Helping Differentiated-Goods Producers Succeed in Exports Markets through Good Exporting Practices: Experimental evidence from Argentina

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Abstract

We evaluate an export consulting program implemented as a randomized controlled trial by Argentina's national export promotion agency. The intervention disseminated a codified set of 20 "good exporting practices" through 72 hours of firm-level consulting in the food and beverages sector. While average treatment effects are statistically indistinguishable from zero, we document substantial heterogeneity. Firms producing differentiated goods and enrolling early in the recruitment process—characteristics aligned with the program's intended scope—experience large and persistent gains along the extensive margin of exports. Five years after the intervention, treated firms in this subgroup are 33 percentage points more likely to export than comparable control firms, with no corresponding effects on export intensity. These findings suggest that helping firms adopt good exporting practices can substantially improve their participation in foreign markets.

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1 Introduction

Export development, particularly diversification away from commodities, has long been viewed as a key driver of economic development (Balassa, 1978; Hausmann and Rodrik, 2003; Hausmann and Klinger, 2006; Brenton et al., 2009). While transport costs (Limao and Venables, 2001; Hummels, 2007), tariffs (Corden, 1966; Fajgelbaum et al., 2020), and non-tariff measures (Orefice, 2016) remain important barriers, firms producing differentiated goods often face deeper knowledge and capability constraints that hinder success in foreign markets. Domestic producers frequently lack detailed knowledge about foreign demand conditions, regulatory requirements, distribution channels, and commercial practices. They may also struggle to adapt products and internal processes to meet the idiosyncrasies of destination markets (Easterly and Reshef, 2010; Artopoulos et al., 2013; Urmeneta, 2018). These knowledge and capability gaps have motivated public interventions aimed at strengthening firms' export performance, including export promotion services and capability-building programs (Volpe Martincus, 2010; Lederman et al., 2010; Crespi et al., 2014; Cruz et al., 2018).

Among these interventions, export consulting programs attempt to strengthen firms' export capabilities through intensive technical assistance. Unlike basic export training or informational seminars, consulting interventions typically involve sustained one-on-one engagement aimed at transferring tacit knowledge and promoting organizational adjustments in areas such as strategy, production, and commercial practices. Despite their growing importance and relatively high cost, credible evidence on the effectiveness of such capability-building programs remains limited.

This paper evaluates, through a randomized controlled trial (RCT), the Good Exporting Practices (GEP) program implemented in Argentina between 2017 and 2019 by the national export promotion agency (AAICI). The program provided 72 hours of individualized consulting to firms in the treatment group, with the objective of disseminating and encouraging the adoption of a codified set of export-oriented business practices. A total of 213 food and beverage firms participated in the program, of which 107 were randomly assigned to receive consulting support. Following Bloom et al. (2013), we codified a system of good exporting practices and measured their adoption before and after the intervention.

Exporting differentiated goods to developed markets often requires coordinated adjustments in product design, production standards, marketing, and commercial practices. These ad-

justments demand detailed knowledge about foreign customer preferences, quality standards, certification requirements, and distribution channels—knowledge that domestic producers frequently lack (Easterly and Reshef, 2010; Artopoulos et al., 2013; Mion and Opromolla, 2014). Evidence shows that easing such knowledge constraints can induce firms to modify production processes and organizational routines in response to foreign market requirements (Artopoulos et al., 2013; Atkin, Khandelwal, and Osman, 2017). Because many export-related practices are complementary, their adoption may require structured managerial effort rather than isolated adjustments. Intensive consulting interventions may facilitate such transformations by organizing and transferring export-specific knowledge and promoting the coordinated adoption of export-oriented practices. To the extent that these constraints affect firms' ability to establish and sustain an export business, impacts are more likely to arise along the extensive margin than along the intensive margin of exports.

We consider three primary export outcomes: export participation, the logarithm of export value, and the inverse hyperbolic sine (IHS) transformation of export value. The first captures impacts on the extensive margin of exports, the second captures impacts on the intensive margin, and the third encompasses both margins without excluding zero-valued observations. As secondary outcomes, we examine the number of export destinations and the average per capita income of destination markets.

Estimating average treatment effects across the full sample of participating firms, we do not find statistically significant impacts on any of these export outcomes. The absence of average effects suggests that the intervention did not uniformly improve export performance among participating firms.

The GEP program was designed for producers of differentiated goods willing to undertake sustained export-oriented organizational adjustments. However, implementation occurred under tight administrative deadlines and political commitments that constrained the screening process. As a result, participating firms differed in characteristics directly related to the intervention's intended scope, including product differentiation status and preparedness to engage with a structured assistance program. Under these conditions, observable variation across firms—such as enrollment timing—may proxy differences in alignment with the program's objectives. This variation suggests that effectiveness may depend critically on firms' suitability for the program's design.

We therefore examine whether treatment effects differ according to firms' alignment with the program's intended target profile, focusing on two characteristics determined prior to treatment and directly related to the program's design: product differentiation status and enrollment timing. Had screening fully aligned participation with the target profile, all firms would have been differentiated-goods producers and enrollment timing would have had limited relevance for effectiveness. Implementation constraints, however, generated observable variation along these dimensions. Because this variation maps directly into the intervention's objectives, we estimate treatment effects separately along these predetermined characteristics.

Focusing on firms that both produce differentiated goods and enrolled early in the program ("aligned" firms), we find large, consistent, and statistically significant impacts on export participation. Five years after treatment, the probability of exporting increases by 33 percentage points for this subset of firms. The impacts are concentrated on the extensive margin, with no statistically significant changes in export intensity. These results indicate that export consulting on export business practices can generate economically meaningful gains in export participation when firms are aligned with the intervention's intended scope, while yielding no significant average effects across the full sample. More broadly, they underscore that even well-designed consulting interventions may produce negligible average impacts when participant alignment with program scope is imperfect—a realistic feature of policy implementation rather than an exceptional failure.

We also explore treatment-effect heterogeneity along more conventional firm characteristics, including firm size and baseline GEP adoption. These dimensions yield limited and inconsistent patterns, providing little evidence that differences in scale or initial export-practice adoption account for the absence of average treatment effects.

To further assess the heterogeneous patterns, we complement the regression-based analysis with a data-driven procedure developed by Chernozhukov et al. (2025). The Generic Machine Learning framework uses sample splitting to identify heterogeneity patterns based on the full set of pre-treatment variables. While overall heterogeneity is not statistically significant given the sample size, the algorithm systematically identifies firms with higher predicted treatment effects that disproportionately exhibit the same characteristics captured by our alignment measures—namely, producing differentiated goods and enrolling early. This independent exercise reinforces the interpretation that treatment suitability, rather than arbitrary subgroup selection,

underlies the heterogeneous impacts we document.

Regarding adoption of good exporting practices, we exploit the codification effort underlying the program to construct baseline and follow-up GEP scores. While we observe suggestive evidence of practice adoption, measurement noise and the timing of the follow-up survey limit our ability to precisely estimate the program's effect on GEP adoption. Nevertheless, the evidence is consistent with export improvements among aligned firms being associated with greater adoption of export-oriented practices.

Our contribution is threefold. First, we provide the first randomized evidence on the impact of a structured export consulting program designed to codify and disseminate export-oriented business practices. Second, we document that the program's effects are concentrated on the extensive margin of exports, contributing to understanding how capability-building interventions affect firms' export dynamics. Third, we highlight the importance of participant targeting and alignment with program objectives for the effectiveness of capability-building interventions.

Overall, the findings suggest that costly consulting interventions can generate substantial export gains when properly targeted, but may yield negligible average impacts when screening is imperfect. Designing diagnostic systems that align firms with appropriate capability-building services appears crucial for the effectiveness of export promotion policies.

2 Related Literature

A large empirical literature evaluates the effectiveness of export promotion agencies in fostering firm-level export performance. This literature generally finds stronger impacts for smaller firms, firms with limited prior export experience, and firms attempting to enter new markets or export differentiated goods. Impacts are typically concentrated along the extensive margin of exports, consistent with the presence of informational and capability barriers to export entry.[1]

A related strand focuses on specific export promotion services, such as organizing participation in trade fairs, coordinating trade missions, and providing market intelligence. While many studies find positive effects of these services, results are mixed and often modest, particularly

[1]See Volpe Martincus and Carballo (2008, 2010a, 2010b, 2010c, 2012), Volpe Martincus et al. (2012), Van Biesebroeck et al. (2015, 2016), Broocks and Van Biesebroeck (2017), Cruz (2014), and Munch and Schaur (2018).

for firms already engaged in export activity.[2] In response, export promotion agencies have increasingly shifted toward more intensive capability-building services, including export training and consulting (Volpe Martincus, 2010; Lederman et al., 2010; Crespi et al., 2014; Cruz et al., 2018).

A useful way to organize these interventions is along a "route to exporting," reflecting different stages of firms' export engagement. At an initial stage, programs provide general export training on procedural and commercial aspects of exporting—such as understanding bureaucratic requirements, exploring logistics options, or pricing export items—typically delivered through conferences, seminars, or classroom and virtual courses. These low-intensity interventions disseminate standardized information to a broad set of firms. Evidence suggests that such programs often have limited direct effects on export performance, although they may affect intermediate outcomes such as intention to export (Kim et al., 2018; Breinlich et al., 2017; Carvalho et al., 2024).

More intensive interventions at subsequent stages involve progressively greater firm-level engagement and higher implementation costs. A second stage involves consulting interventions aimed at preparing firms to export by strengthening export-specific organizational and managerial capabilities. Unlike basic training delivered in classroom or virtual settings, these programs typically involve individualized technical assistance provided at the firm's premises or through sustained one-on-one engagement. Consultants help firms adapt products, packaging, quality standards, and commercial practices to meet foreign market requirements. By facilitating coordinated adjustments in export-relevant practices, such interventions are expected to reduce barriers to export entry and early survival, thereby generating stronger effects along the extensive margin. Evidence from matching-grant programs and consulting interventions shows heterogeneous but often positive impacts, particularly on export participation (Alvarez, 2004; Volpe Martincus and Carballo, 2010c; Figal-Garone et al., 2017; Comi and Resmini, 2020). Our GEP program belongs to this category and contributes randomized evidence on the effectiveness of a structured export consulting intervention designed to codify and disseminate export-oriented business practices.

A third stage targets firms that have already acquired general export capabilities and fo-

[2]See Seringhaus and Rosson (1991), Wilkinson and Brouthers (2000a), Spence (2003), Álvarez (2004), Head and Reis (2010), Cadot et al. (2015), Comi and Resmini (2020), and Munch and Schaur (2018).

cuses on facilitating concrete sales in specific foreign markets—for example, through in-market representation or assistance in building distribution networks. These interventions address destination-specific market-access barriers and therefore tend to generate stronger impacts along the intensive margin of exports. Evidence from quasi-experimental and experimental settings is consistent with this pattern (Buus et al., 2025; Barteska and Lee, 2024; Cusolito et al., 2023). In a closely related experimental setting, Ali et al. (2024) similarly show that matching grants aimed at financing market-access fixed costs generate significant impacts on export intensity but not on export participation.

Finally, our work relates to a broader literature on management consulting and firm performance. Standard heterogeneous-firm trade models (e.g., Melitz, 2003) predict that productivity improvements lower the threshold for export participation and increase export intensity. A large experimental and quasi-experimental literature shows that management consulting can raise productivity and improve firm performance (Bloom et al., 2013; Bruhn et al., 2018; Higuchi et al., 2019; Iacovone et al., 2022). Some studies also document downstream effects on exports (Bloom et al., 2021; Giorcelli, 2019), although findings are mixed (Iacovone et al., 2023). Unlike general management interventions that aim to improve productivity broadly, the GEP program targets export-specific practices tailored to foreign market requirements.

3 Good Exporting Practices

3.1 Exporting differentiated products from developing countries

Evidence on export emergence in differentiated-goods sectors suggests that sustained export success often requires the adoption of export-specific business practices that differ from those commonly used in domestic operations. Firms that establish a consistent presence in developed-country markets tend to treat exporting as a strategic growth channel and undertake coordinated adjustments across multiple organizational areas, including product adaptation, quality upgrading, logistics, communication, and distribution management (Artopoulos et al., 2013).

The broader trade literature has emphasized the informational frictions associated with trade in differentiated goods (Rauch, 1999) and the role of quality upgrading in gaining access to high-income markets (Maskus et al., 2005; Hallak, 2006, 2010; Sutton, 2007; Verhoogen,

2008; Hallak and Sivadasan, 2013; Atkin et al., 2017). Producers in developing countries seeking to enter geographically and culturally distant markets must navigate destination-specific standards, distribution structures, and commercial norms that are often poorly understood ex ante. Much of the knowledge required to operate successfully in these environments is tacit and embedded in organizational routines, making it difficult to acquire and diffuse. Case-based evidence indicates that firms overcoming these barriers frequently incorporate export-specific organizational practices that extend beyond product quality upgrading alone (Artopoulos et al., 2013).

Aligned with the management-practices literature (Bloom and Van Reenen, 2007), we conceive good exporting practices as organizational routines and structures that shape how firms conduct export activities. While many general management practices—such as quality control systems or lean production—are widely codified and disseminated through business education and consulting markets, export-specific practices have received comparatively less systematic formalization. The present intervention translated qualitative research insights and practitioner experience into a structured set of export-oriented practices that could be operationalized, measured, and disseminated through a consulting program.

3.2 The good exporting practices

We codified a set of 20 good exporting practices intended to operationalize the organizational adjustments associated with sustained export success.[3] The framework integrates qualitative research evidence (Artopoulos et al., 2013), academic contributions on export upgrading, practitioner experience, and export-oriented practices promoted by a number of export promotion agencies in different institutional settings. The objective was to consolidate these insights into a structured and measurable set of export-specific organizational practices that could be implemented through a consulting intervention.

The 20 practices were grouped into seven organizational areas: (i) Strategy—defining exports as a growth channel and planning their implementation; (ii) Market Identification and Segmentation—analyzing export markets and positioning products in target segments; (iii) Product Design and Adaptation—adapting products to foreign requirements; (iv) Production—ensuring

[3]The codification effort was developed in collaboration with the Argentine think tank CIPPEC and with technical support from The World Bank.

quality compliance and reliable delivery; (v) Communication—managing brand identity, packaging, and interactions with distribution channels; (vi) Distribution—organizing logistics and maintaining foreign distribution networks; and (vii) Administration—adapting internal systems to foreign regulatory, pricing, and financing requirements. Together, these areas capture complementary dimensions of export readiness, ranging from defining exports as a strategic growth channel to adapting internal processes and commercial policies to foreign-market requirements. The full set of practices is described in Appendix I.

4 The Intervention

4.1 General features

The Good Exporting Practices (GEP) program was an export-management consulting initiative implemented by the Argentine Agency for Investment and International Trade (AAICI) between March 2017 and December 2019, with support from the Secretary of Commerce and the World Bank, and in collaboration with other public agencies and the Center for Development Economic Studies at UNSAM on specific components of the program.[4] The program was nationwide and provided individualized consulting services free of charge to participating firms.

