

Stronger Together? Female Export Consortia

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November 8, 2024

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Abstract

Exporting offers high private and public returns, yet in most countries, only a few large, male-managed firms engage in exporting. We incentivize small, female-managed firms to form a consortium, a corporate group, to test whether they can collectively overcome the fixed export costs. We randomize 176 firms into four sectoral consortia or a control group and study the consortium's effect on firm performance. After two years, consortia members were 28pp (+107%) more likely to export and doubled their sales. The results are driven by consortia members expanding and using their business networks more, gaining entrepreneurial confidence, and improving management practices. Yet, cooperation is also costly. Only half of the invited firms ultimately join the consortium and conflicts arise during cooperation, suggesting careful selection and conflict resolution mechanisms would improve the intervention. Incentivizing horizontal integration of small firms offers a cost-effective, scalable way to share investment costs for export or technology adoption, with the potential to foster broader economic development.

Keywords: Female Entrepreneurs, Export, Firms, Networks

JEL Codes: D04, D22, F14, L52, O12, O14, O25

Acknowledgements: This study has been pre-registered at the AEA Social Sciences registry, RCT ID: AEARCTR-0009910. We are grateful for feedback and funding from the International Growth Centre and the SGB Evidence Fund. We benefited from the feedback from participants of the IPA Entrepreneurship and Private Sector Development Working Group Meeting at Columbia University, the Firms, Labor Markets, and Development seminar at Turin University, the CSAE conference at Oxford University, and the EBRD-WeFi-CEPR Financing Women-led SMEs conference. Finally, we are indebted to Kais Jomaa, Siwar Hakim, Ayoub Chamakhi, Amina Bousnina, and Eya Hanefi for exceptional research assistance and to Nadia Ali, Eric Verhoogen, Massimiliano Cali and Jawhar Abidi as well as our partners Lisa Menucha and Majed Khairi for their support in accessing administrative data.

1 Introduction

Export is considered key for contemporary success stories of economic growth and development.¹ Export provides firms in low-income countries with access to larger markets (Goldberg and Reed, 2023) and richer clients (Verhoogen, 2023), enabling improvements in productivity, quality, and management practices (Atkin et al., 2017; Alfaro-Ureña et al., 2022; Bloom et al., 2021).

The private and public returns from exporting are well-documented, but the existing literature offers little insight about how firms *become* exporters. Theory predicts those firms capable of covering the export market entry costs engage in exporting (Melitz, 2003). Empirical data shows only a few large firms manage to export (Bank, 2020; Freund and Pierola, 2015; Zavala, 2023).²

Female entrepreneurs incur a double burden: they tend to manage small, unproductive firms (Fang et al., 2022; Allison et al., 2021; Campos et al., 2018), and encounter additional barriers to export, e.g., fewer management skills, smaller networks, and lower confidence or risk tolerance (Ubfal, 2023). As a result, female entrepreneurs make up only a tiny proportion of exporters worldwide, particularly in the Middle East and North Africa (World Bank and WTO, 2020). While the existing literature has identified barriers to female entrepreneurs and exporters, it is unclear what type of programs are effective in alleviating them, and, in particular how to address several barriers simultaneously (Ubfal, 2023; McKenzie et al., 2023).

How can small firms, which constitute the vast majority of firms in low-income countries, benefit from export and globalisation opportunities? And how to address the additional barriers that female entrepreneurs face?

This paper tests and shows in a randomized controlled trial in Tunisia that small female-managed firms manage to export and grow by sharing costs, human, and social capital if collectively organised in a consortium. The core idea and novelty is to help small firms export by incentivizing and coordinating them in creating a business organisation, a consortium, which provides them with the legal framework to collectivize the fixed costs of export, too high for an individual company. Moreover, the interaction in the consortium provides female entrepreneurs also with a space to network and new business contacts disconnected from family and friends, as well as human capital spillovers and confidence from peer-to-peer exchange. This is the first paper, together with Asiedu et al. (2023), showing that business networks and organisations help female entrepreneurs grow their companies, gain human capital and entrepreneurial self-confidence - a proxy for empowerment. The results suggest more broadly that horizontal integration can be a powerful and cost-effective alternative strategy to enable small firms to benefit from globalisation rather than letting them die from its competitive pressures. Horizontal integration and collectivisation of investment costs can be achieved under other organizational arrangements and applied to other types of fixed costs too, e.g. those for technology adoption, and could spur growth by accelerating structural change from small to medium-sized corporations in low-income countries.³

¹Export-led growth or industrialization captures the idea that (East Asian) countries' growth and industrialization were driven by exports. For excellent reviews see Krueger (1984) or Harrison and Rodríguez-Clare (2010).

²Export firm concentration is stark: Firms that both import-and-export account on average for 15% of all trading firms, but capture 80% of total trade (Bank, 2020). Freund and Pierola (2015) find the top five "export superstars" account for nearly 50% of countries' exports to GDP ratio. Zavala (2023), for example, shows that in half of 157 export crops in Ecuador, one single exporter controls 90% of the market share.

³For example, ubiquitous small agricultural producers in low-income countries could be organized to share investment costs for water-saving technologies crucial to combat climate change or for quality control and cooling facilities required for export markets.

We incentivize 87 among 176 female-managed firms to form a consortium - a corporate group - and investigate the effect on firms' performance in a randomized controlled trial with the Tunisian Export Promotion Agency. The firms are sampled in a nationwide communication campaign in 2021. The firms are formally registered, either managed or owned by a women, have a median of seven employees and operate in one of four sectors: agro-food, handicrafts and cosmetics, digital services and consulting. They are located across the whole country and have no prior relationship. Three of out five firms have no export experience.⁴

The eligible firms are allocated via stratified randomization into a treatment group and a pure control group in 2022, leading to a balanced sample. In the treatment group, we create four consortia, each regrouping firms from one of the four sectors. The groups then receive i) the offer to join the sectoral female export consortium, which provides firms with access to the network and membership in a business organization, ii) access to a series of consortium-level consulting on export and business management, designed to create trust and a group spirit between the firms and to provide the knowledge necessary for export (year 1), and iii) a consortium-level subsidy (year 2), which is only announced after the firms have legally joined the consortium to reduce moral hazard and which is restricted to specific expenditure to kickstart the consortium (e.g., design brand, rent office, hire accountant), cover coordination costs (e.g., hire coordinator) and part of the fixed export costs (e.g., build webpage, travel to trade fairs). About two-thirds of the invited firms join the consortium when it is legally created after the first year of group-consulting workshops. At endline, 45% remain in the consortium, which is close to the 50% that we anticipated. We explore the reasons for drop-out in Sections 3.3 and 6.4.

The treatment simultaneously tackles three constraints - networks, skills, and market access. Once the consortium is created, the individual firms offer their products jointly under the consortium brand (e.g., Digital Services Consortia Tunisia) and promote each other's products as consortium representatives in trade fairs and via digital marketing. The firms thereby collectively achieve a wider scale in marketing and share the costs of searching for clients, business and export opportunities.⁵ Moreover, female entrepreneurs foster new professional networks via the consortium. Regular interaction with professional peers and consultants facilitates knowledge transfer regarding management practices and boosts entrepreneurial confidence.

The empirical analysis is primarily based on survey data, soon to be combined with administrative data, and an ANCOVA regression specification. The firms were surveyed online and via telephone when they applied (baseline, 100% response rate, 2021), when they decided whether to join the consortium after one year (midline, 82% response rate, 2022), and when the consortium operated for one year (endline, 72% response rate, 2023). In addition, we collected qualitative evidence in focus groups, qualitative interviews as well as by accompanying the consortia to international trade fairs. Our main regression specification uses an ANVOCA specification (McKenzie, 2012), and compares treated with control firms at the endline or midline, controlling for the initial baseline value of the outcome and randomization strata.

⁴The four sectors were selected as there were sufficiently large numbers of applicants to construct treatment and control groups, but applications from any sector were eligible in principle.

⁵The practical process is very similar to the search process described theoretically in Hausmann and Rodrik (2003).

First, what is the consortia's effect on firms' export and business performance?

We estimate firms in the treatment group were 16.5 percentage points more likely to have exported in 2023, corresponding to a 63% increase relative to a control mean of 0.26 ($p < 0.05$). These effects are large. In comparison, subsidized trade fare participation increased Japanese firms' export likelihood by 9 percentage points, and market intelligence increased Danish firms' export likelihood by 8-9 percentage points - about a third of the consortia's effect (Makioka, 2021; Munch and Schaur, 2018). Consulting or information provision alone did not firms' export likelihood in Colombia and Vietnam (Kim et al., 2018; Iacovone et al., 2023). On the intensive margin, consortia members export to half an additional foreign market - a 48.5% increase relative to the control mean of 1.03 ($p < 0.05$). Heterogeneity analysis reveals that it is in particular firms that already had realised one export operation at baseline that managed to export to one additional market.

The consortia increased treated firms' sales by 146% on average in 2023, the second year of the intervention. While there are firms that experience strong positive and negative growth at the lower and upper tail of the distribution in both groups, it is the firms between the 25th and 75th percentile in the treatment group that experience much stronger sales growth. For example, the median firm in the treatment group has increased its total sales by 100% relative to the baseline, while the median control firm has grown by 40%. On aggregate, treated firms report an additional 5 million Tunisian dinars (€ 1.5 million), resulting in roughly 1 million Tunisian dinars (€ 300,000) in additional tax revenue from value-added tax, implying the program paid for itself within two years. The expansion in sales is driven by domestic and export sales.

The effect on sales, however, is not matched with an equivalent effect on profits, employment or innovation. The results for profit are noisy, suggesting a significant increase at the midline (1 year after treatment start) but no effect at the endline (1 year after the consortium started operating). The noisy results on profit may have several reasons. One potential reason is that several firms in the treatment group reported negative profits in year 2, explaining that they invested in implementing themselves in new markets, increasing variance, reducing power and suggesting investment may result in future profits.

In the following, we investigate *how* the consortium may have helped female entrepreneurs expand their exports and sales. Recall the consortium provided firms with three inputs - a new network via consortium membership, consulting on management and export, and joint product marketing via subsidized trade fare participation and a webpage. We focus on four key intermediary outcomes: networks, self-confidence, knowledge transfer via peers and consultants, and export readiness.

First, joining a consortium has transformed female entrepreneurs' business networks and how they leverage these networks for business growth. Regarding *network size*, consortia members regularly discuss business with five additional contacts ($p < 0.05$), mainly other female entrepreneurs. A 64% increase relative to a control group average of 8 contacts. The magnitude of the effect is immense: in fact, 80% of the female entrepreneurs they regularly discuss business with have been encountered via the consortium. Consortia members have dramatically changed and intensified their *network use* for business: they are roughly 39, 36, and 47 percentage points more likely to share management practices, export experience or product ideas, and 32 and 46 percentage points more likely to have cooperated in a joint contract bid or to have received emotional support and confidence vis-à-vis risks and uncertainty of exporting. If these interfirm linkages persist in the future, they are likely to permanently transform

these firms' and female entrepreneurs' business performance.

Second, the consortia strengthened female entrepreneurs' belief in their ability. Consortia members have 0.42 standard deviations higher levels of self-perceived entrepreneurial efficacy (ability) ($p < 0.05$). This corresponds to four times the median in the control group or moving from the 25th to 50th or 50th to 75th percentile of entrepreneurial efficacy. Qualitative interviews and documentation of consortia meetings suggest that female entrepreneurs felt empowered and encouraged to exchange with peers who faced similar challenges, underlining the importance of a female-only consortium. Interestingly, the same does not hold for entrepreneurs' locus of control over their entrepreneurial environment, including, for example, their sense of control over reconciling personal and professional life, e.g., in terms of gender roles and care responsibilities. It is important to emphasize the relevance of these results given existing approaches (McKenzie and Puerto, 2021; Bulte et al., 2017), e.g. adding a gender component to entrepreneurship training, have not yielded similar results and given group-level delivery and encouraging exchange in safe spaces could be relatively easily scaled and adopted in other programs. Having said this, the external validity of the results needs to be cautioned as the Tunisian context is, to a certain extent, specific in terms of its low female entrepreneurship rates and partly strong gender norms and roles, which make e.g. after-work networking more difficult and gender discrimination comparably strong.

Third, the consortia enabled knowledge transfer via peers and consultants, resulting in improved management practices. The consortium increased management practices by 0.08 standard deviations ($p < 0.05$). This corresponds to three and a half times the median in the control group. The increase is driven by improvements in accounting, e.g. separating business and personal accounts, and production management. Female entrepreneurs are significantly more likely to have learned about these management practices from consultants, as in Iacovone et al. (2021), and significantly less likely to have relied on family and friends. Yet, learning about management practices from other entrepreneurs is not more common than in the control group. This may be related to initially low levels of formal management knowledge among the firms and underscores the need to combine network creation with external expert knowledge inputs for target groups with low initial capabilities.

Fourth, the consortia improved firms' export readiness, particularly regarding subsidised activities and exports to other African countries, an objective of the program. While consortia members do not perform significantly differently on an index of general export readiness measures (e.g., having an international quality certificate or a sales structure abroad), they are 50 percentage points more likely to have participated in an international trade fare, and 34 and 26 percentage points more likely to have a potential client and commercial partner in another African country, and roughly 40 percentage points more likely to know Tunisia's trade agreements with other African countries.

This study contributes to two strands of literature. Firstly, it contributes to literature on the role of firms for economic development (McKenzie et al., 2023), and more specifically, to the strands about the promotion of female entrepreneurs (Jayachandran, 2021; McKenzie et al., 2023; Ashraf et al., 2019) and cooperation between firms to foster firm growth (Cai and Szeidl, 2018; Fafchamps and Quinn, 2016; Brooks et al., 2018; Hardy and McCasland, 2021). Campos et al. (2019); World Bank and WTO (2020) suggested studying interventions to expand female entrepreneurs' networks as "causal evidence is not available on the business performance of women-led businesses" (Ubfal, 2023). To the best of our knowledge, this paper in the first together with Asiedu et al. (2023) to provide evidence on the

role of business linkages and entrepreneurial networks for female entrepreneurs. In particular, it is the first rigorous intervention that finds evidence that group, rather than individual interventions, might be particularly helpful in empowering female entrepreneurs. Moreover, this work distinguishes itself from the existing literature by focusing on creating long-term, permanent cooperation between entrepreneurs instead of temporary networking or mentoring (Cai and Szeidl, 2018; Asiedu et al., 2023; Brooks et al., 2018; Fafchamps and Quinn, 2016).

Secondly, this study contributes to the literature on export promotion and, in particular, market access. To our knowledge, it is one of the first RCTs in export promotion and the first to study export consortia. Atkin et al. (2017) show that selling to international buyers can improve quality and productivity. However, the study does not examine how to help firms get in contact with international clients in the first place. First RCTs of export promotion measures found null effects (Kim et al., 2018; Breinlich et al., 2017; Iacovone et al., 2023) and quasi-experimental studies mixed results (Makioka, 2019). Munch and Schaur (2018) illustrate that more actionable information, like market intelligence, can promote exporting, especially for firms with fewer than 25 employees, and Makioka (2021) that subsidized visits to geographically distanced trade fairs can help firms enter new export markets. Export consortia have been primarily assessed by qualitative case studies (Forte and Oliveira, 2019) except for two early studies in Chile that find positive and significant effects on firms' probability of exporting but say little about mechanisms (Alvarez, 2004; Álvarez et al., 2000)

In the following, section 2 provides information about female entrepreneurship in Tunisia and the sample of female entrepreneurs in this study, section 3 outlines the research design, section 4 details the regression specifications and the main outcomes. Section 5 lays out results and mechanisms.

2 Context and Sample

Section 2.1 describes the challenges in doing business and export for female entrepreneurs in Tunisia based on focus group interviews with treatment group firms. Section 2.2 describes the characteristics of the firms and the female entrepreneurs in the sample. It also provides a deep dive into the companies in each of the four consortia.

2.1 Context: Female Entrepreneurs in Tunisia

Women in the Middle East and North Africa have the lowest rates of female entrepreneurship among global regions, with only around 10 percent of all firms being managed by women (Figure 7) (Campos et al., 2019). In Tunisia, 19 percent of formal businesses are headed by women and only 5.3 percent of corporate board members are women (Ben Mohamed et al., 2022). Women's labor force participation rate in Tunisia is roughly 27 percent, 42 percent among women in lower-income households, even though two-thirds of university graduates are women (Hattab, 2012).

Based on focus group interviews, we provide further details about and show that the situation of female entrepreneurs in Tunisia resonates with the international evidence (Jayachandran, 2021). The first recurrent thread documented in the interviews and existing literature is the tension between the role of an entrepreneur and the traditional role of women as mothers and wives, caretakers of the household, and family members. Despite their enterprise, many female entrepreneurs maintain responsibility over

private household matters, in particular child care. Female entrepreneurs describe in several ways how such traditional role models act as an additional barrier or tax on their business and exporting.

Self-confidence and discrimination Many female entrepreneurs encounter opposition to their decision to become an entrepreneur, which lowers their confidence, is emotionally draining, including even divorcing partners, and limits their ability to operate their business (e.g., one entrepreneur kept her entrepreneurship a secret from family members). Several female entrepreneurs describe cases of discrimination in business conduct, such as access to funding, dealing with public authorities, and interactions with clients, competitors, and employees.⁶ For example, several female entrepreneurs express difficulty in accessing bank loans. This is partly due to unequal inheritance laws that cause women to hold smaller capital, both fluid and physical, e.g., home ownership titles that could act as a mortgage (Hattab, 2012). At the same time, female entrepreneurs feel lower regard and trust of male bank employers in their capability to develop a profitable business, mirroring experimental evidence from Turkey (Alibhai et al., 2019). In a similar realm, female entrepreneurs describe how some civil servants or clients doubt their competence (while granting it to less competent male entrepreneurs without doubt), causing them a disadvantage in winning contracts and receiving licenses.

Networks Female entrepreneurs report difficulty to network after work due to their sole responsibility for household work. After-work networking in Tunisia takes place primarily in coffee shops (cafés) and restaurants, which are regularly either male-dominated or gender-separated, making it difficult to enter male business circles. As a result, female entrepreneurs are less informed, e.g., about public support programs or business opportunities (Drine and Grach, 2012). The female entrepreneurs in our sample have more male than female business contacts, and more business contacts outside their family than within their family. While many have sizeable networks, a substantial share has no or very few contacts with other (female) entrepreneurs.

Management practices Several female entrepreneurs think they lack business management skills. This is corroborated in the baseline survey and in existing research. For example, Drine and Grach (2012) find female entrepreneurs in Tunisia, particularly at the early stage of business development, are less likely to have benefited from formal management training (Drine and Grach, 2012).

Exporting (Some) Female entrepreneurs explain they are hesitant to travel abroad to identify business partners for export as they feel obligated to look after their children and are concerned about their personal security, which resonates with evidence from female entrepreneurs in Ghana (Ackah et al., 2020). International travel requires women to find childcare, often only provided by family members, as professional childcare services are not yet strongly established in Tunisia. Finally, some female entrepreneurs also express that the uncertainty and risk related to exporting discourage them.

We asked focus group participants to rate the relative importance of each barrier for operating their business on a scale from one, not so important, to seven, very important (Table 9). The lack of access to funds is the most important barrier. The second most important perceived barrier is the risk, such as high costs, uncertainty, and competition, related to operating a business and exporting. Overall, the large heterogeneity reflects that the relative salience of each barrier depends on the individual entrepreneur.

⁶Several female entrepreneurs also emphasize the supportiveness of their (male) family members, civil servants, or other entrepreneurs, reflecting Tunisia's diverse society. A few female entrepreneurs call into question whether gender matters in running a business or put the blame on female entrepreneurs' lack of confidence, risk-taking, assertiveness etc.

2.2 Sample characteristics

The firms had to fulfil four eligibility criteria. First, they had to be either female-managed or female-owned. This was verified based on the firms' registration, the second criterion, and legal ownership or employment structure. The implementation partner conducted in-depth case-by-case decisions for conflictual cases, e.g. if companies were co-owned with men. Third, they had to confirm their interest/intention in starting to export within the next 24 months or be exporting already. Fourth, they had to be in one of the four sectors where at least 30 firms applied - to be able to form groups of at least 15 firms in treatment and 15 in control. The four sectors that had sufficient number of female-managed or owned firms interested in the consortia program were: agro-food, handicrafts and cosmetics, consulting and digital services.

Among the 176 companies in the sample, 25.6 percent (45 firms) operate in the agro-food sector, 30.7 percent (54 firms) are handicraft producers, 23.3 percent (41 firms) provide consulting services and 20.5 percent (36 firms) digital services. The median company has five employees and 80 percent have 10 or fewer employees, implying that only 35 firms have more than 10 employees. Overall, the companies tend to be quite "young", as half of the companies in the sample did not exist for more than four years. Interestingly, a majority, or 60.6 percent of the female CEOs, have one family member who has a company. Half of the firms in the sample regularly discuss business ideas or challenges with seven or fewer other people and 90 percent with 25 or fewer. In contrast to our expectation based on the existing literature, women discuss business ideas or challenges only with three family members but 10 outsiders on average. Hence, many entrepreneurs in the sample seem to have a relatively small network, while some also dispose of very extended networks, mostly made up of business contacts outside rather than within families.

