Exporting Sweatshops?
Evidence from Myanmar

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Abstract

There is a long-standing debate over the impact of global trade on workers and firms in developing countries. In this paper I investigate the causal effect of exporting on working conditions and firm performance in Myanmar. This analysis draws on a new survey I conducted on Myanmar manufacturing firms from 2013 to 2015. I use the rapid opening of Myanmar to foreign trade after 2011 alongside identification strategies that exploit product, geographic and industry variations to obtain causal estimates of the impact of trade. I find that exporting has large positive impacts on working conditions in terms of improved fire safety, health-care, union recognition, and wages. My results also indicate that exporting increases firm sales, employment, management practice scores, and the likelihood of receiving a labor audit.

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1 Introduction

While many developed countries grant reduced tariff rates to low-income countries under preferential tariff schemes, there is little empirical evidence that such trade policies benefit workers in developing countries. Furthermore, in the press and trade policy debates, concerns have repeatedly been raised about unsafe and exploitative working conditions in low-income country firms exporting their products to developed countries. Many human rights organizations oppose trade of developing countries with developed countries because of the weakness of government regulations and prevalence of sweatshop conditions in their manufacturing plants[1]. These concerns raise a question that has important policy implications: Does improving access to the markets in high-income countries undermine working conditions in developing countries?

The theoretical implications of exporting on working conditions in standard trade models are unclear. For example, in the Melitz (2003) model, a reduction in trade cost induces an increase in the average size of exporting firms. Increases in employment and sales might improve working conditions if the return to better conditions is increasing in firm size[2]. Yet, trade might worsen conditions if the cost-cutting management technologies adopted for exporting are harsh on workers, such as ratcheting up employees discipline and skimping on fire safety and employee healthcare[3].

In addition to the indirect effects through size and productivity on working conditions, increased globalization may also pressure high-income country firms to raise the labor standards in their supplier firms in low-income countries. In recent years, many human rights activists have pressured individual companies regarding their implementation of labor standards along their supply chain[4] (Harrison and Scorse 2010). For example, many multinational retailers such as Nike require their supplier firms to comply with international labor standards. These retailers typically import products from developing countries firms on the condition that their suppliers pass labor compliance audits.

However, empirical progress in answering the question is challenged by a lack of data and a wide

[1]For example, Global Exchange, a leading human right organization opposing free trade, argues that "The corporations' gain will come at workers' expense, as more and more people can find only jobs that offer no dignity and provide no opportunity. The FTAA (The Free Trade Area of the Americas) will be a boon for the sweatshop economy." (Global Exchange 2015) http://www.globalexchange.org/fairtrade/sweatfree/faq.

[2]For example, the cost of introducing fire safety equipment is likely to be the same for large and small firms, while the benefit would be higher for firms with more employees and larger size of inventory. In addition, in many countries, local regulations on occupational safety apply only for larger firms, imposing higher cost of operating under unsafe conditions to larger firms.

[3]See, for example, the technology adoption models of Yeaple 2005; Verhoogen 2008; Bustos 2011; Caliendo, Rossi-Hansberg 2012.

[4]For instance, as a well-publicized fact, when the Bangladeshi Rana Plaza collapsed in 2013, causing more than one thousand casualties mostly among garment workers, brand-named multinational retailers that imported from the collapsed factories were blamed for the tragedy.

array of endogeneity problems. Understanding the effect of trade on working conditions requires data on conditions in exporting and non-exporting firms, which have been absent in developing countries. Moreover, self-selection of exporters makes it difficult to identify the causal effects. As the previous literature shows, more productive firms are likely to be exporters, and productivity is likely to be correlated with working conditions.

This paper investigates how international trade affects working conditions, firm size and management practices in low-income countries by collecting and analyzing new survey data about Myanmar garment and processed food firms. Myanmar offers a historical experiment in the causal effects of trade liberalization. In the mid 2000s, Myanmar was under US and EU trade sanctions because of concerns about human rights violations by the military government. In addition, the government imposed 10% taxes on earnings from exported goods. These trade barriers significantly limited the export profitability of Myanmar manufacturing firms. In the late 2000s, when there was a gradual increase in the demand for Myanmar apparel products from Japan, which did not have sanctions against Myanmar, some firms started to export to Japan. Then in 2011, the Myanmar government suddenly initiated democratic and economic reforms. A part of the reforms included the reduction and abolishment of its export tax in 2011 and 2012, and this substantially increased the value of apparel exports to Japan. The US and the EU lifted their trade sanctions in late 2012 and 2013 respectively, creating access to new profitable markets for Myanmar exports. Hence, Myanmar thus had a sudden large transition from almost an autarky to an open economy in the years after the mid 2000s.

To investigate the impact of this rapid entry into the global trading system, I collected measures of firm-level working conditions and management practices by carrying out a field survey in Myanmar through three waves (2013-2015) of in-person interviews with plant managers in a panel of 381 garment and 316 processed food firms. My annual measurements of working conditions evaluate whether plant labor practices comply with the international labor standards advocated by the International Labor Organization (ILO) and major private initiatives providing certification and auditing services. Using the standards and codes of conduct published by these institutions as a baseline, I examine fire safety, health management, salaries, and hours of work. Additionally, I examine the presence of trade unions and their interactions with managers, and measures on management practices based on the work by Bloom and Van Reenen (2007). I match the data on working conditions and management practices with the firm characteristics in 2005 from the Survey of Garment Industry in Myanmar (conducted by the Japanese External Trade Organization).

To estimate the causal impact of exporting on worker and firm outcomes, I exploited three

different identification strategies. First, I use the fact that the Japanese preferential tariffs for low-income countries were more strict on knit apparel than woven products. The manufacturing process for making knit and woven apparel from fabric is the same, and according to the data on garment firms in 2005, producers of knit and Woven apparel products indeed resembled one another in terms of productivity and firm sizes. However, when Japanese demand rapidly expanded after 2005 due to the shifting of trade from China after the Liancourt Rocks dispute, this led to a rapid growth in Myanmar exporting of woven apparel but not in that of knit apparel. Therefore, for the first identification strategy, I use production of woven apparel in 2005 as an instrument to predict exporting from 2013-2015. The second instrument uses garment plants proximity to international airports in 2005 when Myanmar was autarkic. The travel time is likely to influence export demand and transaction costs (e.g. Giroud 2013, Giroud and Mueller 2013, Sheard 2014), and indeed I find airpot distance in 2005 is a strong predictor of exporting from 2013 to 2015. Finally, I run a difference in difference from 2013 to 2015 comparing the garment sector, which had an export boom following the trade liberalization after 2011, with the processed food sector, which had no export boom because of international food regulations.

All three identification strategies generate very similar results. First, exporting has large positive impacts on working conditions. In particular, exporting leads to the adoption of better fire safety and health management, improvement in interactions with unions (including allowing unions), and increases in wages. The magnitude of these effects are also large: exporting improves a measure of working conditions (an index evaluating fire safety, health-care, and union interactions) by 130%, which is very similar to the difference between local plants and multinational plants operating in Myanmar. Furthermore, the results indicate that exporting increases sales and employment. Finally, exporting also leads to the adoption management practices that are recommended in developed countries.

One question is what is the mechanism for exporting to improve working conditions? A possible channel is that international buyers require to check the firms' compliance to international labor standards. I collect data on labor audits and indeed find that exporting significantly increases the likelihood of an audit. In addition to this, the increased firm sizes and changes in management can also be the pathways, but even controlling for these variables in my working conditions regression, I still find large effects for exporting suggesting these are not the only channels.

This paper makes three principal contributions to the empirical literature regarding the impact of access to foreign markets on workers and firm performance[5]. First, I provide novel evidence of

[5]Studies undertaken by Bernard and Jensen (1999) and Clerides, Lach, and Tybout (1998) were among the

the impact of exporting on firms in a low-income country in a natural experimental setting. In previous studies using natural experimental settings, the data have been acquired in developed countries (Lelieva and Trefler 2010 in Canada) and middle-income countries (Clerides, Lach and Tybout 1998 in Columbia, Mexico and Morocco; De Locker 2007 in Slovenia; Verhoogen 2008 in Mexico; Bustos 2011, and Brambilla, Lederman, and Porto 2012 in Argentina). In the first study implementing a randomized control trial, Atkin, Khandelwal, and Osman (2014) find that an Egyptian export facilitation program improved product quality and firm profits. My paper is different from theirs by focusing on working conditions, by focusing on large firms (their firms have less than 5 employees while my firms have 300 on average), and finally I focus on a much lower income country[6].

Second, this study provides the first firm-level evidence of the causal effect of trade on working conditions in firms in developing countries. Several studies show indirect or correlational evidence using firm or establishment level data. Verhoogen (2008) provides evidence that when initially productive Mexican manufacturing firms started to export during the peso crises period their accident rates declined. Harrison and Scorse (2010) conclude that anti-sweatshop campaigns can lead to increases in real wages in targeted companies. In addition, some studies examine the working conditions among Cambodian exporting firms that were monitored by the ILO under the Better Factories Cambodia (Polaski (2006); Neak and Robertson (2009); Oka (2010); Ang etal (2012); and Brown, Dehejia, and Robertson (2015)). However, these studies do not provide causal evidence of trade on fire safety, health, and union negotiations, which I investigate in this paper. There are also studies using cross-country panel data to investigate the relationships between exposures to trade and labor conditions (Busse 2004, Edmonds and Pavcnik, 2006; Neumayer and De Soysa 2006; Mosley and Uno 2007; Greenhill, Mosley, and Uno 2009). These cross-country studies mainly examine the associations of trade activities with changes in countries' labor regulations, which is a channel I exclude in this study.

Third, this research is the first to investigate the causal impact of exporting on management practices. It is widely believed that market access leads to improvements in production technology, which in turn prompt improvements in productivity and quality (Verhoogen 2008, Lelieva and Trefler 2010, Bustos 2011, Brambilla, Lederman, and Porto 2012). How firm managers organize the

earliest to examine firm panel data. They did not find evidence that firm performance improves after firms start to export. Since then, many empirical studies have compared firms that have started exporting to those that have not (Aw, Chung, and Roberts (2002), Wagner (2002), Blalock and Gertler (2004), Wagner (2005), Lopez (2005), Biesebroeck (2005), De Locker (2007), Fafchamps, El Hamine and Zeufack (2007), Aw, Roberts, and Xu (2008)).

[6]The estimate of GDP per capita in Myanmar was about one-third of that of Egypt in 2013 (1,107 USD for Myanmar and 3,314 USD for Egypt).

production process is a key part of production technology determining firm performance (Bertrand, Schoar 2003, Bloom, Van Reenen 2007)[7]. Although previous empirical studies have examined the impact of trade on productivity, the composition of skilled workers, and technology upgrading, the impact of trade on managerial input remains largely uninvestigated[8].

The rest of paper is organized as follows. Section 2 introduces the unique data that I collected in Myanmar. In section 3, I develop a model to guide the empirical analysis. Section 4 describes my identification strategy, followed by empirical results in section 5. Then I summarize the results of robustness checks in section 6, and conclude in section 7.

2 Data

2.1 Survey data from 2013-2015

My main data source is garment plant panel data that I collected in three waves of field surveys conducted in 2013, 2014 and 2015. There has not been an enterprise census in Myanmar, therefore, at the beginning of the first wave, in May 2013, I assembled a population list of garment plants in Yangon and Mandalay, the two major industrial regions in Myanmar, by combining information from industry directories, lists of manufacturers provided by industry associations, and firm registration records. I also asked local wholesalers for information about their supplier firms. A research company in Myanmar helped me conduct in-person interviews in Burmese with garment plant managers. Between June and August of 2013, we contacted all 238 garment plants in our population list, and we were granted interviews in 176 plants. During the second season, in May 2014, I repeated the population database construction and found 305 plants. Between June to August of 2014, I contacted these plants and were granted 201 interviews. By repeating the same exercise starting in May 2015, I found 351 plants and interviewed 209 plants among them.

The sample for my main analysis is restricted to domestically owned firms started before 2005. A total of 150 such plants were observed at least once during 2013, 2014 and 2015; of these, 111

[7]The effect on direct measures of organizational practices is informative to understand the *real* effect of exporting on firm performance for several reasons. First, as pointed out by Bertrand, Eaton, Jensen and Kortum (2003), the correlation of standard productivity measures and trade performance differs according to market structure. Second, assuming, as Melitz and Ottaviano (2008) do, non-CES preferences, markups can differ as a function of market size, and they can influence estimates of productivity. Third, in a model that allows firms to choose their product mix, as Bernard, Redding and Schott (2011) propose, exporting induces a re-optimization of product varieties, which can change measured firm level productivity (De Loecker 2011).

[8]Some recent studies have shown that export performance is positively associated with production hierarchies (Caliendo, Monte, and Rossi-Hansberg 2012) and with management practices (Bloom, Manova, Van Reene, and Yu 2015)

were observed every year[9]. In all years, I asked about employment, export orientation, owner characteristics, management practices, and workplace conditions at the beginning of the fiscal year (April).

Using the same technique, I also surveyed the processed food and beverage sector. I first constructed a population database of manufactures in the sector, and in 2013 and 2014 I collected the same set of data. Of the 316 processed food and beverage firms surveyed, only one exported its products, presumably because developed countries have stringent imported food security regulations. The processed food and beverage firm sample serves as a control group to check whether one of my instrumental variable (proximity to airports) directly effects performance.

Survey instruments on workplace conditions were constructed to measure the level of compliance with international labor standards. To this end, I referred to labor standards prescribed by the International Labor Organization (ILO) and globally recognized initiatives that provide auditing and certification programs on labor compliance for private companies[10].

The international labor standards of the ILO and the above initiatives typically have eight major areas of labor standards[11]: forced labor, child labor, wage, working hours, discrimination, harassment, freedom of association and health/safety. Given the sensitivity of some of these the topics, I spoke with managers about five areas of compliance: fire safety, health management, freedom of negotiation, salary, and working hours. A consultant who works in the certification industry helped me construct the questionnaire to address the practices that auditors typically check in garment industry.

Regarding *fire safety*, I asked, "What kinds of measures do you have in case of fire?" and "Do you practice fire drills?" In countries with underdeveloped electric infrastructure like Myanmar, unstable electricity sometimes causes factory fires. In the garment sector, where workers come and go on a monthly basis, it is important to practice fire drills and to post visible and readily understandable evacuation maps.

Regarding *health*, I asked the following questions: "Do you have a record of injuries at your plant?" "Do you have a list of hospitals to go to in case of emergency?" "Do you have a private contract with a health clinic?" "Is there a nurse or a doctor at this plant?" Sewing for many hours sometimes leads to occupational injuries. For instance, working for more than 10 hours per day

[9] In practice, this is not the set of samples for my main analysis because I further restrict my samples to firms where plant addresses in 2005 are observed. This is for constructing the measure of airport proximity as an instrumental variable. More details are discussed in the section 4.

[10] These include Labor Association (FLA), Business Social Compliance Initiative (BSCI), and Worldwide Responsible Accredited Production (WRAP).

[11] An extensive summary of these standards are documented by Smith and Feldman (2003).

in the same posture can lead to chronic fatigue and cause injuries during sewing and cutting. In response to these concerns, international labor standards recommend easy access to a nurse's office and preparation for emergencies.

Questions on *freedom of negotiation* were asked to measure the ability of workers to negotiate with the firm over working conditions. The freedom to negotiate in Myanmar was required to be less direct. In Myanmar, unionized collective bargaining is very much in an early stage. Only after the government passed the 2011 labor law was collective bargaining by unions allowed, so many people were unfamiliar with the concept of a "union". Therefore, to comprehensively capture the existence of workers' representatives and their interaction with managerial teams, I asked, "Is there a workers' leader appointed by this firm or by workers?" Where a leader was present, I asked how frequently the managers met with the leader on regular basis. In addition, I asked whether the plant has a suggestion box, which could be another potential communication point.

Hours of work is measured by plants' average weekly hours of work including overtime hours of work. Workers in the garment sector typically worked for some scheduled hours (often 8 hours) and a few more hours as overtime. For *salary*, I use monthly salary including overtime payment. To minimize variation caused by the fact that different skill levels are required at different plants, my measure of salary is for an entry-level sewing operator.

For fire safety, health and freedom of negotiation, no consensus on how to quantitatively evaluate these aspects. For my main empirical analysis, I construct scores on a scale from 0 to 1 and average within each dimension (fire safety, health management, and negotiation). The overall working conditions score is the average of the three dimensions in non-cash standards. Appendix Table 1 documents scoring based on survey questions. As shown in Figure 1, the overall working conditions score is distributed with a fat tail and large variation, implying that many of the firms in the sample have few safety and health measures as well as very little negotiation points with workers; however some firms appear to be practicing high labor standards.

