

Exporting and Firm Performance: Evidence from a Randomized Experiment

David Atkin, Amit K. Khandelwal, and Adam Osman

Appendices for Online Publication

Online Appendix B The Global and Egyptian Rug Industry

The handmade craft industry and the carpet and rug industry are large and important sources of employment in developing economies. Global handmade craft production was estimated at \$23.2 billion in 2005, while world production of carpets and rugs totaled \$32 billion in 2008 (UNCTAD Creative Economy Report, 2010). Egypt is the 11th largest global producer of carpets and rugs with a total production of \$734 million in 2013 (36 percent of Egypt's total textile sector and 1.3 percent of total manufacturing output).¹ More than 17,000 people work in the carpet and rug industry in Egypt, representing 7 percent of world employment in this industry and 1.7 percent of total manufacturing employment in Egypt (UNIDO 2013). Egypt has a revealed comparative advantage in this sector, and in 2013 Egypt's exports in HS57 ("carpets and other textile floor coverings") constituted 1.4 percent of its total exports. The top 5 destinations for these exports are the U.S., Germany, Italy, United Kingdom, and Canada, which together account for 59 percent of total exports in the category. Indirect exporting is common in both the sector and among small firms. As noted in the main text, 2006-2014 World Bank Enterprise Surveys reveal that 36 percent of exporters across countries and sectors use an intermediary (and 62 percent for exporting firms with 5 or fewer employees). Moreover, using Chinese customs data, we are able to obtain the share of exports that go through intermediaries for the specific HS code that the rugs in our study are classified under, HS 570231 ("Carpets and other textile floor coverings, wool").² Exporting via intermediaries is particularly common in the rug industry with 52 percent of exports in HS Code 570231 going through intermediaries compared to 20 percent of overall exports.

Online Appendix C The Rug Production and Marketing Process

The firms in Fowa typically operate out of a rented space or sometimes the home of the owner. The owner is almost always the primary weaver and most firms have no other full time employees, although family members often assist with restringing the loom and the finishing stage. Firms self-identify as specialists in one of four flat-weave rug types: duble, tups, kasaees and goublan. Duble and tups rugs are the most common types, with Tups rugs typically having more elaborate patterns than Duble rugs; kasaees rugs are woven from rags and are the cheapest type; goublan rugs are the most expensive type and are works of art used as wall hangings. See Figure C.1 for pictures of each type.

¹Statistics from Euromonitor International Passport Database, Egypt national statistics, UN and OECD.

²See Ahn et al. (2011) to see how exports through intermediaries are classified in this setting.

The process of producing rugs is standardized across firms. The elements of the production technology are marked in Figure C.2. The rugs are made on a large wooden foot-treadle loom. The width of the loom determines the maximum width of a rug. Rugs can be made of any length. The *warp thread* is the wool or cotton thread that spans the entire length of the rug and must be attached to the loom before rugs can be weaved as part of the restringing process. These threads cannot be seen on the final rug but are necessary to hold the rug together. The warp threads are kept in place using a *reed* which resembles a very large comb. The *weft thread* (typically made from wool) is the visible thread on the rug and is weaved between these warp threads using a shuttle. A foot-operated *heddle* is used to raise every alternate warp thread allowing the weaver to more quickly weave the weft threads between the warp threads. The weaver changes out the weft thread as he weaves based on the needs of the design until the rug is complete. At that point he cuts off the completed rug and continues to utilize the remaining warp thread until the production run of that particular type of rug is finished. Hence, the length of the production run is determined by the amount of warp thread in the warp thread ball attached to the loom.

Duble rugs are the thickest of the rug types and typically made using a reed with 200 openings per meter. In contrast, tups and goublan rugs are more intricate. Goublan rugs usually require a reed with 400 openings per meter and because of the intricate design patterns, weavers use their hands, instead of shuttles, for precision in weaving the weft thread. Tups rugs are also finely woven using a reed with 400 openings per meter but because they are used as floor rugs and have simpler designs, weavers use shuttles to increase the speed of production. Finally, kasaees rugs use reeds with 250 openings per meter but these rugs use left-over cloth (for example, torn up t-shirts) in their weave instead of more expensive wool inputs.

The vast majority of rug producers in Fowa use intermediaries to market their products.³ The baseline survey revealed that 88 percent of firms sell products through one of the intermediaries located in Fowa. We find no statistical difference in the proportion of firms using intermediaries between treatment and control, nor is there a statistically significant difference in the use of intermediaries by firms who had exported at baseline and those who had not. Thus, the reliance on intermediaries is not unique to exports. (And as noted earlier in Online Appendix B, the use of intermediaries more generally is common, particularly for small firms). Finally, the baseline data indicate that the (limited number of) firms who report having manufactured rugs for export markets have lower unadjusted output per hour and higher quality metrics, just as we found for firms induced to export by our intervention.⁴ This evidence suggests that, for the firms in Fowa at least, the process of exporting through Hamis Carpets is similar to the process of exporting through other means.

³In addition to purchasing from producers, some intermediaries employ in-house workers. For example, throughout the project, Hamis employed workers who worked on its premises producing samples as well as orders outside our research project.

⁴A regression of log unadjusted output per hour on having exported at baseline gives a coefficient of -0.224 (s.e. 0.139), while a regression of the mean of all quality metrics on having exported at baseline gives a coefficient of 0.143 (s.e. 0.083).

Figure C.1: Examples of Duble, Tups, Kasaees, and Goublan Rugs



Notes: Figure illustrates the four flat-weave rug types produced by firms in Fowa, Egypt: duble, tups, kasaees, and goublan.

Figure C.2: Production Technology



Online Appendix D Additional Details on Experiment Protocol

In this appendix, we provide a detailed description of the experiment protocol. For completeness, we repeat the details reported in the main text, as well as provide additional information.

Online Appendix D.1 Experiment Protocol

As described in the main text, Hamis Carpets marketed rugs to overseas buyers with ATA's assistance.⁵ Once export orders were secured, we divided the orders into smaller packets. The treatment firms were visited by our survey team and a representative of Hamis carpets, and were offered the opportunity to produce one of these packets of export orders. More precisely, Hamis Carpets showed them the rug design, explained that the carpet would be exported to a high-income country, and offered them an order of 110m² which translates to about 11 weeks of work. The 110m² was chosen by trading off the desire to have a reasonable sized initial order and the need to have enough orders to treat all the treatment firms. Hamis was given discretion regarding what price to offer the treatment firms, and chose prices based on the specifications of the particular rug orders. The initial protocol intended for us to offer this 110m² packet in one go, and for the rug orders to be of the type the firm was specialized in producing. As we discuss in [Online Appendix D.2](#), this was the protocol followed for Sample 2. Given our initial difficulties in generating export orders, in Sample 1 we could only offer duble and kasaees rugs orders, and only by sequentially offering smaller packet sizes that summed to 110m².⁶

If the firm accepted, Hamis delivered the input thread and the correctly sized reed and heddle to ensure all rug orders were consistent across producers. At the same time, as is typical in many buyer-producer relationships, Hamis would discuss the technical aspects of the specific rug order and answer any questions the firm may have. Firms would deliver rugs to Hamis and receive payment upon delivery.

As further export orders were generated, Hamis continued to place them with the treatment firms. Just as in any arms-length transaction, after the initial order amounts were offered, Hamis was not bound to continue to make subsequent purchases from any particular treatment firm if the quality was below par or the previous rugs were not delivered on time.⁷ (And firms were informed of this arrangement.) The experiment protocol simply required Hamis to offer an *initial* order to the treatment firm.⁸ Hamis was not allowed to allocate any orders to control firms and

⁵ATA's grant expired and in September 2012 it formally ended its involvement in this project and closed its Cairo office. However, Hamis Carpets agreed to continue participating in the research experiment after ATA exited for several reasons. First, we sponsored the CEO's visit to the New York International Gift Fair in January 2013. Second, we provided a quarter of the capital (\$7,000) to finance a sample order for a new client which was ultimately unsuccessful. Third, we provided \$500 a month to offset costs of participating in the experiment (conducting rug quality surveys, filling out order books etc.). Finally, the CEO believes that showing how exporting improves the livelihoods of the local population will be good for promoting Fowa's weaving industry.

⁶As kasaees rugs are substantially quicker to produce we offered an initial packet size of 250m² to Kassaees producers.

⁷On a more practical note, it would also have been infeasible to demand that Hamis continue to work with a firm that was clearly not able to produce at an acceptable standard. Hamis' foreign buyers are demanding and would not accept subpar rugs.

⁸In cases in which the treatment firms were unable to produce the rugs at the quality level required by Hamis Carpets, the research team would reimburse Hamis carpets the cost of the materials that were used in the first 110m².

we maintained a project coordinator and survey team in Fowa to ensure that the protocols were followed.⁹ Thus, the intervention provided treatment firms with the opportunity to produce rugs for the export market.

Online Appendix D.2 Sample, Randomization and Take up

Since there is no official census of firms that manufacture rugs in Fowa, we hired a Fowa-based NGO to go street by street looking for rug-making firms in homes and workshops that satisfied the following characteristics: a) had fewer than 5 employees; b) worked on their own account (meaning that they bought their own inputs when an order required); c) had never previously worked with Hamis, and d) were willing to participate in a research experiment on exporting. We stopped the recruitment drive when the NGO had identified 300 firms. As there are far more than 300 rug-making firms in Fowa, the first recruitment drive provided us with a sample of firms in central areas of Fowa that were operating and observable at the time of recruitment. This exercise produced a list of 303 firms, which we refer to as “Sample 1”.

Firms specialize in one of four rug types. We stratified the sample on the type of rug produced and the loom size. Within each stratum we randomized firms into treatment and control using a random number generator and strata that contained an odd number of firms were assigned one more firm to control than to treatment. The first two rows of columns 2, 3, 4 and 6 in Table 1 show the total number of firms by rug type and treatment status for Sample 1. The third row of Table 1 shows the takeup status for these firms. As anticipated by our decision to stratify along this dimension, takeup rates varied greatly depending on the firm’s primary rug type. For goublain and tups producers, the two rug types for which we obtained no orders, takeup rates were 10 and 19 percent, respectively. We expected low take up in these strata since these firms do not typically produce duble or kasaees rugs. Nevertheless, we attempted to treat these firms and found that very few were willing to switch rug types. In follow-up round 2, we asked all treated firms who did not take up why they did not take up. Table F.1 presents these results. The main reason for refusals among goublain and tups firms was that the export rug order “was not the suitable rug type”. While this could mean that either the rug category (i.e. duble, tups, kasaees, goublain) was not suitable, or that the export rugs had sufficiently different specifications such that firms perceived them to be a different rug type, we take this as confirmatory evidence.

Table 1 shows that among kasaees and duble rug producers in Sample 1, take up was 26 and 38 percent, respectively. These takeup rates were still relatively low. As we detail in Section 2.2, between December 2010 and May 2012 we were able to generate a small number of export orders for kasaees and duble rugs (see Figure 3). However, given the small number of export orders, we were unable to approach treatment firms in Sample 1 with the opportunity to produce the full 110m² in one go. Instead, we had to sequentially offer smaller orders of 10-20m², or about two weeks of work. Because these orders were small, many firms were unwilling to work with us:

This happened in only 3 cases, and in none of Duble producing-firms that comprise the Joint Sample we use in the paper (see Table 1).

⁹As noted in the draft, one control firm was incorrectly treated due to an error by Hamis. In the empirical analysis we make the most conservative assumption and keep this firm in the control group.