The business performance of the sample firms is quite heterogeneous. The median company has total sales of around 74,000 Tunisian dinars (roughly equivalent to 24,666€). The heterogeneity in revenue in the sample is high, even after removing one strong outlier: the standard deviation in total sales is 1,077,435 Tunisian dinars and the baseline mean (434,854 Tunisian dinars) is approximately 5 times as large as the median ⁷ At baseline, companies have relatively poor formal management practices as defined in previous research (Bloom et al., 2013, 2020). The average company has around 7.4, and the median company has 8 points on a 25-point management practices indicator based on five questions, each providing up to 5 points. The companies perform worst on average in examining the firm's financial performance and monitoring employees' performance via indicators. Finally, 108 firms, or 61.4 percent of the sample, did not yet export. Among the 68 firms that realized revenue from export, firms exported to 2.5 (2) other countries on average (median), and the top 25 percent exported to three and up to 15 countries.

Overall randomization led to two balanced groups. Table 11 provides a balance table summarizing the mean and standard deviation in the treatment and control group, and p-values for t-tests of statistically significant differences between the two groups as well as F-Tests for joint independence between treatment status and all major outcome variables. While there are no statistically significant differences, modest sample size and high heterogeneity between the firms, lead to insignificant but notable differences, in particular, in variables with a high variance, such as sales. As a result, we cannot reject the null hypothesis of joint insignificance of all outcome variables from treatment status for the

⁷Without removing the outlier, the baseline mean is 625,031 and the standard deviation is 2,668,589 Tunisian Dinar.

Table 1: Balance Balance and Summary Statistics: *Entrepreneur-level* Characteristics

Variable	(1)	(2)	T-test
	Control Mean [SD]	Treatment Mean [SD]	P-value (1)-(2)
Management practices points	5.25 [1.22]	5.47 [1.14]	0.23
Network size	12.33 [16.02]	13.21 [17.72]	0.73
Perceived network quality	7.11 [2.61]	7.33 [2.69]	0.60
Pos. view CEO interaction	2.15 [0.78]	2.14 [0.74]	0.95
Neg. view CEO interaction	0.73 [0.64]	0.73 [0.60]	0.98
Entrepreneurial efficacy	12.03 [2.34]	11.74 [2.16]	0.40
Entrepreneurial control	16.05 [2.83]	16.15 [2.83]	0.83
N	89	86	

Notes: The values displayed for t-tests are p-values. Standard deviations are robust and reported in squared brackets. All missing values in balance variables are treated as zero. ***, **, and * indicate significance at the 1, 5, and 10 percent critical levels.

untransformed variables. However, Table 12 in the appendix shows that after correction for outliers via winsorization and inverse hyperbolic sine transformation of accounting variables, treatment status is entirely independent of all outcome variables. It is also noteworthy that the insignificant but notable differences are sporadic in the sense that they do not consistently favor either the treatment or the control group. In contrast, the differences are driven by significant outliers in either group that affect the average.

Table 2: Baseline Balance and Summary Statistics: *Firm-level* Characteristics

Variable	(1)	(2)	T-test
	Control Mean [SD]	Treatment Mean [SD]	P-value (1)-(2)
Age	7.13 [9.85]	6.38 [7.97]	0.58
Sales	379,164.93 [856,094.54]	255,363.41 [499,282.35]	0.24
Costs	341,052.58 [828,216.34]	216,103.97 [422,304.77]	0.21
Profit	30,128.14 [106,663.40]	39,115.32 [96,394.04]	0.56
Employees	7.94 [10.44]	11.37 [37.64]	0.42
Export readiness points	3.42 [2.03]	3.61 [1.97]	0.55
Perceived export costs	5.74 [2.60]	5.49 [2.79]	0.54
Investment in export	10,528.15 [22,584.96]	24,916.93 [97,659.24]	0.18
<i>Export sales</i> > 0	0.37 [0.49]	0.41 [0.49]	0.63
Export sales	96,287.29 [465,104.02]	128,541.19 [421,321.92]	0.63
Export countries	1.14 [2.12]	1.43 [2.73]	0.43
N	89	86	

Notes: All accounting variables (sales, profit, investment) are in Tunisian Dinar. The values displayed for t-tests are p-values. Standard deviations are robust and reported in squared brackets. All missing values in balance variables are treated as zero. ***, **, and * indicate significance at the 1, 5, and 10 percent critical levels.

In total, the 87 firms in the treatment group came from four sectors, two of which are manufacturing sectors (agro-food (23) and handicrafts (26)), and the two others are service sectors (consulting

services (20) and digital services (18)). The 14 firms that decided to become part of the agro-food consortium are either agricultural producers (e.g., olive oil, orange, almonds), produce processed food products (e.g., digestive crackers or jam/spread), or offer agro-food services (e.g., plant nursery, catering, import-export/trade logistics specifically for food products). The companies employ on average seven and up to 25 employees in various locations across Tunisia. 12 among the 14 firms (85 percent) have not exported in 2020, the lowest share of exporters among all three consortia. The 17 firms in the handicraft consortium offer a range of lifestyle products, such as cosmetics (e.g., various natural oils, beauty, and baby care products), leather and textile products (e.g., leather belts, bags, or bracelets), and furniture (e.g., tables, tableware, and decorations). Seven among the 17 firms in the handicraft consortium have already exported. Almost all export to France, one to Libya, and one to Algeria. Regarding their characteristics, the firms in the handicraft consortium are very similar to those in the agro-food consortium.

The other two consortia consist of firms that offer services. The smaller one comprises consulting firms that provide consulting, training, coaching, audits, management certification, or environmental feasibility studies. The larger one comprises 14 firms offering Digital services, including website development and digital marketing, online education, data analytics, cloud storage, 3D printing, and digital strategy consulting. The firms from both service consortia are more concentrated in the metropolitan area of Tunis than the firms in the other two consortia. 60 percent, 10 out of the 14 companies in the digital services consortia, are in the larger Tunis area. The same applies to 40 percent of the firms in the consulting service consortia. The rest of the firms are in different regions of Tunisia. Half of the digital service consortium firms have already exported, the highest value among all consortia, and 40 percent in the consulting service consortium. The firms' main export destinations are European countries, such as Germany, France, Italy or Belgium. A few firms also export to neighbouring countries, such as Libya, and francophone African countries, such as Senegal or Benin.

3 Experimental Design

In the following, Section 3.1 summarizes the treatment and Sections 3.1.1 and 3.1.2 describe it in detail. Section 3.2 documents the sampling and randomization of female-managed firms into a treatment group, divided into four consortia, and a pure control group.

3.1 Treatment

The treatment is a bundle of i) membership in an exogenously created, new and permanent business network and organization, the consortium, ii) consortium-level consulting, and iii) a consortium-level subsidy whose use is restricted to specific expenditure to kickstart the consortium and find clients in foreign markets.

The treatment is implemented in two phases, *Consortia Creation* and *Export Promotion*, each taking one year. The first phase, *Consortia Creation* (Section 3.1.1), is dedicated to establishing the consortium as a legal entity and fostering cooperation between the firms. This is done via a series of group-level consulting workshops focusing on creating *trust* and strengthening export and management *skills*, given the entrepreneurs do not know each other beforehand and half have no export experience.

At the end of the first period, the firms decide whether to join the consortium and sign a legal agreement that entails the consortium starts to exist as a corporate legal entity.

The second phase, *Export Promotion* (Section 3.1.2) focuses on making the consortia operational and helping each consortium develop its export. For this purpose, each consortium receives a group-level *subsidy* of €75,000. The subsidy can only be spent on the following activities, meant to kickstart the consortium, cover the coordination and fixed export costs: Creating professional websites and social media profiles for the consortium, hiring an accountant and coordinator for each consortium, renting office space, and funding travel to international trade fairs and B2B missions.

Figure 1 provides an overview of the research design and treatment implementation, described in detail in the following two paragraphs. The intervention was co-designed and implemented with the German Development Agency, GIZ, and Tunisia's export promotion office (CEPEX) with the various challenges in mind female entrepreneurs face in Tunisia presented in the previous section (section 2). The GIZ and CEPEX had already created three (majority-male) export consortia during the prior cooperation period (2018-2020). In addition, we jointly interviewed entrepreneurs and consultants who participated in this first phase and female entrepreneurs, consultants, and representatives of the National Federation of Female Entrepreneurs to inform the intervention.

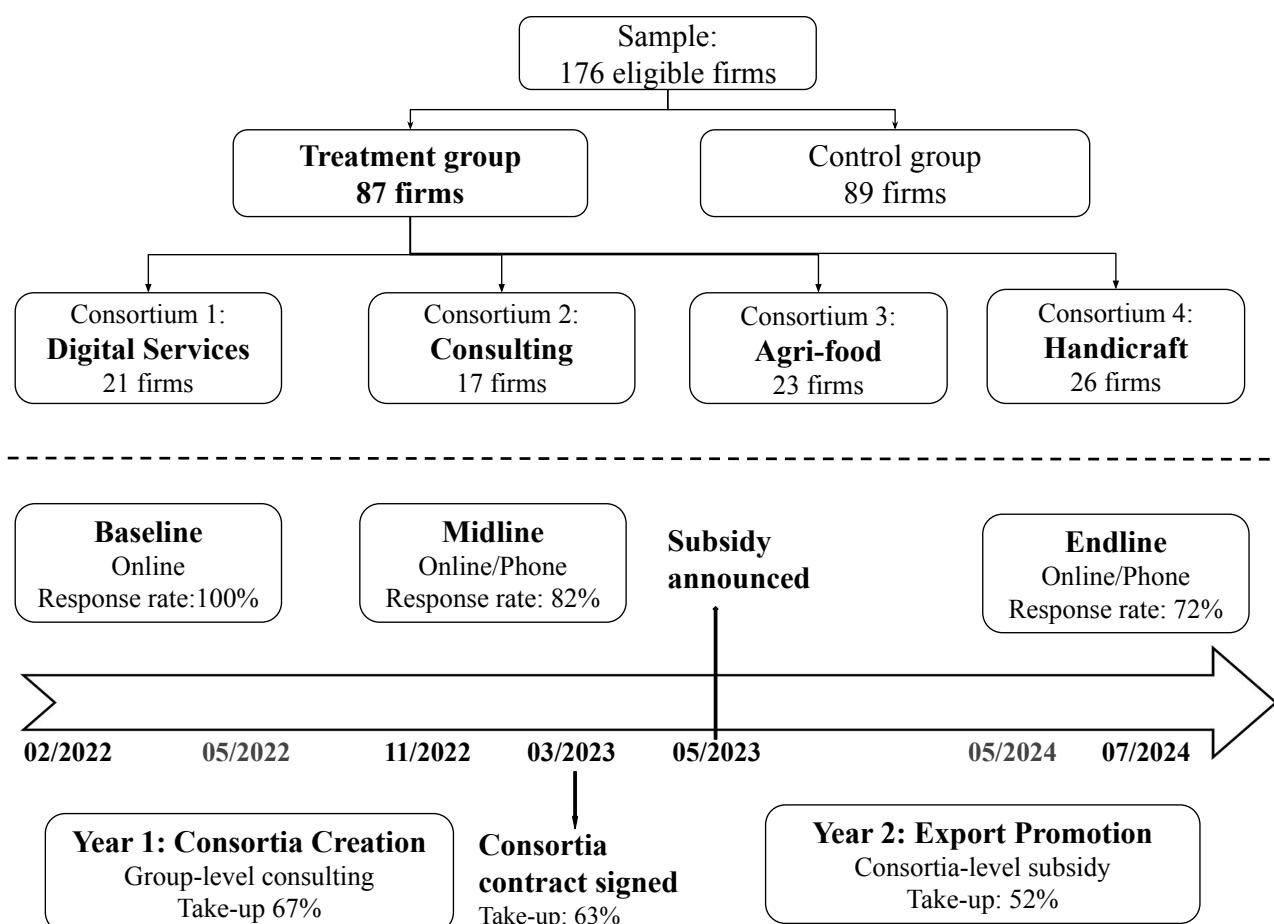


Figure 1: Treatment allocation and timeline

3.1.1 Treatment phase-1: Consortia Creation

The first period, *Consortia Creation*, focuses on establishing the consortium. In addition, it aims to provide the firms with the *skills* necessary to export and to strengthen female entrepreneurs' *self-confidence* and *networks*.

To establish a consortium, it is crucial for entrepreneurs who do not have a prior relationship to get to know and trust each other. The fact that the program exclusively targeted female entrepreneurs and consistently emphasized empowerment and mutual gains via female business cooperation in its communication helped motivate entrepreneurs to sign up for the program. For example, 98% stated being part of a female business network as a reason for signing up for the program at baseline. At the start, few firms were familiar with the consortium concept. Accordingly, part of the group-level consulting sessions described in the following paragraph focused on interfirm communication, mutual gains from cooperation and explaining different models of firm cooperation.

The female entrepreneurs receive a bundle of group-level consulting, personal coaching, and group-level networking events that aim to foster a group spirit (network) and provide the firms with the knowledge necessary for export. Treated firms were invited to a series of 8 virtual and in-person full-day group workshops with business and export consultants, inspirational talks from successful local female entrepreneurs (role models), and networking events from the export promotion agency (see Table 3). The core part is a series of three two-day long workshops mixing knowledge inputs, e.g., regarding general and export-specific business management, export and business opportunities in other African countries, gender awareness and communication training, and team building. There is an emphasis on intra-African export markets as the program, as the funds were provided by a program focusing on promoting intra-African trade. The workshops are all conducted by local female consultants, except one male consultant. Again, the reason to rely on female consultants mostly is to create a safe space in a context where business networking is complicated for female entrepreneurs (see Section 2) and to promote a spirit of female solidarity and mutual empowerment. The meetings occur in a neutral location in Tunis or at the Tunisian export promotion office headquarters. Participants are offered accommodation (but no mobility support). In line with Iacovone et al. (2021), we use consultants to avoid firms having to incur coordination costs, to moderate the exchange and to guide participants through the consortia establishment process. In principle, firms could self-organize or follow a rotation schedule of organised meetings at each other's premises as in Cai and Szeidl (2018); historically, consortia have been created independently by small firms, e.g., in Spain or Italy, suggesting government intervention is not mandatory (?). However, coordination costs and the lack of knowledge about potential business partners justify government intervention. Moreover, 60% of the firms do not have export experience at baseline, and given the ambitious goal to turn them into exporters within two years, external knowledge input was deemed important.

The workshops are complemented by up to five personal coaching sessions, two networking events with entrepreneurs in sub-Saharan countries, and a Slack channel via which the women can exchange and receive the inputs used for the workshops. In Table 43 and Figure 22, we categorized and analyzed the topics that female entrepreneurs discussed during their coaching based on administrative project documents. The majority of issues, 52 percent, were related to core business management fields, such as marketing (17 percent), business development (16 percent), and product/service development (15 percent). The second most prevalent category was accounting and financial management, including

Table 3: Group-level Consulting: Workshop Topics

Session No.	Workshop Topic
1	Launch event
2	Export opportunities & African markets (prospecting, target markets, planning)
3	Export & business development (marketing, logistics)
4	Export transactions (payment, contract, insurance)
5	Gender and female entrepreneurship
6	Networking events
7	Inspirational talk from successful female entrepreneurs
8	Options, functioning, & choice of legal format for business co-operation

price setting and balance sheet accounting. Two other frequent issues, reflecting the analysis of the context in section 2, were access to funding sources (8 percent) and access to government support programs (6 percent), in particular, Tunisia's start-up label. Moreover, 6 percent of the issues were related to personal development, such as a lack of self-confidence.

During the last group workshop, the entrepreneurs decided whether to establish a permanent form of cooperation. They decided on the format (e.g., joint ventures, co-contracting, informal and formal business associations, consortia), whether they wanted to join the export consortium, and elected a future consortium president to advance the consortia creation process. All four groups decided to create an export consortium. The implementation partners then followed up with the consortium president and the members and guided them through the legal process of formally registering the consortium and signing the legal agreement establishing the consortium, which took several months.⁸ The signature of the legal agreements was celebrated at a public event at the national export promotion agency, establishing a consortium as a legal entity with its own organizational structure, such as a consortium president and joint decision-making processes.

The first phase was moderately costly. Not counting the labour costs of the implementing agency, the consultancy, and the event organization, including rents for rooms and accommodation for firm representatives, the cost was around €2000 per company. This paid for an equivalent of roughly 70 face-to-face hours between consultants and firms. This is much lower than Iacovone et al. (2021) regarding treatment intensity or absolute face-to-face hours (70h vs. 408h) but comparable in costs per face-to-face hour.

3.1.2 Treatment phase-2: Export Promotion

The second period, *consortia export promotion*, focused on making the consortia operational and finding clients in foreign markets. For this purpose, each consortium received a subsidy worth €75,000. The subsidy was only announced upon the formal signature creating the consortium as a legal corporate entity to reduce moral hazard. Moreover, the subsidy is not allocated on the individual firm level but at the consortium level and earmarked toward specific activities meant to kickstart the consortium and to cover members' coordination costs and part of the fixed costs of export.

⁸In Tunisia there exists a specific legal format to set-up a consortia, called "Groupement d'Intérêt Economique", which all four groups chose as their legal format for cooperation.

While the political partners led the consortia establishment process, the second treatment phase is driven by the consortia members themselves. As no official meetings or check-posts are scheduled by the political partners anymore - the process now depends on the consortia members' motivation to do business together. To be able to document this process, we hired research assistants - female postgraduate students from Tunisia - who conducted qualitative interviews, participated in general assemblies of each consortium, and accompanied the consortia representatives to two trade fairs in Dubai and Morocco.

To make the consortium operational, members could use the subsidy to rent office space and hire a consultant and an administrative coordinator. Proof of payment had to be provided to the implementation agency, making it difficult to use the subsidy for another purpose. The consortium members elect a president, a vice-president, and a treasury who form the Executive Office. The Executive Office takes key day-to-day business decisions and leads in setting up the consortia workflows. In general, there has been an organic process of group formation during the group workshops in the first treatment period that saw leaders and core groups emerge - a process that was expected and partly promoted by the implementation partners who deemed each consortium required a few core members that take the lead in the consortium. Strategic business decisions are taken in general assemblies of consortium members, e.g., which export markets to target. The frequency of general assemblies varies. It intensifies before joint trade fair visits or B2B missions and is less frequent in other periods. The meeting takes place in person or also online - given the consortia members are located in different parts of the country, many meetings are held via virtual communication technology. Moreover, the consortia members intensively communicate via telephone calls and text messages - already after the first workshop, most consortia created a private communication channel, off the Slack channel provided by the project, and communicate regularly.

The key collectivization or sharing of the fixed export costs occurred while searching for clients. Each consortium used the subsidy to send one or a few representatives to international trade fairs or B2B missions. Table 4 documents that each consortium participated in 4-6 trade fairs or B2B missions; while each member participated at least in one trade fair, some, mostly the executive office members elected to represent the consortium, went to up to five trade fairs. During the trade fairs/B2B missions, the representatives advertised all members' products rather than their own. Our research assistants documented how members introduced themselves as consortia representatives, introduced other members' (and their own) products, shared pictures of business cards of potential buyers via text and voice messages immediately with members, and sent information on innovative solutions from competitors, e.g. in terms of packaging, with the other consortia members. The representatives also conducted business meetings with potential clients or commercial partners in foreign countries jointly. Members thereby benefit from strategizing together, and those less apt in foreign languages or in constructing personal links with clients from more comfortable consortia members. In addition, some female entrepreneurs expressed they felt more comfortable travelling abroad as a group than alone and were encouraged by more confident members. In other words, the consortia members collectivized the opportunity or search costs of exploring potential business opportunities in a foreign market. This information would have been private if one individual firm participated and invested singlehandedly in exploring a new market. The decision for a target market and trade fair is based on an export plan developed for the consortium as a whole in cooperation with consultants; given the programs focus on

promoting South-South and, in particular intra-African trade, the consortia focused on opportunities in African markets, but also selectively participated in trade fairs in Gulf countries and Europe.

Moreover, the consortia members market their products under one common brand, enabling them to gain visibility and diversify their product offerings. Financed by the subsidy, the consortia set up websites and social media profiles that list each member's company and its products in an online catalogue. The online marketing targeted both domestic and international customers. The consortia also enable firms to offer a wider variety of products. For example, the Digital Service consortium could offer website construction, app creation, digital marketing, and cloud services simultaneously rather than individually, making it more attractive to larger buyers who prefer to contract all services from the same provider rather than from separate ones (see Figure 2).