Complicating my examination of workplace conditions is the possibility that managers did not answer questions truthfully. To evaluate this possibility, survey teams arranged plant tours after interviews had been concluded. During these tours, they observed and later recorded the presence of marked fire exits, light level, temperature, whether workers work with bare foot, and the presence of piles of fabric on the floor. The observations are correlated with the working conditions scores in the expected directions: fire exits are more likely to be observed in plants with higher fire safety scores; and low right level, high temperature inside the plant, workers working with bare foot, and presence piles of fabric on floor are negatively correlated with health scores and negotiation scores

(Appendix Table 3). In addition, in order to investigate a possibility that managers' response are systematically biased based on firm performance, I tested whether there are correlations between firm performance and the gaps between managers' responses and interview staff's observations. The gap is a sum of (1) the measurement error between the response and the truth and (2) the error between the truth and the observation. If there is a correlation between a performance measure and the first part of the measurement error, it is likely that the gap is correlated with the performance measure. As shown in Appendix Table 4, the gap is not statistically correlated with exporting and employment and the signs of the coefficients are not systematic across the performance measures.

The differences in the managers' responses and the observations are correlated with neither firm performance measures (exporting, employment size, and management scores) nor with my instrumental variables (Appendix Table 4).

Following standards outlined in the literature on management and business practices, I measured management practices using the criteria specified in the World Management Survey (WMS)[12] initiated by Bloom and Van Reenen (2007) and in the US Census Bureau's Management and Organizational Practices Survey (MOPS)[13]. Managers were asked 9 questions about three dimension of work: production monitoring, quality control, and machine maintenance. Some of the questions included were the following: "Do you have boards to show the number of produced pieces, and if so how frequently are they adjusted?" (production monitoring), "Are there records of defects by the types of defects?" (quality control), and "How frequently is machine downtime analyzed?" (machine maintenance). After the interviews, scores are constructed on a scale from 0 to 1[14] and averaged the scores by dimensions to construct management scores for production monitoring, quality control, and machine maintenance. The overall management score is the average of these scores across three dimensions.

In 2014, the WMS was conducted in Myanmar and 50 garment firms in my sample were also interviewed in the WMS. Therefore, I compare my management score and the management score in the WMS among these 50 firms and find that the two scores are highly significantly correlated (see Appendix Table 19). Among the four dimensions of management practices asked in the WMS (operation, monitoring, target, and human management), my overall management score is best predicted by the score on monitoring in the WMS, which makes sense considering questions asked in my survey.

The basic statistics of variables used for the analysis are provided in Table 1.

[12] `http://www.worldmanagementsurvey.com/`.

[13] The survey instruments and documents of MOPS are at `http://www.census.gov/mcd/mops`.

[14] Appendix Table 2 shows the ways of scoring based on original questions.

2.2 Survey data in 2005

The 2005 data on garment firms was obtained from the Survey on Garment Industry in Myanmar (SGIM) conducted by the Institute of Developing Economies of the Japan External Trade Organization (JETRO IDE), which targeted the entire population of Yangon garment firms in 2005. The survey constructed a list of existing garment firms in mid-2005 by combining information from the garment industry association and a local market research company. Surveyors carried out interviews at 142 of the 165 firms found. The survey records detailed information about 2005 sales, assets, working capital, product categories, and managers' characteristics. It also contains detailed information about woven and knit products as well as the plant addresses.

3 Model of working conditions and trade

This section develops a simple model, in which firms determine exporting and workplace safety conditions. In describing the simple model, I show that, under some conditions, access to foreign markets can either improve or worsen safety conditions. I consider a setting with two countries, Home and Foreign. Firms use a single factor of production, labor, and produce under the same production technology. To allow for the cases where trade worsens the Home's working conditions, I assume that firm owners are altruistic and care about worker safety[15]. Running a factory with higher safety standards is more costly for the firm. To introduce the possibility that trade directly affects working conditions through buyers' imposition of labor compliance, the model allows consumers to have preference based on the safety in firms where goods are produced. In this model, the key tradeoff faced by firm managers when determining safety levels upon trade liberalization is that the liberalization provides a greater incentive to cut costs on safety, but operating with better safety can lead to an increase the price in the export market given that the foreign consumer cares about safety (and so is willing to pay more for it).

3.1 Setup of the model

3.1.1 Household preference

The utility of the representative household in country $j(= H, F)$ (H = Home, F = Foreign) takes the CES form: $U_j = \left(z_{ij} \int_{i\in\Omega_j} \left(x_{ji} a_j(s_i)\right)^{\alpha} di\right)^{\frac{1}{\alpha}}$, with $\alpha \in (0, 1)$. Here, z_{ij} is a country-

[15] This is a classical assumption used for explaining firms' investment on corporate social responsibility (Elfenbein, Fisman, and Mcmanus 2012). Without this assumption, in this model, trade liberalization leads to either improvement or no changes of working conditions.

specific demand shifter on firm i's product, x_{ij} is the quantity of product i purchased and s_i is the safety level under which product i is manufactured[16]. Assume that foreign consumer can have a different valuation of safety, represented by functions a_F, while Home household does not value safety, i.e. $a_H = 1$. This assumption reflects the notion that anti-sweatshop activisms and the associated product boycotts are often found in developed country but not in a developing country like Myanmar. Households maximize the utility given the price sets, resulting in demand functions $x_{ij} = z_{ij} R_j (P_j a_j(s_i))^{\sigma-1} p_{ij}^{-\sigma}$, where R_j, P_j are the aggregate revenue and price, respectively.

The households supply labor inelastically and receive wages. I assume that the safety level of the workplace does not enter the utility function of the household in Home. This assumption is reasonable if the household in Home does not have the access to the information from audits, while the household in Foreign does.

If we instead assume workers know the safety and care about it, then according to the theory of compensating differentials (Rosen 1986), in equilibrium all firms should offer each worker a combination of wage and safety that provides the same level of utility. This is a reasonable assumption, however, the prediction is not supported by the empirical results in this study. I will discuss more about this aspect in the result section.

3.1.2 Firms

Both Home and Foreign countries are endowed with L units of labor. There is a single industry in which each firm produces a differentiated product and firms compete in a monopolistic competition setting. There is free entry into the industry. Running a factory with higher safety standards is more costly. To operate with a safety level of s_i, firms incur a marginal cost of production, s_i/φ. For simplicity, φ is constant across firms[17]. Owners are altruistic and have preferences based on workplace safety as represented by a utility function $u_i = \pi_i + g(s_i)$, where π_i is firm profit. Assume that $g' > 0, g'' < 0$ and $s_i \geq 1$.

At time 0, each firm draws z_{ij}^H and z_{ij}^F, exogenous demand shifters in Home and Foreign markets. These are the only sources of heterogeneity across firms in this model. At time 1, firms make their decisions on entries, exports and safety conditions. There are fixed costs associated with entry into each market, represented by f_H and f_F respectively.

[16] This variable is likely to be known to consumers through auditing and certification systems

[17] Assuming firms to be heterogeneous in productivity as in the model of Melitz (2003) or assuming that firms can make investment on technology adoption as in the model of Bustos (2011) does not change the model's main prediction.

3.2 Firms' behavior

I drop notation i for convenience. Let τ be an iceberg tariff cost for goods exported from the Home to the Foreign country. Given φ, s, D (decision to enter the domestic market), E (the export decision) and demand functions ($x_j(p_j) = z_j R_j (P_j a_j(s))^{\sigma-1} p_j^{-\sigma}$), firms in the Home country choose optimal prices

$$\max_{p_H, p_F} \quad D\Big(p_H - \frac{s}{\varphi}\Big)x_H + E\Big(\frac{p_F}{\tau} - \frac{s}{\varphi}\Big)x_F + g(s).$$

The optimal prices for firms in Home and Foreign are $p_H(\varphi) = \dfrac{s}{\alpha\varphi}$ and $p_F(\varphi;\tau) = \dfrac{\tau s}{\alpha\varphi}$. The expected revenue functions in domestic and foreign operations are therefore $r_H(s, z_H) = A_H z_H \varphi^{\sigma-1} s^{1-\sigma}$ and $r_F(s, z_F) = \tau^{-\sigma} A_F z_F (a_F(s)\varphi)^{\sigma-1} s^{1-\sigma}$, where $A_j = (1-\alpha)\alpha^{\sigma-1} R_j P_j^{\sigma-1}$.

In the Home country, a firm owner's decisions on exporting and safety level are characterized by the following maximization problem.

$$\max_{s,E,D} \quad D r_H(s; z_H)\sigma^{-1} + E\ r_F(s; z_F)\sigma^{-1} - D f_d - E f_e + g(s).$$

From this form, we obtain a key model prediction on how changes in z_F affect the choices of safety level s. The predictions are summarized as follows.

1. s is weakly increasing in z_F if and only if $a_F'(s) \geq a_F(s)/s$
2. s is weakly decreasing in z_F if and only if $a_F'(s) \leq a_F(s)/s$

The condition in the first statement ($a_F'(s) \geq a_F(s)/s$) means that the Foreign demand is elastic to the cost devoted to safety. The statement implies that firm improves the safety level upon reduction of trade cost if the Foreign consumer cares enough about the worker safety and compensates for the cost. However, under the condition in the second statement, consumer's care on safety is not enough to compensate for the benefit from cutting cost on worker safety. The increase in z_F positively affects the return on reducing the marginal cost, and therefore without enough compensation by Foreign consumer, this leads to a reduction in s.

4 Identification Strategy

4.1 Instrumental variable strategy using firm characteristics in 2005

For investigating the effect of exporting on working conditions and other related firm performance, I specify the main empirical equation as

$$Y_{it} = \xi_0 + \beta_E Export_{it} + \xi_x X_{it} + \eta_t + u_{it}, \tag{1}$$

where i indexes plants; t indexes the years from 2013 to 2015; Y_{it} is one of the plant performance measures (working conditions, management scores, or firm sizes) in year t; $Export_{it}$ is a dummy variable that takes the value of 1 if the firm exported in year t; X_{it} are a set of firm characteristics included as control variables, and η_t are year fixed effects.

Since $Export_{it}$ is likely to be endogenous in the above equation, I use an instrumental strategy focusing on the garment sector. The model described in the above predicts that a higher foreign demand shifter z_{iF} positively affects exporting decisions. Therefore, for the first stage, I specify the entry in the export market following a linear probability model:

$$Export_{it} = \alpha_0 + \beta_z Z_i + \alpha_x X_{it} + \mu_t + \epsilon_{it} \tag{2}$$

where Z_i is a foreign demand shifter; μ_t are year fixed effects that capture unobserved time effects.

The 2SLS estimate is consistent to β_E given the identification assumptions that $\beta_z \neq 0$ and that Z_i is not correlated with u_{it}. For finding such instruments, I use three features of the Myanmar garment sector: (1) the trade was limited in 2005 for several institutional reasons; (2) Japanese demand increased in the late 2000s and trade costs declined after 2011; and (3) the magnitudes of (2) on individual firms were different by products and plant locations in 2005. Given that my data provides performance measures from 2013-2015, these settings make the initial products and plant locations the potential candidates for instrumental variables for exporting during 2013-2015. I will explain these points in detail in this subsection.

4.1.1 Closed economy and market opening

Myanmar was almost autarky in 2005. The estimate of the share of manufacturing exports in GDP was only 2% in 2005[18]. This is likely to be the results of several institutional factors. Myanmar was under the US import sanction (that prohibited all imports from Myanmar) and the EU's tariff sanction (that excluded Myanmar from the set of low-income countries that receive its preferential tariffs). Furthermore, the Myanmar government until 2011 imposed a 10% tax on all earnings from processing trade, which had been the principal mean of exporting for the manufacturing firms.

The only large economy that did not place any trade sanction on Myanmar before 2011 was Japan, and it continues to grant a preferential tariff (free tariff rate) to Myanmar. Coinciding

[18] Appendix A.2 describes the way of calculation.

roughly with the start of island disputes with China in 2005 and continuing through the late 2000s, Japanese demand shifted from products made in China to those made in Southeast Asia[19]. As shown in Figure 3, where values of apparel export from Myanmar to Japan are plotted over years, the exports of apparel from Myanmar to Japan gradually increased during the late 2000s (52 million USD in 2005 to 180 million USD in 2010)[20].

In 2011, the Myanmar government initiated democratization reforms unexpectedly, and during the next two years many trade barriers were lifted[21]. The process started in October 2010 with the election of Thein Sein, who represented the military party. The international community initially regarded the election as fraudulent, but the new government started a number of political and economic reforms. The government reduced the export tax to 2% in 2011, and it ended the tax in 2012. The result was a large increase in the export of apparel to Japan (in 2011 the value was 340 million USD which was 92% increase from the previous year). In 2011, the apparel exports to Japan accounted for the largest share of the total export (41% of the total export of apparel from Myanmar to the world). The new government initiated political reforms that included the release of political prisoners and meetings with Aung San Suu Kyi, a leader of the opposition party who previously had been placed under house arrest by the military government. These political changes led the US to lift its import ban in November 2012. Moreover, in May 2013, the EU lifted its sanction on GSP. Now most Myanmar products enter the EU countries under preferential tariffs. The total value of Myanmar's apparel exports increased from 900 million USD in 2010 to around 1.56 million USD in 2014[22].

Contrary to the increase in apparel exports, the exports of processed food stayed negligible even after 2011. This is confirmed in the left part of Figure 4, which plots the values of apparel and processed food exports from Myanmar to the world over years. This figure presumably reflects foreign countries' food security policies accompanied by stringent regulations on food imports. As studied by Jongwanich (2009), in developing countries the regulations on food safety standards

[19] Appendix Figure 1 records the increase in the total apparel exports from Southeast Asia to Japan after 2007 and the decline in exports from China to Japan after 2011.

[20] These numbers are still quite small compared to those of neighboring countries. For example, Vietnam, a country with similar population size as Myanmar, exported apparel to Japan 586 million USD in 2005 and 1.16 billion USD in 2010.

[21] The democratization reforms started after 2011 were unexpected. In 2009, the New York Times reports that "Secretary of State Hillary Rodham Clinton, frustrated over the junta's intransigence on human and political rights, ordered the policy review. 'Clearly, the path we have taken in imposing sanctions hasn't influenced the Burmese junta,' she said last month. 'Reaching out and trying to engage them hasn't worked either.' The reforms started with the election of Sein Thein in 2010. Regarding prospect of this election, the same article concludes as follows. The regime has pledged to hold 'multiparty, democratic elections' in 2010 as part of its 'road map to democracy.' The last previous election, in 1990, was a landslide victory for the opposition. The junta, however, refused to recognize the result and has remained in power ever since."

[22] The total export value of apparel and processed food from Myanmar in shown in Figure 4.

impose large constraints on food manufacturer exports. Indeed, in my sample of 595 processed food and beverage plants, only one plant exported its products.

4.1.2 Product variation in 2005

To infer the impacts of this trade opening on local firms, I exploit two pre-determined sources of firm-level variation in 2005 that affected exporting from 2013 to 2015. The first such source of variation is the production of woven apparel products that qualify for Japanese preferential tariffs with fewer constraints.

Since the mid 2000s, Japanese demand increased in woven apparel products (such as shirts and jackets) but not in knit apparel products (such as T-shirts and sweaters). This is evident in Figure 3, which plots the values of the two types of apparel exports from Myanmar to Japan. The difference reflects the rule of origin requirements for the Japanese preferential tariffs (GSP).

Under the preferential tariff regime (GSP), Japan allows a product from a beneficiary country to enter the Japanese market with a free tariff rate if the rule of origin requirements is met. In general, the requirements set the required conversions for each product in beneficiary countries. In the case of knit apparel products (Harmonized System code 61), the products have to be processed in the beneficiary country from textile yarn (HS 50 to 59) to knit fabric (HS 60) and from knit fabric to knit apparel (HS 61). In the case of woven products (HS 62), products are eligible for GSP if there is a conversion in the beneficiary country from woven fabrics (HS 50 to 59) to woven apparel (HS 62)[23]. For this reason, woven garment manufacturers can use low-cost fabric imported from China to export to Japan under GSP, but knit garment manufacturers cannot. This is a large constraint for the knit apparel group because the Myanmar textile industry is significantly underdeveloped[24]. Without GSP, Japanese MFN (Most Favored Nation) tariff rates on apparel range from 9% to 12%.

The manufacturing process from fabric to apparel is technically similar across these products (Figure 2 displays pictures of two factories producing woven and knitted apparel products in Myanmar). Knit and woven apparels are distinguished by the types of fabric that they use, but the sewing technology is the same. The two are distinguished only by the fact that knit fabric stretches more than woven fabric. For this reason, sewing workers need to be trained in either knit or woven

[23] It is unclear why exactly the Japanese government sets the rule of origin. One possible reason is that the rule defines that all the apparel products have to be converted from HS 5 to HS 6 within a country. For woven apparel, this means converting from fabric (HS 50 to 59) to apparel (HS 62); for knit apparel this means converting from textile yarn (HS 50 to 59) to apparel (HS 61).

