Language barriers in multinational companies and knowledge transfers

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Language Barriers in MNCs and Knowledge Transfers[*]

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Abstract

Many countries routinely offer subsidies to attract MNCs, hoping to generate positive spillovers. A distinctive feature of MNC affiliates' organizational structure is a three-tier hierarchy: foreign managers (FMs) supervise domestic middle managers (DMs) who supervise domestic production workers. Language barriers between FMs and DMs could impede transfers of management knowledge and reduce beneficial spillovers from foreign investment. We develop a model in which DMs learn management skills by communicating with FMs. Communication effort and, therefore, the transfer of management knowledge, is non-contractible and thus potentially under provided. If (A) management knowledge acquired through communication is a general skill, the social planner should intervene to reduce communication frictions between FMs and DMs. Furthermore, if (B) communication is complementary with language skills, subsidizing foreign language acquisition can increase social welfare. We experimentally test the validity of conditions (A) and (B) among MNCs operating in Myanmar, a context in which communication between FMs and DMs occurs in English despite DMs' low English proficiency. The first experiment examines assumption (A) by hiring human-resource managers at domestic firms to rate hypothetical job candidates with randomly different characteristics. Domestic employers value candidates with both higher English proficiency and MNC experience, and this is driven, in part, by a premium for frequent interactions with FMs. The second experiment examines (C) by providing English training to a random sample of DMs working at MNCs. At endline, treated DMs have higher English proficiency, communicate more frequently with their FMs, are more involved in firm management, and perform better in simulated management tasks. The empirical results therefore support the view that there is an under-investment in English knowledge relative to the social optimum.

1 Introduction

Multinational companies (MNCs) are larger, more productive, have superior technology, and are better managed than other firms (e.g., Bloom et al. 2012b, Antràs and Yeaple 2014). Developing countries routinely offer subsidies to attract these champions, hoping that their physical presence generates positive spillovers. While some studies detect evidence of the latter (Smarzynska Javorcik 2004, Alfaro-Urena et al. 2019), others do not (Aitken and Harrison 1999, Harrison and Rodriguez-Clare 2010). The uneven empirical support suggest that beneficial spillovers are not automatic, and that policymakers should consider complementary policies to maximize the likelihood of spillovers from FDI.

This paper examines a potential impediment to knowledge spillovers from MNCs: language barriers. A distinct feature of MNC organizational structures is that the subsidiary is typically led by experienced foreign managers (FMs) who supervise less-experienced domestic middle managers (DMs) who in turn manage domestic production workers. In these firms, communication between FMs and DMs often occurs in a non-native language, generating frictions which could impede knowledge transfers. In our setting–MNCs operating in Myanmar–communication occurs in English. Tailored surveys reveal that DMs' English proficiency is, on average, low and consistently point to language barriers as a key impediment to learning from FMs. Language acquisition and communication, however, are costly activities. A certain level of language barriers, therefore, is consistent with privately optimal investment in English training on the part of both firms and workers. Under what conditions should a planner intervene to reduce communication barriers between FMs and DMs in order to raise knowledge transfers? And, are these conditions supported in reality?

To answer these questions, we first formulate a model to clarify the conditions under which language barriers create an inefficiency that justifies a policy intervention. We explore a framework in which DMs learn management skills by communicating with FMs. We capture the tacit, hard-to-codify, nature of the management knowledge that DMs can potentially acquire from FMs by assuming that the amount, and content, of communication between FMs and DMs is non-contractible.[1] This "within MNCs" contractual friction, which we take to be a realistic feature of commercial life, potentially leads to under-supply of communication between organizational layers even when DMs and FMs are fully rational, have no information asymmetries or credit constraints, and operate within perfectly functioning English-training markets. In particular, we show that if (A) management knowledge acquired through communication is a general skill, the social planner should intervene to reduce communication frictions between FMs and DMs. The non-contractibility of communication within organizations likely prevents the planner from targeting directly the market failure. Instead, we consider one practical policy instrument to bring the decentralized equilibrium closer to the socially efficient level of communication: subsidizing language acquisition. If (B) communication is complementary with language ability, the planner can (partially) correct the

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[1]The non-contractible nature of communication is a cornerstone of organizational economics, see, e.g., Crawford and Sobel (1982), Dessein (2002) and, for an approach closer to our model, Dewatripont and Tirole (2005).

inefficiency by subsidizing English acquisition.

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We explore the validity of conditions (A) and (B) through two experimental protocols. The first protocol examines (A), management knowledge learned at MNCs through communication is a general skill. We recruit a sample of 51 experienced human-resource managers who work at domestic firms to rate hypothetical resumes of potential job applicants for managerial positions. HR managers are shown pairs of resumes that vary randomly in applicant characteristics. HR managers place a large premium (both in their choice and in their wage offer) on applicants with English knowledge and prior MNC experience. A hypothetical applicant with both MNC experience and advanced English proficiency is chosen at roughly the same likelihood (and offered roughly the same wage) as an applicant with two years of additional work experience, an attribute that ranked (in a separate module) as the most important factor in hiring decisions. We further explore (A) in a second rating exercise where HR managers choose among applicants according to hypothetical answers to interview questions. Here, potential candidates all had high English proficiency and were currently employed at a MNC. We randomly vary how frequently the applicant reports interacting with their FM, how involved they are in management, and how frequently they use Microsoft Office (a hard skill). Applicants with frequent interactions with FMs are as likely to be chosen as applicants with the hard skill (but re-assuringly less likely than applicants highly involved in direct management).[3] These findings support condition (A): the domestic labor market values skills aquired through frequent communication with FMs.

The second experiment explores condition (B), the complementarity between communication effort and English proficiency and the non-contractibility of communication. We provide a free 48-hour English training course to a random sample of DMs employed at 27 MNCs operating at Myanmar's largest Special Economic Zone. At endline, treatment DMs' English skills, as measured by a tailored test, improves relative to control. Several checks support the complementarity assumption (C): treated DMs report more frequent communication and interactions with their FMs, and report being more involved in the management of personnel.[4] Since DMs perform a range of large tasks at the MNCs, it is difficult to measure the extent to these outcomes translate into better performance on the job. We therefore design an standardized management exercise that simulates the organzational structure of an MNC. An English-speaking enumerator acting as a "FM" provides instructions to a DM to manage a packaging task. The task is a randomly drawn vector of steps

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[2]Note that the logic of this result is distinct from standard arguments for intervention in training for general skills. In a Beckerian framework for English training, the DM would have an incentive to invest privately in English training, unless there are frictions (e.g., search frictions in the labor market, or credit constraints; see Acemoglu and Pischke 1998). In our setting, we assume perfect information and no credit constraints to focus specifically on the role of non-contractible communication within organizational hierarchies.).

[3]A potential concern is that HR managers in domestic firms might perceive these candidates to be better selected, rather than having directly benefited from frequent communication with FMs in their previous jobs. A third response option regarding frequency of communication, which explains that the applicant was supposed to interact frequently with the FM, but did not for exogenous reasons, allows us to test for this possibility. We find no evidence for a potential selection effect.

[4]A potential concern is that the treatment DMs' communication with FMs comes at the expense of control DMs, but we do not find evidence of such a reallocation.

that places specific items in a specific order and packaged in a certain way. The DM then manages two (actors) production workers "PWs" (with no English proficiency) to complete the task. "PWs" supervised by treatment DMs complete their assigned task faster with no differences in mistakes–i.e., achieve higher performance–relative to control DMs. Treated DMs, however, spend *more* time communicating with the "FM"–by asking more questions–which further supports the complementary assumption (and supports the model's assumption of costly communication effort incurred by FMs).[5]

It is important to reiterate that our experimental design aims to assess whether conditions that would justify a policy intervention are likely to be met in practice, and is not meant to provide a comprehensive evaluation of the costs and benefits of a particular English training program. In fact, using the estimated results, we perform back-of-envelope calculations and conclude that neither DMs nor FMs would, on average, privately invest in our language training course. The NPV of the potential wage benefits for DMs (from the resume results) from privately investing in the language course does not offset the penucuniary and opportunity costs. The MNCs would benefit from providing subsidies for language training through more efficient management of PWs (from the language experiment, management simulation), but this is offset by the program costs, opporutnity cost of FM communication, and the probability that DMs exit. The average NPV across firms is close to zero.[6]

Taken together, the results suggest that the conditions that justify a policy intervention to reduce communication barriers between DMs and FMs are likely to be verified in our setting. We can only speculate on the extent to which our results are relevant to other contexts.[7] In settings where middle-managers are bilingual–which is more likely to be satisfied in high human capital countries or host countries with shared ties with the MNC country–language barriers may be a smaller barrier. Despite the country being a former British colony, English levels in Myanmar are low but not significantly lower than several other countries that are significant hosts for FDI flows in the region, such as XYZ. Furthermore, recent decades have seen the emergence of South-South FDI flows, e.g., the recent surge of Chinese investments in Africa. Language barriers could be an important impediment to knowledge transfers in those contexts as well.

Our results connect two related but separate strands of the literature. Multinationals are a key source of technology and knowledge (e.g., Keller and Yeaple 2013, Yeaple 2013) and drive a large share of world trade (Bernard et al. 2018). For this reason, a large literature seeks to under-

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[5]Further evidence supports the assumption that communication is non-contractible. In particular, under non-contractibility of communication, the model implies that treated DMs have a higher willingness-to-pay (WTP) to spend additional time communicating with FMs. At endiline, DMs report a higher WTP to spend an extra hour with FMs (including with FMs unaffiliated with the firm) but not with domestic bosses. Anecdotally, we have found no evidence that DMs compensate FMs to increase communication, either through direct transfers or by accepting a lower salary.

[6]Larger firms should be more inclined to provide language training since they would realize efficiency gains on a large production workers workforce. Anecdotally, this appears to be the case in our sample.

[7]Language is an important driver of trade and FDI flows. A robust empirical finding is that shared language ties facilitate trade (Rauch and Trindade 2002, Head et al. 2010, Melitz and Toubal 2014). A survey article by Blonigen and Piger (2014) argues that common language is, *ceteris paribus*, associated with a twofold increase in FDI flows, a magnitude that vastly exceeds the responsiveness to tax exemptions.

stand the consequences of FDI on developing countries; see the comprehensive survey by Harrison and Rodriguez-Clare (2010). These studies typically focus on spillovers from MNCs to domestic firms and workers, for example through supply-chain linkages (e.g., Aitken and Harrison 1999, Smarzynska Javorcik 2004) or through wages (e.g., Balsvik 2011, Poole 2013). Systematic evidence for positive FDI spillovers has proven elusive. One possibility, overcome by some recent contributions (see, e.g., Alfaro-Ureña et al. 2019), is that measurement and identification challenges make spillovers difficult to detect. A distinct possibility, instead, is that contextual factors and policies might hinder or enhance the likelihood that FDI generate positive spillover for the host economy. This paper highlights language barriers as a potential impediment to management knowledge transfers. The approach in this paper, combining original surveys and RCTs, can however be deployed to understand factors impeding or enhancing other channels of spillovers in other contexts. A separate literature has analyzed the internal organizational structures of MNCs; see the survey by Antràs and Rossi-Hansberg (2009). Antràs et al. (2006) model the formation of cross-country hierarchical production teams with less skilled workers specialized in production and more skilled workers specialized in problem solving (see also Caliendo and Rossi-Hansberg 2012). Antràs et al. (2008) argue that MNCs create a middle-management layers in host countries to reduce the costs of transmitting knowledge across borders. Relatedly, Keller and Yeaple (2013) also argue that because knowledge embedded within MNCs is difficult to codify, offshore production requires communication between headquarters and foreign affiliates.

Our main contribution, therefore, is to connect communication frictions that arise *within* MNCs to potential spillovers from FDI *across* the host economy. In so doing, our paper also contributes to the literature on management practices (e.g., Bloom and Van Reenen 2007, Bloom et al. 2012b). This literature uncovers two findings that motivate our work. First, firm performance correlates quite strongly with the quality of management practices, which indicates that good management practices diffuse slowly as they are hard to codify and transmit (e.g., Gibbons and Henderson 2012, Bloom et al. 2016). Second, multinational firms are better managed (Bloom and Van Reenen, 2007). Rather than offering explicit management consulting or training interventions (e.g., Bloom et al. 2012a, Macchiavello et al. 2015, Alfonsi et al. 2020), our paper argues that management can be learned from direct interactions with superiors within an organization and that the employment of domestic middle-managers at foreign firms could be a potent diffuser of top management practices in developing countries.[8] At the same time, communication frictions arising from language barriers could impede knowledge diffusion. This finding also relates to Atkin et al. (2017). They show that technology adoption can be slowed by communication frictions–due to incentive problems rather than language barriers–inside firms.

The paper is structured as follows. Section 2 describes the setting and facts that motivate the model and experimental protocols. Section 3 describes the model. Section 5 describes the language

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[8]For example, Giorcelli (2019) shows that management training trips for Italian managers to US firms had positive lasting productivity impact on participating Italian firms. Abebe et al. (2020) shows that management can be learned through a RCT matching program in Ethiopia. More generally, Anant XYZ, Shoar XYZ highlights the importance of middle-level managers for firms performance.

experiment that tests the comparative statics of the model. Section 4 assesses key assumptions of the model. Section 7 concludes.

2   Setting & Motivating Evidence

This section describes our setting and the evidence that motivates the research design.

2.1   Setting

Following a political coup in 1962, Myanmar spent nearly five decades isolated from global trade and foreign investment. Beginning in 2010, the military-backed government agreed to transition towards democratic rule, and a few years later, the country initiated economic reforms to re-integrate into the global economy by removing trade barriers and implementing new regulations to attract FDI. These reforms have been successful and average annual FDI inflows between 2010-19 was $2.6 billion compared to just $0.4 billion in the previous decade. Roughly 80% of flows originate from East and South-East Asia.[9]

The 2014 Special Economic Zone Law was a key component of the economic reforms and it established the regulatory framework that governs the country's SEZs. Our analysis focuses on firms operating in the country's main zone, Thilawa SEZ, which opened in September 2015. Firms receive the typical benefits associated with SEZs: tax breaks, duty drawbacks on imports used for exports, and high-quality infrastructure (roads, easy access to a wet and dry port, electricity, and water).[10] Appendix Figure A.3 reports the summary statistics of the firms in our sample. Japanese MNCs are the most frequent investors, followed by Thai, Singaporean and Korean MNCs. The MNCs span a wide range of sectors, including chemicals, electronics, food processing, garments, metals, and logistics.

2.2   Data

Our data come from tailored worker and firm surveys conducted between June 2017 and December 2020.[11] In June 2017, we implemented a survey that targeted all employees at the MNCs located at the SEZ. In July 2018, we conducted a survey specifically covering domestic managers. A consistent definition of a "manager" is challenging because the firms span many sectors and managers span many tasks (e.g., production supervisors, human-resource managers, purchasing agents, and so forth). Piloting revealed that individuals earning over $200/month, the income-tax reporting threshold in Myanmar, is a plausible objective metric to identify DMs at each company. This survey assessed language proficiency in English and in the original foreign language of the company, and asked about DMs' communication and interactions with FMs. We simultaneously

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[9]Calculations from UNCTAD and Myanmar's Directorate of Investment and Company Administration.

[10]Specifically, firms are exempt from corporate taxes, customs duties and other taxes for import of material inputs and capital goods for the first 5-7 years of operation, with subsequent discounts of around 50% in the succeeding years. Some firms are also further exempt from commercial taxes.

[11]We supplement these tailored surveys with administrative data collected by the SEZ, when available.

conducted a firm-level survey by asking the HR managers questions about FMs' language skills and learning frictions at the company level.

In January 2019, we designed the language experiment protocols and recruited 27 MNCs to participate (out of the 46 MNCs who participated in earlier surveys).[12]We surveyed 298 DMs at these firms by phone to collect a few outcomes and their scheduling preferences for the language training. When we refer to the "baseline survey", we refer to both the 2018 in-person survey and the shorter phone survey from January 2019. We then periodically surveyed participants by phone throughout the duration of the treatment and beyond. In January 2020, we started administering the endline survey, testing participants on language and asking about communication within the firm.[13] The in-person endline was interrupted in March 2020 due to COVID-19 and, given necessary precautions, the survey resumed remotely. The endline was completed in June 2020. In December 2020, we started a follow-up survey which was conducted remotely until the military coup on February 1st, 2021.

In June 2020, we recruited human-resource managers at domestic firms to conduct remotely the resume rating exercise. We explain more details about the surveys in Sections 4 and 5.

