

# Language Barriers and Knowledge Transfers from FDI: Experimental Evidence \*

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## Abstract

Developing countries subsidize investment from foreign firms (FDI) hoping for productivity spillovers such as knowledge transfers to domestic employees. This project identifies language barriers as a first-order impediment to knowledge transfers within FDI firms located in Myanmar's largest Special Economic Zone. In these firms, foreign managers (FMs) oversee domestic middle-level managers (DMs) that manage domestic production workers. Three facts motivate our analysis: (i) DMs report that learning management skills from FMs is the main benefit of working in the SEZ; (ii) DMs knowledge of English - the primary working language between people of different nationality in the Zone - is low; (iii) among DMs, even rudimentary English knowledge is associated with higher self-reported learning from FMs. We develop a model in which communication between FMs and DMs increases knowledge transfers. When (i) knowledge transfers are valuable in jobs outside the Zone and (ii) communication between FMs and DMs is non-contractible, valuable knowledge transfers are left unrealized. Two RCTs test the predictions and assumptions of the model. RCT 1 provides free English language training to randomly selected DMs. The training leads to improvement in English knowledge, more frequent communication with FMs and better performance in simulated management exercises. RCT 2, in which experienced HR managers at firms outside the zone are recruited to rate hypothetical DMs' resumes, establishes that knowledge transfers gained in FDI firms are highly valued in the domestic labor market. Further experimental results point at the non-contractibility of communication and thus at valuable knowledge transfers left unrealized due to language barriers.

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# I Introduction

Multinational Corporations (MNCs) account for a large share of global economic activity. In 2018, there were \$1.8 trillion Foreign Direct Investment (FDI) inflows globally, 35% of which were invested into developing countries (UNCTAD 2018). A large literature has documented that MNCs are more productive and better managed (e.g., Bloom et al. 2012). Countries around the world therefore invest significant public resources to attract FDI in the hopes that their presence will generate positive spillover by transferring knowledge to domestic workers and suppliers (Harrison and Rodríguez-Clare 2010). Despite the large empirical literature, direct evidence of such knowledge spillover – particularly in developing countries – has proven elusive due to both measurement and identification challenges (Aitken and Harrison 1999, Smarzynska Javorcik 2004).

A defining feature of FDI activity is that it involves collaborations between employees who are culturally distant and often do not share a common language. At the aggregate level, language barriers are one of the main predictors of bilateral FDI: for example, Blonigen and Piger 2014 show that sharing a common language is associated with a twofold increase in FDI flows, a magnitude that vastly exceeds the responsiveness of FDI flows to tax exemptions. Language barriers exist not just between headquarters and foreign affiliates, but also *within* establishments in the host country as multinationals typically deploy expatriate senior managers to run their foreign affiliates.

This paper investigates whether communication frictions arising from language barriers inhibit knowledge transfers between senior foreign managers and domestic middle-level managers. We overcome both measurement and identification challenges by conducting tailored surveys and by implementing two randomized control trials. Our setting is a sample of FDI firms located in Myanmar’s recently established and largest Special Economic Zone (SEZ)<sup>1</sup>, a common setting with other industrializing countries to attract FDI. The typical establishment in the Thilawa SEZ is a manufacturing factory owned by a Japanese, Chinese, or Korean multinational firm. The establishment is led by senior foreign managers (FMs) who supervise domestic middle managers (DMs) and production workers. We focus on the interactions between the FMs and DMs.

Our surveys reveal that knowledge of English, the primary language of communication between workers of different nationalities in most firms in the SEZ, is strikingly low among domestic managers. We document that the resulting language barrier substantially hinders knowledge transfers from foreign managers to domestic managers. In the first experiment, we offer free English training to a random sample of domestic managers employed at MNCs in the SEZ. At endline, we find that treated managers improve the amount and quality of communication with their foreign bosses and perform better in exercises that simulate the management of complex tasks.

Does this language barrier imply an inefficiency and a potential role for industrial policy? Since it is costly to learn a foreign language, the language barrier in itself doesn’t imply a market fail-

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<sup>1</sup>The World Bank defines an SEZ as a “geographically limited area, usually physically secured (fenced-in); single management or administration; eligibility for benefits based upon physical location within the zone; separate customs area (duty-free benefits) and streamlined procedures.” The Thilawa SEZ in Myanmar where our study is based meets this definition. Encouraged by the success of many SEZs in China, there are now thousands around the world (see, e.g., Farole (2011), Khandelwal and Teachout (2016)).

ure. A simple framework in which knowledge transfers depend on the amount of communication between foreign and domestic managers clarifies that when: (i) knowledge transfers are valuable in jobs outside the SEZ, and (ii) communication between FMs and DMs is non-contractible, an inefficiency arises. Two additional pieces of evidence support the conditions leading to inefficiently low knowledge transfers. We establish that knowledge acquired from interactions with foreign managers is indeed valued in the broader Myanmar labor market by conducting a second experiment that asks experienced human-resource managers at firms outside the SEZ to rate hypothetical resumes of domestic managers. We also document several suggestive pieces of evidence consistent with (inherently harder to test for) assumption of non-contractibility of communication. For example, domestic managers that were randomly assigned to English training report a higher willingness to pay to further interact with foreign managers relative to control. Taken together, these results point to the existence that knowledge transfers are impeded by language barriers and suggest a potential role for industrial policy to subsidize English language training for domestic managers.

We describe the context in detail and present motivating facts that guide our conceptual framework and experimental design in Section II. Using surveys that measure communication between these two layers, we document three motivating facts. First, language barriers are severe. FMs do not speak Burmese, DMs do not speak Japanese (or Chinese or Korean), and all communication occurs in English.<sup>2</sup> English knowledge, particularly among DMs, is low: 60% (65%) of surveyed DMs score at most the elementary A2 level as per the internationally recognized Common European Framework of Reference for Languages (CEFR) in listening comprehension (speaking). Consequently, substantial time, resources and information are “lost in translation”. Second, DMs report that learning management practices – which are hard to imitate and codify – is their primary reason for working in the foreign firms in the SEZ. Third, across DMs, proficiency in English correlates not just with wages, but also with knowledge of management practices, involvement and communication with foreign managers. DMs with some knowledge of English report to learn *relatively* more from FMs than DMs with no English knowledge.

Motivated by these facts, we introduce a framework to guide the empirical analysis in Section III. We consider a three-layer hierarchy: an FM imparts instructions to a DM who then transmits those instructions to a domestic worker. In the first period, the performance of the domestic worker depends on how much is communicated between the FM and DM. At the beginning of the second period, the DM decides whether to continue working in the current job, or leave for a job outside the zone. In both cases, her productivity depends upon her management knowledge – an increasing function of her communication with the FM in period 1. We model communication between the FM and DM as a problem of moral hazard in teams, along the lines of Dewatripont and Tirole (2005). Communication effort is thus non-contractible. We assume that the DM’s English knowledge is complementary to the FM’s communication effort, that is, a higher level of DM English knowledge raises the marginal returns to FM’s communication effort. The model yields

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<sup>2</sup>76.9% of firms use an average of 2.3 employees for translation for 1.5 per day. External translators are highly expensive to hire, charging almost \$100 per day. We discuss this further below.

several testable implications. First, an increase in DM English knowledge increases communication between FM and DM and productivity. Second, the framework clarifies that, even when the market for English language training functions perfectly, the DM under-invests in English and learns a sub-optimal amount of valuable general skills. In particular, if the knowledge acquired from the FM is valuable in the outside job, the DM’s willingness to pay for an additional unit of communication with FM increases.<sup>3</sup>

We test the predictions of the model by conducting two RCTs. The first experiment described in Section IV explores the model’s comparative statics with respect to DM’s English knowledge. Specifically, we provide free English training to a random set of 150 DMs employed at 30 FDI firms. The training is a 48-hour course conducted over 12 weeks that are outside of normal working hours. Take-up of the training program is high at 76%, where we define takeup as having attended at least one session, and 45% when we define takeup as having attended 75% of the course (i.e., 18 sessions of two hours out of 24 sessions).<sup>4</sup> Results show that English training translated into higher English proficiency by 0.15 standard deviation among DMs assigned to treatment group.

The model predicts that higher English knowledge translates into more frequent and higher quality communication with FMs and higher managerial performance. We indeed find evidence that the English training increased the frequency and quality of communication with FMs (but not with other DMs). With regards to the prediction on managerial performance, we face an empirical challenge. Since the firms operate across different sectors, it is not possible to standardize DM performances across firms. To assess improvements in management performance, we develop and implement exercises that simulate managerial tasks in a bilingual context (e.g., see [Macchiavello et al. \(2015a\)](#)) to assess differences between treatment and control managers.<sup>5</sup> We find that Treated DMs perform better: their teams take less time to perform the task without committing more mistakes. Treated DMs also spend more time asking questions to the acting FMs, consistently with the model predictions. We rule out concerns that the treatment itself changes effort in the simulation exercise by running placebo exercises. Taken together, these experimental results provide a causal interpretation to the motivating facts and suggests that indeed language barriers reduce performance and potentially hamper DMs’ learning opportunities from FMs.

Section V investigates the conditions under which language barriers generate inefficiently low knowledge transfers. Since it is costly to learn English, the existence of language barriers in itself

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<sup>3</sup>This implication has a subtle difference from standard frameworks of vocational training, which typically are not modeled as transmitted through hierarchies within firms ([Acemoglu and Pischke, 1998](#)). In the standard model, English is a “general skill” and there is thus no incentive for the foreign firm to invest in it. In a Beckerian framework for general training, the worker will have incentive to invest. Under-investment thus typically arises if there are frictions in the training market, e.g., due information asymmetry or to credit constraints ([Acemoglu and Pischke, 1998](#)). In our model, instead, we assume that the market for English training is perfect and highlight how the complementarities between the non-contractible communication and the language skills lead to under-investment in (English) training.

<sup>4</sup>The company that conducted the training is one of the two leading English language training providers in Yangon.

<sup>5</sup>Both sets of enumerators, acting as FMs and as teams of domestic workers, operate under single blind conditions, i.e., without knowing who, among DMs, was eligible for training and who wasn’t. We randomize orders and enumerators across DMs.

doesn't imply an inefficient market outcome. The model clarifies that the existence of an inefficiency critically hinges on (i) knowledge transfers acquired within FDI firms being valuable in the domestic economy and (ii) communication between FMs and DMs being non-contractible. Several pieces of evidence suggest that both conditions are likely met in practice.

In a second experiment, we directly measure the value of knowledge transfers acquired working in FDI firms in the Myanmar labor market (condition (ii)). We run a hypothetical resume rating experiment along the lines of [Kessler et al. \(2019\)](#). We enroll human-resource managers who work at domestic and FDI firms outside the SEZ and ask them to rate resumes of managers that they know to be hypothetical. We find an economically large premium to English knowledge, particularly for those workers with experience in FDI firms. The magnitude of the effect is comparable in size to two additional years of relevant work experience - an attribute consistently rated by HR managers in the sample as the most important factor in hiring decision. We isolate knowledge transfers as the main source of the observed premium as opposed to a potential selection effect in the second part of the rating experiment. This second part takes the form of hypothetical answers to interview questions, for the hypothetical candidates are fluent in English and are currently employed in an FDI firm. We randomly vary whether the DM has had frequent opportunities to interact with FMs or not, and what they had been hired for when they started the job. Results reveal a substantial premium for DMs that interact frequently in relative to those that do not, *regardless* of whether they had originally been selected to interact frequently with FMs or not. Results thus confirm that it is specifically knowledge transfers from FMs - rather than selection - that drive the premium.

Further experimental evidence is consistent with the (inherently harder to test for) assumption of non-contractibility of communication between FMs and DMs (condition (ii)). First, at the endline we ask DMs willingness to pay to spend additional time with FMs. Although the question is hypothetical, DMs that had been randomly assigned to English training in the first experiment report a higher willingness to pay to interact with FMs in their firm and - to a lesser extent - with similar FMs in other firms. This suggests that higher knowledge of English expands the wedge between the amount of communication desired by DMs (which include learning for future jobs) and the amount of communication effectively provided by FMs (who only consider efficiency on the job). We fail to detect any differential effect of the training on the willingness to pay to communicate with other DMs.<sup>6</sup>

This paper relates to different strands of literature. First, we contribute to the literature on FDI firms. On the one hand, a large body of theoretical and empirical work has focused on investigating the normative implications of, and the empirical support for, spillover from FDI firms (see [Harrison and Rodríguez-Clare 2010](#) for a comprehensive summary). Direct evidence of such knowledge spillover - particularly in developing countries - has proven elusive due to both measurement and identification challenges.<sup>7</sup> The literature has focused on spillover through supply-chain linkages

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<sup>6</sup>DMs that received English training also report a higher rate of applications to jobs outside the Zone. We also discuss (unreported) results from an additional experiment aimed at testing whether attendance to English training sections maximized the FM and DM's joint surplus.

