanding of concepts), but conduct interviews in their native language.¹¹ Fourth, the WMS maximizes response rates by engaging several follow-up strategies and reaches 40 to 50 percent, which is quite high relative to other voluntary firm surveys.¹²

Broadly, the interview covers a set of practices that span operations, monitoring, target setting and people management practices. Each industry sector has between 18 (manufacturing) and 23 (schools) topics and each is scored on a scale of 1 (little to no structure) to 5 (well-structured). The WMS does not measure the skills of the *manager per se* but rather measures the processes embedded in each managerial practice in place within the establishment. Conceptually, the scores for each management topic imply the following: (a) a score between 1 to 2 refers to an establishment with practically no structured management practices; (b) a score between 2 to 3 refers to an establishment with some informal practices implemented, but these practices consist mostly of a reactive approach to managing the organization; (c) a score between 3 to 4 refers to an establishment that has a set of

sector in customization of titles and context: e.g. “principal” and “school” in education versus “plant manager” and “factory” in manufacturing firms. It is important that the respondent is senior enough to have decision-making powers and line control of others, but not too senior so as to be detached from the day-to-day running of the establishment. As such, CEOs and regional managers are not generally the interviewed party but rather plant/operations managers (manufacturing), store managers (retail), school principals (education) or department nurse managers (hospitals).

¹¹Questionnaires were translated and back-translated to ensure appropriate terminology, and translation related issues are minimized in open-ended questions administered via phone surveys with follow-up.

¹²For example, consider the international effort to collect similar data via self-responder surveys, the International Management and Organizational Practices Survey (Ohlmacher et al. 2022). Response rates for most countries with voluntary surveys are in the 6% to 30% range, even when some of the invitations to participate come from the countries’ government agencies.

formal management process in place and these practices consist mostly of a proactive approach to managing the organization; (d) a score between 4 to 5 refers to an establishment with well-defined structured practices in place which are often seen as best practices in the sector.

2.2.2 Variable descriptions

Core management practices variables. The manufacturing survey has 18 main practices measured, while the retail survey has 19, the healthcare survey has 21 and the education survey has 23 main practices. Tables A2 to A5 in the Appendix outline each practice and the primary information collected by the interviewer during the survey. There is a wealth of variation to be explored across firms, across countries, and across questions within the survey. Figure 1 summarizes the distribution of scores across countries for the manufacturing dataset, with the highlighted colored boxes indicating the interquartile range of scores and the grey whiskers covering the distribution of scores beyond the 25th and 75th percentile for each country. The marker indicates the median score for each country and the countries are ordered relative to their median scores by continent. There is substantial variation across and within countries in the overall management score alone. Work with census data or survey data from statistical agencies has the benefit of including a large number of observations and links to other performance data within their respective countries, though often have limited accessibility and cross-country comparability. The WMS is limited in the sample size and industry mix, but has open accessibility and a cross-country comparable scope.¹³

The individual scores are naturally correlated with each other, but to varying degrees. Figure 2 shows the correlation matrix for the main sub-indices (lean operations, monitoring, targets and people) across the six continents and across industry types. These bundles of practices were pre-set in the survey methodology, but also ex-post validated in factor analysis exercises.¹⁴ There is an active literature in this space (e.g. Hong et al. 2019, Brynjolfsson & Milgrom 2012, McElheran et al. 2021), but still much to explore using the WMS data.¹⁵

The management practices in the WMS are certainly *not* meant to be considered exhaustive. The practices included in the survey came out of the management literature, consultants and industry experts (depending on the industry the WMS was being applied to) on which “core factors were important in the efficiency of a good or service that a firm was delivering. While this has been verified to be true empirically, the measure does not purport to encompass the entire spectrum of ‘what is management.’” (Scur et al. 2021). The measure purposefully omits important aspects such

¹³One of the key highlights from both Figure 1 and Figure 3 is that while there are key trends across different countries, there is also substantial overlap in the distribution of firms, both in terms of management scores and in terms of industry representation. The WMS measures the same structured practices in the same way across countries, allowing for scholars to examine these similarities and differences in a consistent and replicable manner.

¹⁴See Scur et al. (2021) for a simple factor analysis across sectors.

¹⁵In the early work with the WMS such a decomposition was not feasible as there were too few data points to counter-balance the potential measurement error in each observation. With the dataset over 20 times larger, such analyses are now feasible.

as innovation, financing and marketing, entry and exit considerations, and, broadly, the process of strategic decision-making.¹⁶ This is because these constructs are more complex and do not lend themselves to simple metrics of “less structured” to “more structured” as do the basic management practices of the core WMS topics.

The practices that are measured are, by design, simple in the sense that they measure the level of formality and adherence to basic structures of monitoring, targets and personnel operations in an establishment. The *average* positive relationship between such practices and firm outcomes is common knowledge in management and strategy scholarship. However, as a key tenet in strategic management is that managers choose strategies based on their firm’s context (Wolffolds & Siegel 2019, Shaver 2020), we propose that strategy scholars are best placed to explore the determinants of the distribution of different sets of practices firms adopt within and across similar and different contexts (Bettis, Helfat & Shaver 2016, Köhler & Cortina 2021, Tsang & Kwan 1999).

Firm and workforce characteristics. The data includes a number of identifiers (such as firm ID, country of operation and postal code) and firm characteristics.¹⁷ The firm characteristics include: industry code (3-digit SIC), foundation date, firm and plant size (number of employees), headquarter co-location identifier, total number of production sites and number of foreign production sites, share of workers who are unionized, whether the firm exports their product, and firm ownership. We provide a visual summary of industry-level data in Figure 3. Panel (a) shows the share of observations in each industry “type” (low, mid or high tech) across continents.¹⁸ Panel (b) plots the distribution of the overall management scores across 2-digit industries, ordered by type and median score.

In Table 1 we provide an overview of the average value of key variables for the firms in the sample across the 35 countries in the manufacturing dataset, separated by continent. We include averages for firm age, firm and plant employment, the share of firms that reported having HQ on-site, the average number of total firm establishments (sites) and the average number of establishments outside of the home country, the share of unionized workers, the average number of reported competitors, the share of output that is exported, the share of firms that export at all, and the sample size (total number of observations in that country).¹⁹ Table 2, in turn, summarizes the key

¹⁶The WMS does include questions on the autonomy level of plant managers in terms of basic resource allocation decisions on hiring full time employees, expenditures on sales and marketing and decisions on new product introductions. While these are, of course, a class of strategic decision making, they are not part of the WMS core questions that measure *processes* but rather part of the organizational structures module that measures autonomy of decision-making.

¹⁷The primary ID in the WMS dataset is generally the ID from the database of the source sampling frame. For the majority of firms, this is the BvD ID from Orbis. For US public firms, the ID is from Compustat. For Australia and New Zealand, the ID is from Dunn and Bradstreet and for Colombia, the ID is from Supersociedades.

¹⁸We broadly define low tech as industries in SIC 20-27, 31 and 39. High tech industries are defined as SIC 35-38, while those in neither category are classified as “mid” tech, SIC 28-30, 32-34).

¹⁹Following each survey wave, a follow-up project verifies the factual information for a random sample of firms: for example, comparing the number of employees and ownership status reported by the manager with the number of employees reported in firm accounts. The vast majority of reported data is correct, and updated if not. If a

workforce characteristics in the sample firms. These include the share of workers in the firm that are managers, the share of managers and share of non-managers with college degrees, the average tenure of the interviewed manager, and their perception of the quality of management in their firm.²⁰

Organizational governance. The WMS also includes a number of variables that describe a firm’s organizational form. Table 3 provides an overview of the share of firms that are owned and run by their founders, the share of firms that are owned and run by a family (2+ generations), the share of firms classified as dispersed shareholders (defined as no one shareholder owning more than 25 percent of the firm), the share of firms classified as multinationals, the average hierarchy levels (between shopfloor and plant manager, and shopfloor and CEO), and the average number of direct reports (span of control).²¹ Figure 4 provides a visual summary of the ownership shares in Panel (a), by continent. Panel (b), in turn, plots the distribution of overall management scores over the key ownership categories.

2.2.3 Data coverage

Sampling of manufacturing survey. The manufacturing WMS was originally a random sample of firms with 100 to 5000 employees, and as of 2014 it expanded to a stratified random sample with 20% of the sample including firms between 50 and 100 employees.²² The sampling frame for most countries comes from accounting databases and national firm registers compiled by Bureau van Dijk (BVD) Orbis, which have been shown to be comparable in terms of aggregate employment to country-specific census data (Bloom et al. 2015).²³ In turn, the WMS sample is a random sample of these frames. The average response rate across all countries is about 40%, which is high for cold-call, voluntary surveys. The respondent and non-respondent firms were compared in terms of observable characteristics, and they are broadly not statistically different from each other. Importantly,

manager reports not knowing the information, analysts either ask to speak to someone else or search for the correct information on firm websites.

²⁰Note that this is the only question in the entire survey that asks specifically for an opinion/perception from the respondent manager.

²¹The hierarchy levels are measured as follows: the count of layers *between* each level, such that a firm that has a layer of shopfloor workers reporting to supervisors who then report to a plant manager have a value of 1. The span of control of the plant manager (PM) is defined as the number of *direct* reports to the PM (that is, day-to-day or regular contact).

²²The WMS project has collected data across four sectors: manufacturing, retail, education (secondary schools) and hospitals. This paper focuses primarily on describing the manufacturing sector data, but there are myriad potential research avenues with the (broadly defined) public sector data, too.

²³In the few instances when Orbis was deemed incomplete (for example, Australia, New Zealand and India), the sampling frame from Orbis was supplemented with additional sources. In general, the sampling frames used to draw the random sample of firms interviewed in the WMS are as close an approximation to the population of firms with more than 50 employees as can be found across public and private data for all countries included. For the African countries in the sample, an additional 6-month project was undertaken prior to the survey wave in 2013 to build the sampling frames as they did not exist at all. Further detailed information on sampling frame construction can be found in Appendix B of Bloom et al. (2016).

the response rate was “uncorrelated with the (independently collected) performance measures for the firm – thus, [the survey was] not disproportionately interviewing successful or failing organizations” (Bloom et al. 2014). Further, “within a country, industry, and year, respondents were not significantly more productive, profitable, or capital intensive than non-responders. Respondents did tend to be slightly larger,²⁴ but were not more likely to be older or multinationals. Since all regressions [can] include size, country, industry and time dummies, this potential source of bias is [feasible to] control for.” (Bloom et al. 2016)

The WMS has conducted survey waves in 2004, 2006/2007, 2008/2009, 2010, 2013, 2014/2015, and 2021/2022. Each wave focuses on different sets of countries, and when countries are repeated the sampling frame includes all the panel firms (so there are repeated attempts to re-interview firms) as well as a “fresh sample” of new firms.²⁵ As in all panel surveys, there is attrition and not all firms contacted in the first waves can be reached in subsequent waves. Data users can create sample weights from the sampling frame to help estimate the rate of non-response and partially correct for selection.

Level of analysis. As the data is collected as a country-level random sample of *establishments*, multi-establishment firms are sampled in accordance to their prevalence in the manufacturing sector of each country.²⁶ As of 2022, the public WMS includes about 12,780 unique establishments, with 11,760 unique firms. Just over 45% of the manufacturing plants in the sample belong to a single production establishment firm. Another 15% belong to a two-establishment firm, and another 20% belong to firms with between 3 to 6 establishments. The final 20% belong to firms with more than 6 establishments (Figure A1a). The share of firms with multiple sites, however, varies widely by country (Figure A1b). While it is random whether two or more plants within the ownership tree of any particular firm are interviewed, nearly 2,000 plants in the WMS sample fall in this category.

2.3 Data validation

There are two primary concerns with new datasets in terms of validation: first, does the data accurately and consistently measure what it purports to measure? And second, does it explain any meaningful variation in relevant outcomes? We discuss each in turn.

Data accuracy. On accurate measurement, the WMS methodology includes a number of internal checks to ensure that the scores assigned to the manager responses reflect the practices used at the establishment. One such check is called *double scoring*: this is where a trained interviewer or supervisor silently listens in to the interview being conducted by a “primary” interviewer, and

²⁴Doubling firm size is associated with a 6% higher probability of response.