Table F.1 shows that the most common reason why duple firms did not take up was an unwillingness to jeopardize their existing relationships with other intermediaries for a small amount of work, and that the export order was not the suitable rug type (presumably because of the very different export specifications). Many kasaees producers were unwilling to accept the export order for the same reason (i.e. because there are several distinct types of kasaees and the particular rug they were asked to produce was different from the kasaees rugs they usually make).

From March 2013, Hamis' major buyers offered assurances that they would continue to place duple rug orders for the foreseeable future so it became feasible to offer the opportunity to produce 110m² in one go. Since this was the intended treatment in our experimental protocol, we conducted a second round of recruitment for firms that specialized in duple rugs. At this stage of the project, we had an experienced Fowa-based team who were able to locate an additional 140 duple firms in Fowa that had been not been found during the initial recruitment drive in July 2011. To our knowledge, these were all the remaining duple rug producers in Fowa with the exception of ten firms who refused to participate. We refer to these additional firms as "Sample 2" and again stratified these firms by loom size. We randomized 35 firms into the treatment group using a random number generator. The choice of 35 treatment firms for Sample 2 was dictated both by Hamis' constraints on the number of firms it could work with, and our desire to ensure that the full 110m² could be offered to each treatment firm. Column 5 of Table 1 reports treatment and takeup statistics for Sample 2. Consistent with the low take up in Sample 1 being due to the inability to offer the full 110m² packet in one go, 32 out of 35 treatment firms in Sample 2 took up the opportunity to produce export orders.¹⁰

We combine the duple strata from Sample 1 with the firms in Sample 2—who are exclusively duple firms—to form the *Joint Sample* of 219 firms (74 in treatment, 47 of which took up). This is almost every duple producer in Fowa which mitigates concerns of internal validity that would arise if we focused only on the second sample that was treated with the full 110² initial order in one go. This is essentially all the duple producers in Fowa willing to identify themselves to our surveyors (minus ten firms who refused to participate). By focusing on the Joint Sample instead of only Sample 2 (the sample that received the treatment closest to the one we initially intended) we mitigate internal validity concerns arising from unobservable differences between the two samples. (Although we secured some initial orders for kasaees rugs, we exclude them from the analysis because we were unable to secure further export orders for this type of rug and so could not offer any follow-up orders for the 5 firms who took up.)

As noted above, the experiment protocol allowed Hamis Carpets to end their relationship with firms that did not produce the 110m² packet at the expected quality level and in a timely manner. The 5th row of Table 1 reports the number of "successful" takeup firms, defined as those who produced 110m² and then received subsequent orders from Hamis. Only 3 treatment firms (all non-duple firms in Sample 1) failed to secure additional orders from Hamis after the initial treatment. Two of the firms were unable to manufacture the export orders successfully while the other

¹⁰30 of the 35 Sample 2 treatment firms took the offer up immediately in March 2013. The 2 remaining firms began producing orders for Hamis in May 2014. This delay was due to capacity constraints on the side of Hamis.

firm had a falling out with the owner of Hamis.

Samples 1 and 2 do differ on some observables. On average, Sample 2 firms have higher profits and consumption, although similar quality levels and output. These differences may be due to the fact that recruitment was carried out sequentially, so that Sample 2 firms were more difficult to find or less centrally located. However, there are no significant differences in observables between treatment and control groups within either sample as can be seen in Table F.1, or in the Joint Sample of double firms as can be seen in Table 3. We also find that the estimated treatment-on-the-treated (TOT) effects do not differ across samples (we compare TOTs since ITTs will vary due to differences in take up rates). Out of the 44 comparisons of TOTs between the two samples, only three are statistically significant at the 10 percent level and one is statistically significant at the 5 percent level (in line with the number of type 1 errors we would expect).

Online Appendix D.3 Protocol for Quality Lab

In June 2014, we rented a workshop with a loom and invited the primary weaver in all the treatment and control firms in the Joint Sample to come to the workshop to produce an identical rug. The rug specifications mimicked a popular rug design sold at mid-tier domestic retail outlets in Egypt (a 140cm by 70cm rug with a desired weight of 1750g, and the master artisan assigned a difficulty rating of 3—see Figure 2 for the actual design). Prior to the arrival of the firm’s weaver (all of whom were the firm’s owners), our field team prepared the loom for weaving with the help of the master artisan. We provided all the necessary thread, reed and heddle inputs. Thus, each firm used an identical loom, an identical loom setup, and identical inputs to manufacture an identical rug.

This setup was not unusual. Some large intermediaries in Fowa have workshops where they bring producers to and pay them to weave. Nonetheless, our Quality Lab differed in that we invited firms to produce a single rug, instead of many meters of rugs as is the market norm. To mitigate potential Hawthorne effects, where the firms act differently because they know they are being analyzed, we excluded Hamis Carpets from being involved in administering the Quality lab, from participating in contacting the firms, and from encouraging them to participate. Instead, we hired a new staff member to administer the Quality Lab, and he was instructed to invite sample firms to produce a rug at the rented workshop for a LE70 payment, which is about three times the average price for a rug of these specifications. The firms were told that the reason why this lucrative opportunity existed was because there was a buyer in Cairo that was interested in making a one-time purchase of one rug from each of the many producers in Fowa. This claim was truthful, as one of the authors was in Cairo at the time, serving the role of that buyer. There was no mention of Hamis Carpets and no discussion of whether performance in the lab would affect future orders from Hamis.

The firms were shown to the Quality Lab and provided the design and specifications of the rug. The firms were not incentivized to produce quality in any way, nor were they encouraged to produce quickly or slowly, or given a time limit. They also were not given any reason to believe that their performance on this task would impact future opportunities to produce for this buyer,

or given any information about the desired quality of the rug. They were not even told they were being evaluated in any way. Firms were simply informed that as long as they completed the rug they would be given LE70 as promised. Our protocols directed the new staff member to interact with the treatment and control group firms in an identical manner; from the way they were recruited, to how they were told about the LE70 payment, and to the instructions they were given about what type of rug to produce.

The total time taken to weave the rug was recorded and after the rug was completed, the staff member recorded the length, height and weight of the rug, and tagged each rug with a new set of firm identification numbers. After all firms had manufactured the rugs, they were sent to the master artisan to score the quality levels without revealing the master artisan the identity of the firm that made them (only the anonymized identification number). In addition, the rugs were sent to Professor Fayrouz Al-Gamal, a Professor of Handicraft Science from Domietta University, to provide an independent set of quality scores. Professor Al-Gamal has been the chair of the “Spinning, Weaving and Knitting Department” at the Domietta University since 2013 and is an expert in jacquard knitting techniques. He has contributed technical chapters to eight published books, and presented his work at a dozen academic conferences in the last five years.

Online Appendix E Profit Measures

Following [de Mel et al. \(2009\)](#), we construct four measures of profits. The first measure directly records reported profits from the previous month. Firms were asked: “What was the total income from the rug business last month after paying all expenses (inputs, wages to weavers but excluding yourself). That is, what were your profits from this business last month?”

The second measure constructs profits from two survey questions that ask firms to report their total revenues and total costs from the previous month.

The third measure constructs profits from the production modules that contain detailed information on prices and quantities of inputs and outputs, which we refer to as “constructed profits”. This measure is valuable if there is less noise in recalling prices and quantities than total revenues and expenses. This measure is also free of the concern that firms might use business expenses for household consumption (or use business revenues to pay for household expenses) that may be an issue for the other two measures.

The fourth measure is based on a hypothetical question that asks firms how much they would earn from selling a specific quantity of inputs. Specifically, we construct “hypothetical profit” by asking firms how much it would cost to purchase 25 kilograms of the thread they used in the previous month, how long it would take to weave this output, and how much they would earn from selling the output. Although not the realized profits of the firm, this measure alleviates potential concerns regarding the timing of when revenues are earned and costs are incurred, and serves as a check against the other three profit measures.

Online Appendix F Additional Tables and Figures

Table F.1: Reasons for Refusing Treatment, Sample 1

Reasons for Refusal	Goublain Firms		Tups Firms		Kasaees Firms		Duble Firms		All Firms	
	N	%	N	%	N	%	N	%	N	%
(Agreed)	3	6.1	6	14.3	5	26.3	15	38.5	28	18.8
Risk relationship with current intermediary	2	4.1	1	2.4	2	10.5	7	17.9	12	8.1
Price was too low	2	4.1	1	2.4	2	10.5	3	7.7	9	6.0
Left industry or passed away	2	4.1	3	7.1	3	15.8	5	12.8	13	8.7
Export order not suitable rug type	39	79.6	30	71.4	6	31.6	7	17.9	82	55.0
Refused contact with survey team	1	2.0	1	2.4	1	5.3	2	5.1	5	3.4
Total	49	100	42	100	19	100	39	100	149	100

Notes: Table reports the reasons for refusing treatment orders among Sample 1 firms as reported in the second survey round (April-May 2012). As of the second survey round, 28 firms had agreed to take orders. Since that time, an additional duble firm, two additional goublain firms and two additional tups firms have also taken orders resulting in a total of 33 Sample 1 firms takeing up.

Table F.2: Hamis Carpets' Cost Structure

	Revenue and Expenses, Egyptian Pounds per m ²	
	Domestic Orders	Export Orders
Material Expenses	30	40
Payments to Producers	25	40
Shipping Costs	0	40
Price Received	60	160
Markup	9%	33%

Notes: Table reports Hamis Carpets' cost structure on foreign and domstic rugs. Numbers reported in Egyptian Pounds per square meter. The final row indicates self-reported markups on domestic and export orders.

Table F.3: Attrition by Survey Round and Sample

	Control Group		
	Mean	Treatment	Obs.
Attrition in All Follow Up Survey Rounds	0.11 (0.01)	0.00 (0.02)	815
Attrition in Round 1, Sample 1 (Nov-Dec 2011)	-	-	
Attrition in Round 2, Sample 1 (April-May 2012)	0.15 (0.06)	-0.05 (0.08)	79
Attrition in Round 3, Sample 1 (Sept-Dec 2012)	0.10 (0.05)	0.03 (0.07)	79
Attrition in Round 4, Sample 1 (March-Apr 2013)	0.18 (0.06)	0.03 (0.09)	79
Attrition in Round 1, Sample 2 (May-June 2013)	0.05 (0.02)	-0.03 (0.04)	140
Attrition in Round 5, Sample 1 (July-Oct 2013)	0.20 (0.07)	0.05 (0.10)	79
Attrition in Round 2, Sample 2 (Nov-Dec 2013)	0.02 (0.01)	0.01 (0.03)	140
Attrition in Round 6, Sample 1 (Jan-March 2014)	0.28 (0.07)	0.03 (0.10)	79
Attrition in Round 3, Sample 2 (May-June 2014)	0.07 (0.02)	-0.03 (0.04)	140

Notes: Table reports attrition across all follow up survey rounds and then reports attrition separately by round, in chronological order. Attrition is defined as a firm not having answered the survey in a particular round. Statistics regarding Sample 1 only report attrition for the Sample 1 double firms that appear in the Joint Sample. As discussed elsewhere, we do not include Round 1 data for Sample 1 due to evidence of enumerator misconduct. Significance * .10; ** .05; *** .01.