<sup>7</sup>With regards to measurement challenges, knowledge transfers are rarely directly observed in standard admin-

(see, e.g., [Aitken and Harrison 1999](#), [Smarzynska Javorcik 2004](#), [Alfaro-Ureña et al. \(2019\)](#)) on estimating FDI wage premia (see, e.g., [Balsvik \(2011\)](#), [Poole \(2013\)](#), [Alfaro-Urena et al. \(2019\)](#)). On the other hand, a parallel literature has modeled communication frictions within multinational firms. For example, building on [Garicano \(2000\)](#), [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 [Gumpert \(2018\)](#), [Caliendo and Rossi-Hansberg \(2012\)](#)). The primary contribution of this paper is to connect these two literatures and take them to the field to overcome both measurement and identification challenges.

The paper is also related to the literature on management practices in developing countries (see, e.g., [Bloom et al. \(2012\)](#) for a review). Two facts from this literature motivate our work. First, the large dispersion in management practices is strongly correlated with firm performance. This fact suggests that good management practices diffuse slowly, probably because they are hard to codify and transmit (see, e.g., [Gibbons and Henderson \(2012\)](#) for a discussion). Second, multinational firms are better managed ([Bloom et al. \(2012\)](#)). These facts suggest that employment of domestic managers in foreign firms can thus be a potent tool to upgrade management practices in developing countries.<sup>8</sup> This paper shows that communication frictions arising from language barriers can dilute such knowledge transmission.<sup>9</sup>

Finally, we relate to a growing literature evaluating consulting (see, [Bloom et al. \(2012\)](#)) and training (see, e.g., [Alfonsi et al. \(2020\)](#)) programs in developing countries. We focus specifically on training of middle-level managers (see, e.g., [Macchiavello et al. \(2015b\)](#)). The focus of our intervention is, however, quite different. We offer training in a generic skills - English – with the aim of identifying communication frictions as a barrier to knowledge transfers.

## II Setting & Motivating Facts

In this section, we first provide some context on Thilawa SEZ and the organizational structure of FDI firms in our sample. We then present three facts on the effect of communication frictions on knowledge transfers within FDI firms that motivate the theoretical model and the experimental analysis in the remaining sections.

### II.A Thilawa SEZ

After several decades of international isolation, Myanmar initiated a series of economic and political reforms in 2010. In the period since, the country has witnessed significant change as economic sanctions have been lifted, import restrictions have been removed and laws intended to

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istrative datasets. With regards to identification, it is difficult to establish causal links between exposure to MNC activity and outcomes of domestic workers and firms.

<sup>8</sup>[Giorcelli \(2019\)](#) shows that management training trips for Italian managers to US firms had positive lasting productivity impact on participating Italian firms.

<sup>9</sup>[Atkin et al. \(2017\)](#) show that technology adoption can also be slowed by communication frictions (arising from incentive problems, rather than language barriers) inside firms.

facilitate foreign investment have been enacted. As a result, Myanmar’s integration with the global economy has been rapid. As per UNCTAD, the average yearly value of FDI inflows in the period 2010 to 2019 has been approximately \$2.6 US billion, up by a factor of more than five compared to \$417 US million in the period 2000-2009. Statistics published by the government’s Directorate of Investments and Company Administration (DICA) in June 2020, indicate that around 80% of the FDI inflows originate from East and South-East Asia.

As a part of the agenda to reduce bureaucratic hurdles and increase foreign investment, the government promoted Special Economic Zones in the country.<sup>10</sup> The process started with the approval of a Special Economic Zone Law in 2014, which set up the regulatory framework for the functioning of SEZs and delineated the pecuniary benefits that firms subject to the law are entitled to. Three major SEZs were identified under this law - Thilawa SEZ, Dawei SEZ and Kyauk Phyu SEZ. In September 2015, the first and currently most developed of these, Thilawa, commenced commercial operation.<sup>11</sup> It was set up in collaboration with the Japan International Cooperation Agency (JICA) and a few private consortia from Myanmar and Japan. Firms operating in Thilawa SEZ, and hence subject to the 2014 SEZ Law, benefit from the proximity to Thilawa port and the country’s main city, Yangon and are entitled to a favorable tax regime.<sup>12</sup>

Currently there are 111 firms approved for investment in the zone. Collectively, these represent just over 2% of the total value of FDI inflows of \$86 US billion in the country till date. 80% of the firms are in the manufacturing sector, predominantly in low to mid-level valued added industries like chemicals, electronics, garment and packaging. The remaining 20% operate in the services sector, primarily in supply-chain assistance for manufacturing firms, in the logistics and distribution industry. In 2016, we conducted a firm-level survey with 30 of the then 46 operational firms. This forms our sample of firms for the subsequent supply-side experiment. Appendix figures B.1 and B.2 compares firms in our sample with the rest of the firms in the SEZ, by industry and country of origin. Consistent with the aggregate FDI inflow data, around 80% of the MNCs at Thilawa originate from East and South-East Asia, although the share of Japanese firms is higher because of JICA’s involvement at the SEZ.

## II.B Motivating Facts

Our surveys, supported by administrative data collected by the Thilawa SEZ Management Committee, reveal the organizational structure of a typical FDI firm in the Zone. Firms follow a three-tiered structure, summarized in Appendix table A.1. At the very top, a few (approximately 3.9

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<sup>10</sup>Following their success in China, Special Economic Zones have become common tools to attract FDI and promote industrialization (see, e.g., [Khandelwal and Teachout \(2016\)](#)). Currently, countries as diverse as Egypt, Cambodia and the Dominican Republic, are in the process of setting up Special Economic Zones.

<sup>11</sup>Dawei SEZ and Kyauk Phyu SEZ are still in the development stage and yet to begin commercial operation.

<sup>12</sup>The tax liability of firms is dependent on whether they operate in the SEZ’s Free Zone (export at least 75% of their production) or the Promotion Zone (serving the domestic market). Businesses operating in the Free Zone (Promotion Zone) receive corporate tax exemptions for the first seven (five) years. While both are exempted from customs duties and other taxes for imported capital goods, Free Zone firms are further exempt from customs duties on material inputs and commercial tax.



on average) senior foreign managers (henceforth FMs) are responsible for implementing the strategic direction for the plant and overseeing, and communicating with, domestic mid-level managers (henceforth, DMs) - the focus of our analysis. Collectively they manage around 38.7 DMs, so the span of control in the sample, i.e., the number of DMs reporting to each FM, is roughly around 10. In turn, DMs collectively manage about 84.9 production workers on average. FMs are paid about five times more than DMs who, in turn, have wages about three times larger than production workers.

Language barriers emerge as a central challenge in the relationship between FMs and DMs. This challenge became apparent during several pilot conversations with managers in the zone. For example:

*Japanese firm, DM:* 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.

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

*Japanese firm, FM:* 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.

Appendix table A.2 provides several more such examples. Based on these early conversations, and to further understand the language barrier, and its implications on efficiency and learning within the firm, we administered a survey to all DMs in our sample of firms in the zone during the period 2017-2019. This survey reveals three key motivating facts.

### **Fact 1: There are severe Language Barriers between FMs and DMs**

Language barriers are due to the lack of a common language between FMs and DMs. The initial interviews reveal that English is the working language between people of different nationalities for the vast majority of firms in the zone. Like in several other industrializing countries, the overall English language ability in Myanmar is low in general. In terms of the quantity of English speakers, the share of English-speaking population is 4.5% compared to 18% in Bangladesh, 27% in Thailand, 39% in Brunei and 64% in the Philippines. Of all the former British colonies for which data is available, it has the lowest English-speaking population share. Adding a dimension of quality, Myanmar ranks 86th in the EF English Proficiency Index, which lies in the category of *Very Low Proficiency*, the lowest of 4, alongside other industrializing countries such as Bangladesh, Cambodia, Sri Lanka and Thailand.<sup>13</sup>

DMs in our sample are, however, not representative of the broader population: they have three times the average years of education and earn four times the minimum wage.<sup>14</sup> DMs selected to work

<sup>13</sup>The Education First (EF) English Proficiency Index attempts to rank countries by the average level of English language skills among adults who have taken the EF test online.

<sup>14</sup>The minimum monthly wage is approximately \$70 in Myanmar and the mean years of schooling is 5 years. Our sample of managers lies at the upper end of the distribution with an average monthly wage of \$328 (approximately MMK 500,000) and 15.2 mean years of schooling.



in FDI firms might have been selected for the job partly because of their language skills. We thus test knowledge of English knowledge among DMs in the zone. We also tested English knowledge among a sample of FMs. Average English ability among DMs is significantly lower than among FMs, most of whom are from the aforementioned countries in the region. The average English grade for DMs is *A2*, while for FMs it is approximately *B1* to *B2*.<sup>15</sup> When further split into the two dimensions we test, Listening and Speaking, much of the FM’s premium over the DM is driven by the Listening component. This comparison is available in Figures 1 and 2. Appendix figure B.3 furthermore confirms that knowledge of FMs mother tongue among DMs (Chinese, Japanese, Korean, depending on the firm) is practically non-existent.

Language barriers are costly and create inefficiencies within the firm. The surveys reveal that 33.8% of time spent in meetings is lost due to language barriers, and comprehension by DMs in meetings with FMs is low (see Appendix figure (B.6)). Average comprehension is approximately 84.0% with an in-person translator present and 62.9% with Google translator.<sup>16</sup> Despite these challenges, 50.0% of the firms in our sample do not hire a translator and only two firms provide a formal language training program. Translators are expensive, with rates in Myanmar ranging from approximately \$14 per day for a full-time translator to \$100 per day for a part-time one. The latter is almost 40% of the median monthly wage for a DM. As a result, many firms use ad hoc arrangements. 76.9% of firms use an average of 2.3 employees for translation for 1.5 hours per day.

## **Fact 2: DMs want to learn management from FMs**

FDI firms are typically more productive, have better technology and are better managed (see Helpman et al. (2004), Bloom et al. (2012)). This is one of the main reasons why governments around the world try hard to attract FDI firms in the hope of generating knowledge transfers from these firms to the rest of the economy. Indeed our survey reveals that precisely the desire to learn management skills drive DMs to work at the SEZ. Over 50% of the managers at the zone cite *Learning new skills* as the primary reason for working at the zone, and when asked in detail about the specific skills acquired, 40% say *Management skills* (see Figure 3).<sup>17</sup>

Higher wages are not reported by DMs as being one of the main benefits of working in the zone. This is consistent with the fact that the distribution of wages for workers at the SEZ in

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<sup>15</sup>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 listening scores were computed based on multiple-choice questions about the 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). We then compared the scores so obtained with the tests results of the language program participants. Edulink, our language provider, conducted placement tests and then slotted participants into CEFR-like levels. CEFR provides more information, including a benchmark for how these grades correspond to actual understanding in practical scenarios like watching a movie, listening as an audience member or in workplace discussions.

<sup>16</sup>Google translate does not offer a direct Myanmar to Japanese translation option

<sup>17</sup>Note that DMs potentially have the opportunity to learn from FMs while domestic production workers much less so. Consistent with this observation, we find that learning Management skills is not one of the main benefits of working in the zone for domestic production workers (see Appendix figure (B.4)).

Appendix figure B.5 closely resembles the distribution of wages outside the zone recorded in the World Bank’s Enterprise Survey 2014. Furthermore, DMs mostly live in Yangon and thus face a round trip commute of approximately 144 minutes on average per day.<sup>18</sup> Despite these challenges managers come to work 5-6 days a week. The lack of higher wages and the heavy commute is consistent with learning from FMs being ranked as the main benefit of working in the zone.<sup>19</sup>

**Fact 3: Language barriers impede knowledge transfers from FMs**

We capture the role of language barriers and the resultant communication friction on knowledge transfers to the DMs, through the following specification across managers,

$$y_i = \alpha + \beta \text{english}_i + X'_i \delta + \epsilon_i \quad (1)$$

Where  $\text{english}_i$  is the standardized z-score of DMs in the English tests, including both speaking and listening components, at baseline.  $y_i$  is the set of outcomes - log wage, involvement (scale 1-4), management score (scale 1-15) (Bloom and Van Reenen (2007)), and  $X'_i$  is the set of controls - demographics, company, position and department. Columns 1-3 in Table 2 shows the results of these regressions. A one standard deviation increase in the English score is predicted to increase a DM’s involvement by 0.12 out of 4, and log wage by 0.15. The increment associated with the management score is small, 0.08, but the average DM management scores are in any case very low. All these results are significant at the 5% level or more.

The model above raises the concern of omitted variable bias: perhaps the positive correlation between language skill and involvement in the firm is driven by the hidden ability of managers. To alleviate this, we asked managers questions about their communication with three different supervisors (or other managers if unavailable): one other Myanmar manager, often their direct boss, and two senior foreign managers, either their direct boss and another foreign manager, or their “most direct foreign boss” and another foreign manager. We are therefore able to control for each manager’s “ability”. We run the following regression,

$$y_{im} = \alpha_i + \beta_1 \text{english}_i + \beta_2 FM_m + \beta_3 (FM_m \times \text{english}_i) + \text{manager}_i + \epsilon_{im} \quad (2)$$

Where  $\text{english}_i$  captures the DM’s English as before, and  $FM_m$  is an indicator which takes value 1 when communication is with a foreign manager, that is, their direct FM or next closest FM. It takes value 0 when communication is with the direct domestic boss, making it effectively the

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<sup>18</sup>Thilawa SEZ is located in a relatively underdeveloped suburb 20 km South-east of Yangon, called Thanlynn. Thanlynn is still in the process of developing road and retail infrastructure, including scaling up the current shuttle bus services to Yangon to ferry manager-level workers to and fro at affordable rates. While access to the zone and facilities around it, have improved significantly since the zone’s conception, it still lags behind Yangon in these dimensions.