The intervention consisted of structured, one-on-one technical assistance based on the GEP framework described in Section 3. Consultants were trained in the codified set of export-specific practices and delivered approximately 72 hours of consulting to firms assigned to the treatment group. A supervisory team—including some of the authors, who at the time held positions in the Secretary of Commerce—provided technical guidance, trained consultants in the GEP framework, and monitored compliance with the experimental protocol. Administrative and operational responsibilities, including consultant contracting and firm coordination, were managed by AAICI.

The program focused on firms in the food and beverages sector and was open to firms employing between 3 and 250 workers. The sectoral focus facilitated comparability across participating firms and enabled the recruitment of consultants with relevant expertise.

[4]The agencies were the National Institute of Industrial Technology (INTI), the Secretary of Productive Transformation, and the National Direction of Food and Beverages.

Enrollment and Screening. The program was designed to target producers of differentiated food and beverage products willing to commit managerial time and sustained effort to developing and strengthening their export activities. To operationalize this objective, the original design contemplated collecting detailed pre-treatment information through an extensive application form, enabling systematic screening of applicants.

However, enrollment had to be completed within a short time window—approximately 45 days—in order to comply with budget-execution constraints and political commitments. To ensure sufficient take-up within this timeframe, the application process was substantially streamlined and dissemination efforts intensified. These efforts included outreach through sectoral business associations and provincial export promotion agencies, public events, direct contact with firms, and support from the Ministry of Production.

To facilitate enrollment, the originally planned extensive application form was reduced to a short set of basic administrative questions. Although screening did not rely solely on written responses—recruiters also engaged in direct communication with firms to explain program requirements and assess their interest and commitment—the reduction in structured information constrained the scope for systematic ex ante assessment of firm suitability.

At the same time, recruitment responsibilities were expanded beyond AAICI's in-house team to include support from a Ministry call center. While this scaling-up helped achieve the required number of applicants within the compressed timeline, call-center staff were not embedded in export-promotion activities to the same extent as AAICI personnel and had not participated in the same training and close interactions with the supervisory team responsible for developing the GEP framework. Together, the simplification of the application form and the expansion of recruitment responsibilities reduced the uniformity and depth with which targeting criteria and program commitments were conveyed and assessed.

As enrollment progressed under these conditions, the effective stringency with which targeting criteria were applied likely declined. Although enrollment timing is mechanically observed for all firms, it would carry no intrinsic economic meaning under uniformly applied screening standards. In this context, however, the acceleration and institutional adjustments plausibly rendered timing informative: firms enrolling earlier were more likely to have been assessed under relatively stricter screening and clearer communication of program requirements.

Enrollment closed with 279 firms registered, of which 213 satisfied the formal eligibility

criteria—sector (food and beverages) and employment size—and entered the stratified randomization process conducted in April 2017, after enrollment and prior to the baseline survey.[5] The randomization was implemented using predefined stratification variables to ensure balance across treatment and control groups (see Appendix II for details).

Under these implementation constraints, certain observable pre-treatment characteristics—most notably product differentiation status and enrollment timing—acquired informational content as proxies for deeper conceptual dimensions of alignment with the program's intended scope, including consistency with its differentiated-goods focus and preparedness to commit sustained managerial effort within a structured export-improvement framework. While all participating firms were expected to satisfy these criteria, the compressed recruitment phase limited the ability to enforce them uniformly.

4.2 Implementation phases

The program was structured into three phases—diagnostic, consulting, and follow-up—implemented between June 2017 and December 2019.

Diagnostic phase. Between June and December 2017, consultants visited the production facilities of both treatment and control firms to administer a structured diagnostic survey to executive directors or area managers. The survey assessed the adoption of the program's 20 good exporting practices and required approximately nine hours to complete. Consultants assigned scores to each practice on a scale from 0 (minimum adoption) to 5 (maximum adoption). Following the visit, consultants prepared a diagnostic report outlining the firm's degree of adoption across practices, identifying areas for improvement, and prioritizing practices to be addressed. Practice scores were not included in the reports shared with firms.

Consultants were required to have at least five years of professional experience in areas relevant to the program's content, such as strategy, production, or export management. Prior to fieldwork, all consultants received standardized training in the GEP framework and operational guidelines from the supervisory team.

A total of 67 field consultants—each with at least five years of relevant professional experience—conducted the diagnostic visits and received standardized training in the GEP framework

[5]Firms were excluded primarily for failing to meet sectoral or employment-size eligibility criteria.

prior to fieldwork. These consultants were either freelancers or employees of AAICI or INTI. All consultants received approximately 16 hours of training in the GEP framework and were provided with operational instructions by the program's supervisory team. In total, 125 professionals were trained.

Consulting phase. Between April and December 2018, firms assigned to the treatment group received 72 hours of individualized consulting over approximately six months. The 72-hour duration represented the maximum intensity feasible within the program's budget. Each intervention cost approximately $3,000 (USD) per firm, including consultant fees and associated administrative expenses.

Consulting was organized into four thematic modules—Strategy, Product Design, Production, and Communication—reflecting central areas of the GEP framework. Although each module addressed a specific dimension, the intervention emphasized coordinated adjustments across export-related practices. Based on the diagnostic findings, firms were assigned to one of eight predefined assistance packages combining these modules.[6] The selection of the package was based on the gaps identified in the diagnostic phase and was validated with the firm prior to implementation.

The consulting process centered on the design and implementation of a structured work plan aimed at achieving a specific export objective. It typically began with an initial planning meeting to define objectives and identify the firm's managerial team responsible for leading the consulting engagement. Consultants and firm representatives then met regularly—generally every two weeks—to monitor progress and adjust the work plan as needed. The remaining consulting hours were devoted to implementing the agreed activities. For example, firms receiving the 72-hour Strategy package developed an export business plan with the consultant, including market evaluation and target-market selection. Subsequent market-entry efforts were undertaken after the completion of the consulting period.

A total of 74 field consultants implemented the consulting phase. These consultants were supervised by six senior lead consultants responsible for ensuring consistency in the application of the GEP framework, reviewing deliverables, and addressing complex implementation issues.

[6]The assistance packages were: (i) Strategy: 72 hours; (ii) Production: 72 hours; (iii) Communication: 72 hours; (iv) Strategy: 48 hours and Communication: 24 hours; (v) Strategy: 24 hours and Product Design: 48 hours; (vi) Strategy: 24 hours and Production: 48 hours; (vii) Strategy: 24 hours and Communication: 48 hours; and (viii) Production: 24 hours and Product Design: 48 hours.

Follow-up phase. Between September and December 2019, all participating firms—including those in the control group—were visited by a consultant to complete a follow-up survey assessing their adoption of the 20 GEP practices. The same survey instrument used in the diagnostic phase was administered during a 3-to-4-hour meeting. As in the baseline diagnostic, firms did not receive their practice scores or formal reports. Seventeen consultants conducted the follow-up visits.

5 Experimental Design

5.1 Firm characteristics

Table 1 summarizes baseline outcomes and characteristics for the 213 firms included in the randomized sample.

Pre-treatment outcomes. At baseline (year 2017), 60% of firms exported. The median firm recorded a ln export value of 13.7, corresponding to approximately USD 876,000 among exporters. Export values are highly dispersed: firms at the 10th percentile exported roughly USD 32,000 (log value 10.4), while those at the 90th percentile exported USD 9.8 million (log value 16.1). The inverse hyperbolic sine (IHS) transformation of export value, which retains zero-export observations, exhibits a similarly wide dispersion. Market scope also varies substantially: while the median firm exported to one destination, firms at the 90th percentile served 11 markets. The weighted average GDP per capita of export destinations ("export quality") ranges from USD 6,572 at the 10th percentile to USD 50,803 at the 90th percentile.

Baseline adoption of good exporting practices also displays substantial dispersion. The median firm scored 52 points (out of 100), while firms at the 10th and 90th percentiles scored 19 and 73 points, respectively. GEP scores are strongly positively correlated with baseline export participation (correlation = 0.513), consistent with exporters exhibiting higher adoption of good exporting practices prior to the intervention.

Pre-treatment characteristics. Firm size varies considerably across the sample. The median firm employed 23 workers, while employment ranged from 5 workers at the 10th percentile to 200 at the 90th percentile. Average monthly wages also exhibit substantial dispersion, ranging from 7,973 pesos (USD 475) at the 10th percentile to 30,483 pesos (USD 1,818) at the 90th

percentile.

Consistent with the implementation constraints described in Section 4.1, the composition of participating firms deviated from the program's original target along a key design dimension. Although the GEP program was conceived—and pre-specified in the AEA RCT Registry (AEARCTR-0002784)—for producers of differentiated food products, 59 out of the 213 participating firms (28%) primarily produced non-differentiated goods according to the Micro-D classification (Bernini et al., 2018). This deviation is consistent with the implementation constraints described in Section 4.1, including the streamlining of the screening process to meet tight enrollment deadlines. As a result, the final randomized sample exhibits pre-treatment variation in product differentiation status along a dimension directly related to the intervention's intended scope.[7]

In addition, recruitment efforts intensified over the enrollment window in order to meet participation targets. To capture this implementation-stage variation, we define an indicator equal to one for firms enrolling before the sample median enrollment date ("early enrollment"). By construction, half of the participating firms fall into this category. Enrollment timing is predetermined with respect to treatment assignment and subsequent export outcomes. Under uniformly applied screening standards, timing would carry no intrinsic economic meaning; in this context, however, it captures variation in the recruitment environment under which screening criteria were applied.

To examine the joint relevance of these two design-related dimensions, we define an indicator equal to one for firms that both (i) produce differentiated goods and (ii) enrolled before the sample median enrollment date. This intersection captures firms satisfying the program's ex ante target criterion and participating under the initial recruitment environment, when screening standards were applied more consistently. As these firms are aligned with the program' design, we refer to this subgroup as "aligned" firms. Aligned firms comprise 36% of the randomized sample.

Balancing tests reported in Table 1 indicate that treatment and control groups are statistically similar across baseline export outcomes and firm characteristics. The only statistically significant difference arises for the baseline GEP score, which is higher in the control group.

[7]The non-differentiated firms include producers of bulk agricultural products such as legumes, nuts, and fresh produce.

5.2 Data sources

For export outcomes, we use Argentina's customs administrative records, which provide firm-level information on free-on-board (FOB) export values in U.S. dollars by destination country and HS product code. The data span the period 2012–2023 at annual frequency.

To assess export performance, we consider three main indicators. The first is the inverse hyperbolic sine (IHS) transformation of firms' total export values. The IHS transformation, pre-specified in our pre-analysis plan, allows the inclusion of zero-export observations. However, it combines the extensive and intensive margins of export performance, with implicit weights that depend on the scaling of the underlying variable (Mullahy and Norton, 2024; Chen and Roth, 2024). In our analysis, export values are expressed in U.S. dollars in their original units.

In light of these properties, we place primary emphasis on two variables that separately capture the extensive and intensive margins of export performance and report the IHS results as a complementary summary measure. The first, "exporter," is a binary indicator equal to one if a firm records positive exports in a given year and zero otherwise. The second, "ln export value," is the natural logarithm of total annual FOB exports (in U.S. dollars) and captures variation along the intensive margin. This measure is defined for firms exporting both at baseline and in the relevant post-treatment year.

We also consider two secondary indicators. The first, "number of destinations," counts the total number of countries to which a firm exports in a given year. The second, "export quality," is defined as the weighted average GDP per capita of a firm's export destinations, where weights correspond to the share of FOB export value shipped to each destination.[8] This measure is computed for firms exporting both at baseline and in the relevant post-treatment year in order to avoid compositional changes along the intensive margin.

We additionally use administrative data from Argentina's social security agency (ANSES), which provide firm-level information on declared employment and average wages. These data are available through August 2019. To construct annual measures, we compute rolling twelve-month averages using the last four months of the previous calendar year. For example, baseline employment in 2017 is calculated using data from September 2016 to August 2017.

[8]Per-capita GDP is measured in 2017 using data from the IMF World Economic Outlook, World Bank Development Indicators, UN Statistics Division, and the French National Institute of Statistics and Economic Studies (for dependent territories).

As described in Section 4.2, a survey instrument was developed to systematically measure adoption of the 20 good exporting practices. Each practice was scored on a scale from 0 (minimum) to 5 (maximum), yielding a total index ranging from 0 to 100.

5.3 Take up & attrition

Of the 213 randomized firms, 183 completed the baseline diagnostic survey, yielding a baseline take-up rate of 85.9%. Compliance with the consulting intervention was also high: 83 of the 107 firms assigned to the treatment group (77.6%) completed the full 72-hour consulting program. No firms in the control group received consulting services. Finally, 153 of the 213 randomized firms (71.8%) completed the follow-up survey. A total of 148 firms (69.5%) completed both baseline and follow-up surveys.

To assess whether attrition was systematically related to treatment status or baseline characteristics, we conduct additional balancing tests (Appendix Table A.1). Among firms that completed both surveys, there are no statistically significant differences in pre-treatment characteristics between treatment and control groups (Panel A). The probability of attrition does not differ significantly by treatment assignment (Panel B). Moreover, baseline export outcomes do not differ significantly between attritors and non-attritors (Panel C). These patterns are consistent with attrition being unrelated to treatment status or pre-treatment export performance.

6 Average treatment effects

As an initial descriptive step, Figure 1 compares export participation by year for firms assigned to the treatment and control groups. The shares depicted represent the empirical export probability for each group. Visual inspection suggests limited divergence between treated and control firms following the intervention.

Given random assignment, the program's causal impact can be identified using an ANCOVA specification.[9] For each post-treatment year $t = 0$ (2018) to 5 (2023), we estimate the following

[9]We use ANCOVA as our baseline specification due to gains in statistical power relative to difference-in-differences estimation (McKenzie, 2012). For robustness, we also estimate DiD models.

cross-sectional regression:

$$Y_{it} = \beta_0 + \beta_1 T_i + \beta_2 X_{i,pre} + \beta_3 Y_{i,pre} + \epsilon_{it} \tag{1}$$

where Y_{it} is the outcome of interest for firm i in year t, T_i is a dummy variable indicating actual treatment take up, instrumented by the treatment random assignment, $X_{i,pre}$ includes pre-treatment controls (ln number of employees and ln average salary in 2017), $Y_{i,pre}$ is the baseline (2017) outcome, and ϵ_{it} is the firm-level error term.[10]

Alternatively, we estimate a difference-in-differences (DiD) specification. For each post-treatment year $t = 0$ (2018) to 5 (2023), we combine observations from year t with baseline year 2017 and estimate:

$$Y_{im} = \alpha_i + \gamma_m + \beta_t T_{im} + \epsilon_{im}, \qquad m = \{2017, t\} \tag{2}$$

where α_i are firm fixed effects, γ_m are year fixed effects, and T_{im} equals one when $m = t$ and firm i effectively received the consulting intervention, instrumented by random assignment to account for partial compliance. In both specifications, we instrument actual treatment take-up with random assignment to account for partial compliance.