Table F.4: Geographic Spillovers to Control Firms

	Sum of Inverse Distance to Treatment Firms	Sum of Inverse Distance Squared to Treatment	Marginal Effect	R-Squared	Obs.
Ever Exported	-0.2 (0.9)	16.3 (40.2)	6.8 (16.4)	0.12	128
Direct Log Monthly Profits	-0.9 (1.3)	0.3 (43.2)	-0.8 (17.2)	0.26	368
Direct Log Profits per Hour	-0.5 (1.4)	-40.5 (47.5)	-17.7 (19.0)	0.18	368
Log Output per Hour	-1.3 (1.0)	37.3 (36.9)	19.1 (16.4)	0.08	427
Stacked Quality	0.6 (0.4)	-7.1 (15.9)	-2.4 (6.4)	0.06	4,408
Log Unadjusted TFP	-1.5 (1.9)	103.0 * (59.3)	42.0 * (23.9)	0.22	418
Log Adjusted TFP	-1.7 * (1.0)	55.4 (42.5)	21.9 (17.3)	0.10	421

Notes: Table reports results from regressing the outcome variable in each row on the sum of the inverse distance between control firms and all treatment firms and the sum if the inverse distance squared to all treatment firms (with distance measured in meters). The third column shows the marginal effect of distance on the outcome based on the results from the regression. Regressions include round and strata fixed effects and control for baseline values. The stacked quality regression includes quality metric fixed effects. Standard errors clustered at the firm level. Significance * .10; ** .05; *** .01.

Table F.5: Key Results with Firm Fixed-Effects Instead of Baseline Controls

	ITT (1)	TOT (2)	R-squared (3)	Obs. (4)
Ever Exported	0.53 *** (.12)	0.74 *** (.10)	0.71	410
Direct Log Monthly Profits	0.30 ** (.12)	0.47 *** (.16)	0.57	874
Direct Log Profits per Hour	0.28 ** (.12)	0.44 *** (.16)	0.48	874
Log Stacked Quality	1.04 *** (.10)	1.58 *** (.09)	0.61	8,931
Log Output per Hour	-0.18 (.12)	-0.31 (.20)	0.04	901
Log Unadjusted TFP	-0.26 ** (.12)	-0.44 ** (.20)	0.04	890
Log Specification-Adjusted Stacked Quality	0.71 *** 0.09	0.88 *** 0.08	0.30	8,389
Log Specification-Adjusted TFP	0.26 ** (.12)	0.43 ** (.20)	0.15	298

Notes: Table reports treatment effects on eight main outcomes for the Joint Sample of duble firms using firm fixed effects instead of controlling for the baseline value of the variable. All regressions include firm and round fixed effects, and cluster standard errors by firm. Significance * .10; ** .05; *** .01.

Table F.6: Treatment Dynamics

	Log Direct Profits (1)	Log Direct Profits per Hour (2)	Log Output per Hour (3)	Log Unadjusted TFP (4)	Log Specification- Adjusted TFP (5)	Log Specification- Adjusted Quality (6)
Treatment	0.28 *** (0.08)	0.23 *** (0.07)	-0.26 ** (0.11)	-0.29 *** (0.10)	0.19 * (0.10)	0.44 *** (0.06)
x 2nd Survey Round	-0.03 (0.10)	-0.06 (0.09)	0.16 (0.12)	0.18 (0.12)	0.13 (0.11)	0.01 (0.06)
x 3rd Survey Round	-0.07 (0.10)	-0.12 (0.09)	-0.05 (0.13)	-0.08 (0.12)	-0.01 (0.11)	0.01 (0.07)
x 4th Survey Round	-0.07 (0.16)	-0.04 (0.15)	-0.26 (0.24)	-0.31 (0.23)	-0.33 * (0.18)	-0.10 (0.11)
x 5th Survey Round	0.27 * (0.16)	0.27 * (0.15)	0.17 (0.24)	0.13 (0.21)	0.07 (0.15)	-0.21 * (0.11)
R-squared	0.22	0.15	0.18	0.27	0.13	0.18
Observations	573	573	687	674	669	6,860

Notes: Table reports treatment effects interacted with dummies for each round of data collection. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.7: Summary Statistics for Intermediary-Firm Information Flows

	(1)
Number of Visits	11.0 (2.57)
Length of Visit (in minutes)	27.6 (4.88)
Discussed technique (as opposed to pointing out flaws)	90.3%
Observations	44

	Discussed Metric (1A)	Discussed Technique (2A)
Corners	31.8%	100.0%
Waviness	20.5%	100.0%
Weight	54.5%	92.9%
Touch	11.4%	100.0%
Packedness	20.5%	93.8%
Warp Thread Tightness	47.7%	78.9%
Firmness	31.8%	100.0%
Design Accuracy	50.0%	96.2%
Warp Thread Packedness	22.7%	75.0%
Observations	44	

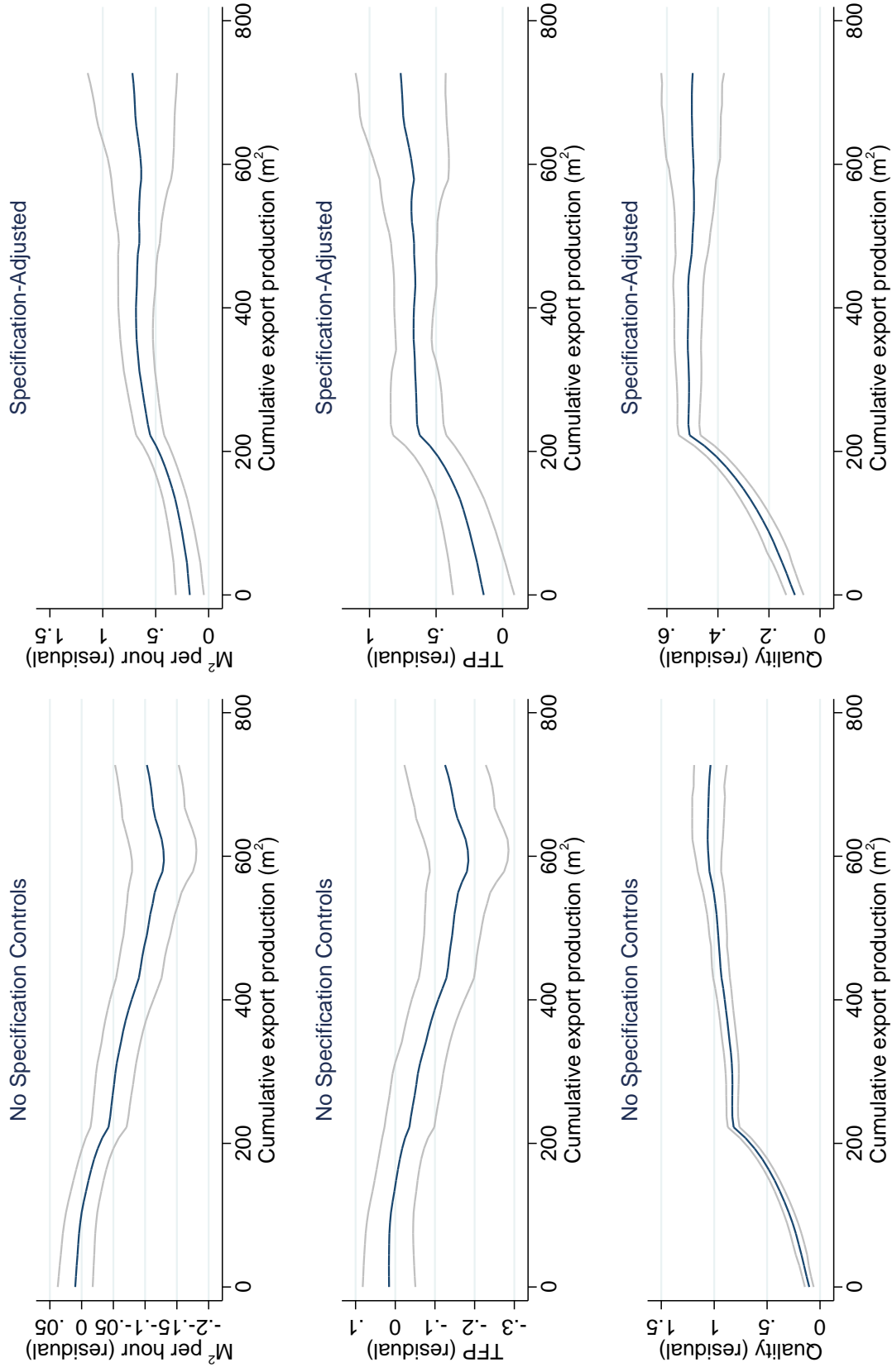
Notes: Table summarizes the data collected about knowledge flows between the intermediary and the firms. All firms were visited at least 7 times, and the top panel reports the average length of each visit in minutes (with standard deviations in parentheses), and the proportion of interactions that discuss technique, rather than simply pointing out flaws. The bottom panel reports the proportion of firms that report discussing the quality metric with the intermediary and, conditional on discussing that metric, the proportion of firms that report that the intermediary discussed techniques to improve along that dimensions rather than simply pointing out flaws. Note that these data were collected before two take-up firms in Sample 2 began producing for export.

Table F.8: Quality Hedonic Regression

	Log Profits Per Hour (1)
Corners	0.08 (0.06)
Waviness	-0.044 (0.06)
Weight	-0.027 (0.05)
Touch	0.189 ** (0.07)
Packedness	-0.150 ** (0.07)
Warp Thread Tightness	0.173 ** (0.08)
Firmness	-0.103 (0.08)
Design Accuracy	0.106 * (0.05)
Warp Thread Packedness	0.032 (0.06)
P-Value of Joint F-Test	0.013
R-squared	0.587
Observations	563