<sup>19</sup>We asked HR managers outside the zone to rank the skills associated with candidates with FDI experience in the domestic labor market. We find the over 75% rank *Management skills* as the first option.

leave-out observation. We include manager fixed effects, and naturally we lose the identification of  $\beta_1$ , which is less important as our interest lies in  $\beta_3$ .  $y_{im}$  is the set of outcomes at the pair level: frequency of communication (scale 1-4), share of conversation understood and whether the FM has been important for the DM’s learning (0-1 indicator), as reported by the latter.

Columns 4-6 in Table 2 reports the results for these regressions. The results are very similar across specifications. A one standard deviation increase in the English score is associated with a higher frequency of communication with FMs by a magnitude of 0.15 on a scale of 1-4, greater comprehension in communication with the FM by 10.28% and a greater likelihood of learning from the FM by 0.08 on a scale of 0-1. All results are significant at the 1% level or more. Collectively, this provides sufficient preliminary evidence that higher English language proficiency is associated with greater communication, understanding and learning by the DMs within the firm.

### III Model

Building on these facts, we introduce our model.

**TO BE ADDED**

### IV Testing Comparative Statics

In this section, we describe how we test the predictions of the model regarding the relationship between DM’s English knowledge and his communication with the FMs and productivity by conducting an RCT. The first subsections describe the research design and the plan for causal inference and the last subsections describe the results.

#### IV.A Research design

In 2018, we recruited domestic managers from all Thilawa SEZ firms earning over \$200 per month, which is the income-tax reporting threshold in Myanmar. We identified this threshold as a likely lower bound for holding a management position and interacting directly with the senior foreign management. We conducted an extensive in-person survey in the second half of 2018 and the first few months of 2019, which recorded outcomes along several dimensions - language listening and speaking skills (including languages other than Burmese and English), intensity of communication with foreign management and managerial involvement within the firm. After obtaining the consent of a subset companies, we recruited 298 domestic managers at 30 firms to form the experimental sample.

Within each firm (our stratum), we randomly assigned a little over half of the domestic managers to attend a free English course. In total, 154 DMs were assigned to treatment. We contracted an Australian company, Edulink, to conduct the language training. They were identified as one of the top providers of English training in the market, with classes conducted exclusively by native-English speakers. The price of classes compared to other providers is presented in Appendix Figure

**B.7** We settled on a 48-hour long English language training program, spread over 12 weeks, with two 2-hour long sessions per week.

Independent of our baseline English assessment, Edulink conducted an internal placement test after which the treatment DMs were assigned to a class of the appropriate difficulty level. Due to capacity constraints, all classes could not be administered simultaneously, and were staggered into 9 cohorts spread from January to December 2019.

The class schedule was designed to match the DMs’ expressed preferences in terms of location and time. Classes took place mostly on weekends and sometimes on weeknights, mostly at Edulink’s premises in downtown Yangon but also at a location we rented near the Thilawa SEZ. To keep DMs informed about the class schedule and timings on a regular basis, we routinely sent them reminder messages at the start of a week. The goal was to avoid inattention leading to a lower takeup on the intensive margin<sup>20</sup>.

Between 6 to 8 weeks after the completion of each cohort’s classes<sup>21</sup>, we administered an in-person endline survey along with a practical management simulation. As management knowledge is tacit and hard to codify through written tests, we attempted to capture the DM’s management knowledge through a simulation exercise resembling the firm’s structure and setting to the best of our ability. We describe it further below. Due to suspension of in-person surveys as a result of Covid-19 lock-downs mandated by the Institutional Review Board, we were forced to cut short our management simulation exercise and continued the rest of the endline survey remotely.

In addition to the baseline and endline surveys, DMs from 8 of 9 cohorts were asked to answer a monthly high-frequency survey, which contained a subset of our baseline and endline survey questions, which enables us to increase the precision of our regressions.

## **IV.B Baseline balance**

Table [A.3](#) shows baseline balance between the treatment and control individuals. The table reports the mean value of each variable for the treatment group, the control group and the difference between control and treatment means). 39% of individuals are Males across the sample. The mean age is in the control group is 27.5 years with a tenure of 2.3 years. The mean English score in the control group is 54%. The average monthly salary is above 300 USD, which matches the frame we had set (minimum \$200).

We find no statistically significant differences between treatment and control individuals with two exceptions. Treated individuals are 0.741 years older than control individuals, a difference which is significant at the 5% level but is minor economically. Treated individuals report talking 0.193 less frequently than control individuals, a difference which is significant at the 10% level. However, we can reject that all these variables taken together predict the treatment status.

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<sup>20</sup>We developed this further into a sub-experiment to test for efficiency in the decision to attend the training. See [Section V](#) for further details.

<sup>21</sup>For individuals who were assigned to controls and for non-takers, we established an hypothetical schedule based on the timing of the baseline survey and their English level and administered the endline survey 6 to 8 weeks after completion of the classes they would have been assigned to, if they had taken up the treatment.

The final row of table reports attrition at endline (see the appendix for attrition for intermediary round). 9% of respondents did not take the endline survey, a low non-response rate which is not significantly different between treatment and control groups.

Compliance with assignment to treat is high. No individual assigned to control took the course and 76% of individuals assigned to treatment took the course, where we define takeup as having attended at least one session. Figure B.8 describes the distribution of attendance for individuals who were assigned to treatment. 45% of individuals who were assigned to treatment attended at least 75% of the course (so 18 sessions of two hours out of 24 sessions).

#### IV.C Causal inference

The randomization methodology allows us to directly measure the effect of the language program on outcomes of interest. We implement McKenzie (2012)’s ANCOVA estimation method to maximize precision. For an individual  $i$  in a firm  $f$ , we regress

$$y_i = \alpha_f + \beta treat_i + \gamma y_{i0} + \sigma mode_i + \epsilon_i \quad (3)$$

where  $y_i$  is the average value of the measurements of the variable made after 75% of the training, or 18 sessions out of 24, has been delivered (average of the endline value and the relevant monthly high-frequency survey values when available).  $\alpha_f$  is a strata fixed effect,  $treat$  is the individual-level treatment status,  $y_{i0}$  is the average value of the variable before treatment (average of the baseline value and the monthly high-frequency survey values when available), and  $mode$  is the mode of the endline (in-person or over the phone, post COVID-19). Since not all individuals who were offered the opportunity to enroll in the English course took up that offer, this is an intent-to-treat (ITT) specification.

We also present results from the treatment-on-the-treated specifications (TOT) which scales up the treatment effect to account for the fact that not everyone took up the treatment.

$$y_i = \alpha_f + \beta take_{up}i + \gamma y_{i0} + \sigma mode_i + \epsilon_i \quad (4)$$

where  $take_{up}i$  takes the value 1 if an individual attended at least 75% of the training (18 sessions out of 24 in total) at endline.

Of course, takeup is not random and may be correlated with unobservables that are important for our outcomes of interest, so we instrument  $take_{up}i$  with  $treatment_i$ , a variable that is uncorrelated with the error by construction since it was randomized.

Note that for both equations, the data used on the left-hand side is the data that collected after the 18th session of the individual while the data used to construct the baseline average on the right-hand side is the data collected after the 18th session. For control individuals and individuals who did not take up the treatment, we construct theoretical calendars to match similar individuals who were treated and complied.

We cluster standard errors at the FM level (95 clusters) and report p-values in brackets.

Because our project was developed in partnership with the management committee of the Thilawa SEZ and we intend for the project to serve the entire Zone, we also show the p-values for a larger sample of firms that we would have been able to recruit from had we begun the experiment later. (Recall that we implemented the experiment when 46 firms were operating at the SEZ, while as of 2020, there are 111 firms). We assume that this larger sample has 90 firms with 10 DMs per company, and 52% of DMs in each firm would be to assigned to treatment. The data is simulated as follows: we generate data from the normal distribution centered on 0 and with standard deviation equal to the standard deviation of the variable. Then we add the value of the treatment effect found using the ANCOVA regression to the individuals assigned to treatment. Last, we regress the assignment to treatment on these simulated residuals. We report the average of the p-value found across 6,000 such simulations in curly brackets under the experimental p-value.

#### IV.C.1 English

We first show that the intervention was successful in improving the participant’s English level. We administered a listening and a speaking test at baseline and endline. The listening test score is obtained by summing the correct answers from the test, while the speaking test is the average of the grades given by two single-blind independent English teachers to whom we sent the recordings of the participants, who had to speak for 30 seconds on a prompt.

As shown in the first column of Table 3, being assigned to treatment increases the average (speaking and listening) English test score by 0.15 SD, which is almost significant at the 5% level. The TOT specification shows an effect that is almost twice as large (0.32 SD) and is significant at the 5% level. The effect appears to be slightly larger for speaking: column 3 shows that Treated DMs score 0.19 SD better on the speaking task, than for listening: column 5 shows that Treated DMs score 0.16 SD better on the MCQ. These effect sizes are consistent with the education literature which finds effects of successful interventions on student performance to be between 0.1 to 0.2 standard deviation. For instance see [Glewwe et al. \(2004, 2009\)](#); [Banerjee et al. \(2007\)](#); [Duflo et al. \(2012\)](#); [Angrist et al. \(2002\)](#).

#### IV.C.2 Communication

Although key to our study, communication within the firm is not a standard outcome, so we assess it through a variety of questions in our surveys.

One of the key measures is the frequency of communication with foreign senior managers (FMs), which is asked on a scale from 1 to 4. The first panel in Table 4 shows that being treated increases the reported frequency of communication with a foreign manager by 0.21 , from a baseline of 2.58 (column 1). The TOT coefficient, reported in the second column, is twice as large at 0.42, and both are significant at the 5% level. We ask the same question with respect to a senior domestic manager. The second panel of Table 4 shows that on the contrary, our treatment has no effect on the reported frequency of communication with senior domestic managers.

An alternative measure of interaction with FMs is obtained through questions about the meetings the respondents take part in. A table available upon request shows that treated individuals are more likely to report that at least one FM was present at the last meeting they attended. However, this outcome is likely to be heterogeneous by industry, company and baseline hierarchy of the DM. We therefore propose an alternative measure of communication *intensity* which is the standardized score of the mean of the frequency of communication with the FM used above and the dummy for the presence of an FM at the last registered meeting. We construct the same variable for a domestic boss. The first panel of Table 5 shows that treated DMs communicate almost 0.30 SD more with FMs (column 1). The TOT coefficient reported in column 2 is twice as large at 0.61 SD, and both coefficients are significant at the 1% level. The second panel shows that the treatment has no effect on communication intensity with a fellow DM.

### IV.C.3 Management simulation

A key question for our project is whether Treated DMs perform better. Measuring performance is typically difficult and was impossible in our context. First, we could not observe individual DMs at work. Second, since we work with individuals working widely different jobs in widely different industries, it is impossible to standardize performance. We therefore decided to run a management simulation.

The simulation exercise involved a single-blind enumerator with Advanced English proficiency, posing as a foreign manager, and a pair of externally hired single-blind local enumerators or student volunteers with at most Elementary English proficiency, posing as production workers. The *foreign manager* assigns a task to the domestic manager from our sample, randomly varying the language of instruction and the complexity of the task. The domestic manager must understand the instructions, pass it on to the *production workers* and supervise the task, while the *foreign manager* records the performance as measured by time taken, mistakes made and questions asked.

The task simulates the function of packaging items on a firm’s assembly line. The domestic manager must 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 DM is allowed to take notes. The manner of injecting complexity in these three elements is discussed in Appendix table A.8. We randomize the instructions across DMs, the order of tasks for a given DM and the order in which DMs are surveyed. *Production workers* are shuffled after a cohort’s surveys are completed, subject to the availability of replacements.

Table 6 describes the results of the management simulation. Due to suspension of in-person surveys as a result of the lock-down mandated by the government of Myanmar, we were forced to cut short our management simulation exercise. The brackets show the p-values with the effective sample of 153 participants (prior to the COVID-19 restrictions), the bold brackets show the p-values with the hypothetical sample of 268 participants (including participants who took the rest of the endline survey remotely but did not all participate in the simulation due to the COVID-19 restrictions) and the curly brackets show the p-values with a hypothetical sample of 900 DMs.



The first panel shows that the production teams led by Treated DMs took less time to complete the tasks: 0.19 minutes less from a baseline of 1.28 minutes (ITT, column 1). This is confirmed by the TOT specification, with a coefficient of -0.37 minutes (column 2). Both coefficients are significant at the 10% level. Despite this shorter time, the teams led by Treated DMs did not make more mistakes, as illustrated in the second panel: we cannot reject that the ITT and TOT coefficients are zero. The proposed mechanism for this improved performance is the increased time spent by DMs with the “FMs” in the simulations: the third panel shows that Treated DMs spent 0.351 more minutes talking with “FMs”(column 5), from a baseline of 1.89 minutes. This is confirmed by the TOT coefficient in column 7 of 0.675 minutes. Both coefficients are significant at the 10% level. This extra time spent with “FMs” is used to ask questions (panel 4), on average 1 more questions (column 7) according to the ITT coefficient and almost 2 more questions (column 8), from a baseline of 2 questions. Both these coefficients are significant at the 5% level.