Table 2 reports results for all three outcomes. In line with the discussion in Section 5.2, we emphasize the separate extensive- and intensive-margin measures.[11] Panel A presents ANCOVA estimates for years 2018–2023. Across all years, estimated treatment effects are statistically insignificant for all three outcomes and display no consistent temporal pattern. Panel B reports DiD estimates, which yield similar results. Appendix Table A.2 reports results for the secondary outcomes, including the number of export destinations and export quality, with no apparent effects observed.

To further assess program effects and evaluate the parallel trends assumption, we estimate an event-study specification extending the pre-treatment period back to 2012:

$$Y_{it} = \alpha_i + \gamma_t + \sum_{l=-6}^{-2} \beta^l T_{it}^l + \sum_{m=0}^{5} \beta^m T_{it}^m + \epsilon_{it} \tag{3}$$

[10] We lose 18 observations due to missing data on control variables.

[11] For ln export value, the sample is restricted to firms exporting both at baseline and in the relevant post-treatment year.

where T_{it}^{l} denote leads (pre-treatment periods) and T_{it}^{m} denote lags (post-treatment periods), with treatment take-up instrumented by random assignment as in the preceding specifications. This specification allows us to test for pre-treatment differences and trace the dynamic evolution of treatment effects. Figure 2 reports estimated coefficients with 10% confidence intervals. We find no statistically significant differences between treated and control firms in the pre-treatment period, consistent with parallel trends, and no persistent divergence in post-treatment years.

We also assess the program's impact on GEP adoption. Figure 3 displays average GEP scores before (light blue bars) and after (blue bars) the intervention for treatment and control groups. Both groups exhibit increases in adoption, with the treatment group showing a larger absolute increase (10 percentage points) relative to the control group (4 percentage points).[12]

Table 3 reports formal estimates of the treatment effect on GEP adoption using ANCOVA (panel A) and DiD (panel B). While the DiD estimate is statistically significant at the 10% level, the ANCOVA estimate is not. This difference likely reflects the pre-treatment imbalance in baseline GEP scores and regression-to-the-mean dynamics in the ANCOVA specification. Overall, the evidence on practice adoption is suggestive but not conclusive.

Finally, we examine impacts across specific practice areas by estimating ANCOVA and DiD specifications separately for each area, restricting the sample to firms receiving treatment in that dimension. Among the seven areas contributing to the overall GEP score, larger effects appear in Strategy, Distribution, and Administration—areas that correspond to the most frequently requested consulting packages. Consistent with the aggregate results, estimated effects are generally larger under DiD than under ANCOVA, though statistical significance varies across specifications.

7 Heterogeneous Effects and Alignment with Program Scope

The null average treatment effects documented in Section 6 do not necessarily imply that the GEP intervention was ineffective; rather, they may reflect systematic variation in firms' alignment with the program's intended scope. If treatment suitability varies across firms,

[12]Descriptive statistics for practice scores are reported in Appendix Table A.3.

average effects may obscure economically meaningful impacts for those meeting these conditions. We therefore investigate heterogeneous treatment effects, proceeding from conventional firm characteristics to dimensions directly related to the program's design and implementation.

7.1 Firm size and GEP score

We begin by examining heterogeneity along two conventional pre-treatment dimensions: firm size and baseline GEP adoption. Firms differ substantially in resources and organizational maturity, and these characteristics may shape their responsiveness to an intensive consulting intervention. On the one hand, smaller firms and those with lower initial GEP adoption may have greater scope for improvement. On the other hand, they may be further from the export participation threshold, limiting the effectiveness of a 72-hour consulting program.

To assess these possibilities, we estimate ANCOVA specifications interacting treatment assignment with indicators for being above the median number of employees and for being above the median baseline GEP score. Table 4 reports the results.

Panel A shows no systematic heterogeneity by firm size across outcome variables. Estimated treatment effects are small and statistically insignificant for both smaller and larger firms. Panel B presents results by baseline GEP adoption. Firms with lower initial GEP scores exhibit positive coefficients on export participation and IHS export value in later years, reaching statistical significance only in 2023. However, no consistent effects emerge for the intensive margin. Overall, heterogeneity along these conventional dimensions appears limited and does not reveal economically meaningful or systematically robust heterogeneous treatment effects.[13]

7.2 Alignment with program scope

We now examine heterogeneity along dimensions directly related to the program's intended scope. As documented in Section 5.1, the randomized sample exhibited pre-treatment variation along two observable dimensions closely tied to that scope. First, although all participating firms were expected to meet the differentiated-goods criterion—pre-specified in the program design and in the AEA RCT Registry (AEARCTR-0002784)—28% primarily produced non-

[13]We also examined heterogeneity along baseline average wage, interacting treatment assignment with an indicator for being above the median wage level. Results (available upon request) show no statistically significant or economically meaningful impacts along this dimension.

differentiated products according to the Micro-D classification (Bernini et al., 2018). Second, while enrollment timing would carry no intrinsic economic meaning under uniformly applied screening standards, the evolution of recruitment conditions during the enrollment process may have rendered timing informative about firms' preparedness to engage with the program's requirements. We therefore assess whether treatment effects vary systematically along these dimensions.

We first interact treatment assignment with an indicator for producing differentiated goods. Panel A of Table 5 reports the ANCOVA estimates. Among differentiated-goods producers, estimated treatment effects are consistently positive for export participation and for the IHS measure but remain imprecisely estimated and statistically insignificant, and no systematic effects emerge for the intensive margin (ln export value). The standalone coefficient on the differentiated-goods indicator is negative in several post-treatment years for extensive-margin outcomes, reflecting weaker average export performance among differentiated producers in those years; however, this pattern does not translate into statistically significant interaction effects. Overall, differentiation status alone yields suggestive extensive-margin patterns but no robust evidence of heterogeneous treatment effects.[14]

We next examine heterogeneity along enrollment timing by interacting treatment assignment with an indicator for firms enrolling before the median enrollment date. Panel B of Table 5 reports the corresponding estimates. For early enrollees, treatment effects on export participation and the IHS measure are positive and tend to increase over time, reaching statistical significance only in the final post-treatment year. No systematic effects emerge for the intensive margin. Since enrollment timing is predetermined with respect to treatment assignment and subsequent export outcomes, these patterns are consistent with greater treatment suitability among early participants. However, as with differentiation status alone, enrollment timing by itself does not yield consistently precise evidence of heterogeneous treatment effects.[15]

We now turn to the subset of aligned firms, defined in Section 5.1 as those producing differentiated goods and enrolling before the median enrollment date. This group combines the two

[14]The estimated coefficient for the "differentiated" variable (without interaction) is negative for all three outcome variables during 2020, 2021, and 2022, and significantly so for those capturing the extensive margin (ln export value is significantly negative only in 2020). The COVID-19 pandemic could have disrupted regular export business operations—such as establishing and maintaining foreign trade relationships—which are particularly critical for differentiated products that require more intensive face-to-face interactions.

[15]DiD estimation, displayed in Appendix Table A.4, yields very similar results.

observable dimensions most closely linked to the program's intended scope and implementation environment.

Figure 4 provides a descriptive comparison of export participation for treated and control firms within this subsample. A clear divergence emerges in the post-treatment period, with treated aligned firms displaying progressively higher export participation than aligned firms in the control group. This visual evidence suggests that the absence of average effects in the full sample may conceal substantial impacts for this subset of firms.

We formalize this comparison by interacting treatment assignment with the aligned-firm indicator in the ANCOVA specification. Table 6 displays the results. In contrast to the previous specifications, estimated treatment effects for aligned firms are economically large and statistically significant along the extensive margin from 2020 onward. Treated aligned firms exhibit persistently higher export participation relative to their control counterparts, with no corresponding effects on the intensive margin (ln export value); the IHS results mirror this pattern. By 2023, the estimated treatment effect on export participation reaches 33 percentage points relative to the control mean for aligned firms. Given that 56% of aligned firms were already exporters at baseline—and that initial export survival rates are typically low (Cebeci et al., 2012; Fanelli et al., 2025)—this magnitude reflects both new firms entering export markets and baseline exporters continuing to export.

Using the DiD specification, we obtain qualitatively similar results (Table 6.B). Treatment effects for aligned firms remain positive for export participation and for the IHS measure, with statistical significance concentrated in the later post-treatment years. Point estimates are somewhat smaller and less precisely estimated than under ANCOVA, while no systematic effects emerge for the intensive margin. Results for secondary outcomes reported in Appendix Table A.5, number of export destinations and export quality, are consistent with the main findings and indicate effects concentrated on the extensive margin.

As an additional robustness check, we re-estimate treatment effects restricting the sample to aligned firms (Table 7). Although the smaller sample reduces statistical power, the results remain consistent with the interaction-based estimates. Treatment effects are positive and statistically significant along the extensive margin in the later post-treatment years, while no systematic effects emerge for the intensive margin. This exercise confirms that the findings are not driven by functional-form assumptions embedded in the interaction specification.

Event-study estimates within the aligned subsample further corroborate these findings (Figures 5.A–C). Pre-treatment coefficients are statistically indistinguishable from zero, providing no evidence of differential trends prior to the intervention. In the post-treatment period, export participation increases gradually over time for treated aligned firms, while no systematic effects are observed for export intensity. The dynamic pattern is consistent with delayed but persistent responses along the extensive margin.

Given the central role of firm alignment in the preceding results, we complement the regression-based analysis with a data-driven heterogeneity exercise using the Generic Machine Learning framework of Chernozhukov et al. (2025). This approach uses sample splitting to identify heterogeneity patterns based on the full set of observable variables. It therefore provides an independent assessment of whether the heterogeneity patterns identified above emerge when treatment-effect variation is allowed to be determined by the data rather than by researcher-specified interactions.

In our setting, the scope for specification search is further limited by the fact that, as discussed in Section 4.1, implementation constraints led to a substantial reduction in the application form, resulting in a relatively small and predetermined set of baseline covariates. The machine-learning exercise thus operates on a parsimonious set of observables, reinforcing its role as a robustness check of the heterogeneity patterns documented above.

Appendix III presents the Generic Machine Learning methodology and detailed results. While the algorithm does not detect statistically significant overall treatment-effect heterogeneity in the full sample (N = 165), the partition it generates is economically informative. When treatment-effect heterogeneity is allowed to emerge from the full set of available pre-treatment variables—without imposing any ex ante subgroup definition—the firms classified into the group of high predicted treatment effects display significantly higher shares of differentiated producers, early enrollees, and, in particular, aligned firms.[16]

In other words, when all observable baseline variables are allowed to compete symmetrically in predicting heterogeneous effects, the dimensions emphasized above—especially their intersection—emerge as those most strongly associated with high predicted treatment impacts. This independent data-driven exercise therefore reinforces the treatment-suitability interpretation

[16]Results are qualitatively unchanged when baseline GEP score is excluded from the set of pre-treatment variables, thereby increasing the estimation sample to N = 195.

advanced in this section. While unobserved dimensions of alignment may also matter, within the set of predetermined pre-treatment characteristics available in our data, these dimensions consistently emerge as those most strongly associated with heterogeneous treatment effects.

Taken together, the regression-based estimates and the data-driven heterogeneity exercise point to a consistent interpretation. The absence of average treatment effects conceals economically meaningful impacts among firms whose observable characteristics are aligned with the program's intended target. For these firms, treatment effects emerge along the extensive margin, with no corresponding impact on export intensity. Overall, the evidence indicates that treatment suitability is central to understanding program effectiveness: the intervention generates sizable gains in export participation when firm characteristics align with the demands of the consulting framework, but yields negligible average effects when applied more broadly.

7.3 Destinations composition among aligned firms

We next examine whether the extensive-margin effects documented for aligned firms differ by destination type. Following Artopoulos et al. (2013), entry into developed markets—such as OECD countries—is typically more demanding in terms of quality standards and market requirements. If the GEP intervention strengthened export-relevant practices, its effects should be particularly visible in these destinations.

To assess differential effects across destination groups, we construct two binary outcomes: *OECD exporter*—equal to one if a firm exports to at least one OECD country— and *non-OECD exporter*—defined analogously—and re-estimate our main heterogeneous treatment effects using these alternative outcome variables.[17] Table 8 reports ANCOVA estimates. Treatment effects for aligned firms are larger and more precisely estimated for OECD destinations, particularly in later post-treatment years. At the same time, we observe positive effects on export participation to non-OECD countries, which are statistically significant in the final years. Overall, the evidence reinforces the interpretation that the intervention operated through improvements in firms' capacity to initiate and sustain export relationships.

[17]We consider all OECD countries in 2019, excluding Chile, which shares a border, language, colonial heritage, and a free trade agreement with Argentina and therefore likely presents substantially lower entry barriers.

7.4 GEP adoption and export outcomes

We examine whether improvements in export performance among aligned firms are associated with greater adoption of good exporting practices (GEP). Figure 6 compares changes in GEP scores between treatment and control firms. While treated firms exhibit larger average increases, Table 9 shows that estimated treatment effects on the overall GEP score are positive but imprecisely estimated under both ANCOVA and DiD specifications. Because GEP scores are available only for firms completing both the baseline and follow-up surveys, the estimation sample is smaller than in the main export-outcome regressions. Similar qualitative patterns emerge across subsamples by practice areas.

Two considerations complicate inference. First, the follow-up survey was conducted in 2019, shortly after completion of the intervention and prior to the emergence of export effects, potentially limiting our ability to capture gradual organizational adjustments. Second, despite efforts to standardize scoring criteria, measurement of GEP adoption may be noisy, particularly because baseline and follow-up assessments were conducted by different consultants.

We therefore interpret the estimated impact on GEP adoption cautiously. In Table 10, we instrument changes in GEP scores with treatment assignment following Bloom et al. (2013). Although the first stage is weak (the F-stat is slightly above 1) and estimates are imprecise, point estimates suggest a positive association between GEP adoption and export participation among aligned firms. Overall, the evidence is consistent with GEP adoption as a plausible mechanism, even though our data do not allow precise identification of its causal contribution.

8 Discussion and Policy Implications

This paper evaluates the impact of an intensive export-consulting program using a randomized controlled trial. Average treatment effects on export performance are statistically indistinguishable from zero. However, this null average masks substantial heterogeneity. Firms whose observable characteristics are aligned with the program's intended scope—producers of differentiated goods that enrolled early in the recruitment process—experience economically meaningful gains along the extensive margin of exports.

For these aligned firms, treatment increases export participation by 33 percentage points

five years after the intervention. Effects emerge gradually and operate through export entry and survival rather than through expansion of export volumes. The absence of intensive-margin effects reinforces the interpretation that the intervention primarily influenced firms' ability to initiate or sustain export activity.

The results suggest that export-oriented management practices can improve firms' international performance, but that impacts are concentrated among firms whose characteristics are aligned with the intervention's scope. In particular, firms producing differentiated goods and prepared to commit sustained managerial effort within a structured export-improvement framework respond strongly to the program, whereas effects for other firms are negligible.