[24] According to field interviews conducted in 2014, most garment producers, including those that sell domestically, import fabric from China.

manufacturing. This makes switching of products from knit to woven difficult because to do so firms need to retrain workers in addition to obtain knowledge about production of new products types. This creates an analytically useful setting for examining how the setting in 2005 affected the trajectories of exporting and firm outcomes after 2005.

In the main empirical specification, I use a firm-level measure of production of woven apparel before 2005 as an instrumental variable for exporting from 2013-2015. For the reasons described in the above, production of woven apparel before 2005 is likely to have affected whether the firm exported to Japan in the later years[25] In addition, this could have affected exporting to the other countries as well, considering a possibility that the fixed cost to export to an additional country is decreasing in the number of countries that the firm previously exported[26]. The effect is a combination of a demand increase z_{iF} and tariff rates τ.

To construct the measure of woven production before 2005, I combined information from the SGIM data in 2005 and a question in the survey in 2014 asking whether the firm had produced woven products before 2005. For firms observed in the SGIM data, I define an indicator for "woven firm" as a variable that takes the value of 1 if the number of woven products divided by the number of all products exceeds a half. Ten of a total of 20 product categories are classified as woven products in the SGIM data. Under the above definition, 62% of the firms in the SGIM data are categorized as woven firms. For firms not observed in the SGIM data, I use the indicator variable constructed from the survey question in 2014 asking whether the firm had produced mainly woven products before 2005. After the imputation, 56% of the plant-year observations in the main sample are identified as woven firms.

My key identifying assumption for this instrument is that, had it not been for the foreign demand from 2005 to 2013, there would have been no systematic differences in outcomes from 2013 to 2015 by being woven firms or not.

A potential threat to this identification strategy is the possibility that knit and woven garment process is different in terms of optimal management styles or plant sizes. Another concern is that some firms might have expected the potential of Japanese market and started to produce woven products before 2005 to export. To address these concerns about the exclusion restriction on the instrument, I examined the garment firm data in 2005 to test whether observable firm performance was different in the production of woven or knit products. As shown in the results section, there

[25] In terms of the model described in section 3, the increase in Japanese demand in the late 2000s would have increased z_{iF} for all products. However, tariff rates for woven products τ were lower, and therefore the effect of the increase in z_{iF} on the expected export revenue was presumably larger for woven products.

[26] The data supports this hypothesis as described in section 5.2.

are no systematic differences. As the main robustness checks for this instrument, I control for firm characteristics in 2005 and for woven production in 2014 in my main 2SLS specification. These results are discussed in the robustness section (section 6).

4.1.3 Proximity to international airports in 2005

Given that the fundamental exclusion restriction with the earlier instrumental variable (woven production) cannot be directly tested, it is useful to have another instrumental variable that rests on a completely different set of identifying assumptions and to see whether the same results hold. Plant proximity to international airports is another source of pre-determined variation in exposures to trade. The identifying assumptions first requires that proximity to airports affects firms' decision of exporting. The variation is likely to affect trade costs for three reasons. First, foreign buyers visit manufacturing plants when they first decide from which plants to purchase products. These foreign visitors usually are CEOs or sourcing managers of retail companies and typically spend less than 3 days in Yangon. Many of these visitors are unfamiliar with Myanmar, which for many years had limited international trade activity. Supporting this view, during field interviews, some foreign buyers who visited Yangon said that they are most attracted to plants located within one hour of travel time to airports. Although they have ex-ante information about local firms, apparel buyers can easily access online directories[27], which list the names, locations, and phone numbers of garment factories. Moreover, in Myanmar in-person communication through plant visits is important because phone and internet connections are under-developed. In these settings, even an hour of difference in travel time could affect a buyer's decision about which plants to visit and hence which firms will begin exporting.

Second, proximity to an airport is important also because when trading starts buyers usually send technical staff to local plants every season to oversee product design changes. As noted in previous studies of flight distance in the US (Giroud 2013, Giroud and Mueller 2013, Sheard 2014), monitoring by trade partners is easier if the costs to visit through flights are low. The buyer is likely to consider this benefit when choosing a plant in which to place a first order. Third, some garment firms ship products by air rather than by sea, particularly during peak season, when final products are needed on short notice.

The mapping of plants in Yangon (Figure 5) provides graphic evidence that plants far from the airports were less likely to export during the 2013-2015 period. The Yangon International Airport

[27] For example, there are the Yellowpage (`http://www.myanmaryellowpages.biz/`) and the Yangon Directory (`http://www.yangondirectory.com/en/`)

is locates in the middle of the map of Yangon region. As a measure for airport proximity, I use the travel time to the nearest international airports from each plant. For firms in the Yangon region, the nearest airport is the Yangon International Airport; for firms in the Mandalay region, it is the Mandalay International Airport. I use the plant locations in 2005 to measure the proximity to the airports. Information on plant addresses in 2005 is obtained from SGIM (2005). If the firm is not observed in the 2005 data and if the firm did not move plants after 2005, the address in 2005 is defined by the address in the survey years. If the firm is not observed in the 2005 data and if the firm moved plants after 2005, I omit the observation from my baseline analysis sample. The baseline sample for the main analysis consists of domestically owned plants that operated before 2005 and have non-missing information on addresses in 2005. It includes 132 plants (128 firms) observed at least in one of the three survey waves. Among them 90 plants are observed every year. The total number of plant-year observations during 2013-2015 is 314.

Since there is no reliable measure of travel time accounting for traffic congestions in Myanmar, I conducted a traffic survey during May-July 2015. Eight locations in Yangon were selected to cover locations where many garment firms are found (for the locations in a map see Appendix Figure 3). Local taxies were hired to drive to and from the international airport 5 times in total for each location. Appendix Table 5 summarizes the results from the traffic survey. The right measure of travel time about which the buyers might plausibly care should be the maximum time of travel because missing a return flight (on the way back to airport) or rescheduling meetings with plant managers (on the way from airport) is costly. To incorporate this notion, I define travel time in my main specification as an estimate of the upper bound of one-sided 95% confidence upper interval of travel time to airports. Appendix A provides the details of how I construct the estimates based on the traffic survey and from Google Map (2015).

The exclusion restriction for using this airport proximity IV as an instrumental variable requires that the instrument affects firm performance only through its export status, conditional on control variables. For five principal reasons this condition is satisfied by proximity to airports. First, for many years the Myanmar economy has had limited access to foreign trade because of foreign trade sanctions and the domestic export tax. When plants produced for domestic markets, proximity to the international airports gave them no competitive advantage. Second, city congestion in Yangon has increased considerably since the 2011 reforms. The number of cars has increased because the government has deregulated the importing of cars. Without traffic, the travel distance would have had a weaker impact on choices of trade partner. For these reasons, it is unlikely that firms in 2005 chose locations closer to the international airports anticipating its benefit. Third, I control for a

few geographic and plant-specific factors that could potentially be correlated with distance to the airports as well as with firm performance. For instance, airports require large areas of land, and governments often construct them in suburban areas where land is more abundant and relatively cheap compared to city centers. Large plants can be built in the same areas for the same reason. In addition, these areas are also likely to be developed by governments as industrial zones, which generally provide superior road and electricity service. Given that infrastructure conditions and proximity to cities can affect productivity, I control for (1) the location of plants within Yangon's industrial zones, and (2) travel distance to the regions' city center. Appendix Figure 2 shows factories in industrial zones and location of the city hall in Yangon. These geographical control variables are also measured for the plant locations in 2005.

Fourth, through an analysis of garment firm data collected in 2005, I show in the next section that there was no systematic correlation between airport distance and firm performance in 2005 after controlling for industrial zones and city distance. Finally, using the survey data from 2013 to 2015, I find no evidence that proximity to airports is correlated with performance in the processed food industries, which produce goods that are not exported. If the exclusion restriction underlying this second instrument is satisfied, airport distance in these industries should have no effect on firm performance. As shown and discussed in section 5.4.2., there is no statistical correlation between airport proximity and outcome measures.

4.2 Difference in difference by garment and processed food sectors over time

As an alternative to the above IV approaches, I estimate a difference-in-difference specification exploiting the differences in industries' exporting trends from 2013 to 2015. As described in section 4.1.1, the trade sanctions of the US and EU countries were lifted in 2012 and 2013. As a result, the total value of apparel exports to the world increased sharply from 2012 to 2014 as shown in the right part of Figure 3. This is mostly due to the increases in exports to EU countries and to the US and the trend of exports to Japan stayed relatively flat. On the other hand, as shown the left part of Figure 4, the exports of processed food stayed negligible even after 2011, presumably due to stringent food security policies in developed countries. Therefore, using the food sector as a control group, I evaluate the impacts of the increases in exporting to the US and EU countries.

Specifically, I estimate the following difference-in-difference specification:

$$Y_{it} = \beta_g Garment_i \times t + \theta_x X_{it} + \phi_t + \omega_i + \nu_{it}, \tag{3}$$

where t denotes the years from 2013 to 2015; Y_{it} is one of the plant outcome measures (the share of export to EU and the US, working conditions, management scores, or firm sizes, etc.) in year t; $Garment_i$ is an indicator variable for garment sector; ω_i are plant fixed effects; and ϕ_t are year fixed effects. The coefficient on the interaction of $Garment_i$ and year t (i.e. β_g) captures the effect of increases in exporting to the US and EU on outcomes Y_{it} under a parallel trend assumption: the means of Y_{it} for garment and food plants follow the same trend in absence of the increase in exporting to the US and EU from 2013 to 2015.

5 Empirical Results

5.1 Balancing test in 2005

Before proceeding to the main results, I check whether there are any systematic correlations between initial firm performance and my instrumental variables. The goal of this exercise is to address concerns about the exclusion restriction, an identifying assumption that instruments do not have direct effects on firm performance. In this specific setting of the Myanmar garment sector, the instruments should not be related with firm performance variables in 2005 if the exclusion restriction is valid.

While 2005 data do not share the same measures of working conditions and management as my survey data, I observe basic firm performance variables: productivity, firm size, wage, labor share (the labor cost share in value added), managers' tenure, and the fraction of highly educated workers. Notably, many of these variables are positively correlated with the measures of working conditions and management in my survey data of non-exporting garment firms from 2013 to 2015 (the results are reported in Appendix Table 7). Hence, if woven production and working conditions are correlated in absence of trade, I expect to see positive correlations between woven production and the above variables in 2005.

Using the 2005 data, Table 2 reports OLS estimates that regress each of the performance measures on woven production (panel A) and airport time (panel B). The performance measures include total factor productivity, log of sales, employment, number of sewing machines, employment growth, capital intensity, wage, manager's years of experience in garment industry, and manager's years of education. TFP is defined as log(value added)- 0.469*log(labor)-0.531*log(capital), where value added is defined as sales less cost of fabric, labor is production hours, and capital is asset value. The factor weights are constructed from the labor cost share in value added and assuming constant return to scale. Capital intensity is defined as log(capital)-log(labor). Wage is the log of

the hourly wage in Myanmar kyat. In panel B, where I examine the balancing by airport proximity, I include two geographical control variables that I later use for the main specification: travel time to city centers and a dummy variable that takes 1 for locating in an industrial zone. For consistency, I restrict the sample to domestically owned firms, although including foreign owned firms does not change the results. The results show that the correlations between the instruments and the above performance variables in 2005 are all not statistically significant.

A shortcoming of this analysis is the small sample size. That said, the directions of signs are not systematic across measures. The sample size of the main specifications of 2SLS are from 98 to 128 observations of firms each year. Still, separating the data by year I observe significant effect of woven production in 2005 on exporting and firm performance in every year. In addition, as a robustness check, I match the 2005 data and my survey data from 2013-2015 (resulting in a panel sample of 48 firms) and control for the 2005 firm characteristics in 2SLS. The results of this exercise are discussed in the robustness check (section 6).

5.2 Determinants of exporting status (first-stage results)

Table 3 shows the results of the OLS estimation of equation (2), where reported standard errors are clustered at the firm level. Column (1) shows the baseline specification for woven production shown, where I only control for year and Yangon and Mandalay region fixed effects. In column (2) for robustness I add control variables describing owner's characteristics that could potentially affect product choice. These include indicators on whether the owner is ethnic Chinese, whether the owner is a university graduate, and a dummy variable that takes the value of 1 if plant is not managed by a member of owner's family (external manager), and firm age. In the baseline specification for airport travel shown in columns (3) and (4), I control for a dummy variable that indicates whether the plant is located in an industrial zone as well as the travel time to city center.

The results show that both woven production and airport distance have the expected effects on exporting in the expected direction: woven production in 2005 has a positive effect on export status from 2013-2015 and plant's distance to airports has a negative effect on exporting. Including all controls, the coefficient of woven production is positive and highly significant (t=4.01), implying that production of woven products before 2005 increases probability of exporting during 2013 and 2015 by 28 percentage points on average. The coefficient of travel time to airports including all controls is negative and significant (t=-2.57). This result suggests that a reduction to bellow one hour of travel time leads to an increase in probability of exporting by 23 percentage points on average. Results including both woven production and airport travel time are shown in the last

two columns. In the full specification in column (8), the coefficients change little from the results of regressing exporting on the individual instrument.

The large and significant effect of woven production on exporting could have proceeded through two channels. In the first channel (described above), firms that produced woven products before 2005 applied for Japanese preferential tariff using Chinese fabric as an input. When Japanese demand increased after 2005, the woven firms that exported to Japan had lower tariffs than knit-producing firms that paid tariffs because they used Chinese fabric. In the second channel, after the knit product firms started exporting to Japan, they accumulated better management and technology, they achieved compliance, and they increased firm size. By the time EU and US import sanctions were lifted, these firms had already paid fixed costs on investment, and they were more likely to export to Western countries. To investigate these channels, I ran OLS regressions using exports to Japan and exports to EU countries or the US. The results show that woven production has positive and significant coefficients in both, although in the latter the estimated effect is smaller than in the former (results are shown in Appendix table 6). This result suggests that the exporting process can be path dependent. Nonetheless, the result raises concerns about the exclusion restriction in the main specification, wherein exporting is measured only during 2013-2015. I address this concern in section 5.3.3.

5.3 Impact of exporting using woven production instrument (2SLS)

As shown in the above, woven production instrument has higher statistical power to predict exporting compared to the airport proximity instrument. Therefore, I first show the 2SLS estimates of equation (1) using the woven production instrument in this subsection.

Table 4 reports the results of the estimates in the second stage. The control variables are the same as those used in the first stage regressions (columns (1) and (2) in Table 3), and standard errors are again clustered at the firm level.

5.3.1 Impact on working conditions

The baseline results on working conditions are presented in panel A of Table 4. Column (1) shows the 2SLS estimate on working conditions score, which is the average of fire safety, health management and union interaction scores. The estimated coefficient is positive (0.33) and significant (standard error = 0.10). The magnitude of the effect is large compared to the means of the scores, implying that exporting improves working conditions by 130%. Adding control variables in column (2) influences the coefficient minimally. Columns (3) to (7) show 2SLS estimates of individual

scores and for wages and hours of work. With the exception of the coefficient for working hours, the estimated coefficients are all positive and significant, and again magnitudes of the effects are large. The effect on working hours is negative, although it is not statistically significant.

The magnitude of the effects is large. This can be seen by comparing the scores in Myanmar firms with those in foreign owned firms operating in Myanmar. Although not included in the main analysis sample, my survey collected data on 45 foreign owned firms in Myanmar (from 2013 to 2015), which are mostly owned by Korea (47%), Japan (26%) and Hong Kong (9%). The averages of working conditions scores for the Myanmar owned and the foreign owned firms are 0.27 (Myanmar) and 0.53 (foreign). These comparisons imply that exporting brings up the levels of working conditions in a low-income country to the standards in firms owned by developed countries.

The results suggest that exporting leads to a positive outcome for workers in every observable aspect. The results are consistent with the literature on large wage dispersions across establishments and across workers in the US and Europe (Groshen 1991a, 1991b; Abowd, Kramarz, and Margolis 1999). As summarized by Groshen (1991b), the dispersions of wages across employees can be explained by at least five models: assortative matching of workers and employees, compensating differentials, models of labor markets with search and mobility costs, efficiency wages, and wage bargaining models. For my case, the assortative matching of workers and employees could partially explain the results. In my data, wage is measured in the survey as the minimum hourly wages (including overtime and other bonus) of sewing operators in the plant. It is possible that exporting leads to production with higher skill and an increase in the minimum level of skill requirement at plant. To explore this channel, I look at the effects on hiring of skilled and unskilled workers. The results show insignificant but negative effect on hiring of workers for both types of skills, but the negative effect is larger for hiring of unskilled workers. The effect on training workers is also found to be negative and insignificant, which possibly implies that exporting firms hire fewer unskilled workers and train them less. Hence, these results are consistent with the explanation that the effect on working conditions reflects differences in the minimum levels of skill at plants.