2.3 Motivating Facts

The data collected in 2018 reveal five facts about MNC organizational structures, language barriers, and learning that motivate the model and two protocols. We describe these facts here.

2.3.1 Three-Layer Organizational Structure

Table 1 reports the organizational structure of the firms. At each MNC, the top layer is comprised of a small number–on average 6.6 –senior expatriate managers (FMs). FMs are responsible for coordinating with headquarter operations, setting the strategic direction for the Myanmar factory, and overseeing operations with the help of a middle-level management layer.[14] These FMs are, on average, 39.3 years old and have 8.8 years of work experience at their firm. Their average salary is $2573 per month with a standard deviation of $2136 .

The second layer is comprised of Myanmar middle-managers (DMs). Table 1 indicates that DMs are younger than FMs, on average 28.6 years old. DMs report directly to, on average, YYYFMs per firm. The average DM monthly salary is $361 , roughly YYY5 times higher than production workers (YYY$103/month, Myanmar's GDP per capita is roughly $1400).

2.3.2 DMs Want to Learn Management Skills

Surveys elicited why DMs chose to work at MNCs. MNCs tend to offer higher wages relative to domestic firms, particularly in developing countries. The left panel of Appendix Figure A.5 shows

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[12]Appendix Table A.1 compares the 27 complier firms with the 19 firms that are not part of the experimental sample. We find XXX.

[13]The DMs in our sample report a total of 81 FMs. The FMs have busy schedules and it was difficult to obtain time to survey them throughout the project. We did conduct a small survey, including a language test, to 23 FMs.

[14]The typical FM relocates Myanmar for about 2.22 years before returning to their origin country.

that nearly XXX60\% of DMs report learning new skills to be the main benefit of working for the MNCs in the SEZ. In contrast, higher wages and better working conditions are reported to be the main benefit of working in the SEZ by only XXX\% and XXX\% respectively. The right panel reveals that it is specifically management skill that most DMs intend to learn at their jobs (more so than hard skills, like production skills or accounting).

2.3.3 DMs English Language Proficiency is Low

Communication between FMs and DMs occurs in English, which is the native language of neither group.[15] Despite being more educated and better selected, in part, to communicate with FMs, English knowledge among DMs in our sample is low.

We assessed language proficiency through two tests. The first test was conducted by the language provider we hired for the language training and administered to a random sample of DMs (see Section 5 for details). Assessing language proficiency is the core business of the provider, we present these results first to establish the baseline level of English proficiency in the sample of DMs. Panel A of Figure 1 presents this distribution. The test scores indicate that YYY38% of this randomly-selected group of DMs has, at best, an elementary level of English proficiency. The majority of DMs place in the A1 or A2 on the Common European Framework of Reference for Languages (CEFR) scale. A person with A1 proficiency can "understand and use only a fewer everyday expressions/phrases aimed at the satisfaction of needs of a concrete type." A person with A2 proficiency can "understand sentences and frequently used expressions for areas of immediate relevance but not much beyond." Only a minority of DMs have achieved the intermediate "B" categories on the scale.

With the help of two external consultants, we also created and administered our own language tests to the full sample of DMs and a small sub-sample of FMs. In the listening module, DMs were asked to answer 16 questions, in an increasing order of difficulty, until they answered two consecutive questions incorrectly. In the speaking module, DMs answered questions in English about their work routine and career aspirations and their answers were indepedently scored by the two consultants. On the subset of DMs who took both the language provider's test and our test, Appendix Figure 2 indicates a positive correlation between the two suggesting that our tailored test can assess language proficiency.

Panel B of Figure 1 reports the distribution of test scores among the DMs and FMs. This figure demonstrates that English proficiency among DMs is on average lower than FMs: the average FM score is about one standard deviation above the average DM score. We had difficulty securing time to administer the English test to FMs, as many repeatedly refused because of time constraints. The HR managers we interviewed also confirm that DMs proficiency is lower than FMs: on average, just YYY11% of DMs are reported to be "proficient" compared to about a third of FMs (see Table

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[15]Despite being a former British colony, English knowledge in Myanmar is low and the country ranks 86th on the EF English Proficiency–which lies in the category of "very low" proficiency–alongside neighboring countries Bangladesh, Cambodia, Sri Lanka and Thailand (EF Proficiency index)

1).

We also created tests to assess FMs' knowledge of Burmese and DMs' knowledge of the native language of the FMs (Chinese, Japanese, Korean, depending on the firm). Appendix Figure A.6 reports these distributions; virtually none of the FMs know Burmese and very few DMs are proficient inthe FMs' language.

2.3.4 Learning Challenges

Language barriers between FMs and DMs appear to create challenges to learning. Our data reveals that out of every 60-minute meeting between FMs and DMs, on average, 33.8% of the time is lost due to language barriers. Additionally, at these meetings, DMs report a low level of comprehension. Comprehension improves with access to two technologies, live translators and Google Translate; average comprehension rises to 62.9% with Google Translate and to 84.0% when a translator is present. Three caveats that limit widespread use of these technologies. First, the meetings last longer when a translator is present. Second, translators are expensive. Half of the firms in our sample do not hire translators. Those that do typically hire translators on a casual basis. Conditional on hiring a translator, these firms typically pay for translation services for, on average, 1.5 hours per day and the translator typically follows only the most senior FMs. Part-time translators cost approximately $100a day, well above the average daily DM wage of YYY$16. Third, Google Translate does not translate directly between Burmese and Japanese/Korea/Chinese (a problem known as "indirect translation").

Several anecdotes provide additional salience to workplace challenges created by language barriers:

- DM, Japanese firm A: *"Although the boss can speak English, if the issue is important, we use translator. The [Myanmar] factory manager cannot speak English at all. So, when the translator is not there, we have to talk to him with body language or by drawing pictures. It takes more time."*

- DM, Japanese firm B: *"He's [FM] not an English native speaker and we are not native speaker either. So, although we try our best, there are misunderstanding frequently. Sometimes, we don't know what he wants."*

- FM, Japanese firm *C: "I told the staff to handle products in certain way but they didn't really understand it and did it differently. Sometimes, they do things that I ask them not to do and until I find out about it, they are doing it wrongly."*

- FM, Korean firm D: *"One problem is that it is difficult to teach Myanmar workers the details of their job due to language barriers."*

- DM, Korean firm E*: "Synonyms had not come out from my mind to clarify the meanings of the words while having conversations with FMs."*

- DM, Korean firm F: *"I asked FMs to repeat what they said for more than two times, and was afraid to speak with them."*

- DM, Thai firm G: *"I could not understand very well what FM said, and could not give concise explanations to FMs. Also, I was afraid of speaking in meetings."*

- DM, Korean firm I: *"I was afraid of writing email and I needed someone to check grammar and usage, besides my emails were long but ineffective."*

- DM, Japanese firm J: *"I needed to use English language in the workplace, I often checked my usages with internet."*

2.3.5 Lower Communication Frictions Correlated with more DM-FM interactions

The final fact that motivates our formal analysis is the finding that lower communication frictions between DMs and FMs is correlated with more interactions. These results are simply correlations from the pre-experiment surveys and serve as further motivation for the interventions we present below.

To study this, we run the following specification that correlates outcomes of DM i with the English test score:

$$y_i = \alpha + \beta english_i + X_i'\delta + \epsilon_i \tag{1}$$

where $english_i$ is the (standardized) English test score at baseline and X_i is a set of controls, including demographics and DM position.[16] We consider four outcomes: frequency of FM communication (scale 1-4)[17], self-reported involvement in plant operations (scale 1-4)[18], the score on questions of best management practices (scale 1-15) following Bloom and Van Reenen (2007), and wages.

Appendix Table 2 reports the results. A one sd increase in the English score is correlated with a XXX higher frequency of communication, 0.12 more involvement, a small increase of 0.08 in management scores, and a 0.15 higher wage.

Of course, the coefficient on English in (1) may be biased. DMs with better English may reflect selection by FMs based on unobserved attributes. An (imperfect) solution to control for unobserved factors is to ask each DM about their communications with three direct superiors: a Myanmar, i.e., domestic, manager (if applicable), and their two most direct FMs.[19] This allows us to compare

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[16]The set of positions is: assistant, staff, officer, leader, assistant manager, manager, senior manager, accountant, supervisor, general manager, director and executive. The set of departments is: general management, accounting and finance, human resource, logistics, production, engineering, research and development, marketing.

[17]The scale is: 1) "never" 2) "seldom" 3) "often" 4) "very often"

[18]The scale is: 1) "not involved at all", 2) "rarely involved", 3) "sometimes involved", and 4) "there is never a discussion without me, and I take the final call".

[19]The Myanmar supervisor or boss is defined as the individual who is directly above the DM in the firm's organizational structure. We define the FM as the non-Myanmar manager who is closest and above person closest to the DM.

interactions with each superior while simultaneously controlling for a DM fixed effect through the following specification:

$$y_{ib} = \alpha_i + \beta_1 FM_b + \beta_2(FM_b \times english_i) + \epsilon_{ib} \tag{2}$$

where α_i is a DM fixed effect, b denotes the boss, and FM_b takes a value of one if the boss is a foreign expat. We examine two outcomes: frequency of communication and the share of a typical conversation understood. For domestic bosses, the share of conversations understood is, naturally 100% since two individuals would be speaking in Burmese. The results of the regression are reported in columns 5-6 of Appendix Table 2. DMs report less frequent communication and poorer comprehension with FMs relative to domestic bosses. However, these interactions improve with DM's English knowledge: a 1 sd increase the DM's English test score is correlated with a higher frequency of communication and better comprehension.

Overall, the evidence collected suggests that DMs have low English levels, and that this language barrier may be impeding their learning of management skills by limiting the quantity and quality of interactions with FMs.Of course, these statistics and anecdotes raise the natural question: if there are efficiency gains to be realized, should not firms subsidize language training and/or DMs invest in language training themselves? The model in the next Section 3 clarifies why there may be *social* underinvestment in language aquisition even when investment in language acquisition and communication effort are privately optimal.

3 Model

This section presents a model to illustrate how language barriers between DMs and FMs may create an inefficiency that justifies a policy intervention. To obtain this result, our framework builds on two assumptions, which subsequently drive the empirical sections of this paper. The first is that DMs learn general management knowledge through communication with FMs (Assumption **A**). The second is that the language ability of DMS is complementary to the communication effort of FMs (Assumption **B**).

The key source of the inefficiency in our model is the non-contractibility of communication between the FM and the DM. It implies that in equilibrium, the level of communication effort supplied by the FM is inefficient, so the learning of general skills by DMs is suboptimal. We abstract from any other market failure, such as credit constraints, asymmetric information or behavioural biases that may also be present in our setting. The model thus justifies why, even in the presence of a perfectly functioning language skill market, the social planner may want to subsidise the acquisition of the foreign language to (partially) correct for the under-provision of communication inside MNEs.

We first provide the set up for the model and then turn to describing the market equilibrim. We show why the social planner would choose a higher level of communication than the privately optimal one, before discussing the potential policies that can reduce the inefficiency.

3.1 Set Up

We consider a 2-period model of production with a single domestic manager (DM) and a foreign manager (FM). We abstract from the labour market for production workers and for DMs, to focus on the productive interaction between the DM and the FM. The DM and the FM communicate through a foreign language to the DM. We note $\lambda \geq 0$ the language ability of the DM and we assume that the market for acquiring language skills is efficient. We note $c(\lambda) = c\lambda + \frac{\lambda^2}{2}$, the cost of aquiring foreign language skills to the DM, where c is the unit price of language training and $\frac{\lambda^2}{2}$ represents the effort cost to the DM of acquiring language skills.

The DM produces a good at price $p = 1$ in both periods[20]. Output produced by the DM is proportional to her productivity level θ (without loss of generality, we set output equal to θ). Productivity depends on the DM's knowledge of management κ, and on the communication with the FM χ. We assume that $\theta(\kappa, \chi)$ is increasing in both arguments and for simplicity, that $\theta(\kappa, 0) = \kappa$ and $\theta(0, \chi) = \chi$.

The DM starts period $[t = 1]$ with a management knowledge normalized to $\kappa_1 = 0$ for simplicity. Communication with the FM is given by $\chi = 2\sqrt{\lambda\tau}$ where $\tau \geq 0$ is the level of communication effort chosen by the FM. We note $\gamma(\tau) = \gamma\tau$ the cost of communication to the FM. [21].

Besides increasing productivity, communication with foreign managers leads to learning. In period $[t = 2]$, the DM has acquired management knowledge through communication with the FM in period $[t = 2]$. We note $\kappa_2 = 2\phi\sqrt{\lambda\tau_1}$ the management knowledge of the DM in period $[t = 2]$, with $0 < \phi \leq 1$[22] a parameter describing the intensity of learning through communication. We thus assume that learning is proportional to the level of communication between the FM and the DM in period $[t = 1]$ (Assumption **A**) and to the language ability of the DM (Assumption **B**). Finally, we assume that the aquired knowledge in period $[t = 1]$ perfectly substitutes for marginal communication with the FM in period $[t = 2]$, i.e., $\frac{\partial\theta(\kappa_2, \chi)}{\partial\chi}|_{\tau\to 0} \to 0$. Since $\gamma(\tau) > 0$, this implies that in period $[t = 2]$ the benefits of communcation do not outweight its cost so there is no further communication with the FM, i.e. the DM produces output on her own. As communication in period $[t = 2]$ is nill, we note $\tau_1 = \tau$ the level of communcation in period $[t = 1]$.

Unlike the foreign language, we thus assume that there is no market to learn management skills. Those must be learned through communication with FMs in MNEs.

The model can thus be summarized by the following timing description:

- $[t = 0]$ DM buys language λ at unit price c and effort cost $\frac{\lambda^2}{2}$

- $[t = 1]$ FM offers a wage w to work with the DM. The FM decides how much to communicate (τ) with the DM with cost of communication effeort $\gamma\tau$. The DM produces total output given by $\theta_1 = 2\sqrt{\lambda\tau}$.

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[20] This assumption allows us to focus on the supply-side of the economy without having to model the demand-side. A demand-side can be included without altering any of the qualitative insights of the analysis.

[21] We thus assume that the cost of communication is entirely born by the FM. Assuming costly communication for both the DM and the FM would not change the outcome of the model.

[22] We actually assume $\phi > \frac{c\gamma}{2}$ so the level of communication and language are positive in equilibrium.

- $[t = 2]$ DM works alone to produce total output given by $\theta_2 = 2\sqrt{\lambda\tau}$.

3.2 Equilibrium

We then turn to the description of the private equilibrium and compare it with the allocation that would be implemented by the social planner.

Private equilibrium

In $[t = 2]$, the profits of the DM are simply given by $2\phi\sqrt{\lambda\tau}$.

In $[t = 1]$, the FM sets τ_1 to solve maximise her profits given by $2\sqrt{\lambda\tau} - \gamma\tau - w$.