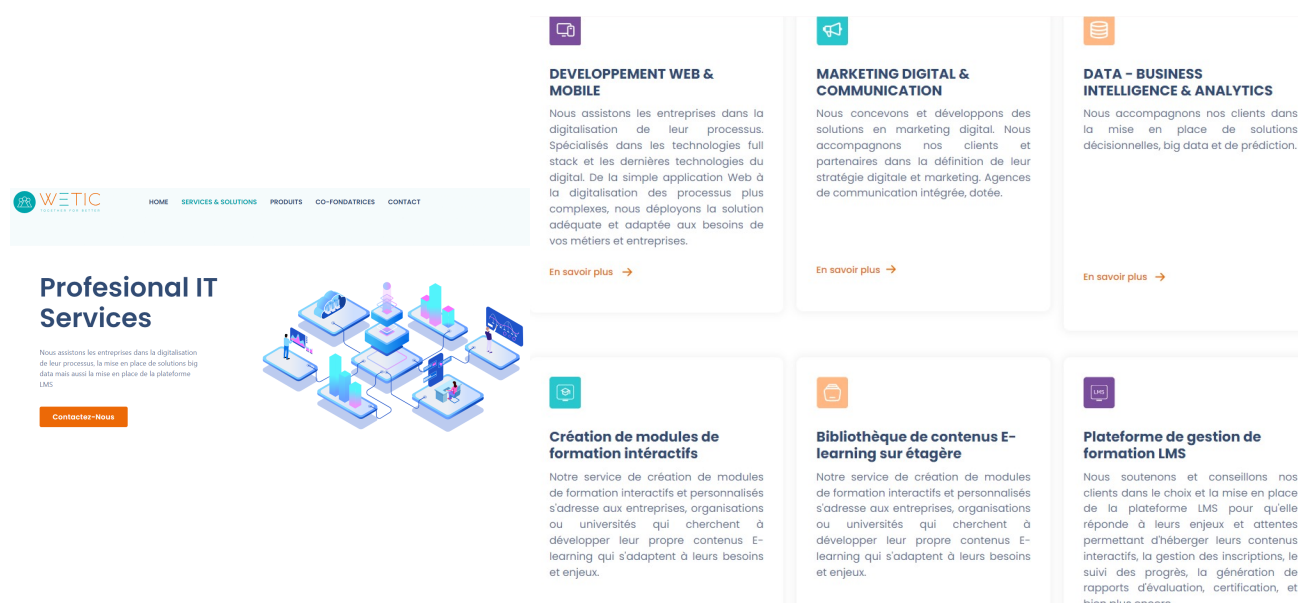


Figure 2: Excerpts from the Digital Services Consortium webpage illustrating the joint branding, online marketing, and gain in product variety. Each service listed in the boxes on the right is provided by one company.

Table 4: Number & destinations of trade fairs and B2B missions

Consortium	N of Countries	Countries
Agro-Food	4	Dakar, Dubai, Egypt, Germany
Handicraft	5	Egypt, France, Saudi Arabia, Senegal, United Arab Emirates
Consulting	5	Egypt, Ivory Coast, Mali, Mauritania, Senegal
Digital services	6	Dubai, Egypt, Ivory Coast, Kenya, Maroc, Rwanda

The second phase of the treatment costs about €3,450 per company or €75,000 per consortium. The funds are entirely attributed to the consortium-level subsidy used, as discussed above.

3.2 Sampling and Randomisation

The sample is based on a nationwide communication campaign. Female entrepreneurs across Tunisia were invited to sign up for the export consortia program. Several communication and marketing chan-

nels were used to attract companies, including an e-mailing campaign, face-to-face or hybrid promotion workshops in Tunis and Sfax, social media and conventional media, such as TV, radio, and press, and implementation partners' own communication channels as well as those of the Tunisian Federation of Female Entrepreneurs. Interested firms could register online via the Tunisian export promotion offices website.

These recruitment efforts led to 263 applications from female-owned or managed firms nationwide. Based on gender-coding data from the Tunisian National Registry of Industrial Firms, we estimate that this corresponds to up to 20% of the total population of female-managed firms with more than five employees. Among the 263 applications, 181 fulfilled the eligibility criteria: intending to export within the next 12 months, having an exportable product (self-reported) that fitted into one sector with sufficient other firms interested in establishing a consortium. Project managers called up companies that did not provide sufficient information and excluded firms without registration and in financial distress.

The randomisation allocated the 176 firms that responded to the baseline survey to a treatment and a control pure control group. We conduct firm-level stratified randomization using STATA 15. We opt for stratified randomization to increase power (McKenzie, 2012). We stratify first by one of the four sectors, agro-food, handicraft and cosmetics, professional business and digital services. Within sectors, we rank firms and form sextuplets of firms with similar export sales, given export is the primary outcome. We opt for sextuplets to avoid losing observations if there are multiple firms in one strata that do not respond to the endline survey.

In addition, we put outlier firms with extremely high sales values into separate strata. As a result, we randomize 87 eligible companies to the treatment group and 89 companies to the control group (see Figure 9).⁹

3.3 Take-Up

We consider take-up along three dimensions: participation in the group-consulting workshops, joining the consortium at the end of the first treatment period, and remaining in the consortium until the endline. First, 27.5% did not show up at all to the group-consulting workshops, despite having registered and responded to the baseline survey. Of the 75.5% (63 companies) that showed up to the first workshop, we lost a further 10% percent or 8 companies during the following workshops.

Second, among the 55 companies (63%) that participated in most workshops, all decided to join the consortium after the first year. The take-up rate is close to the average in firm training programs (67%) (McKenzie et al., 2023) and in the group consulting (67.9%) in Iacovone et al. (2021). Having said this, improved targeting, intensified follow-up (e.g. via phone before workshops) and potentially other ways of facilitating participation, such as reimbursing transport costs, may improve take-up if scaling or replicating this study.

Third, all the 55 companies that joined the consortium participated in at least one international trade fair or B2B mission. However, 16 among the 55 gradually dropped out from the consortia. As a result, only 45% of the initially invited companies remained active in the consortium at endline - leaving all

⁹There is one specific case of a very large female-owned and managed company - the company's size made it such an influential outlier that it would inflate variance in either group it would be allocated. Given political partners had a strong preference for keeping the company in the program, we randomised it with all other companies. It ended up in the treatment group, attended most workshops in the first phase but decided not to join the consortium and did not respond to the endline survey.

four consortia with a final group size of 8-12 firms. This corresponds roughly to the 50% take-up rate that we had anticipated at the beginning of the program, and due to this, we decided to invite twice as many companies as we expected to remain in the consortium. Note that the consortia can recruit new members if all existing members agree, providing an avenue for future group sustainability and growth.

We examine the reasons and determinants for drop-outs in detail in Section 6.4.

3.4 Data Sources

We rely on four data sources: i) firm surveys, ii) administrative data from customs, social security and the tax authority, iii) qualitative interviews, focus groups, and participatory observations from assisting consortia meetings and participating with consortia members in travel to international trade fairs, iv) administrative data from the implementation partners documentation on treatment take-up.

The first data source is firm surveys. We conduct a baseline, midline, and endline survey with a 100%, 82%, 72% response rate. The midline survey occurs after the first treatment period ("consortia creation") has been completed. The endline survey occurs at the end of the second treatment period ("consortia export promotion"). Surveys are conducted in cooperation with a Tunisian survey firm. Respondents can reply online or on the phone. Contact information stems from registration when we collected several contact details (telephone numbers and email addresses of two firm representatives). Firms are called up to 12 times or more until they are declared non-respondents. Surveys are conducted in the local language (Tunisian Arabic) and French. We train enumerators in cooperation with the survey institute for several days, including simulations and piloting. We conduct daily high-frequency checks and spot checks at the survey institute and use automatized logical checks for response consistency. If the respondent consented and responded on the phone, all audio recordings of flagged responses are reviewed, and if inconsistencies are not clarified, respondents are called again until clarification or categorization of refusal.

The second data source is administrative data from customs, social security, and the tax authority. The data comes from our political partners, the Tunisian Export Promotion Agency and the National Statistical Institute.¹⁰ The first data set is customs data. It provides information on firms' product-level export quantities, values, and destinations until October 2024. The only drawback of this data is that export of services is not recorded, while half of the sample are service firms. The second dataset is a firm-year panel that provides aggregated annual export sales values and quantities from customs and from the tax authority, which includes services firms. It also included information about firms' number of employees and wage bills, domestic sales and profits. The drawback of this dataset is that the latest currently available year is 2022 when the treatment started. Accordingly, the current draft does not include the analysis of this data yet.

The third data source is qualitative. First, we conduct long, qualitative interviews with the presidents of each consortium and some of its members starting in the second phase of the intervention when the consortia start operating independently. The interviews help us understand the group dynamics of the consortia and how the members use the consortium/network for their business, and inform the endline survey questionnaire. When conducting the interviews, no connection is made to the experiment, but

¹⁰We are indebted to Nadia Ali, Eric Verhoogen, Massimiliano Cali and Jawhar Abidi as well as our partners Lisa Menucha and Majed Khairi for their support.

interviews are requested to conduct research on barriers to female entrepreneurship in Tunisia. Second, we organized two focus groups with members from two consortia after one of the group-consulting workshops. A key interest was to understand the main barriers to female entrepreneurs in Tunisia for their export and to examine if they correspond to the barriers documented in the literature. The results are documented in Section 2. Third, a research assistant attended several meetings and travelled with the consortia representatives to two international trade fairs in Dubai and Morocco. This provided us with further insights into group dynamics and take-up/drop decisions discussed in Section 6.4 and the functioning of the consortia.

Fourth, we receive implementation data from our political partners. The data provides information about firms' participation in the group-consulting sessions and their use of the subsidy for participation in international trade fairs. Based on the former, we construct take-up numbers discussed in Section 3.3.

4 Empirical strategy

4.1 Estimation

We estimate average treatment effects based on intention-to-treat in an ANCOVA model as defined in McKenzie (2012):

$$Y_{i,t} = \beta_0 + \beta_1 Treatment_i + \Pi Y_{i,t=0} + \gamma M_{i,t=0} + X_s \theta + \varepsilon_i \quad (1)$$

where $Y_{i,t}$ is the given outcome variable measured post-treatment, $Y_{t=0}$ is its baseline value, and $M_{i,t=0}$ a dummy variable indicating whether or not the baseline value is missing, $Treatment_i$ is an indicator for being assigned to treatment, X_s is a vector of randomization strata dummy variables, and ε_i is the error term. Since we randomized at the individual level, Huber-White standard errors will be used. β_1 provides the intent-to-treat or average treatment effect, which is the effect of being selected to receive the intervention among the experimental sample of 176 participants. Given the small size of the firms in the sample and the focus on export, it is unlikely that the stable unit treatment value assumption (SUTVA) is violated, e.g., by treated firms stealing business from firms in the control group.

Based on the invited firms' decision to participate in the consortium and their participation in the project's consortium creation activities, we instrument treatment with the former take-up variables to estimate the treatment effect on the treated:

$$Y_{i,t=1} = \beta_0 + \beta_1 C_i + \Pi Y_{i,t=0} + \gamma M_{i,t=0} + X_s \theta + \varepsilon_i \quad (2)$$

where C_i is an indicator for firm i 's treatment status as instrumented by firms' participation in project activities or their decision to become part of the consortium. β_1 measures the impact for firms having decided to become a member of an export consortium.

4.2 Outcome measurement

We consider four different outcome dimensions. The first outcome dimension is female entrepreneurs' networks. We think about the consortia as a new network of business contacts, independent of family and existing contacts. To quantify and qualify female entrepreneurs' networks, we use the following

indicators based on survey questions. First, we ask female entrepreneurs about the number of female and male entrepreneurs that they meet regularly to discuss business challenges. This provides us with a proxy for the size of female entrepreneurs' business networks. We also differentiate between contacts related and unrelated to family and between male and female contacts. Secondly, we ask respondents to rate the quality of their network on a scale from 1 to 10.

The second outcome dimension concerns female entrepreneurs' entrepreneurial confidence or empowerment. Exporting requires traveling abroad, negotiating and attracting international customers, and investing in export readiness while uncertain about potential returns. Moreover, existing literature has shown that an entrepreneurial mindset is important for entrepreneurial achievement (Frese and Gielnik, 2014; Campos et al., 2017). We measure entrepreneurs' confidence through three conceptual proxies of "confidence" used in the existing literature (Alibhai et al., 2019), namely "locus of control", "self-efficacy", and "sense of initiative". For each dimension, we ask female entrepreneurs to affirm on a 5-point Likert scale a series of statements. Each statement asks about a different dimension of firm and export management. We normalize each question to a z-score and build the average of the z-scores for each dimension as well as across all three dimensions as in Kling et al. (2007).

Moreover, we conduct a list experiment as an additional source of evidence of female entrepreneurs' confidence. One crucial part of (female) empowerment is independent decision-making, which is defined as independent decision-making in intra-household bargaining power toward male partners. This paper is interested in female entrepreneurs' independence in business decision-making. Existing research has shown that male role models, e.g., fathers or other close family members, such as uncles or partners, are important predictors for women's choice to engage in entrepreneurship (Alibhai et al., 2019). In our sample, 60 percent of the female entrepreneurs have one family members that is an entrepreneur. In the list experiment, we ask female entrepreneurs how many of the following statements apply to them, emphasizing that we do not know which of the statements apply to them. All female entrepreneurs see the same three initial, non-sensitive options.¹¹ A randomly selected half of the respondents also see the sensitive option: "I consult my husband (or another man in the family) before making strategic decisions for the company". At midline, we re-randomized half of the treatment and half of the control firms to receive the question with and without the sensitive option. In response to early feedback that consulting one's partner before taking important decisions can also be a sign of a functioning relationship rather than a lack of independence, we adapted the statement at midline to emphasize obligation : "I feel obliged to consult my husband (or another man in the family before making decisions for the company."

The third outcome dimension is knowledge transfer, measured as the adoption of management and export-related practices as well firm innovation. We measure management practices based on selected key outcomes indicators that were found to correlate strongly with the indicator used in Bloom et al. (2013, 2020). We measure export readiness based on selected questions used in export readiness assessments of export promotion agencies as well as applied in Kim et al. (2018); Breinlich et al. (2017). Finally, we measure innovation based on the Oslo Manual definition as significant improvements in product, process, marketing, or organizational innovation (Cai and Szeidl, 2018).

The fourth outcome dimension consists of firms' business and export performance. We measure business performance through the standard self-reported survey indicators, such as annual sales in

¹¹The three answer options are "I always encourage and support my team", "I dreamed of being a successful woman when I was a child" and "I try to do my best job"

Tunisia, total annual sales, the annual number of employees (including differentiation between young and female workers), and annual profits. We measure export performance based on self-reported or administrative firms' export sales, the number of export countries, and the income level of the main exporting destination. In the following section (section 4), we describe how we analyze this data.

5 Results - Main Effects

In this section, we show that the consortia enabled firms to export and grow their sales. In section 6, we study the mechanisms underlying the consortia's economic effects.

5.1 Export Performance

We begin by examining the extensive margin of firms' export performance: Did the consortia help firms become exporters? Table 5 examines whether the consortia increased firms' likelihood to have exported in 2023 or the first six month of 2024, and the number of countries to which firms exported based on the endline survey. Column (1) shows firms invited to treatment were 16.5 percentage points ($p < 0.05$) and firms that joined the consortium at endline were 28.1 percentage points ($p < 0.01$) more likely to have exported in 2023 or 2024. The latter is equivalent to a 107% increase relative to a control mean of 0.26. How do these effects compare to results from other studies?

The effects are large. In comparison, subsidized trade fare participation increased Japanese firms' export likelihood by 9 percentage points, and market intelligence increased Danish firms' export likelihood by 8-9 percentage points - about a third of the consortia's effect (Makioka, 2021; Munch and Schaur, 2018). Consulting or information provision alone did not firms' export likelihood in Colombia and Vietnam (Kim et al., 2018; Iacovone et al., 2023). The effect size may reflect i) efficiency gains from being able to explore several potential export countries simultaneously thanks to the shared effort with other consortia members, ii) the bundled nature of the treatment, which combined supply-side aspects (e.g., consulting, knowledge spillovers from peers) and demand-side features (e.g., online marketing and trade fair visits). We explore the mechanisms further in Section 6.

Column (2), Table 5, investigates the intensive margin of export, namely, if the consortia enabled firms to export to more countries? The intention-to-treat results suggest a positive, but insignificant point estimate of 0.33 additional countries on average, while the point estimate of 0.56 additional export countries for firms that joined and remained in the consortium is weakly significant ($p < 0.1$). Half an additional export country corresponds to a 48.5% increase relative to control mean of 1.02. In Figure 21 in the appendix, we examine if the effect on export countries depends on firms' prior export experience. It is in particular firms that already had realised one export operation at baseline that managed to export to one additional market, while there is no difference with the control group for firms without one export operation at baseline.

5.2 Business Performance

In the following, we investigate whether the consortia promoted firms' sales, both in terms of export and domestic sales, their profits and their number of employees.

Table 5: Export: Market Access Intensive and Extensive Margins

	(1) Exported (Yes = 1)	(2) N. of Export countries
Panel A: Intention-to-treat (ITT)		
Treatment	0.165** (0.064)	0.329 (0.228)
Panel B: Treatment Effect on the Treated (TOT)		
Consortium member	0.281*** (0.094)	0.560* (0.337)
EL control group mean	0.26	1.02
EL control group SD	0.44	1.55
Observations	127	127
BL controls	Yes	Yes
Strata controls	Yes	Yes

Notes: The outcome variable 'Exported' is based on firms' survey response to whether they exported in 2023 or the first six month of 2024. The 'Export countries' variable is winsorized at the 95th percentile as pre-specified. Panel A reports ANCOVA estimates as defined in McKenzie (2012). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following Cai and Szeidl (2018) and reported in parentheses. Each specification includes controls for randomization strata and baseline values of the outcome variable. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

In Table 6 we investigate first the results of the consortia on their sales (or revenue) in 2023. Column (1) presents the results for total sales in 2023 - when the consortia have been operating for one year. We estimate that firms invited to treatment increased their total sales by 91.5% ($p < 0.1$) and consortia members by 151.8% ($p < 0.05$). In column (2) and (3) we examine whether the increase is driven by domestic or export sales. The coefficients suggest domestic and export sales grew by 150% and 171% respectively, although the point estimates are not statistically significant. Given levels of domestic sales are about 2.5 times larger than export sales, the similar relative growth rates translates in much larger increases in domestic than export sales.

Is it surprising that domestic sales grow, and even more than export sales in total amounts? Only on first sight. In fact, there is nothing that restricted the firms to cooperate only in exporting. In contrast, the joint digital marketing and branding of the consortia likely increased firms outreach and notoriety with domestic clients. In addition, we show in Section 6 that consortia firms are significantly more likely to refer each other to clients and bid together for contracts. Finally, implementing oneself in an export market takes time, which is corroborated in our interviews with consortia members who suggest their firms are only starting their business in new export markets.

Where do the domestic sales come from, might consortia firms steal the business of control group firms, therefore violating the stable unit treatment value assumption (SUTVA)?

The effect on sales, however, is not matched with an equivalent effect on profits and employment. The results for profit are noisy; suggesting a significant increase at midline (1 year after treatment start), but no effect at endline (1 year after the consortium started operating). The noisy results on profit may have several reasons. One potential reason is that several firms in the treatment group reported negative

profits in year 2, explaining that they invested in implementing themselves in new markets, increasing variance and reducing our power as well as suggesting investment may result in future profits.

Table 6: Business Performance: Sales 2023

	(1) Total Sales	(2) Domestic Sales	(3) Export Sales
Panel A: Intention-to-treat (ITT)			
Treatment	0.915* (0.485)	0.911 (0.672)	1.017 (0.797)
Panel B: Treatment Effect on the Treated (TOT)			
Consortium member	1.518** (0.673)	1.500 (0.934)	1.710 (1.150)
Control group mean	11.03	10.09	3.82
Control group SD	4.14	4.67	5.55
Observations	119	119	124
Strata controls	Yes	Yes	Yes
BL controls	Yes	Yes	Yes

Notes: All outcome variables are winsorised at the 95th percentile and inverse hyperbolic sine transformed as pre-specified. 'Total', 'Domestic', and 'Export sales' are in units of Tunisian Dinar before transformation. Panel A reports ANCOVA estimates as defined in [McKenzie \(2012\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata and baseline values of the outcome variable. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

6 Results - Mechanisms

We expected the increase in exports and sales to be driven via four mechanisms (see Figure 8 for a visual theory of change): First, the consortia should expand female entrepreneurs business networks (section 6.1). Second, regular interaction with other entrepreneurs and/or experienced consultants in the group workshops should strengthen their entrepreneurial confidence (section 6.2) and, third, lead to knowledge transfer/human capital spillovers (section 6.3), e.g., in the form of learning about better management and export practices from peers or consultants, and innovation, e.g. by imitating peers. Fourth, the subsidy and joint participation in trade fairs should improve female entrepreneurs' export readiness.

6.1 Business Networks

Table 7 displays how the consortia have expanded and changed the composition of female entrepreneurs' business networks at the endline, two years after the start of the intervention. We define the business network as the number of people female entrepreneurs regularly discuss business during a regular month, and ask entrepreneurs to decompose their networks into female/male CEOs and friends and family. Column (1) shows that treatment group firms discuss on average with 3.3 more people and

consortium members even with 5.8. The effects correspond to a 40% and 70% increase respectively and are significant at the 5 and 1 percent level.