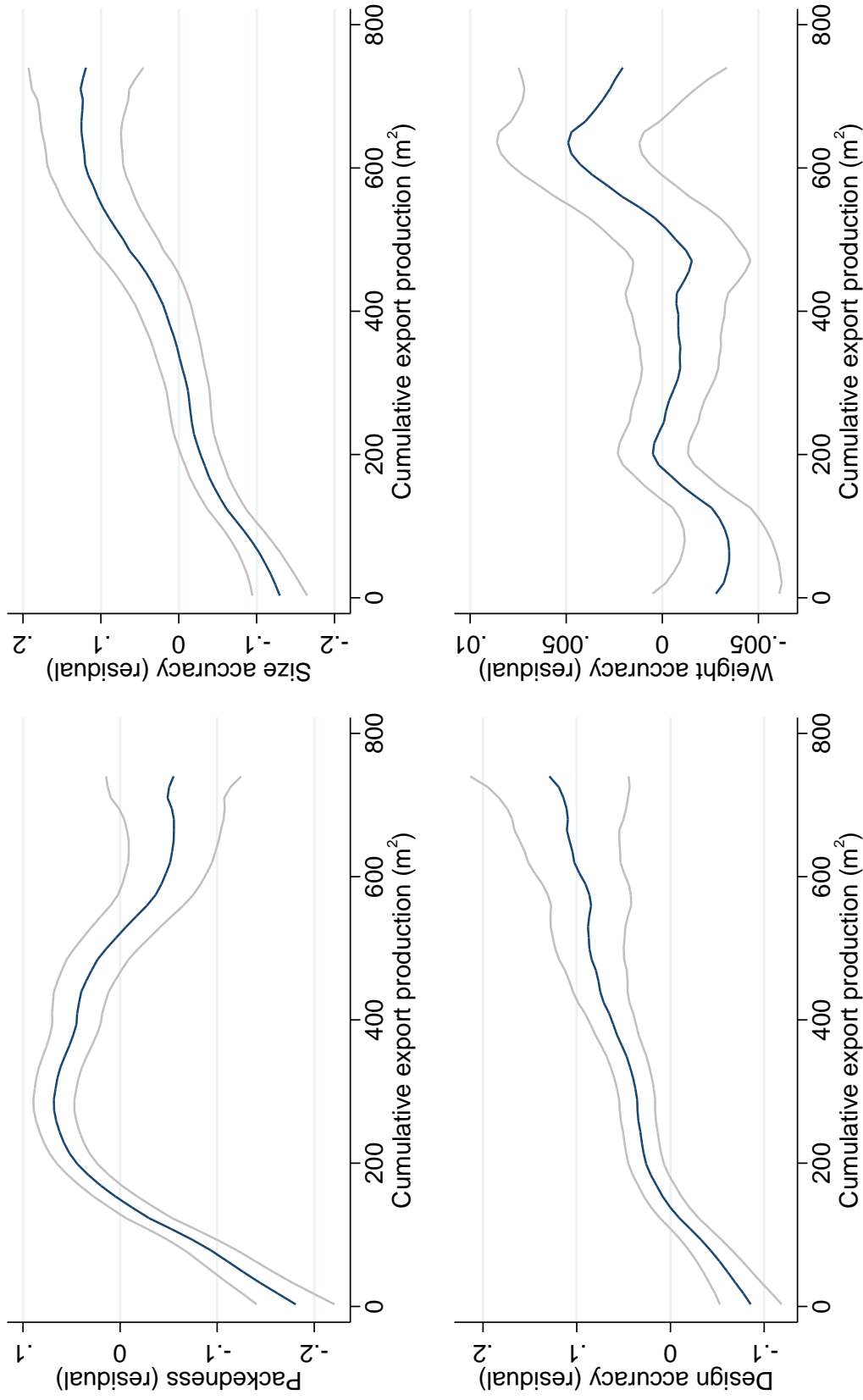
Notes: Table reports the regression of log profits per hour on the nine quality metrics that are recorded in Step 2. The regression is run on all firms producing for the domestic market (the non-takeup firms). Regressions also include strata and round fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Figure F.1: Semi-Parametric Learning Curves for Takeup Firms



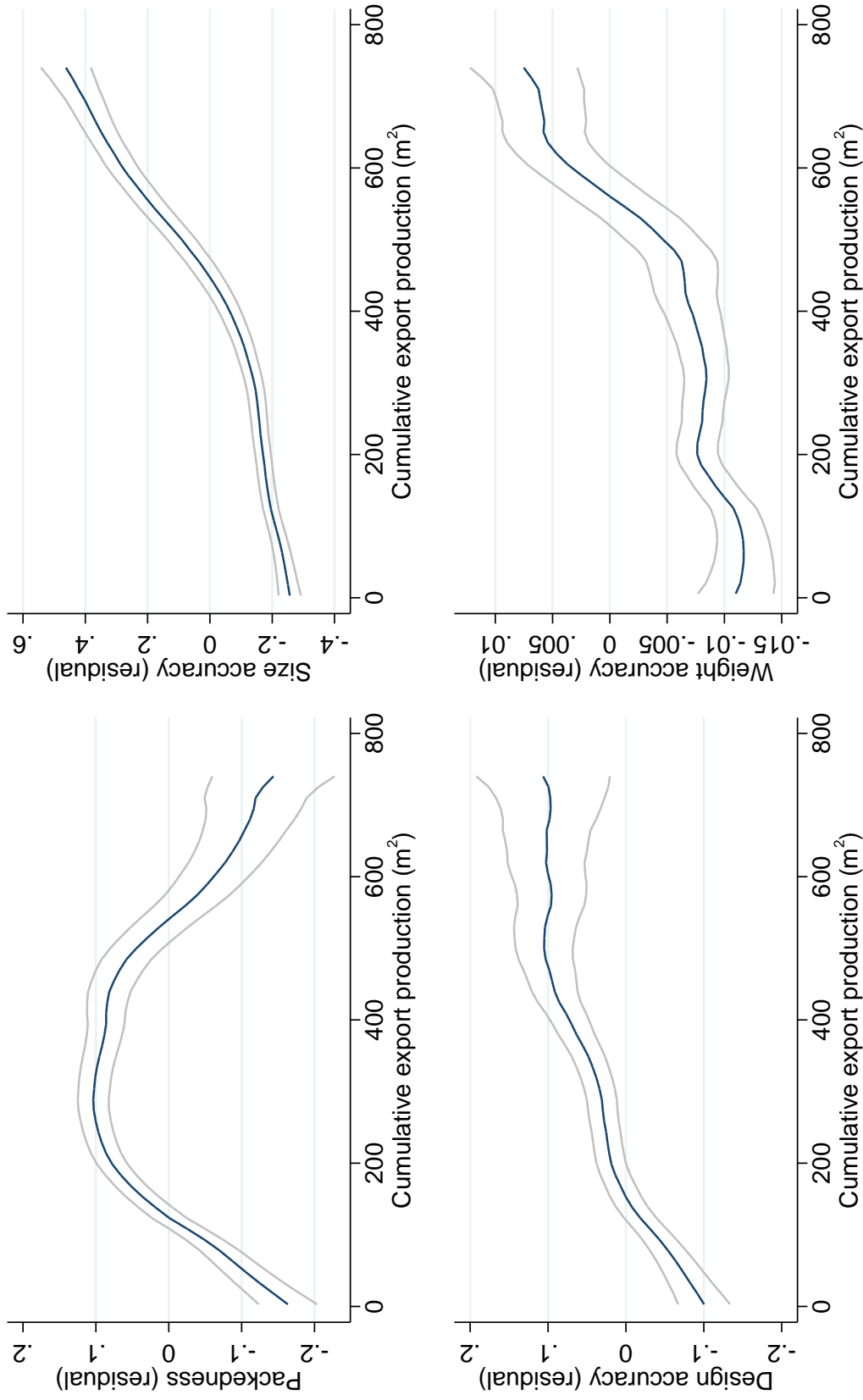
Notes: Figure plots learning curves for quality and productivity measures removing firm and round fixed effects using the partially linear panel data estimator proposed by Baltagi and Li (2002). We present non-parametric plots of the residuals against cumulative export production for takeup firms. Figure restricts attention to range of cumulative exports achieved by Sample 2 firms.

Figure F2: Learning Curves using High-Frequency Order-Book Data for Takeup Firms



Notes: Figure plots learning curves obtained by regressing high-frequency quality measures on firm fixed effects and then plotting a kernel-weighted local polynomial of the residuals against cumulative export production for takeup firms. Quality measures are recorded by the intermediary firm Hamis Carpets for each batch of rugs delivered by each firm (often at a weekly frequency). Weight accuracy is defined as the negative of the absolute value of the difference between the actual weight and the weight specified by the buyer. Figure restricts attention to range of cumulative exports achieved by Sample 2 firms.

Figure F.3: Semi-Parametric Learning Curves using High-Frequency Order-Book Data for Takeup Firms



Notes: Figure plots learning curves for high-frequency quality measures removing firm fixed effects using the partially linear panel data estimator proposed by Baltagi and Li (2002). We present non-parametric plots of the residuals against cumulative export production for takeup firms. Quality measures are recorded by the intermediary firm Hamis Carpets for each batch of rugs delivered by each firm (often at a weekly frequency). Weight accuracy is defined as the negative of the absolute value of the difference between the actual weight and the weight specified by the buyer. Figure restricts attention to range of cumulative exports achieved by Sample 2 firms.