A potential issue here is again the Hawthorne effect, which could affect differentially treatment and control individuals if treatment individuals want to “please” researchers and are more focused and determined during the exercise, resulting in a better outcome. We tackle it by looking at the exact same outcomes for another simulation exercise that took place in Burmese. Complete results are available upon requests, and the last panel in Table 6 shows that teams led by treated individuals do not do any better when the instructions are given in Burmese. For both the ITT and the TOT specifications (columns 9 and 10), we cannot reject that the Treatment has a zero effect on the time taken to perform the task in Burmese.

To summarize the results, we find that a 48-hour English course rises DMs’ English level, increases their communication frequency with their FMs but not other DMs, and increases their managerial performance.

## V Are Knowledge Transfers Inefficiently Low?

The results in the previous Section suggest that language barriers are indeed a constraint to communication and to managerial performance in the firms in the Zone. From this observation alone, however, we cannot conclude that knowledge transfers are inefficiently low. While improving English is beneficial, it also has costs. More importantly, with respect to industrial policy, it is not the benefits inside the firm that matter, but the potential externalities of these knowledge transfers both outside the firm and outside the Zone. The model clarifies that inefficiencies arise if two additional conditions are met: (i) knowledge transfers must be valuable in jobs outside the Zone, and (ii) communication between FMs and DMs is non-contractible. This Section investigates the empirical relevance of both conditions.

## V.A The value of Knowledge Transfers in the Domestic Economy

### V.A.1 Research design

To capture the demand for language skills, FDI experience and learning, we designed a resume experiment following [Kessler et al. \(2019\)](#). We recruited a sample of Burmese managers with hiring experience, working primarily at domestic companies outside Thilawa SEZ. They were asked to take an online survey which involved a hypothetical candidate rating exercise. The rating exercise involved two parts, the pairwise rating of i) candidate profiles ii) interview scripts. In the first part, we provided them a common context for each pairwise comparison of candidate profiles - the same university education, degree, area of residence and position applied for, and randomly varied the candidates along primary dimensions of interest - proficiency in English and experience at an FDI firm - and some additional secondary dimensions of interest. This is laid out in Appendix table [A.9](#). We ask the domestic managers to select the better candidate, provide a wage offer for each candidate, a likert-score on the potential knowledge learned in each candidate's previous job and a likert-score on the extent of involvement by each candidate in i) managing people ii) communicating factory targets.

The second exercise is used to capture the mechanisms behind the rater's preferences in the candidate profile rating exercise, and importantly, distinguish the selection of Advanced-English proficiency candidates into FDI firms, from the treatment effect, which is on-the-job learning, enabled by the position. In the interview rating exercise, we extended the common context for each hypothetical pairwise combination to include characteristics from the candidate profile rating exercise. In addition to the common background for each candidate in the first part, we explicitly mention that each candidate is the same age, gender, has the same upper level of English proficiency, experience at an 125-employee sized FDI firm for 3 years. We display two interview scripts in Burmese, randomly varied along the dimensions delineated in Appendix table [A.10](#). We ask the same questions in the second exercise, save that on the extent of involvement, as we already capture an aspect of management involvement in the interview script.

### V.A.2 Summary statistics

Appendix table [A.7](#) summarizes the main characteristics of the HR managers we recruited for this experiment. They were 30.63 years old on average, with an average of 16.39 years of education and 8.15 years of work experience, including 3.44 years of work experience in an FDI firm on average. They worked in large firms, with 30.63 employees on average. We deliberately targeted HR managers with the goal of having the input of people regularly involved in recruitment. We show these characteristics in Panel B of Table [A.7](#). They indeed reported having read more than 400 resumes in the past six months, with the ultimate hiring of 30 people on average. Among them, they recruited 9 people who had experience in FDI firms on average.

### V.A.3 Results

All the raters are shown all the pairs of resumes (and/or interview answers) we created. In both tables, we show the results of the following regressions at the rater  $i$ -resume  $j$  level:

$$y_{ij} = \alpha + \sum_x \beta_x \text{characteristic}_{xj} + \gamma_i + \delta_{j/2} + \epsilon_{ij} \quad (5)$$

where  $y$  is the outcome (choice, wage, or learning), which we regress on the characteristic of the resume,  $\gamma$  are individual fixed effects and  $\delta$  are pairs of resumes fixed effects.

**FDI/English** The first column of Table 7 shows regression results where the outcome of interest is a dummy for whether the resume was picked by the HR managers when presented with two resumes. We control for pair fixed effects and rater fixed effects. Column 1 shows that resumes that showed a high English proficiency were 0.54 more likely to be picked. Resumes that had an elementary English proficiency (similar to the baseline) but experience in an FDI firm were 0.34 more likely to be picked. Resumes that had both a high English proficiency and experience in an FDI firm were almost 0.78 more likely to be picked, making it the most preferred profile. In this regression as in all the ones presented in this table, we control for individual characteristics of the resumes shown to the raters. While the gender and age (only a year of difference compared to the baseline) do not appear to have any effects, the size of the firm and the number of years of experience appear to matter in the expected direction: a resume having experience in a large firm (125 employees as opposed to 25 employees at baseline) is 0.38 more likely to be picked, while a resume with 3 years of experience (as opposed to 1) is 0.55 more likely to be picked. Both these effects large and significant at the 1% level. They confirm the importance of the English and FDI premia we described above.

The second column in Table 7 reports the results of the same regression with regards to the hypothetical wage offer stated by the HR manager. The results all go in the same direction as for the choice. Importantly, the wage premium offered to resumes with a high English proficiency and an experience in an FDI firm, \$0.78, is larger than the sum of the premia for English (\$0.54) and for an FDI experience (\$0.34) which together sum to \$0.88. This suggests that future employers impute a specific additional value to the experience acquired in an FDI firm when the individual speaks English, which we attribute to learning on the job.

We observe the same pattern, even stronger, in column 3 which again shows the same regressions as before but with respect to the question “how much do you think the candidate has learned in their previous job” on a scale from 1 to 10. A candidate with a high English ability (or a candidate with an experience in an FDI firm but a low English ability) is predicted to have learned 0.25 more (0.27) from a baseline of 4.42 out of 10, but a candidate having both is predicted to have learned 0.78 more, which is more than the sum of the two previous coefficients (0.52). Although this question may seem unusual, we are convinced that the HR managers understood what we meant as the largest coefficient in column 3 is the one for 3 years of experience, and is much larger than

all other coefficients at 1.17, which seems reasonable as we would expect a three-year experience to generate a lot more “learning” than a one-year experience on a job.

The last two columns of this table show the results of the same regression with respect to what we call “involvement on the job” on a scale from 1 to 4, which aims at characterizing the level of management of the hypothetical candidates. Column 4 reports results with respect to involvement in hiring/firing / promoting people, while column 5 reports results with respect to communicating factory-level targets to subordinates. These practices are all part of the assessment sheets used by Bloom and Van Reenen (2007). This question may also seem unusual, but we confirm that participants understood it by looking at the coefficient on firm size. They are close to zero for both columns, which can be interpreted as the fact that when similar candidates (but for firm size) are examined, candidates who work for larger firms are assumed to have a smaller span of control, which makes sense. While the interpretations are similar for the candidates with a good English level and experience in a foreign firm, HR managers report that candidates with a low English level who work in a FDI firm are as involved (and if anything less involved) in management than the leave-out candidates, who have a low English level and work in a domestic firm. This is sensible as it suggests that recruiters assume that employees who do not speak English are less likely to take on responsibilities in an FDI firm.

**Interview experiment** We present the results from the second experiment - the “interview” experiment in Table 8, in a similar order for the first three columns. We did not ask about involvement for this sub experiment, as the texts were already describing job content in more detail. As a reminder the candidates were introduced as having an advanced English ability and working in an FDI firm.

The first column shows the results of the regression using as an outcome variable the dummy for whether the candidate was picked by the rater among the two with which they were presented. We always use rater and “interview” pairs fixed effects. Candidates profiles which show a frequent interaction with FMs at their company are 0.50 more likely to be picked. One might be worried that this does not come from the value recruiters see in learning from FMs, as is our interest in the paper, but because interaction with senior management is a sign of the intrinsic quality of the candidates. However, we separate out the selection and treatment effects by proposing candidates profiles that describe being “selected” for a job involving frequent interaction with foreign management, but not actual interaction (“treatment”) for exogenous reasons. These profiles are only 0.06 more likely to be picked, and this coefficient is not significant. We can therefore conclude that 80 to 85% of the effect of the frequent interaction is a “treatment” rather than a “selection” effect and can therefore be interpreted as learning from FMs. We can compare the size of the learning effect to the value attributed by HR managers to other characteristics we described in the interview scripts. HR managers appear to value management skills, described as frequently setting targets (another element of the Bloom and Van Reenen (2007) methodology), as they are 0.00 more likely to pick a candidate displaying this characteristic, and they value it twice as much as

“hard” skills like Microsoft Office use (0.00 ). We interpret this as the idea that good management skills are scarcer in domestic firms in Myanmar than computer skills, which may be more easily taught using online resources for example.

Columns 2 and 3 confirm the results interpreted above, looking at the hypothetical wage offer and learning on the job, respectively.

**Outside Opportunities** The results from the second experiment with HR managers outside the zone confirm that, not just English, but knowledge transfers in FDI firms are general skills valuable in the domestic market. This observation ties back to the results in the first experiment, in which we found that English training improves DM’s engagement and communication inside the firm, and sheds a light on why the companies are not paying for English courses for their employees. At baseline, only a few companies were contributing to their employees’ English training. During the training (which was provided at no cost to the companies or the managers), no firm allowed for their employees to take English lessons during their working hours.

A potential explanation is the fact that both English and management are general skills. Under fairly general conditions, a company should not pay for an employee’s general skills as the employee is likely to leave for a higher paying job somewhere else, or ask for a higher pay to match the outside wage market, making the company’s investment a zero NPV at best. In developing countries where skilled labor is relatively scarce, middle managers quit more regularly than in other contexts. In our sample, 13.97% of the DMs had quit their job at endline, realized on average one year and a half after the baseline.

We do not find that Treated DMs have quit more than DMs in the control group, and Table A.6 shows that treated DMs have not received more promotion or more raises than control DMs. This may be due to the fact that the true value of the English skill investment is only realized after a few months on the job. However, treated DMs report having applied to more jobs. This suggests that treated DMs are conscious of their own new worth on the labor market, while it may take longer for the companies themselves to adjust. This confirms the idea that paying for English courses would be a bad investment from the firms’ point of view. It also confirms the missing market idea from above, whereby DMs may be frustrated that the company (or the FMs in the company) is not investing enough time in their training.

## V.B Non-Contractibility of Communication

### V.B.1 WTP for additional time with FM

We have shown that English training has a positive effect on various measures of communication and learning inside the firms. The latter was reported as valuable by the DMs before the experiment started. Moreover, our survey of English course providers in Yangon has shown that there exists an apparently well organized market. A puzzle is therefore why DMs do not pay for English courses themselves: at baseline, only 26% had ever taken an English course (96% were “potentially willing to take a course”). Of course, this may partly be due to trivial reasons such as time constraints

(family care, commute which is a hurdle for many since the Thilawa SEZ is far from the rest of the city) and credit constraints (the course we provided, admittedly one of the most expensive ones, costs about \$300 / person which represents an average month’s salary). It could also be accounted for by behavioral biases (present bias). Here, we want to focus instead the contractual failure we introduced in our model. The concept is that although DMs are motivated to learn from the FMs and they know that learning English would help them do this, they have no guarantee that the FMs will spend more time with them once they get better. On the contrary, due to a form of income effect, it could be that as communication between the FM and the DM becomes “cheaper”, it decreases, so that the FM can spend more time on other tasks.

In other words, the fact that the communication effort from FMs is non-contractible generates a form of hold-up that, in turn, leads the DM to underinvest in English. While it is inherently difficult to directly test for non-contractibility of communication, the model predicts that - as a result of non-contractibility - an increase in English knowledge increases the wedge between the amount of communication desired by DMs (which include learning valuable in future jobs) and the amount of communication effectively provided by FMs (who only consider efficiency on the job).

To test this prediction, in the endline, we therefore asked DMs how much they would be willing to pay for an hour of “one-on-one” conversation with a senior manager, either a FM or another DM (more senior than themselves). Table 9 shows that treated individuals are willing to pay \$33 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 \$69 more than DMs in the control group to spend time with their FMs.

One could be worried that the difference between WTP for FM and DM across treatment and control can be accounted for by career concerns and not opportunities learning. In the second panel of Table 9 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 \$27 as opposed to \$32), 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 \$19 more than control individuals for this opportunity, suggesting that English skills develop a DM’s valuation for time with an FMs. Last, another concern is that faced with this unusual question, Treated DMs tries to “please” the researchers by answering a number which they thought would make us happy, since this WTP exercise was not incentivized. We believe this is alleviated by the results in the last panel of Table 9 which shows the WTP for another DM (still a senior manager to the participating DM). Here, the Treated DMs are weakly more willing to pay to spend time with DMs but the difference is much smaller (\$8 for the ITT) and the coefficients are not significant at standard levels.