²⁵Figure A2 plots the first and last scores for the firms with panel data in the WMS, as an illustration of the amount of variation that exists.

²⁶For countries where the phone number directs analysts to the corporate headquarters the analysts then ask for the phone number of the most representative plant that has more than 50 employees.

independently assigns scores to the responses given during the primary interviewer’s conversation. For a subset of firms, additional interviews were conducted with different managers by different interviewers within the same firm — both in-person and over the phone. All exercises yielded scores that were highly correlated with each other, as discussed further below under Common Method Variance. While some measurement error is bound to exist (scores were not identical, after all), the multiple intermediate checks suggest the data collected is consistently measuring what it is meant to measure.²⁷

Where the WMS firms can be matched to administrative data, the interviewed managers’ responses have proven to be remarkably accurate. For example, in Brazil, [Cornwell et al. \(2021\)](#) match Brazilian WMS data to administrative employer-employee data and report a set of firm characteristics that exist in both datasets: number of workers, share of female employees and share of employees with a college degree (Table 1 of their paper). The values reported by the managers are within 0.72 and 2.44 percentage points of each other. In the US, the Census Bureau has a self-respondent version of the WMS, called the Management and Organizational Practices Survey (MOPS). While it is not feasible to do a direct comparison, the main stylized facts all hold in the Census sample of over 40,000 plants (near-universe of manufacturers in the US).²⁸

Common Method Variance. Analysis of survey data based on data collected with the same-instrument is well-known to be potentially problematic. While this is most commonly an issue with self-respondent questionnaires (e.g. see [Chang et al. 2010](#), [Podsakoff & Organ 1986](#)), it could affect all surveys. One concern is that variation in responses would be driven by the questions and the instrument itself rather than the object that the instrument is designed to measure. The open-ended, interview-style data collection of the WMS goes a long way to circumvent this issue as managers’ responses are independently coded by an independent, trained analyst. Their training highlights the importance of probing for truthful and verifiable statements, minimizing desirability bias from the coded responses. For example, interviewers are trained to always ask for examples of stated processes as a verification device: if a manager states they use a range of key performance indicators to track production, the interviewer would follow up with something along the lines of “great, can you give me a few examples of the main indicators you would check on a regular basis?” If the manager struggles to name key indicators, this is indicative the tracking is perhaps not quite as regular as the manager may claim and the interviewer would continue probing until they are satisfied they have a good understanding of the production tracking processes at the firm. As such, the management scores are no longer “perceptual measures derived from the same respondent”, but rather a joint independent assessment (by the interviewer together with the double-scorer) derived from a set of information from a single source (the manager).

A related concern is that the information is being derived from a single respondent within the

²⁷For further details, see [Bloom et al. \(2014\)](#).

²⁸See [Bloom et al. \(2019\)](#) for a summary.

establishment. In the earlier years of the project the research team engaged in substantial efforts to check into how much of a issue this might be: different analysts interviewed different people within the establishment and subsequently compared scores. While these exercises happened over several of the early waves, the most extensive of these exercises happened in 2009 during the Chilean wave, where *different analysts* conducted the same interview with *different respondents* as well as using *different formats*: one in person and one over the phone.²⁹ Figure A3 shows the scatterplot of the independently conducted and scored interviews, along with the 45-degree line of equality. It is clear that, as with every survey, there is noise: the majority of firms in this exercise had two different scores. But it is reassuring that different interviewers with the same training, interviewing different people within the firm, using different modalities, arrive at similar scores: the coefficient of correlation is about 0.81.

Finally, the different levels of correlation across the 18 management topics — especially the lower levels of correlation between the operations-set and people-set of questions — suggest that, while correlated, the practices are not necessarily always systematically or mechanically related to each other. The questions outside of the *core management* group, that is, those regarding firm and workforce characteristics and governance are not at risk of CMV as they are simply factual and easily verified with external datasets.³⁰

Measurement quality. On relevant measurement, validation in this regard is an empirical question; that is, does this metric explain variation in outcomes that we are interested in? For much of the WMS project’s first decade, the primary question of interest was whether the management measure explained differences in firm performance (broadly defined). The dataset has been shared with hundreds of researchers across disciplines and the primary relationship with firm performance outcomes has been found to be consistently positive across firm types, industries and countries, suggesting that while the measure invariably includes some noise and is not exhaustive, it is at least measuring an aspect of management practices that is meaningful. Across these studies, researchers have measured performance in various ways including: labor productivity (sales per employee), profitability (return on assets), market over/under-value (Tobin’s Q), sales growth (5-year), asset growth (5-year) and survival (probability of exit).³¹ A more recent set of studies in the economics literature has started considering outcomes beyond performance, such as labor flows (Bender et al. 2018, Cornwell et al. 2021), misallocation (Bloom et al. 2022) and execution of tax strategy (Bilicka & Scur 2022), but few have considered strategic choices and outcomes using this data.

²⁹The best way to gather the type of information that is measured in the WMS would be, of course, by physically visiting the establishment. However, this is not feasible at scale. Thus, the goal of the format of the phone-based WMS – open ended, often asking for examples – is to closely mimic visiting the establishment.

³⁰A routine data cleaning process for this dataset is to verify these factual statements (for example, number of employees, firm location, ownership status, etc.) with firm registers and random call-backs to speak to other firm personnel (usually HR) to verify the information.

³¹See Scur et al. (2021) for a review, and www.worldmanagementsurvey.org for a list of related papers.

2.4 Dataset boundaries and limitations

Focus on manufacturing sector. Much is missing from the WMS, as it was not meant to be an all-encompassing data source. The goal was circumspect: measure the level of structured management practices adopted at various organizations and collect a few additional governance and firm statistics. By design, the WMS includes only medium to large establishments and thus cannot speak to small scale firms and start-ups. This is because the type of practices measured in the WMS are not likely to be similarly relevant for firms that lack a minimum level of scale.³² The original survey included only manufacturing firms as manufacturing is relatively comparable across countries; that is, the process of manufacturing a product in Vietnam is not too different from making the same product in the UK. Of course, firms in the UK likely have a higher capital-labour ratio in their production process, but, fundamentally, they both need similar inputs (say, fabric) and follow a similar basic process (say, measure, cut, and sew pieces of fabric together). The UK firm might have more automated cutting steps and better sewing machines, for example, but both firms would have to keep track of (and make decisions about) their levels of raw materials, keep track of their production and issues within it, and manage their labor (regardless of whether it is higher or lower levels relative to the number of machines). As far as scoring practices, a firm with an electronic board that automatically counts the number of shirts produced gets a similar score to a firm that has a manually operated but similarly-often updated “white board” on the factory floor. On the other hand, a firm that has a computer-based electronic tracking system that is continuously updated but only managers can see will get a lower score relative to the manually operated but public tracking system.³³

Focus on simple practices. Also by design, the WMS only includes simple and straightforward management practices, steering clear of complex and potentially contingent constructs (such as growth or innovation strategy and financial decisions) as these are less likely to fit on a 1 to 5 monotonic scale. In fact, when inviting managers to participate, interviewers specifically note that the goal is to discuss day-to-day activities and, in particular, “*there are no questions regarding financial information*”. This is partially to avoid the CMV issues discussed above, but also to allow for a greater focus on the topics for which this type of survey method lends a comparative advantage. As such, some of the greatest opportunities with this dataset is the combination of the WMS with other datasets that cover these additional domains, either through merging the data with other firm-, industry-, or country-level datasets or using the WMS as a complement to triangulate with other qualitative data. Such combinations could be useful in considering broader

³²For example, communication of firm goals across the organization may need substantially less structure for a firm of 5 people relative to a firm of 50 people. However, the structures needed for a 500-person firm are more likely to be a scaled version of those needed in a 100-person firm. For those interested in small firms, McKenzie & Woodruff (2017) design and deploy a related survey for management practices specifically for micro and small firms.

³³Figure A4 illustrates the distribution of management scores across establishments in Vietnam and the UK. The firm in the 90th percentile of the Vietnamese distribution should look very similar to the UK’s 65th percentile firm in terms of practices used, even if they may differ in their capital use levels.

strategic issues in value creation and capture that the WMS does not directly measure.

Random sample of firms. Finally, an important boundary of this data is that as the sample is a random draw of firms within a country, many firms (especially multinationals) only have one sampled establishment within the WMS. While it is possible to observe multiple subsidiaries of the same firm by chance, the manufacturing WMS data collection process is not set up for this type of sampling. Census datasets (such as the US Management and Organizational Practices Survey) are better placed for more in-depth within-firm analyses, though it would be restricted to one country. While the WMS was not set up for looking at within-firm changes, with caveats it can be a useful complement to other analysis. For example, [Bilicka & Scur \(2022\)](#) use the WMS multinational data to consider how plant-level management practices could enable or hinder corporate-level profit shifting decisions. They find that firms with more structured monitoring and target-setting practices are also more likely to report lower profitability in high-tax countries, and find evidence that this pattern is likely to be a result of profit shifting activities. Their primary analysis focuses on between-firm differences in management, but they show that looking within-firm yields qualitatively consistent but less precise results. Naturally, whether the data available is sufficient depends on the research question and is up to the researcher to evaluate the tradeoffs.

R&D and innovation. The WMS does not directly collect data on innovation processes, so matching the WMS with datasets that have this type of information can be fruitful.³⁴ For example, [Bloom, Sadun & Van Reenen \(2012a\)](#), match the WMS with Harte Hanks/Aberdeen data and find that “the US IT related productivity advantage is primarily due to its tougher *people management* practices”. Researchers interested in patents and R&D could merge with relevant datasets (such as those available from the US Patent & Trademark Office) to explore patent behavior; [Marx & Fuegi \(2020\)](#), for example, introduces a dataset that matches patents to academic papers that could be further matched into firm data. While the sample may be limited, such efforts could provide new stylized facts about the relationship between structured management practices and innovation activities.

Institutions and regional-level data. As we will discuss in the replication section, merging the WMS with country-level or even region-level data is a fruitful area of further research. The WMS has data on the location of the establishments, including country, region and even the establishment’s postal code. This enables matching the WMS data with country or regional institutions, including cultural measures. This type of link can be useful for researchers studying how institutional distance and cultural factors affect firms across countries. For example, [Salomon & Wu \(2012\)](#) suggest that “since our findings address only asset allocation strategies, future research could investigate how foreign firms balance the opportunities and challenges arising from

³⁴The US Census MOPS, however, does include questions on data-driven decision making and similar constructs. See, for example, [Brynjolfsson & McElheran \(2016\)](#).

institutional distance across a broader array of strategies”. The geographic data in the WMS could be used as the identifier to match the firm data with institutional datasets such as the Worldwide Governance Indicators (e.g. [Kaufmann et al. 2009](#)), GLOBE (e.g. [House et al. 2002](#)), or Hofstede (e.g. [Hofstede 1980](#)), each of which contain well-documented and often-used data on country-level context.

Employee-level data. The WMS data is, by design, at the establishment-level and does not include employee-level data. Matching these practices with employee data is already a growing area of future work. For example, [Bender et al. \(2018\)](#) matches the WMS data with German employee data, and [Cornwell et al. \(2021\)](#) do so for Brazil. Both document new relationships between structured management practices and labor flows in each country. Other datasets that include measures of management practices have also been used to explore this relationship and provide baseline findings that could be expanded with further data linkages. For example, [Meagher & Wait \(2020\)](#) uses data from the Australian Workplace Industrial Relations Survey 1995 (AWIRS95) on worker’s trust of management and delegation of decision-making authority in organizations. They find more delegation where there are higher levels of trust. [Hong et al. \(2019\)](#) use the Workplace and Employee Survey (WES) from Statistics Canada and show that firms adopting performance pay have a lower concentration of decision-making control at the managerial level.