Figure F.4: Total Export Production CDFs

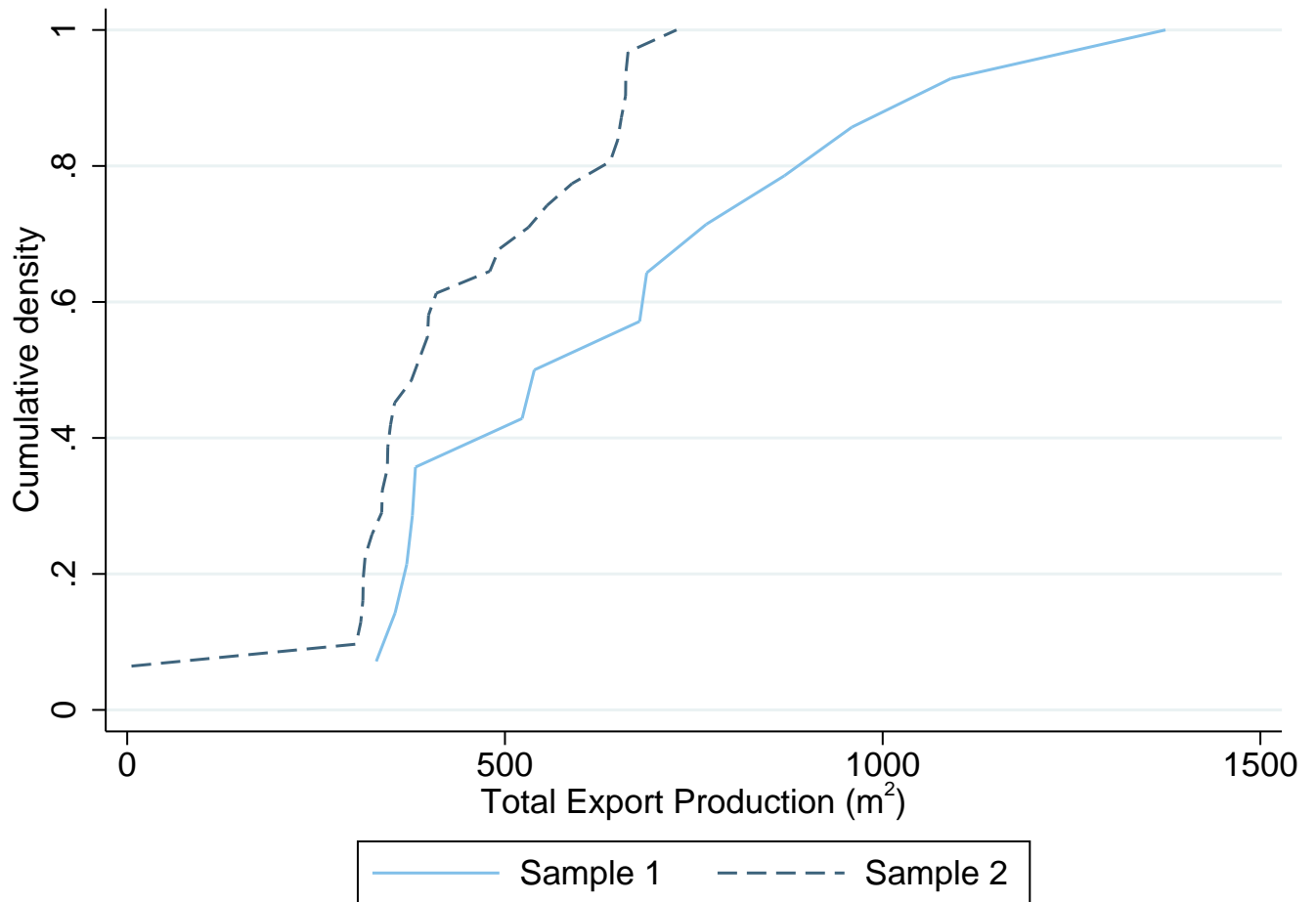


Figure F.5: Cumulative Exports and Days Since First Order

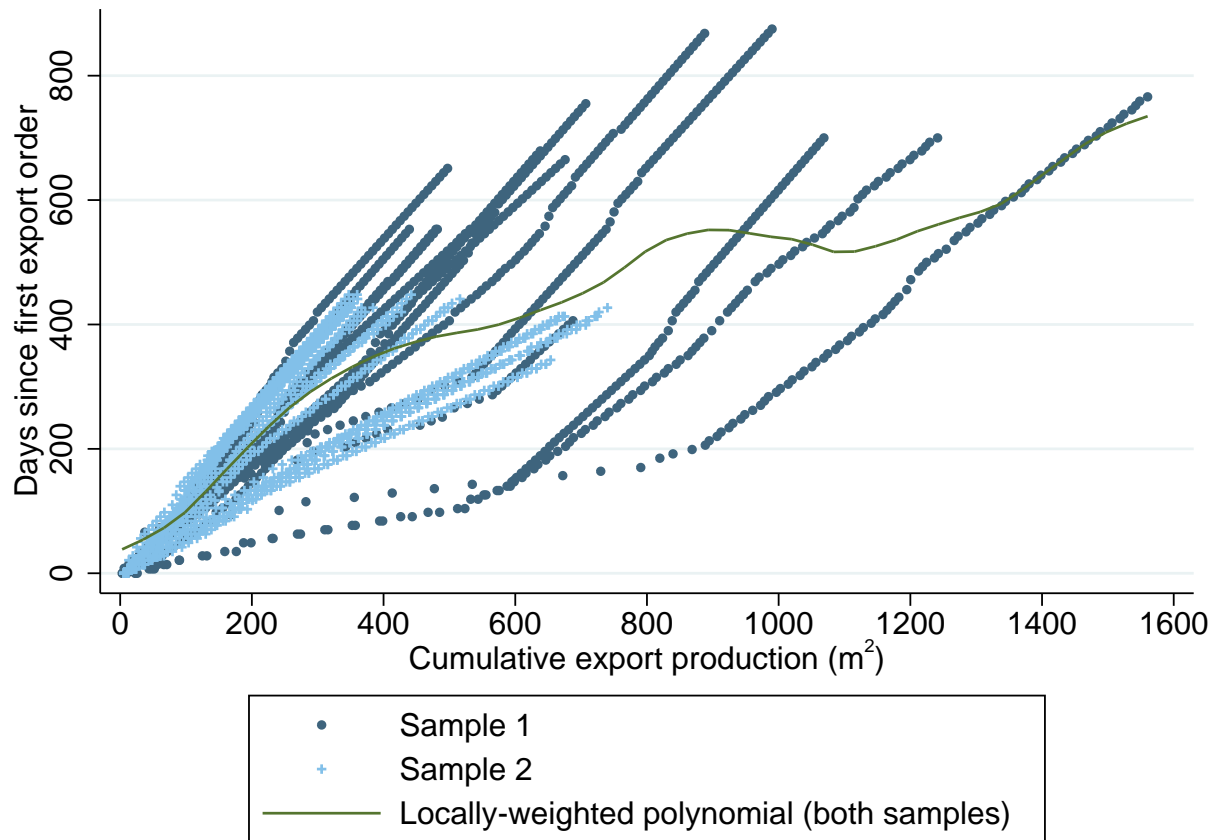


Figure F.6: Quality Problems Noted by Overseas Buyer



Online Appendix G Results for Sample 1 duple firms, Sample 2 firms, and Sample 1 non-duple firms

Tables F.1-F.10 and Figures F.1-F.2 in this appendix repeat the key tables and figures from the main text but now splitting the Joint Sample into Sample 1 duple firms and Sample 2 firms (recall all Sample 2 firms are duple firms). Table F.11 reports the treatment effects for the non-duple firms in Sample 1 who we were not able to provide with sufficient orders in their specialist rug type.¹¹

¹¹Due to funding constraints, we stopped regular data collection on non-duple producers after round 3. We did, however, collect data in round 5 (effectively the endline round) for the tups and kasaees strata but for budgetary reasons we did not include the goublan strata as they had the lowest takeup of all strata.

Table F.1: Baseline Balance for Samples 1 and 2 (Appendix to Table 3)

	Sample 1			Sample 2		
	Control Group Mean	Treatment	Obs.	Control Group Mean	Treatment	Obs.
Panel A: Household Characteristics						
Age	51.4 (1.1)	-1.5 (2.2)	79	50.7 (1.0)	2.8 (2.2)	139
Number of years in rug business	39.3 (1.1)	-2.0 (2.3)	77	36.8 (1.1)	1.9 (2.5)	136
Illiterate?	0.70 (0.05)	0.14 (0.10)	79	0.59 (0.04)	0.07 (0.10)	135
Household size	4.5 (0.2)	-0.1 (0.3)	79	4.1 (0.1)	0.1 (0.3)	140
Household income	1,100.0 (137.0)	-121.0 (278.0)	79	1,090.0 (120.0)	226.0 (340.0)	140
Digit Span Recall	5.0 (0.1)	-0.1 (0.2)	72	6.3 (0.1)	0.5 (0.3)	132
Panel B: Firm Characteristics						
Price per square meter	38.7 (8.6)	13.0 (17.5)	79	25.4 (1.8)	2.1 (3.9)	139
Direct monthly profits from rug business	266 (75.3)	40.2 (153.0)	79	862 (39.5)	-16.6 (86.0)	139
Reported monthly profits from rug business	714 (79.4)	-8.8 (162.0)	78	858 (39.9)	-11.5 (86.2)	139
Hours worked last month	208 (11.5)	-5.7 (23.3)	79	269 (5.1)	1.3 (10.8)	139
Number of employees	1.25 (0.08)	0.00 (0.17)	79	1.00 -	-	139
Total produced last month (m ²)	61.3 (10.9)	7.11 (22.15)	79	43.6 (2.4)	0.3 (5.8)	139
Ever exported?	0.03 (0.02)	0.00 (0.04)	79	0.17 (0.03)	0.03 (0.08)	140
Average Quality	0.22 (0.05)	-0.18 ** (0.08)	78	0.19 (0.03)	-0.09 (0.06)	140
Constructed monthly profits from rug business				865 (42.6)	-35.6 (87.4)	139
Hypothetical monthly profits from rug business				365 (26.5)	-3.6 (57.7)	139
Joint F-test	1.01			1.37		

Notes: Table presents baseline balance for Sample 1 double-firms (left panel) and the Sample 2 (right panel). Each row is a regression of the variable on a constant, treatment dummy and strata fixed effects; the constant (control group mean) and treatment dummy are reported. The last row reports the F-test for a regression of the treatment dummy on all 14 baseline balance variables. Profits and price are winsorized at the 1st and 99th percentile to trim outliers (without winsorizing, the sample still remains statistically balanced between treatment and control groups). The standard error and treatment dummy for "number of employees" in Sample 2 are missing because every firm had one employee, inclusive of the owner. Constructed profits and hypothetical profits were not collected at baseline for sample 1. Significance * .10; ** .05; *** .01.

Table F.2: Impact of Intervention on Firms Knowingly Exporting: Sample 1 and Sample 2
(Appendix to Table 4)

	Sample 1		Sample 2		TOT Comparison
	ITT (1)	TOT (2)	ITT (3)	TOT (4)	
Indicator for Ever Exported	0.31 ** (0.12)	0.79 *** (0.25)	0.68 *** (0.07)	0.75 *** (0.07)	0.90
R-squared	0.12	0.34	0.45	0.49	
Control Mean	0.19	0.19	0.20	0.20	
Observations	59	59	132	132	

Notes: Table regresses an indicator for if a firm has ever knowingly produced rugs for export markets on indicators for treatment (columns 1 and 3) or takeup (columns 2 and 4). The question was asked in Round 5 for Sample 1 and Round 3 for Sample 2. The TOT regressions instrument takeup with treatment. The last column reports the p-value from the statistical test of equivalence of the TOT coefficients between the two samples. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Significance * .10; ** .05; *** .01.

Table F.3: Impact of Exporting on Firm Profits: Sample 1 and Sample 2 (Appendix to Table 5)

Panel A: Profits (in Month Prior to Survey)

Outcome Variable:	Sample 1				Sample 2				
	ITT (1)	TOT (2)	Control Mean (3)	Obs. (4)	ITT (5)	TOT (6)	Control Mean (7)	Obs. (8)	P-Value of TOT Comparison (9)
Log Direct Profits	0.27 ** (.11)	0.83 ** (.33)	890	198	0.25 *** (.06)	0.30 *** (.07)	951	375	0.11
Log (Reported Revenues - Reported Costs)	0.22 ** (.11)	0.71 ** (.33)	892	269	0.23 *** (.05)	0.28 *** (.06)	955	375	0.21
Log (Constructed Revenues - Constructed Costs)	0.14 (.10)	0.48 (.34)	940	310	0.24 *** (.05)	0.29 *** (.07)	957	375	0.59
Log Hypothetical Profits	0.39 ** (.18)	1.29 ** (.64)	465	314	0.36 *** (.10)	0.44 *** (.12)	586	373	0.19

Panel B: Profits per Owner Hour (in Month Prior to Survey)

Outcome Variable:	Sample 1				Sample 2				
	ITT (1)	TOT (2)	Control Mean (3)	Obs. (4)	ITT (5)	TOT (6)	Control Mean (7)	Obs. (8)	P-Value of TOT Comparison (9)
Log Direct Profits	0.24 ** (.10)	0.74 ** (.30)	3.48	198	0.17 *** (.05)	0.21 *** (.06)	3.56	375	0.09
Log (Reported Revenues - Reported Costs)	0.21 ** (.10)	0.66 ** (.30)	3.49	262	0.15 *** (.05)	0.19 *** (.06)	3.58	375	0.12
Log (Constructed Revenues - Constructed Costs)	0.15 * (.09)	0.52 * (.30)	3.50	309	0.16 *** (.05)	0.19 *** (.06)	3.58	375	0.28
Log Hypothetical Profits	0.29 ** (.11)	0.98 ** (.38)	4.80	314	0.21 *** (.07)	0.26 *** (.08)	6.01	373	0.07

Notes: Table reports treatment effects on different measures of real profits in the month prior to the date of the survey, all measured in logs, separately for Sample 1 double-firms and Sample 2. See text for descriptions of each measure. Dependent variable in Panel A is profits. Dependent variable in Panel B is profits per owner hour. Owner hours include the hours of family member production when recorded. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Control group means are reported in levels in Egyptian pounds (LE) in Panel A and LE/hour in Panel B. The TOT regressions instrument takeup with treatment. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.4: Sources of Changes to Firm Profits: Sample 1 and Sample 2 (Appendix to Table 6)

Panel A: Components of Profits

Outcome Variable:	Sample 1				Sample 2				P-Value of TOT Comparison
	ITT	TOT	Control Mean	Obs.	ITT	TOT	Control Mean	Obs.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log Output Prices (LE/m ²)	0.40 ** (0.18)	1.36 ** (0.65)	26.4	315	0.46 *** (0.10)	0.56 *** (0.12)	29.3	376	0.23
Log Output (m ²)	-0.30 * (0.16)	-1.01 * (0.59)	74.7	301	-0.22 ** (0.09)	-0.27 *** (0.10)	57.9	375	0.21
Log Monthly Hours Worked	0.01 (0.03)	0.03 (0.10)	265.0	303	0.08 *** (0.02)	0.10 *** (0.03)	272.0	375	0.57
Number of Employees	0.01 (0.01)	0.01 (0.01)	1.0	319	0.00 .	0.00 .	1.0	376	.
Log Number of Looms	0.01 (0.07)	0.04 (0.22)	1.2	318	-0.06 *** (0.01)	-0.07 *** (0.02)	1.1	376	0.62
Log Warp Thread Ball (kg)	-0.01 (0.20)	-0.03 (0.68)	5.2	311	0.13 ** (0.05)	0.15 ** (0.06)	6.3	377	0.13