In $[t = 0]$, the DM chooses λ to maximise her 2 period profits given by $2\phi\sqrt{\lambda\tau} + w - \left(c\lambda + \frac{\lambda^2}{2}\right)$ (no discount factor)

The first order conditions of these two programmes lead to the following equilibrium levels of communication and language skills:

$$\tau^* = \frac{1}{\gamma^2}\left[\frac{2\phi}{\gamma} - c\right] \qquad \lambda^* = \frac{2\phi}{\gamma} - c$$

Social planner

The social planner chooses both language skills λ and level of communication τ to maximise the overall surplus generated in the economy[23]:

$$\max_{\lambda,\tau} \quad \underbrace{2\phi\sqrt{\lambda\tau}}_{\text{DM prod in [t=2]}} + \underbrace{2\sqrt{\lambda\tau}}_{\text{DM prod in [t=1]}} - \underbrace{\gamma\tau}_{\text{Cost of comm}} - \underbrace{\left(c\lambda + \frac{\lambda^2}{2}\right)}_{\text{Cost of language skills}}$$

The first order conditions of this programme leads to the following level of communication and language skills:

$$\tau^{\text{SP}} = \frac{(1+\phi)^2}{\gamma^2}\left[\frac{(1+\phi)^2}{\gamma} - c\right] > \tau^* \qquad \lambda^{\text{SP}} = \frac{(1+\phi)^2}{\gamma} - c > \lambda^*$$

Non-contractibility of communication

The level of communication under the social planner's problem is higher than in the private equilibrium. The FM underinvests in communcation as she does not internalise the returns to communcation in period $[t = 2]$. The source of the inefficiency in our model is the non-contractibility of communication. If the amount and content of communication were contractable, the DM would

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[23] We assume that the social planner puts the same weight to the DM and the FM surplus. A natural extension would be to consider the case of the *Industrial* planner who would only value the surplus of the FM with weight $\alpha < 1$. The private equilibirum would still deliver a sub-optimal level of communication, except in the extreme case where $\alpha = 0$. XXXX

pay the FM to increase her communication effort in period $[t = 1]$, so the social optimum would be restored. This contractual friction, which we take to be a fact of commercial life, thus creates an inefficiency inside MNEs. [24]

3.3 Language subsidy

We then turn to what the planner can do to reduce the inefficiency. The planner cannot increase the communcation effort of the FM directly by e.g. subsidizing communication effort, which is non-contractible. In designing her intervention, the planner needs to work with the incentive compatibility constraint of the FM set by $\tau = \frac{\lambda}{\gamma^2}$ (IC FM). We thus consider a policy where the planner subsidises the acquisition of language skills by the DM. We note this subsidy s so the total cost of acquiring language skills λ is now $(c - s)\lambda + \frac{\lambda^2}{2}$. Implementing this subsidy has a unit fiscal cost $\Psi > 1$ to the planner. The planner maximises the following programme:

$$\max_s 2\phi\sqrt{\lambda\tau} + 2\sqrt{\lambda\tau} - \gamma\tau - \left((c - s)\lambda + \frac{\lambda^2}{2}\right) - \Psi s\lambda$$

$$\text{s.t.} \begin{cases} \tau = \frac{\lambda}{\gamma^2} & \text{(IC FM)} \\ \lambda = \frac{2\phi}{\gamma} - (c - s) & \text{(IC DM)} \end{cases}$$

The optimal subsidy, and equilibrium level of language skills and communication are given by:

$$s^* = \frac{1}{2\Psi - 1}\left(\frac{2(\phi + 1)}{\gamma} - c\right) \qquad \lambda^s = \frac{1}{2\Psi - 1}\left(\frac{1 + 2\Psi\phi}{\gamma} - \Psi c\right) \qquad \tau^s = \frac{1}{\gamma^2(2\Psi - 1)}\left(\frac{1 + 2\Psi\phi}{\gamma} - \Psi c\right)$$

XXX Louise - different s, but same lambda and tau.

$$s^* = \frac{1}{2\Psi - 1}\left(\frac{2(\phi + 1)}{\gamma} - c - \frac{2\Psi\phi}{\gamma} + c\Psi\right)$$

When $\Psi = 1$ (no distortion created by the subsidy), $\lambda^s = \frac{(1 + 2\phi)}{\gamma} - c$, so $\lambda^* < \lambda^s < \lambda^{SP}$ and $\tau^* < \tau^s < \tau^{SP}$. The language subsidy partially corrects for the inefficiency, by increasing the equilibrium level of language skills of the DM and as communication and language are complements in the production function (Assumption B), the subsidy increases the communication effort provided by the FM and so learning by the DM. As long as the cost of the distortion created by the subsidy remains small $\left(\Psi < 1 + \frac{1}{2\phi + \gamma c}\right)$, it is optimal for the planner to subsidise the acquisition of language skills for the DM.

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[24]We also implicitly assume that DMs cannot commit to work for two periods for the DM, effectievly ruling contracts that would force the DM to work for the FM in both periods. If such contracts were feasible, FMs would potentially be the residual claimant of the full returns of their communcation effort in period $[t = 1]$. The assumption could, however, be relaxed. First, note that such two period contracts would not be renegotiation proof. Second, such two period contracts would also not restore efficiency if communication was a function of both FM and DM non-contractible effort, as in Dewatripont and Tirole (2005) model of communication as moral hazard in teams. Besides capturing a plausible feature of real life labor markets, this assumption could thus also be relaxed without altering the main conclusions of our analysis.

3.4 Discussion

The model presented above clarifies the conditions under which the decentralized equilibrium might be inefficient despite the absence of frictions in the market for acquiring foreign language knowledge and the FM and the DM decisions being privately optimal. The FM does not internalise the benefits of her communication to the economy. Management knowledge learnt through communication in MNEs is a general skill (Assumption **A**) and so benefits other firms once the DM leaves the MNE. As communication is non-contractible, the DM cannot pay the FM to communicate more. The model also shows that if (**B**) foreign language skills λ and communication effort τ are complement, the social planner may want to partially correct the inefficiency by subsidizing foreign language skills.

In the empirical section of the paper, we begin by exploring condition (**A**): DMs learn general management knowledge through communication with FMs. We do so through a resume-rating experiment, where HR managers based in domestic firms evaluate the profiles of candidates with random attributes. We test for assumption (**B**): the complementarity of foreign language skills and communication effort through an experiment that increases english knowledge λ for randomly selected DMs working inside MNEs. We test for complementarities by checking whether the exogenous increase in language skills leads to higher communication and learning.

Empirically testing for the non-contractibility is challenging, and we mainly take this assumption as a fact of commercial life throughout this paper. [25]. Indirectly, however, the language experiment offers an opportunity to also test for the non-contractibility of communication. This is because the wedge between what the optimal communication level would be from a societal point of view and from the FM's perspective increases in the language level of the DM. A DM's marginal benefit from extra communication τ is given by $\phi\sqrt{\frac{\lambda}{\tau}}$. The FM's marginal benefit from extra τ is $\sqrt{\frac{\lambda}{\tau}} - \gamma$. If the DM and FM could contract on τ, these two marginal benefits would sum to zero, so we would have $(1+\phi)\sqrt{\frac{\lambda}{\tau}} - \gamma = 0$, and this condition is indeed satisfied under the social planner programme.

However, in the private equilibrium, the sum of the two marginal benefits is $\phi\sqrt{\frac{\lambda}{\tau}}$, since by privately optimal FOC $\sqrt{\frac{\lambda}{\tau}} - \gamma = 0$.

DM's ex-post WTP under contractibility:

$\phi\sqrt{\frac{\lambda}{\tau}} = \phi\frac{\gamma}{1+\phi}$

DM's ex-post WTP under non- contractibility:

$\phi\sqrt{\frac{\lambda}{\tau}} = \phi\sqrt{\frac{\lambda\gamma^2}{\lambda}} = \phi\gamma$ higher than under contractibility because less communication so marginal utility for extra unit is higher

4 Protocol 1: Resume Ratings

This section investigates the empirical evidence of condition (A), namely that management skills learned by DMs through communication with FMs inside MNCs are general, in the sense of being

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[25] Even if it is feasible to write a contract to talk with the FM for a certain amount of time, it would not be possible to contract of the content of the communication, since management knowledge is not codifiable.

valued by prosopective domestic employers. We investigate the condition through a hypothetical resume rating protocol with HR managers from domestic firms outside the SEZ. We first explain the research design and empirical specification and then present and discuss the results.

4.1 Research design

We assess the value of knowledge transfers from MNCs by eliciting the demand for such skills. To do so, we recruited a sample of YYY51 HR managers who work at *domestic* companies to rate hypothetical resumes of job applicants to their companies.

The HR managers are currently employed at firms located outside of the SEZ. Table A.5 reports summary statistics of the sample. All of the managers work at Myanmar companies, and, as HR managers, they have experience in screening resumes. The typical manager reports screening roughly YYY500 resumes in the past six months and hiring about YYY44 new employees. They have experience hiring employees previously working at MNCs, and, on average, themselves have YYY1.7 years of experience previously working at MNCs (YYY7.0 years of total work experience on average).

The sample was asked to complete an online survey that elicited their preferences on a random set of hypothetical resumes. The respondent was shown pairs of candidate profiles and, within each pair, asked to select: a) which candidate they preferred; b) a wage they would offer; c) how much they think the candidate would have learned at the previous job (1-10 scale); d) how much involved in management they think the candidate would have been at the previous job (1-10 scale). This question was further subdivided into two. Respondents were asked how much they thought the candidate would have been involved in i) hiring/firing/promoting persons at their company, and ii) communicating factory-level targets to subordinates. The two questions yielded similar answers and below we report results on the average of these two measures.

Candidate profiles were created by randomly drawing values from the characteristics reported in panel A of Table 9. The respondent was told that the potential job applicants all graduated from the same university (Yangon University of Economics) with the same degree (Bachelors in Business Administration), lived in Yangon, and were married.[26] They were all applying for a general management position at the company. What varied was the set of characteristics of each applicant: gender, age, English proficiency, previous job at a domestic or Japanese, previous company size, work experience.[27] Each respondent was asked to rate 20 pairs of profiles.

In the second block of the survey, respondents were shown 11 new pairs of candidate profiles that varied in their hypothetical responses to potential interview questions. This block was designed to test the communication friction mechanism. HR nanagers were asked to choose their preferred candidate among the two, make a wage offer, and assess how much that candidate would have learned from the previous job. All applicants were from the same university, degree (Bachelors in

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[26]Pilot interviews revealed that job applicants in Myanmar indicate marital status on their resumes.

[27]We allowed the age–either 25 or 26–to vary to mitigate the respondents focusing only on the other attributes, but kept the range narrow to increase power.

Business Administration from Yangon University), lived in Yangon and were married. In addition, HR managers were told that the applicants were male, age 26, and had 3 years at a 125-employee Japanese company. Additionally, the HR managers were told that the applicants had Advanced English as did their FM. The reason to note the English levels of both the applicant and the FMs was to ensure that the HR manager would perceive little, if any, communication barriers between the applicant and his FM.

What varied across the hypothetical applicants in this block was their responses to three questions: 1) "How often did you interact with your foreign boss (formal/informal meetings, over lunch, etc."; 2) "How frequently did you use Microsoft Office Package (Word, Excel, PowerPoint); and, 3) "How often were you involved in setting and communicating the company's targets". The values to these three questions were drawn from the list noted in Panel B of Table 9. The first question was designed to elicit the importance of communication with FMs. The possible values were "frequently", "infrequently", and "I was hired to interact frequently with the foreign boss but interacted infrequently because he had to leave the country for a family emergency". We were concerned that respondents who saw candidates with frequent communication with FMs may think that the applicant was *chosen* to interact with FM based on unobserved attributes, thus conflating the "treatment effect" of communication with FMs with a "selection effect". It could be that This last value indicates the applicant was chosen to communicate frequently with the FM but ultimately did not for exogenous reasons.[28] The second question introduced knowledge of a hard skill. The third question asked how involved in management the applicant was at the previous job.

4.2 Empirical Specification

Each HR manager r was shown a pair of profiles and we assess their preferences through the following specification:

$$y_{rc} = \alpha_r + \sum_k \beta_k x_{kc} + \epsilon_{rc} \tag{3}$$

where y_{rc} is the outcome of candidate c (e.g., whether her resume is chosen in the pair, or the wage offered) when rated by rater r, x_{kc} are the characteristics (randomly drawn for each respondent) along dimension k. Since respondents scored many pairs of profiles, we include a respondent fixed effect α_r and cluster the standard errors by respondent.[29]

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[28]We were concerned that respondents would find this statement unusual. However, answers to a questionnaire filed after the resume rating exercise was completed, reveal that HR managers found the presented scenario plausible and realistic.

[29]Recall that each respondent is shown two profiles at once and asked to select among the two. We therefore can also include a resume-pair fixed effect α_p and obtain nearly identical results.

4.3 Results

Block 1: Applicant Characteristics

The first column of Table 10 reports the regression results in the first block where respondents were asked to select their preferred candidate among pairs of profiles.

Column 1 reports the results of the chosen profiles. As expected, advanced English proficiency has a 0.27 higher probability of being chosen relative to profiles with elementary English proficiency (the average proficiency among the sample of DMs from Section 5). Candidates with experience in MNCs are also much more likely to be chosen, by YYY%. Moreover, profiles with both high English proficiency *and* MNC experience are 0.35 more likely to be chosen.

The rest of the characteristics serve as useful comparison to place these magnitudes in perspective. Gender and age do not appear to have any effects; the age result is not surprising since the range was deliberately chosen to be small. Company size and work experience do matter. A profile working in a large firm (125 employees) is 0.20 more likely to be chosen relative to a candidate at a small firm (25 employees). The returns to experience is also large: profiles with 3 years of experience are 0.29 more likely to be chosen than profiles with one year of experience.

Column 2 reports the results of the wage offers for each profile. The results are consistent with the choices. Wage offers are higher for profiles with higher English proficiency, experience at MNCs, experience at large companies, and more work experience. Candidates with higher English proficiency and MNC experience receive a differentially higher offer (YYY$95.9 on a mean YYY); their wage premium is larger than the sum of the premia for English ($38.21) and for MNC experience ($33.25). The numbers suggest that potential employers place a differential value on experience acquired in an FDI firm when the individual speaks English.

Column 3 reports the results for "how much do you think the candidate has learned in their previous job" on a scale from 1 to 10. Respondents find that overall work experience is the most important driver of learning, but we again observe a differential predicted learning for profiles with high English proficiency and MNC experience.

Finally, the last column reports the respondent's perception of how involved in management decisions, on a 1 to 4 scale, the profiles would have been at the previous job. To confirm that this response is meaningful, we again find that profiles with more experience are more likely to be perceived as involved in management at the previous job. Respondents perceive profiles with higher English proficiency to be more likely to be involved in management. However, there is a low perception of involvement candidates with previous experience in a MNC but a low English level. In fact, this is no different than candidates with low English level at domestic companies (the leave out). This is consistent with the model's assumption that involvement at MNCs hinges on language proficiency. Candidates with high English proficiency and MNC experience are perceived to be more involved in management.

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Block 2: Mechanisms

The second resume rating block explores the mechanism for *why* profiles with high English proficiency and MNC experience are valued. Table 11 reports these results by examining respondent choices among profile pairs that vary in their hypothetical answers to three questions about their previous job: how frequently did the respondent communicate with their FM, how frequently did they use MS Office, and how frequently they were involved in setting company targets.

The first column reports the effect of the hypothetical answers displayed on the choice made by HR raters. We observe that candidates who actively set company targets are most desired among these responders. Candidates who interact frequently with FMs are highly desired; they are 0.27 more likely to be chosen compared to candidates with limited FM interactions. They are also more likely to be chosen relative to candidates who frequently use MS Office. This suggests that for general management positions, potential employers desire candidates who worked closely with FMs even more than candidates with a "hard" skill.

One worry is that profiles that indicate frequent communications with FMs reflect an unobserved attribute of that applicant. To check for this possibility, some profiles indicated that the candidate had been chosen to interact with the FM, but ultimately did not do so for exogenous reasons. The coefficient on this characteristic is noisy and not statistically different from the leave-out category, limited interactions with FM. This suggests that the respondents value the impact of interactions with FMs as opposed to simply be chosen to interact with the FM.

Column 2 examines the wage offers by response. We observe a similar pattern. Profiles that indicate active involvement in setting targets at the MNC are offered higher wages. Profiles who interacted frequently with the FM are also offered higher wages, a similar value to profiles with the hard skill. We again observe no differential wage offer to the candidates who were simply selected to interact with the FM. The results for learning in column 3 follow a very similar pattern.[30]

Summary and Discussion

Taken together, the evidence suggests that prospective domestic employers value a worker's experience acquired by working in MNCs. Furthrmore, workers that are proficient in English and are given the opportunity to work closely with FMs are particularly valued. The evidence is thus consistent with condition (A): the (management) skills learned in MNCs are general, in the sense of being value in the labour market outside the zone.

It is worth pausing to discuss a few features of our experimental protocol. The use of hypothetical resumes is based on Kessler et al. (2019) who show hypothetical job resumes to recruiters. That study incentivized recruiters by matching them with potential job candidates with similar characteristics to those chosen by the respondent in the rating exercise. In our context, we worked with a sample of HR managers in domestic firms that we contacted by responding to recrutiment ads on job platform. The HR managers in the experiment have a great deal of experience reviewing

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[30]In this block, we did not ask about perceived involvement since that was one of the hypothetical questions.

job applicants and, coupled with diagnostic questions at the end of the survey, we are confident that the rating exercise was well understood and taken seriously by the respondents. Unlike Kessler et al. (2019), however, it was not practical for us to match HR managers in the resume rating to actual job seekers. As our study involved a collaboration with firms in the SEZ, it would have been problematic even to seek consent among DMs in the zone to give their resume to participating HR managers in domestic firms.