These findings contribute to the experimental literature on management and export promotion by helping reconcile mixed evidence across studies. Rather than concluding that export-consulting interventions are broadly ineffective, our results highlight that average null effects may mask economically meaningful gains for subsets of firms. Targeting is therefore not merely an administrative concern but an intrinsic component of program design.

Overall, the evidence implies that export-promotion policies should prioritize identifying firms for which export-oriented organizational improvements are likely to translate into sustained market participation. When such alignment is present, even relatively modest consulting interventions can generate sizable and persistent gains along the extensive margin of exports.

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Table 1. Baseline characteristics

	Baseline distribution						Balancing test: difference of means			
	Mean	p10	p25	p50	p75	p90	Treatment	Control	Difference	P-value
Pre-treatment outcomes										
Exporter	0.6	0	0	1	1	1	0.6 (0.5)	0.6 (0.5)	-0.0 (0.1)	0.93
ln (export value)	13.3	10.4	11.9	13.7	14.8	16.1	13.5 (2.0)	13.2 (2.2)	0.2 (0.4)	0.56
IHS export value	8.4	0	0	11.9	14.7	16.1	8.5 (7.1)	8.4 (7.1)	0.1 (1.0)	0.96
Number of destinations	4.0	0	0	1	4	11	7.7 (9.3)	8.1 (10.1)	-0.5 (2.1)	0.82
Export quality (1,000 USD)	25.4	6.6	11.3	17.0	42.0	50.8	28.8 (18.4)	24.4 (16.2)	4.4 (3.7)	0.24
GEP score	48.7	19	32	52	64	73	44.9 (20.6)	52.6 (19.9)	-7.7 (3.0)	0.01
Pre-treatment characteristics										
Number of employees	85.0	5	10	23	71	200	101 (387)	69 (105)	32 (41)	0.43
Average salary (1,000 Pesos)	18.0	8.0	11.2	17.2	23.4	30.5	17.5 (8.7)	18.5 (9.0)	-1.0 (1.3)	0.45
Differentiated	0.72	0	0	1	1	1	0.76 (0.43)	0.69 (0.47)	0.07 (0.06)	0.27
Early enrollment	0.50	0	0	0	1	1	0.47 (0.50)	0.53 (0.50)	-0.06 (0.07)	0.38
Aligned	0.36	0	0	0	1	1	0.37 (0.49)	0.35 (0.48)	0.02 (0.07)	0.71

Figure 1. Export participation by treatment group

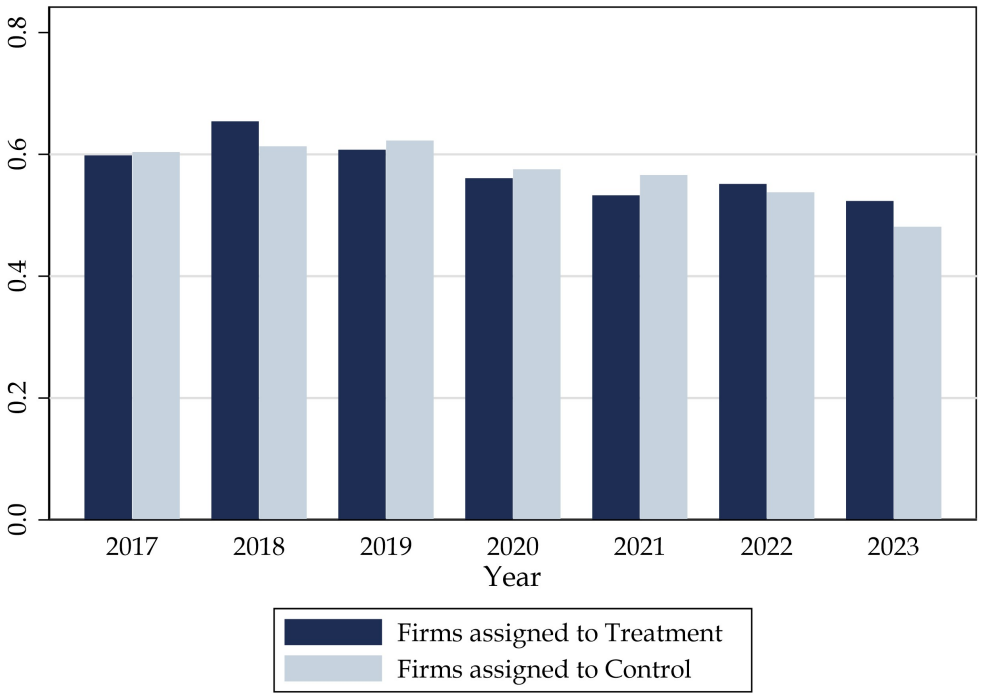


Table 2. Impact of treatment on export performance

	2018	2019	2020	2021	2022	2023
Panel A: ANCOVA						
			Exporter			
Treatment	0.05	−0.03	0.01	−0.03	0.04	0.09
	(0.05)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)
ln (# employees 2017)	0.00	0.05*	0.06**	0.06**	0.05*	0.07**
	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ln (average salary 2017)	0.10*	0.09	0.11*	0.10	0.10	0.09
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Exporter 2017	0.74***	0.66***	0.60***	0.60***	0.58***	0.53***
	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)
			ln (export value)			
Treatment	−0.09	−0.05	0.05	0.00	0.00	−0.37
	(0.22)	(0.28)	(0.31)	(0.33)	(0.41)	(0.44)
ln (# employees 2017)	0.07	0.09	0.18*	0.23*	0.21*	0.18
	(0.08)	(0.09)	(0.10)	(0.12)	(0.11)	(0.12)
ln (average salary 2017)	0.27	0.01	0.38	0.30	0.17	−0.34
	(0.19)	(0.24)	(0.26)	(0.29)	(0.32)	(0.31)
ln (export value 2017)	0.94***	0.92***	0.82***	0.84***	0.90***	0.91***
	(0.06)	(0.07)	(0.07)	(0.07)	(0.09)	(0.09)
			IHS export value			
Treatment	0.46	−0.35	0.15	−0.33	0.42	0.84
	(0.61)	(0.80)	(0.90)	(0.92)	(0.95)	(1.01)
ln (# employees 2017)	0.13	0.80**	0.90**	0.95**	0.85**	1.01**
	(0.23)	(0.36)	(0.38)	(0.38)	(0.39)	(0.40)
ln (average salary 2017)	1.26*	1.31*	1.68**	1.41*	1.44	1.41
	(0.68)	(0.77)	(0.84)	(0.85)	(0.89)	(0.92)
IHS export value 2017	0.80***	0.72***	0.66***	0.68***	0.65***	0.61***
	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
State FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for Exporter and IHS export value. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

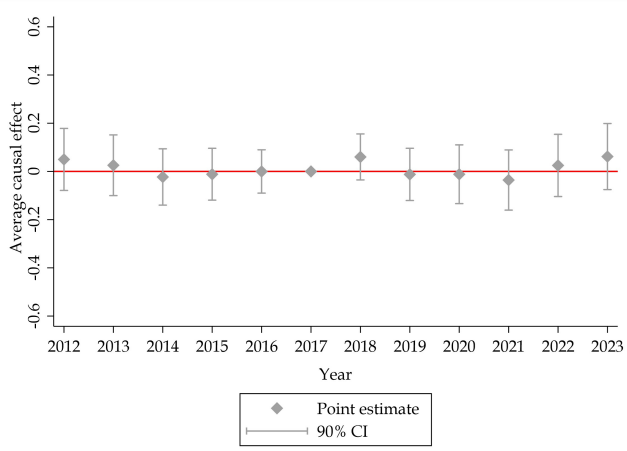
Panel B: Diff-in-Diff

	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment	0.06	−0.01	−0.01	−0.04	0.03	0.06
	(0.06)	(0.07)	(0.08)	(0.08)	(0.08)	(0.09)
			ln (export value)			
Treatment	−0.07	−0.04	0.08	−0.02	0.06	−0.21
	(0.20)	(0.25)	(0.31)	(0.35)	(0.38)	(0.39)
			IHS export value			
Treatment	0.56	−0.25	−0.26	−0.59	0.09	0.38
	(0.70)	(0.84)	(0.97)	(1.00)	(1.06)	(1.13)
Observations	426/240	426/230	426/212	426/206	426/202	426/186
Strata, Firm and Year FE	yes	yes	yes	yes	yes	yes

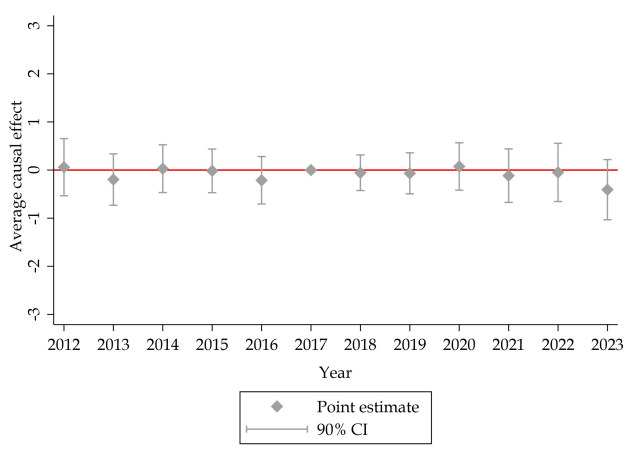
Notes: Standard errors clustered at the firm level in parenthesis. The number of observations is 426 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Figure 2. Event study

Panel A: Exporter



Panel B: ln (export value)



Panel C: IHS export value

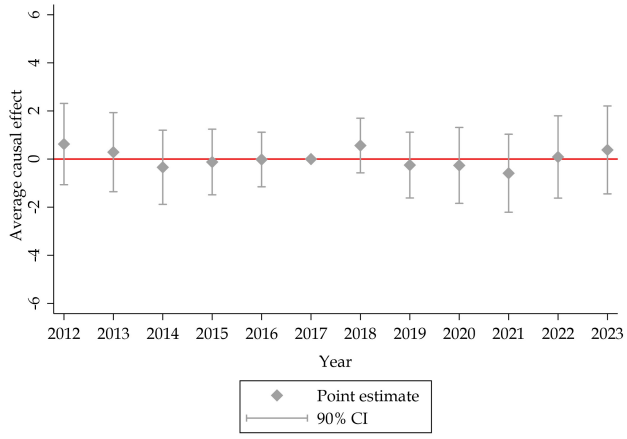


Figure 3. GEP score

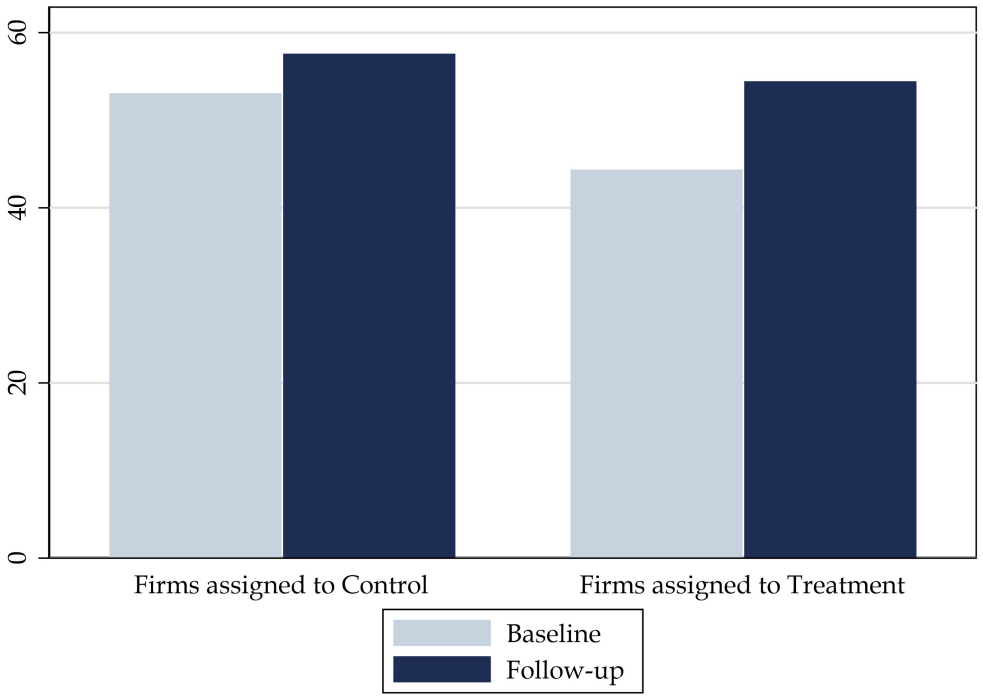


Table 3. Impact of treatment on GEP scores

Panel A: ANCOVA

		Practice areas						
	Total score	Strategy	Market research and segmentation	Product design	Production	Communication	Distribution	Administration
Treatment	**2.19**	4.11	1.72	−6.11	−6.76	2.77	4.75	6.54*
	(3.26)	(3.62)	(4.42)	(21.65)	(6.91)	(5.78)	(4.36)	(3.34)
Observations	137	131	131	71	81	92	131	131
Strata FE	yes	yes	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes	yes	yes

Panel B: Diff-in-Diff

		Practice areas						
	Total score	Strategy	Market research and segmentation	Product design	Production	Communication	Distribution	Administration
Treatment	**5.63***	8.29**	6.29	7.92	−0.15	5.92	9.83**	8.14**
	(3.21)	(4.10)	(4.51)	(16.65)	(7.45)	(5.24)	(4.29)	(4.07)
Observations	296	284	284	152	172	202	284	284
Strata FE	yes	yes	yes	yes	yes	yes	yes	yes
Firm FE	yes	yes	yes	yes	yes	yes	yes	yes
Year FE	yes	yes	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors (Panel A) and standard errors clustered at the firm level (Panel B) in parenthesis. The number of observations varies across columns because each practice-area regression is estimated on the subsample of firms assigned to receive the corresponding area-specific treatment.
*** p<0.01, ** p<0.05, * p<0.1.