Regarding the theory of compensating differentials, one concern is that there could be another aspect influencing workers' welfare that is not measured in my survey and affected negatively by firm's exporting. Unfortunately this possibility cannot be tested with my data. Yet, according to field interviews with garment workers, the current situation in the Myanmar garment sector is reasonably described by models with search and mobility costs[28]. Many of the garment workers

[28]Efficiency wage and bargaining models can also explain my results, although I do not have additional evidence

live nearby their workplaces and obtain information about other factories through their friends and relatives. Therefore, the transition to a steady state is likely to be slow. In fact, estimating the same specification of 2SLS for workers' turnover rate shows that workers in exporting firms are more likely to stay at the firms, although the effect is insignificant (for the results see Appendix Table 16).

In the last column, the dependent variable is a dummy variable that indicates whether a plant has ever been subjected to a labor or environmental compliance audit[29]. Only 17% of those sampled indicated that they been audited. The estimated coefficient is positive, significant and large, implying that exporting almost tripled the probability of being audited. This highlights a channel in which trade directly improves working conditions through buyers imposing high standards. On their websites, many multinationals claim that they check whether their supplier firms are "sweatshops" by implementing third party compliance audits. Several initiatives such as BSCI and WRAP also provide standardized sets of auditing, certifying and consulting services for manufacturing firms and the buyers. Typically auditing staff randomly chose a day to visit supplier firms in order to check fire safety equipment and health measures and talk with workers. In many interviews, managers stated that before a firm can initiate a new trading deal with a foreign buyer, compliance audits must be passed.

5.3.2 Impact on firm size and management practices

The model predicts that exporting firms employ more workers and produce more. Columns (1) to (6) in Table 4 panel B shows 2SLS estimates using logs of employment size, number of sewing machine and sales (value added) as dependent variables. The measure on sales was obtained only in the first survey wave in 2013; therefore, the sample sizes for sales and labor productivity are small (100 plants). The coefficients on plant size are large, positive, and significant, suggesting that exporting increases plant size by 4.5 times (= exp(1.7)-1). This is large and reasonable considering the fact that the exporting firms are 4.7 times larger than non-exporting firms in my sample (averages are 593 workers for exporting and 127 workers for non-exporting plants). In columns (7) and (8), the dependent variable is labor productivity as measured by the logarithm of value added per worker. The estimated coefficient on labor productivity is large (suggesting a 146% increase), but imprecisely estimated.

For sales, employment, labor productivity, and wage, I observe these measures both in 2005 and

to support the hypotheses.

[29]This question is asked only in the survey waves in 2014 and 2015. The audits in the questions exclude government audits.

in years after 2013. Therefore, as a robustness check I match the sample over years and estimated a difference in difference specification by woven production in 2005 over years, using 2005 as a baseline year. This resulted in a sample of 62 domestic garment plants in Yangon observed both in 2005 and in a year after 2013. As shown in Appendix Table 18, the estimated coefficients on the interaction of woven production and years indicating after 2013 are positive for all of the four outcome variables, and statistically significant for sales and labor productivity.

Panel C of Table 4 shows the results for management practices and the related variables as dependent variables. Columns (1) and (2) report the 2SLS estimates of the coefficient of exporting on overall management practice score. The estimated coefficients of exporting with control variables are positive (0.21) and significant (at the level of 5%), implying that exporting positively affects management practices scores by 34%. Concerning about a possibility that the effect is mechanically explained by the positive effect of exporting on plant sizes, in columns (3) and (4), I show estimates controlling for plant sizes. The estimated coefficients remain positive and significant. In columns (5)-(7) I show estimates of individual management scores in all three dimensions: production monitoring, quality control, and machine maintenance. All coefficients are positive and those for production monitoring and machine maintenance are statistically significant.

A potential channel explaining the above results is that foreign buyers transferred knowledge or requested to the plant managers to improve management practices. The dependent variable in column (6) takes the value of 1 if the plant receives suggestions from their main buyers on efficiency and quality[30]. The coefficient on exporting is large (0.86) and significant (standard error 0.30).

5.3.3 Controlling for management and firm performance in working conditions specification

In previous subsections I have presented evidence that, several years after 2005, firms induced to export have on average significantly better working conditions, are larger, and adopt better management practices than other firms. A natural question is whether the results on working conditions are explained by the other factors that are also affected by exporting. For example, if having fire equipment reduces the likelihood of losing all inventory due to fire, then the return from investment in fire safety equipment would be increasing in plant size. Working conditions can also be influenced by management practices. For example, one of the survey question in the health management asks, "Do you keep a record of injuries at the plant?" This resembles a question

[30]The main buyer is defined as a buyer who is the most important in terms of plant sales. The variable was recorded during the 2015 survey only and so for this year the number of observations is comparatively small.

about the management practices asking, "Do you keep a record of machine downtime?" As in a typical habit formation model, if a firm manager becomes accustomed to keeping track of machine downtime, she might do the same with workers. To investigate these possibilities, in the equation of working conditions I control for variables that potentially affect working conditions and are influenced by exporting.

In addition to examining the potential pathways, this exercise addresses a concern that the previous estimates might be biased by omitting variables that are affected by past exporting. It is indeed possible that woven firms started to export to Japan from 2005 to 2012, during which time they experienced knowledge accumulation and size increases that could have directly affect working conditions from 2013-2015. Not controlling for these factors could lead to biases in my estimated coefficients.

The results are shown in Table 5. As in the previous subsections, woven production is used as an instrumental variable and the other specification features are the same as in Table 4. As shown in column (2), controlling for current employment size reduces the coefficient by 16% but the coefficient is still positive (0.25) and significant at the 10% level[31]. In my data, working conditions scores are highly positively correlated with management scores (correlation = 0.35 with standard error = 0.04). However, controlling for the overall management score in column (3) reduces the coefficient surprisingly little.

In column (4), I address the possibility that firms that started to export earlier have strengthened their ties to the industry association. For example, such ties could have helped them receive foreign aid programs to implement better safety standards[32]. As a measure of the tie to the association, I constructed a dummy variable that takes one if the owner of the firm is an executive of the Myanmar Garment Manufacturing Association. Earlier exporting could also influence the composition of workers, which could affect organization of trade unions and bargaining power of workers. Columns (5) and (6) include the fraction of college graduate workers in plant (as the measure of non-production workers) and the fraction of foreign national workers. Relaxation of credit constraint through an increase in export earning could also lead to investment on safety equipment. To explore this pathway, column (7) controls for plant's land ownership as a proxy for the level of credit constraint. In the last column, I show the result controlling for the reception

[31]The reduction in the magnitude of the coefficient could be partly due to the weak power of the instrument after including all of the control variables (F statistic for the first-stage = 8.43), which could lead to small sample biases of the IV estimates toward the OLS estimates. As reported in the Appendix 7 and discussed in Appendix A.3, the estimated OLS coefficients for equation (1) are smaller than the estimated 2SLS coefficients reported in Table 4.

[32]The garment industry association plays a key role of a contact with foreign companies and agencies. There are a few programs on training of social compliance and technical assistance run by foreign governments. Such programs are typically announced through the association.

of a labor compliance audit in the past. In all of the above specifications, the coefficients of the exporting dummy remain stable.

5.4 Impact of exporting using airport travel time instrument (2SLS)

This subsection reports results of using airport proximity as an alternative instrumental variable to woven production. All regressions include the geographical control variables used in the first-stage results: travel time to the city centers and the dummy variable for locating in an industrial zone.

5.4.1 Baseline results using airport travel time as an instrument

Table 6 reports the baseline results using airport time as an instrumental variable. Columns (1)-(4) show the results of 2SLS estimates using overall working conditions scores and individual scores as dependent variables. The estimate for the overall working conditions score is positive (0.15) but insignificant (standard error 0.12). The result for fire safety score is positive (0.42) and significant at the 5% level, and the estimates for other individual scores are positive but insignificant. After a Bonferroni correction for testing the significance for the three individual scores, the result for the fire safety score is significant at at the 10% level. Column (5) shows the results of using the indicator of receiving a social audit as the dependent variable. The coefficient is large (0.73), positive and significant at the 5% level. The effect on overall management score is examined in column (6). The estimate is positive (0.31) and significant at the 10% level. Column (7) reports the estimate for the log of employment, which is large and positive but insignificant. Finally, column (8) shows the result for sales (defined as log of value added). The coefficient is positive and large (3.14), and significant at the 1% level. To summarize, the signs of the coefficients are the same as the results using woven production IV, although the results are mostly marginally significant possibly due to low statistical power of the airport time instrument to predict current export status.

5.4.2 Placebo test using processed food samples

Finally, by examining my survey samples in the processed food sector, I investigate concerns about the exclusion restriction, namely that airport distance could be a proxy for unobserved differences in infrastructure or in local labor markets that affect firm performance directly. Processed food firms sell their products almost entirely in the domestic market. This practice reflects foreign countries' food security policies, which in many countries are accompanied by stringent regulations on food imports. If proximity to airports affects only the performance of exporters, then this variable should have little or no impact on the performance of processed food firms, few of which export.

Table 7 reports the results of this exercise. The measures of management practices are collected only in 2013 for food sector and the data on other variables are currently available only in 2013 and 2014[33]. To compare with the food sample, for garment samples I focus on years when the corresponding measures were available in food firms. For the same reason, I also exclude food firms in Yangon that located in townships where there was no garment plant and food firms that started to operate after 2006. All regressions include the same set of control variables outlined in the main specification (section 5.4.1) and the standard errors are clustered at townships level.

Columns (1)-(3) show the counterpart of the results using the processed food sample. All of the regression coefficients are insignificant and positive. This result supports the assumption of an exclusion restriction in the airport travel time instrument.

In order to adjust for the differences in distributions of food and garment plants across regions, I construct a weight for each food plant based on the relative number of garment plants to the number of food plants in each townships. Columns (4)-(6) report the difference-in-difference estimates using a matched sample of garment and food plants with the above weights for the food plants (weights for the garment plants are one). The estimated coefficients on airport travel time (for food sector) are positive or negative with insignificant, while the coefficients on airport travel time interacted with a dummy variable for the garment sector are negative and statistically significant.

5.5 Difference in difference by garment and processed food sectors over time

As an alternative empirical strategy to 2SLS, I estimate a difference-in-difference specification using differential exporting trends by industries. The results are reported in Table 8. The sample is domestic garment and processed food plants interviewed from 2013 to 2015, excluding the new firms that started to operate in the industries after 2011[34]. This leads to the baseline sample of 433 plants (178 garment plants and 255 food plants) observed in one of the three years. In all specifications, I include firm fixed effects and year fixed effects.

Column (1) reports the result for the share of exports to EU and the US in sales. Although the ideal measure of an exporting outcome in this setting would be the value of exports to the EU and the US, the information is not available because the survey did not collect information on export values or sales in 2014 and 2015 waves. Instead, I use the share of the sales in the region in the plant's total sales, which was relatively less sensitive information than sales, and therefore easier to

[33]The data in 2015 has been collected in the food sector, however, the data entry process has not finished yet.

[34]The exclusion of newer plants is for eliminating endogeneity concern arising from a selection of industries after the trade liberalizations in 2011. I also exclude the processed food firms that have less than 5 employees in order to make the sample comparable to garment plants, where the smallest employment size is 6

be collected. The estimated coefficient on the interaction of the garment sector and year is positive (0.0177) and statistically significant (standard error = 0.008) implying 60% annual increases in the share of sales in the region. In contrast, the share of export to Japan did not increase in these period as expected.

As shown in column (3), the DID estimate for overall working conditions is positive (0.0456) and highly significant (standard error = 0.009), suggesting 30% annual increases in working condition scores in the garment sector compared to the food sector. The results mainly come from the improvements in fire safety and negotiation scores as shown in columns (4)-(6). The result for the hourly wage is also positive and significant (coefficient = 0.172 with standard error 0.054), and the result for the hours of work is negative and significant (coefficient = -0.046 with standard error = 0.012). These results are consistent with the previous results using 2SLS specification in that exporting affects workers' welfare in both cash and non-cash conditions. In the last two columns, I show the results for employment and management practice scores. The coefficients are small, positive, and not statistically significant. This could be partly due to the short period of observations: for example, management practices may not change in just one or two years.

6 Robustness checks

I have extensively tested the robustness of the main results on working conditions. In this section I describe my eleven principal tests. Tables showing the results are provided in the Appendix attached to this paper.

First, given that the measures of working conditions are constructed from managers' responses, a potential concern is that the measurement errors in the variables causes biases in the results of 2SLS estimations. To examine this possibility, I tested whether there are correlations between my instrumental variables and the gap between a manager's response and my staff's observation of fire safety equipment. As described in the data section, the gap between manager's response and interview staff's observation is a sum of (1) the measurement error between the response and the truth and (2) the error between the truth and the observation. If there is a correlation between an instrument and the first part of the measurement error, it is likely to find that the gap is correlated with the instrument. For each of woven and airport proximity instrument, there is no significant or systematic correlation with the gap (Appendix table 4 columns (4)-(6)).

Secondly, the sample sizes in the balancing tests in 2005 on instruments (section 5.1 and table 4) are small (from 98 to 126 firm observations). Therefore, it is still possible that some of these

characteristics directly affect performance in the observed periods from 2013 to 2015. To address this concern, I restricted my samples to firms that are observed in SGIM data in 2005 and directly controlled for size (log of sales), TFP, and capital intensity. Even though this reduces the sample size to 137 observations of 48 firms, the statistical power in the first stage were above 4 and results of 2SLS remain the same as the main results (for results see Appendix Table 9).

Third, in order to address a concern that woven production could have a direct effect on worker-related performance, I controlled for recent woven production in the main 2SLS specification. This was made possible by the fact that 27% of firms switched from knit to woven production, and 10% of firms did so from woven to knit production from 2005 to 2014. While more firms switched from knit to woven than the opposite case, the switching is not statistically correlated with firm size and productivity in 2005. Including the share of woven products in sales in 2014[35] and using woven production in 2005 as an instrument, the coefficient on exporting remains positive and significant with only small changes (Appendix Table 10 column (1)).

Fourth, it is possible that woven firms or exporting firms are clustered in different regions for some reasons like production knowledge spillover. In that case, the increase in Japanese woven apparel demand might lead to a relatively larger number of entries in woven apparel than in the knit apparel sector, which could affect regional labor market competition and working conditions. To investigate this channel, I controlled for the number of garment plants (found in my population list of garment plants in 2015) and the number of exporting garment plants in the plant's neighborhood (defined by a radius of 1 kilometer). In order to account for product types, I also controlled for the number of plants producing the same types of products (woven or knit[36]) in the plant's neighborhood. In all of these exercises, the coefficients on exporting remain similar to the main results (Appendix Table 10 columns (2)-(5)).

Fifth, the scaling of working conditions and management practices across questions can potentially affect the results. As a robustness check, I convert the raw scores (from 0 to 1 scale) to z-scores by normalizing by raw scores to mean zero and standard deviation one. Z-scores for fire safety are obtained as averages of z-scores within the dimension. I repeated this process to construct z-scores for health management and negotiation. Replicating the Panel A and B of Table 4 with these z-scores generates the estimates with the same signs and the levels of significance (for results see Appendix Table 11). In addition, the results of 2SLS for each of the raw scores of working conditions are show in Appendix Table 12.

[35]The survey asked the share of woven products in sales only in 2014, therefore I use only the survey wave in 2014.

[36]This is defined by whether the share of woven products in sales in 2014 is above a half. Therefore, the plants in the neighborhoods are restricted to the plants that were interviewed in my survey in 2014.

Sixth, I estimated the 2SLS specification using both woven production and airport proximity instruments (Appendix Table 13). As expected, the estimated coefficients are similar to the ones where only one of the instruments is used. The results of over-identifying restriction tests using both of the two instruments (Hansen J statistics) suggest that the null hypothesis that instruments are exogenous is not rejected for each of the main outcome variables.

Seventh, the main specification assumes that in both the Yangon and Mandalay regions the impact of airport travel time and other geographical variables on firm performance is similar. But these two regions are far from one another and could be different in many ways: Yangon is a coastal area while Mandalay is landlocked, and the Yangon International Airport has more direct flights to foreign countries than the Mandalay International Airport. For this reason I exclude Mandalay firms and, as shown in panel A of Appendix Table 14, I run the same regressions as in the main specification.