3 Potential application 1: replications-extensions of current work

Replicability of research findings is a fundamental pillar of science. Replications are useful for validating novel results, testing theories across contexts, and extending results in a number of important ways (e.g. [Bettis, Helfat & Shaver 2016](#), [Köhler & Cortina 2021](#)). These can highlight inconsistencies in empirical methodologies (e.g. [Villadsen & Wulff 2021](#)), or how results change when data is temporally updated (e.g. [Gupta et al. 2018](#), [Howard et al. 2016](#), [Goldfarb & King 2016](#)). Further, replications can both provide nuance to prior findings as well as explore mechanisms behind main headline results (e.g. [Durand et al. 2019](#)). However, such replications and extension exercises have proven to be non-trivial in strategy research. This is often because researchers are using proprietary data or their own data that they may be reluctant to share publicly. Even when researchers have access to the same proprietary data, it is not always straightforward to replicate baseline samples. As such, a key potential contribution of the WMS to our field is in its free and wide accessibility. We briefly illustrate replication-extension applications below.³⁵

3.1 Example 1: characterizing firm ownership and control

As a first illustrative exercise, we revisit [Aminadav & Papaioannou \(2020\)](#), where the authors highlight two key empirical challenges in the study of corporate ownership: sample size and

³⁵We thank the referees and editorial board for directing us to these two papers of interest.

composition, and heterogeneity in firm size. They use a large sample of almost 43,000 firms across 127 countries, though include only listed firms.³⁶ This is often the focus of research into ownership structures as public firms generally have to follow strict reporting requirements, while this is much less consistent (especially across the world) for private firms. The WMS has two key differences: (a) the survey directly asks the managers to describe their ownership and control categories and (b) it includes both public and private firms.³⁷ The WMS data used in this replication-extension exercise includes just over 11,000 public and private manufacturing firms across 35 countries. The definition of widely held is fairly similar: in the WMS, firms are classified as widely held (or, “dispersed shareholders”) when no one shareholder owns more than 25% of the corporate shares. Family firms, however, are defined as family owned if the family members (or, block) simply hold a controlling ownership stake – whatever the number of shares (see Table 3).

Replication. The primary database used in their paper is Orbis BvD, augmented by additional data from other sources and their own search. As Orbis data is proprietary, the replication files available via the journal’s website do not include the dataset that would allow replications or extensions.³⁸ As raw data cleaning code files are not generally required by all journals, we were not able to replicate their core dataset despite also having access to the proprietary “base” data ourselves. Nonetheless, we attempted as close a replication of the core stylized facts as we could, though it is worth noting the WMS data used only includes the manufacturing industry while the [Aminadav & Papaioannou \(2020\)](#) data include multiple industries.³⁹

We report the results in Figures 5. They find that 46.3% of their firms “have a shareholder (e.g., family, individual, state, institutional investor) with voting rights exceeding 20%”, and, while not directly comparable in terms of definitions and only for one industry, Panel (a) suggests the statistic for the most similarly classified WMS listed firms is not far off (44%). In terms of family firms, they find the share of family firms is close to 17%, while the WMS listed family firms’ share is 15%.⁴⁰ Finally, they note that government firms are rare in most countries with few exceptions. The WMS data is also consistent in this group of firms, with the average being near 1 to 2% and the bulk of these firms belonging to China (where 10% of manufacturers are government owned). Panel (b) reproduces the classification of countries into each of the four categories of Legal Origins the authors use (Common Law, French, German, or Scandinavian Civil Law). While, again, we only have 35 countries and one industry, the pattern of ownership distribution is remarkably similar.

³⁶Listed here refers to “publicly traded companies” ([Aminadav & Papaioannou 2020](#)).

³⁷These reported ownership structures are later verified by comparing reports to Orbis, and when there is a discrepancy, firms are called back to confirm.

³⁸The replication package does not include a data file, noting that the data is proprietary.

³⁹We thank our reviewers for suggesting the value of these replication-extension exercises in illustrating comparability and use of data, such as in [Tambe & Hitt \(2012\)](#).

⁴⁰They note that including unidentified private owners this doubles, which again is reflected in the WMS statistics as well.

Extension. In both figures we also illustrate potential extensions of this work. In both Panels we repeat the exercise with the “not listed” firms in the WMS sample. Family firms, for example, are much more prevalent in the not listed sample (Panel A) but widely held firms still account for over one-quarter of these firms. Financial institutions (such as Banks and Private Equity) own a similar share of firms whether they are listed or not. Panel B shows firms that are not listed to be much more likely to be controlled across all legal origin institutional types, rather than widely held, but the relative pattern is still similar to listed firms, though nuanced.

In their paper, [Aminadav & Papaioannou \(2020\)](#) suggest that “future research should also try to ‘unbundle’ family firms, distinguishing between established multi-generational family firms and new family firms, and should examine the international dimension of corporate control, for example, by looking at country-pair factors or investigating the role of tax havens”. This is certainly possible with the WMS, as the survey documents the family firm generation, who the CEO is (family member/non-family) and whether the CEO position was passed via primogeniture. For multinationals, the survey also documents the parent country and, if the WMS data is matched to Orbis, [Bilicka & Scur \(2022\)](#) have shown it is possible to build the full ownership tree (including identification of tax havens) for a substantial number of the MNEs in the sample.

3.2 Example 2: generalizability across industries and countries

A notable feature of the WMS is its comparability across countries and time. As the dataset has grown to a large scale, many of the large multinational firms in the sample now have multiple plants randomly sampled across a number of countries. This is particularly useful for researchers considering institutional distance topics. [Salomon & Wu \(2012\)](#), for example, explore “local isomorphism” among bank branches operating in foreign countries, and consider whether various dimensions of country-level measures of distance impact the level of isomorphism (and types of legitimacy à la [Rana & Sørensen \(2021\)](#)). They note, however, that they “would like to have tested whether foreign-bank subsidiaries in the United States imitate strategies of sibling subsidiaries in third countries”.

As the WMS includes information on the location of the firms, it could be useful for studying how the distance from home to focal countries could influence the fit between practices or the relative importance of certain practices or bundles of practices. [Bloom, Sadun & Van Reenen \(2012b\)](#), for example, use this feature to investigate the relationship between bilateral trust between the home and host country and managerial autonomy in investment, hiring, production, and sales decisions. They find that higher levels of bilateral trust increase autonomy and raise aggregate productivity through better corporate resource allocation. This was possible by merging the establishment-level WMS data to an Orbis listing of the parent company ID as well as country-level institutional measures of trust from the World Values Survey.

Using a similar data set-up, researchers interested in these topics could match additional country-level measures of economic, regulatory, and cultural distance (for example, from the WGI

and GLOBE datasets) to construct distance measures between the country in which the multinational is headquartered and each country where it has subsidiaries. This would allow for work that builds on [Salomon & Wu \(2012\)](#)’s findings, including questions such as: how does delegated managerial autonomy vary with economic, regulatory, and cultural distance? Does the level of structured management or managerial characteristics moderate this relationship? Are there meaningful differences in ownership structure that further mediate these patterns?

4 Potential application 2: opportunities for new strategy research

In this section, we briefly outline potential areas of research that could use a dataset such as the WMS. The breadth of variables and easy access and availability of the WMS creates opportunities for further theory-building and testing in the strategy research community. The set of questions we highlight as examples broadly fall into the categories of *intra-organizational*, where research questions center what is happening *within* the organization, and *extra-organizational*, where research questions center around what is happening *outside* of the organization. We then build on a specific example with research topics on strategic human resource management. Our goal is to outline the set of topics that were most salient to us as an illustration, though of course there are many more opportunities than we can name here.

4.1 Intra-Organizational Strategy Research

The variables and coverage of the WMS allow for investigations into the complementarity of practices, as well as how the fit between practices may vary by firm governance, managerial characteristics, and other types of heterogeneity in organizational characteristics and resources.

Strategic fit between activities. An organization is generally defined as a system of interrelated activities (e.g. [Levinthal 1997](#), [Siggelkow 2002](#), [Furnari et al. 2021](#)), and there is prominent literature on (a) whether configurations of organizational attributes can predict performance (e.g. [Doty et al. 1993](#)); (b) the fit between activities (e.g. [Simon et al. 2011](#)); and (c) between activities and the organizational environment (e.g. [Lichtenthaler 2009](#)). However, much of the research in strategic management has been at a higher, C-suite level, rather than the establishment level (e.g. [Chadwick et al. 2015](#), [Venkatraman 1990](#), [Bromiley & Rau 2014](#)) and has relied extensively on expensive proprietary datasets, which is problematic from a replicability and accessibility standpoint.⁴¹

The WMS has a range of practices across a variety of organizational contexts that can be used to expand our understanding of the fit between practices in different contexts. Figure 2, for example, illustrates the pair-wise correlation of the main indices measured in the manufacturing survey.

⁴¹Early papers used the Profit Impact of Market Strategies (PIMS) database extensively (e.g. [Venkatraman & Prescott 1990](#), [Ramanujam & Venkatraman 1984](#)) and more recent work has relied on data aggregators such as Orbis, as detailed in Section 3.

The heterogeneity in this high-level set of relationships could motivate research into the strategic fit between practices, these clusters of practices, including why and how they differ across firms, governance regimes, product market competition levels, having insider vs. outsider managers, or different “flatness” levels.⁴² Questions about the effects of bundles of practices (e.g. Perry-Smith & Blum 2000) continue to pervade the literature, as researchers examine diversity (e.g. Nishii et al. 2018) and family-friendly/flexible-work programs (e.g. Bloom et al. 2011, Choudhury et al. 2021).

Implementation and process of strategy. There is a long literature on strategy implementation (e.g. Shrader et al. 1984, Skivington & Daft 1991, Huff & Reger 1987), including recent reviews of decision-making in organizations (e.g. Joseph & Gaba 2020) and strategy process (e.g. Burgelman et al. 2018). This literature posits that the relationship between implementation of management practices is moderated by the internal fit with these practices (e.g. Zatzick et al. 2012, Tenhiala & Laamanen 2018). As the WMS data can be matched to firm performance data, it allows for considerations of how strategic fit is related to financial outcomes and whether there are potentially optimal combinations across different contexts. The breadth of the WMS dataset would allow strategy scholars to introduce, for example, more nuance into the question of “better design” by considering contingencies of results like in classic works such as Horovitz & Thietart (1982), as well as connect with more recent work focusing on the strategic fit of dynamic capabilities (e.g. Fainshmidt et al. 2019). More broadly, operational practices can also be integral to successfully devising and implementing strategic choices (Sadun et al. 2017). Thus, merging with financial data to consider strategic change decisions over time, researchers can consider whether attempts at strategic change are more viable with more structured operational practices.

4.2 Extra-Organizational Strategy Research

Merging the WMS with additional firm- and country-level data allows for further analyses into questions related to the fit between business practices and an organization’s external context.

Institutional distance and institutional voids. Questions of institutional distance have been studied for decades. These include, how the fit between practices can be influenced by regional-level cultural contexts (e.g. Newman & Nollen 1996, Liberman & Torbiörn 2000), the extent and method of transmission and adoption of practices across large organizations — especially across countries and large physical and cultural distances (e.g. Szulanski 1996, Beugelsdijk et al. 2018), and how the structure of industries (in terms of competition, governance or trade) affects the bundles of optimal practices (including environmental practices, as in Delmas & Toffel (2004), and among nonprofit organizations as in Hager & Brudney (2015)). Figure 2 illustrates that while the

⁴²For example, one thing that stands out from this figure is that in the United States, people management has lower correlation with monitoring and target-setting than in other areas of the world. This stylized fact could be used to motivate future work in how complementarities differ in different institutional settings.

management indices are correlated, they are not near one and thus being a “low scoring firm” does not necessarily mean firms get low scores across all management topics. Some contexts also seem to be more conducive to certain bundles of practices than others.

Another often discussed dimension of institutional work relates to ownership structures and the prevalence of family firms across different contexts. For example, [Chung & Luo \(2013\)](#) study the role of family firms in filling institutional voids, considering whether the governance structure of family firms may have differential performance implications depending on the strength of local institutions. The detailed ownership data in the WMS could facilitate work considering both the governance of family-firms and their business practices across countries. Figure 1 illustrates that there is sufficient variation within and across countries and Figure 4 shows there is sufficient variation across ownership and governance categories, too. Further, the WMS can also be matched to new metrics, such as the family business legitimacy index (FBLI) from [Berrone et al. \(2020\)](#), to understand how institutional context, governance, and management practices interact.