Panel B: Inputs

Outcome Variable:	Sample 1				Sample 2				P-Value of TOT Comparison
	ITT	TOT	Control Mean	Obs.	ITT	TOT	Control Mean	Obs.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Log Weft Thread Price (LE/m ²)	0.16 (0.15)	0.62 (0.53)	12.3	188	0.23 *** (0.04)	0.29 *** (0.05)	13.1	376	0.54
Log Warp Thread Price (LE/m ²)	-0.03 (0.05)	-0.10 (0.17)	19.8	309	-0.03 (0.03)	-0.04 (0.04)	17.0	376	0.74
Log Weft Thread Quantity	-0.25 (0.17)	-0.85 (0.60)	130.0	302	-0.13 (0.09)	-0.16 (0.10)	97.8	375	0.26
Log Warp Thread Quantity	-0.01 (0.20)	-0.03 (0.68)	17.7	311	0.08 (0.09)	0.10 (0.11)	17.8	375	0.85

Notes: Table reports results separately for Sample 1 double-firms and Sample 2. Panel A reports treatment effects on output prices and quantities, hours, number of employees (inclusive of owner), looms and the size of the warp thread ball (which is a proxy for the length of the production run), all measured in logs except number of employees. Panel B analyzes input prices and quantities, all measured in logs. The TOT regressions instrument takeup with treatment. Hours worked are calculated using average daily hours and number of days worked last month. Control group means are reported in levels. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. P-values from testing equivalence of the TOTs from each sample are reported in the last column. We cannot estimate the ITTs or TOTs for "number of employees" as there is no variation in sample 2. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.5: Impact of Exporting on Quality Levels: Sample 1 and Sample 2 (Appendix to Table 7)

Panel A: Quality Metrics

	Sample 1			Sample 2		
	Control Mean	ITT (1)	TOT (2)	Control Mean	ITT (3)	TOT (4)
Corners	2.89	0.66 *** (0.21)	1.73 *** (0.41)	3.00	1.38 *** (0.13)	1.69 *** (0.08)
Waviness	2.89	0.67 *** (0.20)	1.76 *** (0.36)	3.02	1.36 *** (0.13)	1.66 *** (0.08)
Weight	2.90	0.67 *** (0.20)	1.75 *** (0.38)	3.14	1.32 *** (0.12)	1.60 *** (0.09)
Touch	3.14	0.24 *** (0.08)	0.67 *** (0.18)	3.11	0.54 *** (0.08)	0.65 *** (0.06)
Packedness	3.17	0.39 ** (0.15)	1.32 *** (0.36)	3.08	1.38 *** (0.12)	1.68 *** (0.08)
Warp Thread Tightness	3.04	0.43 *** (0.15)	1.38 *** (0.35)	3.05	1.24 *** (0.12)	1.51 *** (0.09)
Firmness	2.99	0.34 ** (0.14)	1.19 *** (0.35)	2.97	1.43 *** (0.13)	1.75 *** (0.08)
Design Accuracy	3.28	0.36 ** (0.15)	1.21 *** (0.35)	3.12	1.22 *** (0.12)	1.48 *** (0.10)
Warp Thread Packedness	2.90	0.66 *** (0.20)	1.71 *** (0.40)	3.10	1.33 *** (0.13)	1.64 *** (0.09)
Inputs	3.09	0.44 *** (0.15)	1.51 *** (0.38)	3.06	1.37 *** (0.11)	1.66 *** (0.09)
Loom	2.03	0.02 (0.02)	0.06 (0.06)	2.02	0.04 (0.04)	0.05 (0.04)
R-squared		0.32	0.50		0.57	0.66
Observations		2,765	2,765		4,120	4,120

Panel B: Stacked Quality Metrics

	Sample 1			Sample 2		
	Control Mean	ITT (1)	TOT (2)	Control Mean	ITT (3)	TOT (4)
Stacked Quality Metrics	2.94	0.41 *** (0.13)	1.26 *** (0.27)	2.97	1.14 *** (0.10)	1.39 *** (0.06)
P-Value of TOT Comparison						0.63
R-squared		0.29	0.44		0.52	0.60
Observations		2,765	2,765		4,120	4,120

Notes: The table reports the estimated impacts separately for Sample 1 double-firms and Sample 2. Panel A stacks the quality metrics and interacts treatment (ITT) or takeup (TOT) with a quality-metric indicator variable. The coefficients on the interactions provide the treatment effects separately for each metric. The TOT instruments takeup (interacted with quality metric) with treatment (also interacted with quality metric). Each regression includes baseline values of the quality metric, strata and round fixed effects, and each of these controls is interacted with a quality-metric indicator variable. Panel B constrains the treatment effects to be equal across quality metrics; these regressions include baseline values, strata and round fixed effects. Control group means are reported in levels. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.6: Impact of Exporting on Productivity: Sample 1 and Sample 2 (Appendix to Table 8)

	Sample 1				Sample 2				P-Value of TOT Comparison
	ITT (1)	TOT (2)	Control Mean (3)	Obs. (4)	ITT (5)	TOT (6)	Control Mean (7)	Obs. (8)	
Log Output Per Hour	-0.24 (0.15)	-0.79 (0.53)	0.30	311	-0.24 *** (0.09)	-0.29 *** (0.10)	0.24	376	0.47
Log Unadjusted TFP	-0.30 * (0.15)	-1.00 * (0.55)	0.58	299	-0.26 *** (0.09)	-0.32 *** (0.10)	0.43	375	0.32

Notes: TFP Table reports treatment effects for the two productivity measures: log unadjusted output per labor hour (in m2/hour) and log unadjusted TFP, separately for Sample 1 double-firms and Sample 2. See text and Appendix A for the methodology used to obtain unadjusted TFP. The TOT specifications instrument takeup with treatment. Control group means are reported in levels. Regressions control for baseline values of the variable, round and strata fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.7: Quality and Productivity, Sample 1 and Sample 2 (Appendix to Table 9)

Stacked Quality Metrics				Log Output per Hour				Log TFP							
Panel A: Specification Controls				P-Value of TOT				P-Value of TOT							
ITT		TOT		ITT		TOT		ITT		TOT		ITT		TOT	
Sample 1		Sample 2		Sample 1		Sample 2		Sample 1		Sample 2		Sample 1		Sample 2	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Treatment															
0.17 ***	0.72 ***	0.52 ***	0.82 ***	0.11	0.44	0.29 ***	0.45 ***	0.04	0.19	0.27 ***	0.42 ***	0.04	0.19	0.27 ***	0.42 ***
(0.04)	(0.15)	(0.09)	(0.09)	(0.11)	(0.43)	(0.10)	(0.16)	(0.11)	(0.40)	(0.10)	(0.15)	(0.11)	(0.40)	(0.10)	(0.15)
(log) Thread quantity															
0.00	-0.03	0.02	0.04	-0.01	-0.03	-0.42 **	-0.40 **	0.08	0.06	-0.38 **	-0.36 **	0.08	0.06	-0.38 **	-0.36 **
(0.06)	(0.05)	(0.10)	(0.07)	(0.16)	(0.15)	(0.19)	(0.18)	(0.15)	(0.15)	(0.18)	(0.17)	(0.15)	(0.15)	(0.18)	(0.17)
Difficulty Control															
0.47 ***	0.33 ***	0.42 ***	0.33 ***	-0.17 **	-0.24 **	-0.11 **	-0.16 ***	-0.22 ***	-0.25 ***	-0.12 **	-0.17 ***	-0.22 ***	-0.25 ***	-0.12 **	-0.17 ***
(0.03)	(0.05)	(0.04)	(0.04)	(0.07)	(0.10)	(0.05)	(0.06)	(0.07)	(0.09)	(0.05)	(0.05)	(0.07)	(0.09)	(0.05)	(0.05)
(log) # colors															
0.03 *	0.02	0.02	0.00	-0.07	-0.07 **	-0.07	-0.08 *	-0.08 **	-0.09 ***	-0.06	-0.07 *	-0.08 **	-0.09 ***	-0.06	-0.07 *
(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.04)
Low-market Segment															
-0.24 ***	-0.07	-0.16 ***	-0.10 **	0.28 **	0.38 **	0.55 ***	0.59 ***	0.26 **	0.30 **	0.55 ***	0.58 ***	0.26 **	0.30 **	0.55 ***	0.58 ***
(0.05)	(0.06)	(0.04)	(0.04)	(0.12)	(0.17)	(0.10)	(0.10)	(0.11)	(0.15)	(0.09)	(0.10)	(0.11)	(0.15)	(0.09)	(0.10)
Mid-Market Segment															
-0.26 ***	-0.09	-0.11 **	-0.04	0.28 **	0.38 **	0.30 ***	0.34 ***	0.21 *	0.25 *	0.33 ***	0.36 ***	0.21 *	0.25 *	0.33 ***	0.36 ***
(0.06)	(0.07)	(0.05)	(0.05)	(0.12)	(0.15)	(0.10)	(0.10)	(0.11)	(0.13)	(0.09)	(0.10)	(0.11)	(0.13)	(0.09)	(0.10)
Rug Type FEs															
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Input Thread Type FEs															
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared															
0.63	0.65	0.67	0.69	0.62	0.63	0.55	0.54	0.69	0.70	0.55	0.55	0.69	0.70	0.55	0.55
2,744	2,744	4,076	4,076	302	302	371	371	290	290	370	370	290	290	370	370
Panel B: Specification Fixed Effects															
Sample 1				Sample 2				Sample 1				Sample 2			
TOT		Comparison		TOT		Comparison		TOT		Comparison		TOT		Comparison	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
0.06	0.51	0.37 ***	0.71 ***	0.22 **	1.53	0.42 ***	0.81 **	0.24 **	1.48 **	0.38 ***	0.73 **	0.24 **	1.48 **	0.38 ***	0.73 **
(0.05)	(0.39)	(0.12)	(0.19)	(0.11)	(0.96)	(0.14)	(0.39)	(0.11)	(0.73)	(0.12)	(0.32)	(0.11)	(0.73)	(0.12)	(0.32)
Specification FEs															
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared															
0.71	0.71	0.73	0.74	0.77	0.70	0.64	0.61	0.78	0.77	0.65	0.64	0.78	0.77	0.65	0.64
2,744	2,744	4,076	4,076	153	153	223	223	143	143	223	223	143	143	223	223
Panel C: Specification-Adjusted Dependent Variables															
Sample 1				Sample 2				Sample 1				Sample 2			
TOT		Comparison		TOT		Comparison		TOT		Comparison		TOT		Comparison	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
0.21 ***	0.65 ***	0.60 ***	0.74 ***	0.04	0.14	0.34 ***	0.41 ***	0.03	0.09	0.38 ***	0.46 ***	0.03	0.09	0.38 ***	0.46 ***
(0.06)	(0.11)	(0.06)	(0.04)	(0.12)	(0.39)	(0.07)	(0.09)	(0.11)	(0.36)	(0.07)	(0.09)	(0.11)	(0.36)	(0.07)	(0.09)
R-squared															
0.12	0.21	0.26	0.32	0.01	0.03	0.16	0.16	0.13	0.15	0.16	0.17	0.13	0.15	0.16	0.17
2,784	2,784	4,076	4,076	307	307	371	371	298	298	371	371	298	298	371	371
Notes: Table reports treatment effects separately for Sample 1 (duble-firms and Sample 2 for the stacked quality measures and the two productivity measures after including various controls for the specifications of the rug on the loom at the time of the survey. The TOT specifications instrument takeup with treatment. In Panel A, there are both rug and input thread type fixed effects in addition to the specification controls included in the table. Panel B uses fixed effects for each of the 435 combinations of the 6 specification controls. Both panels use unadjusted productivity measures. Panel C uses specification-adjusted measure for quality and productivity; see text and Appendix A for details. Regressions in all panels also control for baseline values of the dependent variable (and baseline values of the specification controls in Panel A), as well as round and strata fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.															