Table 7: Business Networks: Size and Composition

	(1) All persons	(2) CEOs	(3) Male CEOs	(4) Female CEOs	(5) Friend/ Family	(6) Male Friend/ Family	(7) Female Friend/Family
Panel A: Intention-to-treat (ITT)							
Treatment	3.3** (1.41)	2.0** (0.92)	0.5 (0.36)	1.4** (0.72)	1.0 (0.60)	0.3 (0.32)	0.8** (0.32)
Panel B: Treatment Effect on the Treated (TOT)							
Consortium member	5.8*** (2.09)	3.6*** (1.38)	0.9* (0.54)	2.5** (1.07)	1.7* (0.90)	0.6 (0.48)	1.4*** (0.49)
Control group mean	8.22	4.75	1.80	2.91	3.38	1.54	1.65
Control group SD	8.23	5.43	3.05	4.27	3.44	1.54	2.13
Observations	119	119	119	119	119	117	117
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BL controls	Yes	No	No	No	No	No	No

Notes: The outcome is the number of people with whom the female entrepreneurs discuss business regularly in a regular month. All variables are winsorised at the 95th percentile as pre-specified. Panel A reports ANCOVA estimates as defined in [McKenzie \(2012\)](#). Panel B documents IV estimates instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata, baseline values of the outcome, and a missing baseline dummy for the outcome variable when available. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

What are the characteristics of the new contacts? Columns (2)-(7) illustrate that 60% of the new contacts are other female entrepreneurs, to lesser extent new female friends and family as well as other male entrepreneurs, at least for consortia members. More specifically, Column (2) documents female entrepreneurs in the treatment group discuss business with 2 additional entrepreneurs and consortia members with 3.6, corresponding to a 42% and 75% percent increase, significant at the 5 and 1 percent level. Among those additional CEOs, 70% are other female entrepreneurs. Figure 12, in the appendix, shows that the firms in the treatment group met all but one of the female entrepreneurs that they regularly discuss business with via the consortium, emphasizing the effect the firms had in creating new and first connections between female entrepreneurs. For example, 22 female entrepreneurs, or about one-quarter of the firms in the control group, meet zero other female entrepreneurs regularly to discuss business at midline (endline numbers suggest the same is true in the second year after the intervention). The same applies to less than half or 9 firms in the treatment group, out of which 8 did not take up the consortia intervention. A drawback might be that the female-only consortia did not create much interfirm linkages with male-led firms, which could be economically beneficial ([Campos et al., 2015](#)). At the endline, consortium members regularly discuss business with one additional male entrepreneur. Given there was no effect on contacts with any male person at the midline (see Table 15, suggesting once operational, the consortium may also facilitate linkages with male entrepreneurs.

Who benefitted most from the consortia? Figure 11 examines whether the network expansion effects

depend on entrepreneurs' initial network size, splitting the sample by firms with less or more than 10 people that they regularly discuss business with at baseline. The results suggest it is firms with smaller initial business networks that discuss business with five additional people while there is no significant difference between treatment and control group firms with large baseline networks.

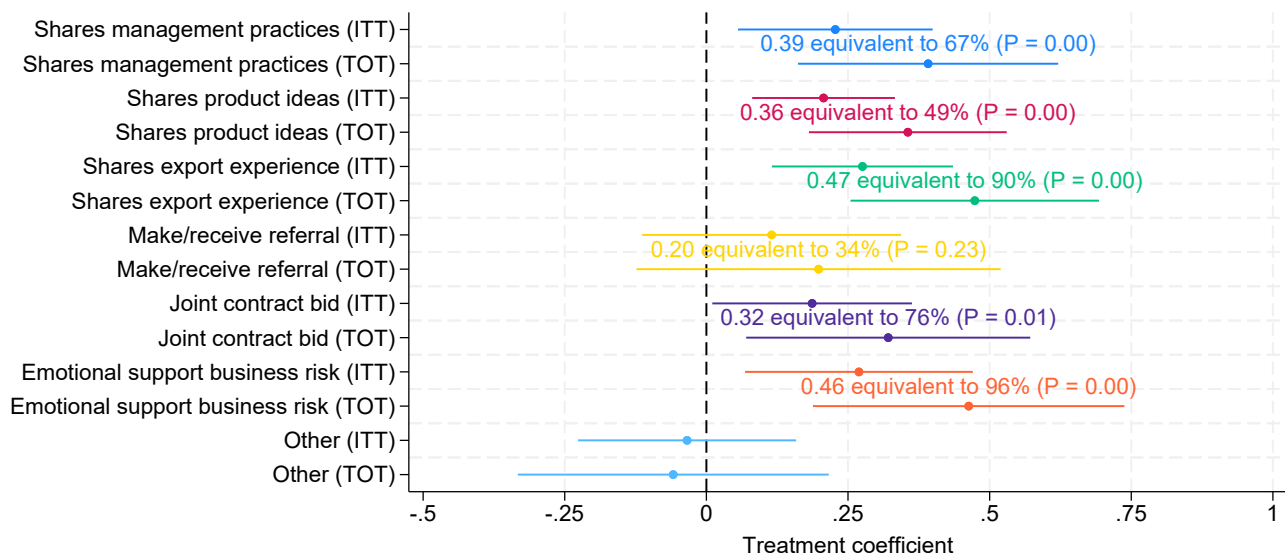


Figure 3: Network Use

Importantly, the treatment changed *how firms use their networks for business* (Figure 3, Table 16). Two years after the start of the intervention, treated firms are 23, 21, and 8 percentage points, and consortia members even 39, 36, and 47 percentage points, more likely to share information about management practices, product ideas, and export experience. This corresponds to a 67%, 49% and 90% increase relative to the control group endline mean, significant at the 1 percent level. Treated firms and consortia members are equally 12, 19, and 27 percentage points, and consortia members, even 20, 32, and 46 percentage points, more likely to make or have benefited from a referral to clients, submitted joint bids with other firms for contracts, and to have received emotional support vis-a-vis the risks and uncertainties of business and export from other entrepreneurs. While the effect on referrals is not statistically significant at conventional levels (CI 95% [-0.11;0.34]), all other effects are.

What is more, we were interested in (female) entrepreneurs' view of cooperation between entrepreneurs (Dimitriadis and Koning, 2019). Tunisian stakeholders and local (female) business consultants were skeptical about entrepreneurs' willingness to cooperate with other entrepreneurs due to cultural and business reasons. Female entrepreneurs invited to the consortia choose on average 0.3 more positive words than the control group when asked about their view of the cooperation with other entrepreneurs, a 12.5 percent increase relative to a control group mean of 2.3 words (Table 14 and Figures 14 and 15). The increase is driven by firms that took up the intervention and, in particular, an increased view of other CEOs as *partners* (81 percent in the treatment group vs. 62 percent in the control group). Treated female entrepreneurs also choose fewer negative words when asked about the interaction between CEOs, although the effect is not statistically significant.

In sum, the consortia have enabled female entrepreneurs to meet almost twice as many other female

entrepreneurs as they would have otherwise; for some of the female entrepreneurs, these were their first interactions with other female entrepreneurs. Crucially, female entrepreneurs also use their networks differently for business, including knowledge and experience exchange about management, export, and innovation, as well as directly cooperating in growing their business, e.g. via joint contract bids, and providing each other emotional support to remain confident vis-a-vis business and export challenges.

6.2 Entrepreneurial empowerment

The treatment significantly increased female entrepreneurs' belief in their own ability (efficacy), which we refer to as entrepreneurial confidence, but not their sense of control over their business environment, which we refer to as locus of control.

We measure entrepreneurial confidence and entrepreneurial locus of control through a series of self-affirmatory questions, building on earlier work (Alibhai et al., 2019; Campos et al., 2017). We adjust the survey items to the specific context of export and female entrepreneurs. For both dimensions, we ask female entrepreneurs to evaluate on a 7-likert scale to which extent they agree with three statements. At the endline, the three statements used for entrepreneurial confidence target entrepreneurs perceived ease of managing their business, accessing funding (which was listed as main barriers in focus group interviews), and motivating and managing employees. The three statements used for entrepreneurial locus of control relate to entrepreneurs ease of establishing new business contacts, including internationally, mastering administrative and logistical processes involved in exporting, and reconciling private and professional life.¹²

Columns (1) and (2) in Table 8 show treated entrepreneurs have 0.228 standard deviations ($p < 0.05$) more confidence in their entrepreneurial abilities than entrepreneurs in the control group (Table 18). The effect is even stronger for entrepreneurs that join initially and remain in the consortium over two years: the remainers' confidence in their entrepreneurial abilities increases by 0.457 standard deviations, which is equivalent of moving a female entrepreneur from the 25th to the 50th or 50th to the 75th percentile of entrepreneurial confidence in the control group.

Columns (3) and (4) in Table 8 examine the treatments' effect on entrepreneurs sense of control over their business environment. The results suggest an interesting dynamic, at first sight surprising. At midline, treated firms feel 0.177 ($p < 0.1$) and consortium members 0.233 ($p < 0.05$) more control over their business environment. At endline, the effect has vanished for the ITT and turned slightly negative for the treatment effect on the female entrepreneurs that joined the consortium. This seems to be driven by two aspects. First, the component of the index that has taken the deepest switch is entrepreneurs ease of establishing new business contacts, including internationally. While the midline was conducted when the consortium had just been created, this question was largely theoretical for all entrepreneurs that had no export experience. At endline, the consortium members had all at least visited one international trade fair or participated in a B2B abroad, which was for many entrepreneurs the first such experience. Qualitative interviews and the documentation of a research assistant who accompanied two consortia to two trade fairs suggest that an important share of the female entrepreneurs was taken by surprise and realised part of the formal export requirements, e.g. having an international quality certification, and informal requirements, e.g. comfortableness presenting and convincing buyers of their products, of export. The second explanatory factor is, that we changed one of the questions

¹²We adjusted the questions slightly between midline and endline. The midline questions had only a 5-point likert scale.

composing the locus of control index; namely, we included a question on reconciling personal and professional life. While the negative point estimate for the question itself is not significant, it contributed at least partially when aggregating the three questions in an index.

Table 8: Entrepreneurial Confidence: Efficacy and Locus of Control

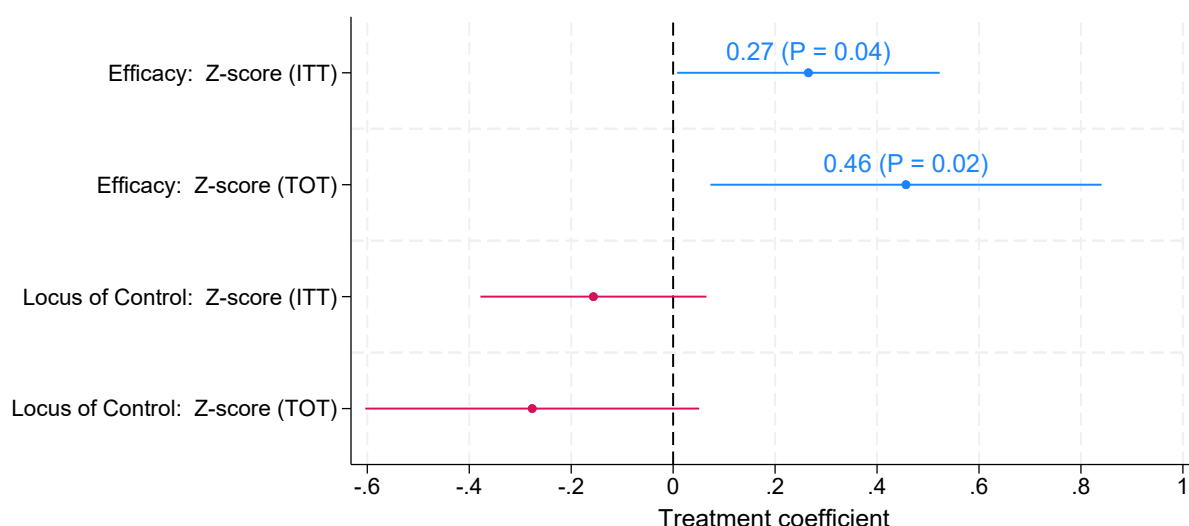
	(1) ML Efficacy	(2) EL Efficacy	(3) ML Locus of Control	(4) EL Locus of Control
Panel A: Intention-to-treat (ITT)				
Treatment	0.228** (0.110)	0.265** (0.129)	0.177* (0.095)	-0.156 (0.111)
Panel B: Treatment Effect on the Treated (TOT)				
Consortium member	0.297** (0.123)	0.457** (0.196)	0.233** (0.109)	-0.276* (0.167)
Control group mean	0.00	-0.00	-0.00	-0.00
Control group SD	0.77	0.82	0.75	0.69
Observations	135	119	134	119
Strata controls	Yes	Yes	Yes	Yes
BL controls	Yes	Yes	Yes	Yes

All dependent variables are indexes calculated based on z-scores as described in [Anderson \(2008\)](#). Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. Panel A reports ANCOVA estimates as defined in [McKenzie \(2012\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors in parentheses are clustered on the consortia-level for treatment group firms and on the firm-level for control group firms following [Cai and Szeidl \(2018\)](#). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Moreover, we measured another dimension of empowerment, namely women’s independence in entrepreneurial decision-making. Given the substantial risk of misreporting due to the privacy of the issue, we used a list experiment. At baseline and before randomization, about 12 percent of the female entrepreneurs indicated consulting a male family member before taking strategic business decisions (Figure 16a). At midline, we re-randomized half the firms in the treatment and control group to being exposed to the sensitive option and strengthened its formulation to “feel obliged to consult a male family member”.¹³ While firms in the treatment group exposed to the sensitive option selected even fewer options on average than unexposed firms in the treatment group, the same percentage of women in the control group (13 percent) as at baseline confirm feeling obliged to consult their husbands or other male family members before taking strategic business decisions (Figure 16b). The list experiment regression results reported in Table 19 in the appendix show that this difference is not statistically significant, which is, at least to a certain extent, due to the small sample size given we had to divide the sample into 2x2 groups, with each group having only around 30-40 firms.

Overall, we interpret the results as strong evidence that the first stage of consortia construction has strengthened female entrepreneurs’ self-confidence and sense of empowerment.

¹³We strengthened the formulation in response to early feedback that consulting with a partner before taking strategic decisions can be considered an essential part of a partnership rather than a sign of a lack of independence.



Note:
The control group baseline median is 0.09.
Confidence intervals are at the 95 percent level.

Figure 4: Entrepreneurial Confidence (Empowerment)

6.3 Knowledge transfer: management practices, innovation, and export readiness

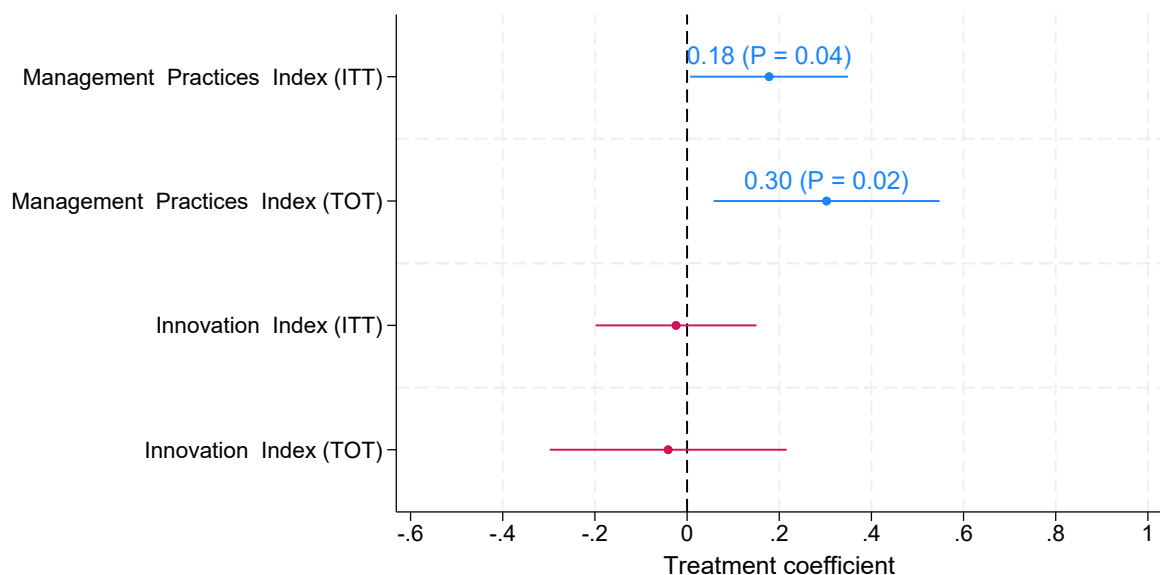
A key outcome and mechanism is knowledge transfer. Knowledge transfer could occur between members of the same consortia (Cai and Szeidl, 2018) or between consultants/experts and consortia participants (Iacovone et al., 2021).

The endline results suggest that knowledge transfer occurred mostly from consultants to female entrepreneurs in terms of general management practices for business administration and export knowledge. Treated firms have about a fifth of a standard deviation better score in a management practice index (Table 28). This is equivalent to moving from the 30th to the 50th or the 50th to the 70th percentiles along the distribution management practices in the control group at endline. However, the result is only statistically significant at the 10 percent level. Treated entrepreneurs learned about new management practices from consultants (55 percent in the treatment group vs. 32 percent in the control group) and through events (71 percent in the treatment vs. 51 percent in the control group, Figure 18). Z-score management practices index captures small, accumulated changes across several dimensions of management practices. Measured in total points, management practices increased by 0.1 points or 5 percent relative to the control group's mean of 1.8 points on a scale from 0-4. The difference between the treatment and the control group does not seem to be driven by one singular management dimension. Instead, treatment group firms provide more promotion incentives for employees and exhibit a higher awareness among employees about company goals, as well as evaluate slightly more key performance indicators more frequently (Figure 17).

In terms of mechanisms, subsidized participation in trade fairs and the focus on export to other African countries seem to have been crucial. While consortia members do not perform significantly different on an index of general export readiness measures (e.g., having international quality certificate, a commercial partner or a sales structure abroad), they are 50 percentage points more likely to have participated in an international trade fair (control mean = 0.35), and 34 and 26 percentage points more likely to have a potential client and commercial partner in another African country, and roughly 40

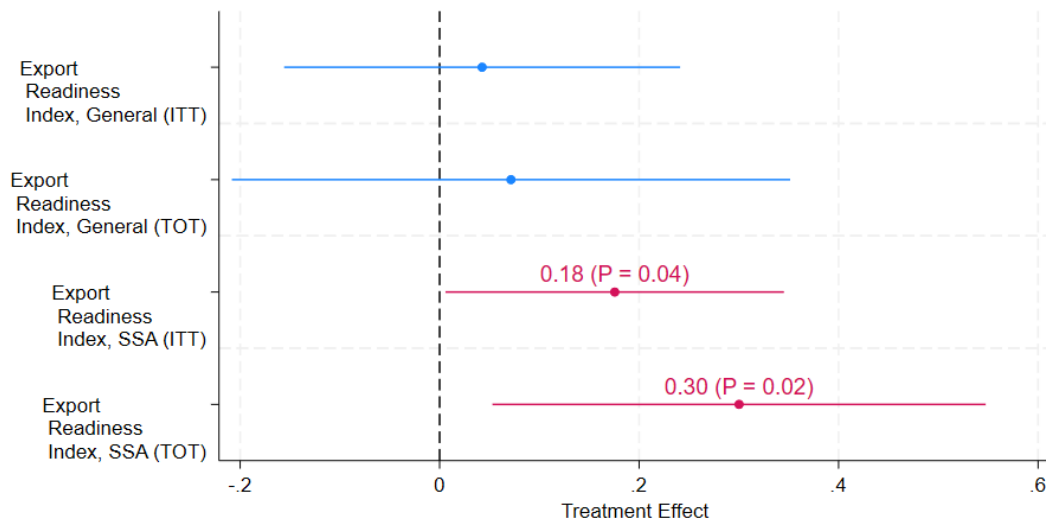
percentage points more likely to know Tunisia's trade agreements with East Africa and the African Continental Free Trade Agreement. In terms of the relative contribution of the subcomponents of the treatment (network, consulting, subsidy), the results suggest that the combination of the former was important given key improvements were made in subsidized areas (trade fare participation) and areas related to consulting (knowledge of trade agreements).

Against our expectations, consortia members did not engage in more innovation, in contrast to [Cai and Szeidl \(2018\)](#) and [Asiedu et al. \(2023\)](#). This could have several reasons. One possibility is that consortia members did not increase the extent, but the quality of innovation: Consortia members are roughly 20 and 30 percentage points more likely to indicate consultants and other entrepreneurs as sources of innovation. Alternative explanations may be that firms shifted limited resources from innovation to exporting, a mechanism documented recently in small firms ([Bergin et al., 2024](#)), or that firms' knowledge domains were too similar given they operate in the same sector. [Asiedu et al. \(2023\)](#), for example, find positive effects on similar innovation practices questions for firms from different sectors. The latter suggests network interventions that target innovation should aim for diversity. In contrast, networking interventions like this one that target sales promotion likely require a degree of product complementary that would not spur (but also not hinder) innovation.



Note: Confidence intervals are at the 95 percent level.

Figure 5: Knowledge Transfer: Management Practices and Innovation



Note: Confidence intervals are at the 95 percent level.

Figure 6: Knowledge Transfer: Export readiness indexes

6.4 Take-up

Finally, we examine what pre-treatment characteristics determine whether firms decide to join and remain in the consortium and how firms perceive the interaction with other businesses.

Two-thirds and half of the invited firms decided to join the consortium at midline and endline, respectively. Based on descriptive statistics and qualitative interviews with consortia members, differences in export experience and firm size or, more generally, firm maturity and personal conflicts explain the participation decision for two-thirds of the dropouts. Another third of the dropouts simply did not show up. Several firms stated in qualitative interviews that the consortia creation and operation process was complicated by firms' heterogeneous maturity, capabilities, and growth orientation. This led to some (not all) larger, more mature firms exiting the consortia while smaller, less export-experienced firms remained in the consortium. This is the case for the Agro-Food, Handicraft and Consulting Services consortium. A similar dynamic was observed in the Digital Services consortium but in the opposite direction as smaller, less experienced firms were in the minority and quit the consortium at midline.