4.3 WMS and Strategic Human Resource Management

While there are myriad uses of this data in strategy research, SHRM was highlighted at the 2021 Academy of Management Perspectives symposium as an area of particular opportunity. Using this example, we outline below why the breadth of the WMS data (in practices, industries and countries) and multi-level nature (single- and multi-plant establishments, across time) make it an especially useful dataset for this endeavor.

Breadth of Practices and Heterogeneity within Practices. [Chadwick & Flinchbaugh \(2021\)](#) highlight key empirical concerns with current SHRM research that play a role in the conclusions and theory that SHRM is currently able to address. First, they argue that “assuming that the implementation of HR practices in firms is non-random, we expect that the HR practices with the greatest impact on firm performance are also those that are likely to have the least variance across a population of firms, because rational firm actors accurately perceive that these HR practices are important and implement them”. Using WMS data, [Bloom, Genakos, Sadun & Van Reenen \(2012\)](#) show that some basic management practices that are widely recognized as impacting firm performance are, however, not implemented consistently. Second, [Chadwick & Flinchbaugh \(2021\)](#) note that much of the prior research has been done from a universalistic perspective, where a single HR system is examined. While there has been significant theoretical emphasis on the importance of horizontal fit (e.g. [Kehoe 2021](#)), there has been relatively less empirical evidence that tests the theories, especially across contexts. As such, important questions remain around contingencies and when horizontal fit between practices is associated with stronger firm performance.

With data from 35 countries and a variety of industries, the WMS would allow for work looking beyond a single industry and beyond data from primarily large companies in highly developed countries to help alleviate concerns raised by [Chadwick & Flinchbaugh \(2021\)](#) that individual

industries or countries may suffer from a lack of heterogeneity in key practices. While concurrent qualitative or case-study work will need to explore mechanisms, the WMS has the breadth of context to explore the types of antecedents and contingencies that this work suggests is needed in SHRM. For example, the WMS data on managerial tenure – for which there is substantial variation (see Table 2) – could be used to explore issues relating to the autonomy local managers have around human resource decisions. Connecting with the performance data, new work could build upon [Collins & Kehoe \(2017\)](#), which examines the fit between the HR system and innovation, with a consideration of industry-level context.

Breadth of Context Across Countries and Industries. [Snell & Morris \(2021\)](#) discuss an ecosystem approach for SHRM that considers both the “interactions among elements of the workforce compositions, capabilities, and cultures” and studies such “alignment in an evolutionary way”. While this is an evolving theoretical literature, the WMS could be used to build on the empirical side of this ecosystem approach. For example, the WMS data contains information that could be used to understand how workforce characteristics (e.g. tenure and education level, see Table 1) interact with management practices in different competitive environments or may manifest important cultural attributes.⁴³ These data could provide a nuanced, broad, and contingency-based view of management practices.

Firm Dynamics Observed from Panel Data and Multi-level Data. [Snell & Morris \(2021\)](#) highlight that there is little research that considers variation across establishments within a parent firm as data on management practices and SHRM has generally been aggregated to the parent firm level. The sample of firms in the WMS that include multiple establishments could be useful in this realm, as it could allow for questions such as: do establishments with different managers have different management practices? Do establishments located in countries with different cultural norms have different management practices?

Further, [Snell & Morris \(2021\)](#) highlight that firm dynamics is a key element missing from SHRM, especially when focused on the universalistic view. In particular, they note that most SHRM research does not account for how management systems may need to change when the environment changes, and that prior research generally does not explicitly consider how the best practices may differ in turbulent environments to allow for more adaptability. The panel component of the WMS could be useful in allowing researchers to examine: 1) how management practices changed across time to account for changing external conditions (e.g. macro economic conditions or industry competition); 2) how establishments that did or did not change practices performed; and 3) how firms differentially changed practices across their establishments. While there is emerging work in economics looking at this topic (e.g. [Aghion et al. 2021](#)), there is scope for further exploration from the strategy and management perspective.

⁴³Say, by comparing with data merged from the Hofstede Cultural Dimensions ([Hofstede 1980](#)). Other relevant context could be gathered from the World Bank Development Indicators.

5 Conclusion

“The use of many different unique sorts of data makes it harder to compare results across studies in different settings, and thereby cumulative research findings. If empirical research in management is to generate stylized facts, we must find ways for our studies to build upon one another. Once again, ‘replication’ studies may be critically important”

(Helfat 2007): 189.

Across multiple social science fields, providing data access for the purposes of advancing the scientific evidence and promoting replication and extension exercises has been a recent focus, and strategic management is no exception (e.g. Bergh et al. 2017, Bettis, Ethiraj, Gambardella, Helfat & Mitchell 2016). Replication is fundamental for the scientific method, and reproducing results in the same as well as across different contexts is crucial in building a greater evidence base for our theories. Making data and empirical analysis codes widely available are an important part of this process. However, while the calls for replications and data access have been made for decades (e.g. Hubbard et al. 1998), strategic management has lagged behind due in part to the more widespread use of proprietary data.

In this paper we highlighted the World Management Survey, a large and freely accessible dataset that researchers can leverage to further strategic management theories relating to questions both internal and external to the firm. We outlined the key features of this dataset and suggested an illustrative set of potential uses in strategy research. In particular, we showed, with two existing publications, how the WMS could be used to specifically build upon existing work and create opportunities for more work that ties together existing theories and lay the groundwork for replication. We also briefly highlight uses in intra-organizational and extra-organizational strategy research and more extensively propose uses in the strategic human resource management literature. Ours was a decidedly non-exhaustive summary, and we hope it serves as a launchpad for testing and further developing theories and empirical findings.

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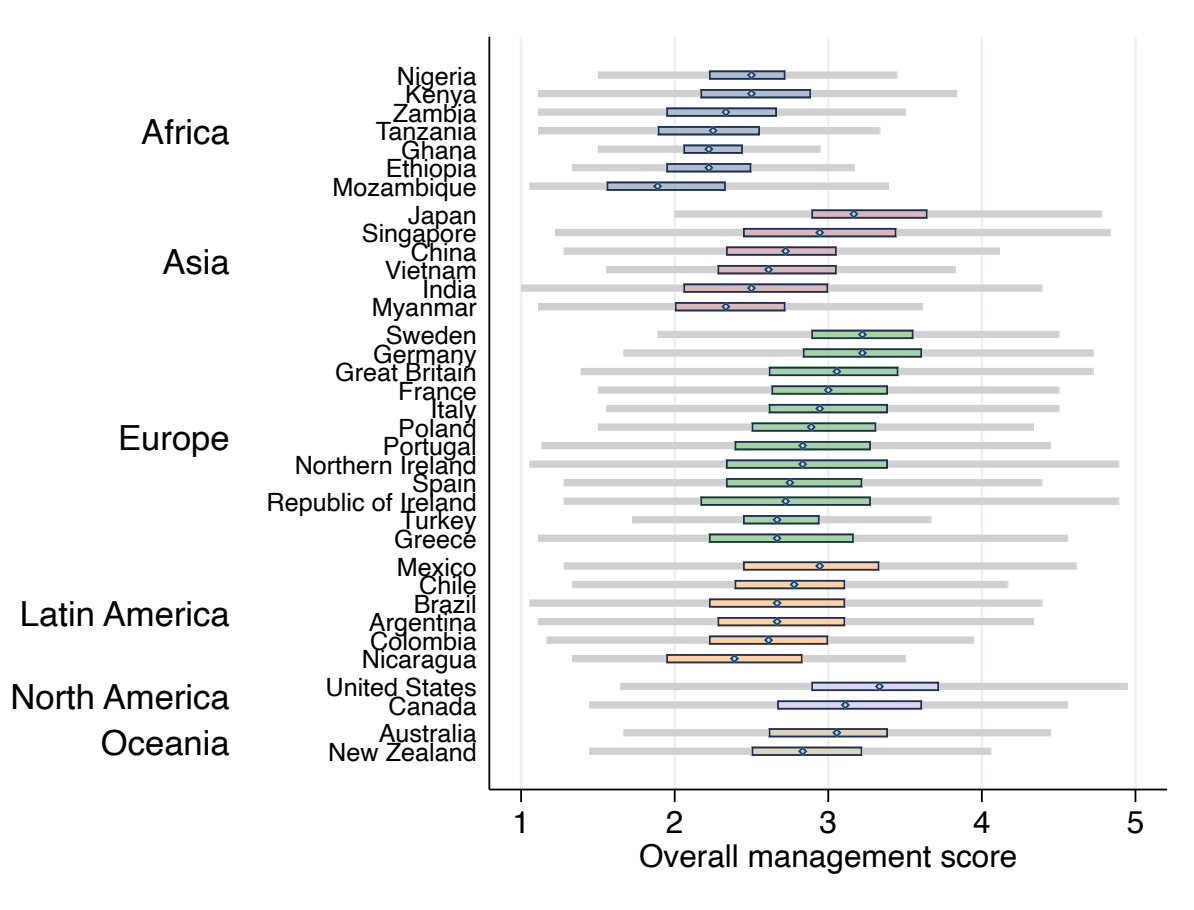
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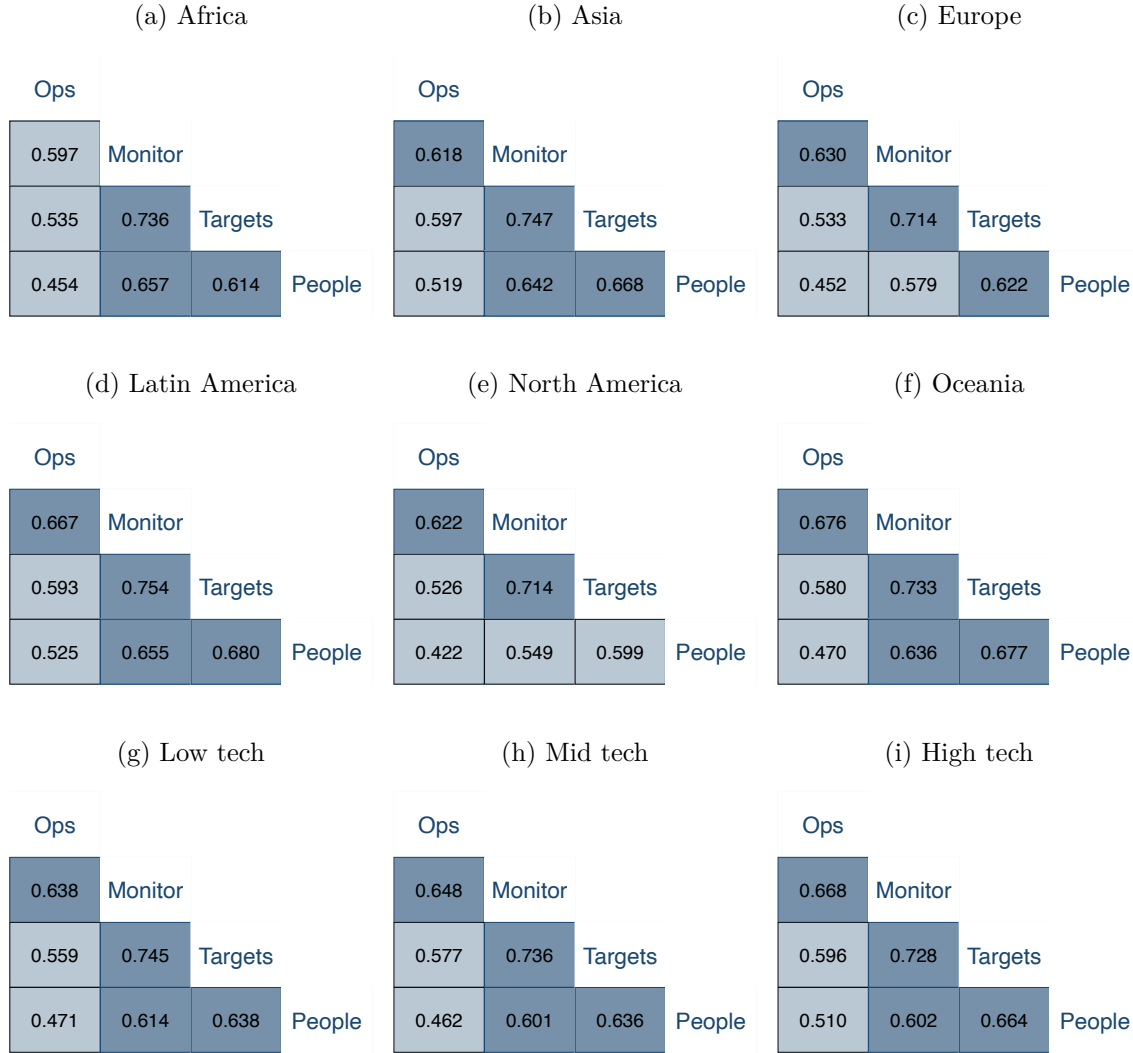
Tables and Figures

Figure 1: Distribution of management scores by country



Note: This figure uses the full World Management Survey manufacturing dataset. See Table 1 for the individual country sample sizes. The x-axis denotes the overall management score (average of 18 topics in the survey), and can range from 1 (least structured) to 5 (most structured). Bars show the distribution of scores within each country, with a white diamond plotting the median value, the colored boxes plotting the inter-quartile range and gray whiskers plotting the adjacent minimum and maximum values. Bars are ordered from highest to lowest median value within each continent.