Table F.8: Quality and Productivity on Identical-Specification Domestic Rugs, Sample 1 and Sample 2 (Appendix to Table 10)

Panel A: Quality Metrics

	Sample 1						Sample 2					
	Master Artisan			Professor			Master Artisan			Professor		
	Control Mean	ITT (1A)	TOT (1B)	Control Mean	ITT (2A)	TOT (2B)	Control Mean	ITT (3A)	TOT (3B)	Control Mean	ITT (4A)	TOT (4B)
Corners	3.27	0.47 *	1.33 **	3.41	0.14	0.39	3.22	0.89 ***	0.98 ***	3.27	0.40 **	0.44 **
		(0.25)	(0.56)		(0.20)	(0.52)		(0.16)	(0.15)		(0.17)	(0.18)
Waviness	3.24	0.30	0.84	3.27	0.19	0.55	3.14	0.72 ***	0.79 ***	3.33	0.29 *	0.32 **
		(0.25)	(0.56)		(0.19)	(0.45)		(0.17)	(0.17)		(0.15)	(0.16)
Weight	3.62	0.27	0.78	3.89	0.53 **	1.50 **	3.59	0.85 ***	0.94 ***	3.53	0.62 **	0.69 ***
		(0.20)	(0.49)		(0.22)	(0.73)		(0.16)	(0.16)		(0.24)	(0.26)
Packedness	3.32	0.31	0.88 *	3.31	0.07	0.21	3.28	1.09 ***	1.20 ***	3.26	0.43 ***	0.47 ***
		(0.22)	(0.49)		(0.19)	(0.48)		(0.15)	(0.15)		(0.14)	(0.15)
Touch	3.41	0.22	0.62	3.27	0.25	0.70	3.24	0.73 ***	0.80 ***	3.27	0.43 ***	0.47 ***
		(0.20)	(0.45)		(0.20)	(0.46)		(0.13)	(0.13)		(0.15)	(0.16)
Warp Thread Tightness	3.03	0.29 *	0.81 **	3.36	-0.02	-0.06	2.99	0.66 ***	0.73 ***	3.28	0.43 ***	0.48 ***
		(0.16)	(0.35)		(0.19)	(0.52)		(0.10)	(0.10)		(0.15)	(0.16)
Firmness	3.32	0.22	0.62	3.24	0.074	0.21	3.16	1.04 ***	1.15 ***	3.22	0.44 ***	0.48 ***
		(0.26)	(0.64)		(0.19)	(0.48)		(0.14)	(0.14)		(0.15)	(0.17)
Design Accuracy	3.75	0.30	0.85 *	3.55	-0.01	-0.02	3.61	0.68 ***	0.75 ***	3.41	0.45 ***	0.50 ***
		(0.18)	(0.46)		(0.21)	(0.60)		(0.14)	(0.14)		(0.12)	(0.13)
Warp Thread Packedness	3.16	0.51 **	1.45 **	3.28	0.14	0.39	3.00	1.12 ***	1.23 ***	3.17	0.57 ***	0.62 ***
		(0.25)	(0.57)		(0.19)	(0.50)		(0.16)	(0.16)		(0.15)	(0.16)
R-squared		0.11	0.31		0.16	0.18		0.31	0.36		0.10	0.10
Observations		593	593		589	589		1,087	1,087		1,078	1,078

Panel B: Stacked Quality Metrics

	Sample 1						Sample 2					
	Master Artisan			Professor			Master Artisan			Professor		
	Control Mean	ITT (1A)	TOT (1B)	Control Mean	ITT (2A)	TOT (2B)	Control Mean	ITT (3A)	TOT (3B)	Control Mean	ITT (4A)	TOT (4B)
Stacked Quality Metric	3.35	0.32 *	0.91 **	3.40	0.15	0.43	3.25	0.87 ***	0.95 ***	3.30	0.45 ***	0.50 ***
		(0.18)	(0.40)		(0.16)	(0.40)		(0.12)	(0.11)		(0.12)	(0.13)
P-Value of TOT Comparison									0.92			0.88
R-squared		0.09	0.30		0.14	0.22		0.29	0.34		0.09	0.09
Observations		593	593		589	589		1,087	1,087		1,078	1,078

Panel C: Objective Metrics

	Sample 1			Sample 2			
	Control Mean	ITT (1A)	TOT (1B)	Control Mean	ITT (3A)	TOT (3B)	P-Value of TOT
Length Accuracy	-4.41	0.70	1.98	-4.56	1.93 ***	2.12 ***	0.95
		(0.85)	(2.17)		(0.63)	(0.70)	
Width Accuracy	-2.22	-0.21	-0.60	-2.32	0.43	0.48	0.48
		(0.52)	(1.50)		(0.34)	(0.36)	
Weight Accuracy	-197.0	83.0 ***	236.0 **	-231.0	93.3 ***	103.0 ***	0.18
		(26.8)	(93.4)		(29.1)	(30.6)	
Time (in minutes)	255.0	-22.10 *	-62.70 *	243.0	5.52	6.1	0.05
		(12.1)	(34.2)		(7.4)	(8.0)	
R-squared		0.87	0.81		0.83	0.83	
Observations		264	264		484	484	

Notes: Table reports ITT and TOT specifications using the 9 quality metrics from the quality lab, separately for Sample 1 double-firms and Sample 2. Panel A stacks the quality metrics and interacts treatment (ITT) or take-up (TOT) with a quality-metric indicator variable. The coefficients on the interactions provide the treatment effects separately for each metric. The TOT instruments take-up (interacted with quality metric) with treatment (also interacted with quality metric). Panel B constrains the treatment effects to be equal across quality metrics. Columns 1A and 1B report scores from the master artisan. Columns 2A and 2B report scores from the Professor of Handicraft Science at Domietta University. Panel C reports objective accuracy measures which are calculated as the negative of the absolute error for that specification, so that a higher value indicates that the manufactured rug was closer to intended length (140 cm), width (70 cm) and weight (1750 g). It also includes the time spent to produce the rug in minutes. As in Panel A, these are run in a single regression by interacting the objective measure with treatment or take-up. All regressions include interactions of strata fixed effects with quality-metric indicators, and standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.9: Treatment Dynamics, Sample 1 and Sample 2

	Log Direct Profits		Log Direct Profits per Hour		Log Output per Hour	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)
Treatment	0.36 (0.21)	0.24 *** (0.08)	0.31 (0.19)	0.20 *** (0.07)	-0.24 (0.22)	-0.28 ** (0.12)
x 2nd Round Since Treatment	-0.23 (0.28)	0.05 (0.08)	-0.17 (0.25)	-0.01 (0.08)	0.23 (0.21)	0.11 (0.14)
x 3rd Round Since Treatment	-0.17 (0.24)	-0.03 (0.09)	-0.21 (0.23)	-0.09 (0.09)	-0.14 (0.27)	0.01 (0.13)
x 4th Round Since Treatment	-0.16 (0.25)		-0.12 (0.23)		-0.28 (0.26)	
x 5th Round Since Treatment	0.16 (0.23)		0.16 (0.21)		0.14 (0.29)	
R-squared	0.15	0.29	0.15	0.18	0.18	0.19
Observations	198	375	198	375	311	376

	Log Unadjusted TFP		Log Specification-Adjusted TFP		Log Specification-Adjusted Quality	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
	(1A)	(1B)	(2A)	(2B)	(3A)	(3B)
Treatment	-0.31 (0.20)	-0.28 ** (0.11)	0.19 * (0.10)	0.37 *** (0.09)	-0.03 (0.05)	0.63 *** (0.08)
x 2nd Round Since Treatment	0.33 (0.24)	0.08 (0.13)	0.13 (0.11)	-0.02 (0.11)	0.16 (0.10)	-0.03 (0.08)
x 3rd Round Since Treatment	-0.17 (0.24)	-0.02 (0.12)	-0.01 (0.11)	0.03 (0.12)	0.34 *** (0.11)	-0.06 (0.08)
x 4th Round Since Treatment	-0.29 (0.25)		-0.33 * (0.18)		0.38 *** (0.10)	
x 5th Round Since Treatment	0.15 (0.24)		0.07 (0.15)		0.27 *** (0.09)	
R-squared	0.31	0.18	0.13	0.16	0.13	0.26
Observations	299	375	669	371	2,784	4,076

Notes: Table reports treatment effects interacted with dummies for each round of data collection, separately for Sample 1 double-firms and Sample 2. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Standard errors are clustered by firm. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F10: Information Flows and Quality Levels: Sample 1 and Sample 2 (Appendix to Table 11)

	Sample 1				Sample 2			
	Stacked Quality Metrics (1)	Specification-Adjusted Stacked Quality Metrics (2)	Stacked Quality Metrics (3)	Specification-Adjusted Stacked Quality Metrics (4)	Stacked Quality Metrics (5)	Specification-Adjusted Stacked Quality Metrics (6)	Stacked Quality Metrics (7)	Specification-Adjusted Stacked Quality Metrics (8)
Panel A: Without "Takeup x Quality" FEs								
Takeup, x {Talked About Dimension} _{id}	0.21 * (0.11)	0.16 (0.13)			0.20 ** (0.10)	0.16 * (0.09)		
Takeup, x {Talked About Technique of Dimension} _{id}			0.31 (0.21)	0.30 (0.20)			0.35 *** (0.08)	0.35 *** (0.09)
Takeup, x {Talked About Mistake of Dimension} _{id}			0.47 *** (0.09)	0.34 *** (0.07)			0.26 *** (0.05)	0.27 *** (0.05)
Quality Metric FEs	yes	yes	yes	yes	yes	yes	yes	yes
Takeup, x Quality Metric FEs	no	no	no	no	no	no	no	no
Firm-fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Specification-adjusted Quality Metrics	no	yes	no	yes	no	yes	no	yes
P-Value for TOT Comparison					0.94	1.00	0.82	0.83
R-squared	0.75	0.39	0.75	0.38	0.76	0.45	0.76	0.45
Observations	602	599	582	579	1098	1068	1088	1058
Panel B: With "Takeup x Quality" FEs								
Takeup, x {Talked About Dimension} _{id}	0.29 *** (0.07)	0.23 *** (0.08)			0.13 * (0.07)	0.10 * (0.05)		
Takeup, x {Talked About Technique of Dimension} _{id}			0.24 (0.19)	0.21 (0.15)			0.19 ** (0.09)	0.16 * (0.09)
Takeup, x {Talked About Mistake of Dimension} _{id}			0.49 *** (0.18)	0.22 (0.15)			0.10 (0.09)	0.13 (0.10)
Quality Metric FEs	yes	yes	yes	yes	yes	yes	yes	yes
Takeup, x Quality Metric FEs	yes	yes	yes	yes	yes	yes	yes	yes
Firm-fixed Effects	yes	yes	yes	yes	yes	yes	yes	yes
Specification-adjusted Quality Metrics	no	yes	no	yes	no	yes	no	yes
P-Value for TOT Comparison					0.08	0.17	0.80	0.75
R-squared	0.79	0.50	0.79	0.48	0.82	0.59	0.81	0.58
Observations	602	599	582	579	1098	1068	1088	1058