Eighth, my survey data might omit small firms that have not registered with the government, industry associations, or the industry directories that are the source of my population database. As a precaution, I restrict my sample to firms that had more than 100 employees during the first year of observation (panel B of Appendix Table 14).

Ninth, I impute the measure of woven production in 2005 by a retrospective survey question in 2014 in case the firm was not observed in 2005 data. In my main sample, I do not observe 61% of the firms, rather I use the survey question. This might have caused measurement errors in the instrument. To address this issue, I restricted my samples to firms observed in SGIM data in 2005, for which the measure of woven instrument is defined by the intensity of woven products in 2005 (panel C of Appendix Table 14).

Tenth, in this study I do not use the panel feature of the survey data from 2013-2015. The reason is because my instruments do not differentially predict exporters in different years. Therefore, the only expected effects of using the three years of data from 2013-2015 is to reduce measurement errors in variables. To see if this is the case, for all variables, I take the average of survey data by plant over three years, construct a cross-sectional dataset, and estimate the same specifications noted in the main tables (the results are shown in Appendix Table 15). In these four experiments (from sixth to ninth robustness checks), the coefficients on exporting remains positive and significant with only small changes.

Finally, there is a concern that firm survival rate from 2005 to 2013 depended on the instrumental variables, which would lead to a bias in my 2SLS estimates. Based on the garment data in 2005

(SGIM), I tested whether the survival to the year 2013[37] is correlated with the firm performance and instrumental variables. While the survival is positively correlated with initial employment size, it is not statistically significantly correlated with woven production or with airport proximity (Appendix Table 17).

7 Concluding remarks

Many developed countries grant preferential tariffs to low-income countries as a means of promoting economic development. Yet, despite their prevalence, there is little evidence that these trade policies benefit workers in beneficiary countries. Access to a foreign market would lead to increases in firm size as predicted in classic trade models like Melitz (2003) model. Potentially, this enhanced firm size might lead to a safer workplace by increasing the benefit from adopting safety equipment. Access to markets in high-income countries can also induce firms to invest in management practices that improve production efficiency. This could indirectly affect working conditions either positively or negatively. Trade could also directly affect conditions through buyers' pressure to impose high labor standards.

In order to investigate the causal effects of exporting on working conditions, firm size and management in developing countries, I measure working conditions (fire safety, health management, union interaction, wage, hours of work) and management practices in manufacturing firms in Myanmar through a unique new field survey from 2013 to 2015. My results draw on a natural experimental setting in the Myanmar garment sector, where exporting from 2013-2015 were affected by the firms' products and geographical characteristics in 2005 when trade was limited.

My empirical results show that exporting to high income countries positively affects working conditions, firm size, and management practices. The level of the impact is substantial: by exporting, labor standards of Myanmar firms become comparable to the standards of multinationals in Myanmar. In addition, I find that exporting positively affects to plant size and adoptions of superior management practices. Furthermore, my results support that exporting induces firms to be audited for labor compliance. Multinational apparel buyers apparently demand these audits because they are often blamed by activist groups for accidents and child labor incidents in their sourcing factories.

One of the future work streams stemming from this study is to evaluate how workers' welfare is affected through surveying workers. My evidence of working conditions in this study is drawn from

[37]The survival is defined as a dummy variable that takes one if the firm is observed either in the survey data from 2013 to 2015 or in the Myanmar Textile and Garment Industry Directories from 2013 to 2015.

interviews with firm managers and not from measures of worker opinions or behaviors. Looking at worker movements across plants, effects on incomes, and formations of trade unions might produce a better understanding of whether workers value better workplace conditions. Another potential area of future research is to understand how the estimated effect differs by destination countries. As shown by Brambilla, Lederman, and Porto (2012), the effects of exporting are likely to differ by destination country. Finally, further work could study how different channels of globalization, such as foreign direct investment, affect labor conditions. For example, do the entries of multinationals affect conditions of labor? Myanmar could be an ideal setting for analyzing this question as well because the country is attracting a large number of foreign direct investment in a short period of time after its democratic reforms.

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8 Figures and Tables

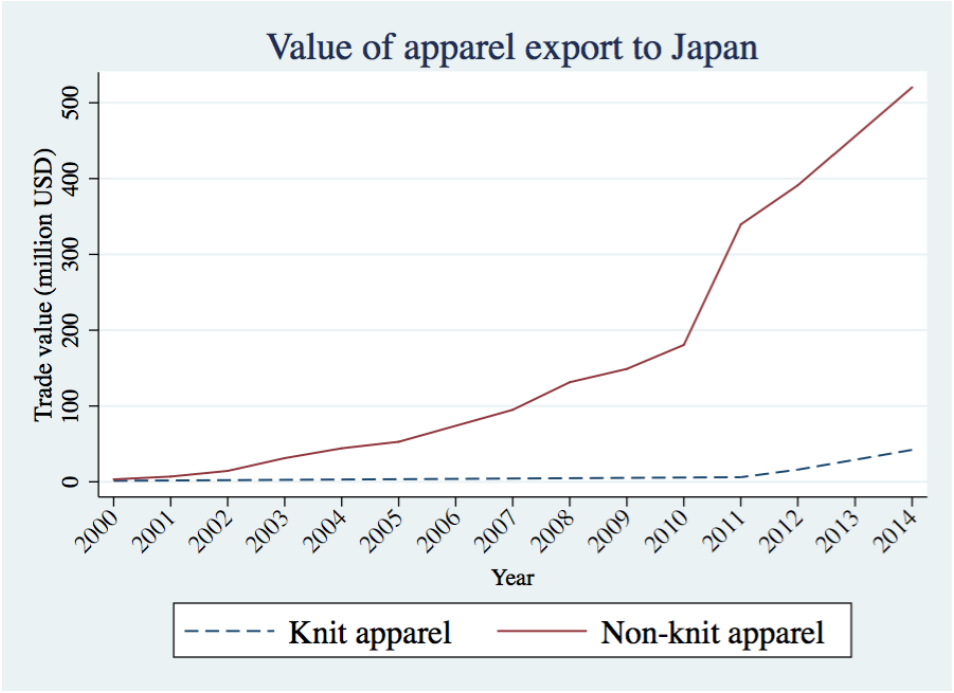
Figure 1: Distribution of working conditions scores

Notes: The figures show histograms of fire safety (fire safety equipment, fire drill), health management (practices to cope with occupational injuries), negotiation (allowance of and interaction with unions), and working conditions average score, which is the average of the three scores.

Figure 2: Woven and knitted apparel factories

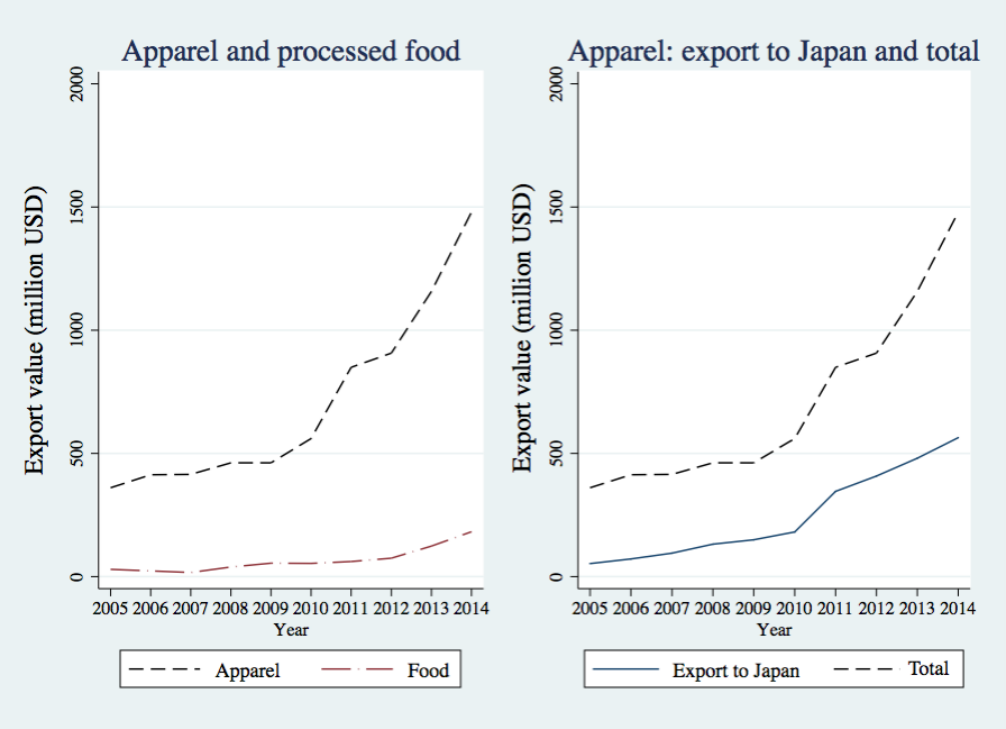
Notes: Pictures at a plant producing woven apparel products (left) and a plant producing knitted apparel products (right) in Myanmar.

Figure 3: Value of apparel export to Japan



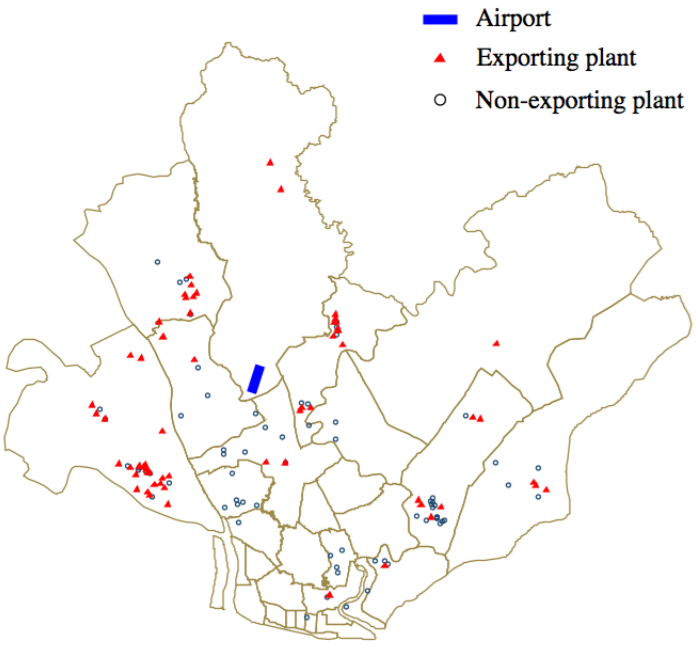
Notes: Total value of Japanese import of HS 61 (Knit apparel) and 62 (woven apparel) from Myanmar reported by Japan. Data from UN Comtrade.

Figure 4: Exports of apparel and processed food from Myanmar



Notes: The left graph shows the value of apparel and processed food products exported from Myanmar to the world. The apparel products include those in SITC (revision 3) 84 and the food products include those in 0 (food and live animal) excluding 011, 012, 034, 036, 041, 042, 043, 044, 045, 046, 047, 054, 057, 0711, and 0721 (live animals and raw food material). The right figure shows the value of export of apparel from Myanmar to Japan and to the world. Data from UN Comtrade.

Figure 5: Map of garment plants and the Yangon International Airport



Notes: Map in Yangon region with township boundaries. Plants exporting in the earliest years in 2012-2014 are marked with triangle and the other garment plants are shown with hole circle. Locations are measured with addresses in 2005.

Table 1: Basic sample statistics of baseline garment sample

Variable	Mean	SD	Min.	Max.	N
Export	0.369	0.483	0	1	314
Export to Japan	0.229	0.421	0	1	314
Employment	302	380	6	2000	314
Number of sewing machines	233	284	8	1520	314
Value added (USD)	836,289	2,273,415	605	18,000,000	100
Woven (2005)	0.561	0.497	0	1	314
Travel time to airport (2005)	0.852	0.43	0.102	3.143	314
Travel time to city center (2005)	1.376	0.552	0.102	3.793	314
Plant in an industrial zone (2005)	0.682	0.467	0	1	314
Working conditions score	0.257	0.185	0	0.917	314
Fire safety score	0.332	0.283	0	1	314
Health score	0.223	0.238	0	1	307
Negotiation score	0.219	0.226	0	1	313
Fire exit	0.688	0.464	0	1	314
Fire extinguisher	1	0	1	1	314
Fire hose	0.538	0.499	0	1	314
Fire alarm	0.49	0.501	0	1	314
Evacuation route map	0.417	0.494	0	1	314
Practice fire drill	0.131	0.337	0	1	314
Nurse at plant	0.075	0.264	0	1	307
List of hospitals for emergency	0.213	0.41	0	1	314
Record injury	0.166	0.372	0	1	314
No workers' leader	0.334	0.473	0	1	314
There is a workers' leader appointed by workers	0.169	0.375	0	1	314
Hourly wage (USD)	0.302	0.073	0.141	0.614	220
Hours of work per week (incl. overtime)	59.992	6.694	44	91	288
Firm's years of operation (firm age)	14.382	4.48	9	41	314
Ever received labor/environmental compliance audit	0.167	0.374	0	1	204
Management average score	0.555	0.2	0.075	0.979	313
Management: production monitoring score	0.614	0.221	0.063	1	314
Management: quality control score	0.641	0.303	0	1	314
Management: machine maintenance score	0.41	0.321	0	1	314
Number of foreign staff	0.33	1.163	0	9	312
Fraction of college graduate workers	0.057	0.075	-0.14	0.45	302
Buyer staff visit plant & suggest how to improve	0.204	0.405	0	1	103
Plant in Mandalay region	0.032	0.176	0	1	314
Owner university graduated	0.5	0.501	0	1	314
Owner is ethnic Chinese	0.268	0.443	0	1	314

Notes: N is the number of plant-year observations.

Table 2: Firm performance in 2005 by measures of exposures to trade

Panel A: Woven production

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep Var.=	TFP	Sales	Num. workers	Num. machines	Growth	Wage	Labor share	Manager's tenure (years)	% univ. grad. workers
Woven	-0.0167	-0.0481	0.225	-0.0409	0.0546	-0.049	-0.0063	-0.614	-0.028
	(0.232)	(0.291)	(0.209)	(0.217)	(0.0941)	(0.0776)	(0.0451)	(1.487)	(0.0582)
Controls	No	No	No	No	No	No	No	No	No
Observations	122	126	126	126	122	126	126	102	112
Mean dep var	-0.676	11.01	5.050	4.916	-0.221	3.228	0.459	9.686	0.213

Panel B: Airport travel time

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dep Var.=	TFP	Sales	Num. workers	Num. machines	Growth	Wage	Labor share	Manager's tenure (years)	% univ. grad. workers
Airport time	0.420	0.252	-0.0647	0.0351	0.0945	-0.104	-0.0178	-0.528	-0.0130
(hour)	(0.415)	(0.442)	(0.268)	(0.240)	(0.120)	(0.127)	(0.0628)	(2.147)	(0.0532)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	117	120	120	120	116	120	120	98	106
Mean dep var	-0.671	11.01	5.044	4.908	-0.218	3.228	0.462	9.713	0.214

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Robust standard errors are shown in parentheses. Using Survey of Garment Industry in Myanmar (2005). Excluding fully foreign owned firms. In panel A, woven production is an indicator variable that takes the value of 1 if the number of woven products divided by the number of all products produced in the plant is above a half. In panel B, airport time is the estimated driving time to the Yangon International Airport. All regressions in panel B control for travel time to city center, dummy variable for locating in an industrial zone. Number of workers, number of sewing machines and wages (hourly wage) are in logarithms. TFP = log(value added) -0.469*log(total hours work) -0.531*log(asset value) where 0.469 is the average of the cost share of labor in value added. Growth is the measure of employment growth defined by log(employment in 2005) - log(employment in 2004). Labor share is the cost share of labor in value added. Manager's tenure is the year of experience of the manager. "% univ. grad. workers" is the fraction of university graduate workers in the firm.