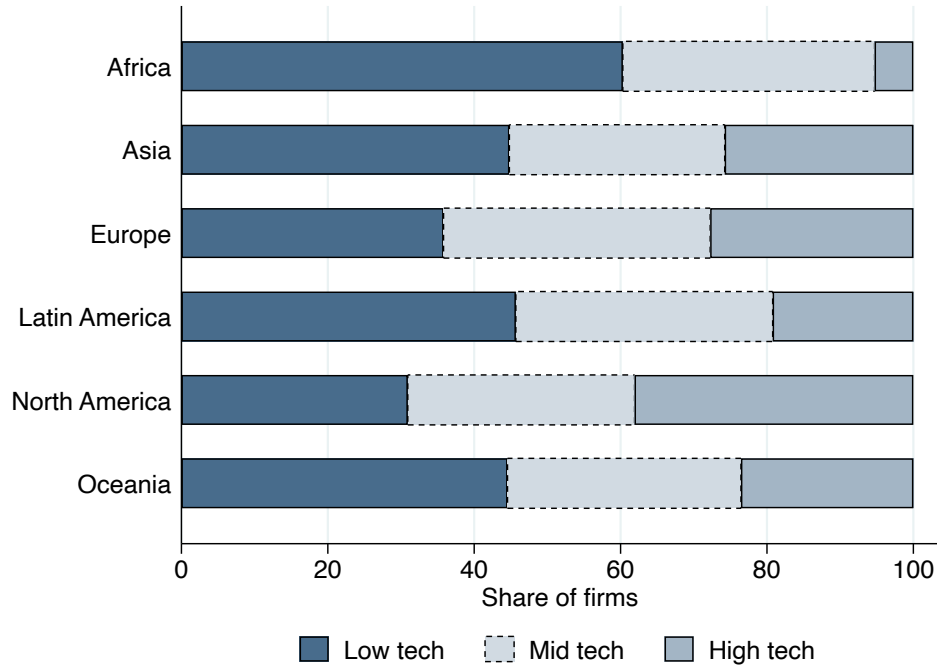
Figure 2: Management Indices Correlation Matrices: by contextual groupings



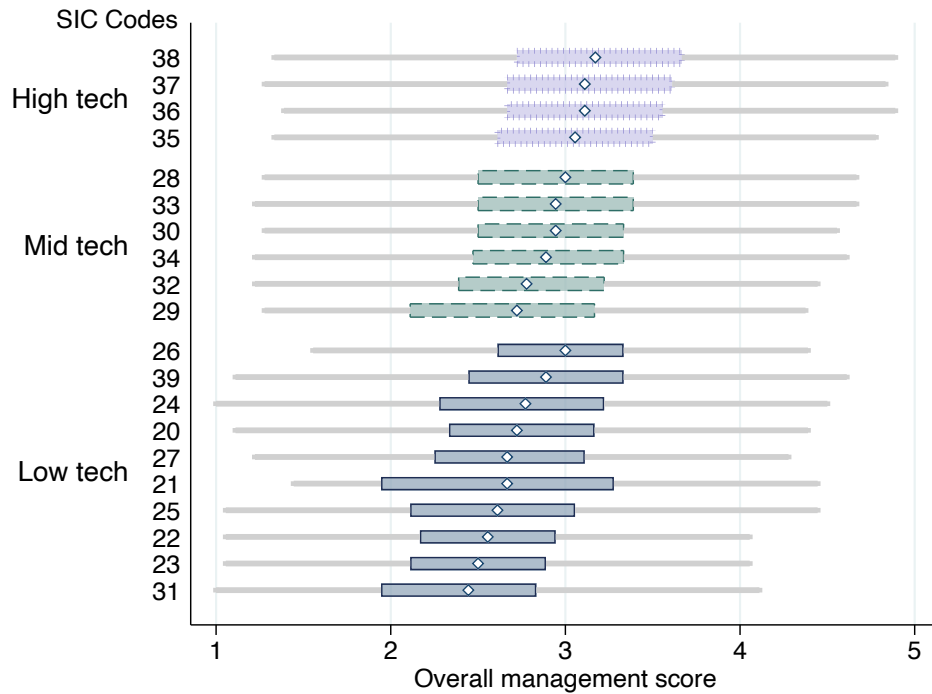
Note: This figure uses the full World Management Survey manufacturing dataset and reports the pair-wise correlation matrix for the 4 sub-groups of topics in the WMS manufacturing survey: Operations includes 2 questions (lean operations and why lean); Monitoring includes 5 questions (process documentation, performance tracking, performance review, performance dialogue and consequence management); Target-setting includes 5 questions (types of targets, connected goals, time horizon, stretch goals, and clear goals); People management includes 6 questions (talent mindset, dealing with good performers, dealing with bad performers, developing talent, employee value proposition and retention). The question topic title is listed at the top/right of each column/row. Each box reports the correlation coefficient. Panels (A) to (F) include only firms in each of the respective continents. Panel (G) includes firms across all countries, but only in low-tech mfg industries (SIC 20-27, 31 and 39). Panel (H) includes firms across all countries, but only in mid-tech mfg industries (SIC 28-30, 32-34). Panel (I) includes firms across all countries, but only in high-tech mfg industries (SIC 35-38).

Figure 3: Industry

(a) Share of firms within each industry type, by continent



(b) Management scores by 2-digit industry, by type

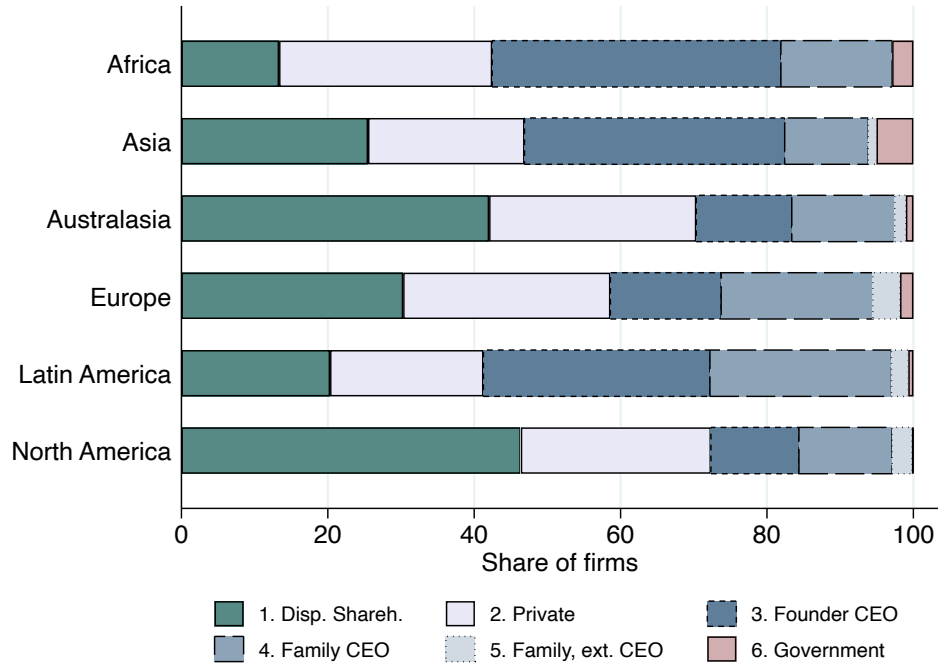


Note: This figure uses the full World Management Survey manufacturing dataset. Panel (A) reports the share of firms in the full dataset that are in each type of industry and continent. Panel (B) plots the overall management score (average of 18 topics in the survey) by 2-digit industry. Scores can range from 1 (least structured) to 5 (most structured). Bars show the distribution of scores within each industry, with a white diamond plotting the median value, the colored boxes plotting the inter-quartile range and gray whiskers plotting the adjacent minimum and maximum values. Bars are ordered from highest to lowest median value within each industry type. Industry codes are as follows:

20: Food and kindred products; 21: Tobacco products; 23: Apparel and other fabrics; 24: Wood products, except furniture; 25: Furniture and fixtures; 26: Paper and allied products; 27: Printing and publishing; 28: Chemicals and allied products; 29: Petroleum refining and related; 30: Rubber and misc plastic products; 31: Leather and leather products; 32: Stone/clay/glass and concrete products; 33: Primary metal industries; 34: Fabricated metal products; 35: Machinery and computer equipment; 36: Electronic and electronic equipment; 37: Transportation equipment; 38: Measuring and controlling instruments; 39: Misc manufacturing industries.

Figure 4: Ownership

(a) Share of firms within each ownership type, by continent



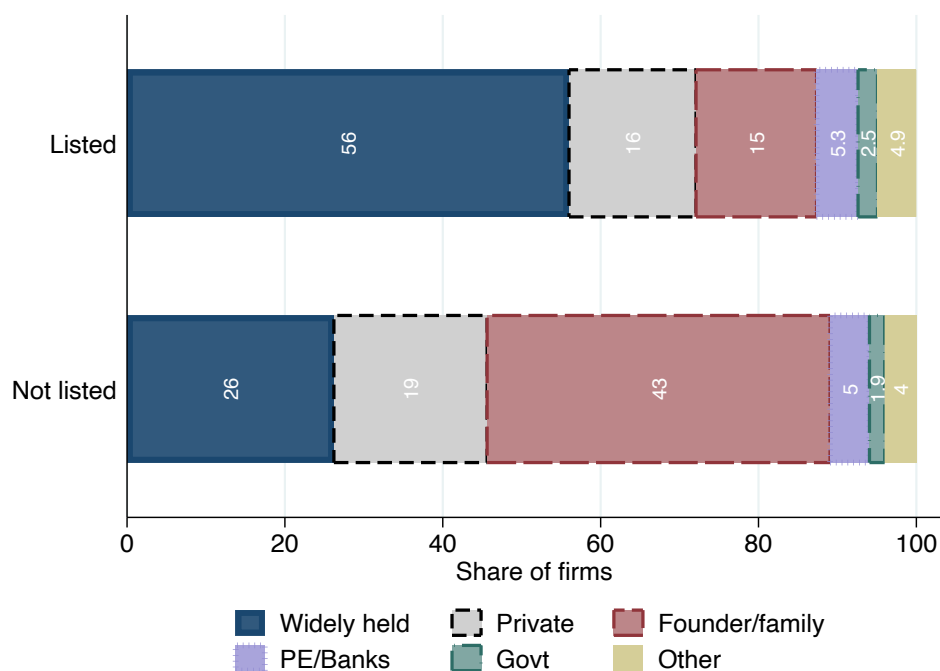
(b) Management scores by ownership category