Table 4. Heterogeneous treatment effects: Firm size and GEP score

	2018	2019	2020	2021	2022	2023
Panel A: Firm size (ANCOVA)						
			Exporter			
Treatment×Large firm	0.05	−0.02	0.01	0.00	0.01	0.08
	(0.08)	(0.08)	(0.11)	(0.10)	(0.11)	(0.10)
Treatment×Small firm	0.03	−0.03	0.02	−0.04	0.08	0.10
	(0.07)	(0.09)	(0.09)	(0.10)	(0.10)	(0.11)
Large firm	−0.15	0.05	0.08	0.05	0.22	0.10
	(0.10)	(0.14)	(0.14)	(0.15)	(0.16)	(0.16)
			ln (export value)			
Treatment×Large firm	0.26	0.25	0.12	0.08	0.60	0.36
	(0.34)	(0.40)	(0.44)	(0.39)	(0.56)	(0.56)
Treatment×Small firm	−0.67**	−0.49	−0.15	−0.18	−0.96	−1.63**
	(0.32)	(0.42)	(0.48)	(0.59)	(0.60)	(0.68)
Large firm	−0.86	−0.18	−0.65	−0.65	−1.22	−0.58
	(0.54)	(0.58)	(0.59)	(0.70)	(0.92)	(0.82)
			IHS export value			
Treatment×Large firm	0.69	0.04	0.25	0.03	0.47	1.14
	(0.96)	(1.11)	(1.38)	(1.39)	(1.42)	(1.43)
Treatment×Small firm	0.04	−0.62	0.15	−0.59	0.58	0.65
	(0.81)	(1.18)	(1.22)	(1.25)	(1.32)	(1.44)
Large firm	−2.29*	0.41	0.74	0.36	1.93	0.42
	(1.25)	(1.81)	(1.87)	(1.97)	(1.96)	(2.06)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: GEP score (ANCOVA)						
	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment×High GEP	0.05	0.07	0.02	−0.04	0.02	0.13
	(0.05)	(0.08)	(0.09)	(0.10)	(0.10)	(0.10)
Treatment×Low GEP	0.07	−0.05	0.03	0.01	0.10	0.18*
	(0.09)	(0.09)	(0.10)	(0.10)	(0.11)	(0.10)
High GEP	0.01	0.03	0.06	0.14	0.14	0.18**
	(0.06)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)
			ln (export value)			
Treatment×High GEP	0.18	−0.09	0.00	0.01	0.21	−0.18
	(0.21)	(0.29)	(0.28)	(0.30)	(0.37)	(0.43)
Treatment×Low GEP	−0.41	0.07	0.28	−0.41	−0.81	−0.94
	(0.36)	(0.48)	(0.70)	(0.76)	(0.86)	(1.02)
High GEP	−0.19	−0.08	0.04	−0.27	−0.57	−0.62
	(0.27)	(0.34)	(0.54)	(0.58)	(0.67)	(0.89)
			IHS export value			
Treatment×High GEP	0.64	0.63	−0.06	−0.73	0.16	1.15
	(0.62)	(0.95)	(1.18)	(1.25)	(1.30)	(1.27)
Treatment×Low GEP	0.53	−0.39	0.68	0.21	1.08	2.08
	(1.04)	(1.17)	(1.31)	(1.36)	(1.39)	(1.39)
High GEP	−0.14	0.32	0.91	1.57	1.55	2.17*
	(0.74)	(0.95)	(1.04)	(1.13)	(1.17)	(1.23)
Observations	167/98	167/94	167/88	167/86	167/84	167/76
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 167 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values. Sample size is larger than in Table 3 because heterogeneity regressions only require baseline GEP scores, while Table 3 restricts the sample to firms with GEP scores observed in both the baseline and follow-up surveys.
*** p<0.01, ** p<0.05, * p<0.1.

Table 5. Heterogeneous treatment effects: Differentiated and Early Enrollment

Panel A: Differentiated (ANCOVA)						
	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment×Differentiated	0.07	0.01	0.12	0.07	0.14	0.14
	(0.06)	(0.07)	(0.08)	(0.08)	(0.09)	(0.09)
Treatment×Non differentiated	0.00	−0.14	−0.27*	−0.27*	−0.22	−0.04
	(0.10)	(0.15)	(0.16)	(0.16)	(0.17)	(0.17)
Differentiated	−0.07	−0.08	−0.16**	−0.17**	−0.16**	−0.07
	(0.06)	(0.07)	(0.08)	(0.08)	(0.08)	(0.09)
			ln (export value)			
Treatment×Differentiated	0.02	0.07	0.36	0.24	−0.04	−0.31
	(0.29)	(0.39)	(0.44)	(0.48)	(0.54)	(0.55)
Treatment×Non differentiated	−0.20	−0.26	−0.32	−0.32	0.25	−0.54
	(0.30)	(0.34)	(0.38)	(0.51)	(0.57)	(0.73)
Differentiated	−0.34*	−0.20	−0.59*	−0.40	−0.28	0.04
	(0.20)	(0.28)	(0.35)	(0.44)	(0.47)	(0.65)
			IHS export value			
Treatment×Differentiated	0.85	0.46	1.73	1.08	1.76	1.62
	(0.78)	(0.92)	(1.06)	(1.08)	(1.10)	(1.14)
Treatment×Non differentiated	−0.26	−2.34	−3.94*	−3.86*	−2.99	−1.23
	(1.21)	(2.06)	(2.21)	(2.21)	(2.36)	(2.39)
Differentiated	−1.26*	−1.45	−2.53***	−2.54***	−2.26**	−1.11
	(0.74)	(0.89)	(0.96)	(0.97)	(1.02)	(1.24)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: Early enrollment (ANCOVA)

	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment×Early enrollment	0.06	0.00	0.17	0.12	0.18	0.22*
	(0.09)	(0.10)	(0.11)	(0.11)	(0.11)	(0.11)
Treatment×Late enrollment	0.05	−0.05	−0.12	−0.15*	−0.08	−0.03
	(0.06)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)
Early enrollment	0.04	0.02	−0.04	−0.07	−0.05	−0.10
	(0.06)	(0.07)	(0.07)	(0.07)	(0.07)	(0.08)
			ln (export value)			
Treatment×Early enrollment	−0.03	−0.17	−0.69	−0.71	−0.48	−0.61
	(0.32)	(0.37)	(0.42)	(0.45)	(0.54)	(0.62)
Treatment×Late enrollment	−0.12	0.04	0.73	0.69	0.39	−0.09
	(0.27)	(0.37)	(0.48)	(0.52)	(0.58)	(0.58)
Early enrollment	0.25	0.37	0.50	0.42	0.60	−0.04
	(0.24)	(0.25)	(0.32)	(0.36)	(0.39)	(0.48)
			IHS export value			
Treatment×Early enrollment	0.53	0.00	1.78	1.11	1.78	2.13
	(1.16)	(1.30)	(1.44)	(1.47)	(1.50)	(1.56)
Treatment×Late enrollment	0.50	−0.54	−1.12	−1.48	−0.62	−0.25
	(0.70)	(0.95)	(1.06)	(1.10)	(1.23)	(1.28)
Early enrollment	0.67	0.53	−0.27	−0.46	−0.13	−0.98
	(0.69)	(0.80)	(0.87)	(0.91)	(0.91)	(1.03)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Figure 4. Export participation by treatment group (Aligned firms)

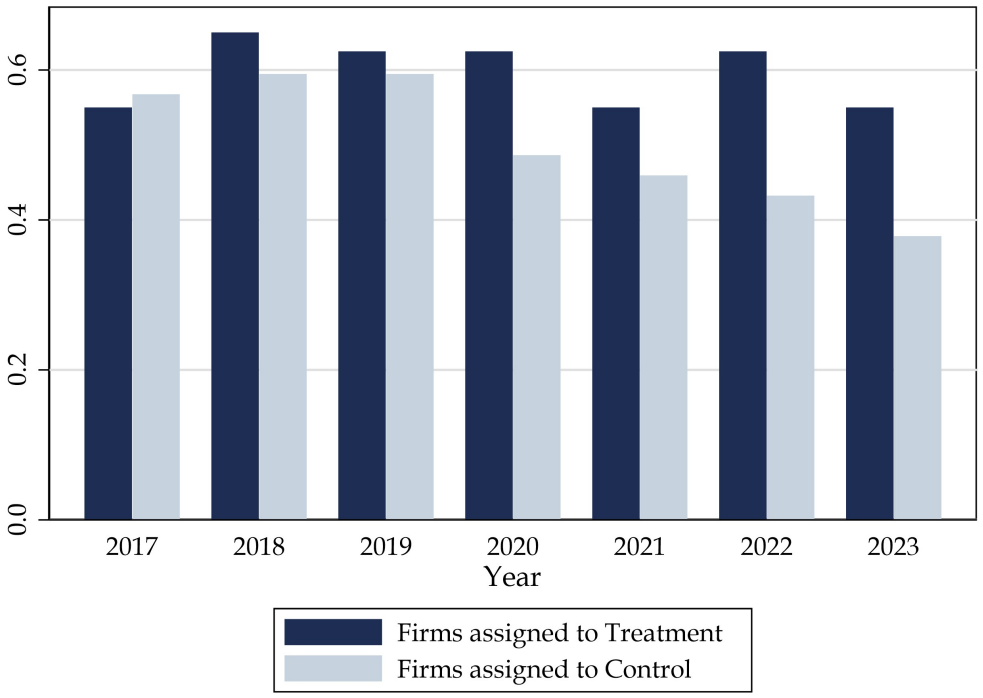


Table 6. Heterogeneous treatment effects: Alignment with program scope

	2018	2019	2020	2021	2022	2023
Panel A: ANCOVA						
			Exporter			
Treatment×Aligned	0.11	0.06	0.31**	0.24*	0.38***	0.33**
	(0.12)	(0.12)	(0.14)	(0.14)	(0.14)	(0.14)
Treatment×Not aligned	0.02	−0.07	−0.13*	−0.15*	−0.13	−0.03
	(0.05)	(0.07)	(0.08)	(0.08)	(0.09)	(0.09)
Aligned	−0.02	−0.04	−0.15*	−0.18**	−0.19**	−0.17**
	(0.07)	(0.08)	(0.09)	(0.09)	(0.08)	(0.09)
			ln (export value)			
Treatment×Aligned	0.13	−0.14	−0.99	−1.03	−1.16	−0.90
	(0.44)	(0.57)	(0.70)	(0.73)	(0.79)	(0.88)
Treatment×Not aligned	−0.18	−0.06	0.46	0.35	0.34	−0.29
	(0.24)	(0.31)	(0.38)	(0.40)	(0.48)	(0.49)
Aligned	0.07	0.40	0.50	0.63	0.94**	0.51
	(0.26)	(0.33)	(0.39)	(0.39)	(0.42)	(0.48)
			IHS export value			
Treatment×Aligned	1.33	1.10	3.59*	2.62	4.24**	3.77**
	(1.41)	(1.56)	(1.82)	(1.81)	(1.83)	(1.80)
Treatment×Not aligned	0.04	−1.06	−1.50	−1.74	−1.42	−0.56
	(0.66)	(0.94)	(1.03)	(1.06)	(1.15)	(1.22)
Aligned	−0.25	−0.45	−1.88*	−1.91	−1.87*	−1.76
	(0.82)	(1.01)	(1.13)	(1.18)	(1.11)	(1.20)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: Diff-in-Diff

	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment×Aligned	0.10	0.07	0.22	0.15	0.30*	0.27*
	(0.12)	(0.13)	(0.16)	(0.16)	(0.15)	(0.16)
Treatment×Not aligned	0.04	−0.05	−0.13	−0.13	−0.11	−0.04
	(0.06)	(0.08)	(0.08)	(0.09)	(0.09)	(0.10)
Aligned	0.03	0.01	−0.08	−0.11	−0.11	−0.10
	(0.07)	(0.08)	(0.09)	(0.10)	(0.09)	(0.11)
			ln (export value)			
Treatment×Aligned	0.06	−0.13	−0.86	−0.73	−0.60	−0.46
	(0.45)	(0.51)	(0.69)	(0.60)	(0.71)	(0.80)
Treatment×Not aligned	−0.13	−0.04	0.39	0.18	0.27	−0.18
	(0.21)	(0.28)	(0.36)	(0.44)	(0.45)	(0.44)
Aligned	0.07	0.39	0.59	0.51	0.52	0.30
	(0.22)	(0.26)	(0.37)	(0.35)	(0.40)	(0.46)
			IHS export value			
Treatment×Aligned	1.03	0.75	2.31	1.40	3.04	2.60
	(1.44)	(1.60)	(2.02)	(2.03)	(1.87)	(2.02)
Treatment×Not aligned	0.31	−0.78	−1.54	−1.56	−1.38	−0.72
	(0.77)	(0.99)	(1.08)	(1.13)	(1.29)	(1.38)
Aligned	0.41	0.42	−0.69	−0.83	−0.70	−0.65
	(0.80)	(1.02)	(1.13)	(1.25)	(1.12)	(1.32)
Observations	426/240	426/230	426/212	426/206	426/202	426/186
Strata, Firm and Year FE	yes	yes	yes	yes	yes	yes

Notes: Standard errors clustered at the firm level in parenthesis. The number of observations is 426 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

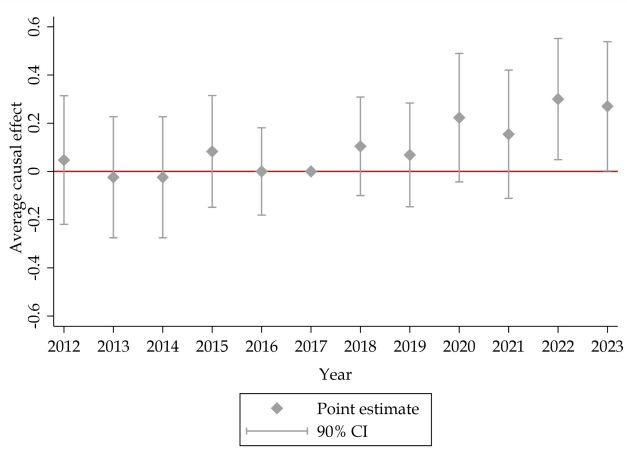
Table 7. Impact of treatment (Aligned firms)

Panel A: ANCOVA						
	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment	0.13	0.02	0.29*	0.21	0.38**	0.28*
	(0.14)	(0.14)	(0.16)	(0.16)	(0.17)	(0.16)
			ln (export value)			
Treatment	0.07	0.10	−1.38	−1.29	−1.12	−0.43
	(0.56)	(0.85)	(1.54)	(1.36)	(1.45)	(1.42)
			IHS export value			
Treatment	1.42	0.45	3.29	2.10	3.95*	2.81
	(1.63)	(1.73)	(1.98)	(2.09)	(2.12)	(2.02)
Observations	71/33	71/35	71/28	71/24	71/26	71/22
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

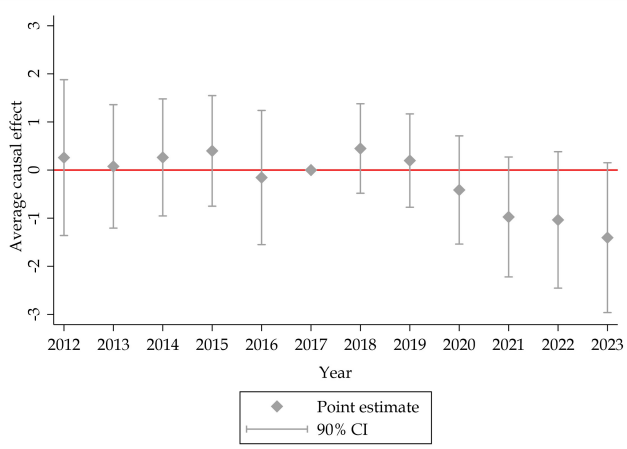
Notes: Robust standard errors in parenthesis. The number of observations is 71 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values. *** p<0.01, ** p<0.05, * p<0.1.