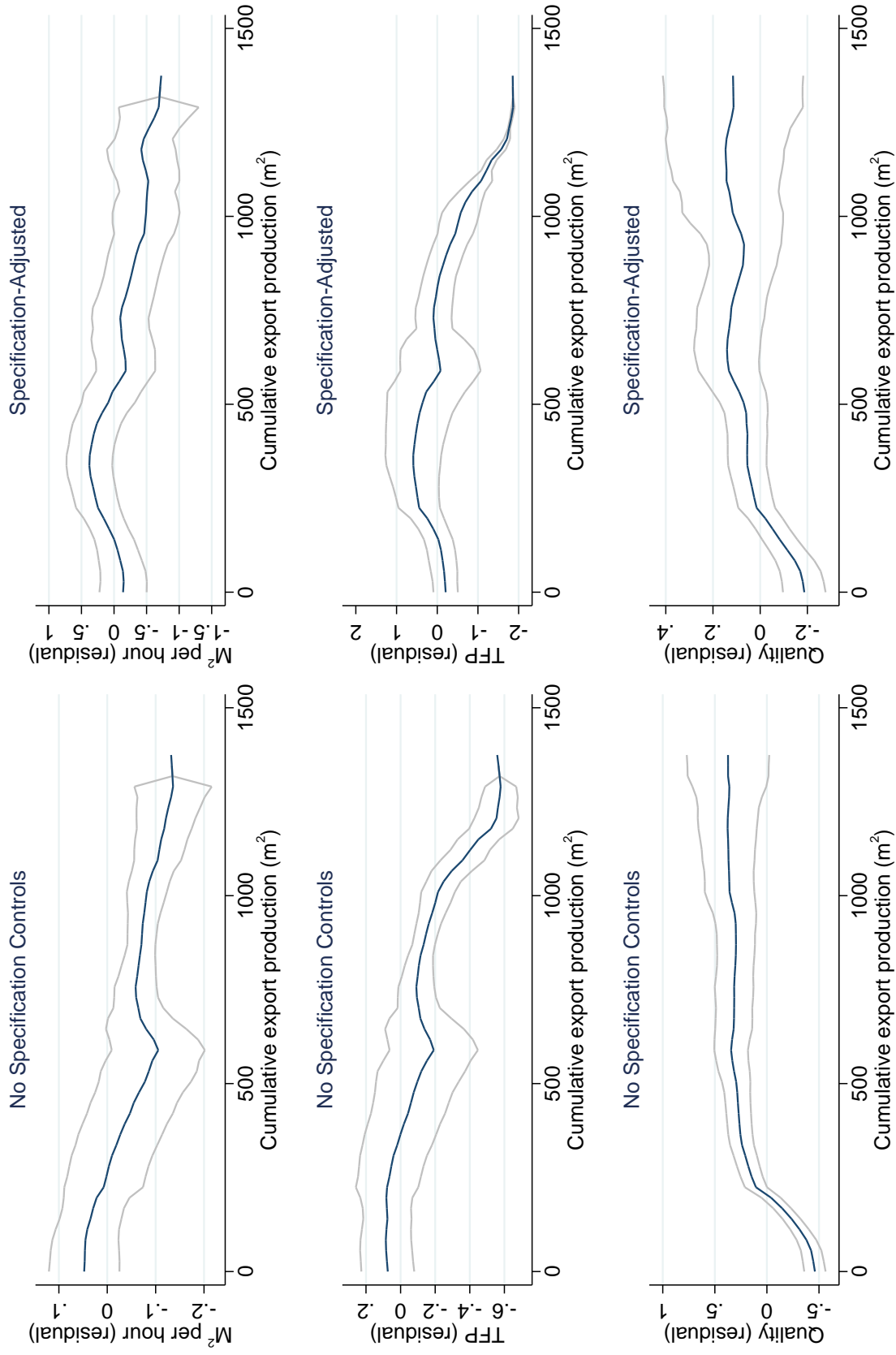
Notes: Table regresses stacked quality metrics on takeover indicator and its interaction with a dummy that takes the value 1 if the intermediary talked to the firm about that particular dimension of quality, separately for Sample 1 and Sample 2. Even-numbered columns use the specification-adjusted quality metrics described in the text. Columns 3 and 4 separate whether the discussion along that dimension was about technique or just pointing out mistakes. Regressions are run on a cross-section of firms and include baseline values, firm fixed effects, quality metric fixed effects, and quality metric fixed effects interacted with takeover. Panel B repeats the regressions in Panel A but also includes takeover interacted with quality metric fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Table F.11: Results for Non-Duble Strata

	ITT	TOT	R-squared	Obs.	TOT for Joint Sample	P-Value for TOT Comparison
	(1)	(2)	(3)	(4)	(5)	(6)
Ever Exported	0.03 (.09)	0.22 (.63)	0.28	90	0.76 *** (.07)	0.40
Direct Log Monthly Profits	-0.01 (.08)	-0.07 (.76)	0.05	324	0.42 *** (.08)	0.52
Direct Log Profits per Hour	0.00 (.07)	-0.02 (.72)	0.04	323	0.32 *** (.08)	0.64
Log Stacked Quality	0.03 0.04	0.30 (.45)	0.58	2830	1.35 *** (.08)	0.02
Log Output per Hour	0.05 (.10)	0.65 (1.30)	0.69	373	-0.42 *** (.16)	0.49
Log Unadjusted TFP	0.03 (.13)	0.38 (1.76)	0.65	351	-0.50 *** (.16)	0.62
Log Specification-Adjusted Stacked Quality	0.03 0.04	0.36 (.37)	0.23	2800	0.72 *** (.04)	0.35
Log Specification-Adjusted TFP	-0.04 (.09)	-0.59 (1.27)	0.31	345	0.36 *** (.12)	0.77

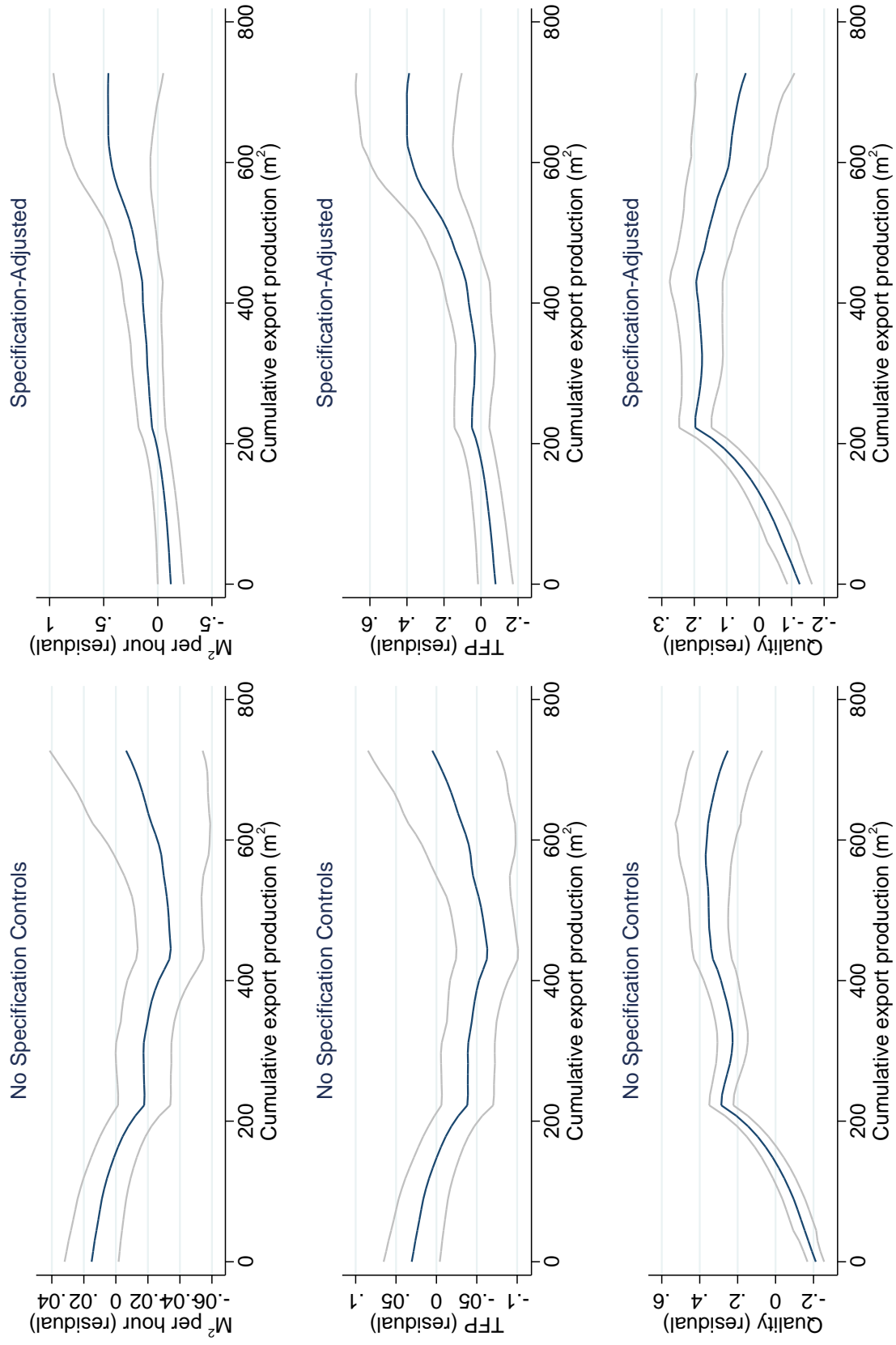
Notes: Table reports treatment effects on eight main outcomes for the firms in Sample 1 who were not in the duble strata. The sample sizes vary across outcomes and in general are lower than for duble strata because after round 3, we stopped regular data collection on these strata because we did not secure sufficient overseas orders for these rugs and had budgetary constraints. In round 5 (essentially the endline), we collected data for the kasaees and tups strata, but did not collect data for the goublain strata which had the lowest takeup of all strata. Regressions include baseline values of the dependent variable and round and strata fixed effects. Standard errors are clustered by firm. Significance * .10; ** .05; *** .01.

Figure F.1: Learning Curves, Sample 1 Takeup Firms (Appendix to Figure 5)



Notes: Figure plots learning curves obtained by regressing quality or productivity measures on firm and round fixed effects and then plotting a kernel-weighted local polynomial of the residuals against cumulative export production for takeup firms in Sample 1.

Figure F.2: Learning Curves, Sample 2 Takeup Firms (Appendix to Figure 5)



Notes: Figure plots learning curves obtained by regressing quality or productivity measures on firm and round fixed effects and then plotting a kernel-weighted local polynomial of the residuals against cumulative export production for takeup firms in Sample 2.