An alternative approach would be to track, over time, DMs from the SEZ, measure the skills they learn on the job and the extent to which those are valuable in the labour market outside the zone. This strategy is empirically challenging for two reasons. First, it would have been much more expensive. We would have needed to survey and track DMs working in the SEZ as they move to jobs outside the zone. Job flows and skill acquisition potentially both take years and we would have also needed to deal with the endogenous selection of DMs in and out of the SEZ. Second, firms in the SEZ and DMs roles within those are highly heterogeneous. What DMs learn on the job and, in particular, from FMs, is thus highly context specific and greatly varies across firms and DMs. In the next Section we describe results from an intervention aimed at improving knowledge of English language among DMs working in the SEZ. After describing the sample, the design and the results, we also provide specific examples of what those DMs learn on the job. The evidence, which is qualitative in nature, corroborates the difficulty of measuring on-the-job learning through survey in such a diverse population of firms and DMs.

4.4

5   Protocol 2: Language Training RCT

This section presents the results of the experiment that explores condition B by offering English language training to a random sample of DMs, thus exogenously shocking their language level λ. Some results also further explore condition A.

5.1   Research Design

We recruited 298 domestic managers at the 27 MNCs operating in the SEZ. As noted above, we define domestic managers as MNCs employees of Myanmar nationality earning over \$200 per month, the income-tax reporting threshold in Myanmar and a plausible lower bound for holding a management position and interacting directly with the senior FMs.[31] A baseline survey measured each DMs' language skills (in English and in the native language of the FMs), their frequency of communications with FMs,d their involvement in the firm and their knowledge of management practices.

The experiment design was as follows. Within each firm (a stratum), we randomly assigned half of the domestic managers to attend a free English training course. In total, 154 DMs were

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[31] 18 MNCs asked that we include a total of 64 DMs below the threshold, and we agreed to include these individuals into the randomization procedure.

assigned to treatment. We contracted with a high-quality English-language company to provide the language training, which was entirely conducted by native English-speaking teachers. The course provided 48 hours of training and was conducted over 3 months, with two 2-hour sessions per week. Only DMs from the SEZ would participate in the classes, and the provider taught its standard English for business course[32]. The sessions took place after working hours and on weekends, and we offered DMs the option to take the course either at a rented space near the SEZ or at the company's main office in downtown Yangon. The company's standard procedure is to conduct an initial English assessment to determine the student's knowledge and place students into a beginners or intermediate course. We allowed the company to follow this practice, and treatment DMs were assigned to one of two sections based on their initial English knowledge. Due to teaching capacity constraints, we could not train all the DMs simultaneously and staggered the training over 9 cohorts through 2019. The typical cohort had around 15 DMs.[33]

Throughout 2019, treatment and control firms were asked to answer short phone surveys that asked about interactions with FMs. Six to eight weeks after completing the course, we administered an endline survey and a management simulation exercise.

Measuring management knowledge in our setting is challenging because DMs perform a range of tasks at firms that span a range of sectors. One approach is to ask closed-end versions of the management questions from Bloom and Van Reenen (2007). But, as we also were interested in management *performance*, we designed a MNC management simulation to assess DMs' management performance on a standardized task.

The simulation exercise was structured as follows. The goal was to mimic the three-tier organizational structure of MNCs (see Table 1) An enumerator with Advanced English proficiency acts as the "FM" by providing instructions in English to DMs to complete a task. The DM would then manage two "production workers" ("PW"), proxied by enumerators with no knowledge of English. These PWs were shielded from the "FM"-DM interactions so they could not hear the instructions. As is the case at the firms, the DM-"PW" interactions occurred in Burmese. The task simulates a common assembly-line task for production workers: precisely placing several items into a package. The task was to instruct the "production workers" to select 4 out of 8 objects, arrange them in a pre-specified order and place them in certain position in a box demarcated for shipping. The objects and orders were randomized across simulations to mitigate potential learning among the production workers. There are a possible 192 combinations of tasks. We shuffled the pair of production workers from a pool of 12 enumerators. We recorded the length of "FM"-DM and DM-"PW" interactions, the number of questions, and the total mistakes completing the task. For each DM, we also performed a second placebo management task (for a different randomly drawn task) where the "FM" delivered the instructions in Burmese.

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[32]This course is similar to any basic language course but the in-class scenarios are replaced with business situations. For example an elementary unit which learning goal was the verb "to be" in the present tense is focused on how businesspeople introduce themselves. A listening exercise asks students to match short oral introductions to business cards (e.g. "I am an IT engineer", "She is Japanese", etc.)

[33]The first cohort comprised DMs from just one company. All other cohorts had DMs from between up to 4 to 11 different companies.

Due to the suspension of in-person surveys in Spring 2020 from Covid-19 lock-downs mandated by the Institutional Review Board, we also had to switch from in-person to phone surveys to collect the main endline variables for 145 out of 298 DMs in the sample, coming from 26 companies out of 27 in the sample . We were unable to implement the management simulation on this sub-sample.

5.2 Summary Statistics and Takeup

Table 3 shows baseline balance between the treatment and control individuals. The table reports the mean value and the standard deviation of each variable for the treatment group and the control group. The last column reports the coefficient and p-value on treatment status from the regression including firm fixed effects (the strata). The average age is 28.2 years with a tenure of 1.3 years. Across the sample, about 39% of DMs are men. The mean English score from our test is 47.4%. The average monthly salary is $351.8.

The table shows that the randomization achieved balance across most observed covariates. Only age is marginally significantly different whe comparing the treatment and control group, with treatment individuals being about 9 months older on average. The final row of table reports attrition at endline (see the appendix for attrition at intermediary rounds of the survey). 9% of respondents did not take the endline survey, a low attrition rate which is not significantly different between treatment and control groups. Last, we perform a joint test of orthogonality with all the variables shown individually and cannot reject it.

Figure A.8 reports takeup rates. 76% of treatment DMs attend at least one course. 45% of treatment DMs attended at least three-quarters of the course (18 out of 24 sessions). In the regressions below, we use a continuous measure of takeup between 0 and 1: on average, treatment DMs attend 56% of potential sessions (this number includes treatment DMs who never showed up).

5.3 Empirical Specification

We estimate causal ITT impacts of treatment on DM i using an ANCOVA specification (McKenzie, 2012):

$$y_i = \alpha_0 + \alpha_f + \beta treat_i + \gamma y_{0i} + \phi mode_i + \epsilon_i \tag{4}$$

The specification includes a firm f fixed effect, which reflects the stratification. Whenever possible, the outcome value is the average value of the variable measured during surveys that took place after 75% of the training has been completed and at endline. If an outcome was only measured at endline, we use just that value. The baseline value, y_{0i}, is the the average value of the variable measured at baseline and during surveys that took place before 75% of the training had been completed.[34]

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[34]For dropouts and treated individuals who did not participate in the training, we assign them to treatment dates corresponding to the trainings they should have attended. For control individuals, we assign them to treatment dates corresponding to the trainings attended by colleagues with a similar English level. In the event when these colleagues were on different schedules, we assigned the control individuals to the schedule attended by the majority of the treatment individuals.

We also include a dummy that turns on if the endline was collected in over the phone because of the COVID-19 lockdown. Standard errors are clustered by company department; there are 76 such departments across the firms.

We also present treatment-on-the-treated specifications (TOT) that scale the ITTs to reflect takeup:

$$y_i = \alpha_0 + \alpha_f + \beta takeup_i + \gamma y_{0i} + \phi mode_i + \epsilon_i \tag{5}$$

where $takeup_i$ is a continous value between 0 and 1 based on the number of sessions attended out of 24. We instrument takeup with the randomized treatment assignment. We cluster standard errors by department.

5.4   Results

The language experiment examines the validity of conditions A and B. Before doing so, we first demonstrate that the intervention did, in fact, improve language proficiency for treatment DMs.

5.4.1   English Proficiency Improves

Table 4 reports the first-stage results that regress takeup on treatment. Column 1 defines takeup as attending at least one class while column 2 represents our baseline definition of continuous takeup. In this latter specification, the takeup rate is 56%.

Columns 3-8 examine the impact of the intervention on English proficiency. The results confirm that the English courses did, in fact, improve treatment DMs' English outcomes, an important result for the interpretation of the results. We administered a new version of the English test described in Section 2.3.3 at the endline.

Column 3 of Table 4 reports the impact on English test scores from being assigned to treatment: $0.15sd$. The TOT specification in column 4 shows an effect that is almost twice as large–$0.26sd$. The remaining columns separate the effects on speaking (columns 5-6) and listening comprehension (columns 7-8). The point estimates on speaking and listening are both statistically different from zero at the 10% level. Thus, the English training appears to have successfully improved the English proficiency for treatment DMs.

We conducted nine survey rounds over the phone in addition to the baseline and endline surveys which took place in person (then over the phone due to COVID-19). Because the treatment was staggered, the actual number of surveys that contributed to the outcome value as opposed to the baseline value vary for each treatment group, but at least two surveys conducted over the phone contribute to the "baseline value" in addition to the actual baseline survey and at least one survey conducted over the phone conttributes to the "endline value" in addition to the actual endline survey. Moreover, the participation rate was lower for the surveys ran between baseline and endline. All participants took the baseline survey, but some participants who did not take the endline survey have an outcome value because they took a phone survey after 75% of the training had been completed. Overall, for 53% of participants at least three surveys contribute to the baseline value (including the actual baseline survey and for 43% of participants at least three surveys contribute to the outcome value (almost always but not always including the actual endline survey).

5.4.2 Communication is Complementary with English Proficiency (Condition B)

The model assumes a complementarity between English proficiency and communication with FMs. The top panel of Table 5 explores communication responses at endline.

We first examine the extensive margin of communication: is there an impact of the language training on the frequency of communication in the past 7 days? Columns 1-2 indicate a positive impact on communication frequency. Treatment DMs increase report a 0.19 increase from a baseline average value of 2.58 (on a 1-4 scale). The TOT coefficient is 0.31 and significant at the 5% level.

15 DMs did not report a direct FM supervisor at baseline. These DMs are either lower in the organizational hierarchy and report to a DM, or higher in the hierarchy and they directly report to the CEO but are not de facto managed by them (e.g., engineers). We (conservatively) assume that these individuals report infrequent (value of 1) communication with their direct FM, and columns 3-4 shows that the results are not sensitive to these indiduals[35]. Columns 5-6 regress an dummy that turns on if the DM participated in a meeting with the FM in the last working day. While noisy, the results suggest a 0.08 increased probability of attending such meetings from a baseline average value of 0.41. Columns 7-8 reports that treatment DMs indicate using more effectively the time they spend with the FMs (by opposition to struggling with translation, misunderstanding etc.) but this result is also imprecisely estimated.

One may be worried that improved English leads to greater confidence and so more communication in the firm in general, not just with foreign managers. Moreover, one might worry about an Hawthorne effect where the results would be driven by program participants wanting to please the researchers by answering more enthusiastically to all quesitons. To address both concerns, in columns 9-12, we turn to DM's interaction with other domestic managers. For some, this is a senior manager and for some it is a colleague of similar hierarchical level. Treated DMs do not report talking more frequently with a fellow DM. They report attending meetings with a fellow DM slightly more frequently but this result is insignificant and the effect measured is much smaller than the one observed with respect to FMs. We conclude that English is complementary with communication between DMs and FMs, and not communication from DMs in general.

5.4.3 Involvement in the firm's management

Panel B of Table 5 examines management involvement. We asked DMs to self-report their involvement on a scale of 1 to 4 in two broad management tasks: managing employees and setting targets. For the former, we asked how involved DMs were in setting individual targets for subordinates, promoting good performers, and hiring new employees for their team. For the latter, we asked how involved DMs were in communicating factory and team targets to subordinates. In columns 1-2, we find that treatment DMs increase their involvement in managing employees by 0.14 , an effect that is significant economically and statistically significant (about 0.15 SD of a standard

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[35]When we do the opposite (imputing a value of 4 for communication frequency to DMs who report not having an FM as a direct supervisor), we still find that the treatment predicts an increase in communication frequency but too a much lesser degree.

deviation). However, we find no differential involvement of treated individuals in communicating targets (columns 3-4). We believe this is sensible given that most of our DMs are middle managers who supervise subordinates (on average 12 people, with a median of 2 people) and are not involved in strategic decisions at the factory level.[36]

We then examine DMs' knowledge of management best practices in columns 5-6. We followed almost exactly the multiple choice questions in the "management practices" section of the U.S. Census's Management and Organizational Practices Survey (MOPS) which aims to get at the same practices as the qualitative questionnaire used in Bloom and Van Reenen (2007). We then score each question and obtain a total "management score".[37]

When we switched to an over-the-phone endline due to COVID-19, we decided to shorten the questionnaire and only included a few questions, about monitoring, from the initial 15. Although we adjust for this in the regression by using a dummy for the mode of endline, we find no result of the treatment on the score on management practices. We interpret this disappointing result as reflecting the fact that the management practices questionnaires are meant to capture something meaningful at the company level, so they are unlikely to vary significantly across individuals within a firm, and even less likely to vary within-individual variation over about 12 months. Early on, this concern lead us to develop the management simulation exercise described below.

5.4.4 Management Simulation (Condition A)

There are two concerns with the communication and involvement results: they are self-reported and potentially measured with large error. The score on the MOPS questionnaire has other caveats highlighted above.

In an ideal scenario, we would obtain records of meetings and performance metrics, but such information was not available to us. Moreover, the firms operate across a wide range of sectors, rendering difficult the comparison of performance measures. The management simulation provides a way to measure performance in a controlled setting. Table 6 reports the results. The first set of results report the "PW" time to complete the task when managed by the treatment DMs relative to controls DMs. Production teams managed by treatment DMs performed the task 0.19 minutes faster relative to the control mean of 1.28, suggesting about a 14.89% improvement in productivity. The TOT is 0.33minutes faster. However, despite this shorter time, mistakes were no different between treatment and control (columns 3-4), so quality-adjusted productivity improved.

Why did performance improve for treatment DMs? Columns 5-6 offers a mechanism. We find that treatment DMs spend more time talking with the "FMs" when receiving the instructions. Column 5 indicates that treatment DMs spend 0.35 more minutes relative to the control mean of 1.89 minutes; and, the TOT estimate is 0.60. The reason for this additional time is because

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[36]Additionally, the null result suggests that treatment DMs did not inflate their answers on every question.

[37]For example, we asked participants "What should managers' promotions primarily based on?" The proposed answers were "Solely performance and ability; Partly performance and ability, and partly other factors (for example, tenure or connections); Mainly factors other than performance and ability (for example, tenure or connections); Managers are normally not promoted."

treatment DMs ask more questions: on average, treatment DMs ask 1.03 additional questions (and the TOT estimate is nearly 1.77 additional questions). This suggests that treatment DMs have more meaningful interactions with the "FM". They spend more time talking and treatment DMs are more likely to understand the task better, thanks to their questions.

As a placebo check, we performed the simulation exercise where the "FM" directed the management task in Burmese (for a new randomly drawn task). We would expect no difference in management performance between treatment and control firms in this placebo simulation, and this is confirmed in Panel B of Table 6.

5.4.5 Non-Contractible Communication (Assumption B)

Our model takes as a given that communication is non-contractible within organizations. Such an assumption has a long history in organization models (Crawford and Sobel (1982); Dessein (2002); Dewatripont and Tirole (2005)). In our setting, it is the imperfection in this market for communication that explains why the DM may under-invest in English training. [LINK BACK TO WTP PREDICTIONS FROM MODEL]

While we take this assumption as a fact of commercial life, we provide two pieces of evidence that support the assumption. First, at the endline, we asked DMs how much they would be willing to pay (WTP) for an hour of "one-on-one" conversation with a senior manager, either a FM or another DM (more senior than themselves). Table 12 shows that treated individuals are willing to pay \$53.62 more to spend an hour with the FM, an effect which is significant at the 5% level. The effect is more than twice as large when looking at the TOT: Treated DMs are willing to pay \$68.76 more than DMs in the control group to spend time with their FMs.

One concern is that difference between WTP for FM and DM across treatment and control can be accounted for by career concerns and not opportunities for learning. In the second panel of Table 12 we therefore ask DMs for their WTP for a one hour conversation with a FM at a similar level from an outside firm. Control DMs are WTP less money to spend time with an FM if they're outside their company (the control mean is \$31.42 as opposed to \$39.74), suggesting that it is considered less valuable, perhaps due to the lack of opportunities to ask for raises or promotions. However, treated DMs are still WTP to pay \$32.29 more than control individuals for this opportunity; this is suggestive that English skills develop a DM's valuation for time with an FMs.