Figure 5. Event study (Aligned firms)

Panel A: Exporter



Panel B: ln (export value)



Panel C: IHS export value

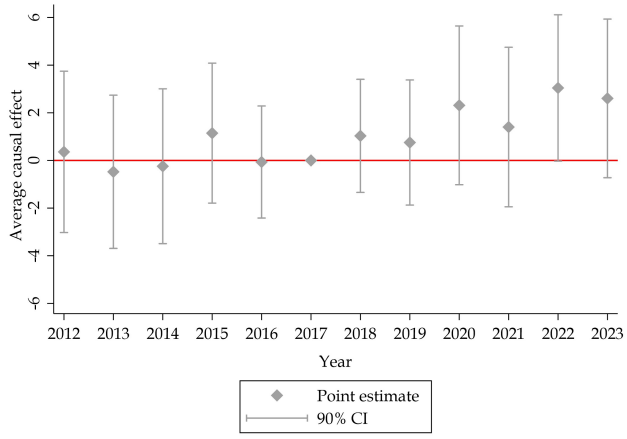


Table 8. Impact of treatment by type of destination

	2018	2019	2020	2021	2022	2023
Panel A: ANCOVA						
			OECD exporter			
Treatment×Aligned	−0.03	0.09	0.09	0.17	0.32***	0.33***
	(0.09)	(0.09)	(0.12)	(0.12)	(0.12)	(0.12)
Treatment×Not aligned	−0.05	−0.01	−0.07	−0.06	−0.05	−0.03
	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)
Aligned	0.00	−0.04	−0.10	−0.11	−0.17**	−0.19**
	(0.06)	(0.07)	(0.07)	(0.08)	(0.07)	(0.08)
			Non-OECD exporter			
Treatment×Aligned	0.13	0.04	0.19	0.20	0.26*	0.26*
	(0.15)	(0.15)	(0.15)	(0.13)	(0.14)	(0.13)
Treatment×Not aligned	0.03	−0.06	−0.07	−0.12	−0.06	−0.02
	(0.07)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
Aligned	0.00	0.02	−0.12	−0.20**	−0.12	−0.10
	(0.09)	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)
Observations	195	195	195	195	195	195
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis.
*** p<0.01, ** p<0.05, * p<0.1.

Figure 6. GEP score (Aligned firms)

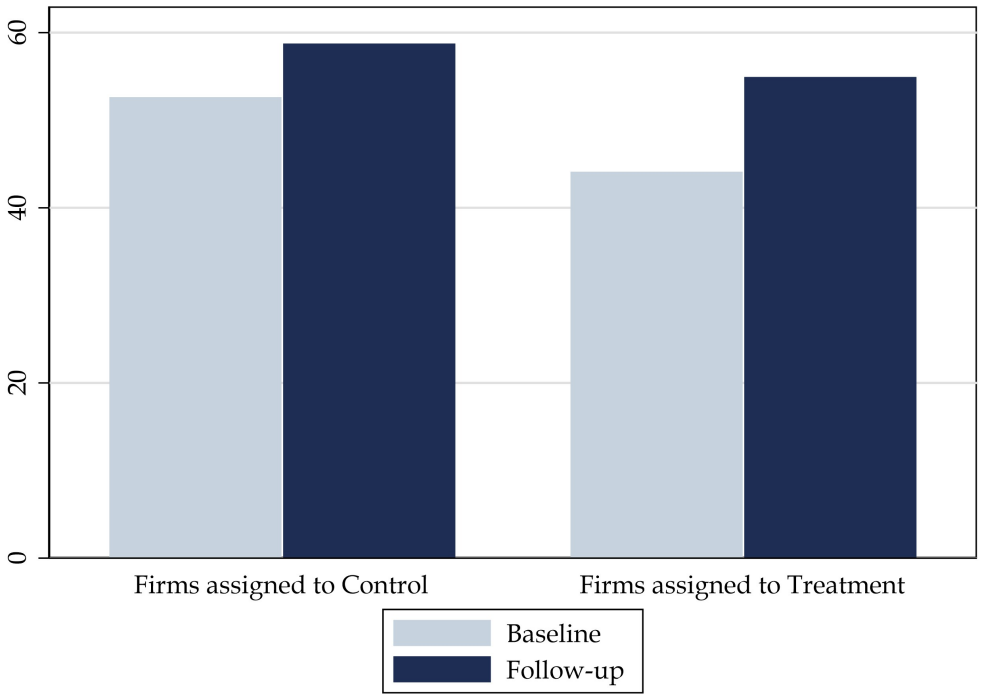


Table 9. Heterogeneous treatment effects on GEP scores: Alignment with program scope

Panel A: ANCOVA

		Practice areas						
	Total score	Strategy	Market research and segmentation	Product design	Production	Communication	Distribution	Administration
Treatment×Aligned	**1.42**	7.09	−3.45	15.98	1.22	0.49	2.06	6.33
	(4.49)	(5.68)	(6.59)	(37.91)	(9.04)	(9.69)	(5.91)	(5.48)
Treatment×Not aligned	**2.46**	2.66	4.39	−14.92	−11.17	3.17	6.03	6.67
	(4.53)	(4.86)	(6.01)	(27.77)	(9.20)	(7.68)	(6.12)	(4.47)
Aligned	**2.12**	−3.76	4.93	−6.35	0.09	6.65	3.45	−0.10
	(4.78)	(5.19)	(6.55)	(7.67)	(4.82)	(5.94)	(6.23)	(5.51)
Observations	137	131	131	71	81	92	131	131
Strata FE	yes	yes	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes	yes	yes

Panel B: Diff-in-Diff

		Practice areas						
	Total score	Strategy	Market research and segmentation	Product design	Production	Communication	Distribution	Administration
Treatment×Aligned	**4.87**	9.33*	0.29	40.83	7.33	4.85	6.64	5.87
	(4.57)	(5.17)	(6.42)	(62.81)	(13.64)	(8.81)	(6.25)	(7.01)
Treatment×Not aligned	**5.95**	7.88	9.50	−2.41	−4.51	6.00	11.38**	9.32*
	(4.28)	(5.68)	(6.03)	(16.39)	(8.65)	(6.38)	(5.68)	(5.02)
Aligned	**2.42**	−3.10	4.88	−6.16	1.97	5.63	4.94	2.43
	(4.53)	(5.34)	(5.92)	(7.66)	(5.78)	(5.58)	(5.98)	(6.35)
Observations	296	284	284	152	172	202	284	284
Strata, Firm, Year FE	yes	yes	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors (Panel A) and standard errors clustered at the firm level (Panel B) in parenthesis.
*** p<0.01, ** p<0.05, * p<0.1.

Table 10. Mechanism: Impact of GEP adoption on export outcomes

	2018	2019	2020	2021	2022	2023
Panel A: ANCOVA						
			Exporter			
Diff practices×Aligned	0.06	0.04	0.09	0.07	0.09	0.08
	(0.06)	(0.05)	(0.10)	(0.08)	(0.10)	(0.10)
Diff practices×Not aligned	0.01	0.00	−0.01	−0.02	−0.01	0.02
	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Aligned	−0.42	−0.37	−0.76	−0.71	−0.76	−0.52
	(0.48)	(0.37)	(0.76)	(0.65)	(0.77)	(0.74)
F-Statistic	1.00	1.00	1.00	1.00	1.00	1.00
			ln (export value)			
Diff practices×Aligned	0.18	0.11	0.36	0.07	0.22	0.28
	(0.78)	(0.46)	(2.29)	(0.29)	(0.42)	(5.10)
Diff practices×Not aligned	−0.02	0.06	0.19	−0.02	−0.01	−0.24
	(0.33)	(0.18)	(1.24)	(0.12)	(0.16)	(2.44)
Aligned	−1.18	0.32	−0.54	−0.77	−1.74	−4.49
	(8.97)	(4.75)	(7.06)	(2.57)	(5.13)	(62.79)
F-Statistic	0.02	0.09	0.01	0.13	0.18	0.00
			IHS export value			
Diff practices×Aligned	0.68	0.63	1.06	0.85	1.01	0.93
	(0.72)	(0.68)	(1.17)	(0.98)	(1.14)	(1.11)
Diff practices×Not aligned	0.06	−0.03	−0.10	−0.17	−0.10	0.16
	(0.16)	(0.18)	(0.25)	(0.27)	(0.26)	(0.27)
Aligned	−5.05	−5.01	−8.98	−8.27	−8.41	−6.22
	(5.44)	(5.06)	(8.76)	(7.35)	(8.58)	(8.47)
F-Statistic	1.10	1.10	1.10	1.10	1.10	1.10
Observations	137/79	137/78	137/71	137/68	137/67	137/61
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 137 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values. The change in practices is instrumented by the random assignment of the treatment.
*** p<0.01, ** p<0.05, * p<0.1.

Appendix Tables

Additional results

Table A.1. Attrition analysis

Panel A: within non attritors				
	Treatment	Control	Difference	P-value
Pre-treatment outcomes				
Exporter	0.57	0.59	-0.02	0.81
	(0.50)	(0.50)	(0.08)	
IHS export value	7.93	8.31	-0.38	0.75
	(7.06)	(7.14)	(1.17)	
Number of destinations	3.96	3.96	0.00	0.99
	(7.81)	(7.30)	(1.25)	
N	77	71	148	
ln (export value)	13.19	13.36	-0.17	0.69
	(1.90)	(2.09)	(0.43)	
Export quality (1,000 USD)	28.93	24.53	4.40	0.24
	(18.03)	(16.67)	(3.75)	
N	44	42	86	
GEP score	44.36	53.07	-8.71	0.01
	(21.31)	(19.43)	(3.36)	
N	77	71	148	
Pre-treatment characteristics				
Number of employees	104.1	75.1	-29.0	0.61
	(445.0)	(117.9)	(56.5)	
Average salary (1,000 Pesos)	17.91	18.61	-0.70	0.63
	(8.19)	(9.00)	(1.47)	
N	71	66	137	
Differentiated	0.77	0.69	0.08	0.30
	(0.43)	(0.47)	(0.07)	
Early enrollment	0.47	0.49	-0.03	0.76
	(0.50)	(0.50)	(0.08)	
Aligned	0.36	0.34	0.03	0.75
	(0.48)	(0.48)	(0.08)	
N	77	71	148	

Panel B: within total sample

	Treatment	Control	Difference	P-value
Proportion of non attritors	0.72	0.67	0.05	0.43
	(0.45)	(0.47)	(0.06)	
N	107	106	213	

Panel C: between non attritors and attritors

	Non attritors	Attritors	Difference	P-value
Pre-treatment outcomes				
Probability of export	0.58	0.65	-0.07	0.37
	(0.50)	(0.48)	(0.07)	
IHS export value	8.11	9.17	-1.05	0.32
	(7.08)	(7.08)	(1.05)	
Number of destinations	3.96	3.98	-0.03	0.98
	(7.55)	(7.50)	(1.12)	
N	148	65	213	
ln (export value)	13.27	13.49	-0.22	0.58
	(1.98)	(2.32)	(0.39)	
Export quality (1,000 USD)	26.78	22.60	4.18	0.20
	(17.42)	(17.05)	(3.26)	
N	86	42	128	
GEP score	48.54	49.14	-0.60	0.88
	(20.82)	(19.77)	(3.88)	
N	148	35	183	
Pre-treatment characteristics				
Number of employees	90.1	71.9	18.2	0.68
	(329.8)	(110.4)	(44.4)	
Average salary (1,000 Pesos)	18.25	17.38	0.87	0.53
	(8.56)	(9.46)	(1.38)	
N	137	58	195	
Differentiated	0.73	0.71	0.02	0.74
	(0.45)	(0.46)	(0.07)	
Early enrollment	0.48	0.54	-0.06	0.43
	(0.50)	(0.50)	(0.07)	
Aligned	0.35	0.38	-0.03	0.64
	(0.48)	(0.49)	(0.07)	
N	148	65	213	

Table A.2. Impact of treatment on alternative outcomes

Panel A: ANCOVA

	2018	2019	2020	2021	2022	2023
			Export destinations			
Treatment	0.03	−0.33	−0.50	−0.29	−0.46	−0.18
	(0.30)	(0.45)	(0.56)	(0.67)	(0.84)	(0.84)
ln (# of employees 2017)	0.14	0.58	0.36	0.45	0.30	0.64
	(0.15)	(0.35)	(0.44)	(0.42)	(0.52)	(0.53)
ln (average salary 2017)	0.38	0.72*	1.00**	1.07*	0.76	0.87
	(0.25)	(0.37)	(0.45)	(0.57)	(0.65)	(0.62)
Export destinations 2017	0.97***	0.94***	0.93***	0.91***	0.85***	0.77***
	(0.03)	(0.05)	(0.07)	(0.08)	(0.10)	(0.10)
			Export quality (1,000 USD)			
Treatment	−0.47	2.79	−1.31	−2.00	−2.56	−3.87
	(1.69)	(2.80)	(2.72)	(2.77)	(2.80)	(3.63)
ln (# of employees 2017)	0.50	−0.45	−1.12	−0.51	−1.33	−1.77
	(0.82)	(0.89)	(1.12)	(1.62)	(1.84)	(1.97)
ln (average salary 2017)	0.65	0.81	3.63	−0.27	3.21	−2.49
	(1.46)	(2.65)	(2.57)	(2.93)	(2.97)	(4.21)
Export quality 2017	0.86***	0.77***	0.82***	0.75***	0.80***	0.67***
	(0.04)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for Export destinations. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: Diff-in-Diff

	2018	2019	2020	2021	2022	2023
			Export destinations			
Treatment	0.01	−0.46	−0.79	−0.62	−0.80	−0.56
	(0.33)	(0.49)	(0.58)	(0.69)	(0.84)	(0.89)
			Export quality (1,000 USD)			
Treatment	−0.76	1.27	−2.42	−1.97	−3.98	−5.79*
	(1.78)	(2.48)	(2.58)	(2.92)	(2.62)	(3.25)
Observations	426/240	426/230	426/212	426/206	426/202	426/186
Strata, Firm and Year FE	yes	yes	yes	yes	yes	yes

Notes: Standard errors clustered at the firm level in parenthesis. The number of observations is 426 for Export destinations. It is smaller for ln(export value), which is defined only for firms with positive export values. *** p<0.01, ** p<0.05, * p<0.1.