These numbers are quite large (10% of the average monthly salary) and underline the absence of the market for such opportunities: in reality, DMs cannot pay to spend time one-on-one with FMs. We interpret this as a “missing market” for learning from FMs in FDI firms.

### V.B.2 An Additional Indirect Test for Non-Contractibility

An additional experimental design provides further indirect support to the assumption of non-contractibility of communication inside the firm. We randomly provided additional monetary incentives to DMs to attend the training. At the start of each week we randomly assign the DMs in a given cohort to receive a monetary incentive or not to attend the training for the week. Within those who receive the information about the incentive, we randomly vary the timing of the reminder for the class (the start of the week v/s a day before the class), and who receives the incentive - a DM or his corresponding FM - based on the DM's attendance. The goal of the former randomization is to test for present bias (in which case individuals who are warned earlier should attend less). The goal of the latter randomization is to test for the efficiency of the relationship between the DM and the FM. If the DM and FM have a relationship that allows them to achieve efficiency, the identity of the person receiving the attendance bonus should not matter. In contrast, the impact of the attendance bonus on might differ if attendance does not maximize joint surplus. However, implementation challenges impose caution in interpreting the results in this sub-experiment, since only DMs who had showed up to the training at least once were included.

In one set of treatments we randomly varied whether the DM or the FM received the incentive based on DM's attendance. The idea behind the design is that, if the DM and FM have a relationship that allows them to split the additional surplus from attending the training efficiently, then the identity of the person receiving the attendance bonus should not matter. In contrast, the impact of the attendance bonus might differ if attendance does not maximize joint surplus. The strategy is thus to test whether DMs and FMs can jointly maximize surplus with regard to DM's attendance to the English training. This decision is related to, but arguably easier to contract upon than, future communication effort between the FM and the DM. Failure to detect efficiency in this decision would thus hint at the possibility that communication effort also doesn't maximize surplus. The results (available upon request) are noisy but suggest that the attendance bonus was more effective when paid to the DM rather than the FM. Implementation challenges however impose caution in interpreting the results.

## VI Conclusion

This paper makes three clear claims which support the case for a social planner's intervention to subsidize English knowledge among DMs in FDI firms in industrializing countries, such as Myanmar. First, there is something *special* about Special Economic Zones, or rather, FDI firms more generally. They are hubs of superior management practices and knowledge of the same among DMs, is valued in the domestic labor market. Second, communication *within* the firm is one clear channel for the transmission of knowledge spillover *within*, and conditional on labor mobility, *outside* the firm. Third, language barriers are a first-order impediment to the transmission of these spillovers, and policy can shock language sufficiently such that these barriers are alleviated. In principle, a social planner could subsidize language training for any language, as long as it is the *lingua franca* within



the firm that senior managers are able to communicate in.

We draw inspiration from [Khandelwal and Teachout \(2016\)](#), which articulates the need to consider SEZs as laboratories for industrial policy experimentation. Indeed the gains from FDI, in general, and SEZs, in particular, have come from contexts where zone facilitators and local administration was somewhat adventurous with trying different policies. (think Shenzhen, cite others) We identify subsidizing English knowledge among DMs as one such policy that the Thilawa SEZ Management Committee could adopt which is low cost and easily scalable to other zones in the country, and beyond, depending on its success and applicability.

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## Tables

Table 1: Summary Statistics

	Mean	Sd	N
Panel A: Firms			
Japanese investor	0.4	(0.5)	30
Garment sector	0.2	(0.4)	30
Years in operation	3.7	(0.6)	19
Number of employees per firm	172.5	(245.4)	19
Panel B: Domestic Managers			
Share Male	0.39	(0.5)	298
Age (years)	28.6	(6.8)	281
Education (years)	6.89	(0.5)	298
Tenure (years)	1.34	(1.3)	298
Big 5 score /5	31.5	(4.4)	298
Monthly salary in USD	361.1	(334.2)	273
English score %	47.4	(22.3)	298
Involvement score 1-4	2.26	(0.9)	298
Management score /5	3.06	(0.6)	298
Understand FM %	77.9	(21.0)	290
Talk Freq. FM 1-4	2.45	(0.9)	286
Endline attrition	0.087	(0.3)	298

**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 sample. The data were collected through publicly available data and surveys realized at the firm level in 2017 and 2018. The second panel reports these statistics for variables related to domestic managers in the sample. The data were collected through the labor survey (in-person survey realized mostly during the second semester of 2018 and in the first few months of 2019), the official baseline survey (online survey administered in January 2019) and through the intermediary online surveys administered at a monthly frequency in 2019. We only keep observations before 75% of the treatment was delivered. When several observations of the same variable is available for one person, we take the average. The last row shows attrition for the endline survey.

Table 2: Language Frictions Matter

	Across managers			Within managers		
	Log wage	Invt score	Mngt score	Talk Freq.	Understand %	Learn
	(1)	(2)	(3)	(4)	(5)	(6)
English Z-score	0.151	0.117	0.078	0.000	0.000	0.000
	[0.000]	[0.016]	[0.026]	[.]	[.]	[.]
FM $\times$ Eng. Z-score				0.149	10.282	0.076
				[0.005]	[0.000]	[0.001]
Dem. controls	Yes	Yes	Yes	Yes	Yes	Yes
Department FEs	Yes	Yes	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes
DM FEs	No	No	No	Yes	Yes	Yes
Mean of Dep. Var.	13.02	2.18	3.07	2.60	81.67	0.79
N	351	375	375	1039	1035	1125
R2	0.76	0.52	0.32	0.57	0.67	0.46

**Notes:** Table reports regression results of communication and management variables on the Z-score of the DM's English ability (first three columns), and the interaction of an indicator for whether the manager is an FM, with the Z-score of the DM's English ability (last three columns). In the first three columns, regressions are at the DM level. Column 1 is the log monthly salary. Column 2 is the average of self-reported involvement (on a scale from 1 to 4) on 16 management practices defined following Bloom and Van Reenen (2007). Column 3 is the total score on a MCQ based off the same 16 management practices, normalized to a score out of 5. The last three columns are at the DM-FM pair level (where some "FM" are in fact other DMs - in that case, the "Foreign" indicator is zero). Column 4 is the communication frequency, reported by the DM on a scale from 1 to 4. Column 5 is the share of the conversation reportedly understood by the DM. Column 6 is a dummy for whether the DM reports having learned management practices from the FM. We report the p-values which we computed clustering at the DM level, in brackets.

Table 3: Impact of Treatment on English score

	Mean		Speaking		Listening	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.154	0.320	0.187	0.384	0.155	0.324
	[0.053]	[0.033]	[0.064]	[0.040]	[0.176]	[0.144]
	{0.048}		{0.047}		{0.095}	
Baseline value	Yes	Yes	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	-0.08	-0.08	-0.07	-0.07	-0.10	-0.10
1st st. F-stat		128.22		125.27		124.05
N	268	268	265	265	267	267
R2	0.48	0.48	0.46	0.47	0.30	0.30

**Notes:** Table regresses different measures of English ability on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeover, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeover with treatment. Dependent variable in the first two columns is the Z-score (normalization of actual variable) of total English score. Dependent variable in columns (3) and (4) is the Z-score of the English speaking score. Dependent variable in the last two columns is the Z-score of English listening score. The English scores were obtained during a test realized at baseline 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 baseline and include strata fixed effects. p-values are reported in brackets. They are computed using a cluster at the FM level. p-values for an hypothetical sample of 900 domestic managers, corresponding to all of the DMs in the entire SEZ, are reported in curly brackets.

Table 4: Impact of Treatment on Communication

	Talk Freq. with FM		Talk Freq. with DM	
	(1)	(2)	(3)	(4)
	ITT	TOT	ITT	TOT
Treatment	0.212	0.424	-0.019	-0.038
	[0.028]	[0.014]	[0.827]	[0.814]
	{0.007}		{0.478}	
Baseline value	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	Yes	Yes
Control mean	2.58	2.58	3.11	3.11
1st st. F-stat		116.60		148.75
N	226	226	258	258
R2	0.29	0.28	0.17	0.17

**Notes:** Table regresses measures of communication frequency on indicators for treatment, defined as the assignment to treatment which was randomly assigned within each strata (odd columns), or takeover, which is defined as having attended at least 75% of the course (even columns). The TOT regressions instrument takeover with treatment. Dependent variable in the first two columns is the communication frequency with the FM on a scale from 1 to 4. Dependent variable in the last two columns is the communication frequency with another DM on a scale from 1 to 4. We average the values obtained during intermediary surveys after 75% of the treatment had taken place and at endline. The regressions 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. p-values are reported in brackets. They are computed using a cluster at the FM level. p-values for an hypothetical sample of 900 domestic managers, corresponding to all of the DMs in the entire SEZ, are reported in curly brackets.



Table 5: Impact of Treatment on Communication - Z scores

	Z-score FM		Z-score DM	
	(1)	(2)	(3)	(4)
	ITT	TOT	ITT	TOT
Treatment	0.298 [0.001] {0.002}	0.605 [0.000]	0.028 [0.805] {0.469}	0.058 [0.791]
Baseline value	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	Yes	Yes
Control mean	-0.12	-0.12	-0.01	-0.01
1st st. F-stat		119.91		124.91
N	267	267	274	274
R2	0.46	0.47	0.15	0.15

**Notes:** Table regresses measures of communication frequency 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 the Z-score of the mean of talk frequency with the Foreign Manager on a scale from 1 to 4 and the indicator for the presence of the Foreign Manager at the latest meeting. Dependent variable in the last two columns is the same construction for Domestic Manager. We average the values obtained during intermediary surveys after 75% of the treatment had taken place and at endline. The regressions 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. p-values are reported in brackets. They are computed using a cluster at the FM level. p-values for an hypothetical sample of 900 domestic managers, corresponding to all of the DMs in the entire SEZ, are reported in curly brackets.

Table 6: Impact of Treatment on Management

	Time worker		Mistakes worker		Time FM		Questions FM		Placebo time W	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ITT	TOT	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	-0.014	-0.028
	[0.067]	[0.052]	[0.718]	[0.694]	[0.060]	[0.054]	[0.012]	[0.008]	[0.778]	[0.757]
	<b>[0.198]</b>		<b>[0.459]</b>		<b>[0.104]</b>		<b>[0.020]</b>		<b>[0.466]</b>	
	{0.025}		{0.372}		{0.003}		{0.000}		{0.408}	
Baseline value	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Strata FEs	Yes	Yes	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	0.49	0.49
1st stage F-stat		61.39		61.39		61.39		61.39		61.39
N	153	153	153	153	153	153	153	153	153	153
R2	0.19	0.19	0.14	0.13	0.32	0.32	0.18	0.19	0.29	0.29

**Notes:** 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 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". The last two columns are the time taken by the DM's "production team" to complete the task, when instructions were given in Burmese. All the data was collected at endline, before COVID-19 made us stop these in-person activities. The regressions include strata fixed effects. p-values are reported in brackets. They are computed using a cluster at the FM level. p-value for the full sample we reached for the endline (N=268) but not for the in-person endline are reported in bold. p-values for an hypothetical sample of 900 domestic managers, corresponding to all of the DMs in the entire SEZ, are reported in curly brackets.

Table 7: Resume rating

	(1)	(2)	(3)	(4)	(5)
	Pick 1	Wage offer	Learning	Inv Ppl	Inv Fact
High Eng, Dom	0.536 [0.000]	43.797 [0.000]	0.250 [0.001]	0.207 [0.000]	0.165 [0.004]
Low Eng, FDI	0.341 [0.000]	21.981 [0.000]	0.270 [0.001]	0.007 [0.903]	-0.024 [0.674]
High Eng, FDI	0.782 [0.000]	85.441 [0.000]	0.775 [0.000]	0.371 [0.000]	0.294 [0.000]
Age (=26)	-0.039 [0.156]	4.811 [0.289]	0.040 [0.520]	0.018 [0.679]	0.064 [0.155]
Male	0.041 [0.110]	2.542 [0.553]	-0.059 [0.319]	-0.075 [0.067]	-0.068 [0.104]
Large size (=125)	0.382 [0.000]	37.258 [0.000]	0.435 [0.000]	0.002 [0.967]	0.026 [0.539]
Experience (=3y)	0.554 [0.000]	74.998 [0.000]	1.174 [0.000]	0.629 [0.000]	0.612 [0.000]
Rater FE	Yes	Yes	Yes	Yes	Yes
Pair FE	Yes	Yes	Yes	Yes	Yes
N	2160	2160	2160	1560	1557
r <sup>2</sup>	0.43	0.86	0.78	0.67	0.67

**Notes:** Table regresses different measures of hiring interests on the resume 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 candidate. 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 last two columns are evaluations made by the respondent of how much the candidate was involved in management at their current company, in managing talent (hiring, promoting, firing, column 5) and in setting factory-level targets (column 6). The regressions include fixed effects for respondents and pairs of resumes. p-values are reported in brackets.