We included a placebo question which asked DMs about their WTP for a meeting with a senior DM. The results are in columns 5-6 of Table 12, and we observe no differential reported WTP between treatment and control.

5.5 General skills and Outside Options (Condition A)

The HR resume rating protocol provides our core evidence for condition A. Here, we provide complementary evidence about what treatment DMs have learned from their FMs and how what they are learning translates in terms of the labor market outside the SEZ. A caveat to these results

is that the endline represents a short-run response, collected roughly 5 months after the language training was completed. Additionally, a large share were collected at the onset of the Covid-19 pandemic, when both learning opportunities and mobility opportunies were lower and noisier than usual[38].

We begin with summarizing what DMs report having learned from working with FMs. Several anecdotes [39] provide insight into how a better English level helped employees seize learning opportunities in their firm. DMs talk mostly about general management skills, and software skills that would be useful in any modern firm.

- DM, Japanese firm*: "I learned Marketing Strategy, Financial management, Report Evaluation and Analysis from FMs. I can learn these skills as my understanding level and communication skills are higher than before."*

- DM, Japanese firm*: "I have learned Excel formula from FM… English is a medium language while he was teaching formula, and I understood completely what he said because my listening skill is higher than before."*

- DM, Japanese firm*: "From FM, I have learned Microsoft Excel and PDCA (Plan Do Check Act cycle) which is used in Japan. There is a slight difference in learning process because I am not afraid of speaking with foreigners and I become to understand what they said."*

- DM, Japanese firm*: "I have learned punctuality, discipline, technical and management skills from Japanese Managers."*

- DM, Thai firm*: "Problem solving, Customer dealing skills have been learned from FMs. The learning process is faster as my confidence allows me to participate in meeting fully and I can understand very well what FMs present in the meetings".*

These increased learning opportunities inside the firm should translate into improved professional opportunities both inside and outside the firm. As Table A.7 shows, we observe no difference in job exits between treatment and control DMs, nor any differences in salaries or promotions.. This may be due to the fact that the endline occurred relatively soon after the English courses completed. However, treated DMs report applying to 0.29 more jobs, up from 0.49 on average for control DMs. This reflects the fact that treated DMs see themselves as having more value on the Myanmar labor market, confirming the results from the resume rating protocol analyzed in Section 4.

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[38]At the end of 2020, we decided to conduct a follow-up survey focused on learning and labor market outcomes which would be administerest at least one year after the end of the training. On February 1st, 2021, a military coup removed the democratically elected government from office, leading to a general strike, massive popular protests and an increasingly violently repression by the army. We immediately stopped collecting the survey.

[39]Collected immediately following the endline on a subset of training participants.

5.6 Spillovers

One concern with the above results is that the impact of the language training on treatment DMs may come at the expense of the control group. While this is not a substantial concern for outcomes such as acquisition of language skills or management skills which are non-rival, the mean through which the latter is acquired, communication with FMs, may be thought of as a rival good, if FMs are constrained in their total communication budget.

Our randomization procedure was not designed to tests for spillovers. Such a design would have varied the intensity of treatment DMs across FMs. Instead, we stratified by firm, and this leads to potentially random variation in the share of treatment DMs across departments within the firm. We choose the department level, described above, as the unit of analysis for spillovers because it represents a relevant unit of management for DMs, with typically at least one FMs above and subordinates under them. Moreover, many FMs have left and been replaced by new FMs across our period of analysis: at endline, 51% of DMs no longer work with the same FM while only 29% of DMs have changed departments.

On average, each control DM is in a department with 5.79 (3.23) other sample DMs, 2.68 (2.07) of whom are treated. However, the variation is not truly random. Table A.8 highlights that control DMs who are in departments with a larger number of treated DMs are more likely to be women and are predicted to score lower on the big 5 personality test and to be less involved in management.

We examine spillovers by running the following specification on controls DMs:

$$y_i = \alpha_0 + \alpha_f + \beta T_d + \gamma S_d + \epsilon_i$$

Where T_d is the number of treated DMs working in the same department and S_d is the total number of sample DMs working in the same department. As in the previous specifications we control for strata (firm) fixed effects α_f.

Table 8 shows results for the main outcome variables. We find that control individuals' English score at endline is slightly negatively correlated with being in a department with more treated DMs, but this would be compensated by the small positive correlation between English and the size of the department. Communication with FMs on the extensive margin (column 2) and on the intensive margin (columns 3 and 4) are not correlated with the number of treated individuals in a control DM's department.

Control DMs' involvement in people management appears to be slightly negatively correlated with the number of treated DMs in their department, but again it would be compensated by the small correlation with the total number of treated DMs, and we know from Table A.8 that control DMs in departments with more treated DMs are less involved. Last, we find that control DMs' WTP to spend additional time with FMs is positively correlated with the number of treated DMs in their department. While this result is not significant, we believe it could suggest that control DMs who see many treated DMs interacting more and learning more from FMs may learn that this communication is valuable, and therefore demand more of it.

6   Private Investments

We now present back-of-envelope calculations to check if the observed level of language training by DMs is privately optimal. The calculations use the results from both experiments to construct the rate of return for DMs to invest in language training themselves, and for MNCs to subsidize language training for their DMs.

6.1   DM Investment

MATTHIEU TO ADD.

6.2   MNC Investment

These results indicate that firms could improve efficiency by subsidizing language training to their employees, and so a legitimate question is: why are firms not providing the training themselves? Our results suggest teaching English to employees generate efficiency gains to firms, but they are modest and do not necessarily pass cost-benefit tests for all firms. To demonstrate this we compute the net present value of the training for a DM using the management simulation results as estimates of the potential benefits. The benefits take the form of the cost of the time saved by PWs on the task (15%, column 1 of Table 6) multiplied by the average span of control of DMs in the firm. There are two costs. First, our results suggest that improvements in language increase the time that FMs would allocate to DMs (19%, column 5 of Table 6). This would be time lost to potentially performing other activities at the firm. Second, the language training we provided would cost the firm $300 per DM. To calculate the NPV, we apply a discount factor of 0.8% per month, a 3% probability that the DM leaves each month (the median tenure of DMs in our sample is 2 years), and the observed average monthly FM and PW wage in each firm in our sample. The variation in the NPV across firms mostly comes from differences in the span of control of DMs . Firms with a large ratio of PWs to DMs would experience large benefits from training, all else equal; and, firms where FMs spend a lot of time communicating with DMs at baseline experience a higher reduction in the value of the training, all else equal. Appendix Figure A.9 shows that on average, the net present value of providing the training is quite close to zero and negative for more than half of the firms. This is consistent with the fact that only two firms in our sample formally offered a English training program.[40]

7   Conclusion

To add.

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[40]This calculation that emphasizes the span of control also suggests that firms with large PW to DM ratios should hire DMs with better English skills, a fact that we do observe in the data. Figure A.10 shows that firms' NPV is positively correlated with the average English-level of DMs.

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Tables and Figures

Table 1: Summary Statistics

	Mean	Std Dev	N firms	N
Total Employees	209.7	293.7	27	5662
Foreign managers (FMs)				
Number †	6.6	10.5	14	92
Wage (USD) †	2573	2136	14	92
Span of control (DMs) †	5.4	8.9	14	92
Span of control (PWs) †	132.4	304.6	14	92
Age (yrs)	39.3	9.1	12	23
Tenure at company (yrs)	8.8	8.4	12	23
Tenure at company in Myanmar (yrs)	2.2	1.7	12	23
English score (%)	63.6	25.1	12	23
Share proficient in English (%) ‡	32.3	41.2	17	-
Domestic managers (DMs)				
Number	10.6	9.4	27	298
Wage (USD)	361	334	27	273
Span of control (PWs)	29.2	72.8	27	298
Age (yrs)	28.6	6.8	27	279
Tenure at company (yrs)	1.3	1.3	27	298
English score (%)	47.0	22.6	27	298
Share proficient in English (%) ‡	11.1	17.1	17	-
Production workers/ Unkilled workers				
Number †	171.1	236.4	23	3935
Wage (USD) †	108.3	34.2	23	3935

Notes: Table reports summary statistics from surveys in a sample of 27 MNCs at the Thilawa SEZ. The †indicates data collected from administrative records collected by the SEZ's management committee. The variables denoted by ‡indicate firm-level information collected from interviews with the a Senior Human Resource manager. The remaining variables are from a survey of employees. DMs as the employees described as such by their companies and earning above the income-tax reporting threshold, $200.

Table 2: English proficiency, Wages, Involvement, and Communication

| | Across managers | | | | Within managers | |
| | BvR Mngt /5 | Invt. (1-4) | Freq. FM (1-4) | Log wage | Freq. (1-4) | Effective time (%) |
	(1)	(2)	(3)	(4)	(5)	(6)
English	0.076	0.127	0.107	0.148	.	.
	(0.035)	(0.057)	(0.055)	(0.027)	(.)	(.)
FM					-0.933	-0.166
					(0.050)	(0.007)
FM × English					0.169	0.056
					(0.050)	(0.007)
Dem. controls	Yes	Yes	Yes	Yes	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
DM FEs	No	No	No	No	Yes	Yes
Mean of Dep. Var.	3.07	2.10	2.48	13.02	2.60	0.89
N	378	378	353	354	1114	1102
R2	0.30	0.49	0.39	0.75	0.57	0.70

Notes: Table reports regression of DM outcomes on English test z-score (columns 1-3), and its interaction of an indicator for whether the supervisor is a foreign manager (columns 4-6). This sample is from surveys that precede the language experiment enrollment. In the first three columns, the observations is equal to the number of DMs. Column 1 is the log monthly salary. Column 2 a score of best management practices (scale 1-15). Column 3 is the average of self-reported involvement (on a scale from 1 to 4). The observations in Columns 4-6 are at the DM-boss level, where the boss could be Myanmar supervisor or a foreign boss. Column 4 is the communication frequency (scale 1-4). Column 5 is the self reported number of minutes lost in translation in a conversaion with the supervisor. Column 6 is a binary indicator of having learned management practices from the supervisor. Standard errors are clustered by DM, and by DM and FM in Columns 4-6. They are reported in parenthesis.

Table 3: Baseline Balance, Language Experiment

	Control			Treatment			Regression	
	mean	sd	N	mean	sd	N	b	p
Male (%)	0.38	0.49	144	0.39	0.49	154	0.002	0.97
Education (yrs)	6.87	0.45	144	6.90	0.56	154	0.039	0.57
Age (yrs)	28.16	6.45	134	28.90	7.06	147	0.616	0.10
Tenure (yrs)	1.33	1.16	144	1.34	1.38	154	0.034	0.74
Big 5 (z score)	-0.08	0.98	144	0.07	1.02	154	0.146	0.18
Monthly salary (USD)	351.76	306.96	133	369.95	358.96	140	20.216	0.65
English score (%)	47.35	22.23	144	47.52	22.45	154	0.450	0.89
Involvement score (1-4)	2.25	0.82	144	2.27	0.89	154	0.015	0.88
Management score (/15)	9.06	1.62	144	9.28	1.67	154	0.210	0.28
Understand FM (%)	77.74	21.11	140	78.00	20.94	150	0.433	0.84
Talk Freq. FM (1-4)	2.55	0.88	138	2.36	0.93	148	-0.178	0.12
Endline attrition (%)	0.12	0.32	144	0.06	0.24	154	-0.062	0.15

The p-value of joint significance test for these 11 variables to predict Treatment status is .47

Notes: Table reports baseline balance on key DM characteristics for the language experiment. The last two columns show the coefficient and p-value of the treatment status from a regression that includes firm fixed effects since we stratified at the firm level.

Table 4: First Stage and Impacts on English Proficiency

	First stage		Overall		Speaking		Listening	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Takeup> 0	Takeup c.	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.767	0.568	0.154	0.258	0.187	0.313	0.155	0.261
	(0.039)	(0.036)	(0.073)	(0.116)	(0.097)	(0.151)	(0.108)	(0.171)
Baseline value	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	0.00	0.00	-0.08	-0.08	-0.07	-0.07	-0.10	-0.10
1st stage F-stat				278.17		272.58		273.78
N	298	298	268	268	265	265	267	267
R2	0.65	0.58	0.48	0.48	0.46	0.47	0.30	0.30

Notes: Table reports first stage results of the instrumental variable regressions of takeup on assignment to treatment in Column 1 and 2. Column 1 defines takeup as attending at least one class, while Column 2 defines takeup as the share of the course sessions attended (continuous measure between 0 and 1). Columns 3-8 regresses different measures of English proficiency on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as the share of the course sessions attended (continuous measure between 0 and 1, ineven columns). The TOT regressions instrument takeup with treatment. Dependent variable in columns 3 and 4 is the Z-score (normalization) of the overal English score. Dependent variable in columns 5 and 6 is the Z-score of just speaking score whereas the last two columns is the Z-score of English listening score. The English scores were obtained during a test realized at endline which took place in person (before COVID-19) and then over the phone. The regressions control for baseline values of the dependent variables and the mode of endline and include strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Table 5: Impact of Treatment on Communication and Management

Panel A: Communication

	FM								DM			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Talk Fqcy (1-4)		Talk Fqcy+ (1-4)		Attend mtg (0/1)		Effective time (%)		Talk Fqcy (1-4)		Attend mtg (0/1)	
	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.192	0.314	0.200	0.331	0.083	0.139	1.969	3.244	-0.026	-0.043	0.030	0.051
	(0.104)	(0.158)	(0.098)	(0.150)	(0.056)	(0.086)	(2.092)	(3.186)	(0.107)	(0.165)	(0.057)	(0.088)
Baseline control	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	.	2.58	.	2.31	.	0.41	.	82.55	.	3.11	.	0.70
1st stage F-stat		307.92		328.53		281.05		281.57		306.88		281.05
N	226	226	272	272	261	261	223	223	258	258	261	261
R2	0.27	0.27	0.36	0.37	0.27	0.28	0.22	0.22	0.14	0.14	0.14	0.15

Panel B: Management

	Involvement (1-4)				Score (/15)	
	(1)	(2)	(3)	(4)	(5)	(6)
	People		Targets		Management	
	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.144	0.243	-0.052	-0.088	0.023	0.039
	(0.063)	(0.097)	(0.093)	(0.147)	(0.038)	(0.060)
Baseline control	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Cluster level						
Control mean	.	2.28	.	2.70	.	2.11
1st stage F-stat		273.56		253.76		282.64
N	277	277	277	277	272	272
R2	0.65	0.66	0.34	0.33	0.94	0.94

Notes: Table regresses measures of communication (panel A) and management (panel B) on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined the share of the course sessions attended (continuous measure between 0 and 1) (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns in Panel A is the communication frequency with the FM on a scale from 1 to 4. Dependent variable in Columns 3-4 is an updated version of that variable, where we impute a value "1" to DMs who report not having a direct FM. Dependent variable in Columns 5-6 is the average probability that the DM attended a meeting with an FM in the last working day. Dependent variable in Columns 7-8 is the share of conversation lost due to tanslation issues as a percentage. Columns 9-10 and 11-12 report similar variables as columns 1-2 and 5-6 but for the DM's Myanmar manager. Panel B regresses measures of management on indicators for treatment and takeup. The dependent variable in Columns 1-2 is involvement in the management of personnel (on a scale of 1-4), columns 3-4 is involvement in setting targets (on a scale of 1-4) and columns 5-6 is involvement in setting targets at the factory level. Columns 7-8 the score on management questions a la Bloom and Van Reenen, out of 15. Most regressions (except for "meeting" related variables) control for the average value of the dependent variable at baseline and at intermediary surveys before 75% of the treatment, the mode of endline and include strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Table 6: Impact of Treatment on Management Simulations

Panel A: DM receives management task in English

	"PWs" time		"PWs" mistakes		Time with "FM"		Qs to "FM"	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	-0.190	-0.365	0.100	0.193	0.351	0.675	1.032	1.982
	(0.148)	(0.263)	(0.259)	(0.459)	(0.186)	(0.351)	(0.368)	(0.736)
Baseline control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	1.28	1.28	1.85	1.85	1.89	1.89	1.97	1.97
1st stage F-stat		66.4		66.4		66.4		66.4
R2	0.19	0.19	0.14	0.13	0.32	0.32	0.18	0.19
N	153	153	153	153	153	153	153	153

Panel B: DM receives management task in Burmese

	"PWs" time		"PWs" mistakes		Time with "FM"		Qs to "FM"	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.054	0.104	0.137	0.263	0.069	0.132	0.312	0.599
	(0.099)	(0.178)	(0.218)	(0.376)	(0.093)	(0.166)	(0.315)	(0.579)
Baseline control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	0.88	0.88	0.63	0.63	1.15	1.15	1.27	1.27
1st stage F-stat		66.4		66.4		66.4		66.4
R2	0.27	0.26	0.12	0.15	0.19	0.19	0.05	0.06
N	153	153	153	153	153	153	153	153

Notes: Panel A in Table regresses outcomes of the management simulation exercise on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as the share of the course sessions attended (continuous measure between 0 and 1) (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns is the time taken by the DM's "production team" to complete the task. Dependent variable in columns 3 and 4 is the number of mistakes made by the DM's "production team" compared to the instructions. Columns 5 and 6 are the time in minutes spent by the DM talking with the "FM". Columns 7 and 8 are the number of questions asked by the DM to the "FM". Panel B shows the same indicators when the DM received instructions in Burmesein Burmese. All the data was collected at endline, before COVID-19 made us stop these in-person activities, as a result we report the results for the N=153 for this management exercise.The regressions include strata fixed effects. Standard errors are reported in parenthesis and are clustesred at the department level.