Table 3: First stage of exporting on woven production and airport proximity

Dep var.=	Export (indicator of exporting)					
Period	2013-15					
OLS	(1)	(2)	(3)	(4)	(5)	(6)
Woven	0.268***	0.278***			0.255***	0.267***
	(0.0766)	(0.0691)			(0.0726)	(0.0663)
Airport time			-0.182*	-0.230**	-0.200**	-0.212***
			(0.0945)	(0.0896)	(0.0892)	(0.0796)
Owner college graduate		0.231***				0.200***
		(0.0671)				(0.0654)
Owner ethnic Chinese		0.170*				0.123
		(0.0878)				(0.0892)
External manager		0.225***				0.208***
		(0.0679)				(0.0640)
Firm age		-0.00336				0.00233
		(0.00530)				(0.00614)
Industrial zone			0.323***	0.235***	0.302***	0.147**
			(0.0718)	(0.0799)	(0.0683)	(0.0681)
City center time				0.183***		0.156***
				(0.0664)		(0.0582)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	314	314	314	314
N firms	128	128	128	128	128	128
R-squared	0.093	0.246	0.099	0.125	0.163	0.286
F test IV=0	12.28	16.22	3.714	6.581	8.407	11.26
Mean dep var	0.38	0.38	0.38	0.38	0.38	0.38

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Woven production is an indicator variable that takes the value of 1 if the number of woven products divided by the number of all products produced in the plant is above a half in 2005 if observed in 2005 SGIM data, otherwise imputed from the survey question in 2014 on whether the firm produced woven product before 2005. Owner ethnic Chinese is an indicator variable that takes 1 if the owner of firm is Chinese Burmese or Chinese. External manager is an indicator variable that takes 1 if the plant is managed by a person who is not a member of owner's family. Airport time is the estimated driving time to the International airports. Industrial zone takes one if the plant is located within one of the industrial zones. City center time is the estimated travel time (hours) to the city halls. These three geographical variables are measured using the plant addresses in 2005.

Table 4: 2SLS (IV= Woven production in 2005)

Panel A: Impact on working conditions								
	Working		Individual scores			Wage	Hours	Audit
	conditions score		Fire	Health	Negotiation			
Period	2013-15		2013-15	2013-15	2013-15	2013-15	2013-15	2013-14
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	0.332***	0.319***	0.369***	0.266**	0.324***	0.191*	-1.352	0.459**
	(0.0967)	(0.0899)	(0.140)	(0.128)	(0.0949)	(0.0985)	(2.860)	(0.208)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	314	307	313	220	288	204
N firms	128	128	128	121	128	126	128	109
F test IV=0	12.28	16.22	16.22	16.39	16.29	20.17	16.13	7.505
Mean dep var	0.257	0.257	0.332	0.223	0.219	-1.226	59.99	0.167
Panel B: Impact on firm size and productivity								
Dependent var.	Employment		N sewing machines		Sales		Labor productivity	
Period	2013-15		2013-15		2013		2013	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	1.727***	1.731***	1.801***	1.770***	2.129***	2.002***	1.014*	0.899
	(0.563)	(0.510)	(0.596)	(0.526)	(0.658)	(0.626)	(0.579)	(0.569)
Year, region FEs	Yes	Yes	Yes	Yes	-	-	-	-
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	314	314	308	308	100	100	100	100
N firms	128	128	122	122	98	98	98	98
F test IV=0	12.28	16.22	12.28	16.22	16.11	17.94	16.11	17.94
Mean dep var	5.007	5.007	4.747	4.747	11.96	11.96	7.277	7.277

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. In Panel A, social audit takes one if plant has ever received labor or environmental compliance audit. The question on social audit was asked only in the survey waves in 2014 and 2015, and therefore the sample size is smaller. All dependent variables are taken logarithm in Panel B. Labor productivity is defined by log sales - log employment. The values of sales are observed only in 2013, therefore columns (5)-(8) restrict the sample to firms with non-missing sales observation in 2013.

Table 4 (continued): 2SLS (IV= Woven production in 2005)

Panel C: Impact on management practices scores

	Management score				Individual scores			Buyer
					Production	Quality	Machine	suggests
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	0.216**	0.207**	0.378*	0.341*	0.206*	0.148	0.540***	0.859***
	(0.0899)	(0.0859)	(0.213)	(0.181)	(0.107)	(0.161)	(0.201)	(0.297)
Employment			-0.0323	-0.0210				
			(0.0607)	(0.0475)				
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	314	314	314	314	314	103
N firms	128	128	128	128	128	128	128	100
F test IV=0	12.28	16.39	6.175	8.852	16.39	16.39	16.39	4.513
Mean dep var	0.568	0.568	0.556	0.556	0.614	0.641	0.410	0.204

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. In Panel C, "foreign staff" is the fraction of staff with foreign nationality and "buyer suggests" takes 1 if the main buyer sends staff who suggests how to improve production process or quality.

Table 5: 2SLS (IV= Woven production in 2005) with additional control variables

Dep var:	Working conditions score							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	0.319***	0.247*	0.312**	0.313***	0.319***	0.319***	0.328***	0.352*
	(0.0899)	(0.141)	(0.132)	(0.0901)	(0.0885)	(0.0913)	(0.0930)	(0.193)
Log employment		0.0416						
		(0.0381)						
Management score			0.0163					
			(0.150)					
Owner industry association executive				0.0860*				
				(0.0497)				
Fraction of college grad employees					0.460***			
					(0.170)			
Fraction of foreign employees						-0.160		
						(4.018)		
Own the plant land							0.0348	
							(0.0304)	
Audit								0.0538
								(0.117)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	313	314	314	314	314	204
N firms	128	128	128	128	128	128	128	109
F test IV=0	16.22	8.434	8.778	15.98	16.16	15.90	15.22	5.349
Mean dep var	0.257	0.257	0.257	0.257	0.257	0.257	0.257	0.257

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. "Industry association executive" takes 1 if the firm owner is an executive of Garment Association. College graduates and foreign workers is the fraction of college graduate workers and foreign national workers in the plant. Land own takes 1 if the firm owns the plant land. Capital intensity is defined by the logarithm of the number of sewing machines divided by the number of employment.

Table 6: 2SLS (IV= airport proximity in 2005)

	Working	Individual scores			Audit	Management	Employment	Sales
	conditions	Fire	Health	Negotiation		score		
Period	2013-15	2013-15	2013-15	2013-15	2013-15	2013-15	2013	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	0.153	0.417**	0.00220	0.102	0.731**	0.305*	1.003	3.142***
	(0.124)	(0.175)	(0.233)	(0.150)	(0.308)	(0.159)	(0.747)	(1.070)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	307	313	204	313	314	105
N plants	128	128	121	128	109	128	128	100
F test IV=0	6.581	6.581	3.328	6.956	3.389	6.561	6.581	4.289
Mean dep var	0.257	0.332	0.223	0.219	0.167	0.555	5.007	12.06

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include the travel time to the city centers and a dummy variable taking one for locating in an industrial zone. Social audit takes one if plant has ever received labor or environmental compliance audit. Production score is the score on production monitoring, which one of the individual scores composing the overall management score. Sales is taken logarithms.

Table 7: Placebo test and difference-in-difference estimation using processed food sector

Sample	Processed food			Garment & matched sample of processed food		
	Fire safety score	Management score	Sales	Fire safety score	Management score	Sales
Period	2013-14	2013	2013	2013-14	2013	2013-14
	(1)	(2)	(3)	(4)	(5)	(6)
Airport time	-0.0140	0.0200	-0.199	0.0335	0.102**	0.0374
	(0.0255)	(0.0168)	(0.340)	(0.0547)	(0.0465)	(0.538)
Airport time x Garment				-0.174**	-0.184***	-1.367***
				(0.0652)	(0.0571)	(0.425)
Garment				0.222***	0.479***	1.240**
				(0.0755)	(0.0460)	(0.569)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs. food plants	421	262	155	376	236	140
Obs. garment plants	0	0	0	290	197	98
N townships	27	27	18	17	17	16
Mean dep var	0.272	0.383	11.23	0.274	0.391	11.20

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at township levels and shown in parentheses. Control variables are travel time to city center, a dummy variable for locating in an industrial zone, and a dummy variable for beverage firms. Columns (1)-(3) use the sample of processed food firms excluding the plants in the Yangon townships where no garment plants was observed. Columns (4)-(6) use both of the garment and processed food firms, and the food sample is weighted by the relative sample sizes of garment to food plants within townships. Sales is the logarithm of value added.

Table 8: Difference in difference by garment and processed food sectors over years

	Export to EU/US (share)	Export to Japan (share)	Working conditions score	Individual scores			Wage (log)	Working hours (log)	Employment (log)	Management practices score
				Fire safety score	Health score	Negotiation score				
Period	2013-15	2013-15	2013-15	2013-15	2013-15	2013-15	2013-15	2013-14	2013-15	2013,2015
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Garment x Year	0.0177**	-0.00205	0.0456***	0.0738***	0.0133	0.0520***	0.172***	-0.0460***	0.0112	0.00100
	(0.00812)	(0.00813)	(0.00902)	(0.0123)	(0.0132)	(0.0131)	(0.0545)	(0.0117)	(0.0324)	(0.00903)
Plant FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,045	1,045	1,045	1,045	1,037	1,041	500	1,009	1,045	681
Number of plants	433	433	433	433	428	433	382	433	433	427
Mean dep var	0.0293	0.0541	0.164	0.256	0.108	0.129	-1.304	4.051	3.831	0.365

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm levels and shown in parentheses. "Export to Japan (share)" and "export to EU/US (share)" are the sales share of export to Japan and to EU/US respectively. Wage is the logarithm of the hourly wage. Data on wage was not collected in 2015 in food sector. Working hour is the logarithm of the hours of work per week including overtime hours.

A Appendix

A.1 Measuring proximity to the airports

My measure of travel time to the international airports from each plant location is based on two kinds of data sources: traffic survey and Google Map (2015).

Plants in my sample are located in 23 township-zone areas, which are the combinations of townships, administrative regions in Myanmar, and industrial zones. In 8 locations in Yangon, traffic survey was conducted in order to obtain the estimates of travel time to the international airport with traffic. These areas are SPTA (Shwe Pyi Thar industrial zone); MGDN (Mingalardon industrial zone), DGSK (Dagon Seikkan Industrial zone), SDGN (South Dagon industrial zone), TMWE (Tamwe township), HLTA (Hlain Thar Yar industrial zone), SLB (Shwe Lin Ban industrial zone). The locations of these points are shown in Appendix Figure 3. Local taxis were hired to drive to and from the international airport 5 times in total for each location during May-July 2015. The details of the statistics are reported in Appendix Table 5.

In 8 township-zone areas where travel time was measured in traffic survey, I use the estimates for the one-sided upper bound of 95% confidence interval of travel time from the traffic survey, measured from the township to the international airport. In townships where travel time was not measured in traffic survey, I obtain travel time from the plant's GIS location to the nearest airports in Google Map (2015). The Google Map in Myanmar provides information on estimated travel time by a car without traffic. To account for traffic, I multiply the travel time measured in Google Map by 2.05, which is the average ratio of travel time with traffic (traffic survey) and time without traffic (Google Map 2015)) among the 8 locations where traffic survey were conducted.

A.2 Estimating the share of manufacturing export in GDP in Myanmar

There is no reliable source of information on the GDP of Myanmar from 2004 to 2011. Therefore, I estimate the one by using the GDP in 2013 and extrapolate assuming the GDP growth rates from 2005 to 2012 to be the same as the one in 2013. Using the data from UN Comtrade, the value of manufacturing export is constructed as the total value of imports of manufacturing products from Myanmar by all countries. The following products under SITC (revision 3) are included in the definition of manufacturing products: 0 (food and live animal) excluding 011, 012, 034, 036, 041, 042, 043, 044, 045, 046, 047, 054, 057, 0711, and 0721 (live animals and raw food material), 5 (chemicals and related products), 6 (manufactured goods classified chiefly by material), 7 (Machinery and transport equipment), and 8 (miscellaneous manufactured articles).

A.3 OLS estimates

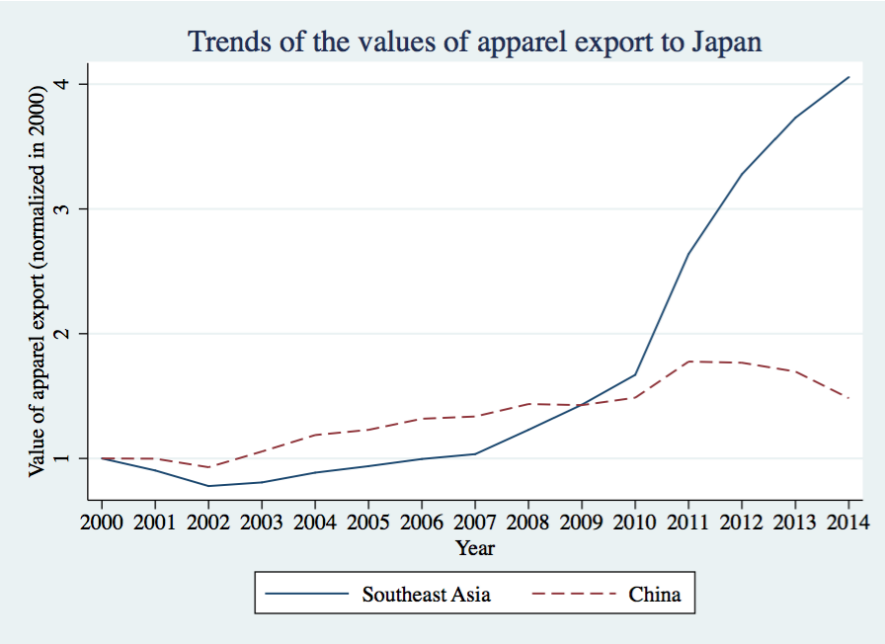
The comparison of OLS and 2SLS estimates of equation (1) provides information on how firms are selected to be exporters. The results are shown in Appendix Table 8. The classic trade models with heterogeneous firms like Melitz (2003) predict that the more productive firms are more likely to decide to export. As expected, for labor productivity, the OLS coefficient of exporting (1.435) is statistically significant and considerably higher than 2SLS estimate (0.701) using woven production IV. In contrast, it is less clear whether whether firms providing better working conditions should be self-selected into exporting. If we consider the model described in section 3 and a heterogeneity in firm owners' valuation of safety, firms with unsafe conditions (due to lower owner's valuation of safety) have lower marginal cost of production, therefore their profit from exporting is higher. These firms would be self-selected into exporting when their product demand increases. In contrast, if we consider a model where workplace safety improves productivity as in an efficiency wage model, then firms with better working conditions would be selected into exporting. The results support the first model: the OLS coefficient is 0.194 (standard errors=0.029) and the 2SLS coefficient is 0.335 (standard errors=0.0931).

In addition to the self-selection effects, another source of the differences in the 2SLS and the OLS estimates might be measurement errors in exporting variable. While I specify the main specification using the dummy variable of exporting in the year from 2013 to 2015, the true effect of exporting could come from intensity of exporting or the length of exporting, for which I do not have reliable measures. Especially, in my setting, some firms are likely to have started exporting earlier than 2013, and these firms might also have

more buyers. In such cases, the OLS estimate could be attenuated toward zero, which explains why the OLS coefficients on management scores and employment are slightly smaller than the 2SLS coefficients.

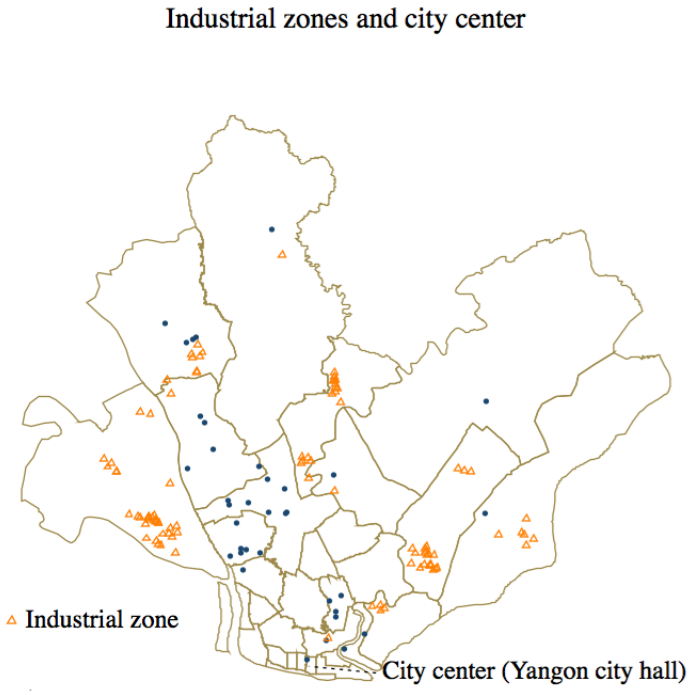
A.4 Appendix figures

Appendix Figure 1: Increase of Japanese demand in other Southeast Asia



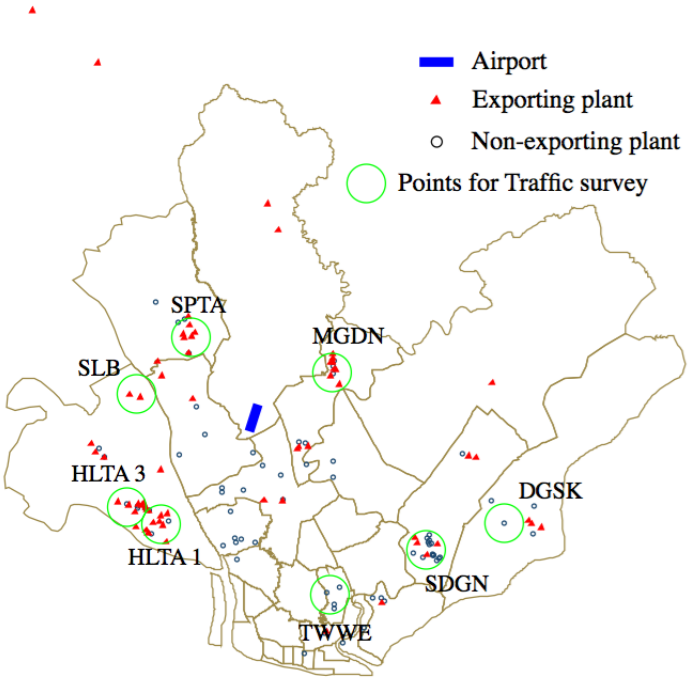
Notes: Total value of Japanese import of HS 61 (Knit apparel) and 62 (woven apparel) from China and the total of Southeast Asian countries excluding Myanmar (Bangladesh, India, Indonesia, Lao PDR, Malaysia, Pakistan, Philippines, Singapore, Thailand, Vietnam) reported by Japan. The values are normalized to to the values in 2000, which are 14.2 billion USD for China and 1.4 billion USD for Southeast Asia). Data from UN Comtrade.