Table 8: Interview script rating

	(1) Pick 1	(2) Wage offer	(3) Learning
Frequent	0.496 [0.000]	38.776 [0.000]	0.543 [0.000]
Selection	0.055 [0.146]	1.912 [0.721]	0.100 [0.149]
Frequently set targets	0.793 [0.000]	55.159 [0.000]	0.904 [0.000]
Frequently used Microsoft	0.381 [0.000]	32.632 [0.000]	0.412 [0.000]
Rater FE	Yes	Yes	Yes
Pair FE	Yes	Yes	Yes
N	1188	1188	1188
r <sup>2</sup>	0.50	0.92	0.86

**Notes:** 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. p-values are reported in brackets.

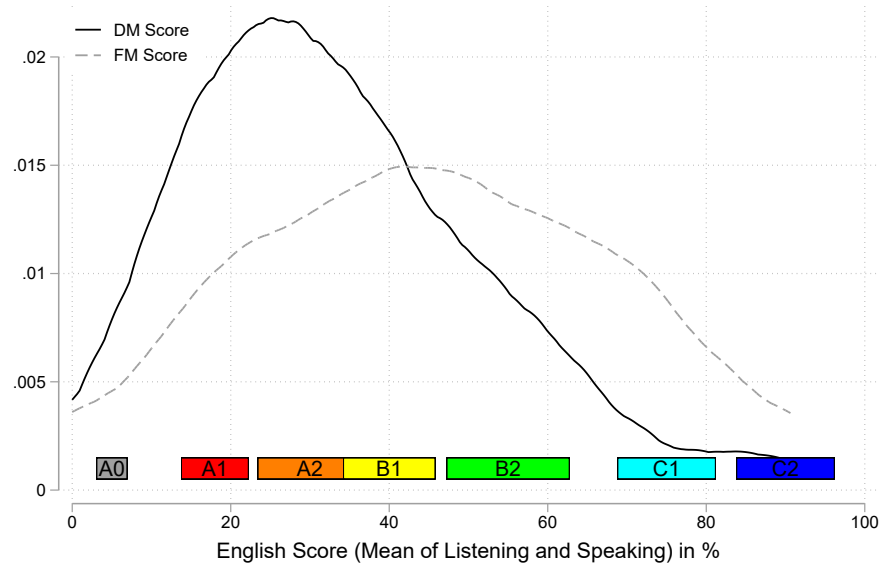
Table 9: Impact of Treatment on WTP for the FM's time

	WTP FM		WTP FM out. firm		WTP 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
	[0.025]	[0.023]	[0.021]	[0.016]	[0.256]	[0.229]
	{0.001}		{0.004}		{0.122}	
Baseline value	No	No	No	No	No	No
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	32.23	49.28	26.89	36.28	24.04	26.99
1st st. F-stat		94.24		123.73		77.63
N	212	212	269	269	220	220
R2	0.16	0.05	0.15	0.08	0.13	0.11

**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 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 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. p-values are reported in brackets. They are computed using a cluster at the FM level. p-values for an hypothetical sample of 900 domestic managers, corresponding to all of the DMs in the entire SEZ, are reported in curly brackets.

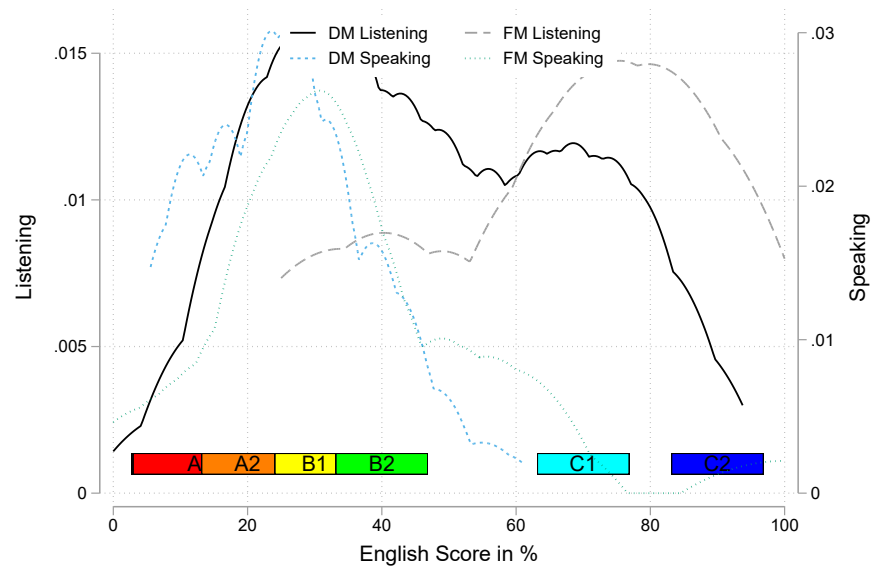
## Figures

Figure 1: English level is low



**Notes:** Figure displays the kernel density of the English scores obtained by DMs and FM, 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). The horizontal tickers represent the correspondence of the scores with the CEFR language levels, based on the placement decision our language provider Edulink made for individuals with these scores.

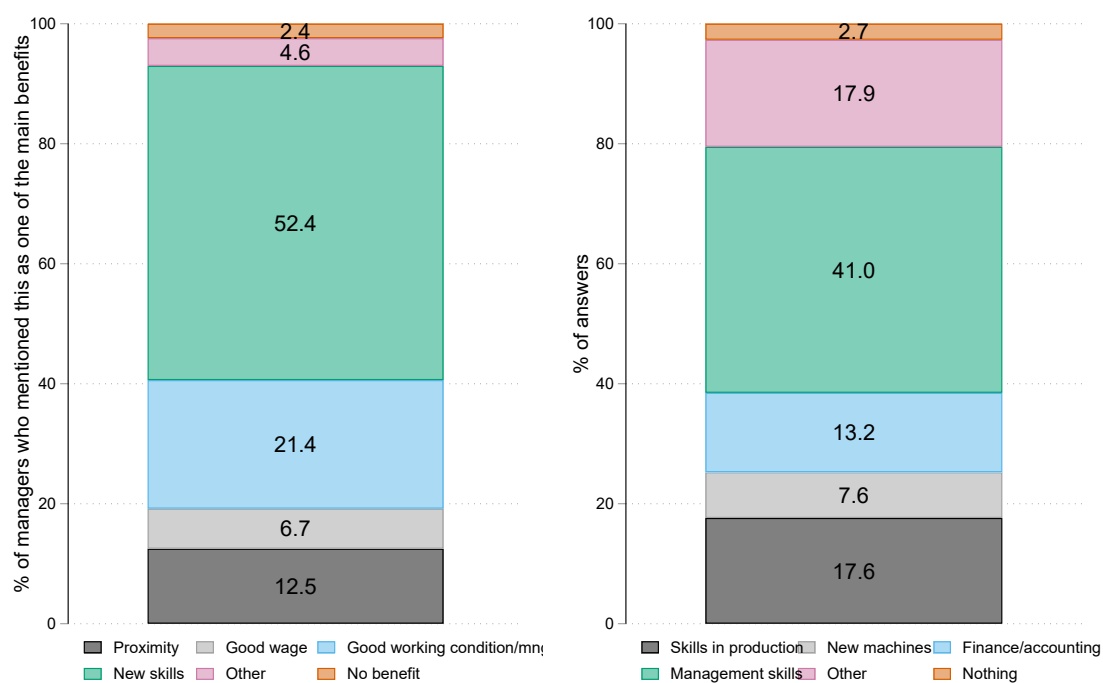
Figure 2: English level is low - Speaking scaled separately



**Notes:** Figure displays the kernel density of the English Listening and speaking scores obtained by DMs and FMs, 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 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). The horizontal tickers represent the correspondence of the scores with the CEFR language levels, based on the placement decision our language provider Edulink made for individuals with these scores.



Figure 3: Main benefits and skills acquired by Managers working at the SEZ



**Notes:** The left-hand side figure displays the share of DMs who reported that each benefit was the main benefit of working at the SEZ. The right-hand side figure shows the share of answers given by DMs who reported that each skill was a skill they were hoping to learn at the SEZ. These answers were collected through paper questionnaires distributed in 2017.

## A. Appendix tables

Table A.1: Organizational structure of a typical FDI firm

	Mean	Std Dev	N firms	N obs
Total Employees	132.2	211.8	36	4758
<b>Foreign managers (FMs)</b>				
Number	3.9	4.4	17	66
Wage (USD)	1538	1083	14	58
English score (%)	66	24	11	20
<b>Domestic managers (DMs)</b>				
Number	38.7	52.3	35	1354
Wage (USD)	329	464	33	1205
English score (%)	45	24	32	402
<b>Production workers</b>				
Number	84.9	159.4	30	2546
Wage (USD)	104.3	88	30	2439

**Notes:** Table reports the mean, SD, number of different companies and number of observations for the number, salary and English score of employees in each hierarchical tier of the FDI companies in the SEZ. The first panel reports these statistics for foreign managers (FMs elsewhere in the paper). The second panel reports these statistics for domestic managers (DMs). The third panel reports these statistics for production workers. The data were collected through administrative data, the labor survey (in-person survey realized mostly during the second semester of 2018 and in the first few months of 2019), and an FM-level survey.

Table A.2: Additional anecdotes from early conversations at the SEZ

Japanese firm, DM: I have to prepare my self [for several hours] before I gave a speech in a meeting with FMs.
Thai firm, DM: 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.
Japanese firm, DM: Once I needed to use English language in the workplace, I often checked my usages with internet
Japanese firm, DM: Some of the suppliers who are from overseas are needed to contact with telecommunication. Conversation is quite difficult for me.
Japanese firm, DM: 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.
Thai firm, DM: I was not comfortable to speak with two FMs and had to think of the sentences firstly before i went to their rooms.
Japanese firm, DM: The most difficult thing for me is writing formal emails.
Korean firm, FM: One problem is that it is difficult to teach Myanmar workers the details of their job due to language barriers

**Notes:** Table reports quotes collected during a firm-level survey with HR managers at the SEZ that took place in 2018.

Table A.3: Baseline balance

	Control			Treatment			Difference	
	mean	sd	N	mean	sd	N	Diff	p
Share Male	0.38	0.49	144	0.39	0.49	154	0.008	0.90
Education (years)	6.87	0.45	144	6.90	0.56	154	0.035	0.61
Age (years)	28.16	6.45	134	28.90	7.06	147	0.741	0.05
Tenure (years)	1.33	1.16	144	1.34	1.38	154	0.006	0.95
Big 5 score /5	31.13	4.25	144	31.77	4.43	154	0.648	0.16
Monthly salary in USD	351.76	306.96	133	369.95	358.96	140	18.189	0.67
English score %	47.35	22.23	144	47.52	22.45	154	0.172	0.96
Involvement score 1-4	2.24	0.82	144	2.27	0.89	154	0.028	0.76
Management score /5	3.02	0.54	144	3.09	0.56	154	0.073	0.23
Understand FM %	77.74	21.19	140	78.02	20.95	150	0.281	0.89
Talk Freq. FM 1-4	2.55	0.88	138	2.36	0.93	148	-0.193	0.08
Endline attrition	0.12	0.32	144	0.06	0.24	154	-0.060	0.15

The F-stat of joint significance for these 11 variables to predict Treatment status is .99

**Notes:** Table reports the mean, SD and number of observation for each of the main descriptive variables, split by groups of assignment to treatment. The data were collected through the labor survey (in-person survey realized mostly during the second semester of 2018 and in the first few months of 2019), the official baseline survey (online survey administered in January 2019) and through the intermediary online surveys administered at a monthly frequency in 2019. We only keep observations before 75% of the treatment was delivered. When several observations of the same variable is available for one person, we take the average. The last two columns show the difference between the mean for the treatment group and the mean for the control group, alongside the p-value of that difference.

Table A.4: Impact of Treatment on English score - PDS Lasso

	Mean		Speaking		Listening	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.154	0.349	0.190	0.385	0.165	0.400
	[0.064]	[0.047]	[0.048]	[0.061]	[0.161]	[0.111]
Method	PDS lasso	PDS lasso	PDS lasso	PDS lasso	PDS lasso	PDS lasso
Control mean	-0.08	-0.08	-0.07	-0.07	-0.10	-0.10
N	268	268	265	265	267	267

**Notes:** Table regresses different 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. Dependent variable in the first two columns is the Z-score (normalization of actual variable) of total English score. Dependent variable in columns (3) and (4) is the Z-score of the English speaking score. Dependent variable in 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 use post double selection LASSO, including all baseline variables and strata fixed effects. p-values are reported in brackets. They are computed using a cluster at the FM level.

Table A.5: Impact of Treatment on Communication - PDS Lasso

	Talk Freq. FM		Talk Freq. DM	
	(1)	(2)	(3)	(4)
	ITT	TOT	ITT	TOT
Treatment	0.220	0.542	-0.070	-0.128
	[0.017]	[0.005]	[0.434]	[0.503]
Method	PDS lasso	PDS lasso	PDS lasso	PDS lasso
Control mean	2.58	2.58	3.11	3.11
N	226	226	258	258

**Notes:** Table regresses measures of communication frequency 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 the communication frequency with the FM on a scale from 1 to 4. Dependent variable in the last two columns is the communication frequency with another DM on a scale from 1 to 4. We average the values obtained during intermediary surveys after 75% of the treatment had taken place and at endline. The regressions use post-double selection LASSO, including all baseline variables and strata fixed effects. p-values are reported in brackets. They are computed using a cluster at the FM level.