Table 7: Learning

	BvR Mngt score (/5)						Self-reported learning					
	Endline		Endline		Follow-up		N skills		Intensity FM Mean		Intensity DM Mean	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ITT	TOC	ITT	TOC	ITT	TOC	ITT	TOC	ITT	TOC	ITT	TOC
Treatment	0.023	0.039	-0.074	-0.115	0.150	0.233	0.800	1.241	0.069	0.107	0.142	0.220
	(0.038)	(0.060)	(0.071)	(0.102)	(0.129)	(0.182)	(1.143)	(1.619)	(0.157)	(0.225)	(0.134)	(0.187)
Baseline control	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1st st. F-stat		282.64		219.06		235.83		236.07		236.07		236.07
Control mean	2.11	2.11	2.39	2.45	3.27	3.27	5.51	5.10	0.75	0.69	0.66	0.62
N	272	272	96	96	96	96	96	96	96	96	96	96
R2	0.94	0.94	0.94	0.93	0.12	0.12	0.16	0.20	0.19	0.21	0.16	0.21

Table 8: Spillovers of treatment on communication within the department

	English z-score (1)	Talk Freq FM B 1-4 (2)	Time FM B min. (3)	Conv. time lost % (4)	People score 1-4 (5)	WTP FM B (6)
N Treatment in Department	-0.108	0.012	-0.544	-3.466	-0.113	17.741
	(0.085)	(0.101)	(3.959)	(2.668)	(0.090)	(11.617)
N Total in Department	0.054	-0.022	1.931	3.312	0.058	-6.967
	(0.051)	(0.064)	(2.328)	(1.455)	(0.055)	(8.196)
Baseline control	Yes	Yes	No	Yes	Yes	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	-0.08	2.58	25.18	17.45	2.28	32.23
N	126	104	80	103	130	98
R2	0.58	0.49	0.37	0.43	0.70	0.24

Table 9: Donor Pool of Characteristics and Interview Responses

Panel A: Donor Pool of Profile Characteristics	
Criteria	Values
Gender	{Male, Female}
Age	{25, 26}
English level x Previous company ownership	{ (Elementary, Myanmar), (Elementary, Japanese) (Advanced, Myanmar), (Advanced, Japanese) }
Previous company size	{25 employees, 125 employees}
Work experience	{1 year, 3 years}
Panel B: Donor Pool of Interview Responses	
Criteria	Values
How often did you interact with your foreign boss (formal/informal meetings, lunches etc.)?	{Frequently, Infrequently, I was hired to interact frequently with the foreign boss but interacted infrequently because he had to leave the country for a family emergency}
How frequently did you use Microsoft Office Package (Word, Powerpoint, Excel)?	{Frequently, Infrequently}
How often were you involved in setting and communicating the company's targets?	{Frequently, Infrequently}

Notes: Table reports the donor pool of values for each demographic characteristic. The second panel reports the donor pool of values for each response to the "interview" questions.

Table 10: Characteristics Valued by HR Managers: Demographics

	Choice	Wage offer (USD)	Perceived learning (1-10)	Perceived Invt. (1-4)
Advanced English, Domestic Experience	0.27	38.21	0.31	0.13
	(0.04)	(6.07)	(0.07)	(0.04)
Elementary English, MNC Experience	0.08	33.25	0.33	0.08
	(0.03)	(6.42)	(0.07)	(0.04)
Advanced English, MNC Experience	0.35	82.58	0.65	0.28
	(0.04)	(10.40)	(0.09)	(0.05)
Age (=26)	0.01	1.68	-0.01	0.01
	(0.02)	(3.14)	(0.05)	(0.02)
Gender (=Male)	0.07	5.62	0.06	0.00
	(0.02)	(2.89)	(0.03)	(0.03)
Large size (=125)	0.20	27.65	0.24	-0.08
	(0.03)	(6.22)	(0.09)	(0.06)
Total Experience (=3y)	0.29	73.20	1.15	0.46
	(0.03)	(7.02)	(0.10)	(0.06)
Rater FEs	Yes	Yes	Yes	Yes
Low Eng, Dom	0.31	280.84	4.40	2.33
R2	0.22	0.81	0.73	0.71
N	2040	2040	2040	1560

Notes: This table regresses different measures of hiring interests on the profile characteristics. Column 1 regresses a dummy of if the profile is chosen among the two shown. Column 2 reports the wage offer to each profile. Column 3 reports the respondent's rating of how much the profile would have learned at the previous job. Column 4 reports the respondent's rating of how involved the profile was in setting and communicating targets and managing people at the previous job. All regressions include respondent and profile pair fixed effects. Standard errors are reported in parenthesis and are clustered at the respondent level.

Table 11: Characteristics Valued by HR Managers: "Interview Responses"

	Choice	Wage offer (USD)	Perceived learning (1-10)
Freq. communication with FM	0.27	29.11	0.36
	(0.03)	(3.61)	(0.06)
Selected to communicate freq.	0.03	5.97	0.10
	(0.04)	(3.49)	(0.06)
Freq. Microsoft user	0.18	22.56	0.27
	(0.03)	(3.36)	(0.05)
Freq. setting and communicating targets	0.41	44.26	0.68
	(0.04)	(5.57)	(0.08)
Rater FE	Yes	Yes	Yes
Infrequent comm with FM	0.67	426.40	5.71
R2	0.25	0.91	0.84
N	1122	1122	1122

This table regresses different measures of hiring interests on the interview characteristics. Dependent variable in the first column is whether the resume was chosen out of the two displayed to the respondent. Dependent variable in the second column is the wage offer stated by the respondent for the profile. Dependent variable in the third column is an evaluation made by the respondent of how much the candidate has learned on the job, on a scale from 1 to 10. The regressions include fixed effects for respondents and pairs of interview scripts. standard errors are reported in parenthesis and are clustered at the respondent level.

Table 12: DMs' Willingness-to-Pay for FM time

|	FM		FM outside firm		DM	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	32.7	68.8	19.1	40.5	7.7	16.4
	(14.2)	(30.2)	(8.7)	(18.1)	(8.8)	(17.8)
Baseline control	No	No	No	No	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	32.23	49.28	26.89	36.28	24.04	26.99
1st stage F-stat		101.7		137.4		82.1
R2	0.16	0.05	0.15	0.08	0.13	0.11
N	212	212	269	269	220	220

Notes: Table regresses Willingness to Pay (WTP) for a one hour, one-on-one conversation with different managers on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as the share of the course sessions attended (continuous measure between 0 and 1) (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns is the WTP for time with FM. Dependent variable in columns (3) and (4) is the WTP for time with an FM in a similar position in another Thilawa company. Dependent variable in the last two columns is the WTP for time with a DM. The data were obtained at endline which took place in person (before COVID-19) and then over the phone. The regressions control for baseline values the mode of endline and include strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Figure 1: English Proficiency of DMs and FMs
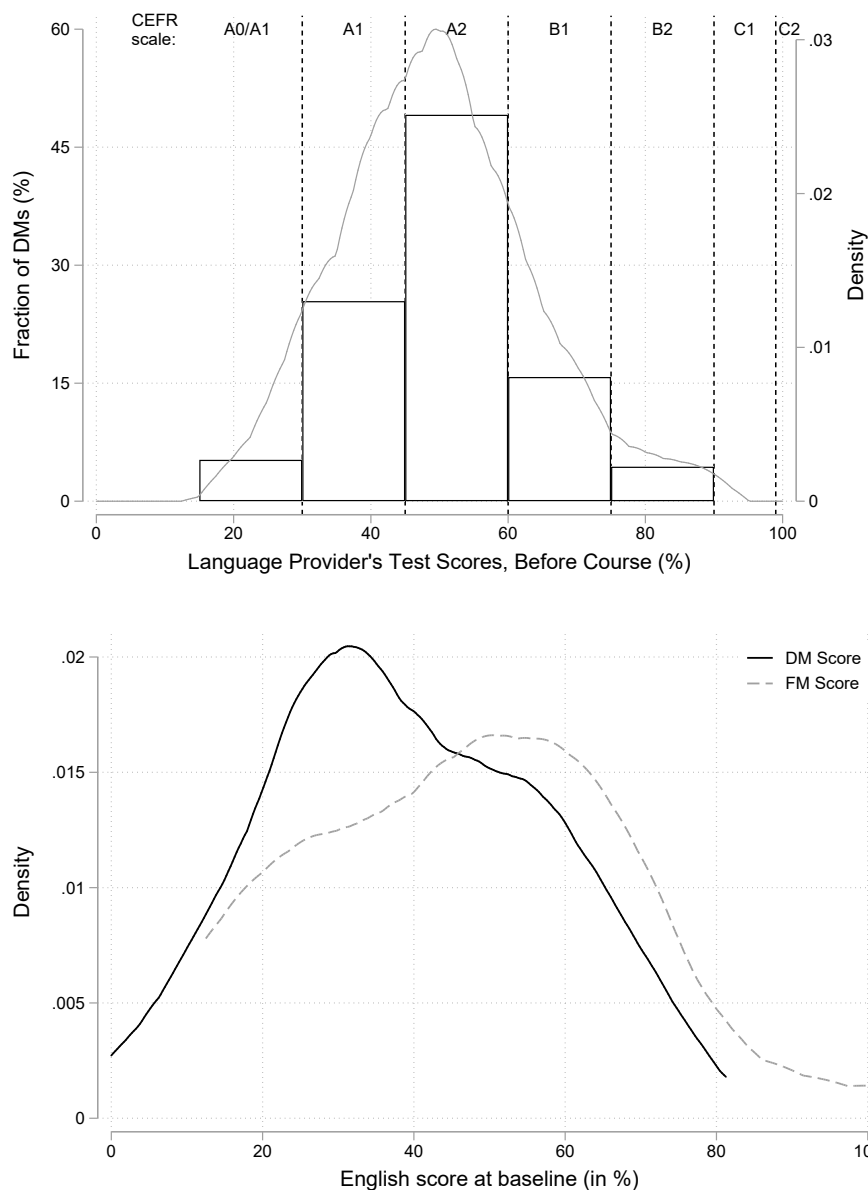
Notes: The first Panel of the Figure displays the kernel density of the English scores (and corresponding levels) in a test recorded by the external Language provider. This was administered on subset of the DMs assigned to treatment, and so N=114. Note that the provider offers classes for more advanced students but none of our DMs placed into them. The second panel compares the distribution of English scores in our test at baseline for the DMs (N=402) and FMs (N=23), respectively. The scores were collected during in-person baseline surveys that took place mostly during the first semester of 2018 and a bit during the first few months of 2019. The scores are the means of a listening scores and a speaking score. The listening scores were computed based on Multiple Choice Questions about audio recordings in English designed by the research team and the speaking scores were given by blind external graders (we took the average of the two scores given).

Figure 2: Comparison with Language provider's scores
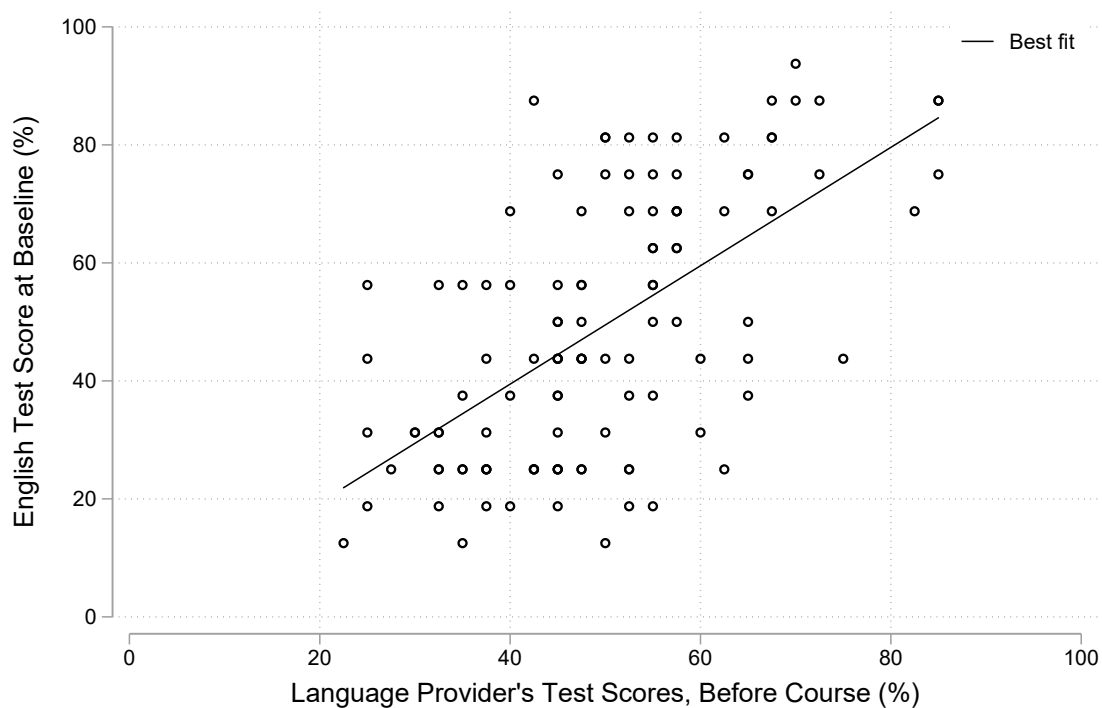
Notes: Figure displays a scatter plot of the scores obtained in the test administered by the external Language provider and as a part of the in-person baseline survey for the N=114 DMs that have taken both assesments. The in-person baseline surveys took place mostly during the first semester of 2018 and a bit during the first few months of 2019. The scores are the means of a listening scores and a speaking score. The listening scores were computed based on Multiple Choice Questions about audio recordings in English designed by the research team and the speaking scores were given by blind external graders (we took the average of the two scores given).

A. Appendix Tables and Figures

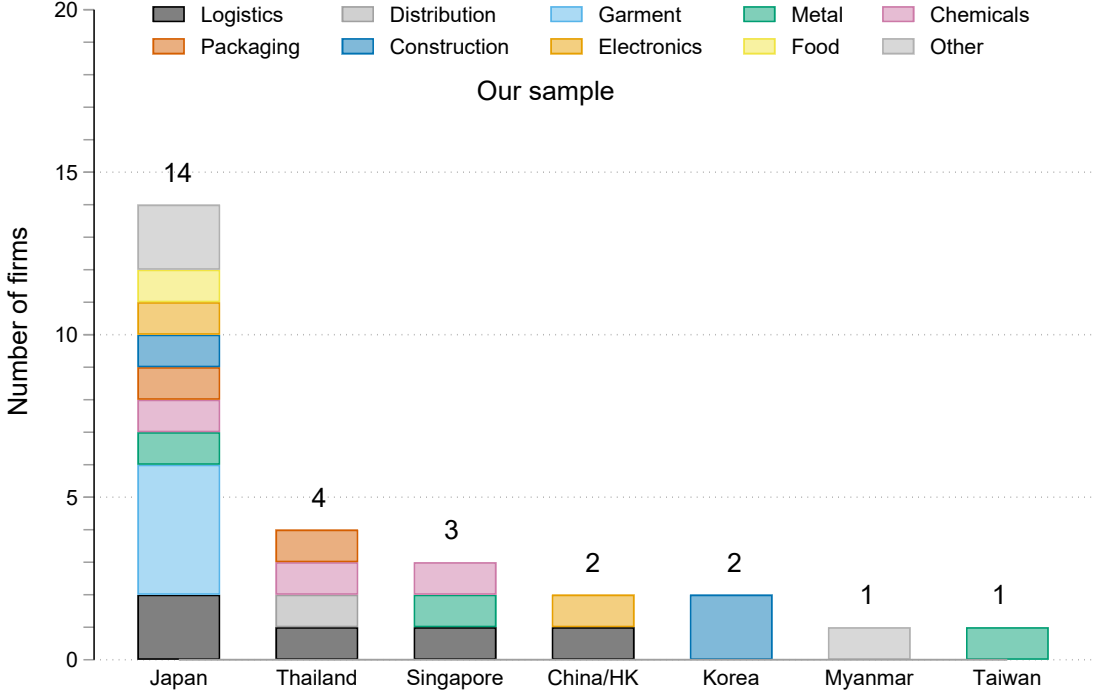Figure A.3: Sample Firms by Country of origin and Sector

Notes: The figure displays the 27 firms in our sample for the language experiment by main country of origin and industry of operation The data are publicly available on the SEZ website.