Appendix Figure 2: Map of plants in industrial zones and location of city center



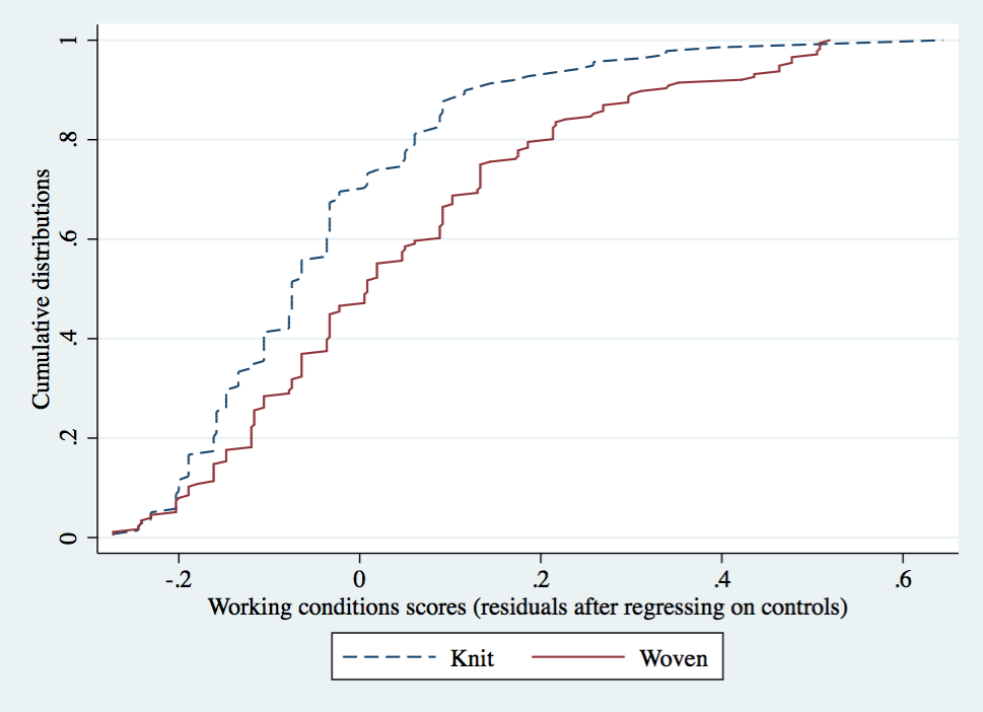
Notes: Map in Yangon region with township boundaries. Orange triangle markers show the garment plants located in an industrial zone.

Appendix Figure 3: Map 8 locations where traffic survey was conducted



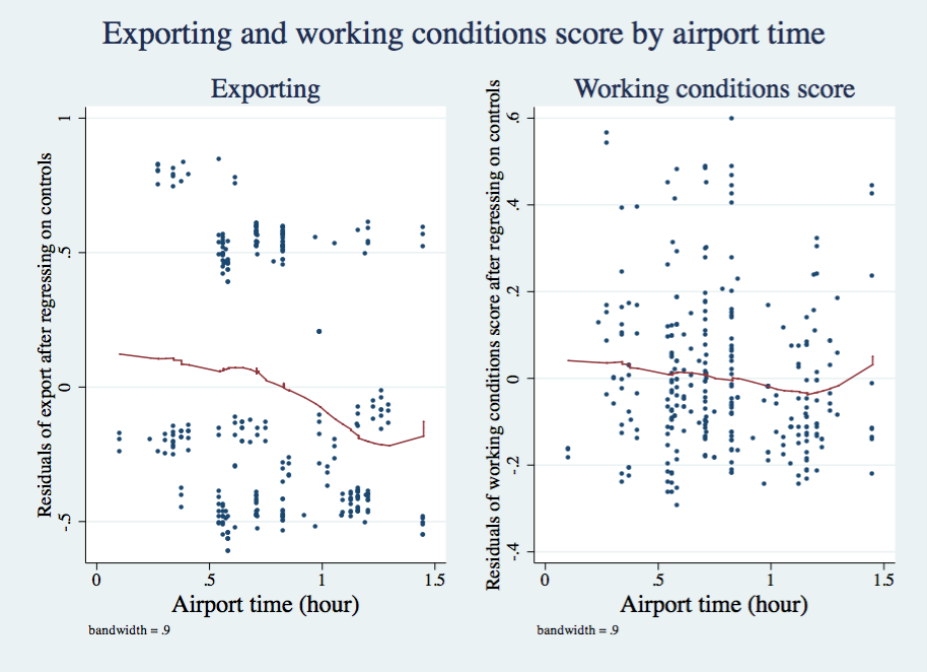
Notes: Traffic survey was conducted in 8 locations in Yangon: SPTA (Shwe Pyi Thar industrial zone); MGDN (Mingalardon industrial zone), DGSK (Dagon Seikkan Industrial zone), SDGN (South Dagon industrial zone), TMWE (Tamwe township), HLTA (Hlain Thar Yar industrial zone), SLB (Shwe Lin Ban industrial zone).

Appendix Figure 4: Cumulative distribution functions of working condition scores by woven and knit firms



Notes: The horizontal axis is the residual of working conditions score from 2013-2015 after regressing the variable on year and region fixed effects. Woven firms are the defined as firms that produced woven products before 2005.

Appendix Figure 5: Export and working conditions scores by travel time to airport



Notes: The vertical axis is the residual of working conditions score from 2013-2015 after regressing the variable on year fixed effects, region fixed effects, travel time to city center and an industrial zone dummy. Non-parametric estimate of local weighted regression (using "lowess" in STATA with a bandwidth of 0.9) of the residual of working conditions score on airport time is shown. Airport time is measured at the plant locations in 2005.

A.5 Appendix tables

Appendix Table 1: Working conditions scoring

Fire safety

Score	**0**	**1/5**	**2/5**	**3/5**	**4/5**	**1**
What kind of equipment do you have for fire safety?		1/5 point for each equipment: marked exit, extinguisher, hose, alarm, evacuation map				
Score	**0**	**1**				
Does this factory practice fire drills?	no	yes				

Health

	Score	**0**	**1**
Is there a nurse or a doctor at this plant?		no	yes
Do you have a private contract with a clinic?		no	yes
Is there a record of past injury cases (e.g. cuts and burns) in this plant?		no	yes
Do you have a written list of hospitals to go for emergency cases?		no	yes

Negotiation

	Score	**0**	**1/4**	**2/4**	**3/4**	**1**
Is there a workers' leader appointed by this firm or by workers?		No leader	Firm appointed	Firm appointed	Workers appointed	Workers appointed
During the last 12 months, were there regular meetings with the workers' leaders, if so in what frequency?			& Infrequent meeting	& Monthly meeting	& Infrequent meeting	& Monthly meeting
	Score	**0**	**1**			
Is there a suggestion box at this plant?		Yes	No			

Appendix Table 2: Management practices scoring

Production monitoring

Score	**0**	**1/5**	**2/5**	**3/5**	**4/5**	**1**
How frequently do you keep track of the volume of production pieces?	no record	by order	monthly	weekly	daily	hourly
Score	**0**	**1**				
Are there displays (e.g. boards) in plant that show target or achieved production pieces?	yes	no				
Score	**0**	**1/4**	**2/4**	**3/4**	**1**	
Who gets to see the production data on at least a weekly basis?	only supervisors	supervisors technicians	only manager	manager supervisor	manager supervisor technicians	
Score	**0**	**1/3**	**2/3**	**1**		
Do meetings to discuss efficiency with production team take place, and if so in what frequency?	no meeting	monthly / when necessary	weekly	daily / morning meeting		

Quality control

Score	**0**	**1**		
Is fabric checked for its quality before used?	yes	no		
Do you record defects defect-wise?	yes	no		
Score	**0**	**1/3**	**2/3**	**1**
Do meeting take place to discuss defects and gradation, and if so in what frequency?	no meeting	monthly / when necessary	weekly	daily / morning meeting

Machine maintenance

Score	**0**	**1**				
Is machine downtime recorded?	yes	no				
Score	**0**	**1/5**	**2/5**	**3/5**	**4/5**	**1**
How frequently is machine downtime analyzed?	never	whenever necessary	yearly	monthly	weekly	daily

Appendix Table 3: Observations in plant tours and working conditions scores

	Fire safety score		Health score		Negotiation score		Had a factory tour	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fire exit observed	0.209***	0.210***			0.0765*	0.0250		
	(0.0380)	(0.0421)			(0.0405)	(0.0468)		
Low light level			-0.0766**	-0.112***	-0.0584*	-0.111***		
			(0.0323)	(0.0361)	(0.0339)	(0.0380)		
Plant too hot			-0.228***	-0.251***	-0.191**	-0.258***		
			(0.0731)	(0.0643)	(0.0896)	(0.0745)		
Workers bare foot			-0.0407	-0.0338	-0.190***	-0.209***		
			(0.0354)	(0.0438)	(0.0430)	(0.0410)		
Fabric piles on floor			-0.125***	-0.0648	-0.146***	-0.0527		
			(0.0408)	(0.0479)	(0.0556)	(0.0607)		
Working conditions scores							0.0800	0.0357
							(0.139)	(0.145)
Export							0.00239	-0.0493
							(0.0565)	(0.0566)
Employment							-0.0428	-0.0289
							(0.0268)	(0.0265)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Interviewer FEs	No	Yes	No	Yes	No	Yes	No	Yes
Observations	244	244	231	231	239	239	464	464
N plants	162	162	155	155	162	162	185	185
R-squared	0.165	0.331	0.106	0.264	0.208	0.400	0.302	0.431
Mean dep var	0.299	0.300	0.209	0.209	0.215	0.215	0.514	0.514

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at plant level and shown in parentheses. Sample in columns (1)-(4) is the domestic garment plants interviewed from 2013 to 2015 where interviewers had plant tours. Sample in columns (5)-(6) is Domestic garment plants interviewed from 2013 to 2015. "Low light level" takes 1 if it is difficult to read newspapers. "Plant too hot" takes 1 if the interviewer felt that the temperature would be above 35 degree celsius. "Workers bare foot" takes 1 if the workers were working with bare foot. "Fabric piles on floor" takes 1 if there were piles of fabric on the plant's floor.

Appendix Table 4: Gaps in managers' responses and observations in plant tours on fire exits

	Response - observation (fire exit)						Factory tour	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Export	0.0604							
	(0.0895)							
Log employment		-0.0157						
		(0.0409)						
Woven			0.0575	0.0527			-0.0807	
			(0.0972)	(0.0943)			(0.0516)	
Airport time					0.192	0.106		-0.0954
					(0.145)	(0.140)		(0.0589)
Year and regions FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Owners' characteristic controls	No	No	No	Yes	No	No	Yes	No
Geographic controls	No	No	No	No	No	Yes	No	Yes
Observations	154	154	154	154	154	154	314	314
N firms	113	113	113	113	113	113	132	132
Mean dep var	0.403	0.403	0.403	0.403	0.403	0.403	0.503	0.503

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at plant level and shown in parentheses. Column (1)-(6) use samples where plant tours were provided. Dependent variable is the differences between managers' response about and observations of fire exits. Owners' characteristic controls include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Geographic controls include travel time to city centers and a dummy variable for locating in an industrial zone. The dependent variable in column (7) is a dummy variable that takes 1 if the plant tour was provided.

Appendix Table 5: Traffic survey results

Location	(1) From Airport -3pm	(2) From Airport 3pm-	(3) To Airport -3pm	(4) To Airport 3pm-	(5) Mean (mins)	(6) Max (mins)	(7) SD (mins)	(8) 95% CI one-side (mins)	(9) No traffic (Google) (mins)	(10) Ratio (4)/(5)
HLTA 1	2	-	2	1	32.0	37	4.3	39.1	24	1.6
HLTA 3	1	-	2	2	37.4	49	9.9	53.7	27	2.0
SLB	-	1	3	1	43.8	56	9.12	58.9	26	2.3
SPTA	2	1	2	1	26.4	28	1.52	28.9	21	1.4
MGDN	1	-	2	2	25.4	32	5.3	34.2	13	2.6
DGSK	-	2	2	1	65.4	79	11.8	84.9	35	2.4
SDGN	1	1	1	2	57.4	82	14.93	82	34	2.4
TMWE	1	2	2	-	38.0	48	6.2	48.2	29	1.7
Average of 5 drivings					40.73	51.38	7.4	53.73	26.1	2.05
2x(Max-Min)					80	108		112	42	

Notes: Traffic survey was conducted in order to obtain the estimates of travel time to the international airport with traffic. Local taxis were hired to drive to and from the international airport 5 times in total for each location during May-July 2015. Column (1)-(4) show the number of driving times by time of the days. Mean, max and standard deviation of the 5 driving times are shown in the columns (5)-(7). 95% CI (one sided) is the upper bound of 95% confidence interval. 2x(Max-Min) is a measure of the time saving of a round trip by choosing closest place instead of farthest place. The 8 locations in Yangon chosen for the traffic surveys are ones of the popular areas for garment plants: HLTA 1(Hlain Thar Yar industrial zone 1), HLTA 3 (Hlain Thar Yar industrial zone 3), SLB (Shwe Lin Ban industrial zone), SPTA (Shwe Pyi Thar industrial zone), MGDN (Mingalardon industrial zone), DGSK (Dagon Seikkan industrial zone), SDGN (South Dagon industrial zone), TMWE (Tamwe township). Appendix Figure 3 shows the map of these locations.

Appendix Table 6: First stage results by destination regions

	Export to					
OLS	Japan (1)	EU/US (2)	Japan (3)	EU/US (4)	Japan (5)	EU/US (6)
Woven	0.195***	0.155***			0.193***	0.145**
	(0.0633)	(0.0589)			(0.0611)	(0.0580)
Airport time			-0.256***	-0.0342	-0.235***	-0.0230
			(0.0807)	(0.0782)	(0.0741)	(0.0748)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	No	No	Yes	Yes
Geo controls	No	No	Yes	Yes	Yes	Yes
Observations	314	314	314	314	314	314
N firms	128	128	128	128	128	128
Mean dep var	0.229	0.178	0.229	0.178	0.229	0.178

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export to each destination country/region takes one if plant exports to the country/region. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Geographic control variables include the travel time to the city centers and an industrial zone dummy.

Appendix Table 7: Variables predicting working conditions and management among non-exporting garment plants (2013-2015)

Dep. var =	Working conditions score	Individual scores			Management score
		Fire safety score	Health score	Negotiation score	
Labor share in sales	0.109***	0.0624*	0.159**	0.0992*	0.0617
	(0.0375)	(0.0323)	(0.0654)	(0.0585)	(0.0423)
N observations	89	89	82	88	89
Log wage	0.0356	0.0930***	0.0684*	-0.0636	0.0741
	(0.0410)	(0.0318)	(0.0405)	(0.0860)	(0.0594)
N observations	201	201	194	200	201
Log employment	0.0849***	0.100***	0.0827***	0.0682***	0.0500***
	(0.0103)	(0.0147)	(0.0189)	(0.0168)	(0.0127)
N observations	297	297	290	296	296
Manager tenure	0.00395*	0.00511*	0.00679***	-0.00004	-0.00250
	(0.00205)	(0.00282)	(0.00233)	(0.00279)	(0.00247)
N observations	121	121	121	121	121
Fraction of university grad employees	0.368**	-0.0483	0.700***	0.466**	0.311
	(0.144)	(0.144)	(0.222)	(0.211)	(0.200)
N observations	286	286	279	285	285

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. The sample is garment plants interviewed from 2013 to 2015 that do not export in the year. Each low shows the OLS estimate of separate regression. All regressions control for year and region fixed effects. Standard errors are clustered at firm level and shown in parentheses. Wage is the logarithm of the hourly wage. Labor share is the cost share of labor in value added. Manager's tenure is the year of experience of the manager. Employment is the logarithm.