Table A.6: Impact of Treatment on Admin outcomes

	Promotion		Log wage		Job applications	
	(1)	(2)	(3)	(4)	(5)	(6)
	ITT	TOT	ITT	TOT	ITT	TOT
Treatment	0.022	0.044	-0.008	-0.017	0.292	0.604
	[0.681]	[0.660]	[0.908]	[0.901]	[0.108]	[0.082]
	{0.433}		{0.469}		{0.045}	
Baseline value	No	No	No	No	No	No
Strata FEs	Yes	Yes	Yes	Yes	Yes	Yes
Control mean	0.56	0.57	5.89	5.88	0.49	0.55
1st st. F-stat		130.85		108.03		129.08
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). p-values are reported in brackets. They are computed using a cluster at the FM level.

Table A.7: Summary Statistics: Resume rating experiment

	Mean	Sd	N
Panel A: Firms			
FDI firm	0.5	(0.5)	54
Number of employees per firm	743.2	(1675.8)	54
Panel B: HR Managers			
Age	30.6	(7.1)	54
Education (years)	16.4	(0.8)	51
Work experience (years)	8.1	(5.8)	54
Experience in FDI (years)	3.4	(4.1)	54
Current company size (empl.)	743.2	(1675.8)	54
Resumes seen in the last 6 months	401.4	(676.4)	54
People recruited in the last 6 months	71.5	(202.6)	54
Recruited people with FDI exp.	32.3	(137.1)	54
Currently in FDI firm	0.5	(0.5)	54

**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 resume experiment sample. The data were collected through an online survey at the beginning of the resume experiment.



Table A.8: Management simulation exercise

Element of Task	Simple Version	Complex Version
Selecting Objects	<i>FM</i> names the 4 objects	<i>FM</i> names a characteristic common to 4 objects. DM must identify the 4 objects and indicate the objects by name to the <i>PWs</i> .
Order	-	Each object has a tag indicating price and weight. Order of placement is determined by the metric {price, weight} in {an increasing, a decreasing} order.
Placement	<i>FM</i> indicates that objects not selected must be disposed {below the table, aside the selected object} and the box must be placed on the {ground, table}	In addition to the two placement options, <i>FM</i> specifies a third placement requirement of objects within the box {vertical, horizontal}
Possible mistakes	1. Incorrect objects 2. Incorrect disposal of rejects 3. Incorrect box placement	1. Incorrect objects 2. Incorrect disposal of rejects 3. Incorrect box placement 4. Incorrect order of arrangement 5. Incorrect placement of shipment items

Table A.9: Resume rating treatment matrix

Criteria	Values
Gender	{Male, Female}
Age	{25, 26}
English level	{Elementary, Advanced}
Previous company ownership	{Myanmar, Japanese}
Previous company size	{25 employees, 125 employees}
Work experience	{1 year, 3 years}

**Notes:** Resume components are listed in the order they appear on hypothetical resumes. All variables were randomized at the pair level with the constraint that for each pair of resumes shown, at least one set of characteristics was different.

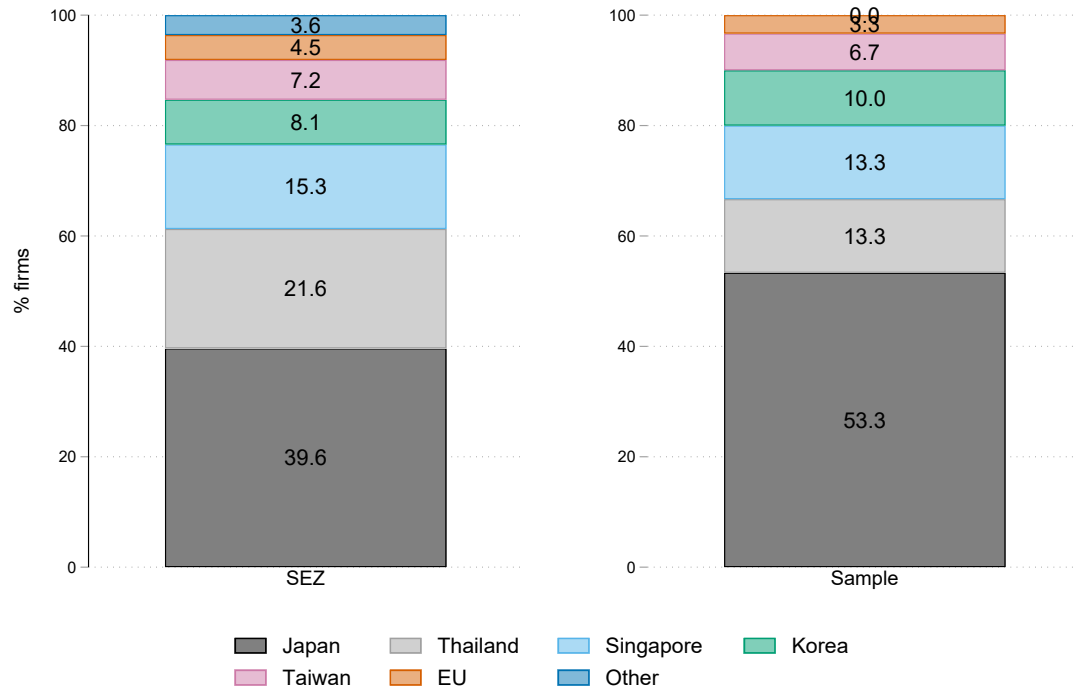
Table A.10: Interview rating treatment matrix

Criteria	Values
Primary treatment arms	
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}
Secondary treatment arms	
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:** Interview components are listed in the order they appear on hypothetical resumes. All variables were randomized at the pair level with the constraint that for each pair of answers shown, at least one set of characteristics was different.

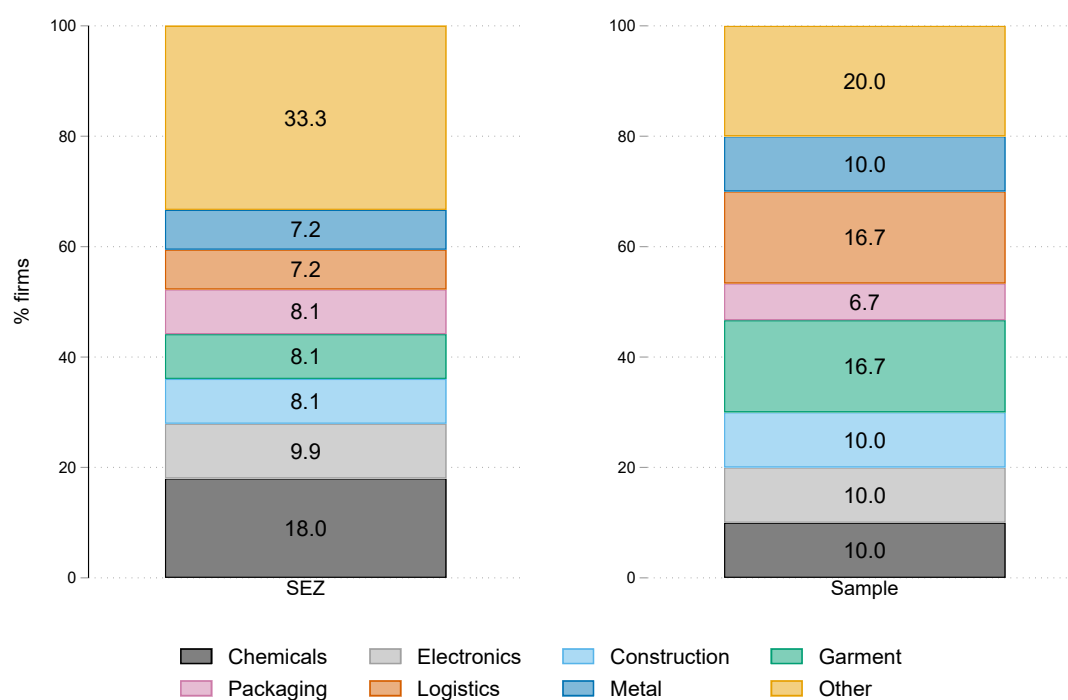
## B. Appendix figures

Figure B.1: SEZ Firms by Country of origin



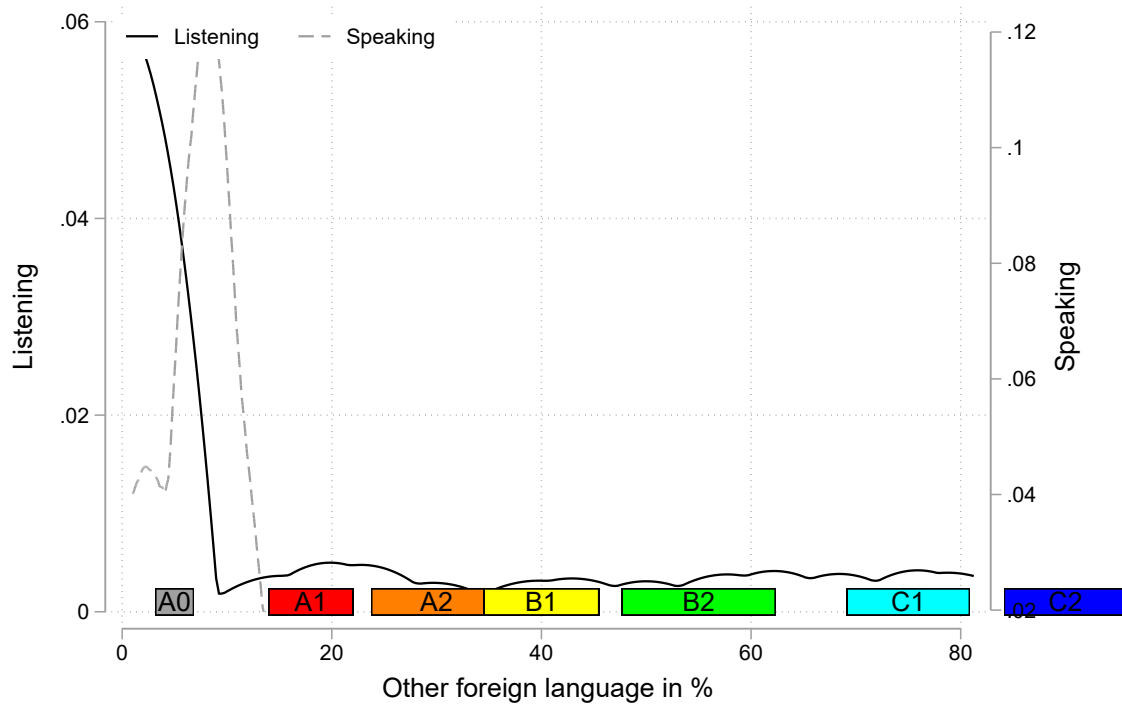
**Notes:** The left-hand side figure displays the share of SEZ firms whose main investor is from each country. The right-hand side figure shows the share of firms in our sample whose main investor is from each country. The data are publicly available on the SEZ website.

Figure B.2: SEZ Firms by Sector



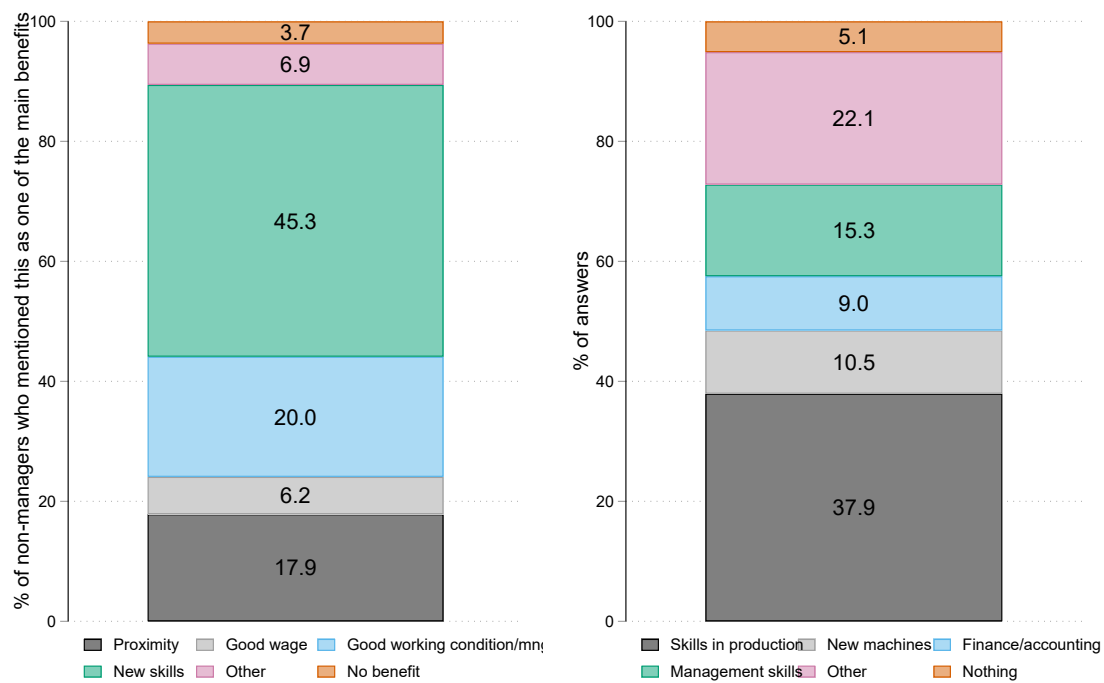
**Notes:** The left-hand side figure displays the share of SEZ firms operating in each sector. The right-hand side figure shows the share of firms in our sample operating in each sector. The data are publicly available on the SEZ website.