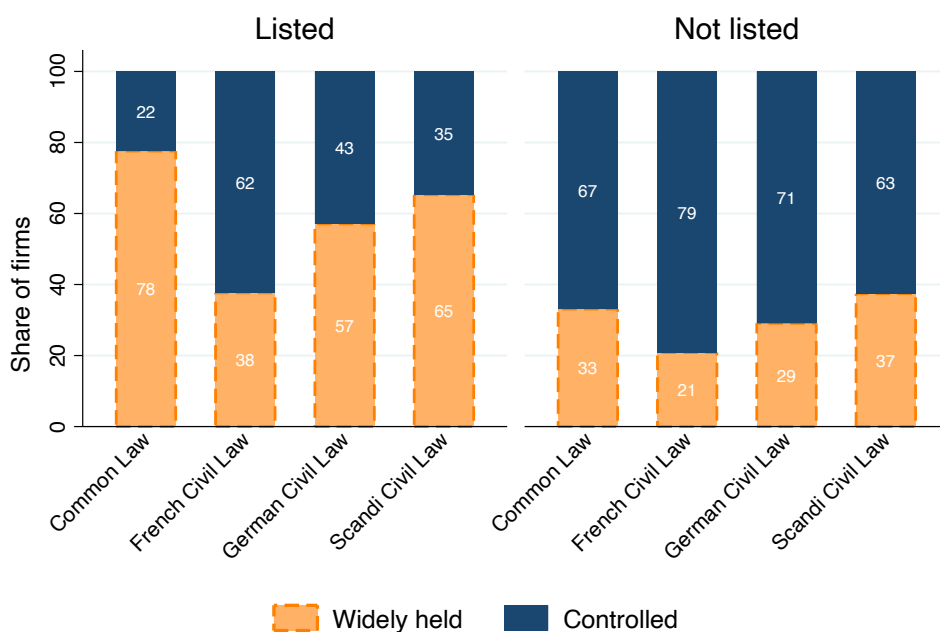
Note: This figure uses the full World Management Survey manufacturing dataset. Panel (A) reports the share of firms in the full dataset that are in each type of ownership and continent. Panel (B) plots the overall management score (average of 18 topics in the survey) by ownership category. Scores can range from 1 (least structured) to 5 (most structured). Bars show the distribution of scores within each ownership category, with a white diamond plotting the median value, the colored boxes plotting the inter-quartile range and gray whiskers plotting the adjacent minimum and maximum values. Bars are ordered from highest to lowest median value.

Figure 5: Replication-extension exercise: [Aminadav & Papaioannou \(2020\)](#) ownership shares

(a) Share of firms, by ownership category and listed status



(b) Share of firm control category, by legal origin



Note: This figure uses the full World Management Survey manufacturing dataset following [Aminadav & Papaioannou \(2020\)](#) country categorizations of legal origin. Widely held is the equivalent of the WMS “dispersed shareholder” category, where no one shareholder owns more than 25% of the firm. PE/Banks includes firms owned by Private Equity or other banks and financial institutions. Govt is government owned. Founder/family includes firms that are owned by their founders or descendants of the founding family. Private includes all privately-owned firms. Other includes other types of ownership, such as institutional, cooperatives or manager-owned firms.

Table 1: Summary of firm characteristics: averages across countries

	Firm age	Firm emp	Plant emp	HQ on-site	# sites total	# sites foreign	Union pct	Compe- titors	Export pct	Exporter pct	N
Africa											
Ethiopia	26.15	429	294	0.70	2	0	56.05	9	10.94	0.25	131
Ghana	28.94	275	207	0.76	1	0	40.88	7	23.56	0.60	108
Kenya	30.90	488	280	0.77	2	0	39.07	8	29.69	0.81	185
Mozambique	23.35	536	163	0.82	2	0	57.13	6	12.37	0.39	109
Nigeria	15.58	523	137	0.77	3	0	22.12	8	7.81	0.30	118
Tanzania	26.89	451	234	0.74	2	1	50.10	6	28.62	0.65	150
Zambia	27.42	332	160	0.68	2	2	52.42	7	18.08	0.66	69
Asia											
China	18.97	732	486	0.78	3	0	45.48	7	39.43	0.84	1072
India	31.52	645	398	0.65	3	1	33.53	8	28.29	0.73	937
Japan	59.09	437	194	0.72	4	3	48.38	8	19.98	0.72	178
Myanmar	13.31	458	361	0.51	1	0	34.71	7	41.90	0.53	147
Singapore	22.90	5060	192	0.58	1	6	10.39	8	45.73	0.74	406
Vietnam	15.28	462	233	0.75	2	0	82.99	8	40.27	0.70	151
Europe											
France	52.08	730	210	0.66	8	5	14.05	7	39.14	0.90	780
Germany	64.48	777	326	0.85	5	3	31.65	7	43.65	0.96	749
Great Britain	52.30	750	192	0.76	6	4	24.34	7	41.17	0.90	1540
Greece	36.73	309	138	0.72	2	1	25.42	7	38.62	0.90	585
Italy	36.54	464	197	0.87	4	2	40.97	8	56.07	0.95	632
Northern Ireland	41.55	599	176	0.68	10	8	19.51	6	29.39	0.58	137
Poland	46.67	434	233	0.78	2	0	20.10	8	35.82	0.90	364
Portugal	45.08	369	219	0.93	2	1	20.25	8	61.19	0.94	410
Republic of Ireland	37.27	547	183	0.63	12	10	41.14	6	33.89	0.65	161
Spain	32.34	291	200	0.83	2	0	28.95	7	46.04	0.90	214
Sweden	70.08	550	269	0.82	4	2	90.80	6	59.88	0.96	404
Turkey	28.34	309	245	0.86	1	0	8.79	8	46.24	0.92	332
Latin America											
Argentina	45.73	502	280	0.72	2	0	71.49	7	20.57	0.80	568
Brazil	36.79	613	320	0.81	3	1	54.53	7	12.50	0.59	1151
Chile	43.40	451	194	0.78	3	2	45.88	7	27.81	0.69	611
Colombia	33.98	386	249	0.82	2	0	5.25	8	16.93	0.67	170
Mexico	37.81	726	346	0.67	3	1	58.49	7	36.85	0.79	525
Nicaragua	30.09	488	292	0.65	2	0	21.92	8	40.38	0.68	97
North America											
Canada	46.67	635	214	0.54	12	8	35.33	7	.	.	419
United States	52.19	1517	233	0.56	9	3	15.66	7	17.53	0.77	1564
Oceania											
Australia	52.89	943	167	0.62	18	19	39.00	7	20.08	0.74	473
New Zealand	44.33	263	105	0.90	8	5	41.14	7	48.33	0.89	151

Note: This table uses the full World Management Survey manufacturing dataset and reports the average values for a set of key firm characteristics by country. Countries are ordered alphabetically, separated by continent. Firm age is the number of years the firm has been operating. Firm emp is total number of employees at the firm. Plant emp is total number of employees at the interviewed plant. HQ on-site is a dummy variable that takes a value of one if the HQ is on the same site as the interviewed plant. The table thus reports the share of interviewed plants that have HQ on-site. # sites total is the total number of production sites the firm has. # sites foreign is the number of production sites that the firm has outside of its “home” country. Union pct is the percentage of employees who are unionized. Competitors is the number of *perceived* direct competitors the manager reports their firm has (more than 10 is top-coded as 10). Export pct is the share of the firm’s output that is exported. Exporter is a dummy variable that takes a value of one if the firm exports any of their output. Exporter pct is the share of firms that export at least some of their output within each country. N is sample size.

Table 2: Summary of workforce characteristics: averages across countries

	% managers	% mgrs w/ degrees	% non-mgrs w/ degrees	Manager tenure	Self-score (out of 5)	N
Africa						
Ethiopia	8.98	58.10	6.07	9.04	3.76	131
Ghana	14.25	69.34	15.23	11.75	3.51	108
Kenya	10.63	65.96	13.14	11.29	3.60	185
Mozambique	9.74	48.80	4.80	11.44	3.72	109
Nigeria	9.51	83.35	23.97	9.98	3.52	118
Tanzania	9.34	58.78	2.99	10.68	3.61	150
Zambia	10.34	61.88	7.97	8.99	3.55	69
Asia						
China	8.36	48.98	13.32	8.75	3.53	1072
India	10.34	82.70	13.91	12.78	3.55	937
Japan	14.66	65.64	25.36	27.57	3.35	178
Myanmar	7.16	69.37	16.42	10.10	3.36	147
Singapore	8.19	56.24	10.28	12.09	3.54	406
Vietnam	12.75	61.99	10.08	8.99	3.56	151
Europe						
France	13.13	56.06	9.40	12.08	3.21	780
Germany	8.51	60.91	9.98	14.39	3.57	749
Great Britain	11.56	42.77	9.01	13.86	3.49	1540
Greece	12.82	69.38	13.01	13.96	3.73	585
Italy	8.28	51.91	11.46	14.12	3.53	632
Poland	9.75	72.77	15.59	13.69	3.41	364
Portugal	11.42	54.38	6.32	14.45	3.64	410
Ireland	11.60	51.91	10.77	12.56	3.57	161
Spain	11.20	63.54	10.88	14.41	3.67	214
Sweden	10.08	44.05	13.19	13.38	3.37	404
Turkey	9.04	81.58	6.94	9.30	3.90	332
Latin America						
Argentina	10.06	51.67	5.80	13.97	3.71	568
Brazil	4.88	72.22	10.05	12.18	3.78	1151
Chile	5.60	79.77	10.47	12.45	3.78	611
Colombia	10.02	67.54	5.08	10.88	3.88	170
Mexico	7.40	83.01	14.34	12.74	4.04	525
Nicaragua	7.02	73.71	13.43	12.22	4.01	97
North America						
Canada	8.22	46.47	8.75	13.76	3.72	419
United States	13.90	61.68	14.91	14.74	3.61	1564
Oceania						
Australia	11.00	44.37	8.26	11.49	3.57	473
New Zealand	10.05	44.43	7.60	12.03	3.58	151

Note: This table uses the full World Management Survey manufacturing dataset and reports the average values for a set of key workforce characteristics by country. Countries are ordered alphabetically, separated by continent. Percent managers is the share of the plant's workforce that are managers. % mgrs with degrees is the share of managers who have college degrees. % non-mgrs w/ degrees is the share of non-managers who have college degrees. Manager tenure is the number of years that the manager has been in their manager post in the plant. Self-score is the re-cast score that the manager gives when asked "excluding yourself, how well managed do you think the rest of your firm is?". N is the sample size.