Table A.3. GEP score: descriptive statistics

Panel A: Pre-treatment

	Mean	SD	Min	Max	p10	p25	p50	p75	p90	N
Total practices	**48.5**	**20.8**	**1**	**96**	**19**	**32**	**51**	**65**	**75**	**148**
Treatment	44.4	21.3	1	96	19	29	41	61	75	77
Control	53.1	19.4	5	94	27	40	58	67	73	71

Panel B: Post-treatment

	Mean	SD	Min	Max	p10	p25	p50	p75	p90	N
Total practices	**56.0**	**22.4**	**6**	**98**	**25**	**38**	**58**	**74**	**84**	**148**
Treatment	54.4	22.4	10	97	23	37	57	73	84	77
Control	57.6	22.4	6	98	29	42	60	76	84	71

Table A.4. Heterogeneous treatment effects: Differentiated and Early Enrollment (Diff-in-Diff)

	2018	2019	2020	2021	2022	2023
Panel A: Differentiated						
			Exporter			
Treatment×Differentiated	0.08	0.01	0.05	0.01	0.07	0.06
	(0.07)	(0.07)	(0.09)	(0.09)	(0.09)	(0.10)
Treatment×Non differentiated	0.01	−0.09	−0.20	−0.15	−0.11	0.06
	(0.13)	(0.17)	(0.17)	(0.18)	(0.19)	(0.20)
Differentiated	−0.03	−0.02	−0.09	−0.10	−0.10	0.00
	(0.05)	(0.07)	(0.07)	(0.08)	(0.08)	(0.09)
			ln (export value)			
Treatment×Differentiated	−0.01	−0.02	0.13	−0.01	−0.10	−0.12
	(0.25)	(0.33)	(0.43)	(0.46)	(0.50)	(0.49)
Treatment×Non differentiated	−0.20	−0.09	−0.11	−0.11	0.37	−0.44
	(0.34)	(0.30)	(0.39)	(0.57)	(0.48)	(0.58)
Differentiated	−0.08	0.01	0.12	0.10	0.16	0.02
	(0.17)	(0.19)	(0.31)	(0.34)	(0.42)	(0.47)
			IHS export value			
Treatment×Differentiated	0.80	0.17	0.64	0.01	0.63	0.36
	(0.80)	(0.90)	(1.10)	(1.12)	(1.13)	(1.21)
Treatment×Non differentiated	−0.07	−1.59	−2.94	−2.22	−1.41	0.31
	(1.63)	(2.26)	(2.35)	(2.49)	(2.79)	(2.85)
Differentiated	−0.41	−0.19	−0.92	−1.05	−0.89	0.35
	(0.61)	(0.85)	(0.88)	(0.92)	(0.98)	(1.22)
Observations	426/240	426/230	426/212	426/206	426/202	426/186
Strata, Firm and Year FE	yes	yes	yes	yes	yes	yes

Notes: Standard errors clustered at the firm level in parenthesis. The number of observations is 426 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: Early enrollment						
	2018	2019	2020	2021	2022	2023
			Exporter			
Treatment×Early enrollment	0.09	0.03	0.13	0.10	0.18	0.22*
	(0.10)	(0.11)	(0.13)	(0.13)	(0.13)	(0.13)
Treatment×Late enrollment	0.05	−0.04	−0.13	−0.15*	−0.10	−0.07
	(0.07)	(0.08)	(0.08)	(0.09)	(0.10)	(0.10)
Early enrollment	0.06	0.04	−0.02	−0.03	−0.01	−0.08
	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)	(0.09)
			ln (export value)			
Treatment×Early enrollment	0.03	−0.10	−0.44	−0.37	−0.09	−0.31
	(0.32)	(0.37)	(0.46)	(0.48)	(0.53)	(0.60)
Treatment×Late enrollment	−0.12	0.02	0.51	0.27	0.19	−0.10
	(0.24)	(0.34)	(0.43)	(0.50)	(0.55)	(0.51)
Early enrollment	0.13	0.29	0.30	0.13	0.14	−0.07
	(0.18)	(0.21)	(0.32)	(0.33)	(0.38)	(0.42)
			IHS export value			
Treatment×Early enrollment	0.94	0.33	1.35	0.98	1.90	2.20
	(1.23)	(1.37)	(1.63)	(1.67)	(1.65)	(1.76)
Treatment×Late enrollment	0.39	−0.60	−1.50	−1.81	−1.27	−1.12
	(0.77)	(1.00)	(1.11)	(1.11)	(1.32)	(1.41)
Early enrollment	0.80	0.65	−0.04	−0.14	0.19	−0.72
	(0.67)	(0.85)	(0.90)	(0.95)	(0.96)	(1.11)
Observations	426/240	426/230	426/212	426/206	426/202	426/186
Strata, Firm and Year FE	yes	yes	yes	yes	yes	yes

Notes: Standard errors clustered at the firm level in parenthesis. The number of observations is 426 for IHS export value and Exporter. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Table A.5. Heterogeneous treatment effects on alternative outcomes

	2018	2019	2020	2021	2022	2023
Panel A: Differentiated (ANCOVA)						
			Export destinations			
Treatment×Differentiated	0.15	0.34	0.77	0.98*	1.28*	0.98
	(0.32)	(0.48)	(0.48)	(0.59)	(0.70)	(0.67)
Treatment×Non Differentiated	−0.18	−1.89*	−3.87**	−3.64*	−5.05*	−3.21
	(0.65)	(1.09)	(1.66)	(2.05)	(2.66)	(2.68)
Differentiated	−0.43	−1.45**	−1.77***	−1.85**	−2.47**	−1.74
	(0.35)	(0.66)	(0.68)	(0.81)	(1.11)	(1.17)
			Export quality (1,000 USD)			
Treatment×Differentiated	−0.85	3.91	−0.15	−1.70	−1.67	−1.99
	(2.26)	(3.82)	(3.46)	(3.83)	(3.56)	(4.55)
Treatment×Non Differentiated	1.34	0.81	−3.67	−1.83	−3.36	−6.32
	(2.22)	(3.65)	(4.37)	(4.09)	(4.52)	(5.55)
Differentiated	−2.41	−2.00	−0.62	−1.48	−2.05	−3.74
	(1.60)	(2.01)	(2.44)	(2.84)	(3.05)	(3.64)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for Export destinations. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel B: Early enrollment (ANCOVA)

	2018	2019	2020	2021	2022	2023
			Export destinations			
Treatment×Early enrollment	0.07	0.64	−0.68	−0.63	−0.76	−0.04
	(0.50)	(0.61)	(0.85)	(1.07)	(1.38)	(1.49)
Treatment×Late enrollment	0.01	−1.15	−0.40	−0.09	−0.26	−0.31
	(0.37)	(0.75)	(0.81)	(0.92)	(1.04)	(0.93)
Early enrollment	0.08	−0.76	−0.31	−0.50	−0.27	−0.15
	(0.33)	(0.51)	(0.54)	(0.62)	(0.76)	(0.86)
			Export quality (1,000 USD)			
Treatment×Early enrollment	0.64	1.42	−2.85	1.26	−2.63	−3.73
	(2.73)	(3.65)	(3.82)	(4.21)	(4.16)	(5.01)
Treatment×Late enrollment	−1.29	4.02	0.39	−5.16	−2.47	−3.53
	(2.27)	(4.19)	(3.91)	(3.98)	(3.81)	(5.64)
Early enrollment	0.04	0.61	0.21	−2.42	0.01	−1.23
	(1.91)	(2.13)	(2.41)	(2.79)	(2.62)	(3.24)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for Export destinations. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Panel C: Alignment with program scope (ANCOVA)

	2018	2019	2020	2021	2022	2023
			Export destinations			
Treatment×Aligned	0.09	1.26**	0.71	1.05	1.74**	1.89**
	(0.55)	(0.61)	(0.64)	(0.75)	(0.86)	(0.87)
Treatment×Not aligned	0.00	−1.08*	−1.06	−0.91	−1.49	−1.15
	(0.34)	(0.59)	(0.73)	(0.90)	(1.21)	(1.18)
Aligned	0.02	−1.04**	−1.02**	−1.25**	−1.77**	−1.65**
	(0.30)	(0.45)	(0.48)	(0.52)	(0.71)	(0.76)
			Export quality (1,000 USD)			
Treatment×Aligned	0.64	2.91	0.12	2.59	0.16	−1.58
	(3.68)	(5.93)	(5.57)	(6.96)	(6.78)	(7.03)
Treatment×Not aligned	−0.90	2.85	−2.02	−4.34	−3.82	−5.00
	(1.97)	(3.79)	(3.53)	(3.17)	(3.13)	(4.71)
Aligned	−1.35	−1.11	−0.19	−1.12	−0.96	−0.53
	(2.32)	(2.83)	(2.99)	(3.72)	(3.38)	(3.97)
Observations	195/116	195/111	195/104	195/101	195/99	195/91
Strata FE	yes	yes	yes	yes	yes	yes
Control variables	yes	yes	yes	yes	yes	yes

Notes: Robust standard errors in parenthesis. The number of observations is 195 for Export destinations. It is smaller for ln(export value), which is defined only for firms with positive export values.
*** p<0.01, ** p<0.05, * p<0.1.

Appendix I

20 good exporting practices

Area A: Strategy

The "Strategy" area includes defining the role of exports and planning export activities as a growth channel for the firm.

Practice 1: Definition of the export role. This practice involves defining and explaining the role of exports within the firm's business strategy. Exporting may serve as a channel for growth, risk diversification, or the placement of surplus products from the domestic market, among other purposes. Clearly articulating the role of exports allows firms to integrate them effectively into their overall business strategy.

Practice 2: Planning the export business as a growth channel for the firm. This practice involves systematically planning export activities by assessing, processing, and analyzing the firm's capabilities and resources. It includes identifying the need to develop them, setting objectives across functional areas, and continuously monitoring the implementation of these plans. Defining strategic priorities –such as the relative importance of domestic versus export markets– and the specific objectives of exporting helps align all areas of the firm. Establishing these priorities fosters commitment across departments and provides clear objectives to guide their operations.

Area B: Market identification and segmentation

The "Market identification and segmentation" area covers the analysis of both potential and current export markets. It includes market evaluation, segmentation, and defining positioning within selected markets.

Practice 3: Market evaluation. This practice involves systematically analyzing foreign markets to select target markets. It requires gathering information on demand, distribution channels, competition, pricing, regulations, and market growth prospects. Selecting a target market involves determining which markets to enter. Exporting firms must thoroughly understand external markets to make strategic decisions regarding market entry, product offerings, positioning, and distribution channels (Barkema et al., 1997; Milesi et al., 2007). Unlike in domestic

markets –where firms often have an inherent understanding of market conditions– export markets require systematic research to compensate for the lack of firsthand experience.

Practice 4: Market segmentation. This practice involves analyzing buyer groups using various segmentation criteria, including geographic, demographic, psychographic (e.g., social class, lifestyle, personality), and behavioral factors (e.g., purchase occasions, usage rates, desired benefits). It requires a deep understanding of target markets, including functional, symbolic, and aspirational consumer needs, as well as preferences, tastes, and consumption habits. Effective segmentation enables firms to assess how well their products meet market demands and identify necessary adjustments. Additionally, segmentation informs product design, improving product-market fit and ultimately enhancing export performance.

Practice 5: Defining the positioning in the selected market. This practice entails identifying the unique attributes that differentiate the firm's products from competitors. It requires understanding consumer needs –both functional and symbolic–and defining how the product will address them. Clear positioning serves as a strategic guide for production, communication, and distribution decisions. By explicitly defining what sets its products apart, a firm ensures consistency in messaging, branding, and marketing efforts. Successful positioning also relies on a thorough analysis of the target market segment to align differentiation strategies with consumer expectations.

Area C: Product design and adaptation

The "Product design and adaptation" area focuses on analyzing export products, including reviewing and adapting product designs.

Practice 6: Definition of product design. This practice involves planning the design of products for foreign markets based on prior market segmentation and positioning strategies. It includes evaluating a product's export potential, developing new products, or modifying existing ones to meet international consumer preferences. Additionally, it considers technical requirements such as certifications and regulatory approvals. Reviewing product design is essential for firms, as it determines the feasibility of adapting domestically marketed products for export. Addressing cultural and market-specific differences in product design ensures greater alignment with foreign consumers. This process requires close collaboration with the production department to maintain product quality throughout manufacturing (Artopoulos et al., 2013).

Effective product design enhances both productivity and export performance (Milesi et al., 2007; Atkin et al., 2017).

Practice 7: Adaptation of the product design. This practice involves implementing the decisions made during the product design review. It includes professionally designing and developing new products or modifying existing ones. Firms must employ design professionals and utilize specialized tools to tailor products to foreign market preferences while documenting all design decisions. Professionalized product design is critical for exporters, as it enables them to create differentiated products based on market analysis while considering production and supply constraints (Milesi et al., 2007; Artopoulos et al., 2011, 2013; González et al., 2012; Atkin et al., 2017). Product design adaptation may also necessitate improvements in production processes to enhance overall product quality.

Area D: Production

The "Production" area includes practices related to sourcing inputs and managing production processes. It covers production planning, ensuring product quality, and fostering commitment with suppliers.

Practice 8: Production planning. This practice involves organizing production to meet the delivery and replenishment timelines required by foreign markets. Developed markets, in particular, have strict delivery schedules, and many industries operate on fixed commercial calendars that exporters must adhere to. To ensure timely deliveries, firms should implement production planning and inventory management systems and gather data on product demand cycles.

Practice 9: Ensuring the quality of the products. This practice focuses on producing goods that meet international quality standards while maintaining consistency over time. Exporters must adapt their inputs and production processes to meet these requirements. Unlike domestic markets in developing countries –where defective products may go unsanctioned– foreign consumers demand high-quality standards and reject subpar goods (Artopoulos et al., 2011; Atkin et al., 2017). Ensuring consistent quality improves productivity and export performance. Studies highlight product quality as a key determinant of export success (Milesi et al., 2007; Easterly and Reshef, 2010).

*Practice 10: Fostering commitment with suppliers.*This practice involves establishing long-

term relationships with suppliers to ensure timely delivery and product quality. Reliable suppliers help firms maintain consistent input quality, meet production schedules, and fulfill export orders on time. Strengthening supplier relationships also facilitates joint product development efforts, expanding production possibilities. Close collaboration with suppliers fosters innovation by enabling a continuous exchange of information on new materials and components. A best practice for exporters is to invest in building both professional and personal relationships with key suppliers to enhance commitment and reliability.

Area E: Communication

The "Communication" area includes corporate identity management, packaging redesign, and promotional efforts in distribution channels.

Practice 11: Corporate identity management. This practice involves developing a consistent corporate identity for SMEs. Corporate identity helps firms communicate a cohesive brand message across different platforms, including packaging, websites, brochures, and catalogs. Effective brand management includes verifying trademark availability in foreign markets and assessing brand acceptance. A strong corporate identity reinforces product differentiation and ensures a unified message to foreign consumers, who may have little prior knowledge of the brand.

Practice 12: Redesign of packaging and accessories. This practice focuses on adapting packaging to meet foreign market requirements. It includes ensuring product preservation, facilitating transportation, and modifying labels for language, mandatory information, and metric conversions. Additionally, it involves designing complementary materials such as user manuals. Packaging redesign must align with international transport and storage standards to prevent damage and streamline logistics.

Practice 13: Development of dissemination actions with the distribution channels. This practice involves developing strategies to promote brands and products through foreign distribution channels. These promotional efforts can include both formal advertising and informal outreach. Collaborating with distribution channels presents a challenge for exporting SMEs, not only due to financial constraints but also because of the trust-based relationships required. However, these collaborations are crucial for successful international market entry. Coordinating dissemination efforts with distributors increases brand awareness and enhances export performance.