Appendix Table 8: OLS results

Panel A: Working conditions							
	Working	Individual scores			Wage	Hours	Audit
	conditions	Fire	Health	Negotiation			
Period	2013-15	2013-15	2013-15	2013-15	2013-15	2013-15	2014-15
OLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export	0.205***	0.268***	0.149***	0.197***	0.0827**	0.0357**	0.391***
	(0.0305)	(0.0426)	(0.0439)	(0.0370)	(0.0338)	(0.0137)	(0.0608)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	307	313	220	288	204
N firms	128	128	121	128	126	128	109
R-squared	0.330	0.297	0.152	0.251	0.093	0.177	0.262
Mean dep var	0.257	0.332	0.223	0.219	-1.226	4.088	0.167
Panel B: Management, firm size							
	Management	Individual scores			Employment	Sales	Labor
	score	Production	Quality	Machine			Productivity
Period	2013-15	2013-15	2013-15	2013-15	2013-15	2013	2013
OLS	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export	0.187***	0.202***	0.116**	0.233***	1.502***	2.797***	1.356***
	(0.0255)	(0.0312)	(0.0496)	(0.0504)	(0.158)	(0.246)	(0.235)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	314	314	314	100	100
N firms	128	128	128	128	128	98	98
R-squared	0.443	0.277	0.182	0.156	0.535	0.630	0.299
Mean dep var	0.555	0.614	0.641	0.410	5.007	12.06	7.277

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy.

Appendix Table 9: Robustness checks by controlling for variables in 2005

	Working conditions score						
Period	2013-15						
IV= Woven	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export	0.353**	0.329**	0.357***	0.340***	0.366**	0.320**	0.262*
	(0.149)	(0.131)	(0.138)	(0.125)	(0.170)	(0.140)	(0.154)
Log sales (2005)	-0.00771	0.00282					0.0532
	(0.0230)	(0.0183)					(0.0400)
TFP (2005)			-0.0305*	-0.0214			-0.0740*
			(0.0169)	(0.0163)			(0.0400)
Capital intensity (2005)					0.0596	-0.0573	-0.406
					(0.211)	(0.172)	(0.298)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	No	Yes	No	Yes	Yes
Observations	137	137	134	134	134	134	134
N firms	48	48	47	47	47	47	47
F test IV=0	7.501	8.106	7.827	8.581	4.744	5.360	4.394
Mean dep var	0.257	0.257	0.257	0.257	0.257	0.257	0.257

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Samples are restricted to firms that are observed in SGIM (2005) data and have non-missing information on sales in 2005.

Appendix Table 10: Robustness checks by controlling for products of own plant and of the nearby plants in 2014

	Working conditions score				
Period	2014				
IV=Woven (2005)	(1)	(2)	(3)	(4)	(5)
Export	0.325***	0.308***	0.305***	0.311***	0.305***
	(0.101)	(0.103)	(0.105)	(0.0801)	(0.0924)
Share of woven products in sales in 2014	-0.00629				0.00249
	(0.0351)				(0.0329)
N garment plants within 1km		-0.00033	-0.00125	-0.00025	-0.00116
		(0.0026)	(0.00296)	(0.0036)	(0.00476)
N garment plants exporting within 1km			0.00235		0.00232
			(0.00631)		(0.00719)
N garment plants producing the same type within 1km				-0.00033	-0.00002
				(0.00548)	(0.00572)
Year, region FEs	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
Observations	304	311	311	311	301
N firms	118	128	128	128	118
F test IV=0	12.73	12.69	11.44	21.11	15.05
Mean dep var	0.257	0.257	0.257	0.257	0.257

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. The share of woven products in sales was asked (only in the survey wave in 2014) and included in column (1). "N garment plants within 300m" and "N garment plants within 1km" are the numbers of garment plants within a radius of 1 kilometers. Defining "woven plant in 2014" as a dummy variable that takes the value of 1 if the plant's woven production in sales is above a half, "N garment plants producing the same type" and "N garment plants producing the same type" are the numbers of woven plants for a woven plant and the numbers of knit plants for a knit plant.

Appendix Table 11: Results for z-scores of working conditions and management practices

Panel A: Working conditions z scores					
	Working conditions		Individual z scores		
	z score		Fire	Health	Negotiation
Period	2013-15			2013-15	
IV=Woven	(1)	(2)	(3)	(4)	(5)
Export	1.716***	1.654***	1.339***	1.099**	1.281***
	(0.521)	(0.486)	(0.493)	(0.547)	(0.411)
Year, region FEs	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes
Observations	314	314	314	307	313
N firms	128	128	128	121	128
F test IV=0	12.28	16.22	16.22	16.39	16.29
Mean dep var	0	0.	0.	0	0
Panel B: Management practices z scores					
	Management		Individual scores		
	average score		Production	Quality	Machine
IV=Woven	(1)	(2)	(3)	(4)	(5)
Export	1.695***	1.602***	1.204**	0.582	1.815***
	(0.532)	(0.493)	(0.474)	(0.540)	(0.624)
Year, region FEs	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes
Observations	314	314	314	313	314
N firms	128	128	128	128	128
F test IV=0	12.28	16.22	16.22	15.93	16.22
Mean dep var	0	0	0	0	0

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. I convert the raw scores of working conditions and management practices from 0-1 scale to z-scores by normalizing by raw scores to mean zero and standard deviation one. z scores for fire safety, health and negotiation are obtained as the averages of z-scores within these dimensions. To ease interpretation, averages are standardized.

Appendix Table 12: Results for raw scores of working conditions

	Fire safety				
	Exit	Hose	Alarm	Map	Drill
IV = Woven	(1)	(2)	(3)	(4)	(5)
Export	0.483*	-0.0216	1.151***	0.545*	0.205
	(0.290)	(0.280)	(0.320)	(0.280)	(0.184)
Controls	Yes	Yes	Yes	Yes	Yes
Observations	314	314	314	314	314
N firms	128	128	128	128	128
F test IV=0	16.22	16.22	16.22	16.22	16.22
Mean dep var	0.688	0.538	0.490	0.417	0.131
	Health				
	Nurse	Contract	Hospital list	Injury record	
IV = Woven	(1)	(2)	(3)	(4)	
Export	0.138	0.459*	0.321	0.142	
	(0.146)	(0.248)	(0.199)	(0.191)	
Controls	Yes	Yes	Yes	Yes	
Observations	307	307	314	314	
N firms	121	121	128	128	
F test IV=0	16.39	16.39	16.22	16.22	
Mean dep var	0.0749	0.430	0.213	0.166	
	Negotiation				
	There is a workers' leader appointed by worker	There is a workers' leader appointed by firm	Meeting with leader at least once in month	Suggestion box	
IV = Woven	(1)	(2)	(3)	(4)	
Export	0.0431	0.274	0.392**	0.537***	
	(0.138)	(0.178)	(0.168)	(0.144)	
Controls	Yes	Yes	Yes	Yes	
Observations	314	314	314	314	
N firms	128	128	128	128	
F test IV=0	12.28	16.22	16.22	16.22	
Mean dep var	0.169	0.704	0.398	0.124	

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Dependent variables are the raw scores of working conditions (with a scale of 0-1) as defined in Table 1.

Appendix Table 13: Results using both woven production and airport proximity as instruments

	Working	Individual scores			Wage	Hours	Audit	Management	Employment	Sale
	conditions	Fire safety	Health	Negotiation				score		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Export	0.263***	0.370***	0.216	0.255***	0.172**	0.0269	0.580***	0.301***	1.366***	2.151***
	(0.0837)	(0.129)	(0.139)	(0.0826)	(0.0862)	(0.0404)	(0.206)	(0.0895)	(0.472)	(0.512)
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	314	314	307	313	220	288	204	313	314	105
N firms	128	128	121	128	126	128	109	128	128	100
F test IV=0	11.26	11.26	9.247	11.54	14.51	12.54	4.471	11.12	11.26	15.60
Hansen J	1.777	0.0274	1.015	2.116	0.0344	2.749	1.066	0.00472	0.888	1.341
Hansen J p-val	0.182	0.869	0.314	0.146	0.853	0.0973	0.302	0.945	0.346	0.247
Mean dep var	0.257	0.332	0.223	0.219	-1.226	4.088	0.167	0.555	5.007	12.06

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age, external manager dummy, travel time to city center, and a dummy variable indicating that the plant locates in an industrial zone. Wage, weekly hours of work, employment, and sales are in the logarithmic form.

Appendix Table 14: Robustness checks by restricting samples

	Working	Individual scores			Audit	Management	Employment
	conditions	Fire safety	Health	Negotiation		score	
IV = Woven	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Yangon region only							
Export	0.319***	0.369***	0.266**	0.323***	0.459**	0.305***	1.727***
	(0.0897)	(0.140)	(0.128)	(0.0947)	(0.208)	(0.102)	(0.510)
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	304	304	303	303	204	304	304
N firms	118	118	117	118	109	118	118
F test IV=0	16.27	16.27	16.44	16.34	7.505	15.98	16.27
Mean dep var	0.261	0.341	0.220	0.222	0.167	0.564	5.066
Panel B: Middle to large firms (employment $\geq$ 100)							
	Working	Individual scores			Audit	Management	Employment
	conditions	Fire safety	Health	Negotiation		score	
IV = Woven	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export	0.273***	0.353**	0.187	0.283***	0.463**	0.304***	1.367***
	(0.0955)	(0.152)	(0.141)	(0.0958)	(0.215)	(0.0949)	(0.394)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	196	196	196	195	125	196	196
N firms	85	85	85	85	72	85	85
F test IV=0	15.98	15.98	15.98	16.33	7.465	15.68	15.98
Mean dep var	0.328	0.430	0.273	0.283	0.264	0.620	5.785
Panel C: Firms observed in SGIM data (2005)							
	Working	Individual scores			Social	Management	Employment
	conditions	Fire safety	Health	Negotiation	audit	score	
IV = Woven	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export	0.270**	0.466**	0.0445	0.304**	0.701**	0.149*	1.218**
	(0.137)	(0.200)	(0.201)	(0.125)	(0.297)	(0.0781)	(0.534)
Year, region FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	139	139	139	138	93	139	139
N firms	49	49	49	49	49	49	49
F test IV=0	7.593	7.593	7.593	7.988	4.515	7.593	7.593
Mean dep var	0.328	0.430	0.273	0.283	0.264	0.620	5.785

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Export takes one if plant exports to a foreign country. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Panel A restricts sample to plants in Yangon region. Panel B restricts sample to plants with more than 100 employees. Panel C restricts sample to firms that are observed in SGIM (2005) data.

Appendix Table 15: Cross-sectional regressions by taking averages of 3 years

	Average	Working	Individual scores			Management	Employment
	exporting	conditions	Fire	Health	Negotiation	score	
IV=Woven	OLS	IV	IV	IV	IV	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Woven	0.209***						
	(0.0762)						
Average export		0.331***	0.452**	0.293	0.251*	0.276**	1.660**
		(0.127)	(0.198)	(0.181)	(0.136)	(0.137)	(0.654)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	132	132	132	125	132	132	132
F test IV=0	7.505	7.505	7.505	7.975	7.505	7.505	7.505
Mean dep var	0.356	0.249	0.299	0.236	0.223	0.542	4.923

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. All variables are the averages of 3 years by plant. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy.

Appendix Table 16: Effects on workers' turnover rate and hiring of skilled and unskilled workers

	Worker turnover rate		Hire skilled worker		Hire unskilled workers	
Period	2014-15		2015		2015	
IV=Woven	(1)	(2)	(3)	(4)	(5)	(6)
Export	-0.0177	-0.0193	-0.0280	-0.00234	-0.463	-0.431
	(0.0676)	(0.0560)	(0.564)	(0.488)	(0.595)	(0.517)
Controls	No	Yes	No	Yes	No	Yes
Observations	127	127	97	97	103	103
N firms	97	97	94	94	100	100
F test IV=0	4.511	6.679	3.424	4.786	3.235	4.100
Mean dep var	0.0622	0.0622	0.361	0.361	0.233	0.233

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. All variables are the averages of 3 years by plant. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy. Turnover rate is defined as the fraction of workers who left the plant in the preceding month from the day of interview. in columns (3) and (4) (column (5) and (6)), the dependent variable is an indicator variable that takes the value of 1 if the plant hires skilled (unskilled) sewing operator in the preceding month. Days of training is the maximum days of training provided at the plant to sewing operators. Information of the turnover rate was collected the surveys in 2014 and 2015 and was not obtained in plants where the managers do not know the number of worker leaves. Information of hiring was collected only in the survey in 2015.

Appendix Table 17: Survival of firms from 2005 to 2013

Dep. var = survived to 2013-15	(1)	(2)	(3)	(4)
TFP	-0.000691	-0.000860	0.00138	0.00112
	(0.0325)	(0.0325)	(0.0323)	(0.0321)
Log employment	0.124***	0.124***	0.0820*	0.0827*
	(0.0421)	(0.0428)	(0.0460)	(0.0464)
Woven		-0.0155		-0.0236
		(0.0942)		(0.0953)
Travel time to airport (hour)			0.0210	0.0191
			(0.110)	(0.113)
Geographic controls	No	No	Yes	Yes
Observations	120	120	120	120
Mean dep var	0.575	0.575	0.575	0.575

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Standard errors are clustered at firm level and shown in parentheses. Uses samples of the domestic firms 2005 data (SGIM). "Survived to 2013-15" is an indicator variable that takes 1 if the firm is surveyed from 2013 to 2015 or listed in the industry directories from 2013 to 2015. Geographic controls include travel time to city center, being located in industrial zone.

Appendix Table 18: Difference in difference within garment firms from 2005 to 2015 by initial woven production

Period = 2005, 2013-2015								
	Sales		Employment		Labor productivity		Wage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Woven (dummy) x After 2013	1.813**		0.173		1.579**		0.237	
	(0.682)		(0.223)		(0.628)		(0.152)	
Woven (intensity) x After 2013		2.965***		0.0447		2.708**		0.154
		(1.101)		(0.318)		(1.028)		(0.191)
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	218	215	316	311	218	215	272	268
N firms	62	60	62	60	62	60	62	60

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Myanmar owned garment firms observed both in SGIM (2005) and the survey from 2013 to 2015. Sales, employment, are wage (hourly wage) in the logarithmic forms. Labor productivity = log(sales)-log(employment). Woven (dummy) takes 1 if the number of woven products divided by the total number of products is above a half. Woven (intensity) is the number of woven products divided by the total number of products.

Appendix Table 19: Comparison of author's management scores with World Management Survey in Myanmar garment sector

Dep. var = Management score (author's survey) Period = 2013-2015						
	(1)	(2)	(3)	(4)	(5)	(6)
Overall management score (WMS)	0.670**	0.697**	0.647**			
	(0.280)	(0.298)	(0.313)			
Operation (WMS)				0.0307	0.0481	0.0486
				(0.0518)	(0.0487)	(0.0489)
Monitoring (WMS)				0.559***	0.472**	0.502**
				(0.171)	(0.190)	(0.201)
Target (WMS)				-0.280	-0.226	-0.235
				(0.240)	(0.240)	(0.245)
Human management (WMS)				0.118	0.130	0.154
				(0.321)	(0.296)	(0.306)
Foreign owned	0.118***	0.0876*	0.0814	0.131***	0.103**	0.111**
	(0.0420)	(0.0486)	(0.0507)	(0.0369)	(0.0437)	(0.0459)
Log employment			0.0101			-0.0107
			(0.0265)			(0.0275)
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	No	Yes	Yes
Observations	140	140	140	140	140	140
N firms	50	50	50	50	50	50
R-squared	0.211	0.262	0.263	0.291	0.324	0.325

Notes: $* < 10\%, ** < 5\%, *** < 1\%$. Comparing the overall management scores of garment firms in author's survey with those in the World Management Survey in Myanmar conducted in 2014. The management scores in WMS is rescaled to a 0-1 scale to compare with the management scores in author's survey. Standard errors are clustered at firm levels and shown in parentheses. Control variables include owner college graduate dummy, owner ethnic Chinese dummy, firm age and external manager dummy.