While the initial consortia creation phase was shaped by a positive, cooperative spirit and a sense of mutual empowerment among female entrepreneurs, personal conflicts over the allocation of resources and decision-making (power) and group dynamics kicked in during the second year when the consortium became operational. At midline, consortium members chose 0.4 more positive terms (+15%) and 0.25 less negative terms (-53%) when asked to select the three most fitting among 10 terms describing their view of the interaction between CEOs. The positive term partnership drove these results. At endline, there was no significant overall difference anymore. Still, some consortia were significantly more likely to select negative terms, e.g. conflict or jealousy, while others were significantly more likely to select positive terms, e.g. cooperate. These results are corroborated in qualitative interviews. Overall, the evidence on take-up and group dynamics suggests improving selection, e.g., by selecting more homogenous firms in terms of maturity and size or entrepreneurs with more cooperative psychological traits, and establishing conflict resolution mechanisms could further improve the intervention.

Table 36 shows that the following stylized facts apply to three among the four - the agro-food, the handicraft, and the business service consortium - while the fourth consortium, digital services, presents an opposite selection dynamic.

Consortia participation seems to be driven by more sociable female entrepreneurs with twice as many business contacts outside families who felt more negative about the prevalent interaction among CEOs in their environment. Joiners have almost twice as many, 11 vs. 6.5, business contacts outside their families with whom they met 50 percent more often in the past three months to discuss business. At the same time, joiners also felt ex-ante considerably more pessimistic about the interaction between CEOs as they selected 0.3 or 57 percent more negative words to describe it. Joiners were unambiguously motivated by "becoming part of a female business network to learn from other female CEOs".

These female entrepreneurs predominantly own and manage much younger and smaller firms with only half as many employees and a third of the domestic sales of those who did not join the consortium. Joiners manage or own firms created four years before program participation, while dropout firms existed already for eight years, four years more. Joiners count 6 employees, 4 employees less than drop-outs on average. In a similar realm, joiners generate roughly 113 thousand Dinar in domestic sales on average, which is less than a third of the 364 thousand Dinar that the dropouts generate on average. This is reflected in proportionally smaller average profits among joiners.

What is more, consortia participants are much less experienced and performing in terms of export than those that dropped out. Roughly a third of the joiners exported or invested in exporting in 2021, while about half of the drop-outs exported and seventy percent invested in export. This is reflected in the below (above) average export readiness scores among joiners (dropouts) and resulted in starkly different average export sales of 13 thousand Dinar among joiners vs. 260 thousand among drop-outs. While true across the three consortia, this pattern is particularly pronounced for the agro-food consortia where the largest 20 percent of invited firms or all firms with more than 400.000 Tunisian Dinar in sales in Tunisia dropped out. The drop-outs were also much more performing in terms of export: 63 percent reported positive export sales (vs. 14 percent among the takers) and 88 percent positive export investments (vs. 29 percent among takers).

As mentioned above, the selection dynamic in the digital consortium defies and reverses the above pattern. The firms that opted to join the digital services consortium outperform the dropouts in all dimensions. Joiners are more likely to report positive investment in exports (71 vs. 0 percent), have 300 thousand Dinar more domestic and 210 thousand Dinar higher export sales on average, resulting in roughly three times as much generated profit and almost double the number of employees (11 vs. 6). What is more, the joiners are considerably older (9 vs. 5 years), have larger networks, report more innovations and better management practices.

In conclusion, we observe two opposite selection dynamics. In three consortia, younger and smaller firms decide to cooperate in setting up a joint consortium to market their products jointly, and larger, more established firms quit. In the fourth group, smaller and less export-oriented companies dropped out and larger, more export-experienced companies joined. These selection dynamics suggest that companies prefer to cooperate with peers of the same caliber and performance. For example, the standard variation in a z-score size index¹⁴ is nine times smaller among the joiners than those invited

¹⁴The size index is an average of the z-scores of employees, total sales, and profits

to join the agro-food, handicraft, or professional business service consortia.

7 Conclusion

We conduct a randomized controlled trial to study the effect of exogenously providing female entrepreneurs with a new professional network composed of other female entrepreneurs with complementary products and the same interest in exporting. At the endline, the intervention enables firms to substantially grow their businesses and even export. It also successfully expanded (female) entrepreneurs' networks and confidence in diffusing better management practices.

How does the study compare to other studies? We find positive effects on female entrepreneurs' entrepreneurial confidence and empowerment compared to other entrepreneurship interventions that focused on business and mindset training for individual female entrepreneurs (McKenzie and Puerto, 2021; Alibhai et al., 2019) and networks of female entrepreneurs (Asiedu et al., 2023). Based on qualitative interviews and our observations during the consortia meetings, we suspect that the exclusive focus on female-only consortia, which created a strong sense of solidarity among female entrepreneurs, paired with personal coaching, a thorny local environment for female entrepreneurs, and the support of two respected implementing agencies have all positively contributed to these positive effects on entrepreneurial confidence and generated a sense of empowerment. In our context, it seems more relevant for their empowerment to enable women to exchange with peers and offer personal coaching, e.g. regarding access to finance, than to add a specific gender component, such as childcare services, to the treatment. In terms of profit, our results point toward the same (positive) direction as in Cai and Szeidl (2018) and Asiedu et al. (2023). On the downside, we find weak effects on peer-to-peer knowledge transfer and no effects on innovation (yet) in comparison to Cai and Szeidl (2018) and Asiedu et al. (2023). We identify three reasons why this might be the case. First, an analysis of the firm characteristics driving take-up suggests that those who took up the intervention are particularly young firms (< five years old) that already had very high levels of innovation, probably best understood as making changes to their business rather than new to the world innovation, prior to the intervention. Second, more established, larger firms dropped out in three of the four consortia, which may have prevented smaller firms from learning from more experienced, larger firms. Thirdly, the first period of the intervention focused more on consultant-firm than firm-firm interaction. Another interpretation may be that it would be more beneficial for innovation to mix firms from different sectors as in Asiedu et al. (2023) to avoid firms are competitors or sharing similar knowledge sets. Finally, an important insight for future programs and studies is that a certain homogeneity of peers seems required for assuring the firm's participation. In other words, firm managers seem to prefer to spend time with peers that have the same caliber in terms of business performance (sales, employees, and export).

Given the focus on small (as opposed to micro) female-managed firms, we could not opt for a research design with several treatment arms. Therefore, we cannot disentangle the causal effect and contribution of each component of the treatment bundle and whether removing one part of the bundle would make the package less or even ineffective. For future work, we consider it would be promising to experiment with an intervention that provides less knowledge and financial input from the implementing agency. If it is enough for governments to act as a coordinator, reducing contracting frictions and search costs, this relatively low-cost intervention compared to cost-intensive consulting (Bruhn

et al., 2018; Bloom et al., 2013) would be an even more attractive option. Yet, removing these components of the intervention seems more advisable when targeting more mature, smaller, and middle-sized companies rather than female-managed firms. Finally, it seems promising to compare gender mixed vs. female-only consortia in future work. Gender-mixed consortia may enable crossovers into other sectors and access to potentially more valuable male entrepreneurs' networks but may compromise the effects on strengthening female entrepreneurs' confidence and empowerment.

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9 Appendices

9.1 Figures

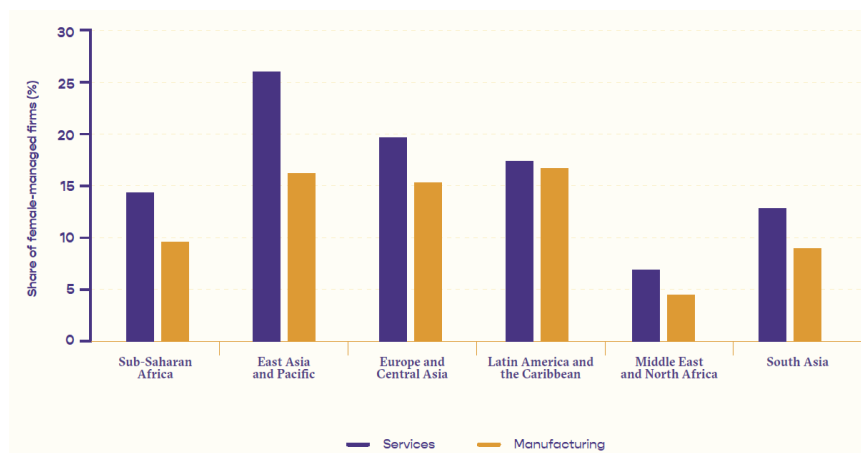


Figure 7: Female-managed firms, by region
World Bank (2019, p.123)

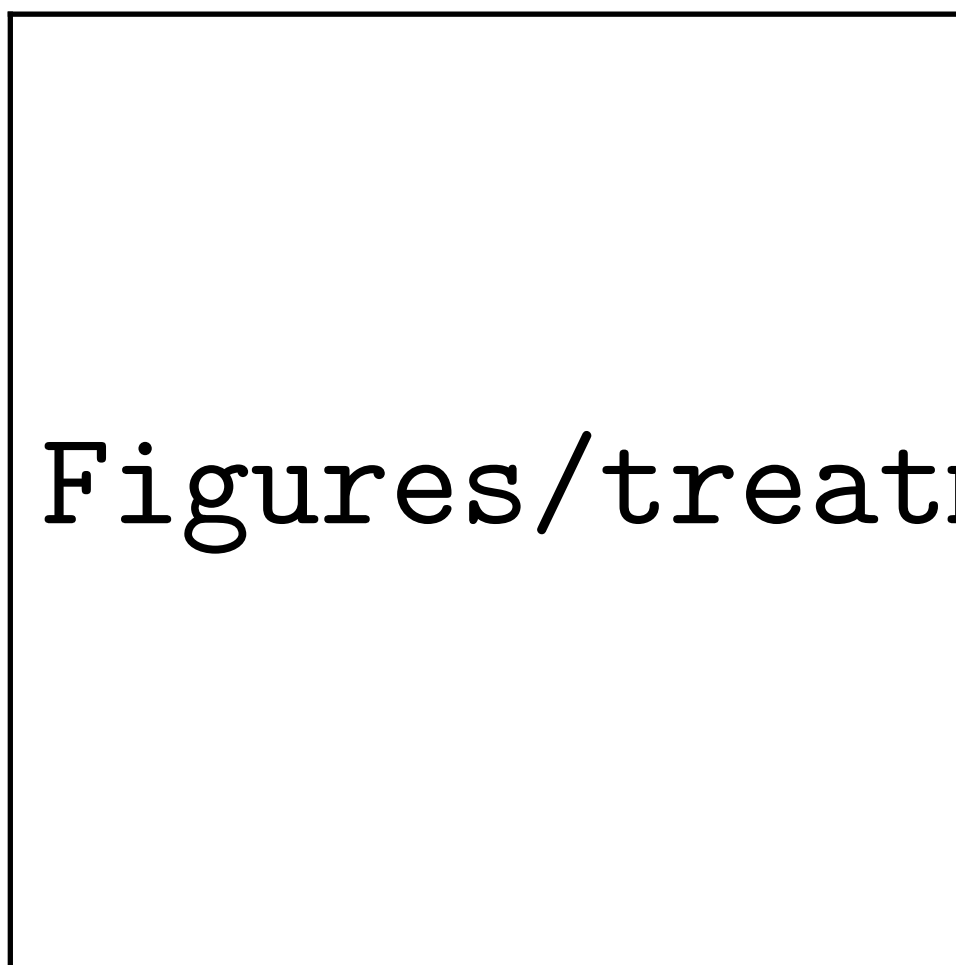


Figure 8: Theory of Change developed before the program started

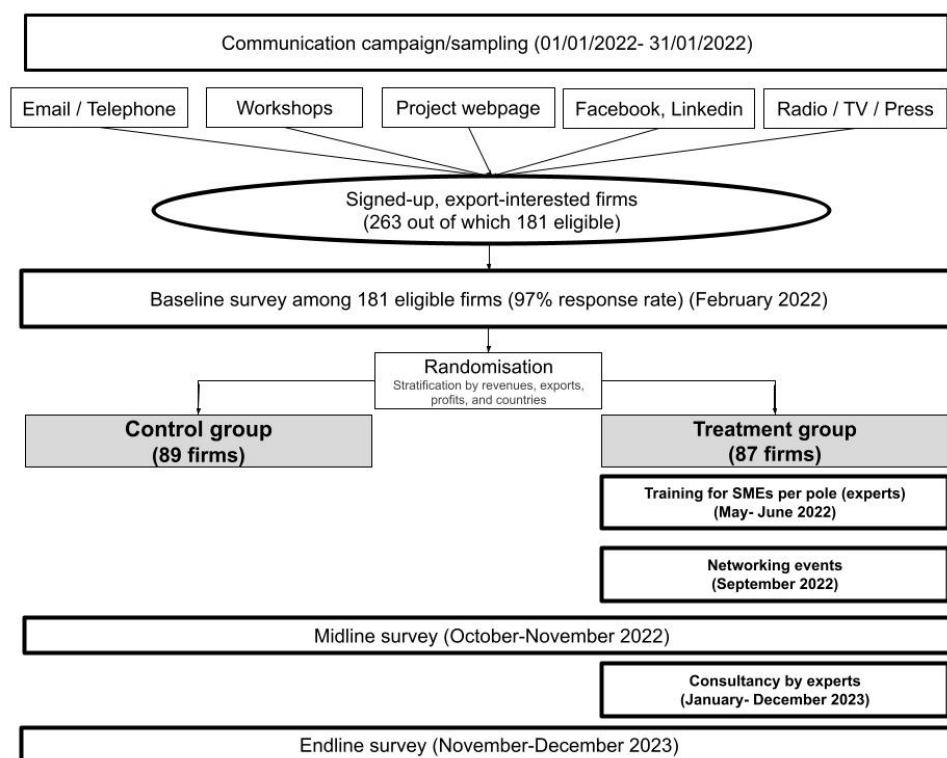
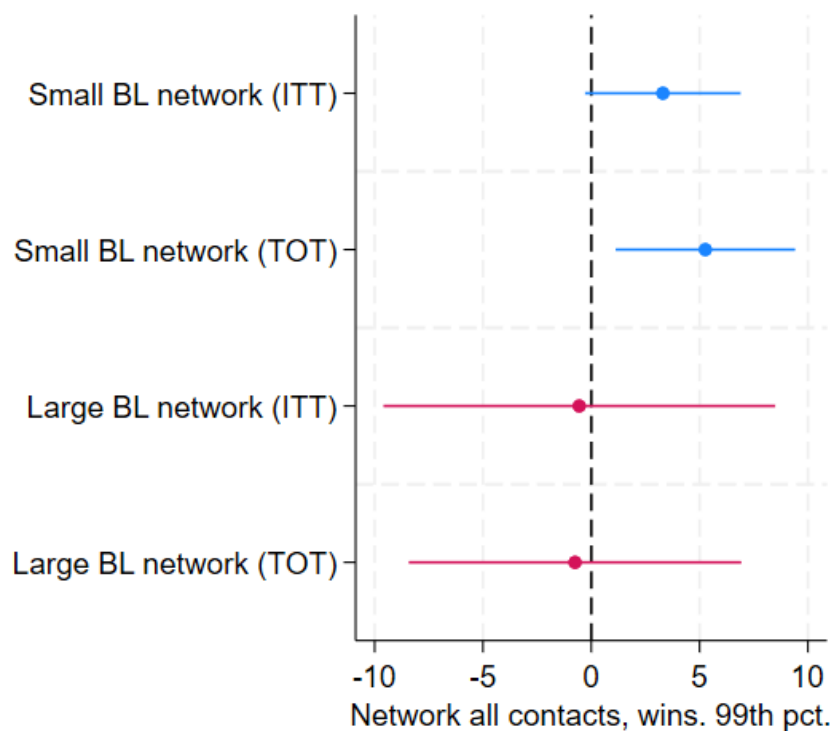


Figure 9: Study design flow chart and timeline

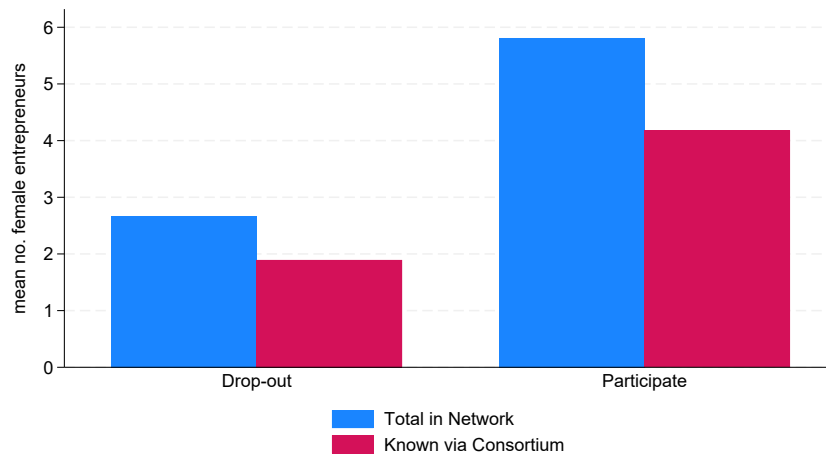
Questions	About
	Introduction
Q1-3	Essence of the enterprise
Q4-7	Knowledge exchange & innovation
Q8-12	Networking size / business contacts
Q13-19	Management practices
Q20	Marketing practices
Q21-27	Export management readiness /export outcomes
Q28-31	Accounting
Q32-38	Characteristics of the enterprise including the gender aspect
Q39-45	Expectations of the enterprise
Q46-47	Contact information

Figure 10: Baseline Questionnaire



Note:
Confidence interval at the 99th percentile.
Small network is less or equal to 10, while large is more than 10.

Figure 11: Heterogeneity in network expansion by small vs. large baseline number of contacts.



Note: Sample : Endline respondents in the treatment group.

Figure 12: Average number of female entrepreneurs encountered in the consortia relative to the total average number of female entrepreneurs with whom firms in the treatment group regularly discuss business by drop-outs vs. consortia members at endline.

10. **net_coop** Choose the 3 words that best describe how you think CEOs interact with each other in business.

3 POSSIBLE ANSWERS.

Win	1	Retreat	6
Communication	2	Partnership	7
Trust	3	Adversary	8
Beat	4	Connect	9
Power	5	Dominate	10

Figure 13: Survey question regarding female entrepreneurs perception of the interaction between CEOs in business.