Area F: Distribution

The "Distribution" area covers the evaluation and selection of distribution channels, building trust and commitment with these channels, managing logistics for timely delivery, and providing after-sales services.

Practice 14: Evaluation and selection of distribution channels. This practice involves analyzing and selecting distribution channels based on their ability to represent the firm's brand and products in foreign markets. Key factors to consider include territorial coverage, product mix, storage capacity, client profiles, promotional practices, and sales staff availability. A rigorous assessment of distribution channels is essential, as they ensure the proper placement of products in target markets. Selection should align with the firm's delivery capabilities and desired profit margins.

Practice 15: Building trust with the distribution channels. This practice focuses on establishing trust-based relationships with foreign distributors. Trust is a crucial factor for developing a stable export market in the medium term (Artopoulos et al., 2013; González et al., 2012). Distribution channels serve a dual role: they are strategic partners in product positioning and valuable sources of market intelligence. Research indicates that successful exporters maintain regular communication with their customers through visits and invitations (Milesi et al., 2007). Firms adopting this practice often engage in various activities to demonstrate reliability and product consistency.

Practice 16: Building a relationship of commitment with the distribution channels. This practice involves establishing long-term commitment with distribution channels by honoring contracts and agreements. Commitment also entails maintaining a continuous exchange of information on buyer behavior and potential market opportunities. By fostering strong relationships, exporting firms can improve market positioning and identify growth prospects.

Practice 17: Logistics management for the delivery of the products in a timely manner. This practice focuses on managing logistics efficiently to ensure timely product delivery to distribution channels. As previously mentioned, foreign markets expect firms to meet strict delivery and replenishment deadlines. To achieve this, exporting firms must not only plan production schedules but also implement effective inventory management processes to prevent stockouts and delays.

Practice 18: Provision of after sales services. This practice involves offering guarantees and post-sale support to distribution channels or customers. After-sales services enhance the perceived value of a product and are an important differentiator in competitive export markets. Exporting firms must design guarantee policies that align with the expectations and legal requirements of target markets, ensuring both distributors and end consumers receive adequate support.

Area G: Administration

The "Administration" area includes adapting the firm's administrative structure and systems to facilitate export operations, as well as establishing pricing and financing policies for distribution channels.

Practice 19: Adaptation of the administrative structure and systems. This practice involves modifying the firm's administrative structure and systems to meet the requirements of international trade operations. In many cases, this entails adopting modern accounting systems and financial mechanisms for handling transactions with foreign firms. Research suggests that export success is closely linked to the proper adaptation of administrative structures and systems (Milesi et al., 2007).

Practice 20: Establishment of a pricing and financing policy for distribution channels. This practice involves developing differentiated pricing and financing policies for foreign distribution channels. It includes setting discount structures and financing terms to enhance market competitiveness. Before engaging with potential distribution partners, exporting firms must thoroughly understand their cost structures to establish pricing strategies that ensure attractive profit margins while maintaining market sustainability.

Appendix II

Stratified randomization process

The randomization process among eligible applicants took place in two steps. First, using enrollment and administrative data, we generated strata based on firm location and employment. We divided the sample into two groups based on location: firms from Buenos Aires, Santa Fe, or Córdoba (which we refer to as the "Pampas Area") and firms from the rest of the country. This resulted in 90 firms from the Pampas Area and 123 from the rest of the country.

Within each of these two groups, we further stratified firms into nine groups based on employment. Specifically, we created nine groups of 10 firms in the Pampas Area. For firms from the rest of the country, we formed seven groups of 14 firms, one group of 13 firms, and one group of 12 firms. Firms were randomly assigned to those groups.

Next, within each stratum, we randomly assigned firms to the consulting intervention. In the Pampas Area groups, we assigned five firms to the treatment and five to the control group. In the remaining groups, we assigned seven firms to the treatment and seven to the control, except for the groups with 13 firms –where we assigned seven firms to the treatment and six to the control group– and 12 firms –where we assigned six firms to the treatment and six to the control group–.

Appendix III

Generic Machine Learning

To address concerns about overfitting from ex-post subgroup choices in heterogeneity analysis, we implement the Generic Machine Learning (GML) framework proposed by Chernozhukov et al. (2025), where sample splitting allows separating prediction from inference. First, in an auxiliary subsample (A), Machine Learning (ML) models generate proxy predictors for the baseline function (the expected outcome under no treatment) and for heterogeneous treatment gains. Then, estimation and inference are conducted in an independent subsample (M), treating these learned proxies as fixed inputs. The key insight is that, since estimation and inference performed in M use independent data from that used for training in A, heterogeneity patterns found in A by chance should not emerge in M.

Since the procedure is data-intensive, in small samples such as ours (fewer than 200 firms), heterogeneity estimates can be imprecise. Therefore, economically meaningful heterogeneity may not be detected with statistical significance.

Operationally, using only observations in A, we train ML[18] learners to obtain for each post-treatment year $t \in \{2020, \ldots, 2023\}$, (i) a proxy for the expected outcome in the absence of treatment, $B_t(z) = \widehat{\mathbb{E}}[Y_{i,t} \mid T = 0, Z = z]$, and (ii) a proxy for the heterogeneity score, $S_t(z) = \widehat{\mathbb{E}}[Y_{i,t} \mid T = 1, Z = z] - \widehat{\mathbb{E}}[Y_{i,t} \mid T = 0, Z = z]$. $S_t(z)$ should be interpreted as a possibly biased and noisy proxy for variation in treatment gains across firms, rather than a fully consistent estimate of the conditional average treatment effect.[19]

Then, we use these proxies to construct three objects: (i) the Best Linear Predictor (BLP), which tests whether treatment effect heterogeneity is detectable based on pre-treatment variables; (ii) Sorted Group Average Treatment Effects (GATES), which estimate average effects across groups formed by the predicted heterogeneity score $S_t(z)$; and (iii) Classification Analysis (CLAN), which compares the mean value of pre-treatment variables in the most- and least-affected groups defined by $S_t(z)$ in order to identify those that contribute most to differentiating between the two groups.

[18] We use two learners: Random Forest and Ridge regression.

[19] We randomly split the sample into two equal halves (A and M) 100 times, use the median estimate across splits, and construct conservative split-adjusted 90% confidence intervals with coverage at least $1-2\alpha$ ($\alpha = 0.05$).

Throughout, we define Z as the vector of all the available variables observed at baseline (year 2017). We group these pre-treatment variables into: (i) *outcomes:* Export participation, OECD exporter, and GEP score, and (ii) *characteristics:* ln(employment), ln(average wage), Early enrollment, Differentiated, Aligned. We focus on results for Exporter status as this is the outcome variable for which we detect significant heterogeneous impacts in the regression-based analysis.

Best Linear Predictor. In the main subsample M, we estimate the BLP of the conditional average treatment effect, treating the estimated proxies $B_{it} = B_t(z)$ and $S_{it} = S_t(z)$ as fixed inputs. We implement the weighted-residual[20] BLP specification of Chernozhukov et al. (2025), as in the *GenericML R* package[21], estimating the model separately for each post-treatment year:

$$Y_{i,t} = \alpha_t + \beta_{0t} B_t(Z_i) + \beta_{1t}(T_i - p(Z_i)) + \beta_{2t}(T_i - p(Z_i))(S_t(Z_i) - \bar{S}_t) + \gamma_{s(i),t} + \varepsilon_{i,t}, \quad (4)$$

where $Y_{i,t}$ is an indicator for exporting in year t, T_i is the treatment indicator, $p(Z_i)$ is the propensity score,[22] $\gamma_{s(i),t}$ denotes strata fixed effects and $\bar{S}_t$ is the mean of $S_t(Z_i)$ in M for year t. We use the residualized treatment indicator $T_i - p(Z_i)$ and interact it with $S_t(Z_i) - \bar{S}_t$ to test whether treatment effects vary systematically with the ML heterogeneity score. The interaction coefficient, β_{2t}, tests for heterogeneity along the learned score. In our application β_{2t} is not statistically different from zero in any post-treatment year.[23]

Group Average Treatment Effects. GATES estimates how treatment effects vary across the distribution of the heterogeneity score $S_t(Z_i)$. In subsample M, for each post-treatment year $t \in \{2020, \ldots, 2023\}$, we sort firms by $S_t(Z_i)$ in ascending order, where higher values indicate higher predicted treatment gains. We partition them into K=3[24] non-overlapping groups. Group 1 ($G1$) contains firms at the bottom of the score distribution, while Group 3 ($G3$) contains those at the top. We then estimate the average treatment effect within each group

[20]The weighted-residual BLP uses weights $w(Z_i) = 1/[p(Z_i)(1-p(Z_i))]$, where $p(Z_i)$ is the propensity score.

[21]Welz, M., Alfons, A., Demirer, M., and Chernozhukov, V. (2022). *GenericML: Generic Machine Learning Inference.* R package version 0.2.3. `https://CRAN.R-project.org/package=GenericML`

[22]The propensity score $p(Z_i) = \Pr(T_i = 1 \mid Z_i)$ is known and constant within strata: assignment is 50-50 in each strata, except for one odd-sized strata with a realized split of 7 treated and 6 control.

[23]We repeat the analysis on a larger sample (N=195) excluding GEP score (not observed for all firms); conclusions are similar.

[24]We choose to use three groups to have at least 30 firms per group. However, the results are similar if we use two or four groups.

and focus on the difference between the most and least affected groups; a positive difference indicates larger effects among firms with higher predicted gains. We find this difference to be positive in all years, although it is not statistically significant at conventional levels.

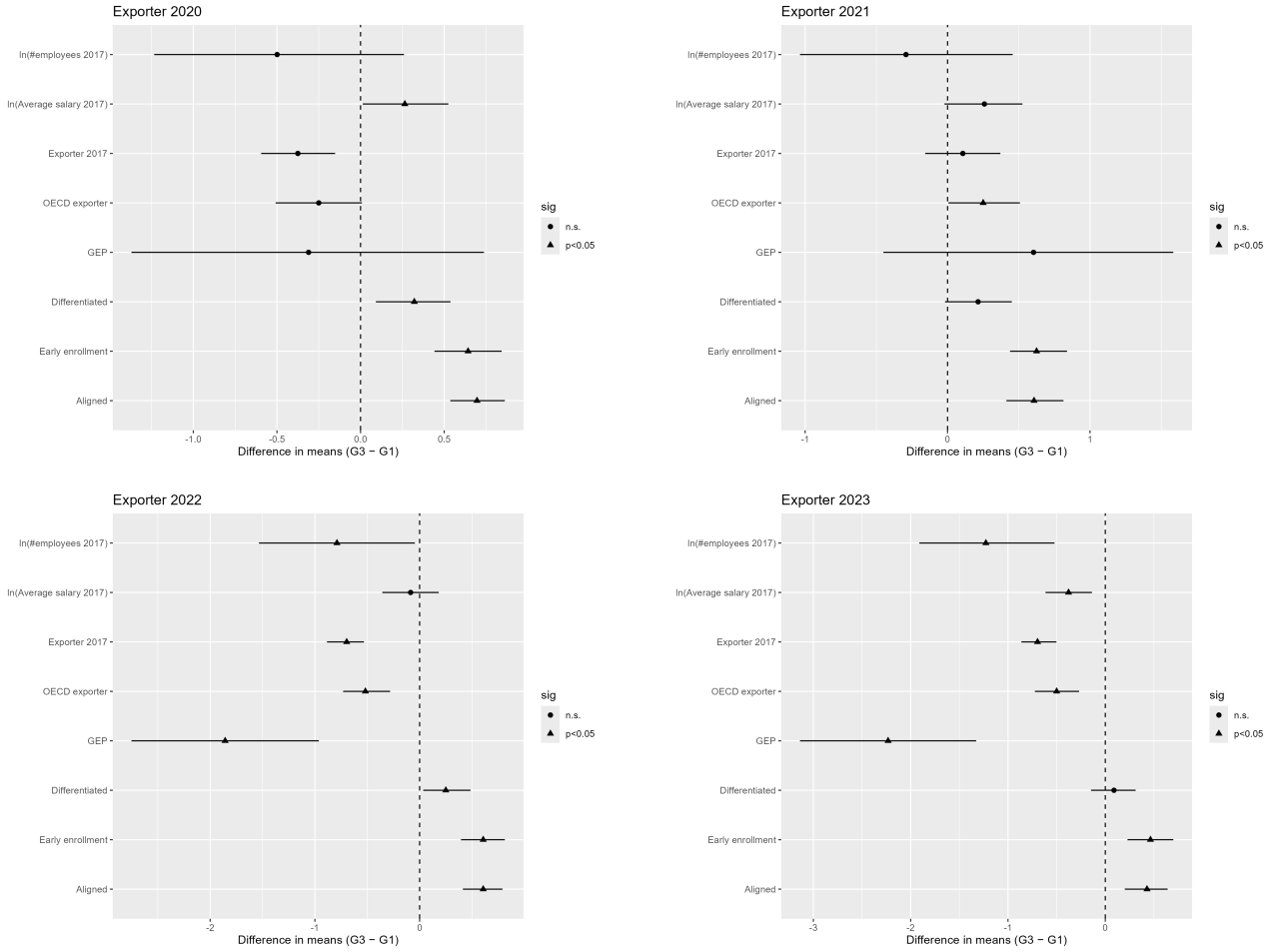
Classification Analysis. CLAN seeks to assess whether the score-based heterogeneity $S_t(Z_i)$ is associated with pre-existing firm characteristics and outcomes. To do this, Figure 7 plots, for each pre-treatment variable, the difference in means between groups $G3$ and $G1$. Positive values indicate that firms predicted to benefit the most from the treatment ($G3$) have a higher baseline value for that variable than those predicted to benefit the least ($G1$).

Figure 7 shows that, among all pre-treatment variables, Aligned and Early enrollment are the two with consistently highest estimated mean differences between the most- and the least-affected groups, as well as the only two with significantly positive differences in all years during the period 2020-2023. This pattern suggests that the learned score $S_t(Z_i)$ ranks firms primarily along these variables. Averaging across 2020-2023, 63.4% of firms are Aligned in the most affected group ($G3$), whereas 2.2% are Aligned firms in the least affected group ($G1$).[25]

The results of this data-driven exercise, where heterogeneity patterns are allowed to emerge without researcher-specified impositions, are consistent with the regression-based heterogeneity analysis in Section 7.2. These results indicate that treatment effects are concentrated among firms aligned with the program's intended scope.

[25]As a robustness check, we exclude baseline GEP, since it is missing for some firms, thereby increasing the estimation sample to N = 195. Results are qualitatively unchanged.

Figure 7. CLAN: High–Low Differences in Pre-treatment Variables



Notes: Figures report CLAN estimates for exporter participation in years 2020–2023. Each plot shows high-low differences in mean pre-treatment variables. Points and triangles show median estimates across 100 splits; horizontal bars represent 90% split-adjusted confidence intervals. Triangles denote statistical significance at the 5% level. For visual clarity, the GEP measure is divided by 10 in the plot. N = 165.