Table A.1: Sample firms comparison with non-compliers

	Sample			Other SEZ firms			Difference		
	Mean	Sd	N	Mean	Sd	N	Dif	Se	t
Total Employees	209.7	293.6	27	161.5	350.9	19	48.2	95.31	0.51
Foreign managers (FMs)									
Number	7.0	10.8	13	6.1	6.7	16	0.9	3.29	0.29
Wage (USD)	2212.6	1770.5	12	1926.1	969.5	13	286.5	564.67	0.51
Domestic managers (DMs)									
Number	13.6	12.7	27	14.6	11.7	19	-1.0	3.68	-0.28
Wage (USD)	353.2	173.8	27	418.0	136.6	19	-64.8	47.79	-1.36
Production workers/ Unkilled workers									
Number	171.1	236.4	23	149.3	379.9	16	21.8	98.61	0.22
Wage (USD)	108.3	34.2	23	112.3	33.8	16	-4.0	11.08	-0.36

Notes:

Table A.2: Impact of Treatment on English

	First stage		Overall		Speaking		Listening	
	(1) Takeup > 0	(2) Takeup c.	(3) ITT	(4) TOC	(5) ITT	(6) TOC	(7) ITT	(8) TOC
Treatment	0.767	0.568	0.173	0.281	0.208	0.313	0.169	0.297
	(0.035)	(0.030)	(0.080)	(0.119)	(0.102)	(0.151)	(0.109)	(0.165)
Baseline value		No	Yes	Yes	Yes	Yes	Yes	Yes
Strata FEs		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean			-0.08	-0.08	-0.07	-0.07	-0.10	-0.10
1st stage F-stat				277.37		272.58		275.40
N	298	298	268	268	265	265	267	267
R2	0.65	0.58	0.50	0.50	0.47	0.47	0.34	0.34

Notes: Table uses PDS lasso techniques (Belloni et al.) to regress measures of English ability on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeup with treatment. Suggested controls for the PDS Lasso procedure include the average value of the dependent variable at baseline and at intermediary surveys before 75% of the treatment, the mode of endline and strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Table A.3: Impact of Treatment on Communication and Management using PDS Lasso

Panel A: Communication

| | FM | | | | | | | | DM | | | |
| | Talk Fqcy (1-4) | | Talk Fqcy+ (1-4) | | Attend mtg (0/1) | | Minutes lost (%) | | Talk Fqcy (1-4) | | Attend mtg (0/1) | |
	(1) ITT	(2) TOT	(3) ITT	(4) TOT	(5) ITT	(6) TOT	(7) ITT	(8) TOT	(9) ITT	(10) TOT	(11) ITT	(12) TOT
Treatment	0.231	0.378	0.192	0.315	0.062	0.096	-2.803	-4.619	-0.044	-0.049	0.042	0.058
	(0.103)	(0.152)	(0.099)	(0.145)	(0.056)	(0.082)	(1.915)	(2.868)	(0.113)	(0.165)	(0.055)	(0.087)
Baseline control	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	2.58	2.58	2.31	2.31	0.42	0.42	17.45	17.45	3.11	3.11	0.70	0.70
1st stage F-stat		302.85		311.98		269.29		286.21		306.88		283.19
N	226	226	272	272	260	260	223	223	258	258	260	260
R2	0.32	0.32	0.41	0.42	0.34	0.35	0.35	0.35	0.14	0.14	0.18	0.18

Panel B: Management

| | Involvement (1-4) | | | | Score (/15) | |
| | People | | Targets | | Management | |
	(1) ITT	(2) TOC	(3) ITT	(4) TOC	(5) ITT	(6) TOC
Treatment	0.135	0.235	-0.042	-0.031	0.081	0.117
	(0.064)	(0.098)	(0.077)	(0.122)	(0.113)	(0.179)
Baseline control	Yes	No	Yes	No	Yes	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	2.28	2.28	2.69	2.69	6.32	6.32
1st stage F-stat		272.50		246.75		282.64
N	277	277	277	277	272	272
R2	0.65	0.66	0.51	0.51	0.94	0.94

Notes: Table uses PDS lasso techniques (Belloni et al.) to regress measures of communication (panel A) and management (panel B) on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns in Panel A is the communication frequency with the FM on a scale from 1 to 4. Dependent variable in Columns 3-4 is an updated version of that variable, where we impute a value "1" to DMs who report not having a direct FM. Dependent variable in Columns 5-6 is the average probability that the DM attended a meeting with an FM in the last working day. Dependent variable in Columns 7-8 is the share of conversation lost due to tanslation issues as a percentage. Columns 9-10 and 11-12 report similar variables as columns 1-2 and 5-6 but for the DM's Myanmar manager. Panel B regresses measures of management on indicators for treatment and takeup. The dependent variable in Columns 1-2 is involvement in the management of personnel (on a scale of 1-4), columns 3-4 is involvement in setting targets (on a scale of 1-4) and columns 5-6 is involvement in setting targets at the factory level. Columns 7-8 the score on management questions a la Bloom and Van Reenen, out of 15. Most regressions (except for "meeting" related variables) control for the average value of the dependent variable at baseline and at intermediary surveys before 75% of the treatment, the mode of endline and include strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Table A.4: Impact of Treatment on Management (simulation exercise) using PDS Lasso

	Time		Mistakes		Time		Questions	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ITT	TOT	ITT	TOT	ITT	TOT	ITT	TOT

Panel A: DM receives management task in English

	(1) ITT	(2) TOT	(3) ITT	(4) TOT	(5) ITT	(6) TOT	(7) ITT	(8) TOT
Treatment	-0.224	-0.365	0.100	0.294	0.393	0.678	1.116	1.982
	(0.162)	(0.263)	(0.284)	(0.480)	(0.198)	(0.346)	(0.389)	(0.736)
Baseline control	No	No	No	No	No	No	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	1.28	1.28	1.85	1.85	1.89	1.89	1.97	1.97
1st stage F-stat		66.40		67.69		66.20		66.40
N	153	153	153	153	153	153	153	153
R2	0.20	0.01	0.28	0.15	0.36	0.07	0.19	0.05

Panel B: DM receives management task in Burmese

	Time		Mistakes		Time		Questions	
	(1) ITT	(2) TOT	(3) ITT	(4) TOT	(5) ITT	(6) TOT	(7) ITT	(8) TOT
Treatment	-0.007	-0.019	0.081	0.103	0.030	0.070	0.255	0.504
	(0.047)	(0.078)	(0.082)	(0.136)	(0.060)	(0.099)	(0.200)	(0.351)
Baseline control	No	No	No	No	No	No	No	No
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	0.49	0.49	0.27	0.27	0.75	0.75	0.57	0.57
1st stage F-stat		66.18		66.40		70.77		66.40
N	153	153	153	153	153	153	153	153
R2	0.30	0.01	0.14	0.02	0.52	0.34	0.09	0.02

Notes: Table uses PDS lasso techniques (Belloni et al.) to regress measures collected from a management simulation exercise on treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns is the time taken by the DM's "production team" to complete the task. Dependent variable in columns 3 and 4 is the number of mistakes made by the DM's "production team" compared to the instructions. Columns 5 and 6 are the time in minutes spent by the DM talking with the "FM". Columns 7 and 8 are the number of questions asked by the DM to the "FM". Panel B shows the same indicators when the DM received instructions in Burmesein Burmese. Most regressions (except for "meeting" related variables) control for the average value of the dependent variable at baseline and at intermediary surveys before 75% of the treatment, the mode of endline and include strata fixed effects. Standard errors are reported in parenthesis and are clustered at the department level.

Table A.5: Human Resource Managers Summary Statistics

	Mean	Sd	N
Age	29.3	6.1	50
Education (years)	16.2	0.9	48
Work experience (years)	7.0	4.9	51
Experience in FDI (years)	1.7	2.6	51
Company size (# employees)	1127.9	2474.5	51
Resumes seen in the last 6 months	522.5	953.5	51
People recruited in the last 6 months	44.5	67.3	51
Recruited people with FDI exp.	10.7	25.8	51
Currently in FDI firm	0	0	51

Notes: Table reports the mean, SD and number of observations for different variables. The first panel reports these statistics for variables related to firms in the resume experiment sample. The second panel reports these statistics for variables related to HR managers in the profile and interview rating experiment sample. The data were collected through an online survey at the beginning of the resume experiment.

Table A.6: English uses outside the firm

	Read textbooks (1)	Watch news (2)	Take courses (3)	Watch movie (4)	Travel (5)	Study (6)	Social media (7)
Treatment	0.056	0.036	-0.066	-0.012	0.025	0.022	0.007
	(0.082)	(0.062)	(0.087)	(0.078)	(0.044)	(0.050)	(0.086)
Baseline control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	0.41	0.16	0.27	0.59	0.07	0.07	0.40
N	153	153	153	153	153	153	153
R2	0.16	0.11	0.18	0.16	0.12	0.09	0.12

Table A.7: Promotion, Wages and Job Search

	Endline at $\sim$ +5 months					
	Promotion		Log wage		N applications	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	TOC	ITT	TOC	ITT	TOC
Treatment	0.022	0.036	-0.008	-0.013	0.292	0.486
	(0.054)	(0.084)	(0.069)	(0.107)	(0.158)	(0.244)
Baseline value	No	No	No	No	No	No
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	.	0.56	.	5.88	.	0.50
1st stage F-stat		286.65		228.64		289.05
N	269	269	235	235	266	266
R2	0.20	0.20	0.23	0.23	0.16	0.15

Notes: Table regresses different professional outcomes on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeup, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeup with treatment. Dependent variable in the first two columns is an indicator for whether the respondent has received a promotion. Dependent variable in columns (3) and (4) is the log wage. Dependent variable in the last two columns is the number of job applications reported by the respondent. The data were collected at endline which took place in person (before COVID-19) and then over the phone. The regressions control for the mode of endline, include strata fixed effects and the baseline value of log wage for columns (3) and (4). Standard errors are reported in parenthesis and are clustered at the Team level..

Table A.8: Balance table for treatment saturation

	N treat Department min: 0			N treat Department max: 8			Regression		
	mean	sd	N	mean	sd	N	Coeff	p	N
Male (%)	0.46	0.52	13	0.17	0.41	6	-0.124	0.00	
Education (yrs)	6.92	0.28	13	6.67	0.52	6	0.038	0.44	
Age (yrs)	27.92	9.53	13	23.75	5.56	4	-0.343	0.72	
Tenure (yrs)	0.83	0.73	13	0.85	0.76	6	0.056	0.49	
Big 5 (z score)	0.19	0.81	13	0.09	1.44	6	-0.281	0.00	
Monthly salary (USD)	551.19	808.54	12	236.95	119.70	6	-18.472	0.58	
English score (%)	48.08	16.21	13	35.42	13.50	6	0.720	0.82	
Involvement score (1-4)	2.32	0.90	13	2.02	0.92	6	-0.291	0.02	
Management score (/15)	9.38	1.88	13	8.10	1.03	6	0.246	0.18	
Understand FM (%)	79.46	28.03	12	72.61	28.93	6	-0.418	0.84	
Talk Freq. FM (1-4)	2.92	0.79	12	2.50	1.05	6	-0.173	0.33	
Endline attrition (%)	0.23	0.44	13	0.00	0.00	6	-0.076	0.06	

The p-value of the joint significance test for these 11 variables to predict N Treatment is .26

In this table, we report the mean, standard deviation and number of observations of the baseline variables for individuals in the control group with no treated individuals working in the same department (first three columns), with eight treated individuals working in the same department (following three columns). In the last columns, we report the coefficient and standard error for the regression of the baseline variable on the number of treated individuals working in the same department, controlling for firm fixed effects and the total number of individuals working in the same department. We cluster standard errors at the firm level.

Table A.9: Balance table for experiment participation

|	Survey Sample			Participants			Regression	
	mean	sd	N	mean	sd	N	b	p
Male (%)	0.41	0.49	104	0.39	0.49	298	-0.232	0.01
Education (yrs)	6.35	1.05	104	6.89	0.51	298	0.240	0.12
Age (yrs)	28.59	8.11	99	28.55	6.77	281	-2.642	0.12
Tenure (yrs)	1.59	1.34	104	1.34	1.27	298	-0.162	0.44
Big 5 (z score)	-0.05	1.00	104	0.02	1.00	298	0.157	0.46
Monthly salary (USD)	387.41	788.60	95	361.09	334.15	273	-139.020	0.47
English score (%)	38.70	25.79	104	47.44	22.31	298	1.344	0.74
Involvement score (1-4)	2.23	0.85	104	2.16	0.80	298	-0.182	0.20
Management score (/15)	9.33	1.52	104	9.17	1.65	298	0.493	0.00
Understand FM (%)	66.86	32.61	90	75.79	24.36	285	-6.455	0.16
Talk Freq. FM (1-4)	2.57	0.79	90	2.45	0.91	286	-0.256	0.06

The p-value of joint significance test for these 11 variables to predict participation is .07

Figure A.4: All Foreign firms in Myanmar by Country of origin and Sector
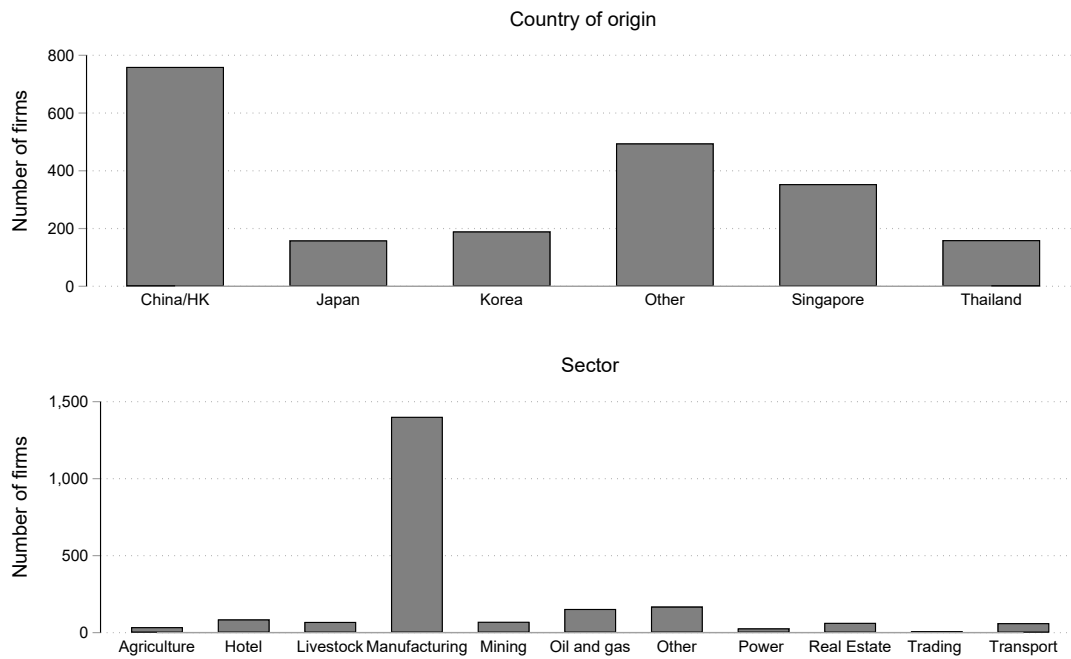
Notes: The figure displays the 2118 approved foreign firms in Myanmar as of June 2020 by main country of origin and about 75% of those by sector of operation. We do not show sectors like Agriculture, Oil and Gas and other activities. These are separated by two routes of investment - through the Myanmar Investment Law and the 2014 SEZ Law. The data are publicly available on the DICAwebsite.