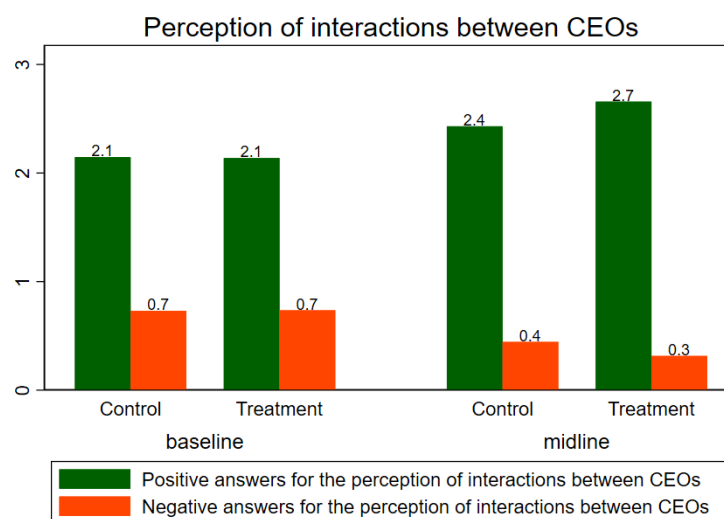


Figure 14: Perception of interactions

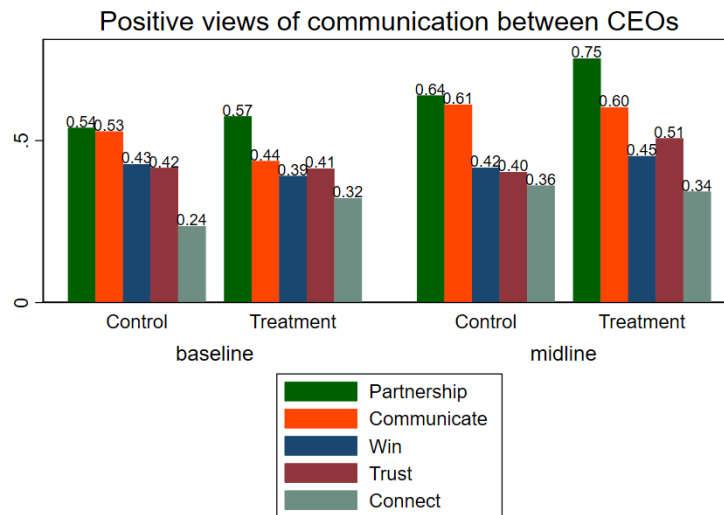


Figure 15: Most common word selected in positive interactions

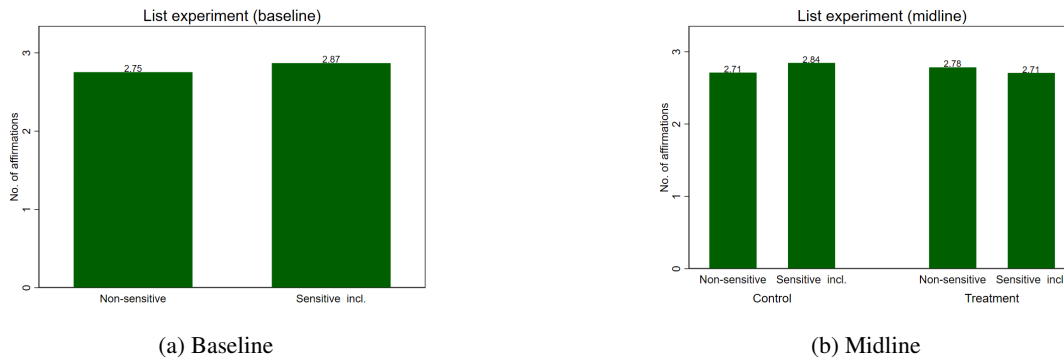


Figure 16: List experiment

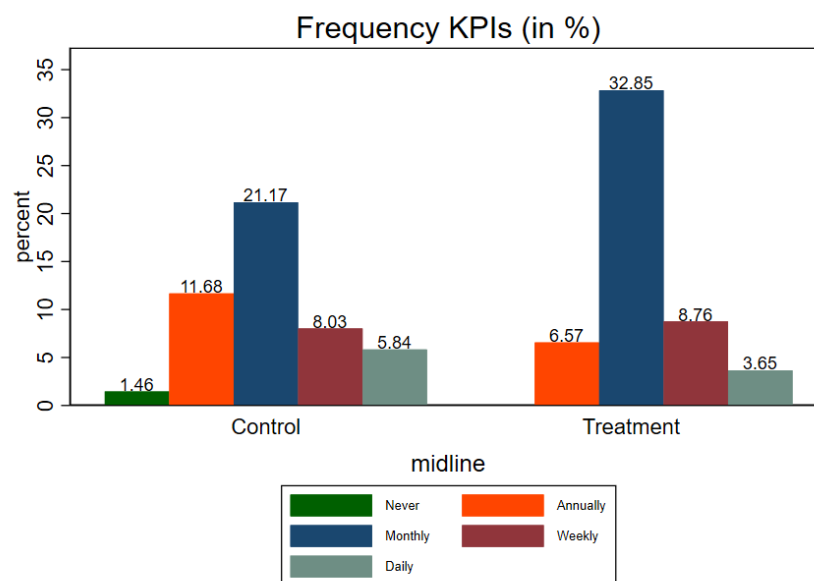


Figure 17: Frequency of key performance indicators evaluation

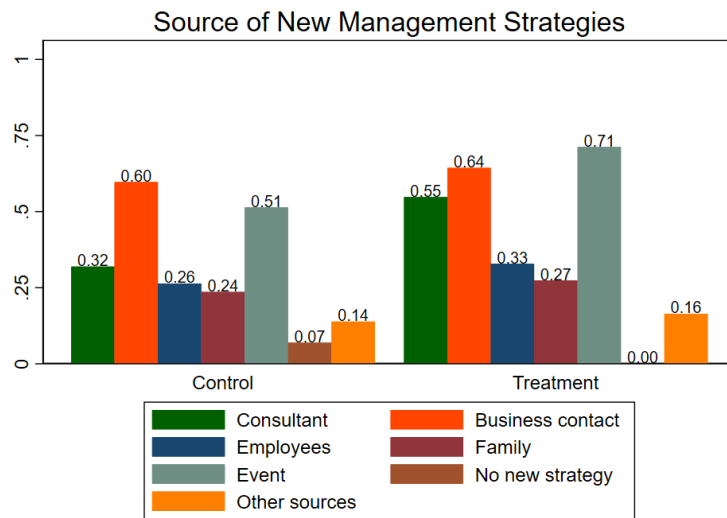


Figure 18: Sources of new management strategies

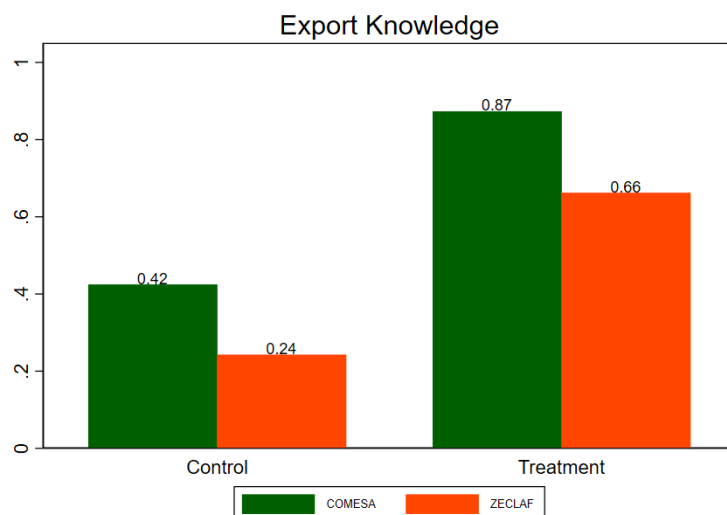


Figure 19: Knowledge about African Trade Agreements

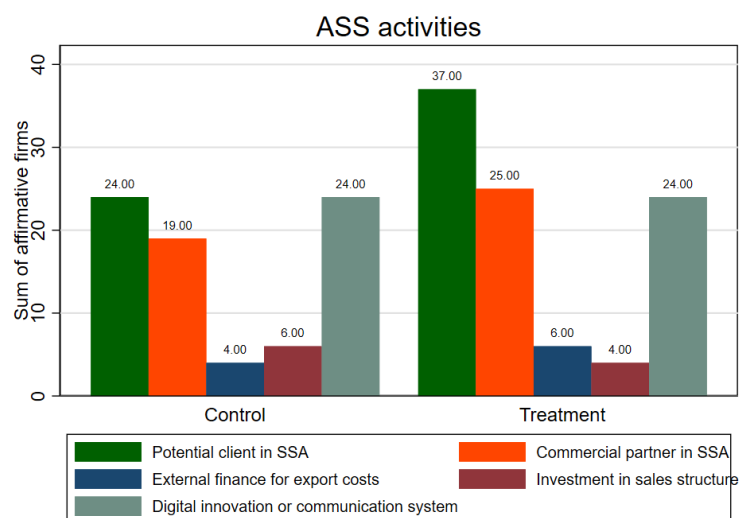


Figure 20: Actions done in Sub-Saharan African markets

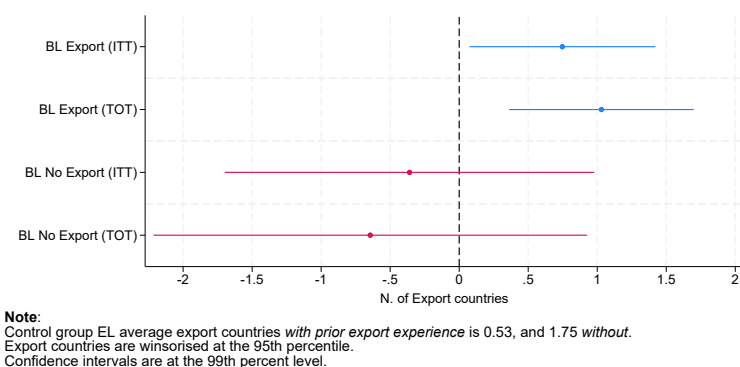


Figure 21: Heterogeneity in export country effect

9.2 Tables

Table 9: Focus groups: Relative importance of barriers to entrepreneurship

Company	Social norms and family commitments	Lack of funds and resources	Lack of business and export knowledge	Regulatory and administrative barriers	International barriers: travel, language, culture	Important Risks: high costs, uncertainty, competition
Company 1	4	6	3	3	4	6
Company 2	6	4	4	3	5	3
Company 3	3	5	5	5	1	3
Company 4	2	4	2	5	1	1
Company 5	3	7	2	2	2	5
Company 6	7	7	7	7	6	7
Company 7	3	1	1	1	2	1
Company 8	7	7	7	7	7	7
Company 9	4	7	7	5	4	7
Company 10	7	7	7	6	7	7
Company 11	1	7	5	7	5	7
Mean:	4,27	5,64	4,55	4,64	4,00	4,91

Table 10: Description of main outcome variables

Outcome dimension	Indicators	Source
Network	Network size	Firm survey
	Network advice quality	
	Perception of interaction between CEOs	
Entrepreneurial confidence	Female Empowerment Index	Firm survey
	Locus of control	
	Efficacy	
	Initiative	
	List experiment	
Knowledge transfer	Management Practices	Firm survey
	Innovation	
	Export readiness	
Business Performance	Sales (domestic, total)	Firm survey
	Profit	
	Number of Employees	
Export	Export sales	Firm survey & admin data
	Export countries	
	Investment in export	
	Perception of export costs	

Table 11: Baseline balance: Untransformed variables

Variable	(1) Control Mean/SD	(2) Treatment Mean/SD	T-test P-value (1)-(2)
Network size	12.33 (16.02)	13.21 (17.62)	0.73
Network quality	7.11 (2.61)	7.31 (2.68)	0.62
Pos. view CEO interaction	2.15 (0.78)	2.14 (0.73)	0.94
Neg. view CEO interaction	0.73 (0.64)	0.74 (0.60)	0.95
Entrepreneurial empowerment	-0.01 (0.66)	-0.08 (0.60)	0.44
Effifacy	0.00 (0.76)	-0.10 (0.72)	0.36
Locus of control	-0.05 (0.73)	-0.03 (0.72)	0.85
Management practices	-0.00 (0.48)	0.05 (0.51)	0.53
Total innovations	1.69 (1.40)	1.68 (1.38)	0.97
Innovated	0.74 (0.44)	0.72 (0.45)	0.80
R&D expenditure	53,044.41 (318,164.24)	18,825.96 (36,859.08)	0.32
Age	7.13 (9.85)	6.66 (8.31)	0.73
Sales	391,879.33 (856,501.52)	624,609.70 (3,419,255.86)	0.54
Costs	386,105.02 (854,081.57)	624,506.76 (3,419,259.51)	0.53
Profit	29,258.93 (106,668.96)	17,594.97 (219,209.12)	0.66
Employees	7.94 (10.44)	14.68 (48.49)	0.21
Export readiness	-0.04 (0.53)	0.01 (0.52)	0.60
Export costs	5.74 (2.60)	5.54 (2.82)	0.62
investment in export activities	10,520.96 (22,582.69)	24,624.40 (97,126.99)	0.19
Export sales > 0	0.37 (0.49)	0.40 (0.49)	0.67
Export sales	96,287.29 (465,104.02)	127,063.70 (419,091.85)	0.65
number of countries exported to in 2021	1.14 (2.12)	1.41 (2.72)	0.45
N	89	87	
F-test of joint significance (F-stat)			12.34***
F-test, number of observations			176

Notes: The value displayed for t-tests are p-values. The value displayed for F-tests are the F-statistics. Standard deviations are robust. All missing values in balance variables are treated as zero.***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 12: Baseline balance: transformed variables

Variable	(1) Control Mean/SD	(2) Treatment Mean/SD	T-test P-value (1)-(2)
Network size	12.00 (14.23)	12.76 (15.23)	0.73
Network quality	7.11 (2.61)	7.31 (2.68)	0.62
Pos. view CEO interaction	2.15 (0.78)	2.14 (0.73)	0.94
Neg. view CEO interaction	0.73 (0.64)	0.74 (0.60)	0.95
Entrepreneurial empowerment	-0.01 (0.66)	-0.08 (0.60)	0.44
Effifacy	0.00 (0.76)	-0.10 (0.72)	0.36
Locus of control	-0.05 (0.73)	-0.03 (0.72)	0.85
Management practices	-0.00 (0.48)	0.05 (0.51)	0.53
Total innovations	1.69 (1.40)	1.68 (1.38)	0.97
Innovated	0.74 (0.44)	0.72 (0.45)	0.80
R&D expenditure	21,985.02 (47,898.69)	18,087.04 (36,663.11)	0.54
Age	7.13 (9.85)	6.66 (8.31)	0.73
Domestic sales	1.02 (1.22)	1.04 (1.18)	0.92
IHS Costs wins. 99th K ⁴	0.78 (1.03)	0.80 (1.08)	0.93
Profit	29,258.93 (106,668.96)	17,594.97 (219,209.12)	0.66
Employees	7.94 (10.44)	14.68 (48.49)	0.21
Export readiness	-0.04 (0.53)	0.01 (0.52)	0.60
Export sales	0.27 (0.74)	0.40 (0.91)	0.29
number of countries exported to in 2021	1.14 (2.11)	1.34 (2.25)	0.53
Export investment	0.09 (0.20)	0.15 (0.38)	0.20
Export costs	5.74 (2.60)	5.54 (2.82)	0.62
Export sales > 0	0.47 (0.49)	0.40 (0.49)	0.67

Table 13: Firm characteristics by economic activity

Variable	(1)	(2)	(3)	(4)	T-test					
	agro-alimentaire Mean/SD	artisanat & cosmétique Mean/SD	service Mean/SD	TIC Mean/SD	(1)-(2)	(1)-(3)	(1)-(4)	(2)-(3)	(2)-(4)	(3)-(4)
Gender index -Z Score	-0.05 (0.58)	0.02 (0.72)	-0.03 (0.61)	-0.17 (0.58)	0.63	0.91	0.36	0.72	0.18	0.32
Women's entrepreneurial efficacy - z score	-0.05 (0.74)	0.01 (0.74)	-0.07 (0.82)	-0.12 (0.68)	0.68	0.90	0.64	0.61	0.37	0.76
Women's locus of control - z score	-0.08 (0.68)	0.06 (0.82)	0.02 (0.63)	-0.22 (0.72)	0.34	0.46	0.38	0.78	0.08*	0.12
total sales in TND	525,790.65 (1,093,526.27)	204,894.61 (338,162.35)	320,982.90 (498,322.78)	798,336.58 (1,799,212.50)	0.06*	0.26	0.43	0.20	0.05*	0.13
profit in TND in bl = 2021, ml = 2022, el = 2023	40,839.53 (107,481.35)	18,230.54 (84,648.97)	52,462.24 (87,086.93)	30,916.15 (129,271.25)	0.26	0.58	0.71	0.06*	0.60	0.40
nombre d'employés de l'entreprise	14.82 (52.02)	7.22 (6.83)	5.83 (6.31)	11.22 (15.03)	0.34	0.26	0.66	0.31	0.14	0.05**
export sales in TND in bl = 2021, ml = 2022, el = 2023	161,649.55 (516,418.59)	26,537.04 (96,838.26)	58,352.37 (195,457.25)	241,280.11 (745,559.18)	0.09*	0.22	0.59	0.34	0.09*	0.16
export sales $\hat{\epsilon}_0$	0.39 (0.49)	0.31 (0.47)	0.41 (0.50)	0.47 (0.51)	0.47	0.79	0.45	0.32	0.14	0.62
costs of export activities	5.98 (2.61)	6.09 (2.74)	5.15 (2.89)	5.00 (2.37)	0.83	0.17	0.08*	0.11	0.05**	0.81
investment in export activities	32,710.23 (131,680.76)	7,960.37 (27,890.11)	7,867.07 (17,686.67)	19,294.72 (37,652.42)	0.22	0.22	0.52	0.98	0.13	0.10*
N	44	54	41	36						
F-test of joint significance (F-stat)					5.29***	5.70***	2.73***	4.32***	6.69***	1.93*
F-test, number of observations					98	85	80	95	90	77

Notes: The value displayed for t-tests are p-values. The value displayed for F-tests are the F-statistics. Standard deviations are robust. All missing values in balance variables are treated as zero.***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 14: Business Networks

	(1)	(2)	(3)	(4)	(5)	(6)
	Network size	Female CEOs met	Male CEOs met	Network quality	+ view CEO exchange	- view CEO exchange
Panel A: Intention-to-treat (ITT)						
Treatment	2.187 (2.295)	2.242* (1.197)	0.106 (1.435)	0.188 (0.397)	0.239* (0.136)	-0.168 (0.128)
	0.342	0.063	0.941	0.637	0.082	0.192
	.568	.107	.874	.568	.05	.107
Panel B: Treatment Effect on the Treated (TOT)						
Consortium participant	2.924 (2.676)	2.994** (1.382)	0.142 (1.692)	0.252 (0.454)	0.324** (0.162)	-0.229 (0.153)
	0.275	0.030	0.933	0.579	0.046	0.136
	.543	.082	.874	.543	.034	.082
Control group mean	8.46	3.67	4.80	7.76	2.43	0.44
Control group SD	12.35	6.23	8.27	2.26	0.84	0.67
Observations	141	141	141	123	145	145
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. The only exception are columns 2 and 3 for which we did not collect baseline data. The number of observations for network quality is only 123 as all other 18 firms reported zero contacts with other entrepreneurs. The total of female, male and all other CEOs met are winsorized at the 99th percentile. Coefficients display absolute values of the outcomes. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 15: Business Networks: Midline

	(1)	(2)	(3)	(4)	(5)	(6)
	All persons	Female CEOs	Male CEOs	Network quality	Pos. View CEO interaction	Neg. View CEO interaction
Panel A: Intention-to-treat (ITT)						
Treatment	1.683 (1.282)	1.979*** (0.609)	-0.068 (0.702)	0.188 (0.388)	0.141 (0.098)	-0.191* (0.109)
Panel B: Treatment Effect on the Treated (TOT)						
Consortium member	2.252 (1.482)	2.643*** (0.685)	-0.091 (0.826)	0.252 (0.439)	0.189 (0.115)	-0.257** (0.128)
Control group mean	7.75	3.23	4.07	7.76	2.57	0.47
Control group SD	9.86	4.11	5.41	2.26	0.61	0.68
Observations	141	141	141	123	140	140
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	No	No	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline values of the outcome, and a missing baseline dummy for the outcome variable when available. The total of female, male and all other CEOs met with whom the female entrepreneurs discuss business regularly in the past three months are winsorised at the 95th percentile as pre-specified. The number of observations drops to 123 for Network Quality as 18 entrepreneurs to not discuss their business challenges with anyone. Panel A reports ANCOVA estimates as defined in McKenzie (2012). Panel B documents IV estimates instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and the consortium-level for the treatment group following Cai and Szeidl (2018) and reported in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 16: Networks: Use

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Manage- ment	Innovation	Export	Referral	Joint bid	Emotional support	Other use
Panel A: Intention-to-treat (ITT)							
Treatment	0.23** (0.09)	0.21*** (0.06)	0.28*** (0.08)	0.12 (0.11)	0.19** (0.09)	0.27*** (0.10)	-0.03 (0.10)
Panel B: Treatment Effect on the Treated (TOT)							
Consortium participant	0.39*** (0.12)	0.36*** (0.09)	0.47*** (0.11)	0.20 (0.16)	0.32** (0.13)	0.46*** (0.14)	-0.06 (0.14)
Control group mean	0.58	0.74	0.52	0.58	0.42	0.48	0.20
Control group SD	0.50	0.44	0.50	0.50	0.50	0.50	0.40
Observations	112	112	112	112	112	112	112
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BL controls	No	No	No	No	No	No	No

Notes: All outcomes are based on a binary yes-no-question whether the entrepreneur either shares, e.g., management practices, innovation ideas, export experience with or has made or received a referral, emotional support vis-a-vis business and exports risks and uncertainty or participated in a joint contract bid with other entrepreneurs. Panel A reports ANCOVA estimates as defined in Bruhn and McKenzie (2009). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following Cai and Szeidl (2018) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 17: View of interaction between entrepreneurs

	(1) Pos. view ML	(2) Pos. view EL	(3) Neg. view ML	(4) Neg. view EL
Panel A: Intention-to-treat (ITT)				
Treatment	0.14 (0.10)	0.09 (0.18)	−0.19* (0.11)	−0.09 (0.18)
Panel B: Treatment Effect on the Treated (TOT)				
Consortium member	0.19* (0.12)	0.17 (0.27)	−0.26** (0.13)	−0.16 (0.28)
Control group mean	2.57	2.07	0.47	0.93
Control group SD	0.61	0.92	0.68	0.92
Observations	140	119	140	119
Strata controls	Yes	Yes	Yes	Yes
BL controls	Yes	Yes	Yes	Yes

Notes: Respondents selected three among the following five negative terms (Jealousy, Protect business secrets, Risks, Conflict, Competition) and positive terms (Cooperate, Trust, Learn, Partnership, Connect). Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata and baseline values of the outcome variable when available. *** $p < 0.01$, ** $p < 0.05$, * $p \leq 0.1$ denote the significance level.