Figure B.3: Other language ability in DM Sample



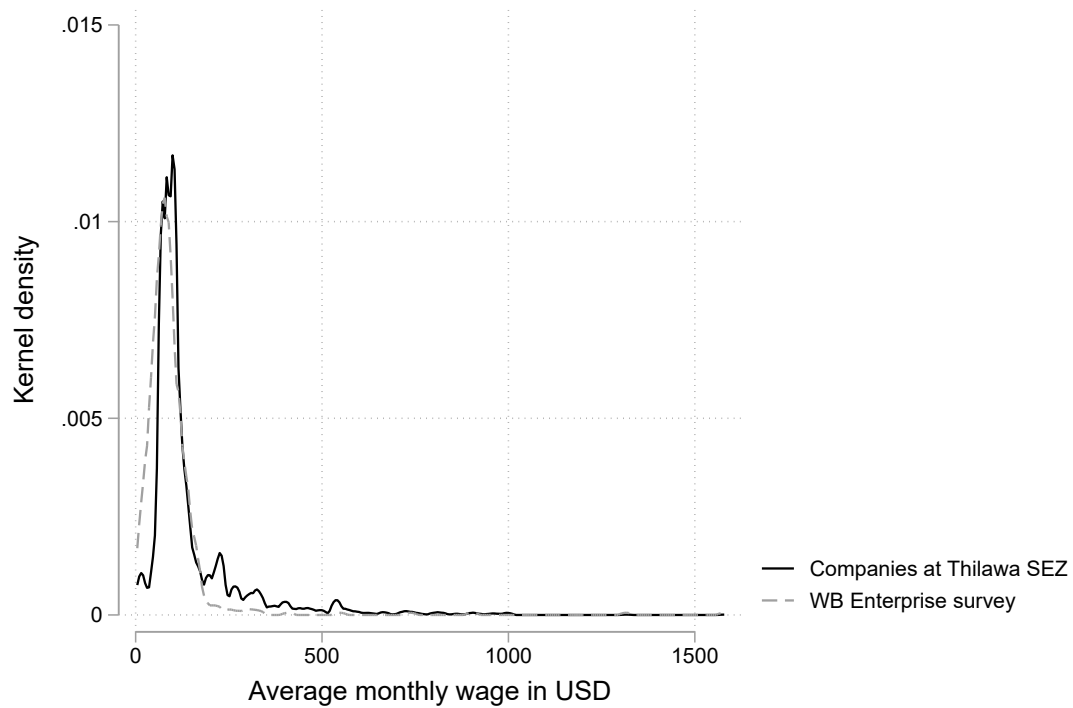
**Notes:** Figure displays the kernel density of the Japanese, Korean or Chinese Listening and speaking scores obtained by DMs, respectively according to the language spoken by FMs in their company. The scores were collected during in-person baseline surveys that took place mostly during the first semester of 2018 and a bit during the first few months of 2019. The listening scores were computed based on Multiple Choice Questions about audio recordings in Japanese, Korean or Chinese designed by the research team and the speaking scores were given by blind external graders. The horizontal tickers represent the correspondence of the scores with the CEFR language levels, based on the ranges we established for English above.

Figure B.4: Main benefits and skills acquired for non-Managers in the SEZ



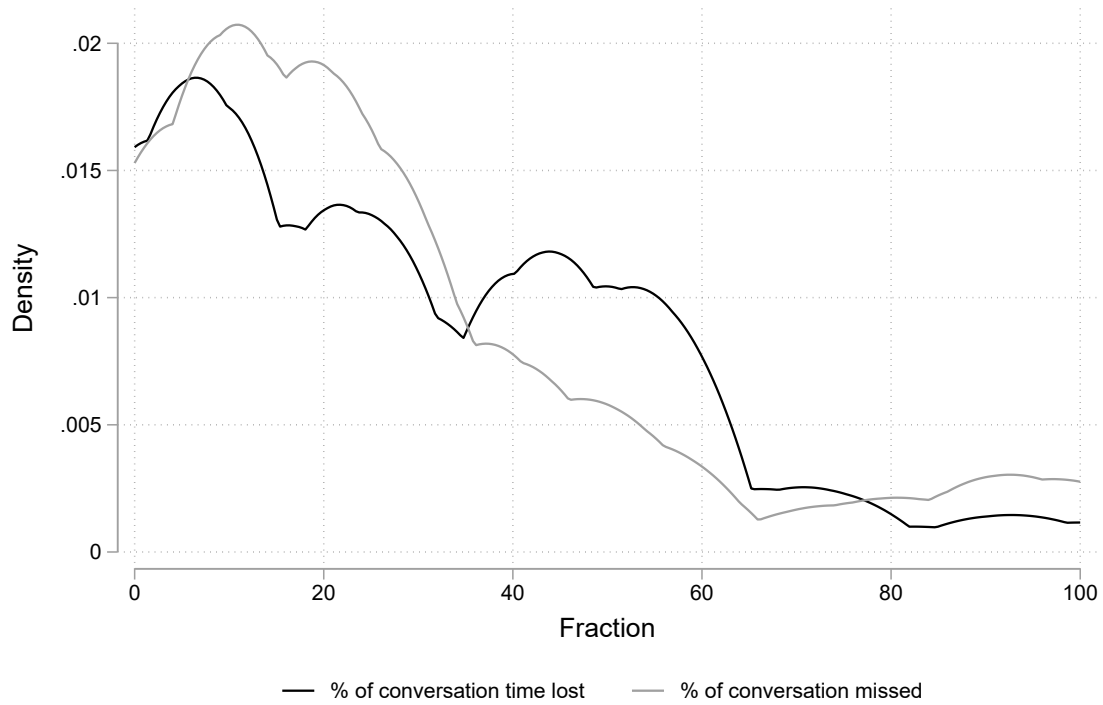
**Notes:** The left-hand side figure displays the share of employees who are not managers who reported that each benefit was the main benefit of working at the SEZ. The right-hand side figure shows the share of answers given by employees who are not managers who reported that each skill was a skill they were hoping to learn at the SEZ. These answers were collected through paper questionnaires distributed in 2017.

Figure B.5: Wage distribution inside and outside the SEZ



**Notes:** The figure displays the distribution of monthly wage in USD of employees of companies located at Thilawa SEZ compared to employees of companies surveyed by the World Bank Enterprise survey, which aims to be representative of Myanmar firms. The data for Thilawa SEZ companies was collected through a paper-based survey distributed to all employees in 2017.

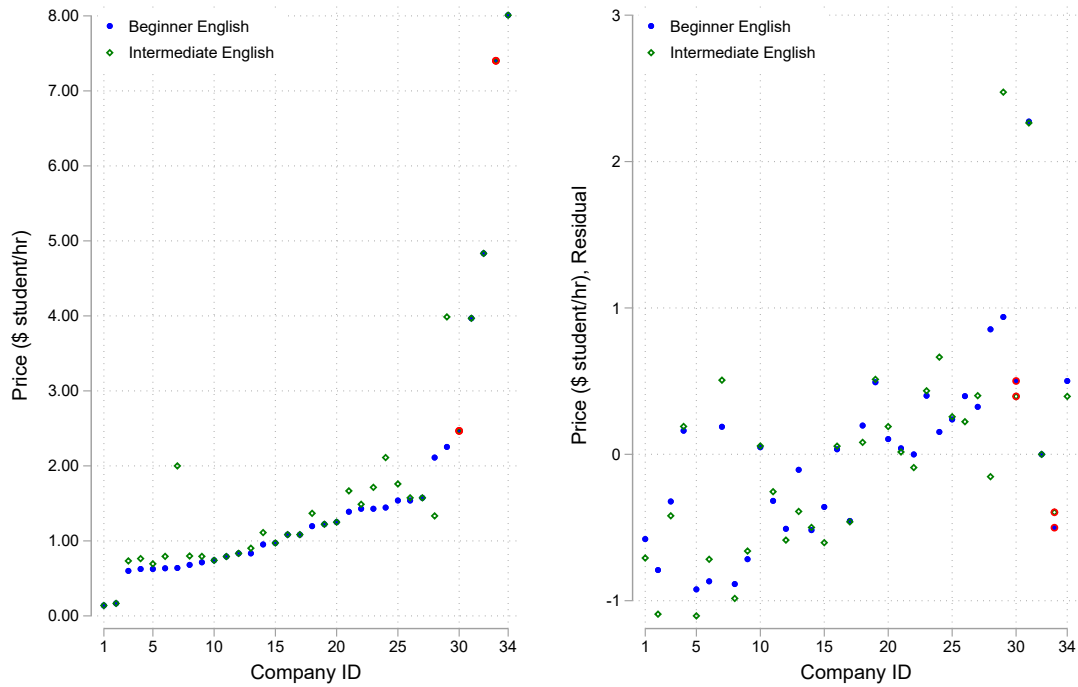
Figure B.6: Conversation frictions



**Notes:** The figure displays the distribution of two measures of language frictions in the Thilawa SEZ. The data were collected during an in-person DM-level survey which took place mostly in the second semester of 2018 and in the first few months of 2019. The questions were asked with respect to each DM's FM (the closest FM, and another FM when available). The first question asked how much time they lost out of 60 minutes spent with the FM, due to translation, misunderstandings, repetitions etc. We convert it to a percentage and average for each DM when there are reports for two FMs. The second question asked what share of the conversation with the FM they think they understood. We take the opposite of the report and average for each DM when there are reports for two FMs.

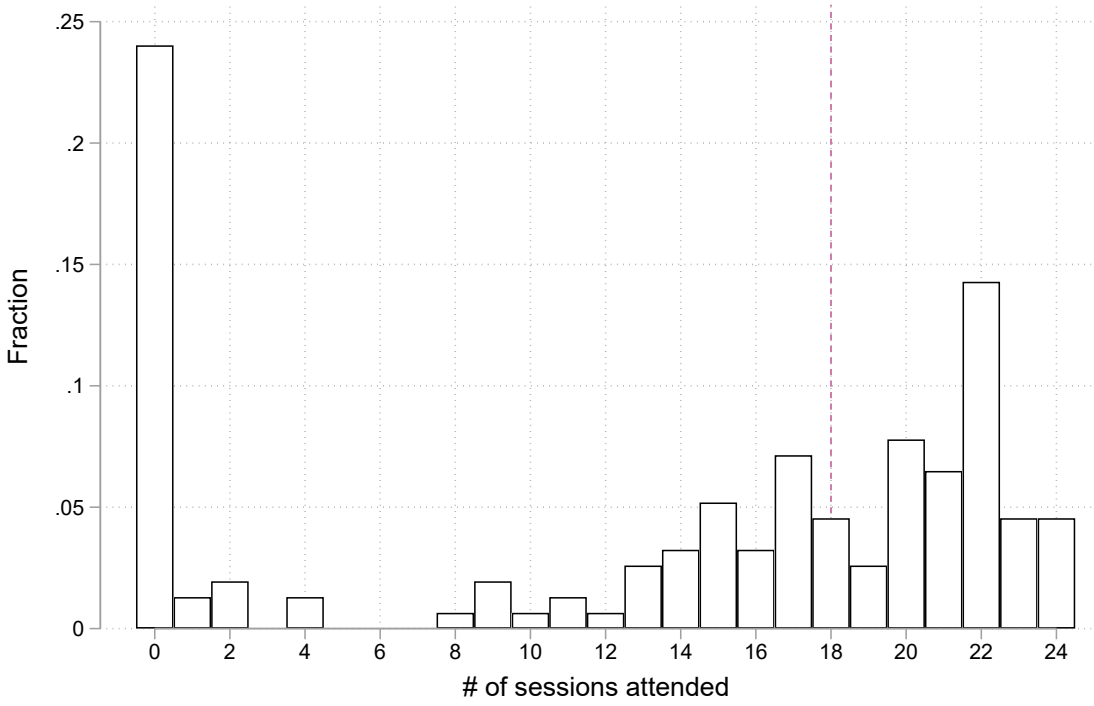


Figure B.7: Prices of English language providers in Yangon



**Notes:** The left-hand side figure displays the price per student per hour of beginner (in blue) and intermediate (in green) English classes at different English language schools in Yangon. The red circles represent the schools that use Native English language speakers. The right-hand side panel displays the residuals of these observations after controlling for location, certifications, native English language teachers, advertising channel and company size. The data are publicly available on each language school's website or flyers.

Figure B.8: Attendance of the treatment by individuals assigned to treatment



**Notes:** The figure represents the distribution of attendance of study participants who were assigned to treatment. 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.