Figure A.5: Expectations of employees of the SEZ
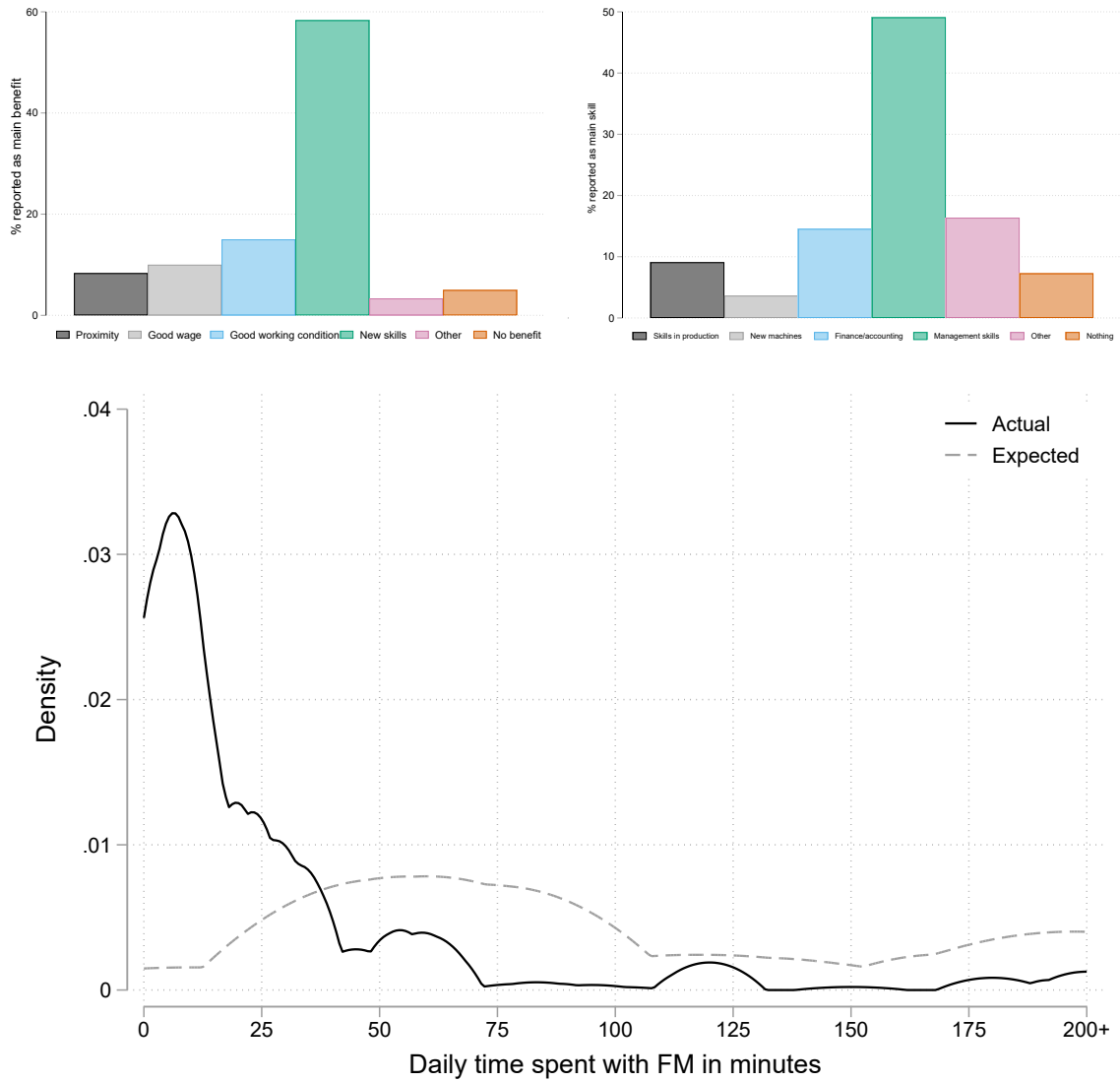
Notes: The top panel displays the share of DMs who reported the particular benefit as their primary benefit of working at the zone (on the left side) and the share of DMs that reported the particular skill as their primary skill they were hoping to acquire at the zone (on the right side). These answers were collected through the 2017 worker-level survey. The bottom panel shows the difference between the communication quantity survey participants thought they would get before starting their job and what they were getting during the baseline survey.

Figure A.6: Other language proficiency in DM Sample
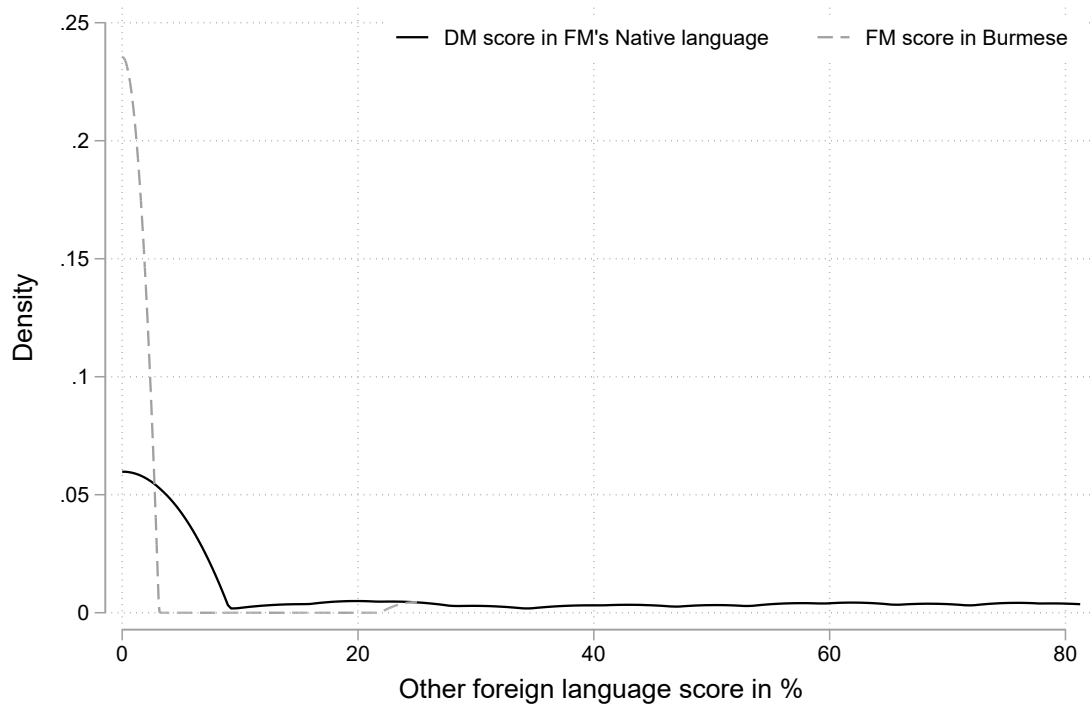
Notes: Figure displays the distribution of DM test scores on the native language of FMs at their company, and the distribution of FM test scores in Burmese.

Figure A.7: Improvement in English measured by Language Provider's Test


Notes: Figure displays the distribution of DM test scores on the test administered by the Language provider at the beginning and end of the course. The 45 degree line is plotted for indication..

Figure A.8: Attendance by Treatment DMs
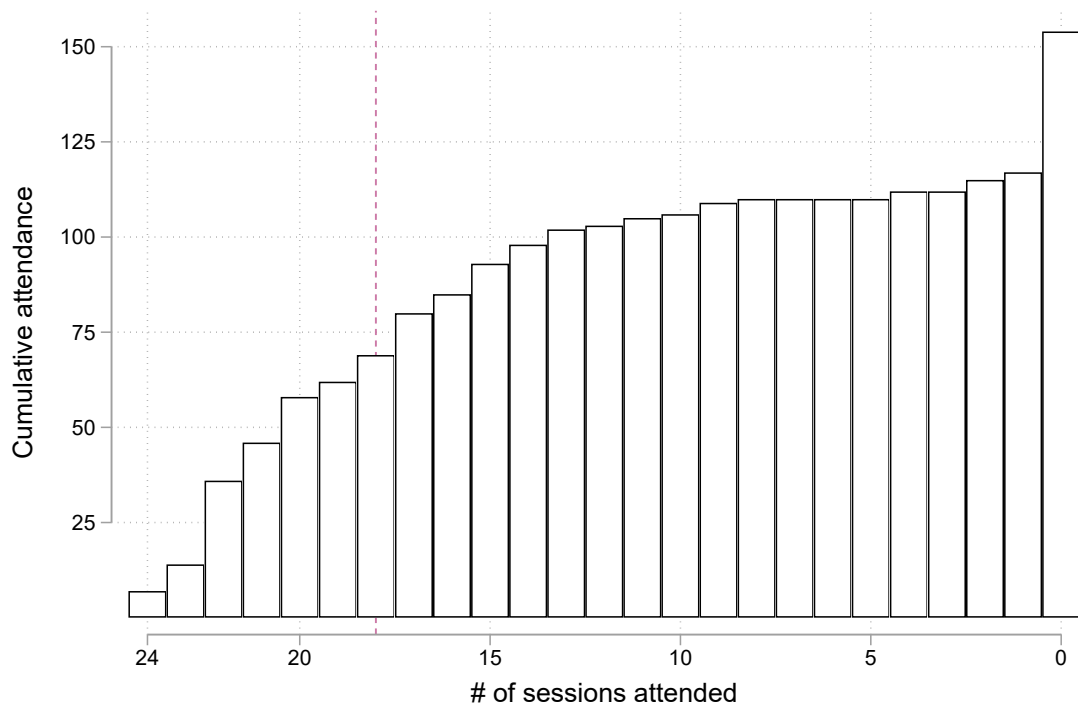
Notes: The figure represents the distribution of attendance of study participants who were assigned to treatment on a reversed axis. The unit is the number of sessions (two hours). The red line represents the relevant threshold of participation for what we defined as "takeup" 75% or 18 sessions.

Figure A.9: Distribution of the NPV of the language training for a DM for each firmt
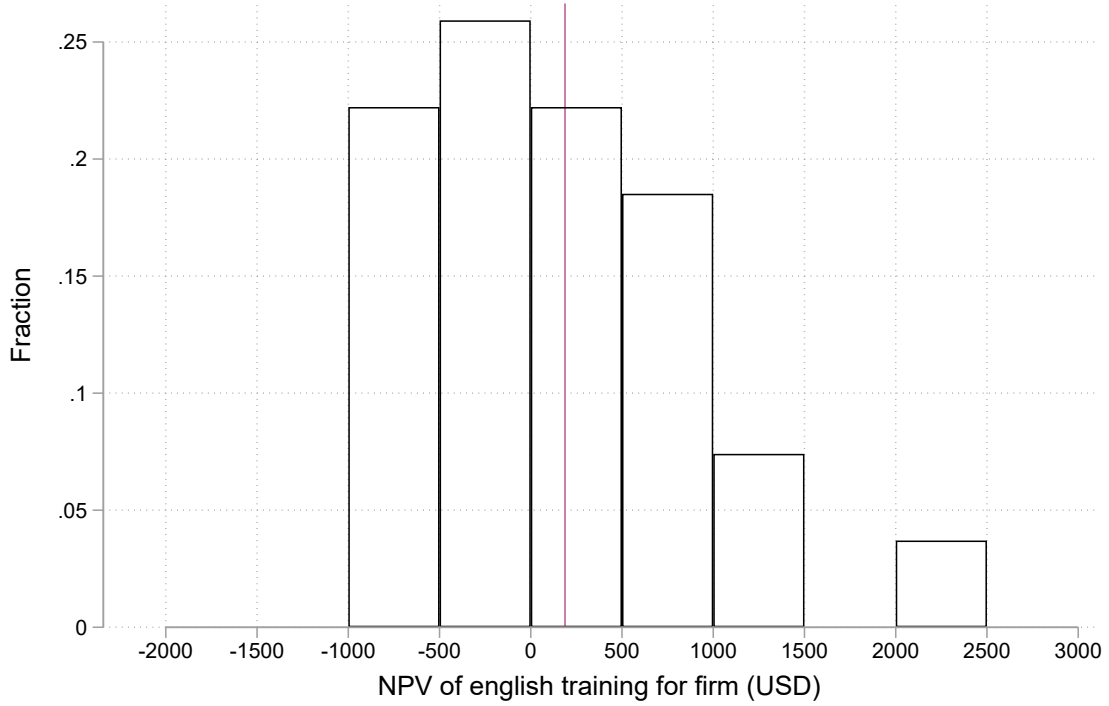
Notes: We use the following formula to compute the net present value of the training for each firm: $NPV_i = \frac{1}{r+p}(0.15 \times w_{PW,i} \times SC_{DM,i}^{0.5} - 0.19 \times w_{FM,i} \times t_{FM,i}) - C$. where r is the monthly interest rate which we take equal to 0.8%. p is the monthly probability of the DM leaving which we set at 3% so that the median turnover of a DM is 2 years. $w_{PW,i}$ is the average wage of production workers in firm i. $SC_{DM,i}$ is the firm-specific span of control of an average DM in terms of PWs. $w_{FM,i}$ is the average wage of FMs in firm i . . $t_F M$ is the average share of the FM's time spent communicating with DMs . (When we do not observe one of the firm specific variable in our data, we replace it by the average across all firms of the same country of origin). C is the cost the language training (USD 300). Our measure of NPV The figure plots the distribution of NPVs across firms in our sample. The vertical bar shows the average value across firms.

Figure A.10: NPV of the language training and average English level across firmst
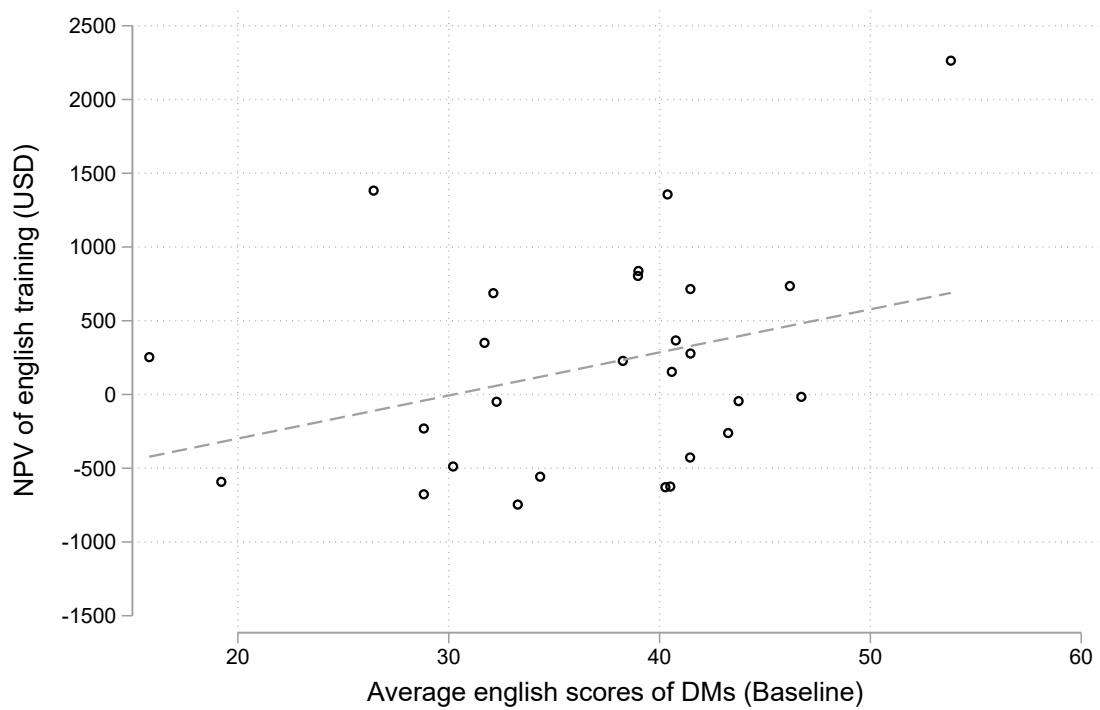
Notes: This figure shows the positive correlation between the NPVs of the language training computed for each firm (see Figure A10 for details on the computation) and the average English-level of DMs in that firm.