Table 18: Entrepreneurial empowerment

	(1)	(2)	(3)
	Entrepreneurial empowerment	Efficacy	Locus of control
Panel A: Intention-to-treat (ITT)			
Treatment	0.228**	0.224*	0.175
	(0.111)	(0.125)	(0.115)
	0.041	0.075	0.131
	.0212	.056	.056
Panel B: Treatment Effect on the Treated (TOT)			
Consortium participant	0.298**	0.292**	0.229*
	(0.127)	(0.143)	(0.131)
	0.019	0.042	0.081
	.017	.055	.056
Control group mean	0.01	0.00	-0.00
Control group SD	0.69	0.76	0.74
Observations	135	135	134
Strata controls	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All outcomes are z-scores calculated following Kling et al. (2007). Coefficients display effects in standard deviation units of the outcome. Entrepreneurial empowerment combines all indicators used for locus of control and efficacy. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 19: List experiment: Independent entrepreneurial decision-making

	(1) Baseline	(2) Midline
Sensitive option=1	0.110 (0.151) 0.467	0.030 (0.185) 0.871
Treatment		0.021 (0.152) 0.891
Treatment \times Sensitive option=1		-0.059 (0.243) 0.809
Observations	176	134
Strata controls	Yes	Yes
Y0 controls		Yes

Notes: Column (1) presents baseline results with strata controls. Column (2) presents an ANCOVA specification with strata controls. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 20: Entrepreneurial empowerment

	(1) Effifacy	(2) Locus of control
Panel A: Intention-to-treat (ITT)		
Treatment	0.27** (0.13)	-0.16 (0.11)
Panel B: Treatment Effect on the Treated (TOT)		
Consortium member	0.46** (0.20)	-0.28* (0.17)
Control group mean	-0.00	-0.00
Control group SD	0.82	0.69
Observations	119	119
Strata controls	Yes	Yes
BL controls	Yes	Yes

Notes: The outcomes are z-scores following [Anderson \(2008\)](#). Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 21: Knowledge Transfer: Management and Innovation Indexes

	(1) Management practices	(2) Innovation practices
Panel A: Intention-to-treat (ITT)		
Treatment	0.18** (0.09)	-0.02 (0.09)
Panel B: Treatment Effect on the Treated (TOT)		
Consortium member	0.30** (0.13)	-0.04 (0.13)
Control group median	0.08	0.06
Control group SD	0.60	0.64
Observations	124	131
Strata controls	Yes	Yes
BL controls	Yes	No

Notes: The outcomes are z-scores following [Anderson \(2008\)](#). Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 22: Management practices - Knowledge Sources

	(1) Consultant	(2) Entre- preneur	(3) Family/ Friend	(4) Event	(5) Training	(6) Other
Panel A: Intention-to-treat (ITT)						
Treatment	0.13 (0.08)	0.05 (0.07)	-0.27*** (0.07)	0.06 (0.07)	0.16** (0.07)	0.01 (0.08)
Panel B: Treatment Effect on the Treated (TOT)						
Consortium member	0.22* (0.12)	0.08 (0.10)	-0.47*** (0.10)	0.11 (0.11)	0.29*** (0.10)	0.01 (0.12)
Control group mean	0.48	0.59	0.61	0.66	0.18	0.59
Control group SD	0.50	0.50	0.49	0.48	0.39	0.50
Observations	120	120	120	120	128	120
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes
BL controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The outcome variables are either zero or one. Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 23: Innovation - Knowledge Sources

	(1) Consultant	(2) Entrepreneur	(3) Event	(4) Client	(5) Other
Panel A: Intention-to-treat (ITT)					
Treatment	0.15 (0.10)	0.18** (0.09)	0.10 (0.08)	0.10 (0.10)	-0.03 (0.09)
Panel B: Treatment Effect on the Treated (TOT)					
Consortium member	0.26* (0.14)	0.31** (0.13)	0.17 (0.11)	0.17 (0.14)	-0.05 (0.13)
Control group mean	0.15	0.20	0.35	0.41	0.50
Control group SD	0.36	0.41	0.48	0.50	0.50
Observations	115	115	115	115	115
Strata controls	Yes	Yes	Yes	Yes	Yes
BL controls	No	No	No	No	No

Notes: The outcome variables are either zero or one. Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 24: Management practices - Knowledge Sources

	(1) KPIs	(2) Prod- uction	(3) Input	(4) Stock	(5) Empl- oyees	(6) Logis- tics	(7) KPIs Freq.	(8) Bud- get	(9) Cost estimate	(10) Business/ private
Panel A: Intention-to-treat (ITT)										
Treatment	-0.01 (0.04)	0.11* (0.05)	0.06 (0.07)	0.07 (0.07)	-0.08 (0.07)	0.03 (0.06)	0.05 (0.04)	0.07 (0.08)	0.06 (0.09)	0.15** (0.06)
Panel B: Treatment Effect on the Treated (TOT)										
Consortium member	-0.02 (0.07)	0.18** (0.08)	0.09 (0.11)	0.12 (0.11)	-0.14 (0.10)	0.06 (0.08)	0.09 (0.06)	0.12 (0.12)	0.10 (0.13)	0.25*** (0.09)
Control group mean	0.88	0.71	0.73	0.59	0.75	0.83	0.64	0.66	0.80	0.78
Control group SD	0.33	0.46	0.45	0.50	0.44	0.38	0.25	0.48	0.41	0.42
Observations	124	124	124	124	124	124	120	124	124	124
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BL controls	No	No	No	No	No	No	Yes	No	No	No

Notes: The outcome variables are either zero or one. Panel A reports ANCOVA estimates as defined in Bruhn and McKenzie (2009). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following Cai and Szeidl (2018) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 25: Knowledge Transfer - Export Readiness Index

	(1) Export readiness	(2) Export readiness SSA
Panel A: Intention-to-treat (ITT)		
Treatment	0.043 (0.099)	0.176** (0.085)
	0.669	0.043
Panel B: Treatment Effect on the Treated (TOT)		
Consortium member	0.072 (0.143)	0.300** (0.126)
	0.616	0.017
Control group median	-0.17	-0.35
Control group SD	0.63	0.69
Observations	125	126
Strata controls	Yes	Yes
BL controls	Yes	No

Notes: The outcomes are z-scores calculated as in [Anderson \(2008\)](#). Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata and baseline values of the outcome variable when available. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 26: Knowledge Transfer - Export Readiness Subsahara-Africa: Sub-componenents

	(1) Client	(2) Business Partner	(3) Funding	(4) Sales structure
Panel A: Intention-to-treat (ITT)				
Treatment	0.25*** (0.07)	0.28*** (0.07)	0.07** (0.03)	-0.00 (0.04)
Panel B: Treatment Effect on the Treated (TOT)				
Consortium member	0.41*** (0.11)	0.47*** (0.10)	0.12** (0.05)	-0.01 (0.06)
Control group mean	0.37	0.15	0.05	0.08
Control group SD	0.49	0.36	0.22	0.28
Observations	125	125	125	125
Strata controls	Yes	Yes	Yes	Yes
BL controls	No	No	No	No

Notes: The outcome variables are either zero or one. Panel A reports ANCOVA estimates as defined in Bruhn and McKenzie (2009). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following Cai and Szeidl (2018) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 27: Knowledge Transfer - Export Readiness General: Sub-components

	(1) Export manager	(2) Trade Fair	(3) Business Partner	(4) Intl. Certification	(5) Sales structure
Panel A: Intention-to-treat (ITT)					
Treatment	-0.08 (0.08)	0.33*** (0.08)	0.04 (0.08)	-0.07 (0.08)	-0.08 (0.06)
Panel B: Treatment Effect on the Treated (TOT)					
Consortium member	-0.13 (0.12)	0.56*** (0.11)	0.07 (0.11)	-0.12 (0.11)	-0.13 (0.09)
Control group mean	0.23	0.37	0.35	0.30	0.22
Control group SD	0.43	0.49	0.48	0.46	0.42
Observations	125	125	125	125	125
Strata controls	Yes	Yes	Yes	Yes	Yes
BL controls	Yes	Yes	Yes	Yes	No

Notes: The outcome variables are either zero or one. Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 28: Knowledge transfer: Management practices, Innovation, Export readiness

	(1)	(2)	(3)	(4)	(5)	(6)
	Management practices	Total innovations	Innovated	Export readiness	Export readiness SSA	SSA client
Panel A: Intention-to-treat (ITT)						
Treatment	0.143	-0.109	-0.104	0.020	0.021	0.142
	(0.091)	(0.193)	(0.070)	(0.099)	(0.101)	(0.094)
	0.118	0.572	0.140	0.841	0.837	0.135
	.176	.607	.007	.959	.858	.176
	-0.04,0.32	-0.69,0.21	-0.29,-0.04	-0.18,0.22	-0.18,0.22	-0.04,0.33
Panel B: Treatment Effect on the Treated (TOT)						
Consortium participant	0.190*	-0.173	-0.166	0.026	0.027	0.186*
	(0.106)	(0.277)	(0.102)	(0.113)	(0.116)	(0.108)
	0.073	0.532	0.106	0.819	0.814	0.083
	.145	.559	.002	.959	.854	.176
	-0.02,0.40	-0.85,0.20	-0.44,-0.09	-0.20,0.25	-0.20,0.25	-0.02,0.40
Control group mean	0.01	1.27	0.60	0.06	0.00	0.39
Control group SD	0.60	1.35	0.49	0.69	0.69	0.49
Observations	139	176	176	136	131	131
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All variables are winsorized at the 99th percentile and ihs-transformed. The units for ihs-transformation are chosen based on the highest R-square, ten thousand for all variables, as described in Aihounton and Henningsen (2020). Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 29: Innovation

	(1)	(2)	(3)	(4)
	Product innovation	Process innovation	Organizational innovation	Marketing innovation
Panel A: Intention-to-treat (ITT)				
Treatment	0.042	-0.051	-0.184**	-0.075
	(0.079)	(0.079)	(0.077)	(0.082)
	0.594	0.526	0.019	0.365
	.58	.58	.039	.58
Panel B: Treatment Effect on the Treated (TOT)				
Consortium participant	0.057	-0.069	-0.250***	-0.101
	(0.094)	(0.095)	(0.093)	(0.098)
	0.546	0.469	0.008	0.303
	.58	.58	.023	.556
Control group median				
Control group SD	0.45	0.48	0.50	0.50
Observations	142	142	142	142
Strata controls	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All outcomes dummy variables, coded equal to 1 if the firm does a type of innovation and zero otherwise. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) are reported below the standard errors.

Table 30: Business Performance: Profits, Costs, and Employment

	(1) Profits	(2) Costs	(3) N. of Employees
Panel A: Intention-to-treat (ITT)			
Treatment	-0.094 (1.376)	0.911 (0.665)	-0.075 (0.120)
Panel B: Treatment Effect on the Treated (TOT)			
Consortium member	-0.157 (1.954)	1.516 (0.941)	-0.127 (0.176)
Control group mean	4.94	10.57	2.18
Control group SD	8.98	4.89	1.08
Observations	119	119	124
Strata controls	Yes	Yes	Yes
BL controls	Yes	Yes	Yes

Notes: All outcome variables are winsorised at the 95th percentile and inverse hyperbolic sine transformed as pre-specified. 'Profits' and 'Costs' are in units of Tunisian Dinar before transformation. 'Costs' values are calculated by subtracting profits from total sales. Panel A reports ANCOVA estimates as defined in [Bruhn and McKenzie \(2009\)](#). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Standard errors are clustered on the firm-level for the control group and on the consortium-level for the treatment group following [Cai and Szeidl \(2018\)](#) and reported in parentheses. Each specification includes controls for randomization strata and baseline values of the outcome variable. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level.

Table 31: Business performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Total sales	Export sales	IHS Costs, wins.	IHS profit, wins.	Profit, pct	Employees	Female employees
Panel A: Intention-to-treat (ITT)							
Treatment	0.081	0.029	-0.025	2.707*	0.061	-0.007	0.051*
	(0.147)	(0.109)	(0.114)	(1.619)	(0.049)	(0.019)	(0.028)
	0.585	0.789	0.829	0.097	0.215	0.725	0.075
	-0.21,0.37	-0.19,0.25	-0.25,0.20	-0.50,5.92	-0.04,0.16	-0.04,0.03	-0.01,0.11
Panel B: Treatment Effect on the Treated (TOT)							
Consortium participant	0.102	0.037	-0.031	3.453**	0.077	-0.008	0.065**
	(0.156)	(0.115)	(0.120)	(1.724)	(0.051)	(0.020)	(0.031)
	0.511	0.748	0.794	0.045	0.134	0.671	0.038
	-0.20,0.41	-0.19,0.26	-0.27,0.20	0.07,6.83	-0.02,0.18	-0.05,0.03	0.00,0.13
Control group mean	1.29	0.44	0.94	4.86	0.49	0.08	0.05
Control group SD	1.52	0.93	1.18	9.47	0.30	0.12	0.09
Observations	103	102	103	103	103	103	103
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All variables are winsorized at the 99th percentile and ihs-transformed. The units for ihs-transformation are chosen based on the highest R-square, thousands for employee variables and ten thousands for all other variables, as described in Aihounton and Henningsen (2020). The only exception is the percentile transformed profit variable in column (4) (Deliuss and Sterck, 2020). Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 32: Costs

	(1)	(2)	(3)
	IHS Costs, wins.	IHS Total sales, wins	IHS Profit, wins
Panel A: Intention-to-treat (ITT)			
Treatment	-1.887	0.616	2.707*
	(1.730)	(0.457)	(1.619)
	0.278	0.181	0.097
	-5.32,1.55	-0.29,1.52	-0.50,5.92
Panel B: Treatment Effect on the Treated (TOT)			
Consortium participant	-2.411	0.799	3.453**
	(1.835)	(0.513)	(1.724)
	0.189	0.120	0.045
	-6.01,1.19	-0.21,1.81	0.07,6.83
Control group mean	6.47	11.43	4.86
Control group SD	9.02	3.82	9.47
Observations	103	118	103
Strata controls	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All outcomes are z-scores calculated following Kling et al. (2007). Coefficients display effects in standard deviation units of the outcome. Entrepreneurial empowerment combines all indicators used for locus of control and efficacy. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 33: Export performance

	(1)	(2)	(3)	(4)	(5)
	Export investment > 0	Export investment	Export costs	Export sales > 0	Export sales
Panel A: Intention-to-treat (ITT)					
Treatment	0.135	-0.046	0.481	-0.063	-0.029
	(0.089)	(0.071)	(0.360)	(0.074)	(0.105)
	0.133	0.523	0.183	0.394	0.784
	.358	.84	.358	.832	.84
	-0.04,0.31	-0.19,0.10	-0.23,1.19	-0.21,0.08	-0.24,0.18
Panel B: Treatment Effect on the Treated (TOT)					
Consortium participant	0.175*	-0.058	0.629	-0.082	-0.037
	(0.100)	(0.079)	(0.425)	(0.081)	(0.115)
	0.081	0.461	0.139	0.316	0.747
	.308	.832	.353	.822	.84
	-0.02,0.37	-0.21,0.10	-0.20,1.46	-0.24,0.08	-0.26,0.19
Control group mean	0.59	0.27	6.25	0.38	0.44
Control group SD	0.50	0.51	2.44	0.49	0.93
Observations	129	129	135	119	119
Strata controls	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All variables are winsorized at the 99th percentile and ihs-transformed. The units for ihs-transformation are chosen based on the highest R-square, ten thousand for all variables, as described in Aihounton and Henningsen (2020). Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors.

Table 34: Sensitivity of profit estimates to transformation choice

	(1) Profit, k = 1	(2) Profit, k = 2	(3) Profit, k = 3	(4) Profit, k = 4	(5) Profit, pct	(6) Profit > 0
Panel A: Intention-to-treat (ITT)						
Treatment	2.719*	0.905	0.430	0.130	0.061	0.120
	(1.619)	(0.595)	(0.304)	(0.115)	(0.049)	(0.089)
	0.096	0.131	0.160	0.258	0.215	0.181
	.304	.304	.304	.304	.404	.404
	-0.49,5.93	-0.28,2.09	-0.17,1.03	-0.10,0.36	-0.04,0.16	-0.06,0.30
Panel B: Treatment Effect on the Treated (TOT)						
Consortium participant	3.467**	1.150*	0.543*	0.163	0.077	0.152
	(1.724)	(0.635)	(0.324)	(0.121)	(0.051)	(0.093)
	0.044	0.070	0.093	0.176	0.134	0.101
	.276	.304	.291	.276	.404	.382
	0.09,6.85	-0.09,2.40	-0.09,1.18	-0.07,0.40	-0.02,0.18	-0.03,0.33
Control group mean	4.86	2.07	1.14	0.36	0.49	0.66
Control group SD	9.47	3.59	1.90	0.70	0.30	0.48
Observations	103	103	103	103	103	103
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All variables are winsorized at the 99th percentile (apart from the positive profit dummy). K refers to the units of profits. $K = 4$ implies profit is measured in units of ten thousand (10^4), $k = 3$ implies profit is measured in units of thousand (10^3), and so forth. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) with 999 bootstrap replications are reported below the standard errors. Confidence intervals are documented below the adjusted p-values.

Table 35: Heterogeneous effects: Entrepreneurial Confidence and Empowerment

	(1) Small firms	(2) Large firms	(3) Small network	(4) Large network	(5) Small fam. network	(6) Large fam. network	(7) Rural	(8) City	(9) No children	(10) Children
Treatment	0.196	0.487*	0.314*	-0.075	0.361**	-0.210	0.255	0.192	0.457	0.228**
	(0.134)	(0.265)	(0.160)	(0.133)	(0.172)	(0.186)	(0.258)	(0.131)	(0.345)	(0.111)
	0.147	0.079	0.054	0.578	0.039	0.264	0.328	0.146	0.190	0.041
Observations	112.00	23.00	74.00	61.00	77.00	58.00	51.00	84.00	56.00	135.00
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. All outcomes are z-scores calculated following Kling et al. (2007). Coefficients display effects in standard deviation units of the outcome. Entrepreneurial empowerment combines all indicators used for locus of control and efficacy. Panel A reports ANCOVA estimates as defined in McKenzie and Bruhn (2011). Panel B documents IV estimates, instrumenting take-up with treatment assignment. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values and adjusted p-values for multiple hypotheses testing using the Romano-Wolf correction procedure (Clarke et al., 2020) are reported below the standard errors.

Table 36: Take-up and firm characteristics across consortia

Variable	Agro-food, Handicraft, Business Service			Digital Services		
	(1)	(2)	T-test	(1)	(2)	T-test
	Drop-out Mean/SD	Participate Mean/SD	P-value (1)-(2) Variable	Drop-out Mean/SD	Participate Mean/SD	P-value (1)-(2)
Export sales > 0	0.52 (0.51)	0.29 (0.46)	0.07*	0.50 (0.58)	0.50 (0.52)	1.00
Export investment > 0	0.70 (0.47)	0.34 (0.48)	0.00***	0.00 (0.00)	0.71 (0.47)	0.00***
Export to SSA	0.23 (0.42)	0.20 (0.40)	0.77	0.16 (0.18)	0.36 (0.50)	0.22
Export readiness	0.18 (0.52)	-0.08 (0.52)	0.04**	-0.29 (0.35)	-0.00 (0.49)	0.19
Sales	364,790.80 (634,830.34)	113,417.88 (153,604.64)	0.05**	189,000.31 (184,640.71)	486,001.52 (774,453.07)	0.21
Export sales	258,004.16 (612,340.75)	12,982.20 (31,955.24)	0.04**	69,510.94 (111,704.33)	283,624.55 (545,488.92)	0.19
Profit	57,683.20 (109,927.78)	23,219.02 (58,453.61)	0.14	19,558.75 (21,594.03)	57,713.93 (154,832.54)	0.39
Profit > 0	0.78 (0.42)	0.80 (0.40)	0.79	0.50 (0.58)	0.43 (0.51)	0.81
Employees	10.19 (13.39)	5.88 (4.76)	0.11	5.75 (3.10)	10.93 (10.73)	0.13
Online presence	0.93 (0.27)	0.90 (0.30)	0.74	1.00 (0.00)	0.93 (0.27)	0.34
HQ in Tunis	0.56 (0.51)	0.46 (0.50)	0.46	0.75 (0.50)	0.64 (0.50)	0.69
Age	8.00 (10.48)	4.44 (3.83)	0.09*	5.00 (3.16)	9.36 (10.97)	0.21
Capital	51,397.41 (135,722.38)	29,170.88 (41,315.34)	0.41	33,750.00 (57,575.31)	54,785.71 (86,478.26)	0.56
Family business network	2.68 (2.01)	3.99 (5.33)	0.16	2.63 (1.09)	3.43 (3.69)	0.49
Outside family business network	6.57 (5.94)	11.03 (17.59)	0.14	11.13 (5.57)	15.79 (18.29)	0.42
Network quality	7.04 (2.82)	7.88 (2.18)	0.19	4.50 (5.26)	7.07 (2.59)	0.32
Meetings with other CEOs, past 3 months	6.45 (6.67)	9.42 (16.65)	0.31	10.28 (7.40)	9.36 (9.21)	0.83
Neg. view CEO interaction	0.56 (0.58)	0.88 (0.64)	0.03**	0.25 (0.50)	0.79 (0.43)	0.05*
R&D expenditure	13,596.91 (17,859.45)	19,102.85 (48,583.84)	0.51	13,651.25 (10,791.61)	24,774.29 (29,442.94)	0.26
Total innovations	1.37 (1.42)	1.88 (1.40)	0.15	0.75 (0.96)	2.07 (1.14)	0.03**
Innovated	0.63 (0.49)	0.78 (0.42)	0.19	0.50 (0.58)	0.86 (0.36)	0.23
Management practices	0.01 (0.52)	0.08 (0.52)	0.59	-0.34 (0.56)	0.11 (0.46)	0.13
Marketing practices	0.01 (0.57)	0.09 (0.51)	0.56	-0.17 (0.84)	0.16 (0.33)	0.42
Entrepreneurial empowerment	-0.06 (0.60)	-0.08 (0.65)	0.90	-0.31 (0.84)	-0.10 (0.43)	0.60
N	27	41		4	14	
F-test of joint significance (F-stat)	67		5.70***			
F-test, number of observations			68			

Notes: Sample limited to treatment group. Accounting variables are winsorized at the 99th percentile. One observation is not included given it is

Table 37: Effect of peer quality on management practices

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
distance to peer average management practices	-0.988*** (0.014) 0.000									
distance to top-3 average management practices		-0.993*** (0.007) 0.000								
distance to peer average entrepreneurial confidence			-0.205** (0.093) 0.032							
distance to top-3 average entrepreneurial confidence				-0.215** (0.097) 0.031						
distance to peer average export performance					-0.228 (0.195) 0.247					
distance to top-3 average export performance						-0.179 (0.209) 0.395				
distance to peer average business size							-0.281 (0.208) 0.182			
distance to top-3 average business size								-0.316 (0.220) 0.157		
distance to peer average profit									0.000** (0.000) 0.011	
distance to top-3 average profit										0.000*** (0.000) 0.003
Take-up mean	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Take-up SD	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
Observations	54	54	54	54	51	51	54	54	45	45
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The dependent variable is the change in the management practices index between baseline and midline. Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. The sample is restricted to companies that joined the consortium. Take-up mean and take-up SD refer to the outcome variable mean and SD at midline. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values are reported below the standard errors.