Table 3: Summary of organizational governance: averages across countries

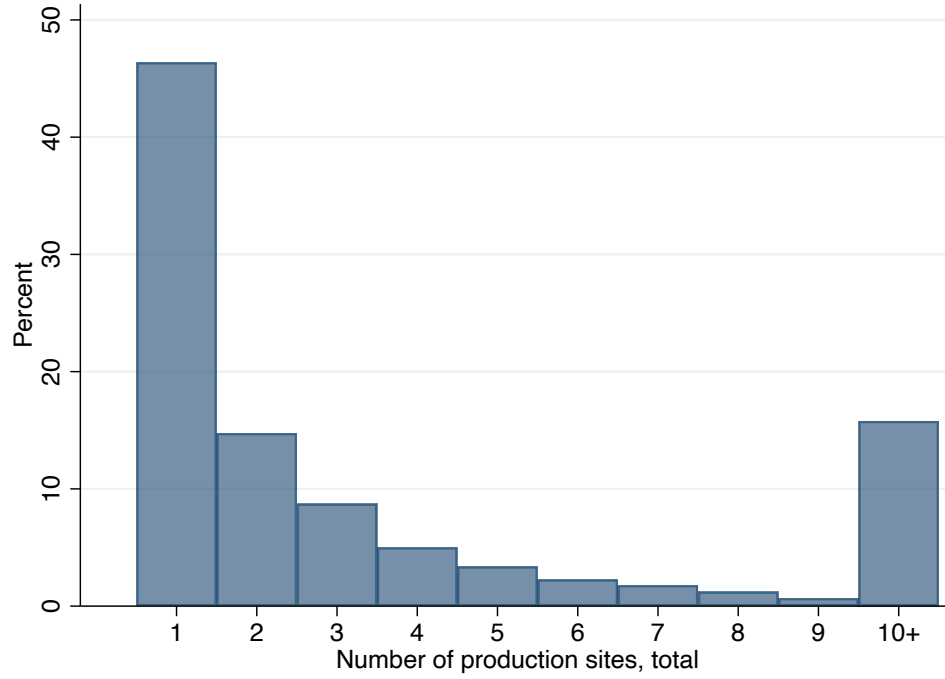
	% founder firm	% family firm	% dispersed shareh. firm	% MNE	% Public	Levels to CEO	Levels to PM	Span of control	N
Africa									
Ethiopia	0.36	0.08	0.00	0.02	0.00	3.20	2.11	5	131
Ghana	0.50	0.07	0.08	0.29	0.00	3.42	2.15	5	108
Kenya	0.33	0.26	0.16	0.17	0.00	3.62	2.42	7	185
Mozambique	0.34	0.08	0.19	0.29	0.01	3.02	1.93	5	109
Nigeria	0.56	0.14	0.16	0.15	0.00	3.14	2.40	5	118
Tanzania	0.34	0.19	0.17	0.24	0.00	3.83	2.52	6	150
Zambia	0.38	0.17	0.14	0.33	0.00	3.58	2.43	6	69
Asia									
China	0.30	0.02	0.23	0.29	0.04	4.49	2.90	8	1072
India	0.47	0.25	0.13	0.13	0.00	3.94	2.37	10	937
Japan	0.02	0.30	0.58	0.37	0.01	5.70	3.35	9	178
Myanmar	0.81	0.03	0.10	0.11	0.00	5.35	4.24	6	147
Singapore	0.19	0.10	0.45	0.45	0.04	4.05	2.08	8	406
Vietnam	0.38	0.03	0.38	0.25	0.03	3.39	2.31	7	151
Europe									
France	0.06	0.21	0.30	0.68	0.01	5.81	4.81	14	790
Germany	0.05	0.32	0.29	0.66	0.27	5.06	4.17	14	767
Great Britain	0.07	0.20	0.37	0.59	0.11	4.73	3.28	11	1549
Greece	0.23	0.34	0.24	0.33	0.05	3.43	2.21	6	585
Italy	0.18	0.36	0.18	0.45	0.00	4.14	3.15	12	666
Poland	0.10	0.07	0.21	0.38	0.05	3.44	1.84	10	364
Portugal	0.22	0.31	0.13	0.44	0.07	3.25	2.22	7	410
Republic of Ireland	0.23	0.17	0.25	0.47	0.02	3.59	1.83	7	161
Spain	0.15	0.34	0.20	0.40	0.02	3.04	1.98	7	248
Sweden	0.04	0.11	0.47	0.71	0.05	3.25	2.28	8	404
Turkey	0.57	0.13	0.02	0.07	0.03	3.56	2.42	5	332
Latin America									
Argentina	0.23	0.34	0.24	0.31	0.00	3.56	2.38	7	568
Brazil	0.35	0.26	0.13	0.20	0.00	3.42	2.11	7	1151
Chile	0.20	0.26	0.29	0.35	0.00	3.32	2.13	7	611
Colombia	0.44	0.24	0.12	0.12	0.00	2.91	1.60	7	170
Mexico	0.27	0.29	0.24	0.38	0.00	3.73	2.30	7	525
Nicaragua	0.30	0.23	0.13	0.24	0.00	3.07	1.85	7	97
North America									
Canada	0.14	0.13	0.30	0.54	0.01	4.12	1.84	9	419
United States	0.10	0.16	0.42	0.52	0.02	5.51	3.82	14	1607
Oceania									
Australia	0.10	0.15	0.44	0.65	0.15	4.07	2.17	7	473
New Zealand	0.18	0.17	0.27	0.58	0.00	3.49	1.77	6	151

Note: This table uses the full World Management Survey manufacturing dataset and reports the average values for a set of key organizational characteristics by country. Countries are ordered alphabetically, separated by continent. % founder is the share of firms that owned by their founder. % family firm is the share of firms owned by the second (or further) generation of family owners, descendants from the firm's founder. % dispersed shareh. firm is the share of firms that do not have any one owner who owns more than 25% of the shares of the firm. % MNE is the share of firms that are multinationals. % public is the share of firms that are publicly listed on the stock market. Levels to CEO is the number of hierarchical layers between shopfloor and CEO. Levels to PM is the number of hierarchical layers between shopfloor and plant manager. Span of control is the number of direct reports to the plant manager. N is the sample size.

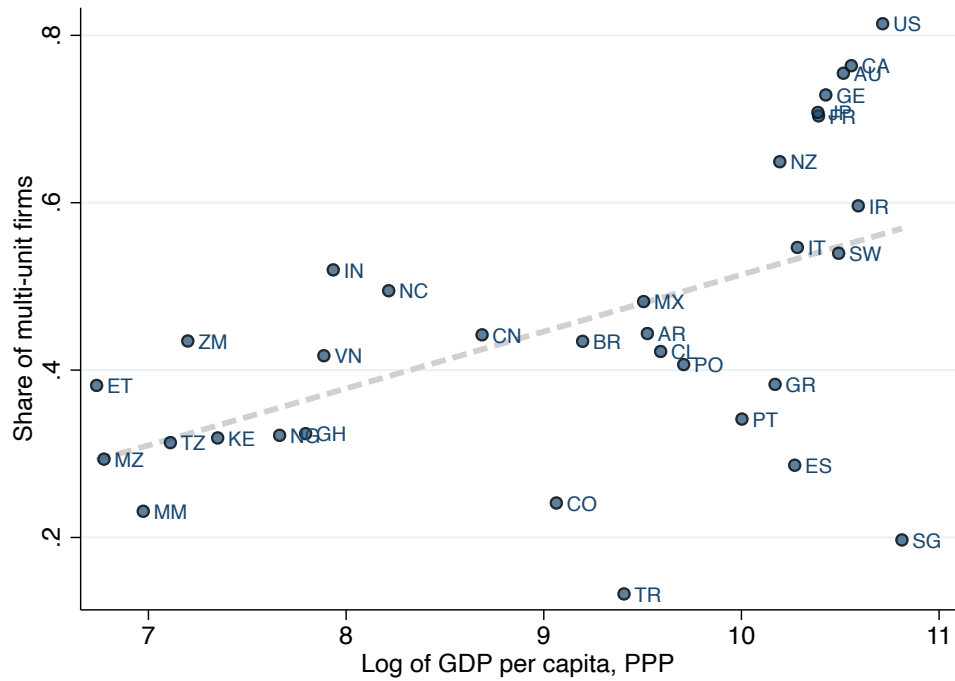
Appendix

Figure A1: Incidence of single- and multi-unit firms in the WMS.

(a) Distribution of the number of production sites in interviewed establishments

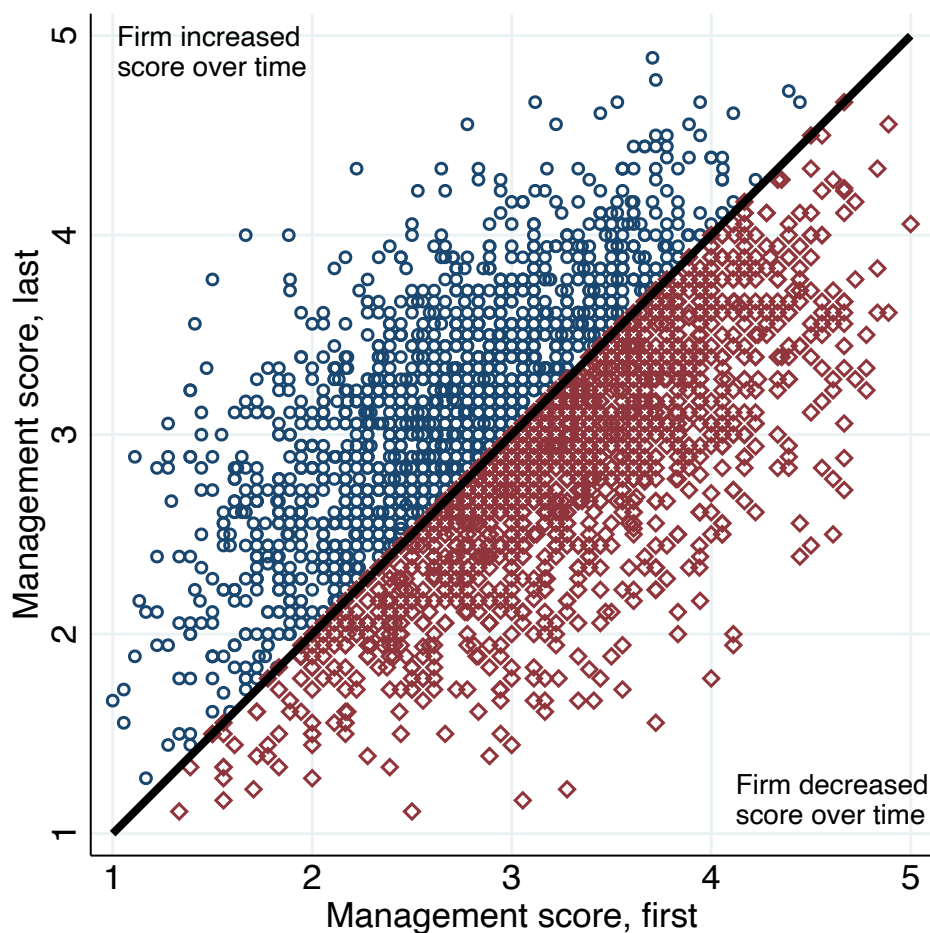


(b) Share of multi-site firms in the WMS, by country



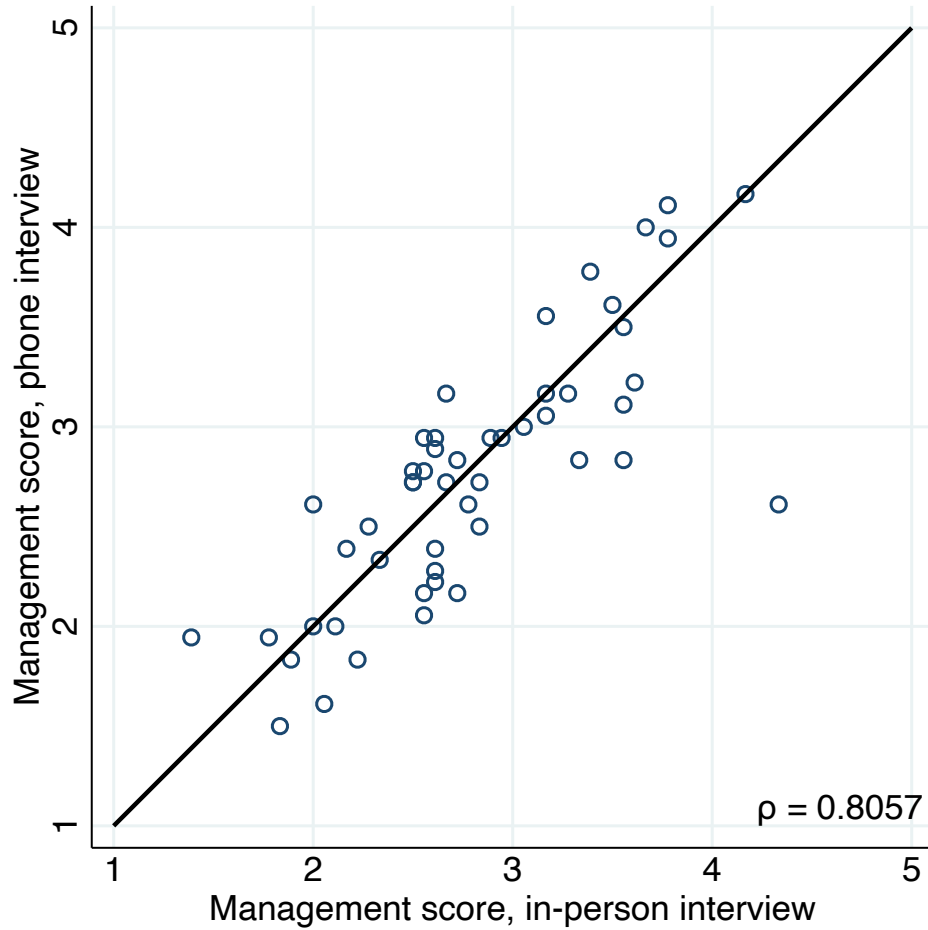
Note: Panel (a): Data from the World Management Survey. The survey asks managers to report the total number of production sites that the firm has. This data is audited via Orbis and other firm official sources (such as firm websites). This graph shows that nearly half of the firms in the WMS are single-unit firms. Panel (b): Data from the World Management Survey, collapsed at the country level. This graph shows the share of firms that have more than one production site (multi-unit firms) relative to their GDP per capita (2013 PPP).