Table 38: Effect of peer quality on entrepreneurial confidence

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
distance to peer average management practices	-0.508 (0.314) 0.111									
distance to top-3 average management practices		-0.547* (0.317) 0.090								
distance to peer average entrepreneurial confidence			-1.011*** (0.006) 0.000							
distance to top-3 average entrepreneurial confidence				-1.002*** (0.003) 0.000						
distance to peer average export performance					0.239 (0.354) 0.504					
distance to top-3 average export performance						0.245 (0.375) 0.516				
distance to peer average business size							-0.422 (0.358) 0.244			
distance to top-3 average business size								-0.432 (0.369) 0.247		
distance to peer average profit									0.000 (0.000) 0.494	
distance to top-3 average profit										0.000 (0.000) 0.439
Take-up mean	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Take-up SD	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Observations	54	54	54	54	51	51	54	54	45	45
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in entrepreneurial confidence between baseline and midline. Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. The sample is restricted to companies that joined the consortium. Take-up mean and take-up SD refer to the outcome variable mean and SD at midline. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values are reported below the standard errors.

Table 39: Effect of peer quality on profit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
distance to peer average management practices	4.695 (4.769) 0.330									
distance to top-3 average management practices		4.709 (5.165) 0.367								
distance to peer average entrepreneurial confidence			-2.253 (3.435) 0.515							
distance to top-3 average entrepreneurial confidence				-2.341 (3.478) 0.504						
distance to peer average export performance					-4.270 (5.294) 0.424					
distance to top-3 average export performance						-7.434 (8.179) 0.368				
distance to peer average business size							1.754 (5.128) 0.734			
distance to top-3 average business size								2.271 (5.480) 0.681		
distance to peer average profit									-0.000* (0.000) 0.075	
distance to top-3 average profit										-0.000* (0.000) 0.067
Take-up mean	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19
Take-up SD	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53	9.53
Observations	45	45	45	45	45	45	45	45	45	45
Strata controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Y0 controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variable is the change in inverse hyperbolic sine transformed profits between baseline and midline. Each specification includes controls for randomization strata, baseline outcome, and a missing baseline dummy. The sample is restricted to companies that joined the consortium. Take-up mean and take-up SD refer to the outcome variable mean and SD at midline. Clustered standard errors by firms in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote the significance level. P-values are reported below the standard errors.

9.3 Hypotheses

This study focuses on the following major outcomes: (i) export performance, (ii) business performance, and (iii) network size, composition, and quality. We are also interested in the following secondary outcomes: (i) knowledge transfer (between firms and from consultants to firms), including for example management and export practices and innovation, and (ii) entrepreneurial gender empowerment.

The following hypotheses are tested:

9.3.1 Primary Hypothesis

(PH1) Primary Hypothesis 1: Consortia promote export.

We use the following outcomes to test this hypothesis:

1. Extensive margin. 1: self-reported indirect (via an intermediary) or direct export (0 = no export).
2: administrative custom records (0 = no export transaction recorded in a given year). We will look at 1. and 2. separately and combined to maximize the available information, given, for example, service firms may export without an administrative custom record.
2. Direct/indirect export activities to an African country ¹⁵ : This is a binary variable that takes the value 1 if the company directly or indirectly export (part of) its products and services to an African country, and 0 otherwise. Note that one objective of the program is to specifically promote intra-African trade, which is why we are interested in this outcome.
3. Intensive margin: inverse hyperbolic sine transformed annual export sales. This variable will be winsorized before the IHS-transformation at the 95-99th percentile depending on the number of outliers, and will be reported in Tunisian dinars. It will be coded as zero for firms that have not invested anything in the export. Note that we will also consider a regression specification that includes only treatment and control firms with export sales ≥ 0 in at least one surveyround to reduce variation in export sales.
4. Number of annual export destination countries, coded as zero for firms that did not export, and winsorized at 99th percentile.

We aim to detect impact mechanisms, such as sharing of fixed costs of exporting in consortia and collective investment in export preparation activities, through the following variables:

1. Annual investment in export preparation activities, measured in Tunisian Dinar, inverse hyperbolic sine transformed, and winsorized at the 95-99th percentile depending on the severity of outliers. Coded zero for firms that have not invested anything in export readiness.
2. Export costs per dollar of export sales: annual investment in export (readiness) activities (as outlined above) divided by annual export sales. Coded as zero for firms that have no export or export but have zero investment in export activities.

¹⁵an indirect export is self reported

3. Export readiness index: average of standardized z-scores of the following outcomes: a) participate in international trade exhibitions/fairs, b) engage or work with an international trading company, c) designate an employee in charge of export-related activities, d) undertake an analysis of target export markets, e) undertake a trade mission/travel to one of the target markets, f) access the customs website, g) maintain or develop an export plan, h) Product is certified according to the quality standards in target markets. All variables are binary which takes the value 1 if the participant firm did the activity during the last 12 months and 0 otherwise.
4. Export to sub-Saharan Africa (SSA): index, average of standardized z-scores of the following outcomes: a) knowledge of COMESA and ZLECAF, b) expression of interest from a client in SSA, c) external finance for export (subsidy, credit, guarantee), d) investment in sales structures in SSA destination market. All variables are binary which takes the value 1 if the participant firm did the activity during the last 12 months and 0 otherwise.
5. Raw value of self-reported costs of export activities: scale from 1 to 10, with 1 meaning the estimate of the firm's perception of export costs is extremely low, and 10 means extremely high.

(PH2) Primary Hypothesis 2: Consortia generates business growth (sales, profits, employees).

This will be tested by measuring the treatment effects on the following outcome measures in the surveys:

1. Annual sales: winsorized at the 95-99th percentile depending on the number of outliers, IHS-transformed and reported in Tunisian dinars.
2. Annual profit: winsorized at the 95-99th percentile depending on the number of outliers, IHS-transformed and reported in Tunisian dinars.
3. Annual number of employees: winsorized at the 95-99th percentile depending on the number of outliers, IHS-transformed and reported in Tunisian dinars.

Note that we will also consider a regression specification that includes only treatment and control firms with sales ≥ 0 in at least one surveyround for all three business growth variables to reduce their variation.

(PH3) Primary Hypothesis 3: Consortia increases size, changes composition, and improves quality of business network and intensity of interaction.

1. Number of other female and male CEOs regularly met to exchange about business. Winsorized at the 95-99th percentile depending on the number of outliers. We also inquire about business contacts outside and inside family networks, and differential trust in doing business with other female vs. male CEOs internationally and domestically.
2. Quality advice of the business network: It is a scale of 1 to 10, with 1 meaning the advice and information from the personal network is not useful for the management and 10 means extremely useful.
3. Time spent with other directors during the last 12 months: Frequency of meetings measured in number of weeks, and 0 otherwise.

4. Perception of interaction between the enterprises (Dimitriadis and Koning, 2019): 3 words must be selected from a list of 10 words that best describe the perception of interactions between CEOs in the context of business. They are divided into 5 positive and 5 negative words, and they will be transformed into a continuous variable with a minimum value of 0 and a maximum value of 3 depending on the number of positive words. It is coded as the following:

Positive	Win (=1) Communicate (=2) Trust (=3) Partnership (=7) Connect (=9)
Negative	Eliminate/Block (=4) Power (=5) Hold back/Retreat (=6) Opponent (=8) Dominate (=10)

Note: at the endline, we may add a more objective measure from the psychology literature on the cooperativeness and trust of entrepreneurs, as well as conduct implicit association tests to examine whether the intervention has changed the unconscious priors about the role of men and women in business.

9.3.2 Secondary Hypothesis

(SH1) Secondary Hypothesis 1: Women entrepreneurs learn from peers about new business practices.

We test this hypothesis by measuring the treatment impacts on the following secondary outcomes (the variables are selected in line with (Cai and Szeidl, 2018)):

1. Innovation: we use a binary (0 = no innovation, 1 = any innovation) and a count measure (number of innovations, max. = 4) based on firms' of one of the following outcomes: a) product innovation, b) process innovation, c) organizational innovation, d) product commercialisation innovation. All variables are binary, which takes the value 1 if the participant firm did the activity during the last 12 months and 0 otherwise. We will explore the different sources of innovation through additional questions.
2. Annual spending on innovation research and development: This variable will be winsorized at the 95-99th percentile depending on the number of outliers, IHS-transformed, and reported in Tunisian dinars.
3. Management practices index - Z Score: it is the average of standardized z-scores of outcomes envisioned to provide a summary measure of management practices: a) performance indicators for employees b) regular meetings with employees for feedback c) frequency of measuring anomalies in production d) registration of sales and purchases e) knowing the profit per product/service f) frequency of examining financial performance. At midline, we changed the management practices questions based on new research to the following practices: a) sources of new management strategies b) who is aware of production indicators c) frequency of examining performance indicators d) number of performance indicators e) employees' promotion policy.
4. Marketing practices index - Z Score: it is the average of standardized z-scores of outcomes intended to deliver a summary measure of marketing practices: a) study the prices and/or products

of one of competitors b) ask customers what other products they would like to be produced c) investigate why past customers have stopped buying from the company d) attract customers with a special offer e) advertising in any form. All variables are binary, which take value 1 if the participant firm did the activity during the last 12 months and 0 otherwise.

(SH2) Secondary Hypothesis 2: Being part of a female-only consortia increases female CEO entrepreneurial empowerment (self-efficacy, locus of control, sense of initiative and independent decision-making).

This will be measured by an index measure of female empowerment and list experiment:

1. Female empowerment - Z Score: it is the average of standardized z-scores of outcomes measuring the following binary variables:

- Belief in own ability: a) participant has the skills to access new sources of funding b) participant negotiates the affairs of the company well c) participant manages to convince employees and partners to agree with me.
- Sense of own initiative: a) participant actively confront business problems when they arise b) Participant take the initiative immediately, when others do not c) participant spot and seize opportunities quickly to achieve her professional goals. The set of answer options for this variable is not part of the midline survey.
- Sense of control over the business situation: a) participant is well able to determine the success of her business b) participant knows how to determine what is happening in the internal and external environment of the company c) participant inspires other women to be better entrepreneurs. In the midline survey, we replaced the last answer option with c) participant masters the administrative and logistical procedures around export.

2. List experiment: In order to measure self-confidence and independence in entrepreneurial decision-making, we randomly divided the sample of respondents into treatment and control groups and asked the following question to the control group:

How many of the following statements apply to you? Please note that we cannot recognize which statements you choose.

- I always support and encourage my team.
- I dreamed of becoming a successful woman when I was a child.
- I try to do my best in my job.

For the treatment group, we asked an identical question, except that a sensitive item concerning self-confidence was appended to the list:

- I always support and encourage my team.
- I dreamed of becoming a successful woman when I was a child.

- I try to do my best in my job.
- Baseline: I consult my husband (or another man in my family) before making strategic decisions for the company.
- Midline: I feel obliged to consult my husband (or another man in my family) before making strategic decisions for the company.
- Endline: I feel obliged to consult my husband (or another man in my family) before making strategic decisions for the company.

Note that at midline and endline we re-randomize within treatment and control group into a list experiment treatment group (sees sensitive option) and a list experiment control group (does not see sensitive option).

The baseline questionnaire can be found here:

https://docs.google.com/document/d/1xqAweVIfkZvH-sRq0-1DzJ1n_zTovqXM/edit?usp=drive_link&ouid=118421303433036502342&rtpof=true&sd=true

The midline questionnaire can be found here:

https://docs.google.com/document/d/1MdzXARVQMqbmOegQ-DfqG16Enuc1v35Y/edit?usp=drive_link&ouid=118421303433036502342&rtpof=true&sd=true

9.4 Treatment details

9.4.1 Consortia-level Workshops

Table 40: Summary workshop 1

Workshop 1	Presentation Topics	Summary of activities
Women entrepreneurs conquering Africa	Program 's mission presentation	<ul style="list-style-type: none"> - Explain the mission of the 'Consortia' program - Gender aspect of the program (role of gender equality in development, GII) - Women entrepreneurship in Tunisia (statistics, obstacles, programs to promote it) - SMEs exports managed by Tunisian women (access to funding, statistics, difficulties) - Women representation in professional networks - SSA market (member countries, GDP, official languages)
	Female presence in Tunisian firms	<ul style="list-style-type: none"> - Information about each target country of the program: Cameroon, Ivory Coast, DR Congo, Kenya, Nigeria - Interests in exporting (incentives and advantages) - Socio-economic situation of women entrepreneurs - Information about RAIDA Program - Export strategy and guidelines for direct and indirect export - The role of gender equality
	Sub-Saharan Africa market	<ul style="list-style-type: none"> - in women entrepreneurs' empowerment - Information on gender inequality in Tunisia and around the world - The trade agreements between Tunisia and the export target region - Information on programs and activities of COMESA and AfCFTA in Tunisia
	Female-led firms' participation in export	<ul style="list-style-type: none"> - Free trade agreements list of countries partnered in bilateral agreements with Tunisia - Information on COMESA and AfCFTA
	Opting for women's consortium: an empowerment solution	
	Free trade agreements	
Duration	2 days	
Date	May 2022	

Table 41: Summary workshop 2

Workshop 2	Presentation Topics	Summary of activities
Creation of women's consortium	Interpersonal communication	<ul style="list-style-type: none"> -The importance of a better communication - Information on the types, filters, channels, and process of communication - Perceptions and information modeling - Practical exercise on how to actively listen and give feedback
	Woman- Woman Cooperation: Essential mentoring elements	<ul style="list-style-type: none"> - Information on the concept of mentorship - Advantages and disadvantages of mentorships, as well as tips for mentor and mentee - Examples of successful mentoring cases and woman-to-woman mentoring
	Securing exports to SSA for Tunisian women entrepreneurs	<ul style="list-style-type: none"> - Means of payment to choose when exporting to SSA - Management of problems that may arrive using one mean of payment over another - What type of contract should a Tunisian women entrepreneur get to safeguard her financial interests - Means of transport and delivery for export to SSA
Duration	2 days	
Date	May-June 2022	

Table 42: Summary workshop 3

Workshop 3	Presentation Topics	Summary of activities
Women Consortia	The different types of consortia 1	<ul style="list-style-type: none"> -Information on types of consortia: definitions of joint ventures, co-contracting, formal and informal groups - Advantages and disadvantages of each consortia type
	The different types of consortia 2	<ul style="list-style-type: none"> - Reminder of consortia types followed by a practical exercise for each type
	Assistance in choosing the consortium	<ul style="list-style-type: none"> - Practical exercise to assist women entrepreneurs in choosing their consortium
Duration	2 days	
Date	June 2022	

9.4.2 Individual Coaching

Table 43: Examples of individual coaching sessions

Consortium	Session	Example of subject	Category
Agro-food	1	Financing of a new campaign	Access to funding
Agro-food	2	Fund raising	Access to funding
Agro-food	1	Tax reporting coaching for herself and her accountant.	Accounting & Financial Management
Agro-food	1	Specificities of the SSA market.	Business Development
Agro-food	2	Specificities of the SSA market - Important terms to negotiate in an export operation to the SSA market	Business Development
Agro-food	3	How to set up a consulting office	Business Development
Agro-food	1	How to benefit from the STARTUP label	Government programs & tenders
Agro-food	1	Conflict management at work	Human relations/ resources
Agro-food	2	Tax reporting coaching.	Legal and administrative aspects
Agro-food	1	How to attract and convince customers	Marketing
Agro-food	2	How to negotiate in the African market - Which sales techniques that increase sales.	Marketing
Agro-food	1	Define the product line	Product/ Service Development
Agro-food	1	How to launch a business.	Product/ Service Development
Agro-food	3	Choice of the implantation region.	Product/ Service Development
Agro-food	2	How to launch a business.	Product/ Service Development
Agro-food	2	How to draw up a business plan considering its development forecasts.	Product/ Service Development
Agro-food	1	Communicate better in public and make a successful presentation	Self-Development
Agro-food	2	Public speaking	Self-Development
Handicrafts & Cosmetics	1	Fund raising	Access to funding
Handicrafts & Cosmetics	1	The price structure (calculation of direct charges, allocation of indirect charges for this product)	Accounting & Financial Management
Handicrafts & Cosmetics	2	Price calculation formula	Accounting & Financial Management
Handicrafts & Cosmetics	5	Review cost calculation	Accounting & Financial Management
Handicrafts & Cosmetics	1	How to diversify into business	Business Development
Handicrafts & Cosmetics	1	Specificities of the SSA market.	Business Development
Handicrafts & Cosmetics	2	Lack of a clear strategy for digital communication	Business Development
Handicrafts & Cosmetics	3	Company structure and organization chart	Business Development
Handicrafts & Cosmetics	2	How to benefit from the STARTUP label	Government programs & tenders
Handicrafts & Cosmetics	2	Recruitment of production management assistants	Human relations/ resources
Handicrafts & Cosmetics	1	Lack of a clear strategy for digital communication	Marketing
Handicrafts & Cosmetics	1	Set a communication strategy - Recruit a social media manager	Marketing
Handicrafts & Cosmetics	1	Lack of segmentation and targeting -Campaign on social networks	Marketing
Handicrafts & Cosmetics	2	Customer targeting - Sales action plan	Marketing
Handicrafts & Cosmetics	3	Absence of marketing -Product visibility on the market	Marketing
Handicrafts & Cosmetics	1	Develop a 'Business Model Canvas'.	Product/ Service Development
Handicrafts & Cosmetics	2	Explain the business plan to set the business strategy.	Product/ Service Development
Handicrafts & Cosmetics	4	How to diversify into business	Product/ Service Development
Handicrafts & Cosmetics	3	Defining its mission, vision and axes of orientation	Product/ Service Development
Handicrafts & Cosmetics	3	Stress management	Self-Development
Services	1	Lack of working capital	Accounting & Financial Management
Services	2	Lack of financial resources management.	Accounting & Financial Management
Services	1	B2B export management	Business Development
Services	2	Defining the company's strategy	Product/ Service Development

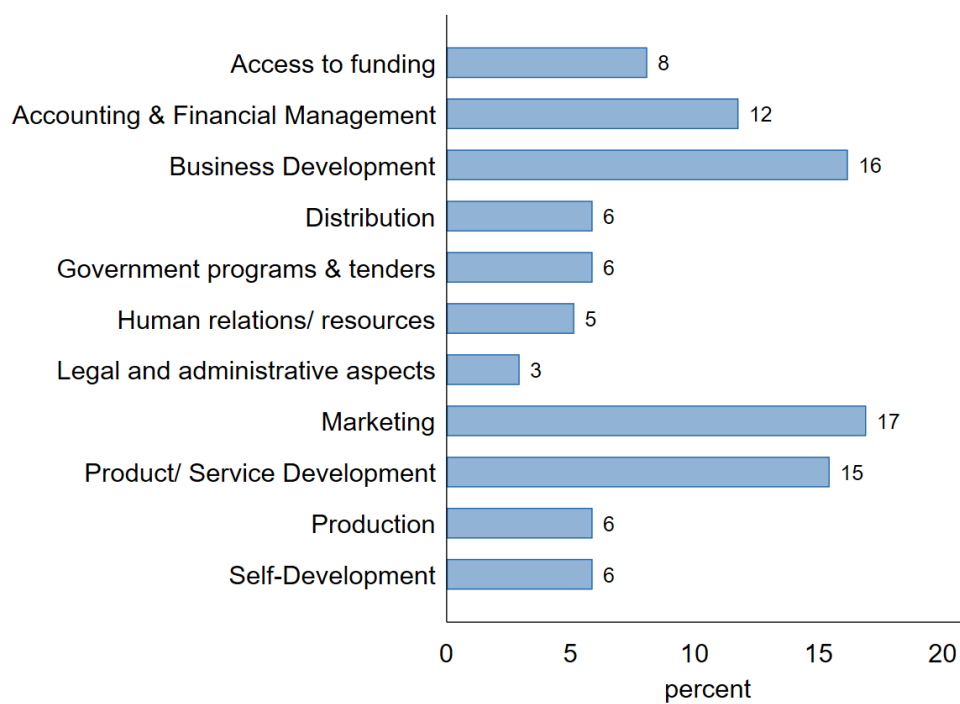


Figure 22: Distribution of the different categories in the individual coaching sessions

9.4.3 Budget & intensity of the different activities

Table 44: Cost for the first phase

	Activity	Budget spent (€)	Hours worked (h/d)	Hours worked (duration)
Phase I: Forming Consortiums	1) Webinar launch	6,500€	33	6 months
	2) 3 First meetings	33,000 € accommodation fees & 30,000 € for consultants' mobilization	155	45 days (PEMA)
	3) Slack exchange and individual coaching	30,000€	150	30 days (PEMA)
	4) 3 Intermediate meetings	33,000 € accommodation fees & 31,000 € for consultants mobilization	155	90 hours/day (PEMA)
	5) Operationalization meeting & decision of the executive office	8,000€	32	45 days (PEMA)
Total		171,500€		