Figure A2: Management scores in first and last interviews for WMS panel firms



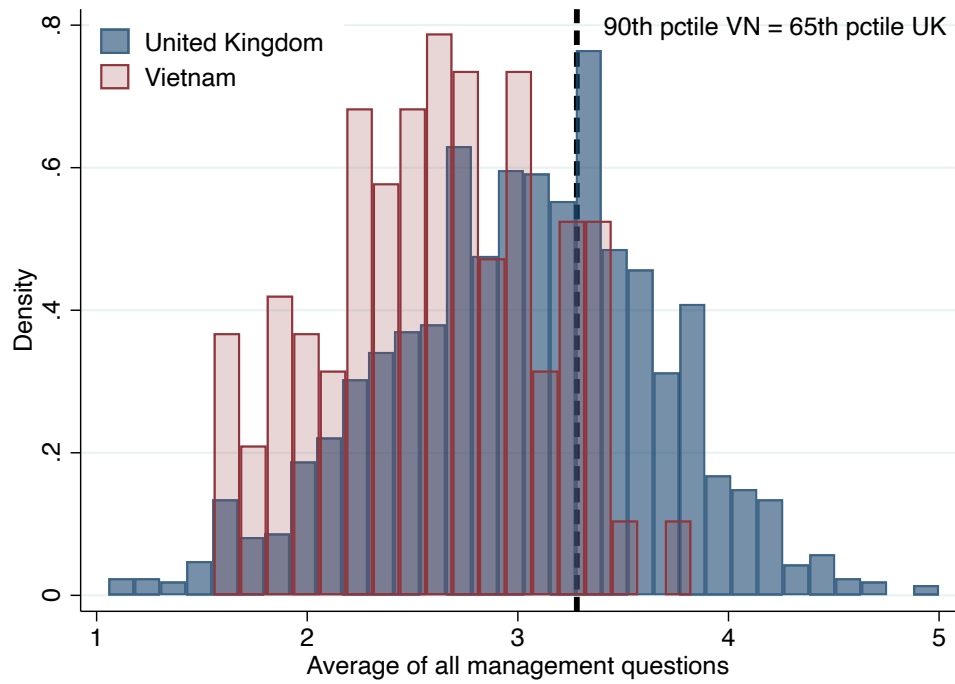
Note: Data from the World Management Survey, firms for which there is panel data only. Each circle is a firm, each with at least two interviews conducted over time. This graph compares the first and the last interview recorded in the WMS: the score for the last interview in the y-axis and the score for the first interview in the x-axis. The thick black line indicates the 45-degree line of equality. Blue circles indicate that the firm's score increased between the first and last interviews. Red triangles indicate that the firm's scores decreased between the first and last interviews.

Figure A3: Correlation between scores with different interviewers and methods



Note: Data from the World Management Survey, Chilean wave in 2009. Each circle is a single firm, each of which had two interviews conducted by two different analysts, with two different senior managers. One interview was conducted in person (x-axis) and one interview was conducted on the phone (y-axis). This graph compares the two scores. The black line is the 45-degree line of equality.

Figure A4: Distribution of management: Vietnam and the UK



Note: This figure uses the WMS manufacturing dataset and reports the distribution of the overall average management scores for Vietnam (N=151) and the UK (N=1,686). The 90th percentile score in Vietnam is about 3.28, which corresponds to a score around the 65th percentile of the UK distribution.

Table A1: Summary of citation and uses of the World Management Survey

Strategy and Management	Citations	Uses	Earliest date	Latest date
Management Science	19	5	2014	2021
Strategic Management Journal	11	3	2009	2021
Organizational Science	10	0	2010	2020
Academy of Management Journal	2	0	2010	2011
Academy of Management Annals	2	0	2017	2019
Academy of Management Perspectives	3	1	2012	2014
Global Strategy Journal	7	0	2013	2021
Journal of Management Studies	5	3	2008	2021
Strategy Science	4	0	2018	2021
Journal of Management	3	0	2011	2021
Strategic Entrepreneurship Journal	2	0	2011	2016
Strategic Organization	1	0	2015	2015
Organization Studies	1	0	2014	2014
Administrative Science Quarterly	0	0	-	-
Human Resources				
Industrial and Labor Relations Review	11	1	2013	2021
Human Resource Management Review	2	0	2018	2020
Human Resource Management Journal	1	0	2021	2021
Economics				
American Economic Review	22	3	2009	2021
Quarterly Journal of Economics	16	4	2009	2021
Economic Journal	9	3	2008	2021
Review of Economic Studies	8	2	2015	2021
Journal of Economics and Management Strategy	7	0	2011	2021
Journal of the European Economic Association	6	3	2014	2021
Journal of Economic Behavior and Organization	12	3	2012	2021
Journal of Political Economy	8	1	2016	2021
Review of Economics and Statistics	7	2	2011	2021
Journal of Labor Economics	7	1	2009	2021
Econometrica	2	0	2009	2016

Note: This table lists the number of citations and uses of the World Management Survey across key journals in strategy, management, HR and economics. To build this list we searched for mentions of “World Management Survey” or “Bloom and Van Reenen (2007)” in papers published between 2007 and 2021 across this list of journals. This list is non-exhaustive. The goal is merely illustrative of the impact of the WMS dataset on the relevant literatures. It is also likely a lower-bound of this impact, as our “baseline” search would miss articles that only cited the more recent iterations of the survey papers, or only the education or healthcare-specific papers.

Table A2: World Management Survey Questions: Core Operations

Question topic	Information collected
Manufacturing	
Adoption of modern practices	What aspects of manufacturing have been formally introduced, including just-in-time delivery from suppliers, automation, flexible manpower, support systems, attitudes, and behavior?
Rationale for adoption	Were modern manufacturing techniques adopted just because others were using them, or are they linked to meeting business objectives like reducing costs and improving quality?
Hospitals	
Adoption of modern practices	What is the typical patient journey (or flow) through the hospital? How closely located are wards, theatres, diagnostic centers and consumables? How often do you run into problems with the current layout and pathway management?
Rationale for adoption	What was the rationale for improving the patient pathway? How often do you challenge/streamline the pathway? What factors led to the adoption of these practices?
Standardization of processes	How standardized are the main clinical processes? How clear are they to staff? What tools and resources do staff regularly employ? How do managers monitor protocol adherence?
Good use of human resources	What happens when different areas become busier than others? How do you know which tasks are best suited to different staff? What kind of procedures do you have to assist staff flow and coordination?
Schools	
Data driven planning and transitions	How is data used to inform planning and student transitions? What drove the move towards more data-driven planning and tracking?
Standardization of processes	How standardized are the instructional planning processes in the school? What tools and resources do teachers use to ensure consistent quality? How do leaders monitor and ensure consistency of quality cross classrooms?
Personalization of instruction	How much does the school identify and accommodate individual student needs? How do leaders ensure teachers are effective in personalizing instruction within classrooms? How are parents and students engaged?
Instructional best practices	How do leaders and teachers learn about instructional best practices? How do leaders encourage adoption and knowledge sharing across teachers? How do leaders ensure new practices are being used?

Table A3: World Management Survey Questions: Monitoring and target-setting

Question topic	Information collected
Manufacturing, hospitals and schools	
Process problem documentation	Are process improvements made only when problems arise, or are they actively sought out for continuous improvement as part of normal day-to-day processes?
Performance tracking	Is tracking ad-hoc and incomplete, or is performance continually tracked and communicated to all staff?
Performance review	Is performance reviewed infrequently and only on a success/failure scale, or is performance reviewed continually with an expectation of continuous improvement?
Performance dialogue	In review/performance conversations, to what extent are the purpose, data, agenda, and follow-up steps (like coaching) clear to all parties?
Consequence management	To what extent does failure to achieve agreed objectives carry consequences, which can include retraining or reassignment to other jobs?
Target balance	What type of goals does the organization have? Are they uni-dimensional (say, only financial for firms, or only government-assigned for public sector)? Is there a balance of targets?
Target interconnection	Are goals based on “shareholder value”? Are goals cascaded down the organization in a way that works through units and ultimately is connected to individual performance expectations?
Target time horizon	Do leaders focus mainly on the short term, or do they understand short-term targets as a “staircase” toward the main focus on long-term goals?
Target stretching	Are goals too easy to achieve, especially for some “protected/special” areas of the organization, or are goals demanding but attainable for all areas?
Performance clarity	Are performance measures ill-defined, poorly understood, and private, or are they well-defined, clearly communicated, and made public?

Note: Table replicated from [Scur et al. \(2021\)](#). Notes from the original article: “This table lists the **monitoring and target-setting** management topics covered in the World Management Survey questionnaires. The column “question topic” outlines the broad topic being measured. The last column includes a more detailed explanation of the types of follow-up questions that are asked of the manager to garner the information required for scoring. This set of questions are common to all industries.”

Table A4: World Management Survey Questions: People and incentives

Question topic	Information collected
Manufacturing, hospitals and schools	
Managing human capital	How do leaders show that attracting talent is important for the organization? To what extent are senior managers evaluated and held accountable for attracting, retaining, and developing talent throughout the organization?
Rewarding high performance	To what extent are people in the organization rewarded equally irrespective of performance level, or is performance clearly related to accountability and rewards?
Fixing poor performers	Are poor performers rarely removed, or are they retrained and/or moved into different roles or out of the company as soon as the weakness is identified?
Promoting high performers	Are people promoted mainly on the basis of tenure, or does the organization actively identify, develop, and promote its top performers?
Attracting human capital	Do competitors offer stronger reasons for talented people to join their organizations, or does a firm provide a wide range of reasons to encourage talented people to join?
Retaining human capital	Does the organization do relatively little to retain top talent, or does it do whatever it takes to retain top talent when they look likely to leave?

Note: Table replicated from [Scur et al. \(2021\)](#). Notes from the original article: “This table lists the **people** management topics covered in the World Management Survey questionnaires. The column “question topic” outlines the broad topic being measured. The last column includes a more detailed explanation of the types of follow-up questions that are asked of the manager to garner the information required for scoring. This set of questions are common to all industries.”

Table A5: World Management Survey Questions: Leadership

Question topic	Information collected
Hospitals	
Clearly defined accountability	What is the role of clinicians in improving performance and achieving targets? How are individual clinicians responsible for delivering targets? Does this apply to cost targets as well as quality targets? How do clinicians take on roles to deliver improvements?
Schools	
Leadership vision	What is the school’s vision for the next five years? Do teachers/staff know and understand the vision? Who are the stakeholders for the school and how is the vision communicated? How are they engaged in setting the vision?
Clearly defined accountability	Who is accountable for delivering on school targets? How are individual school leaders held responsible for targets? What authority do you have to impact factors that are important for delivering on the targets?
Clearly defined roles	How are the responsibilities of the school leader defined? How are responsibilities distributed across teachers and staff? How are roles defined? How are they linked to student performance?

Note: Table replicated from [Scur et al. \(2021\)](#). Notes from the original article: “This table lists the **leadership** topics covered in the World Management Survey questionnaires for schools and hospitals. These questions are not part of the manufacturing surveys. The column “question topic” outlines the broad topic being measured. The last column includes a more detailed explanation of the types of follow-up questions that are asked of the manager to garner the information required for scoring.”